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Research Article

Designing Modern Women's Costumes Using Shape Stability and Transformation Elements

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Abstract

The article extensively discusses the structural and technological solutions of traditional Uzbek national costumes and the current role of national fabrics. At the same time, the relevance of targeted scientific research in such areas as ensuring shape stability of garment components, functionality of clothing in the garment industry, and expanding the range of garments in consumers' wardrobes through the use of transformation elements is thoroughly addressed. The activities of prominent designers who have worked in the global fashion industry to date, as well as the demand for national fabrics and the stages of their development, are examined. In order to design a modern women's costume, a survey was conducted among 284 respondents aged 20 to 45 representing various professional fields. The study presents an analysis of the survey results. Based on the survey results, the fabric, type of garment, transformation elements, and elements to be used in garment components for a transformable women's costume were analyzed. Based on the results of the analysis, a new design for a women's costume was developed. The designed women's costume incorporates reversible additional components as well as a warm collar-vest, making it possible to change the external appearance of the garment by modifying its components. The jacket is made from the main costume fabric, while the additional components are made from adras and silk fabrics. The technological process of garment production was also analyzed in the study. The use of a polymer composition instead of interlining fabric (dublerin) to ensure shape stability in garment components was investigated.

Keywords

Transformation, Wardrobe, Fashion, Module, Innovation, Couture, Shape, Adras

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1. Introduction

The development of the garment industry worldwide is achieved through the introduction of advanced innovations into production processes.

Particular attention is currently being paid to rapidly identifying consumer needs and future fashion trends in the design of women's clothing. Significant attention is being given to the development of new, high-quality and competitive garments, including women's clothing that meets hygienic, ergonomic, functional and aesthetic requirements, as well as to increasing the variety of clothing types through the use of modern styles and improving quality indicators.

Scientific research is being conducted worldwide aimed at developing innovative technologies and equipment for the garment and light industry based on the effective use of modern achievements in science and technology, as well as improving existing technologies.

In this area, priority is given to research aimed at developing the scientific foundations of garment production technologies, efficiently using local raw materials, and expanding the range of competitive products based on resource-saving technologies.

At the same time, targeted scientific research in areas such as ensuring the functionality of garments, which is important for the garment industry, and expanding the range of clothing in consumers' wardrobes through the use of transformation elements represents an important and relevant task.

2. Literature Review

Fashion emerges in the cultural and social environment in opposition to established tastes and traditions of dress. After competing with and eventually replacing them, it dominates society for a certain period of time. It continues to exist until a new fashion emerges against it and, according to the principle of the negation of negation, is itself replaced by a new fashion and becomes part of the pages of history.

According to specialists in the field: "Fashion is complex in character, like elegant and capricious ladies. It is possible to try to predict its behavior and even influence it to some extent, but this always involves risk. Fashion may betray itself at the last moment and abandon even those aspects that it had previously recommended and considered fashionable and beautiful" [1].

Of course, not all fashions have the same lifespan. The longevity of fashion is determined by the creative inspiration invested in it by the artist-designer, its ability to embody the fundamental needs of members of society, and its ability to absorb the spirit of the era.

"For fashion to emerge, an artist and people who can wear the garments created by that artist are required. This pair must understand each other well; if possible, their worldviews and tastes should be as compatible as possible, and they must certainly be able to perceive the spirit of the times in the same way" [2].

Thus, ensuring the perfection of fashion requires not only modern clothing but also consideration of the human body appropriate to such clothing and the individual's worldview.

When discussing the close relationship between fashion and social life, it is appropriate to recall the words of the famous Italian writer Alberto Moravia:

"Fashion is history, and history itself cannot argue, debate or reject this issue. Only peoples without history ignore problems related to the culture of dress."

Thus, clothing in every socio-historical period embodies the spirit of that period [3].

In his work *On the Taste that Responds to Fashion*, the German philosopher Immanuel Kant stated: "Fashion is the law of imitation. To possess a significant characteristic compared with others without pursuing any practical benefit is called fashion" [4].

