

Trending Technologies – Changing Fashion and Future



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Introduction

Textiles is one of the most prominent manufacturing sectors, with a three trillion-dollar economy and a 2% share of the global Gross Domestic Product (GDP) [1]. With the advent of Industry 4.0 the textile industry is moving toward sustainable production and implementing advanced technologies like machine learning and artificial intelligence (AI). Thus, keeping up with the pace and coping with the expectations of evolving consumer demands has become an essential and dire need for the textile value chain to survive today and grow tomorrow.

These new technologies' distinctive and intelligent characteristics can lead to sustainable industrialization. It reduces unnecessary wastage in product development, provides better tracking and retention of production data, and prevents the industry from huge losses by accurately determining the trends. Manufacturers and merchants have been inspired to use these technologies to improve their supply chains to create a sustainable industry and future. These technologies benefit the consumers as they can get the trial experience of a product without purchasing on the online platform, and also promote circularity in the textile value chain as it becomes easier to track and identify the material after it is discarded by the users hence taken by either the brands or local collector.

Internet of Things (IoT)

The Internet of Things (IoT) describes objects with sensors, processing ability, and programming to connect to other systems and devices over the Internet or wireless communication networks. The real-time control of fashion industry activities like product tracking and feedback system, the health monitoring of textile wearers and the implementation of security systems through an article of intelligent apparel and wearables clothing can all be accomplished with the help of IoT [2].

A few major examples of IoT in the textile industry can be seen in the form of Intelligent clothing and Radio Frequency Identification (RFID) tags. With the integration of IoT and AI, smart clothing is expected to significantly improve health, well-being, and quality of life. These two technologies will reinforce and improve real-time monitoring of the actions of athletes, patients and the elderly regarding their health status and daily activities [3].

Considering RFID technology, the best thing is that it works without the interrogator having to "see" the tag for it to function. When the tagged object enters the reading zone, it receives a signal from an interrogator to transfer its recorded data to the controller via radio waves. Compared to barcode technology, RFID can be much more useful in production and inventory/sales operations. Thus, RFID applications in the textile industry are expected to significantly help manufacturing and commercial businesses [4].

3D Printing

3D printing is a computer-aided design (CAD) and computer-aided manufacturing (CAM) method. A component or the entire product is built layer-by-layer based on a 3D digital model using fluid or rigid materials. Thereby, innovative, cost-effective, and sustainable production methodology based on fashion design is made possible by the 3D Printing additive manufacturing technique. Researchers also hypothesised that this technology would enhance rapid prototyping, sustainability, and cost reduction compared to conventional approaches [5].

Artificial Intelligence (AI)

The fast development of computer vision, machine learning, and artificial intelligence, alongside the growing need for online shopping platforms, created great potential for the fashion

industry. The possible uses of AI in the fashion industry are highly diverse. They range from design support systems to fashion recommendation through sensory evaluation, intelligent tracking, fashion forecasting, supply chain management, social network decision-making, and e-marketing [6].

Augmented Reality (AR) and Virtual Reality (VR)

The term “augmented reality” (AR) refers to interactive technology combining virtual elements or visuals with real-world environments. Magic mirrors, smart mirrors, and filters that may be applied to a scene or a person using a mobile app are a few examples of augmented reality. In contrast to AR, the virtual world created by VR is not present physically and is separated from the real world by a screen or head-mounted display. Due to the rise in online shopping, VR and AR may offer a chance to revive the high street by giving customers engaging, enjoyable, and practical experiences.

In the fashion industry, AR comprises virtual try-on, which use customised simulated models to imitate the presence of garment patterns on a human form. An international brand allows customers to try all of the colours available for a selection of garments through this and provides a ‘seamless retail experience’. AR and VR are examples of what is referred to as “consumer-facing” technology, which denotes that they are products and/or services that customers interact with and directly experience while shopping in-person or online. Furthermore, bridging the gap between channels, AR in particular, could assist in allowing a better experience for customers [7].

Blockchain Technology

Blockchain technology is an encrypted distributed ledger containing a distributed database of records or a shared public ledger of all transactions between participants. Since the emergence of fast fashion, supply chain management, counterfeiting, and brand preservation have become serious issues for the fashion industry.


A few potential advantages of adopting Blockchain in the textile industry include enhanced risk mitigation, operational efficiency, value creation, and shopping experience. The research demonstrates that it is challenging for firms to use blockchain technologies for their benefit. Companies are hesitant to adopt scalability and flexibility to the system because it is a recent invention, and a variety of features of it, including economic, managerial, and industrial issues, need to be investigated [8].

Summary

With changing nature of the fashion industry, it can be speculated that the UN SDGs are pertinent to the fashion business and can be achieved by integrating digitalized technology such as IoT, AI, blockchain, AR, and VR. Different technology carries different potential and when used in combination, can change the prospective and future of the textile industry.

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