



# TECHNOLOGY INTERVENTION TO DEVELOP SUSTAINABLE FASHION PRODUCTS

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## ABSTRACT –

Fashion industry is considered to be one of the most polluted industry amongst all, the reason being end number of manufacturing processes being taken to convert the fiber into finished fabric or garment. Fashion industry, a fast moving and ever changing industry needs to bring all together a new collection in almost every three months, to meet the ever changing demands of the fashion consumers who always seek for something new, fresh and unique in garments, so that they could look different from rest others. This thought of looking different, only pushes the fashion industry to be in trend by supplying the never ending fashion demands of the consumers. But while meeting this demand, fashion industry forget that; apart from business they have some social responsibilities towards the people, towards the nature, and in turn they keep on replenishing the environment and natural resources just to be in race. But thanks to the new age technology, and people becoming conscious about preserving our mother earth for our better future. People now a day's demand for Eco friendly fashion, which in turn leads the fashion industries to look for sustainable techniques of making fashion products, and prevent our nature from being get exploited.

## INTRODUCTION –

Fashion & technology go hand in hand, in earlier times when people used to prepare fabric or garment, very traditional methods of manufacturing went in way, which were of course tedious, time consuming and most of all much wastage of natural resources was there, due to lack of eco-friendly approach towards the production. But thanks to technology and awareness among the fashion consumers which compelled the fashion industries to look for minimum wastage and environmental friendly approach towards making fashion world, less pollution free and more eco-friendly. Here listed below few technological interventions in making fashion world more sustainable and environmental friendly.

### 1. Wearable Technology:

With this technological trend, one can implant multimedia, sensor, and wireless communication technology into people's clothes and apparel which support gesture and eye movement operation, and many interactive ways, mainly explore and create directly wearable intelligent devices. It is one of the most obvious technological trends in fashion industry with the emergence of wearable devices like smart watches and fitness trackers and many more. By integrating and utilizing various materials and precious metals, high-end materials, and even gemstones, techy startups are now focusing on activity trackers and sensors into stylish pieces of jewellery, especially trendy rings, bracelets, and watches. Now, fashion leaders are trying to merge various form and function to make wearables more stylish and functional. Many fashion brands and startups are collaborating up to create connected bracelets, rings, and necklaces. Past collaborations were Tory Burch and Fitbit, as well as Swarovski and Misfit Wearables.



## 2. 3D Printing and Lasers-

In today's scenario, **3D printing** is becoming essential in the design and development of clothing and footwear, as it gives a biggest advantage for producers to prototype in real time, instantly modifying and altering in a way that's a lot more efficient and precise than it once was. Now, cutting-edge 3D printing technologies and lasers are available which designers can use to create customized pieces quickly, affordably, and with significantly less effort. There are 3D custom software which has ability of virtual browsing, visually impact-full prints and richly textured fabrics. 3D printing is also hugely impactful to footwear industry. Popular brands like New Balance and Reebok both use 3D printing to print elements of their shoes, including laces and soles.



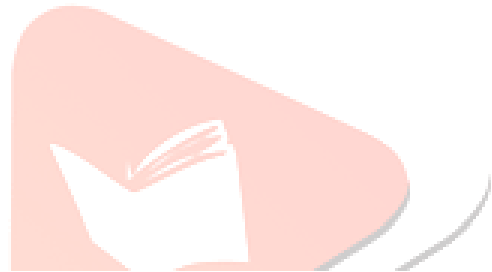
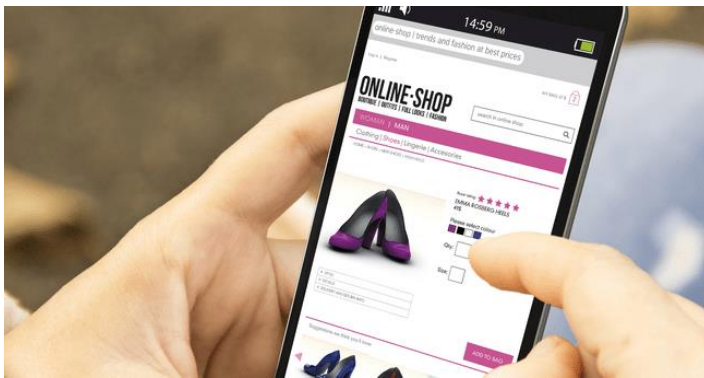
## 3. Internet of Things (IoT) for Fashion:

Fashion industry has adopted the concept of Internet of Things (IoT) where 70% of retailers around the globe are utilizing this concept in their business to improve overall customer experience and the performance of company. For example, Nadi X is yoga pants which have sensors in them. This is one such product and there are many more products to come in future. IoT driven products will help retailers to create a personalized experience for their customers. Presently, IoT in fashion is not only limited to application of wearable but also involves the stitching of invisible sensors onto cloth fabrics or enhancing interconnected apparels to perform various functions such as advising the user about the product's materials, helping in detecting the product if its lost or even in facilitating style tips. The Internet of Things (IoT) basically makes the tasks easy for its users and helps them in cutting down the loss and in enabling more efficient and effective management of inventory with the help of its tracking feature.



