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Transformable Dress Practices

Dönüştürülebilir Elbise Uygulamaları

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Araştırma Makalesi / Research Article

TRANSFORMABLE DRESS PRACTICES

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ABSTRACT: The purpose of this study is to examine transformable dress designs that can be converted into multiple design with the same basic pattern under the umbrella of sustainable fashion in terms of design, usability and marketability. For this purpose, the study was carried out in two stages. First, a capsule collection was prepared for young women working in the upper-middle socio-cultural group, who will purchase the limited productions of national and international premium fashion brands focused on price / quality and care about sustainable fashion. In the study where the design process of the selected five dresses in this collection presented, the main idea is that each dress adapts to multiple sizes and, each dress forms can be created in different combinations from same garment pattern. Iterative design trials were carried out on the 38 size, ½ proportion and scale female miniature clothing form. How many different ways each dress can be used is calculated with the subset combination formula. In the second stage, prepared dresses; target consumer opinions about design-usability and marketability were obtained by sharing from one of the researchers' personal social media accounts. From the opinions and comments of target consumers; Although they do not decrease their shopping speeds, it is concluded that they like such designs, they are happy with their customisation, they can make emotional connection with dresses and find them marketable.As a result of the combination calculations of clothes and target consumer responses, it was pointed out that the concept of sustainability can be adapted to ready-to-wear production with transformable designs.

Keywords: Garment design, slow design, sustainability, transformable garments, and creativity.

DÖNÜŞTÜRÜLEBİLİR ELBİSE UYGULAMALARI

ÖZET: Bu çalışmanın amacı, sürdürülebilir moda şemsiyesi altında aynı temel yapıya sahip çoklu tasarıma dönüştürülebilen elbise tasarımlarını tasarım, kullanılabilirlik ve pazarlanabilirlik açısından incelemektir. Bu amaçla, çalışma iki aşama yürütülmüştür. Öncelikle, ulusal ve uluslararası fiyat/kalite odaklı, sürdürülebilir modayı önemseyen premium moda markalarının sınırlı üretimlerini satın alacak orta üstü sosyo kültürel gruba dahil çalışan genç kadınlara yönelik kapsül bir koleksiyon hazırlanmıştır. Bu koleksiyonda yer alan beş adet elbisenin tasarım sürecinin aktarıldığı çalışmada ana fikir; her bir elbisenin birden çok bedene uyum sağlaması ve bir kalıp ile farklı kombinasyonlarda elbise formlarının oluşturulabilirliğidir. Tekrarlı tasarım denemeleri 38 beden ½ oranlı ve ölçekli kadın minyatür giysi formu üzerinde yapılmıştır. Alt küme kombinasyonu formülüyle her bir elbisenin kaç farklı şekilde kullanılabileceği hesaplanmıştır. İkinci aşamada, hazırlanan elbiseler; araştırmacılardan birinin kişisel sosyal medya hesabından paylaşılarak tasarım-kullanılabilirlik ve pazarlanabilirlik durumları hakkında hedef tüketici görüşleri alınmıştır. Görüş ve yorumlardan hedef tüketicilerin; alışveriş hızlarını düşürmese de bu tür tasarımları beğendikleri, kişiselleştirme özelliğinden mutlu oldukları, elbiseler ile duygusal bağ kurabildikleri ve pazarlanabilir buldukları sonuçlarına ulaşılmıştır. Elbiselerin kombinasyon hesapları ve hedef tüketici cevapları sonucunda, sürdürülebilirlik kavramının dönüştürülebilir tasarımlar ile hazır giyim üretimine de uyarlanabileceğine dikkat çekilmiştir.

Anahtar Kelimeler: Giysi tasarımı, sürdürülebilirlik, yavaş moda, dönüştürülebilir elbiseler, yaratıcılık.

