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Computerised Textiles-A Current Fashion

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ABSTRACT: Once upon a time, and for centuries thereafter, computers did not have anything to do with textile production, especially handlooms. This was the era before computers developed and in the early decades of their existence. With increase in demand for textiles, use of computers in textile production has reduced time and effort taken to produce fabric and increased production. Technological developments have helped qualitative and quantitative changes in textiles. Computers are used for their speed, power and versatility. They facilitate quick computations and precise solutions, saving time. A set of instructions and procedures address the task to be performed, speeding up production and avoiding slower manual work. Computers are widely used in various departments of the textile industry.

KEYWORDS: computerised, textiles, current, fashion, technological, versatility, industry

I.INTRODUCTION

Most operations are controlled through user-friendly operating systems, such as push buttons, electronic screens and electronic stop motions. Electronic screens provide data such as number of bales plucked during a single passage, length of sliver in carding, controls of the machine to be conveyed to another worker and length and diameter of the yarn. Push buttons provide easy access to control the machine¹. Electronic stop motions stop the machine during any breakage, reducing losses. Touch screens are the most recent trend in operating these machines. Using a programme, one can develop a peg plan or card cutting plan providing pattern and loom specifications. This saves time and effort. Software creates the card cutting plan by clicking pictures of an object or a person². Unlike older punch jacquard looms, electronic looms use computer generated files that lift threads to make a pattern entered into a computer. Each pixel represents one thread. The computer translates the design into instructions for the loom. A black dot lifts a warp thread or no hole is punched.³ White spaces represent warp threads to be left down or punch a hole. Electronic jacquard looms use computer-generated point papers to control the loom. This file is the source for modern card punching equipment.⁴

Modern knitting machines knit a whole garment without cutting or sewing. Some designs may require partial stitching. Software converts the design into a code which the computer understands.⁵ The code is fed through a chip and the mechanisms are shown on an electronic screen so that the machine can communicate with the operator. The whole process, from casting on to casting off, to shaping and making many different types of stitches, is automated. The gauge and needle butts follow the path according to the instructions from the software to create the design. This allows faster knitting and higher productivity. Computers are principally used in testing to record and compute values.⁶ To record, values are transferred via analogue to digital form and displayed on the screen. Instruments like AFIS and HVI have this facility and error-free results are processed at a fast rate. These machines compute collected data and provide results of the test. They also store data and print it. The process is automated and can be repeated.⁷ Some mistakes were inevitable during wet processing. They could not be recognised or tested by humans. So, computers were brought in.⁸

- Spectrophotometer: checks the shade of the dyed fabric
- Data colour: for formation of accurate dye types
- Buffer Calculator: calculates amount of alkali/acid for the required buffer
- Fastness properties: computers check the fastness properties

In printing, computers develop the designs and prepare screens which need accuracy like galvano and liquor screens. Digitised printing is the most happening segment in the vertical. Inkjet printing on fabric is also possible with an inkjet printer by using fabric sheets with removable paper backing.⁹

CAD/CAM technology is finding wide acceptance because of its immense use in design and development of textile machinery. CAD/CAM technology allows the user to design a product or a part of the product or even alter the product.

The product can be viewed in 2D or 3D format. Parts of the machine like cams, tappets and the making of blue prints of the machines or parts of the machine. The efficiency and result of the altered part could also be tested in the software itself. Computers are also used to create the patterns for apparel and alter them with software like Richpeace and Tukatech. A marker is a long, thin paper which contains of all necessary pattern pieces of different sizes of a particular garment. The pattern pieces should be arranged in such a way that there should be less fabric wastage. These patterns are arranged in various ways in the marker making software. The direction and position of pattern pieces could be rearranged a number of times, which is a tedious process if paper is used. The sizes can also be altered easily on a computer.¹⁰

Most embroidery machines in the garment sector are controlled by computers. They work according to the pre-processing programmes given by the user. The instructions can be given through a USB or the machine can be connected directly to the system. The computer controls different motors which move the needle bar up and down and side by side, tensioning discs, feed dog and other elements in the machine.¹¹

In single needle embroidery machines, the user changes thread colour. In multi-needle embroidery machines, the machine trims and changes thread colour according to programmed instructions. Popular software includes Bernina, Wilcom Deco Studio E3, and Embird Embroidery Studio Digitizing Software. In home textiles, we often see patterns repeated. These patterns are placed at the required position using the software and then printed on the fabric. The positioning is exact, using grid lines.¹² The design could be flipped horizontally, vertically or diagonally or repeated, since software offers flexibility. Software like Illustrator, Photoshop, Firework and Genuie (for ipod) create and repeat patterns. Infant garments cost more than adult garments because extra care is taken during their production as the patterns are small and seams should not be uncomfortable for the baby. So, it is necessary to give the manufacturer every minute detail such as stitch length, type of stitch, direction of stitch and patterning. For that, 3D patterns allow every part of the garment to be clearly visible and production is smooth. Through E-commerce, products are reaching customers easily. Textiles are the top selling category in the E-commerce sector. Not only garments, even textile machinery is sold online. Even handloom products are available at the doorstep, unlike the previous scenario where the customer had to purchase the product at the manufacturing area. Success of sites like Jabong, Myntra and Snapdeal has encouraged India's leading textile manufacturer Arvind Ltd to start its own e-commerce site, Arvind Internet Ltd.¹³