#### 4. Mobile Commerce for Fashion:

Nowadays, smart phones are considered as cool and important gadgets but they are the biggest supporter of eCommerce. Consumer can easily search the market for easy online shopping where payments are made digitally. Lately, shoppers has given priority for making purchases online, giving reasons of convenience and less struggle time. Seeing the importance of technological advancement, fashion industry has shifted focus on Development for Mobile applications that are very simple to use and help buyer purchase online.



For example, when we talk about Instagram App, it has a shopping feature that makes shopping of the product easy, just by clicking on a liked item to be displayed to the product page to make a purchase. So, fashion industry is paying attention to give convenience and ease to the users so that you are able to expand on your existing business.

#### 4. Block chain:

Block chain is a best tool for transparency, traceability and efficiency in the **supply chain management**. The best feature of this is that it allows all of its members, from carriers and banks, to intermediaries and suppliers, to be in connect and exchange information, documents and data, directly and securely.



#### But what is blockchain and how does it work?

Blockchain is mostly a record-keeping technology behind bitcoin and digital currency. “Blocks” on the blockchain are particularly made up of pieces digital data which stores the information about different transactions like the date, time, and dollar amount of your most recent purchase, as well as who is involved in the transactions. However, they also store the information which helps to distinguish them from other

blocks, using a unique code called hash. This can be used to effectively track and keep records of clothing apparel and supply chains through different technologies like track and trace, inventory management and many more.

## 5. 3D Scanning in the Apparel Industry:

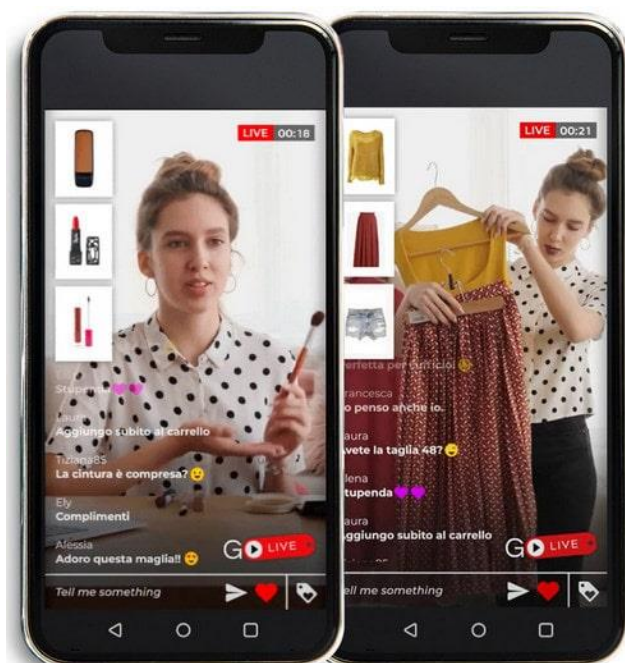
It is very difficult for the customers to find the perfect fit when shopping for clothes online, but 3D scanning and **garment fitting** tech could change that. Retailers are hoping that this technological advancement could also reduce returns. TG3D Studio, for an individual, has developed a 3D body scanner which ensures a tailored fit. It works in such a way that users get scanned via an app and can dress up their avatar in different garments to see how they fit.



Virtual try-on solutions are being offered by many **fashion brands** as well. Israeli startup Zeekit's platform has allowed shoppers to virtually try on clothing items from online stores. This technology is already embedded into the websites of major retailers, including Walmart, Macy's, and ASOS. Fit:Match has also come up with **3D body scanning** solutions to help with sizing. First, a 3D camera will scan the in-store shoppers. The software then asks users about individual preferences and priority before suggesting a list of different clothing items from retail partners. Customers also get an ID that they can be even used in the future and when shopping online.

## 6. Livestreaming and Ambushing Social Media:

Nowadays, the excitement and craze of social media platforms are very high and it also offers a wealth of data that can help luxury and fashion brands find new insights and sales opportunities. Heuritech, it is a Paris-based tech startup, which specially uses AI to provide trend forecasting. The company's platform analyzes millions of images which are available on **social media** to forecast which patterns, designs, and items or any design elements which are in demand with different consumer groups. The software also helps to predicts product trends that will be in demand in the next 12 months.