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1. INTRODUCTION

Sustainability discussed at the "United Nations Human Environment Conference" held in Stockholm in 1972 [1] involves complex and changing environmental dynamics that affect human livelihoods and well-being, with intersecting ecological, economic, and socio-political dimensions, both globally and locally [2]. Until the 2000s, the garment industry, whose main goal was to introduce products that support continuous consumption under the name of "brand new", adopts more environmentally friendly and longer usage oriented design strategies from the beginning of the millennium. Approaches such as slow fashion and sustainable fashion are developed especially against the fast consumption cycle. According to the Research about raising awareness of fashion sustainability that "*young consumers are more interested in social and environmental practices in fashion, and more than 50% of consumers plan to switch brands in the future if another brand acts more environmentally and socially friendly than their preferred one."* [3]. As Niinimäki mentioned that one of the key issue in sustainable development is extending the use of clothes [4]. Reaching of this issue, the focus should be extending product life cycle and utilization after buying or selling the product. All participants such as designer, manufacturer, retailer and user should make an effort in this issue.

Karell draws attention to emotional durability for sustainability that the consumers wish to keep and use for longer clothes by stronger emotional connection with the pieces one already own. Some of general strategies are as follows: "enhancing a garment's value; using co-creation and personalisation strategies to customize a garment's function and aesthetics to the actual needs and desires of the wearer; keeping the interest of the wearer by using techniques for updating possibilities of the pieces; using materials, coatings and techniques" [5]. One of the techniques is transformable clothing. Transformable has been determined as capable of being change something function from one state to another [6]. As stated these garments "offer two or more functional or aesthetic alternative styles through various manipulative methods, such as wrapping, binding, rolling, twisting, tying, folding, gathering and shirring. In other cases, clothing can also be transformed without changing its form or silhouette surface decorations and embellishments are some examples" [7]. Transformable clothing aligns with a few different aspects of environmentally ethical fashion design. For one, a garment made in a manner that can change appearances easily may encourage consumers to buy fewer clothing items, given its versatility. Additionally, enabling users to affect the design of a garment may cause them to feel more emotionally attached to the garment, delaying its psychological obsolescence [7].

Yohji Yamamoto's wedding dress can be best samples of transformable designs in Figure 1a/b. It was exhibited in 2001 at the V&A Museum "Fashion Radical" exhibition [8]. The dresses of Hussein Chalayan are other good examples that can be given to transformable clothes in Figure 2a/b [9].

Some users responded that they would like to decrease the frequency of their garment purchases and the size of their wardrobes as a result of increasing the use of transformable tops [11].

Fletcher [12] expresses that "Good stuff is durable, made from locally sourced, sustainable materials, is repairable, fit for purpose and dismantle-able (thus easily up-cycled or recycled). It has a valued purpose (not just a fantasy-advertising-based, flash-fashionable appeal). Let's make stuff remarkable again".

In brief, transformable garments have the potential to be used more frequently thanks to their ability to serve multiple needs in less time with fewer parts, increasing the product life cycle. The Covit 19 pandemic process has increased the do-it-yourself (DIY) activities of worldwide users. Global fashion interviews [13] point out that the new trends of the future fashion concept will be protective and global garment designs in the user focus.

Figure 1a/b. Yohji Yamamoto's Spring Collection, 1999 [10]

Figure 2 a/b. Hussein Chalayan's Autumn Winter Collection, 2013 [9]

2. THE AIM AND SIGNIFICANCE

The purpose of this study is to examine transformable dress designs that can be converted into multiple design with the same basic pattern under the umbrella of sustainable fashion in terms of design, usability and marketability. For this purpose, answers of the two questions were sought in this study:

- How can we make transformable dresses for different bodies by using a single dress pattern?
- Can transformable dresses increase the product lifetime of users?

This study is important for drawing attention to the extension of the product-life process and product customization and creating sustainable product awareness. Such garments support conscious consumption and harmonize with ethical fashion design. Thanks to their easy modifiable looks, these dresses may foster consumers to buy less. May be by including the users in the design process, they can be connected to the clothing loyalty and delay the impression of the cloth is worn out. New fashion trends aim to attribute some kind of emotional commitment to clothes and attribute value with their user experience [14]. For example, it tries to create a bond of emotional loyalty to users with a personalized product. One of the keys to success in a design is to create a link between the user and the designer. For this, the inclusion of the user in the production process can enable them to connect with the product and the manufacturer [15]. It is planned to include the user in the design process by providing the use of the clothes in different options in this study.

