

## **EVOLVING TECHNOLOGY IN ARTS, FASHION AND TEXTILE DESIGN**

### **ABSTRACT**

Art an expressive medium uniquely human, involving conscious use of skill and creative imagination. Technology is reinventing how art and designs are made which is more efficient, faster and more accurate. The embracing of technologies by the textile world has accelerated the consumption of textile products in the 21st century compared to the previous centuries. It has made it simpler for different brands in the fashion industry to display their styles and vogues to a larger audience while the emergence of designing applications has made designs unique. Using the art of the 1990s as an example, there are obvious differences and improvements in the means of expression and content compared to the art of the 21st century. The increase in the use of computers and the internet made it simpler for people's interactions and sharing of ideas which contributed to growth in the industry. This paper identified how information technology has enhanced the growth of arts and textile industry.

Keywords; Technology, Arts, Textile Design, Fashion

### **INTRODUCTION**

In the age of mass production, skilled workers must adapt to maintain their role in the textile industry. Skilled workers in this context can be regarded as craftsmen with extensive knowledge of textile production and textile-related objects and using the tools currently available. As machines became more powerful, these machines were able to produce textiles in less time and less money, making it harder for individuals to keep up economically and on time. Technology has driven the growth of human society in a myriad of ways. From basic food, clothing and shelter needs to advanced robotics and healthcare, technology has rapidly embraced the status of undoubtedly essential and highly effective tools in our time. Clothing has always been a necessity associated with human civilization and a means of expressing one's culture and interests. Social status, religious tendencies, cultural diversity and professional status can be comprehensively reflected in clothing. Supported by powerful technical tools that complement and shape the creative ideas of fabric designers, a variety of clothing styles are possible.

[[www.fibre2fashion.com](http://www.fibre2fashion.com) (2021), History Crunch Writer. "Textile Manufacturing in the Industrial Revolution (2019)]

In recent years, design has evolved and improved so much that design companies and textile factories are now using it. Textile printing allowed manufacturers to create digital patterns and paint designs before the old method. While it's clear that technology is influencing the style of design produced by textile artists, we are using digital technology to speed up their design process. [History crunch writer. "Textile Manufacturing in the Industrial Revolution (2019)]

As a result, stylists have maintained a higher level of design quality and aesthetics by continually improving the design in the printing process. The use of photographic images, digital layering of images, and the complexity of colours and tones require both knowledge and hands-on experience with the required software. [History crunch writer. "Textile Manufacturing in the Industrial Revolution (2019)]

## DISCUSSIONS

### TECHNOLOGY IN THE ARTS

In Art, the technological advancement from the first paintings to the production of musical instruments and modern films would simply be impossible without the aid of historical archives of technological advancement. Throughout history and modern times, technologies ranging from ink, paper and glass to cameras, microphones and computers have enabled new forms of art. Without them, it would be impossible to realize paintings, ornaments, photographs, movies, and modern digital works that fill our museums and galleries. Boucher (2019)

Technology has helped to broaden the perspective and prospect of artists' inventiveness while limiting the problems encountered. It has made the production of art a lot less exhausting, and as a result, artists now have more time to contemplate and expand their creativity Jin et al.,.(2012)

According to Boucher 2019, Technology and the arts are broadly considered distinct sectors of modern society with some important links similar to those between the commercial, industrial and legal sectors.

### TECHNOLOGY IN TEXTILE INDUSTRY

Today, textile artists need to adapt to the availability of machines such as laser cutters, knitting machines, and computerized looms. When textile tools became more automated and computerized, a division broke out within the industry which created separate roles for the artist and the machine operator [Carp, 2017].

The artist may choose both roles in the textile industry, making his practice more efficient. However, not all textile artists have this advantage, as these machines are costly and often require skilled hands to operate without damage. According to the Los Angeles Times, computer-controlled knitting machines range in price from \$ 10,000 to \$ 190,000. At the top of this price range, the machine is very reliable and fast. Shima Seiki Seisakusho is a company that sells various types of high-end computer knitting machines. This is one of the best manufacturers in the field. Older used models from inferior brands can be found on eBay for just under \$ 1,000. [Treadaway, C (2004)]

The textile and apparel industry is one of the largest industries in the world market, considering the many components of the supply chain for converting raw materials into products and providing them to end-users. RUPPERT-STROESCU (2009)

Computers and information technologies that facilitate the transmission of information are integrated at every stage of the textile and apparel supply chain, from design, manufacturing and distribution to marketing, sales and consumption. Technology is an integral part of today's business world. RUPPERT-STROESCU, (2009)