Regardless of how long discussions about the national character of fashion may continue, it should also be noted that the shape, appearance and colors of clothing, as well as the types of fabrics corresponding to the generosity of nature, have developed and been refined over centuries under the influence of external factors and internal worldviews, in connection with the geographical environment, climate, socio-geographical conditions and spiritual characteristics of the people [5].

Coco Chanel left a remarkable definition of fashion: "Fashion is not simply a matter of clothing. Everyone anticipates it and feels it intuitively. It is in the sky and on the road" [6].

The difference between style and fashion has also been described by several renowned creative figures. According to Spanish designer Oscar de la Renta: "Fashion is the art of dressing according to the latest trends. Style is the art of being yourself" [7].

Vogue editor Anna Wintour stated that "fashion is about looking toward the future," while model Lauren Hutton said: "Fashion is what designers offer four times a year, while style is what you choose" [8].

Fashion designer Giorgio Armani stated that "the difference between style and fashion is quality", Gianni Versace expressed an interesting contrasting view, emphasizing that fashion does not stand still while clothing may remain unchanged: "Fashion is not about labels or brands. It is about another process taking place inside us". Ralph Lauren described fashion as "a reflection of the experiences taking place in the human heart and soul".

Designer Miuccia Prada also seemed to confirm these ideas by stating:

"Your clothing is a way of presenting yourself to the world, especially at a time when communication is becoming increasingly rapid; fashion is an instant language".

Coco Chanel revealed the essence of fashion and style

through her statements: "Fashion passes, style remains," "Fashion cannot be called fashion if it cannot be worn on the street," and "Fashion has two purposes: comfort and love. Beauty emerges, and fashion achieves these goals" [9].

The famous Japanese designer Issey Miyake stated: "Everything has become so expensive and so couture-like that it is time to start thinking differently and present something new". The famous designer Paco Rabanne created an impressive clothing collection using metal plates based on a modular approach. This represented the introduction of clothing based on a new modular concept.

Previous research has mainly focused on the cut and external shape of outerwear, the development of fashion styles, and the use of costume and national fabrics in outerwear. However, the use of transformation elements with national fabrics in women's costumes and the application of polymer compositions to various women's costumes in the rapidly changing fashion industry have not been sufficiently studied. Therefore, the aim of this research was to use transformation elements in women's national costumes and apply polymer compositions to ensure the shape stability of garment components.

3. Methods

A module is selected based on human body measurements and the optimal dimensions of the garment. Usually, a module consists of simple geometric shapes. When the "patchwork" method is used in clothing design, the main characteristic of the module is that both its front and reverse sides are finished neatly. The materials used, methods of joining, colors and geometric shapes allow the creation of garments in various configurations.

In the transformation method, joining techniques that allow the shape of a garment to be changed should be applied. The reasons for changing the shape of a garment may include:

1) increasing a small form into a larger one or reducing a large form into a smaller one, using the method of folding or unfolding the module;
2) creating a complex shape from a simple shape or a simple shape from a complex shape;
3) changing the intended purpose of a garment by changing its shape.

When a module has a complex shape, such as a flower, leaf, butterfly, bird, etc., the modules can be joined by sewing them together, using embroidery techniques such as the "richelieu" embroidery element, or using garment accessories.

When modules of different shapes are attached on top of one another, complex compositions can be created. The famous Japanese designer Issey Miyake stated: "Everything has become so expensive and so couture-like that it is time to start thinking differently and present something new". The famous designer Paco Rabanne created an impressive clothing collection from metal plates using a modular method. This represented the introduction of a new modular approach to clothing.

A module is selected based on human body measurements and the optimal dimensions of clothing. Usually, a module consists of simple geometric shapes.

When the "patchwork" method is used in clothing design, the main characteristic of the module is that both its front and reverse sides are finished neatly. The materials used, methods of joining, colors and geometric shapes make it possible to create garments in different variations.