3. METHOD

Tim Brown's [16] innovative design approach was used in process. The research was carried out in two stages. The first stage consists of the design and the second stage evaluation.

3.1. First Stage- Preparation of Capsule Collection

Sample and limitations are built according to target market and concept creating (focus subject) given in Table 1 by using design based research method. The higher the position of the branded product is defined the more tangible and exotic the user is willing to access [17]. For this reason, based on the need hierarchy of Maslow, the scenario setup focused on the accessible and transformable luxury product that appeals to the emotions that are the concept of the future. With this foresight, designs that are both transformable, providing long and various usage possibilities and offering personalization have been developed. Within the framework of the prepared scenario, the theme of the capsule collection named Transformable. The mood board given in Figure 3 was prepared for design inspiration process. Transform points to the dynamic process in the universe, and is symbolized by the binding strips through loopholes on the dress. The reason for choosing the Loopholes technique is that the clothes prepared for a similar production period offer the user the option of customizing the product with a very simple shirring and gathering motion.

Table 1. Target Market & Creating Concept

Positioning	International & national price/quality driven premium or accessible luxury fashion brands
Geographic region	Global & Regional
Marketing Type	E-marketing
Target Audience	Stylist but environmentalist women consumers
Creativity Level	New product development with implementation of creativity
Design & product specifications	Transformable design, Customization
Concept	Transformable, Flexibility, Viability of multiple size

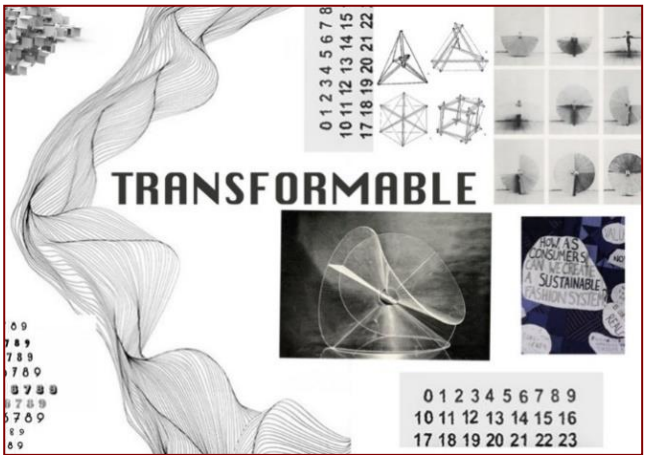


Figure 3. Mood board: Transformable

Focus issues/Concepts of the scenario are that each dress can be used in multiple options and adapt to different body strips. Selected five dresses from capsule collection prepared for the target audience features for fashion set-one stage looks in Table 1 were obtained by iterative pre and prototypes trials and without sketching, with draping technique on half scale female form. After prototype approval, technical drawing was prepared for limited line production. Using the subset combination calculation formula, it was found how many different forms can be designed by shirring and gathering binding strips in each dress.

Combination accounts were used to draw the attention of users to changes in design. Combinational operations are the calculations to determine all possible sequences, grouping and sorting by using a certain number of objects and also about how many different objects can be selected [18]. The sub number of a set with n elements is 2^n [19].

Model is created as follows:

if it is free form (none of the n binding strip is not gathered) $\binom{n}{0}$=1,

if one of the n binding strip is gathered… $\binom{n}{1}$= n,

if n number of the n binding strip is gathered…$\binom{n}{n}$=1.

when every dress binding strip gathered formula $\binom{n}{0}+\binom{n}{1}+\ldots\ldots\ldots\binom{n}{n}=2^n$ is used for calculating of the combinations that will occur. The transformational design process with the visuals and the combination calculations of each dress is given in the findings.