Technological changes have transformed the manufacturing process of fabric preparation, cutting, material handling, fusing, sewing, pressing, finishing and dyeing by bringing new advanced machines into the industry. Technology has made the textile and apparel sector tailor different innovations to meet customer demands. Nazururu Islam (2002)

Digital technology is a computer-assisted technique for developing textile design and textile patterning mechanisms that transform an artist's visual information into a final presentation. The computer is operated by a textile designer or technician who understands the particular textile machine that the original drawing can work with. The designer or technician inputs the original drawing through a combination of graphical input devices and traces the drawing of a freehand print. After the original design is in the core, it is developed into the visual information to control the patterning mechanism of a specific kind of textile design. For example, the woven design should depict the weaving of each of the

warp and weft. The knitting design should represent each stitch of the knit mesh. Also, the design you print must represent the areas of each colour as separate images. [Treadaway, C (2004),]

## USE OF COMPUTERS IN TEXTILE AND INDUSTRY

Computer-aided design (CAD) in the textile industry is the technology used for designs and technical documentation which has replaced the drafting of designs manually. CAD was originally used to produce high precision machines, but it has penetrated other industries, especially in the 1970s when it gained entry into the textile and garment industry.

Today, most foreign companies are integrating some form of CAD into their design and manufacturing processes. The level of technology related to the automation of textile machinery has advanced significantly and the domestic approach to the technology of machinery manufactured in industrialized countries is experiencing various modifications. Significant and sustainable efforts have been made to strengthen domestic efforts and technical support, and today major manufacturers supply the latest machines.

Textile technology, once considered a handicraft has evolved into sophisticated scientific and technological activities involving new types of yarns and techniques of production. This area includes various fields of engineering such as mechanical, electrical, computer, chemistry, instrumentation, electronics, and civil engineering. Garment and fashion technology, which is part of textile technology, has become crucial in the activity of clothing design, creation and marketing. All of this requires knowledge of the latest technology and today's textile design students are ready to take on the challenge. Sudalaimuthu Et Al. (2007)

Over the last two decades, major changes have occurred in the production processes of textiles. These changes are due to global environmental factors, including technological, economic, social, demographic, political, and legal factors. The most crucial changes are related to the introduction of new machines and advanced manufacturing systems. The modernization of technology has transformed the traditional production system of textiles and garments into a modern system. Nazururu Islam (2002)

## EARLY INVENTIONS THAT TRANSFORMED THE TEXTILE INDUSTRY

The Industrial Revolution was one of the most important factors in transforming the textile industry. Fabric production increased rapidly as it created new machines that allowed fewer workers to do more and less time. [Collier Et Al, 2009].

During the transition from the 18th century to the 19th century, there was an accelerated development of new technologies and methods that changed the textile industry. With the spread of machines in factories, production volume has increased dramatically.

These huge factory-style brick buildings were quickly becoming very popular as people shifted from handlooms at homes or businesses to these new machines, which increased production time by over seventy times faster than some artisans could do themselves. This led to many more changes, such as an increase in wages because of more jobs being available and improved living standards through improved working conditions since workers were employed full-time with time off on Sundays and holidays. [Collier Et Al ,2009, Clarke, Simon, 1963}

These huge factory-style brick buildings became popular as soon as textile designers switched from handlooms to these new machines, which increased production time by over seventy times faster than some craftsmen could do on their own. This also led to many more changes, such as an increase in wages because of more jobs being available and improved living standards through improved working conditions since workers were employed full-time with time off on Sundays. [Collier Et Al. , 2009, Clarke, Simon, 1963}

Discussed below are three of the top and exciting inventions that caused a significant transformation in the textile industry:

**The Cotton Gin:** Cotton gin has made it easier to clean seeds from cotton fibre seeds, making cotton a popular source of fibre. This can be compared to the scientific revolution in which institutions like Essay Mama exist today to help write essays and create the best essays to help schools and increase the chances of future success.

**The Spinning Jenny:** The spinning jenny has made it possible to produce more yarn without the need for more workers, and fabric production has increased rapidly

**Printing Presses:** Printing presses have led to an increase in printing fabrics because they can be easily and quickly duplicated on a machine rather than manually on canvas. It was also much cheaper than

previously manufactured, making it quicker and easier to sell. [Fiber processing.

<http://textilelearner.blogspot.com>]

## THE ROLE OF TECHNOLOGY IN FABRIC DESIGN AND FASHION

State of the art technological advancement in the digital age revolutionized the textile and fashion industry by molding the future to accommodate the realities of today. The advanced innovations have changed the development patterns upsetting the apparel business worldwide to offer an astonishing cluster of benefits remodeling the fashion design business scene

Fashion is an extension of one's identity and is about transforming self-esteem into a personal style.

