TEMPORAL EVALUATION OF CUSTOMIZED CLOTHING PATTERNS AND PATTERN DESIGNS

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Abstract: *With the development of garment manufacturing, huge amounts of garment production in short time has been possible; which led to an increase in the profitability of companies and meeting customer expectations. But in due course, with the increase of household income, customers started to ask for dressing different than other individuals instead of wearing same clothes with everyone. Therefore, in order to maintain the variety of styles in manufacturing, the production quantities have decreased and the production methods have been evolved in this direction. Accordingly, due to meet these new expectations, customized clothing production concept has been born. The main fact which differentiates this production method from the old style tailoring is that; the design is also personally customized. The fabric, color, design, pattern details of the cloths can be customized according to customer choice. All of above points naturally increase the cost of the product. However in this method, the main importance is the customers who aspire their dream cloth instead of the product price. With this research, the systems which is needed to meet the new high level customer expectations have been analyzed; the production lead time and the effect of this method on the labour has been investigated in a facility which is making customized production.*

Keywords: *Customized clothing design, production time, pattern placement.*

1 INTRODUCTION

Rapid development of technology continuously changes the daily life course, preferences and expectations. For this reason, it is indispensable to develop different marketing strategies. One of them is customized production system. Customized production is supported by new technologies such as virtual merchandising, online shopping, three dimensional systems and body scanners which pioneered revolutionary innovations in textile industry [1, 2]. Companies that favored lesser model and much production strategy in the past have been passed to customer focused production model today. Thanks to possibility provided by digital technology, transition to production model according to demand has become much easier. Suitability of dress to the body is an important criterion for evaluation of a textile product by a customer [3]. Today it is determined that many customers cannot make use of ready-made products from non-compliance of body measurements with the standards. A study in the United States revealed that 62% of consumers could not find fit clothes for themselves, 59% of them found the fitness to body has changed even with the same trademark, 57% of them found that their bodies did not fit to the standards and 85% of them claimed that only reason of a trademark was the fitness of dresses to their bodies [4].

A wide variety of printing methods have been developed for ornament purposes in the garment industry [5]. The increase in digital products has also been effective in the development of the transfer printing method. This method is for considering the demands of the customized production. Customers can provide specification in color and design. This method is applied especially for low quantities. Thanks to the working with transfer printing machine, different types of fabric structures and unlimited colors even the most complex colors can be printed at once [6-8]. Transfer printing technology has high printing quality and enables to achieve expected fabric attitude and to save time [9, 10]. Within the scope of this study the research has been conducted on customized production techniques which have been increasing in importance in recent years that are predicted to provide a significant competitive advantage to the clothing industry of our country. In the study concrete data about the functioning of the system were determined by making sample applications in a plant that designs personalized patterns. The time required for the completion of these processes is calculated by ensuring the customer pattern inside the model molds with customer pattern measurements. At the same time all details such as pattern preference, color selection and pattern size are determined by the customers. After design is completed, the mold can be printed

on the fabric with body sizes directly. In this study, it was aimed to evaluate the time spent on the design of the garment, taking into account the preferences and opinions of the customer.

2 EXPERIMENTAL PART

2.1 Materials

Within the scope of the study, design prepared specially for customer studies were conducted in a plant operating according to transfer printing method. The molds in which patterns are placed were prepared in the CAD system. Design dimensions and pattern size magnification and reduction were designed by the designer using Photoshop program. Working in connection with transfer printing machine, designs prepared were transferred to the printing paper machine. In transfer printing, dyestuff is transferred to the printing paper. Designs first printed to paper with heat and steam by dyestuff, were transferred to fabric by transfer printing. In the fabric mixture various fabrics such as PES (polyester), PAC (polyacrylic), EA (elastane) can be printed, In this study printing was applied in pain weave fabric produced from 100%PES. Since printed fabrics were used in transfer printing, they did not go through any finishing process. If requested by customer antistatic finishing may be applied to prevent electrification in the fabric.