3.2. Second Stage- Evaluation of Dresses:

The dresses, which were prepared, were shared with one of the researchers (with 708 followers) via their personal social media account “Instagram”. Participant’s opinions on the design-use-marketability status of each dress were received over a 24-hour timeframe on their social media account.

The four questions posed to the participants are: Would it make you happy if the dresses offer customization? Does the possibility of customization cause you to establish an emotional bond between you and the dresses? Does obtaining more than one form with one pattern slow down your product purchase speed? Are designs marketable? /would you buy it?. The implications of the answers are discussed in the findings section.

Ethics commission permissions of Ankara Haci Bayram Veli University, numbered 11054618-302.08.01 and coded 2020/91 were obtained for this study.

4. FINDINGS

Research questions are that “How can we make transformable dresses for different bodies by using a single dress pattern? In addition, can transformable dresses increase the product lifetime of users? Scenario based trial findings for the answers to the research questions are given below.

4.1. Findings about Transformable Dress Designs:

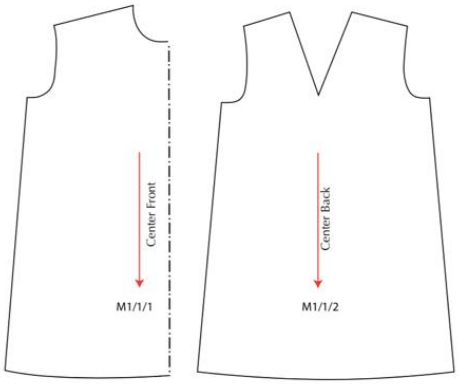
Model 1: The design details are constructed by the look created by the shirring of the bindings passing through vertical loopholes. There are eight in the front pattern and four in the back pattern of these strips forming the dress silhouette. While the front body is symmetrical, the shoulders are asymmetrical in the back pattern. When the free form (non-gathered binding strips) and the combination of these are calculated, $\binom{12}{0}+\binom{12}{1}+\ldots\binom{12}{12}=2^{12}$=4096 number of different design forms can be created. Model 1 presentation board is given in Table 1.

Model 2: The outlook waist and hip have been changed via circular and irregular loopholes in the back pattern and horizontal loopholes at the level of the armhole respectively. The loopholes in the back allow dress styling. There are thirteen loopholes in the front body, and three ones in the back, when the bilateral shirring options are taken into account. According to results obtained from trial process, the dress can create combinations as $\binom{16}{0}+\binom{16}{1}+\ldots\binom{16}{16}=2^{16}$=65536 in different ways. Model 2 presentation board is given in Table 2.

Table 2. Presentation Board of Model 1

Design Combinations: 4096

Patterns



Measurement

1-2 Armscye depth: 11 cm.

1-3 Model length: 43 cm.

4-5 2nd Tuck: 1 cm. 5-6 3rd tuck: 1 cm.

6-7 4th tuck: 1 cm. 7-8 5th tuck: 1 cm.

8-9 Colar width: 7 cm. 9-10 Shoulder (front): 6 cm.

11-12 1st tuck: 1 cm. 13-14 Hem width: 63 cm.

15-16 Chest width: 24 cm. 1-17 Tuck length:35 cm.

18-19 Shoulder (back):6 cm.

18-20 Shoulder 1st tuck (back): 2 cm.

20-21 Shoulder 2nd tuck (back): 2 cm.

22-23 Hem width (back): 38 cm.

24-25: Back tuck: 3 cm.

26-29 Shoulder tuck length: 25 cm.

27-28: Back tuck length: 19 cm.

