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Development of a Collection of Garments Inspired by the Hawa Mahal Historical Monument

Razvoj kolekcije oblačil, navdihnjene z zgodovinskim spomenikom Hawa Mahal

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Abstract

Sources of inspiration play a vital role during the initial stages of the fashion design process by providing a specific direction to the entire fashion design process. Fashion designers interpret their imagination to improve the creative use of design inspirations during the development of clothing collections. Such exploration for design inspiration is crucial in the fashion design process for absorbing visual ideas and translating them into original creative clothing. The uniqueness of such creatively and systematically designed original clothing will also improve significantly. The current study focuses on the systematic development of a collection of casual women's wear inspired by the Hawa Mahal (The Palace of Winds) historical monument in Jaipur, Rajasthan. The fabric patterns were developed by extracting motifs from the Hawa Mahal architectural marvel using computer-aided designing solutions and digital printing with hand embroidery. In order to check the market potential of developed garments, a mini-survey was also conducted to analyse the extent of the appropriateness of garment silhouettes, fitting and drape, and overall aesthetic features among targeted consumers.
Keywords: fabric pattern design, historical motif, clothing collection

Izvleček

Viri navdiha igrajo ključno vlogo v začetnih fazah modnega oblikovanja, tako da določijo smer celotnemu procesu modnega oblikovanja. Modni oblikovalci interpretirajo svojo domišljijo z namenom, da bi izboljšali kreativno uporabo oblikovalskega navdiha za razvoj kolekcije oblačil. Takšno raziskovanje oblikovalskega navdiha je ključnega pomena pri modnem oblikovanju, in sicer za dojemanje vizualnih idej in njihovo prevajanje v izvirna kreativna oblačila. Tako se edinstvenost takšnih ustvarjalno in sistematično zasnovanih izvirnih oblačil tudi bistveno izboljša. Ta študija se osredinja na sistematičen razvoj kolekcije sproščenih ženskih oblačil, ki jih je navdihnil zgodovinski spomenik Hawa Mahal Palača vetrov iz Džaipurja v Radžastanu. Vzorci tkanin so bili razviti na podlagi motivov iz arhitekturnega čudesa Hawa Mahal z uporabo računalniško podprtih oblikovalskih rešitev in uporabo digitalnega tiska z ročnim vezenjem. Za preverjanje tržnega potenciala razvitih oblačil je bila izvedena manjša anketa med ciljnimi potrošniki, da bi ugotovili ustreznost silhuet oblačil, prileganja in drapiranja ter splošnih estetskih lastnosti. Ključne besede: oblikovanje vzorcev tkanin, zgodovinski motiv, kolekcija oblačil

1 Introduction

The fashion design process is the systematic and sequential creative activity of incorporating research from different sources, analysing scrutinized inputs and utilising the information effectively and efficiently to achieve the desired outcome [1–4]. A fashion designer seeks inspiration from various natural sources, such as flora and fauna, and from architectural monuments and the virtual world [5–6]. One of the key characteristic quality features of a successful fashion designer is the ability to be a good absorber of visual ideas, creative thinker and skilled interpreter. In order to achieve the desired output, a fashion designer should be able to utilize the inputs from different sources in line with design principles and design empathy. Such practice is crucial to improving creativity, originality and uniqueness in a design [7–8]. In the process of apparel range development, the sources of design inspiration play a significant role by providing the right direction to the entire early design process [9]. Unlike other previously developed products, new product development also includes design taking into account functionality, aesthetics and expressiveness [10]. Thus, a uniquely designed product reveals many things about the visual perception of the designers. Fashion designers anticipate trending styles, colours, silhouettes and materials based on the outcome of their research and observations from numerous sources. Architectural monuments, including historical monuments, can also serve as great sources of inspiration for fashion designers [11–13]. There exists a strong connection between fashion and architecture due to similarities in the design process and equal applications of basic design elements and principles. According to the famous designer Coco Chanel, "Fashion is architecture: it's a matter of proportion" [14]. Modern architecture or a historical monument can be a great source of garment silhouettes, derived motifs and patterns [15–16]. In the recent past, many renowned fashion designers also took inspiration from architectural monuments [17–19].