Cloud computing or Internet-based computing provides data sharing to computers and other devices on demand. This has replaced the need to carry stacks of papers and files which could then be misplaced. Large files are transferred within minutes. The order quantity information, the CAD/CAM files, machinery guides, production planning files, raw material management and supply chain management are easily shared. However, cloud computing runs the risk of hacking, data loss and lack of control. The industry needs to keep up with developing technology. In the last few decades, many developments like automation in spinning, weaving and garmenting have taken place in the textile sector. The Information Technology (IT) revolution made things easier and faster. Using computers, the textile sector reached new heights. Computers are, in fact, the pointer to a more promising future.¹⁴

II.DISCUSSION

Over the decades computers and fashion have developed gradually, changed with time, taste and trend. But nobody knew that a time will come when both these fields will complement each other so well. Today fashion design has reached new heights by computer aided methods of design. As a result of which, computer industry has got its new customer. Computer technology is making waves in the fashion design zone. From determining textile weaves to sizing designs; computers are a vital component of the fashion industry. Computer aided design (CAD) programs reduce the demand for manual sketches.¹⁵ New software programs continue to replace old manual skills. Going by the wayside are "old fashioned" flat pattern construction, pencil sketching and traditional math-based pattern sizing. Those who lag in math and falter at sketching can now breathe a little easier. Computer-aided design (CAD), also known as computer-aided design and drafting (CADD), is the use of computer technology for the process of design and design-documentation. Computer Aided Drafting describes the process of drafting with a computer. CADD software,¹⁶ or environments, provides the user with input-tools for the purpose of streamlining design processes; drafting, documentation, and manufacturing processes. CAD may be used to design curves and figures in two-dimensional (2D) space; or curves, surfaces, and solids in three-dimensional (3D) objects.¹⁷

Although most designers initially sketch designs by hand, a growing number also translate these hand sketches to the computer. CAD allows designers to view designs of clothing on virtual models and in various colors and shapes, thus saving time by requiring fewer adjustments of prototypes and samples later. Most fashion design colleges, however, still teach traditional design methods, including manual flat pattern construction, draping and line drawing. No doubt that learning of these methods are essential for having a good idea about fashion design but Cutting-edge education also

focuses on computer aided methods of design. Software can help students draw, create woven textures, drape models to create patterns, adjust sizes and even determine fabric colors. By Introducing this technological aspect will enable students to understand alot better and try various combinations in their design. This also cuts downthe time factor i.e. by use of CAD methods students can learn a lot faster and more software in less time but Fashion Design is not an easy profession. You dont have to word hard rather WORK SMART.¹⁸

Its not that one should neglect the manual design methods and completely focus on CAD methods. State-of-the-art technology is important, but a sound understanding of the methods behind production is also essential. Manually figuring size adjustments and cutting pattern pieces instills that knowledge. Software programs constantly evolve. A program used today may be obsolete within several years. Being trained on today's software does not guarantee it will be used when you are ready to go out into the field. Understanding calculations is timeless, as is computer competency. Software, however, shifts rapidly.¹⁹

Sketching remains a basic design skill. The option now exists to create computer generated drawings of your work. Take advantage of the old and new. Master the ability to sketch on paper and perfect your skills as a computer-aided designer. Masterful sketches, whether hand-drawn or computer-generated, are what sell your designs. Fashion continues to evolve with computer technology pointing forward. You must not lag behind. Yet you should not forge forward without a sound understanding of the basics. Computer technology is the prevalent method for both knit and woven pattern construction and is coming to the forefront as the sketching method of choice. Learn the necessary technologies to stay on fashion's forefront.²⁰

III.RESULTS

Computer graphics is an art of drawing pictures on computer screen with the help of programming. It is a discipline that involves the skilful generation of images through the creation, manipulation, and computation of data . it is seen that there is barely a field of human activity today that has not felt the impact of the dramatic changes in Information and Communication Technology, ICT in the last 10 - 15 years. The fields of Clothing and Textiles have continued to experience their fair share of the influence of ICT in their operations. It has also been noted that an appreciable number of developed nations such as United States of America, France, and China, have grown their economies through the fashion and textiles industries .These industries can therefore be counted as strong economic forces to be reckoned with in the development of a nation when given the required attention right from the training institutions before students get into the labour world .²¹

The acronym CAD is Computer Aided Design while CADs is Computer Aided Design Software. The term 'Computer Aided Design-CAD' could implies the use of computer technology to carry out or assist the design process. A CAD system is an information technology hardware; a specialized software which may have a particular area of application. It could also be peripherals which in certain applications are quite specialized .²²