Today's fashion cycle is driven primarily by the Internet. When a style was causing hysteria in the market, fashion designers began to create a new range of looks. This affects the fashion cycle, which causes fierce competition. Recent advances in digital technology have had a major impact on fashion e-commerce and fashion retailing. Innovation has continually made great strides in the smart fashion wearable industry. Therefore, fashion and branding have become ubiquitous in today's society.[Prafulla Kumar Padhi (2018)]

Fashion is a system of bodily displays derived from costumes that go beyond jewelry, luggage and perfume shades to a broader definition of luxury goods. Fashion is usually characterized as both forms of everyday wear and as a luxury rather than functional needs. Another distinctive feature that the noun "fashion" gives us is that it shows a constantly changing value system that an item can be considered to be in or out of fashion. Therefore, symbolic revaluation of its cultural and economic values changes rapidly. Fashion is time-based and culturally located. It is a combination of design and innovation, so its quality is defined contextually and relationally, not absolutely. In this sense, fashion can be part of any product. Some argue that this aspect is becoming an important part of explaining the growth and change of the industry, as the design and fashion elements of all products are increasing.

Fashion and Technology: Today's fashion sector is full of creative and innovative trends, including business model changes, new communication strategies, new consumption patterns, new production technologies and materials. Importantly, these new trends are primarily the result of the integration of fashion systems with current technological advances. Business model innovation Technology and fashion

are an inseparable combination. Technology has become an integral part of our products, while it affects textile production and packaging, communication and distribution, and changes the entire production process. Recent technological and infrastructure developments in e-commerce have led to the development of new online business models in the fashion and luxury segments. The following describes the most innovative models: personal subscription, social merchandising / cloud production, mass customization, and collaborative consumption. [Pratt, Et Al. , (2012)]

In this technological revolution, where computers have replaced much of the designer's manual work, fashion designers are in a situation similar to the artists at the dawn of the Industrial Revolution.

From the invention of sewing machines to the rise of e-commerce, fashion is always at the forefront of innovation. As technology, fashion is future-oriented and cyclical. [C Binsights, 2022]. One of the most important consequences of the famous Industrial Revolution was the mechanization of textile production. Power looms and mechanized spinning mills have significantly increased production and reduced production time many times over. Recently, more new materials have been designed, which improves both the quality and compatibility of the fabric. .[ Bowles, Melanie,(2012)]

The so-called smart materials have enabled the production of clever fabrics, with high-end technology like atomic force microscopy and polymeric Nano fibres going into the design, manufacturing and testing of these fabrics. Ranging from special applications like the design of suits for space travel, swimsuits and suits for military purposes to the usage of more durable and adaptable garments for daily use, these methods have proved to be extremely effective. Several research centres have sprung up to investigate these exciting possibilities. The role of computers is unarguably prominent in fashion technology [<http://textilelearner.blogspot.com> (2010)]. The visualization of the final design right at the conceptualization stage, down to the finest detail, making suitable modifications if so desired, automating several stages in the manufacturing process and finally executing quality control procedures all of them involve computing at various levels of complexity. Whether you're using CAD to create appreciable designs or run computer-controlled knitting and weaving machines, automation is fast becoming a buzzword. In recent fashion courses, the curriculum always includes a great technical focus to help aspiring designers keep up with the latest trends. [Blum Et Al. , 1986]

Having a single piece of clothing that can be worn in both summer and winter and that changes texture, colour and even shape depending on the external environment will be a great achievement in the fashion industry. All of this gradually transcends from mere fantasy to reality. Digital clothing, which integrates sensors into the clothing itself, and other attractive possibilities are opened primarily through interdisciplinary efforts with fabrics and fashion technology. At a more mediocre level, you can be pleased when you consider making clothes that are much faster and several times more durable to the exact specifications. [<http://textilelearner.blogspot.com> (2010)]

## CURRENT TRENDS

According to Kochar 2022, Social media is changing how fashion is consumed and has trained customers to want instant access to the latest trends, as soon as they hit the catwalks and at the same time. The prevailing inclination or drift in art, fashion and textile design have made products tailored to the needs and taste of the younger generation who wants to emerge different which brought about different innovations. These innovations are biotechnology, nanotechnology, genetic engineering and artificial intelligence (AI) [Kochar, 2022]

## BIOTECHNOLOGY TECHNIQUES

Biotechnology is based on DNA technology that leads to enzyme synthesis to save energy, time, and most importantly resources such as water. With this advanced technology, the manufacturing industry has reached a new horizon with endless opportunities for success and productivity. In this era, biotechnology plays an important role in saving the planet and making it more sustainable and safe for future generations. [<https://www.fibre2fashion.com> <http://textilelearner.blogspot.com>]

Textile biotechnology deals with innovative and advanced technologies applied to textile fibre composite structures developed for use in specific design industries. This is an updated performance-based technology that has resulted in the development of many new high-tech fabrics with high-performance properties such as Water and dirt repellent, shockproof, lightweight, temperature control, etc. [<https://www.fibre2fashion.com>, <http://textilelearner.blogspot.com>]

Presently, Biotechnology is a dynamic force in the design industry even though it has been used in multiple domains such as textiles, medicine, agriculture, fashion and design



Textiles, mainly integrate natural and synthetic materials and It has developed the enormous advancement of multiple properties in one material, that is beneficial to designers in many ways, including Climate-based materials used for clothing, home fashion, luxury cars, and usually outdoors.