Livestream shopping is trendy and creative way used by many brands. In China, for instance, livestreaming is predicted to generate around a fifth of the country's total online sales by 2022, according to HSBC and Qianhai Securities. There are many live video platforms such as Kuaishou, Bytedance, that are rapidly adding commerce features.

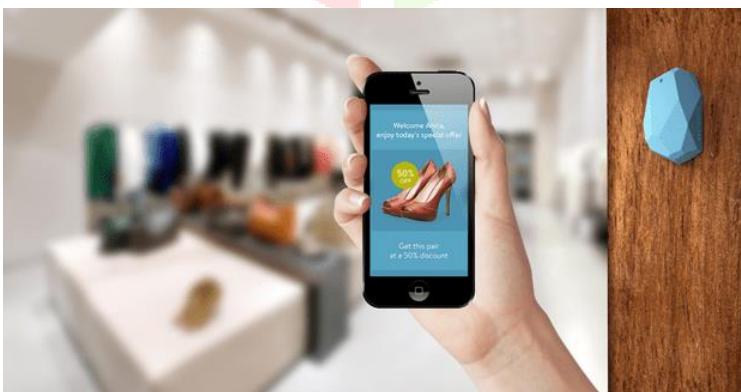
## 7. Fashion Shows as Tech Events:

Currently, all fashion brands and designers have their concerned on fashion shows that have to go in a huge space and was being a memorable moment for the audience. As a result of technology it is being widely used in creating a memorable runway experience through 3D projections, 360 degree view and other tech gadget to give an impressive look and feel to the show. There are various custom made software which are available that helps in programming in different aspects such as event lights, fountains, music and other gadgets during the fashion show. Technology is heart here for making the entire event a complete success for the brand.



## 8. Beacons and Geo-fencing for Fashion:

The primary objective of integrating this technology in fashion industry is to give a more customized experience to consumers while shopping. Beacons are small sensors that are simply kept in retail stores that will be connected to smart phones and push content in them. This helps fashion retailers to pass commercial content to the consumer's mobile device; which particularly helps in promotion of fashion brands through dispatching of various coupons on mobile devices. Just imagine locking a broader element of relevant customers by offering them a 15% discount coupon on the retail brand. Such technology is emerging and powerful and yet helpful in getting more revenue to one's business.



## 9. Mobile Enterprise Resource Management for Fashion:

Fashion industry is highly benefiting from Mobile **ERP** applications which highlight the live KPI dashboards, expense reporting and other important information which is required to keep the businesses up and running seamless. To talk about vendor, inventory and procurement management, these parts plays a huge role in the fashion industry. Any fall down on the quantity or any miscommunication with the vendor can lead to an emergency situation. Through Mobile ERP app, the business management side of

any retail brand is effectively handled and managed. Therefore, one of the most useful custom fashion technology solutions is a Mobile ERP.



## 11. Sustainability

In the past fashion has always followed the traditional seasonal format. Designers released spring/summer and fall/winter lines, as well as pre-fall and pre-spring runways. Lately, as the reality of the climate emergency sets in, we've seen designers move away from seasonal collections in favour of designing timeless pieces that can serve consumers for years. In fast fashion, designs move quickly from runway to store shelves. Fast fashion giants can produce as many as 52 micro collections per year. To keep up with the rapid consumer demand traditional brands had to keep up and release up to 11 collections per year. As rapid production runs create excessive textile waste, lots of apparel ends in landfill and harms both factory workers and the environment. Around 12.8M tons of clothing is sent to landfills annually. The fashion industry is responsible for up to 10% of global CO2 emissions, 20% of the world's industrial wastewater, 24% of insecticides, and 11% of pesticides used.

Due to this environmental impact, more consumers and fashion brands are turning to the concept of "slow fashion" and away from the long and costly manufacturing process. As a result, more brands are opting for sustainable production and more consumers are choosing conscious brands over fast fashion. According to the fashion search engine Lyst there is a 47% increase in shoppers looking for ethical and sustainable products. Another sustainable practice that is getting even more popular now is buying secondhand clothing through consignment and thrift stores. One of the largest online thrift stores, ThredUp, predicts that the total secondhand apparel market will hit \$51B by 2023. Clothing site Re-Fashion has developed the perfect cyclical structure for sustainable fashion. They sell second-hand designer clothing at excellent prices, whilst also accepting donations for free. The site has cornered an in-demand market by offering both sustainable buying and donation options that consumers love. It's also a completely digital platform, pushing the sustainable message through their online market place. This demonstrates how sustainability is pushing business decisions, as well as reshaping the online market. Arguably, thrifting has now gone digital as sustainability is now the order of the day for most brands and designers.

## 12. Virtual models

If you're into fashion, you're likely familiar with Fashion Week. This iconic event is held twice a year in the big four fashion capitals of New York, London, Milan and Paris. Here, editors, buyers and models gather to showcase the latest trends and newest collections.