Prior to the advent of CAD software, design sketches were made on paper with the aid of T-squares, set-squares,³⁶ French curves, compass, pencils, erasers and a specialized drawing table. Designs sketches of are often hand-drawn; this requires skills mastery in the mechanics of drawing lines in relation to the actual measurement, with precision, accuracy and attention to detail (Trika, 2016). The process could be cumbersome and laborious. This however do not suggest that the use of CADs may completely expunge the need for hand-drawn preliminary design sketches, but it is advantageous in the sense that CAD assist in modifying a drawing or correcting mistakes without necessarily starting all over again. It is also important to note that the invention of the graphic tablet, a peripheral of the computer system does not totally erase the input of user in the drawing activities²³. This implies that the user must have basic knowledge of design principle and simple drawing skills to put the gadgets to adequate use. It is usually comfortable when designing with CADs. Although , opines that it may be faster to create a 'rough' drawing such as a sketch by hand (pencil and paper) than using Computer Aided-Design (CAD), however, for larger and more complex drawings which involve similar shapes or repetitive operations,³⁵ CAD method is more efficient. This assumption may not be correct, giving the advent of the Graphic Tablet that is usually accompanied with light pen, used in drawing on the tablet. The user views the pattern or design on the computer monitor as the drawing is made, and necessary corrections are made using drawing tools in the CADs to perfect the drawing. The drawn patterns are printed out on paper when completed, and transferred on the garment to be embroidered.²⁴

Production in the fashion industry before the advent CAD software was usually carried out by a team of workers each with specific job description. The whole process was time consuming due to repetitive work involved at every stage of

production, particularly when intricate patterns are to be drawn out. Patterns are now easily drawn out with the aid of CADs and better still, there are software with pattern template from which the Designer could pick from.

Due to costs associated with maintenance, import fees and norms, as well as cost for adequately training personnel on the machine operations, the spread of automation is still limited in the developing world. This is not unconnected with the cost of procuring the machine, and other paraphernalia expenditures that are more expensive than the cost of procuring labour for manual process. Despite the challenge, Computer Aided Design, CAD and/or Computer Aided Manufacturing, CAM systems have spread in developing countries such as Thailand and Sri Lanka.²⁵

Advances in technological have rubbed off on the clothing industry, particularly in developed countries.³⁴The innovation birthed by the new technologies include smart fibres (i.e. clothing with integrated electronics as a main feature), fibre surface coatings (i.e. coatings applied to make clothing flame retardant, water resistant, antimicrobial, etc.), radio frequency identification chips (i.e. tags applied to clothing to improve stock accuracy and product availability, and that might become useful as a tool for theft prevention or anti-counterfeiting), and biodegradable clothing (i.e. clothing produced from banana leaves, corn and bamboo), among others. Both the textile and clothing industries also use technological innovations generated in the chemicals industry, such as complex man-made fibres.²⁶

The study among other achievements has been able to highlights embroidery as a form of a visual art practice that needs to embrace latest technology to be sustained and remain relevant. The result of the survey carried out in the study areas also reveals the preference of embroiderers for machine embroidery.³³ The result further shows that embroiderers believe that CADs usage in their design process will make their work less cumbersome and increase patronage of their embroidery.³² This finding therefore implies that research of this manner will continue to help sustains the tradition of embroidery practice. It is expected that the information garnered from the study will further enrich the body of knowledge in the field of embroidery production.

However, to keep pace with advancement in technology; a dynamic phenomenon, the aspiration towards full automation of embroidery practice should be encouraged. To achieve full automation, there must be sizeable number of embroiderers who have been trained in the use of CADs to make their design. The embroiderers could also employ the services of trained Designers/Artists to help in drawing out the patterns before transferring them on the textile garment.²⁷

It is therefore imperative to note that either the embroiderer has decided to use the embroidery machine or the traditional means of needle work, the use of CADs is very valuable and handy in both methods; machine or traditional method of embroidery.³¹ This assumption is further buttressed by the fact that the younger generation are no longer interested in the traditional method of mentorship training in embroidery design and production. With the computer technology savvy crop of youths today, there is a need to keep promoting automated embroidery production. This approach is believed to attract the younger generation and keep the art of embroidery alive. There is also a call for synergy between the Nigerian Fashion Designers and CADs developer so that indigenous cultural symbols are created as parts of the cliparts as well as including cultural shapes and forms in the CADs tools.²⁸

IV.CONCLUSIONS

Nowadays Computer-aided design (CAD) techniques such as Lectra Modaris is becoming exceedingly popular in the apparel industries worldwide for pattern construction because of its accuracy, efficiency and time-saving solutions to much arduous operation (Sayem et al., 2010). The principle objective of this article is to draft a set of pattern pieces by applying Lectra Modaris design environment after selecting a convenient style of trouser by different retail websites or fashion manuals.³⁰ This paper contains all the essential draft patterns for the selected trouser such as front, back, waistband, pocket bag, pocket facing and fly piece which are constructed in Lectra Modaris V6R1 design software. These patterns are prepared after incorporating measurements into the design extracted from the body-scan point cloud data and from manual tape measurement.²⁹

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