Review Article

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 compare 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 improvement in the means of expression and content compared to the art of the 21st century. The increase in the use of computers and 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 in order to sustain their role in the textiles industry. In this context, skilled workers can be considered a crafts people who have a vast knowledge of textile production and textiles-related objects and use the tools available at the time. As machines have become more capable, individuals have had trouble keeping up economically and temporally since these machines can produce textiles in less time, for less money. Technology has propelled the growth of human society in innumerable ways. From the basic needs of food, clothing and shelter to advanced robotics and health care, technology has rapidly assumed the status of an arguably indispensable and

highly effective tool in the modern era. Clothing has always been both a necessity with regard to human civilization and a means of showcasing ones culture and interests. Social status, religious leanings, cultural diversity and professional status can all be amply reflected by ones clothes. A wide array of different styles of clothing is now possible, aided by powerful technological tools that supplement and shape the creative ideas of fabric designers.[1,2]

In the last several years, design has been widely developed and improved on so that design firms and textile mills are now utilizing these for their production. Textile printing has enabled manufacturers to produce a digital sampling and strike off designs prior to old method. It is apparent that technology has influenced the style of the design that is being produced by textile artists , but digital technology has been utilized to accelerate their design processes.[2]

Consequently, stylists have maintained a higher level of a design quality and aesthetics by continually refining the design in the printing process. The use of photographic imagery, the digital layering of images and the complexities of colour and tone require both knowledge and practical expertise with the requisite software.[2]

TECHNOLOGY IN THE ARTS AND TEXTILE INDUSTRY

Today, the textile artist must adapt depending on the accessibility of machinery such as laser cutting, knitting machines, or computerized looms. A divide developed within the industry around the time that textile tools became more automated and computerized. This division has created the separated roles of the artist and the machine operator.[3] The artist could decide to be both, rendering their practice more efficient. However, this is an advantage that not all textile artists have as these machines are expensive and oftentimes require experienced hands to operate without damage. For example, a computerized knitting machine price range is anywhere between $10,000-$190,000 according to the Los Angeles Times. On the higher end of that price range, the machines are very reliable and fast. Shima Seiki is a company that sells various kinds of high end computerized knitting machines. This is one of the most top notch manufacturers in its domain. Older used models of lower tier brands can be found on eBay for just under $1,000.[4]

Digital technology is a computer-aided technique for developing a textile design and textile patterning mechanism which transforms visual information from an artist to the final presentation. The computer is operated by a textile designer or technician who understands the particular textile machinery for which he/she is adapting the original drawing. The designer or technician inputs the original drawing by a combination of graphical input devices; tracing on drawing free-hand printing. After the original design is in core, it is developed into the visual information to control the patterning mechanism of a specific kind of textile design. For example, a design to be woven must represent each interlacing of warp and weft; a design to be knitted must represent each stitch of the knitted mesh; and a design to be printed must represent the areas of each colour as separate images.[4]

EARLY INVENTIONS THAT TRANSFORMED THE TEXTILE INDUSTRY

The industrial revolution was one of the main factors in transforming the textile industry. It created new machines, which allowed for many more things to be done in a shorter time with fewer workers, so cloth production increased rapidly. [5]

During the transition period from the 18th century to the 19th, there was a rapid development of new technologies and methods that changed the textile industry. The widespread use of machines in factories made it possible for production to increase exponentially.

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.[5,6]

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

The Cotton Gin: The cotton gin made it easier to clean the seed from cotton fibers, which allowed cotton to become a popular source of fiber. This can only be compared to the revolution in academics where today, there are agencies like EssayMama that can help guide you in essay writing ensuring that you produce the best essays to increase your chances of succeeding in school and in the future.

The Spinning Jenny: The spinning jenny made it possible to produce more thread without many more workers, so cloth production increased rapidly.

Printing Presses: Printing presses led to an increase in printed fabrics because they could be easily reproduced quickly on machines instead of being done by hand on canvases. They were also much cheaper than any made before, which helped them be sold faster and easier.[7]

THE ROLE OF TECHNOLOGY IN FABRIC DESIGN AND FASHION

One of the most significant outcomes of the famed Industrial Revolution was the mechanization of textile manufacture. The power loom and the mechanized cotton mill resulted in a huge increase in the quantum of production by shortening the time required for production manifold. In the more recent times, there has been a proliferation of novel materials designed, and this has enhanced both the quality and adaptability of fabrics.[9] The so-called smart materials enable the production of clever fabrics, with high-end technology like atomic force microscopy and polymeric nanofibres 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[10]. 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. Be it creating an eye-catching design using CAD or running the computerized knitting and weaving machinery, automation is fast becoming the buzzword. Fashion courses nowadays invariably include a major technological thrust in the curriculum to enable prospective designers to be abreast with the latest trends.[8]