Technical Sketch

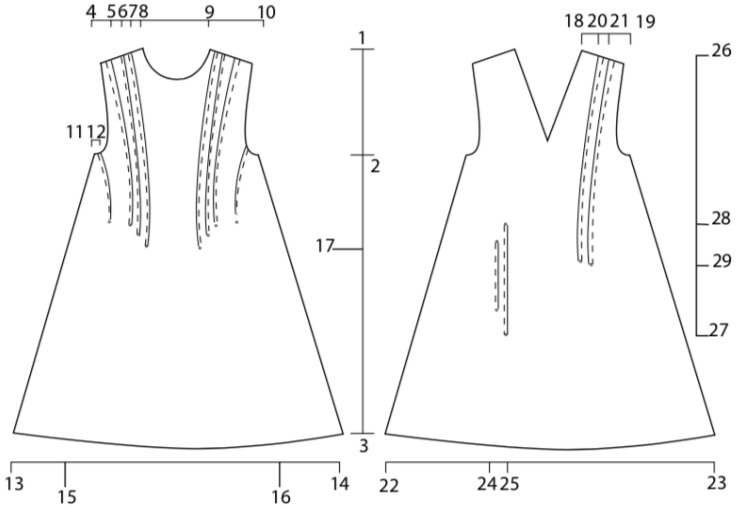
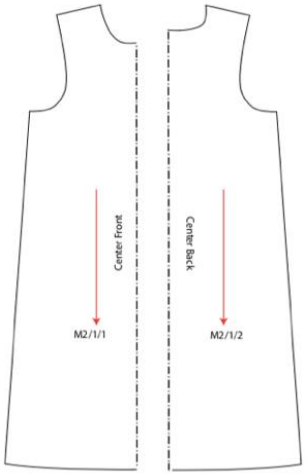


Table 3. Presentation Board of Model 2

Design Combinations: 65536

Patterns



Measurement

1-2 Armscye depth: 11 cm

1-3 Model length: 40 cm

4-5 Shoulders: 19 cm.

6-7 Hem width: 35 cm.

8-9 Chest width: 30 cm.

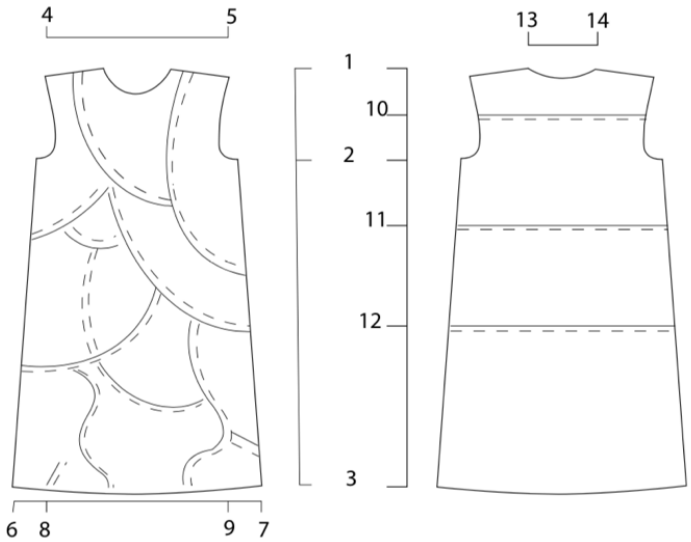
1-10 1st tuck (Back): 6 cm.

1-11 2nd tuck (Back):18 cm.

1-12 3rh tuck (Bcak): 29 cm.

13-14 Colar width: 7 cm.

Technical Sketch

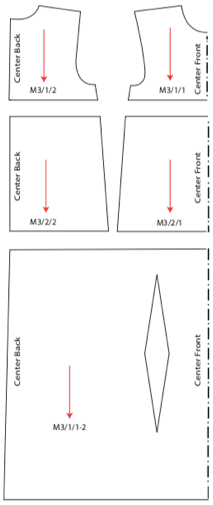


Model 3: The design detail in this model is binding strips through the loopholes used transversely. The dress has the options of expanding and narrowing with the two darts on the front pattern. Nineteen transverse loopholes are used in the dress. Considering the gathered and released form of the binding strips in these loopholes; the dress can be used in $\binom{19}{0}+\binom{19}{1}+\ldots\binom{19}{19}=2^{19}=524288$ combinations. Model 3 presentation board is given in Table 3.