Unfortunately, these shows generate tons of material waste, not to mention 37% of global annual carbon emissions.

Some designers are using virtual models to showcase their creations and curb waste. Many of these avatars have their own social media accounts and a significant online following, allowing designers a wider reach than if they were to participate in physical fashion shows.

Because the CGI models wear clothes that haven't actually been manufactured, they help reduce textile waste and effectively conserve resources like water and energy.

## 13. Digital Sampling

Digital sampling has also reduced fabric waste, especially during the pandemic. As retailers closed their doors and dressing rooms became unavailable, many shoppers resorted to buying pieces online.

A few years ago, this would have entailed size charts, inaccurate measurements and billions of returns. Now, however, consumers can use digital sampling, a technology that allows you to try on clothes virtually, just as you would in a store.

This innovative solution has lowered production costs for hundreds of major retailers and designers. More importantly, it's reduced the need to create physical samples, thereby saving time, energy and resources while simultaneously decreasing — and even eliminating — waste.

## 14. Machine learning

Fashion brands are constantly reshaping their approach to product design by predicting what customers will want to wear next. How do they know which upcoming trend will pique public interest?

Two words: machine learning.

This technology collects data directly from consumers to determine what's hot and what's not. It then uses the information to forecast demand, spot trends and help brands make better business decisions.

The more data these systems glean, the smarter artificial intelligence becomes, allowing brands to manage inventory and satisfy customers without overstocking or overproducing.

Machine learning also incorporates algorithms and big data to adopt more efficient manufacturing and distribution processes. Ultimately, this tech saves time, money and precious resources like water and energy.

## 15. Alternative textiles

Are consumers actually interested in sustainable apparel? Well, if they weren't, there wouldn't be so many alternative textiles to choose from. Nearly 60% of those between ages 18 and 21 care whether marketers offer environmentally friendly products, which means green fabrics are in high demand these days.

In response, hundreds of brands have begun implementing materials like vegan pineapple leather, linen from flax plant fibers, and natural fibers like lyocell and hemp.

Conscious designers also use cork, bamboo and even seaweed to make ethical clothes. Many of these items are also biodegradable, so they'll quickly decompose if they do end up in a landfill or marine environment.

## 16. Returns technology

Returns in the U.S. alone generate 15 million tons of carbon emission and 5 billion pounds of landfill waste every year. By dealing more efficiently with the returns process, the fashion industry might get more use out of second hand garments and minimize waste.

Luckily, return technology has already made this possible for hundreds of brands. This innovation uses cloud-based software and algorithms to divert returns from landfills and back to stock, refurbishment centres and charitable organizations.

Artificial intelligence may also aid in reducing return rates. Consumers send items back for various reasons, including poor fit and slow delivery times. With the help of AI, brands can implement customer database segmentation to determine exactly why and what shoppers are returning.

This tech will uncover patterns, behaviours and consumer characteristics to help retailers make smarter choices regarding advertising, quality control and product presentation.

## Conclusion

Fast fashion is destroying the planet, and the facts speak for themselves. The fashion industry is responsible for 10% of annual global carbon emissions and 20% of worldwide wastewater treatment. Although less than 1% of clothing is recycled into new garments, brands continue to ramp up design and production. If the industry keeps chugging along at this same rate, the Earth and its inhabitants will surely run out of resources or bury themselves in textile waste — whichever comes first. Luckily, today's consumers are starting to demand change. Shoppers are tired of excessive waste and greenwashing and want honesty and slow, sustainable fashion.

Subsequently, many clothing brands are turning to technology for help. In 2022, some innovations could make fashion more sustainable — and boost customer satisfaction. As long as consumers keep demanding sustainable fashion, the industry will rise to meet and exceed their expectations. The future of fashion will undoubtedly focus on eco-friendliness, from design to distribution. Upcoming innovations like mobile body scanning will allow consumers to purchase clothes that fit their exact body type and physical proportions, reducing returns and associated waste.

Machine learning will grow smarter, and big data will improve analytics so brands can better predict trends in design and demand. Alternative fabrics will become comfier, more durable and more sustainable, and new, natural materials will replace synthetic fibers. It would not be wrong to say that the fashion industry has been taken over by technology just like all other industries. In a few years, these technology trends will be adopted by the entire textile and fashion industry, leading way for other trends to take place. Upcoming and established brands can upgrade their industry with Web development solutions or mobile-based apps. As one of the biggest industries in the world, generating an estimated \$1.5 trillion a year, it will not be surprising to learn that the way fashion will operated in future will be totally different. With the technological advancements in fashion industry, will be beneficial to both consumers and brands in terms of cost, shopping experience and customer satisfaction.

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