2.2 Methods

After the pattern work is set in the reports and colors requested by the customer, a printing attempt on the fabric is made to present it to the customer. At operation conditions first printing of the design is realized on a special printing paper at the printing machine. The fabric quality of the sample printed on the printing machine was determined on special printing paper in the sample transfer hand printing machine so that color test is carried out by providing the transfer of the special printing paper to the fabric (Figure 1).

Figure 1 Fabric after color trial and transferred paper image

If the color is not the same as the color tone suggested by the customer, a color check is made by printing again. If the colors on the fabric comply with the color references requested by the customer, the production phase is started. Roll-shaped pattern paper was printed by special printing machine is mounted under the machine and printing is provided by heat transfer.

3 EXAMPLE OF CUSTOMIZED PATTERN WORK

The steps of placing the design in the garment pattern are explained as below.

Pattern preparation: The original file of the pattern marker layout is taken from the pattern Gerber Accumark v10.3 pattern program (Figure 2).

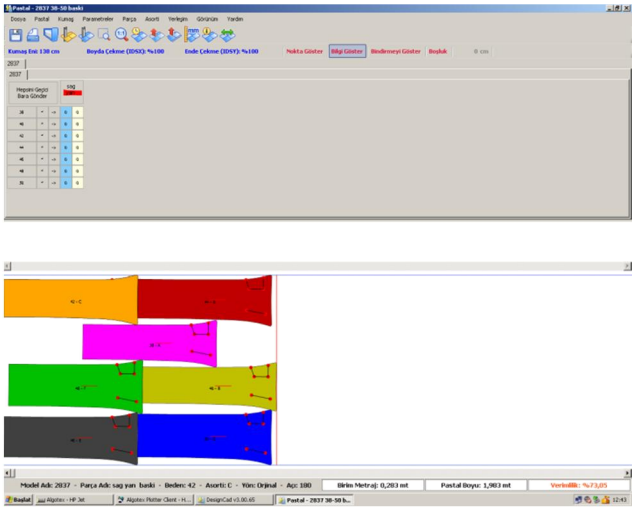

Figure 2 Images of the pattern programme

Pattern placement: The original version of the pattern is enlarged in the pattern program in the original mold size. The requirement of the customer is placed in it as in Figure 3.

Figure 3 Pattern work placed in the mold

The combination of all the parts that make up the related size is ignored. The printing is done in parts in a few sizes. After the pattern work is completed, the original size pattern is printed on the digital paper machine described above and transferred to the fabric in the fabric quality requested by the customer.

4 FINDINGS

Images of 10 different patterns requested by customer are given in Figure 4.

The time spent by the designer to place 10 different patterns designed specifically for customer demands were examined in two stages as pattern preparation and pattern placement. The first stage, the mold preparation time, gives the time to take the screenshots of the molds prepared in the CAD system, transfer them to the Photoshop program and bring the mold back to its original dimensions. The second stage, which is specified as the pattern placement in Table 2, shows the time spent in placing the designated patterns in these patterns brought to their original dimensions. Information about the times and how many parts the patterns consist of are given in Table 1 below.