In the transformation method, joining techniques that allow the shape of the garment to be changed should be applied. The reasons for changing the garment shape may include increasing or reducing its size, creating a complex shape from a simple one or vice versa, and changing the intended purpose of the garment through changes in its shape.

When modules have complex shapes, such as flowers, leaves, butterflies or birds, they can be joined by sewing, embroidery techniques such as the "richelieu" element, or garment accessories. Combining modules of different shapes can create complex compositions [12-15].

4. Results and Discussion

From a scientific perspective, the results of this survey provide a basis for developing a theoretical model for combining national identity, functionality and modernity in women's clothing. Based on the results, scientific conclusions can be drawn in the areas of ergonomic form, color psychology, fabric structure and structural modeling in clothing design. The theoretical significance of the study lies in its reinterpretation of the concept of national clothing design while taking consumer psychology and sociocultural factors into account.

The survey results presented below are analyzed in detail from the perspectives of stylistic preferences in women's clothing, harmony of color and form, fabric selection, and the role of functional elements in design.

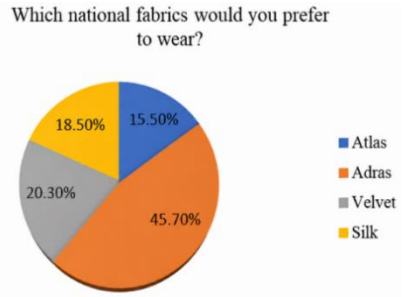


Figure 1. Results of respondents' preferences regarding types of national fabrics.

According to the survey regarding which national fabric respondents would prefer for clothing, 45.70% preferred garments made from adras, 15.50% preferred atlas, 18.50% preferred silk, and 20.30% preferred velvet (Figure 1). Based on the survey results and respondents' needs and preferences, it was decided to use adras fabric as the main fabric for the garment being designed.

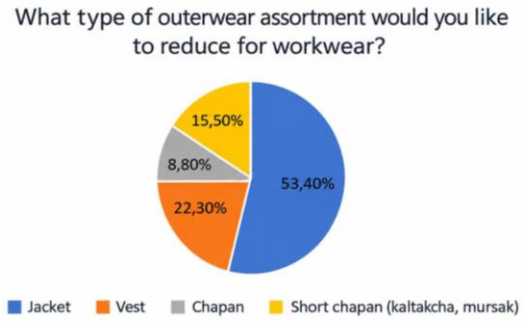


Figure 2. *Results of respondents' preferred outerwear assortment for workwear.*

A total of 53.4% of respondents preferred a jacket among the proposed types of workwear outerwear. Another 22.3% preferred a vest, while 15.5% preferred a chapan. Since more than half of the 284 respondents selected a jacket as their preferred outerwear for professional activities, a jacket was selected for the garment being designed (Figure 2).

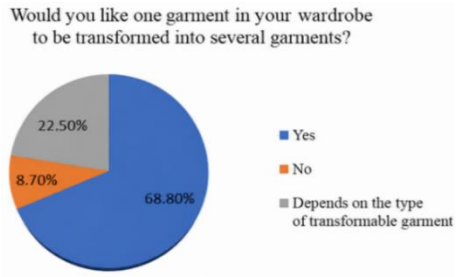


Figure 3. *Results of respondents' preferences regarding transformation of garments within the wardrobe.*

A total of 68.8% of respondents expressed a desire for one garment in their wardrobe to be transformable into several garments. According to 22.5% of respondents, their desire for transformation depended on the type of garment. Another 8.7% answered "No" to this question. The responses demonstrate a strong demand and desire for transformable garments. Therefore, it is appropriate to use a transformation method in the garment being designed (Figure 3).