How about having a single garment that one can use both in the summer and winter one that would change texture, colour and even shape in response to external environments? All these are gradually transcending from being mere fantasies to reality. Digital clothing that incorporates sensors in the very clothing that one wears and other fascinating possibilities lie in store - courtesy the largely

interdisciplinary explorations into the field of fabric and fashion technology. At a more mundane level, one could most definitely be pleased by the thoughts of having clothes made to precise specifications at a much faster rate and with several times more durability.[10]

CURRENT TRENDS

BIOTECHNOLOGY TECHNIQUES

Biotechnology is based on DNA technology heading to Enzymes synthesis to save resources like, energy, time, and most importantly water. This advanced technology has directed the manufacturing industry towards the new horizon, where the possibilities of success and productivity are endless. In current times, Biotechnology is playing a key role to save this planet and creating it more sustainable and safe for the future generations.[10,11]

Biotechnology in textiles deals in innovative and advance technologies, where it applies on composed structure of textile fibers, which are designed to use in specific design industry. This is an updated and performance based technology, in result of it many high tech novel fabrics have been developed, which contains the high performance properties, such as water and dirt repellant, shock proof, lightweight, temperature regulating etc[10,11]

Biotechnology is currently a driving force in design industry, although it has been used in multiple domains such as, textiles, medicine, agriculture, fashion and design. In textiles it is mainly integrates of natural and synthetic materials. It has developed the enormous development of multiple properties in one material, which is somehow beneficial for the designers in many ways like, apparel, home fashion, luxury automobiles and climate based materials, which are normally used in outdoor areas.

Biotechnology is playing a vital role in terms of innovations like.[10]

Self-cleansing Surface

Self-cleansing fabric has huge impact upon fashion and design industry for the outer looks; these fabrics repel the dirt and can be cleaned easily. They are not soiled whatsoever[10]

Naturally Colored Cotton

Who can visualize the naturally colored cotton better than designers? One of the marvelous innovations of Biotechnology is the production of naturally colored cotton through genetic engineering, though color range is limited. However, in future, it can be so interesting to see fields of cotton with primary, secondary and tertiary colors, and world would be far better place, without dyes and pigments, which are so injurious to human health, as well as devastating the environment [10]

Animal Fiber

To get the valuable wool for the outerwear, Biotechnology vaccines are there which when injected into sheep, after specific time breaks appear and wool fiber can be pulled off. This procedure will take half the time of labor for shearing the sheep. Another important breakthrough is the scorpion goat, which produces wool fit to endure extremely high temperature, and used in making astronauts space suits.[10]

NANOTECHNOLOGY TECHNIQUES

Nanotechnology is an industrial revolution, in which the properties of materials will drastically change when they are reduced to NANO scale. To treat textiles with the coating of NANO materials is the NANO technology, which improves the properties of the material and making it more durable. It is great news for the designers that when you see the NANO particles through proper equipment, it changes its color at this NANO level. Innovations in NANO technology have changed the commercial aspect of all, related to design, textile and Fashion business.[12]

By NANO technology techniques textile sector functionalities, have changed as the innovative fabrics with high performance properties came to exist. Stain repellant, Water repellant, UV protected, Anti static, Wrinkle free, Anti bacterial, Fire retardant, Bio degradable, Bulletproof and defense clothing to name a few.[13]

GENETIC ENGINEERING TECHNIQUES

In Genetic Engineering techniques, the major development is the Colored Florescent Silk category of material, which is somehow look very fashionable, and design oriented. As the material, it is so much attractive and appealing to design. The technique which researchers have used, that they have inserted glowing proteins which are the taken from Corals and Jellyfish, into the silk worm Genome. In result of

this genetic engineering innovation is the properties of the material is more or like same as silk but it become slightly weaker after processing . In the area of Fashion and design this whole process of genetically engineered silk is very fascinating and it will open up new directions of taking and using these materials in a more creative and sustainable way. Another latest and more sustainable genetic engineering material is “SYNTHETIC SPIDER SILK”. Though it is synthetic but it is more Biodegradable.[15]

ARTIFICIAL INTELLIGENCE

In this advanced technology world, Artificial intelligence, (AI) is playing very important role in the area of Fashion and Design industry. In the presence of Artificial intelligence the role of designers have become more critical, as they will have to equip themselves with the next generation’s tools and technology.[16] AI tools in terms of Fashion and Design are so important in this technological world. As it is difficult for the designers to look up multiple season collections and figure out the data about what was hot selling what was not. AI has come up with this solution, as there is a complete database for all the previous collections and incredible amount of information is available with the click of the button.

In this case traditional process to design is still the same as to do research, collecting fabrics, making prototypes etc. but to catch the latest technology development, designers will be able to learn about new tools, which are definitely improving the design process day by day.[17]

CONCLUSION

The textile industry was first altered during the industrial revolution with a new division of labor, decreased domestic production, and improved machinery. Then with printing presses and new methods, the textile industry developed more rapidly into a factory-style system, allowing for its progression into today’s modernized world. Technology is scaling tremendous heights and with it, so are all its applications. Textile and Arts design have in store lots of promises and continue to be a standing example of the prowess of technology

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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