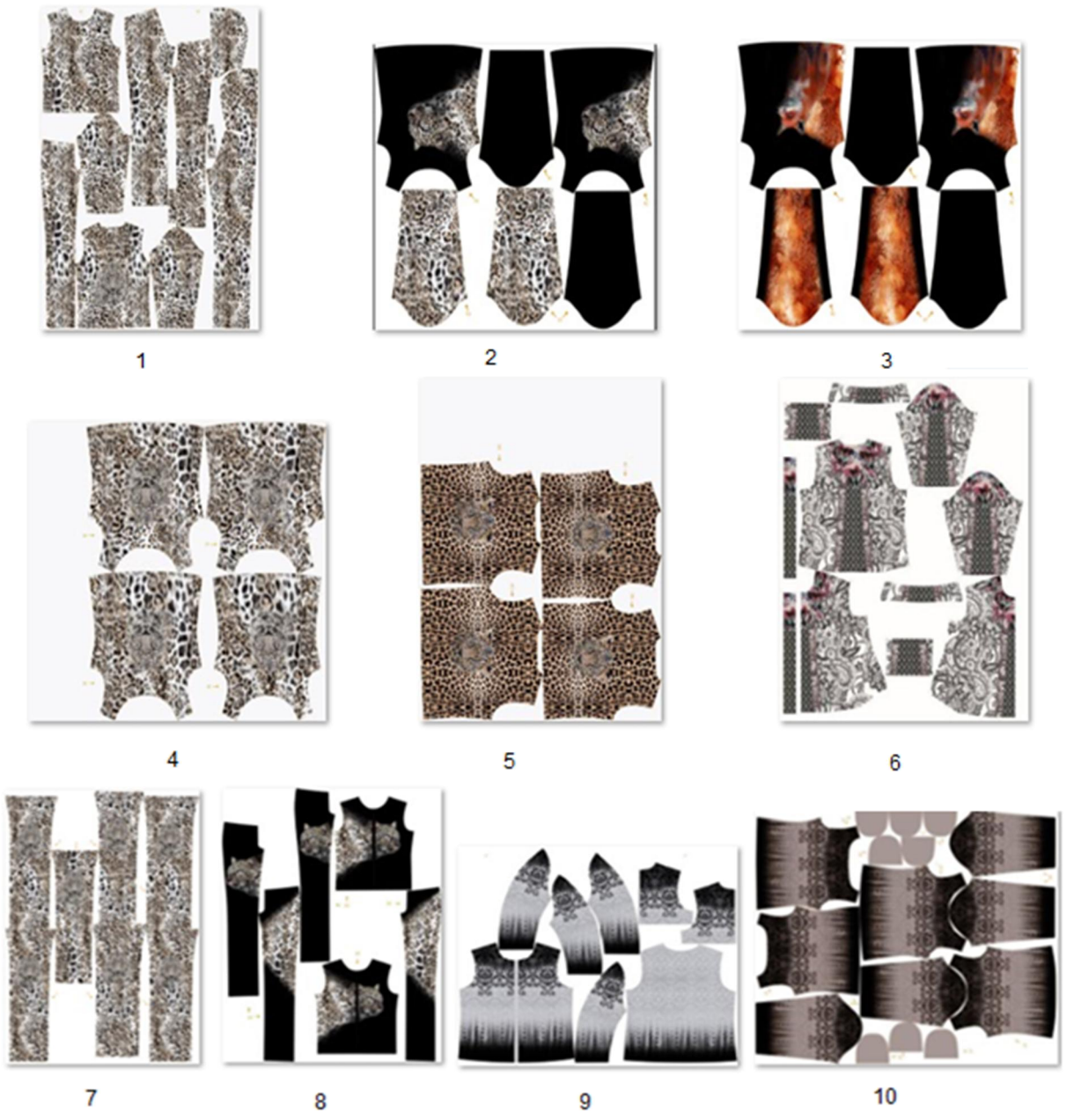

Figure 4 Customized pattern placement images

Table 1 Times spent on pattern creation and pattern placement

Pattern No.	Number of pieces that make up the patterns	1. PHASE	2. PHASE
		Pattern preparation [min]	Pattern placement [min]
1.	11	25	90
2.	6	10	60
3.	6	10	70
4.	4	10	45
5.	4	10	45
6.	11	31	180
7.	7	15	60
8.	6	15	90
9.	9	20	150
10.	16	35	90
Average [min]		**18**	**88**

5 CONCLUSIONS

Some pattern reports are requested specially to be placed on the garment in line with customer demands. The most important factor in demanding this layout is that the pattern is easily placed in the designated places, saving the fabric, cancelling some operations in the workflow and making the layout more standard. When it is desired to place special patterns on different parts of the product, this process should be preferred. Thus, the method of placing a pattern in the mold in the fabric design provides an advantage for the patterns to be positioned at the desired place. Pattern 1 in Table 1 covered the entire surface of the mold. Due to the high number of molds, the durations were found to be longer.