The Hawa Mahal, known as the Palace of Winds, is a major tourist attraction of the UNESCO world heritage city Jaipur, Rajasthan. It is also known as the pride of the pink city Jaipur due to its unique architectural resemblance to the honeycomb structure of a pyramid shape. The Hawa Mahal was specially designed for queens who gazed outside through the 953 perforated windows (Jharokhas) that keep the Hawa Mahal cool. The Hawa Mahal was constructed in 1799 by Maharaja Sawai Pratap Singh from red and pink sandstone [20]. Due to the characteristic features of the Hawa Mahal, it is not just an architectural marvel of Jaipur, but also a great source of inspiration for designers.

This study focuses on the development of a collection of casual wear for women inspired by the famous Hawa Mahal historical monument situated in state capital Jaipur of Rajasthan. The focus of the current study was more on deriving and developing motifs for an apparel range inspired by the Hawa Mahal. The patterns of the garment collection was developed after deriving, scrutinizing and analysing the development of the motif using computer-aided design. The process of motif development requires a great deal of effort, scrutiny and patience. Once the motifs were ready, it was comparatively easier to convert these developed motifs into desired patterns. The development of fabric appearance was carried out using digital printing and hand embroidery techniques. Consumer behaviour was also observed by conducting market research in order to analyse the market potential of products in terms of garment silhouettes, drape and fitting and the overall aesthetic features of developed garments.

2 Materials and methods
2.1 Material

Due to the exceptional comfort properties of cotton, 100% cotton fabric of 125 g/m^2 (GSM) was used for the final development of a collection comprising five garments. The cotton fabric was sourced from the local market of the city of Jaipur. The women's casual wear collection produced using breathable cotton fabrics also meets the requirements of targeted consumers of Jaipur, Rajasthan. That casual wear is also the preferred choice of consumers for summer wear for hot and humid Indian tropical conditions.

2.2 Methods

An eight-step new product development process was considered for the development of a range of women's casual summer wear. Those eight steps include idea generation, idea screening, concept development and testing, marketing strategy development, business analysis, product development, market testing and commercialisation [21–22]. Idea generation and idea screening help in filtering infeasible ideas through brainstorming. Developing a concept focuses on design and features, whereas developing a marketing

strategy deals with identifying the target market, product positioning, pricing and distribution, and marketing communication. Business analysis is performed to verify the economic viability of the concept by projecting sales and profit. Moreover, a product is developed and initially tested on the market on a small scale before product commercialisation. Among all involved steps, a few steps, such as a part of business analysis and product commercialisation, were kept optional and skipped due to study feasibility limitations. In order to observe and analyse the taste of targeted consumers of the city of Jaipur, a mini-survey was conducted among young females aged 18–25 years. The control factors considered for this survey were garment silhouettes, garment drape and fit, and the overall aesthetic features of the garment. The frequency of respondents' responses in terms of acceptance was recorded individually for each garment. A total of 500 respondents from various background (students, corporate sector employees and academic professionals) shared their feedback in the mini-survey, which was conducted to observe and analyse the market potential of the developed garments during the initial stage. For each garment sample, 100 randomly selected respondents were asked to give a score out of 100 for control factors, such as garment silhouettes, fitting and drape, and

the overall aesthetics of the garment. The mean value of these 100 readings was determined for individual garments and expressed in percentages, as shown in Table 1 in the results and discussion section.

Clothing comfort is crucial when selecting a garment silhouette for modern targeted consumers. Garment silhouettes with a wide-cut were incorporated to facilitate better movement and improved air permeability. The focus of this study was deriving and developing motifs using computer-aided design and then depicting scrutinized motifs on fabric using digital printing and hand embroidery techniques. Digital printing was selected for depicting developed motifs because of the higher accuracy of the print quality. Along with digital printing, hand embroidery was considered an effective tool for additional surface embellishment and is very popular among local consumers.