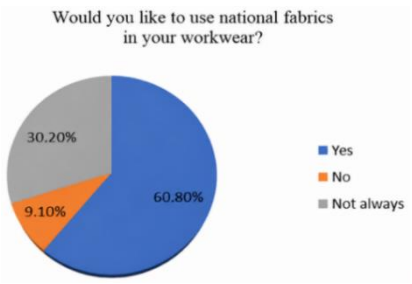


Figure 4. *Results of respondents' preferences regarding the use of national fabrics in workwear.*

A total of 60.8% of respondents expressed a desire to use national fabrics in their workwear. This demonstrates that the use of national fabrics in people's wardrobes and workwear can satisfy a significant level of demand (Figure 4).

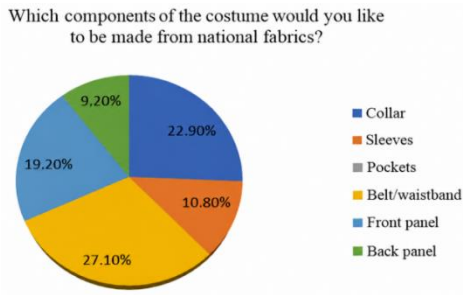


Figure 5. *Results of respondents' preferences regarding garment components made from national fabrics.*

The source chart indicates the corresponding percentage for the pocket component; the original text specifically discusses the leading three preferences. In response to this question, 27.1% of respondents wanted the belt/waistband to be made from national fabrics, 22.9% preferred the collar, and 19.2% wanted national fabric components on the front panel. The needs and preferences of respondents determine which components of the designed garment should be made from national fabrics (Figure 5).

In the scientific research, a questionnaire was developed to determine what should be considered when designing women's clothing using national fabrics such as atlas, adras, bekasam and banoras, woven from a mixture of natural silk and cotton fibers. Representatives of various professional fields aged 20 to 45 from Tashkent city, Tashkent region and other regions participated in the survey. Based on the results of the survey, a design for a modern transformable women's costume was developed.

The "Transformable women's jacket with reversible additional components made from national fabrics" is characterized by the following main compositional elements:

1) a jacket with additional components made from national fabrics — adras and silk;
2) a reversible shawl-collar vest;
3) a shawl collar with a warm vest;
4) a reversible peplum;
5) reversible additional sleeve components (cuffs).

The jacket has a semi-fitted silhouette, reaches below the waist to the hip area, and has long sleeves. It features a notched lapel collar with an English-style collar, over which a shawl collar is placed. The jacket is fastened with a single button and has a peplum at the lower part. The sleeves, sleeve extensions (cuffs), peplum and shawl collar are designed as detachable components.



Figure 6. *Modern transformable women's costume.*

The jacket is equipped with concealed snap fasteners for attaching and detaching the removable components. These fasteners are located on the inner chest area, shoulder area, waist area and cuff area. The shawl collar is designed in the form of a vest, with the collar attached to the vest. It is intended to be worn over the English-style collar.

The sleeve extensions are designed in the form of wide cuffs. The peplum is also designed to be wide. In addition, there is a shawl collar combined with a warm vest. The warm shawl collar is produced using a quilted construction method. The jacket can be worn with reversible additional components as well as with the warm collar-vest. By changing the components, it is possible to modify the external appearance of the garment. The jacket is made from the main costume fabric, while the additional components are made from adras and silk fabrics.

The scientific study also examined a comparative analysis of the consumption of interlining materials and polymer compositions used in garment components. The amount of polymer composition used for a 10 × 10 cm^2 fabric sample ranged from 20 to 60 mg, depending on the type of fabric [10].

The technological process of treating women's costumes using interlining fabric (dublerin) and polymer composition is presented in Figure 7. For the interlining method, the processes of developing patterns for the interlining, preparing the layout and marking, cutting the interlining components, assembling the components, and pressing the interlining onto the outer fabric components were studied under production conditions and compared with the proposed method [11].