Table 4. Presentation Board of Model 3

Design Combinations: 524288

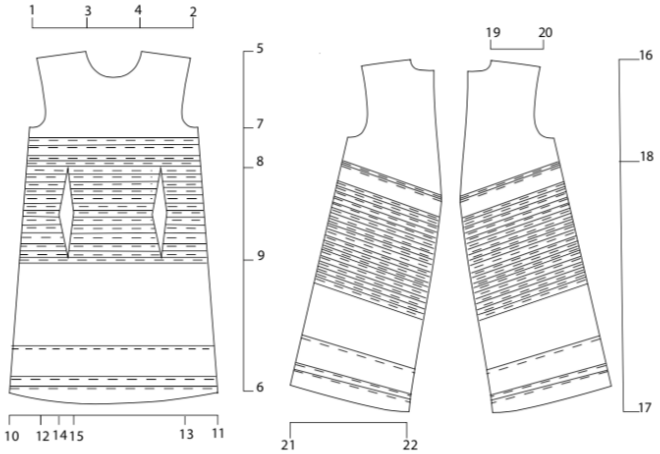
Patterns



Measurement

1-2 Shoulders: 19 cm
1-3 Shoulder: 6 cm
5-6 Model length (Front):40 cm
3-4 Colar width: 7 cm
5-7 Armscye depth:11 cm
8-9 Dart lenght: 13 cm
5-8 Dart punched hole: 14 cm
10-11 Hem width: 42 cm
12-13 Chest width: 28 cm
14-15 Dart width: 5 cm
16-18 1st tuck (back): 23 cm
19-20 Shoulder (back): 9 cm
16-17 Model length (Back): 45 cm
21-22 Back hem width: 16 cm

Technical Sketch

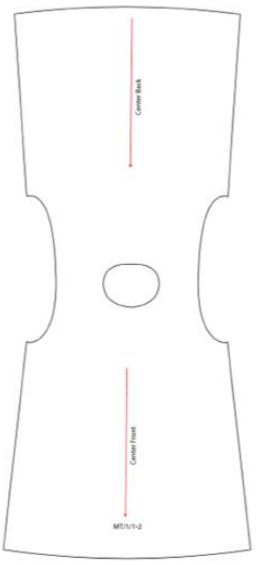


Model 4: In this model, form options were developed both in the length and width of the dress, with the binding strips passing through the vertical loopholes and surrounding the armhole. There are eight channels, four in the front and four at the back. The channels start from the front body and continue to the backwards. Dress can be used in $\binom{8}{0}+\binom{8}{1}+\ldots\binom{8}{8}=2^8=256$ ways. Model 4 presentation board is given in Table 4.

Table 5. Presentation Board of Model 4

Design Combinations: 256

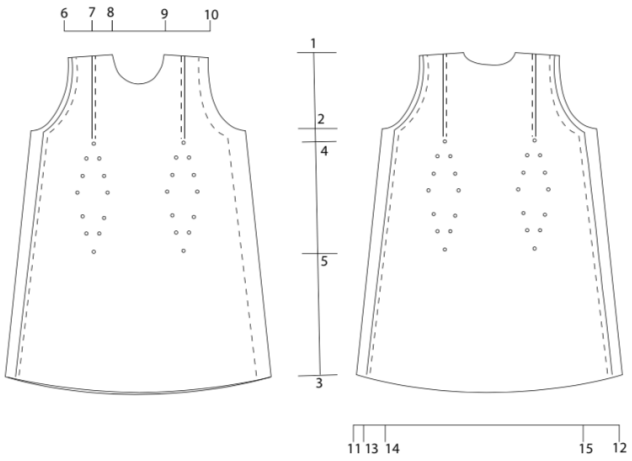
Patterns



Measurement

1-2 Armscye Depth: 11 cm
11-12 Hem width: 39 cm
1-3 Model length: 44 cm
1-4 Dart punched hole:13 cm
4-5 Dart lenght: 17 cm
6-7 Shoulder tuck: 3 cm
8-9 Colar width: 7 cm.
6-10 Shoulders:19 cm
11-13 Side seam tuck: 3 cm
14-15 Chest width: 30 cm.