Biotechnology is playing a crucial part in terms of innovations like

#### Self-cleansing Surface

The huge impact Self-cleansing fabrics have made in the fashion and design industry has made the appearance of fabrics better by repelling dirt, easy to clean and not easily soiled

#### Naturally Coloured Cotton

Who is better at visualizing natural dye cotton than designers? One of the great innovations in biotechnology is the production of naturally coloured cotton by genetic engineering, although the range of colour is limited but it may be very interesting to see primary, secondary and tertiary cotton fields in the future. The world would be a much better place without dyes and pigments that are very harmful to human health and the environment.

#### Animal Fibre

There are biotechnological vaccines that are injected into sheep to get valuable wool for outerwear. A break occurs for a period of time, and the wool fibres can be peeled off. This procedure takes half the effort to cut sheep's hair. Another major advance is the scorpion goat wool, which can withstand very high temperatures which are used to make astronaut spacesuits. [<https://www.fibre2fashion.com>]

### NANOTECHNOLOGY TECHNIQUES

Nanotechnology is one of the innovations during the era of the industrial revolution which involves the properties of materials being drastically amended after they are reduced to the NANO scale. The NANO Technology is treating the textile materials by coating them with NANO materials to improve the properties of the fabric and creating additional sturdy. It's encouraging news for designers that once you see the NANO particles through correct instrumentation, it changes their colour at this NANO level.

Innovations in NANO technology have modified the business facet of all, associated with style, fashion

and the textile industry. [[www.azonano.com](http://www.azonano.com) ]. By NANO technology techniques textile sector functionalities, have been modified because the innovative high-performance properties came to exist. Stain repellent, Water repellent, ultraviolet light protected, opposing static, Wrinkle-free, opposing microorganism, hearth retardant, Bio-degradable, Bulletproof and defence article of clothing to call some. [<http://textilelearner.blogspot.com> ]

## GENETIC ENGINEERING TECHNIQUES

In Genetic Engineering techniques, the key development is that the coloured Florescent Silk class of fabric, that in some way look terribly trendy and style orientated because the material is appealing to style. Researchers have used this technique by inserting glowing proteins taken from Corals and Jellyfish, into the silk worm Genom. A result of this genetic engineering transformation is that the properties of the fabric are additional or like the same as silk however it becomes slightly weaker after processing. The process involved in Genetically Engineered silk is captivating and will pioneer modern ways of utilizing these materials in an innovative, productive and viable ways in the area of fashion and textiles.

"SYNTHETIC SPIDER SILK is one of the latest innovations in Genetic Engineering with the additional property of being biodegradable. [[www.smithsonianmag.com](http://www.smithsonianmag.com)]

## ARTIFICIAL INTELLIGENCE

In the Textile and fashion design industry, Artificial Intelligence, (AI) is enjoying an important role which has made the duties of designers become a lot more crucial so much more that they will need to equip themselves with consequent generation's tools and technology. [[www.businessinsider.com](http://www.businessinsider.com)]

In terms of Fashion design, AI tools are vital in this era of technological advancement. Because it is challenging for the designers to check several season collections about the newest trend and keep up with the data collection and sorting. AI has come back up with this resolution, as there's entire information for all the previous collections and an unimaginable quantity of knowledge is on the market with the press of a button. In this case ancient method to design or style remains the same to do analysis, assembling materials, creating prototypes, etc. However to catch the newest technology development, designers will be able to master the new tools to enhance design processes. .[ <https://wtvox.com/>]

Kochar 2022 opines that AI is being used by brands to boost customers' searching expertise, analyze data, boost sales, forecast trends and provide inventory-related steering. These technologies have accentuated AI as the way forward for development in the fashion industry.

## CONCLUSION

Art, fashion and textile design technologies have a deep and exceptional connection that goes through all phases of evolving growth. It also created an advanced environment for social and business synergies that helped innovators and producers to address the challenges of the day. This technology is very expensive and is compatible with all its applications. Textiles and artistic design have much potential and continue to be a lasting example of the power of technology.

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