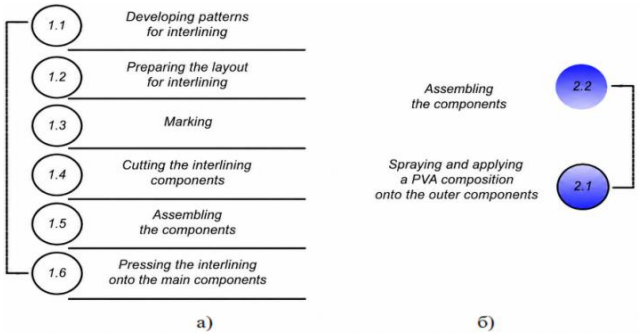


Figure 7. *Technological Process Flowchart.*

The analysis showed that the technological process using interlining consists of six operations (Figure 7a). Under the proposed technology, the process includes spraying the polymer composition onto the cut outer-fabric components, drying them, and assembling the components, resulting in a total of two operations (Figure 7b). Thus, it can be concluded that using a polymer composition instead of interlining to increase shape stability in women's costumes reduces the technological garment-production process by *3.0 times*.

5. Conclusion

The article extensively examined the structural and technological solutions of traditional Uzbek national costumes and the current role of national fabrics.

At the same time, the relevance of targeted scientific research in areas important for the garment industry, such as ensuring garment functionality and expanding the range of clothing in consumers' wardrobes through the use of transformation elements, was thoroughly addressed. The activities of prominent designers who have worked in the global fashion industry to date, the demand for national fabrics, and the stages of their development were also examined. In order to design a modern women's costume, a survey was conducted among 284 respondents aged 20 to 45 representing various professional fields. The results of the survey were analyzed in the research. Based on these results, the fabric, type of garment, transformation elements, and components to be used in the women's transformable costume were analyzed. Based on the results of the analysis, a new design for a women's costume was developed. The designed women's costume includes reversible additional components as well as warm collar-vest components, allowing the external appearance of the garment to be changed by modifying these components. The jacket is made from the main costume fabric, while the additional components are made from adras and silk fabrics. The technological process of garment production was also analyzed in the study. The use of a polymer composition instead of interlining fabric (dublerin) to ensure shape stability in garment components was investigated.

As a result, the use of polymer composition instead of dublerin to increase shape stability in women's costumes made it

possible to reduce the technological process of garment production by *3.0 times*.

Author Contributions

Mirziyodova Komila Bahodir Qizi: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Methodology, Resources, Software, Validation, Writing – original draft, Writing – review & editing

Rasulova Mastura Kabilovna: Conceptualization, Supervision, Visualization, Writing – review & editing

Allayeva Yulduz Baxtiyarovna: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Resources, Software, Validation, Writing – original draft, Writing – review & editing

Artikbayeva Nozima Mumindjanovna: Investigation, Methodology, Resources, Software, Validation, Writing – original draft, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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Biography



Mirziyodova Komila Bahodir Qizi is a doctoral student at the Tashkent Institute of Textile and Light Industry, Tashkent, Uzbekistan. Her research focuses on clothing design, garment construction, traditional embroidery, and innovative techniques for designing women's garments.



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Artikbayeva Nozima Mumindjanovna is a researcher in the field of garment technology and clothing design at the Tashkent Institute of Textile and Light Industry, Tashkent, Uzbekistan. She received her PhD in Technical Sciences in 2024. Her research focuses on improving technologies for increasing the shape stability of clothing components.

Research Field

Mirziyodova Komila Bahodir Qizi: Clothing Design, Garment Construction, Textile and Apparel Technology, Traditional Embroidery, Fashion Design, Innovative Garment Design Techniques

Rasulova Mastura Kabilovna: Garment Design and Construction, Sewing Technology, Textile and Apparel Engineering, Special-purpose Clothing, Clothing Materials, Manufacturing Processes

Allayeva Yulduz Baxtiyarovna: Textile Industry, Light Industry, Textile Manufacturing, Industrial Development, Export Competitiveness, Energy Efficiency

Artikbayeva Nozima Mumindjanovna: Garment Technology, Clothing Design, Garment Construction, Textile and Apparel Engineering, Shape Stability of Clothing Components, Sewing Technology