Technical Sketch

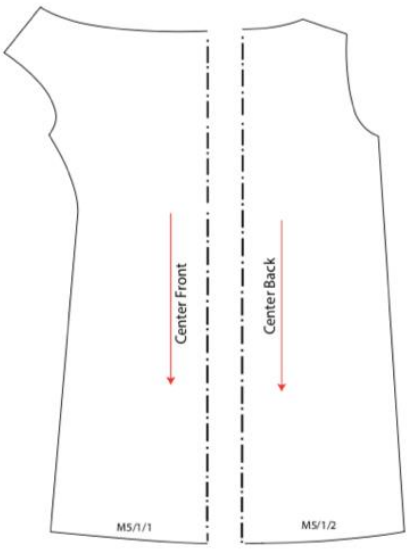


Model 5: There are two darts on the front and one at the back. When the front darts are released, a model with a cowl neck is obtained. The back darts on the pattern waist help the dress fit. The dress can be used in $\binom{3}{0}+\binom{3}{1}+\ldots\binom{3}{3}=2^3=$ 8 different combinations. Model 5 presentation board is given in Table 5.

Table 6. Presentation Board of Model 5

Design Combinations: 8

Patterns



Measurement

1-2 Colar width: 22 cm.

3-4 Armscye depth: 11 cm

3-5 Model length: 42 cm.

6-7 2nd punched hole: 4 cm.

7-8 3rh punched hole: 4 cm.

8-9 4th punched hole: 5 cm.

9-10 5th punched hole: 4 cm.

10-11 6th punched hole: 4 cm.

11-12 7th punched hole: 3 cm.

13-14 Hem width: 37 cm.

15-16 Chest width: 30 cm.

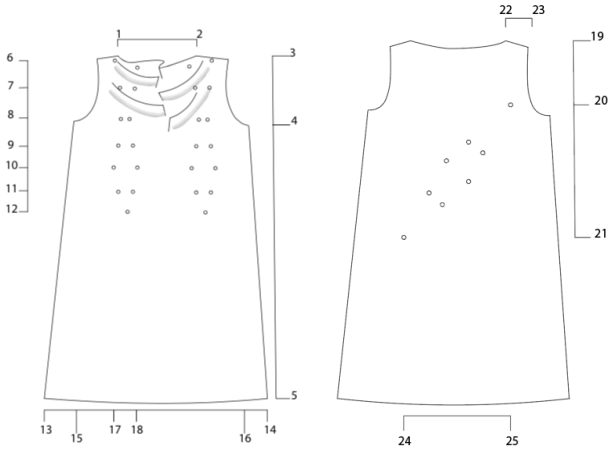
17-18: Dart width (front): 4 cm.

19-20 1st punched hole (back): 13 cm.

19-21 5th punched hole (back): 33 cm.

24-25 Dart width (back): 15 cm.

Technical Sketch



4.2. Finding about Evaluation of Dresses:

The views of the participants of the survey on the dress designs have been presented in the Table 7. One hundred and ninety-two of the 197 people who answered the first question stated that "Customizing the dresses would make them happy. Of the 191 participants who answered the second question, 156 answered yes and 35 answered no. Despite the negative views, it indicates that the possibility of customisation to establish an emotional bond between the person and the product will contribute to extending the life of the product. Of the 188 participants who answered the third question, 111 answered yes, 77 answered no. The rate of answers is very close to each other. Some of the verbal comments made are as follows:

- I do not think I will decrease my shopping speed, but I would wear it more often if I had such a dress.
- These kinds of dresses are very good and sensible as an idea, but I love shopping.

These comments reveal that even if they support sustainable designs, they cannot easily reduce their clothing purchasing behaviours. One hundred and fifty-nine of the 189 participants who answered the fourth question found the dresses marketable. These answers indicate that it would be beneficial to work on transformable dress designs.