When the 2nd and 3rd pattern periods are examined, it is seen that the patterns and preparation times are the same, but the patterns applied to the sleeves are different. This difference was due to the placement of the 3rd pattern being different on the arms. It took a little more time for pattern placement than it should be left with an equal spacing on the right and left of the arms. Also, the 4th and 5th patterns are very similar. For this reason, mold preparation and pattern placement times were the same. When pattern 7 and pattern 8 are examined, mold preparation times are found equal. Pattern 8 was placed in certain parts of the mold, pattern placement needed more time to position it. Although the 9th and 10th patterns are similar, the pattern preparation and pattern placement times are different. Since the number of molds in the pattern 10 is higher, the mold preparation time is longer. However, since there are no patterns on small molds, pattern placement time is shorter.

Thanks to transfer and digital printing, customers' needs are responded quickly. These technologies have provided great convenience in the production of personalized production. Changes in the design and color determined by the customers can be answered in a short time. Developments in this regard are in a way to support lesser productions. With this method used, the possibility of designing the pattern on the computer and transferring it to the fabric provides designers with many options for obtaining the pattern, color and similar issues.

With all kinds of changes can be made according to the customer requests, it has made the possibility of that the printing pattern can be created and then placed in the mold that the customer wants to use, with different variations. It has reduced the waste rates in the sector. Information in transfer printing can work with computer programs. It is suitable to make the print sizes based on body series. It is possible to adjust the pattern used in printing according to each body size.

With a competitive focus; increasing product diversity, shortening of product life curves, demanding quality products with low prices, has made classic production models obsolete. Innovations made in this field can be organized especially in accordance with the production in low quantities.

6 REFERENCES

1. Vuruşkan A.: Developing a new approach on customized clothing considering fit and design parameters, Dokuz Eylül University, Institute of Science and Technology, PhD thesis, İzmir, 2010, 191 p. (in Turkish)
2. Yıldıran M.: The desing and production by 3D printings in the fashion ındustry, Art-e Art Journal 9(17), 2016, pp. 155-172 (in Turkish)
3. Bye E., LaBat K.: An analysis of apparel industry fit sessions, Journal of Textile and Apparel, Technology and Management 4(3), 2005, pp. 1-5
4. Kurt Salmon Associates, Annual consumer outlook survey, American Apparel and Footwear Association Apparel Research Committee, Orlando, FL, November 2000
5. Akpınarlı F., Bulat F.: Manipulation of textile surfaces and trialling of digital transfer printing, Motif Academy Journal of Folklore 9(17), 2016, pp. 167-186 (in Turkish)
6. Akbostancı İ.: The chaning definition of printed textile design and manufacturing in the 20th and 21st century, Art and Design Journal (5), 2014, pp. 31-41 (in Turkish)
7. Yüksel D.: Printing various feautured textile patterns with today's printing styles, Marmara University, Graduate School of Fine Arts, Master thesis, İstanbul, 2009 (in Turkish)
8. Özpulat F., Yurt D.: Design styles and techniques in current print patterned fabrics, Journal of Mediterranean Art 4(7), 2011 (in Turkish)
9. Miles L.W.C.: Textile printing, 2nd ed., Society of Dyers and Colourists, 2003, 320 p., ISBN: 978-0901956798
10. Yüksel M.: The tests and results of the fabrics that are put in production by printing process through new technologies on woven and non-woven surfaces, Haliç University, Institute of Social Sciences, Textile and Fashion Design, Master Thesis, İstanbul, 2012