Table 7. Participant Views on Transformable Dress Designs

Questions	Total number of respondents	Yes		No	
		f	%	f	%
1. Does the customizability of the dresses make you happy?	197	192	97	5	3
2.Does customization contribute to an emotional bond with the suit?	191	156	82	35	18
3.Doing multiple forms with the same garment contribute to buying less?	188	111	59	77	41
4.Are the dresses marketable (would you buy it)?	189	159	84	30	16

5. CONCLUSIONS

5.1. Conclusions of Capsule Collection Design:

The dresses are in a sleeveless, plain "A" silhouette that does not fit the contours of the body. The basic principle in the design is the customizability of the binding strips passing through loopholes in different ways. Each dress can be transformed into a different look with its own interior details. By this way, the same dress has different looks for the user aesthetically. In Models 1 and 2, the shirring of the binding strips passing through the loopholes were used, whereas, in Model 3, 4 and 5 the dart applications were used additionally. In the first one of the five dresses prepared with the concept of transformable design, binding strips are placed vertically, while in the second one they are arranged regularly and irregularly. Darts supported the shirring techniques through the longitudinal and transverse loopholes in the third, fourth and fifth dresses. Adaptation to different body widths is provided by these ways.

In the study, the expected targets in terms of transformation have been reached. As can be seen in the photos in the findings, each dress could be transformed into a usable form in different ways with the combination options created by shirring with binding strips. Although it is the same pattern, different looks are obtained. Each prepared model can be produced by scaling it up 1/1 with the help of the technical drawings and dimensions provided. However, some restrictions are emerged during the application. These are the problems experienced in passing the binding strips used on the body into the flexible loopholes and the process takes time. Strips could not move easily in the loopholes due to the use of coarse-textured ready strips. Attention should be paid to the selection of binding strips materials used in the loopholes of different designs.

According to the applied combination formula, the first of the five models 4096, the second 65536, the third 524288, the fourth 256, the fifth can be used in 8 different ways. There has been a decrease in the number of design combinations directly proportional to the number of binding strips. Combination numbers may not always be as meaningful as mathematics science for the designer and user. However, the aim of this study is to draw attention to the longer use of products with more forms. In this way, it is to show the user how a dress can fit in a different form and how many options it has for this. Experiences can make a positive contribution to users' choice of transformable clothing. This approach can create alternatives that transform the numerical surplus of fast fashion into model diversity.

5.2. Conclusions about Evaluation of Dresses

One hundred and ninety-two of the 197 people who answered the first question of the study stated that they were happy that the prepared dresses were customizable; One hundred and fifty-six of the 191 participants who answered their second question think that personalization will contribute to establishing an emotional bond with the dress.

Models that are transformable in multiple combinations and compatible with different sizes and shapes with in the same dress are obtained in this study. The designs offer users possibility of customisation. Transformable applications aim to make optimum use of dresses. Thus, different outcomes are available for the users optionally by creating various options in the dresses. Giving users the chance to make changes to products can contribute to their reduction in consumption demands. Production of garments with multiple optional usage can support the more efficient use of resources and reduce the negative environmental impacts at every stage of production.

A hundred eleven of 188 people who answered the third question of the research stated that obtaining more than one form with the same clothing may contribute to the purchase of less clothing; 77 people stated that although they liked the designs and used more frequently, they could not slow down the speed of buying new products. A hundred fifty nine of the 189 participants who answered the fourth question found the dresses marketable. These answers indicate that it will be beneficial to work on transformable dress designs in the future.

When the answers given to the third and fourth questions are considered together, it seems difficult to change consumer trends in a short time. However, this study emphasizes the involvement of users in the design / transformation process in some way. Optional product use can be linked to the concepts of slow fashion and sustainability, both individually and globally. In this way, people's orientation to change-transform rather than throw-away can be supported.

On the other hand, it is aimed to reduce the economic burden of designing for niche consumer groups separately. Ability to create different versions of the same dress can also affect the production speed positively. In terms of the target audience, the dresses can also be questioned on middle-aged women who are in the high socio-economic class and who care sustainable clothing but style-oriented. The development of the dress over the basic dress pattern increases the applicability to the production of large number of ready-made garments with lower quality and price.

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