3 Results and discussion
3.1 Motif development

In this study, the motifs were derived and developed using computer-aided design software, including Adobe Illustrator and Optitex PDS from the source of inspiration, which was the Hawa Mahal historical monument. In the initial stage, photographs of

Figure 1: Royal women gazing through the iconic "Jharokha" window of the Hawa Mahal

some unique and inspiring elements and sequences were taken by visiting Hawa Mahal. A motif of royal women gazing through the uniquely designed "Jharokha" windows of the Hawa Mahal depicts the richness of the 18th century costumes of royal women from Jaipur, Rajasthan, as shown in the Figure 1.

The second scrutinized motif used for pattern development was a motif inspired by the uniquely designed iconic "Jharokha" windows of the Hawa Mahal, which serve as the smallest unit of repetition in the honeycomb structure of the front side of the Hawa Mahal. It consists of one main window in the front and two relatively smaller side windows,

as shown in Figure 2. The motif developed for creating a pattern is shown in Figure 2, together with a pigeon. A pigeon is included here because, in front of the Hawa Mahal, hundreds of pigeons sit on the electric wires outside of this architectural marvel at all times. These birds sitting on the wires add beauty to the Hawa Mahal, as "the birds seem motionless as if in meditation," described Gulzar [23].

Among many other developed motifs, the third motif is a depiction of the front view of theHawa Mahal, which is a honeycomb structure made up of the repetition of rows and columns of the iconic "Jharokhas" windows of the Hawa Mahal,as shown in Figure 3.
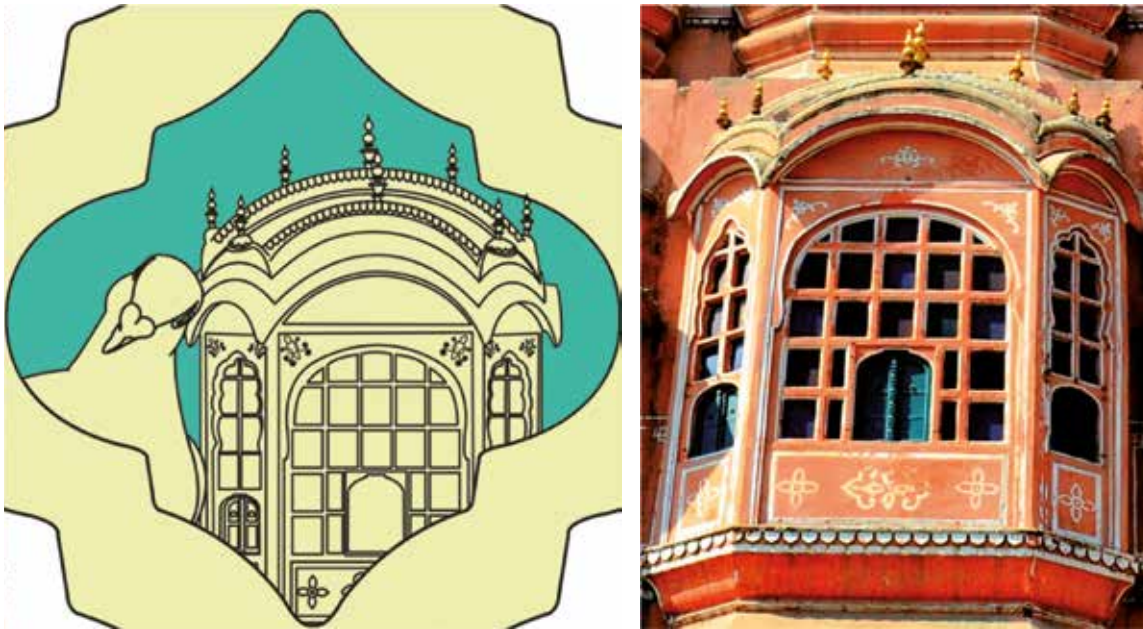

Figure 2: Motif developed (left) from the iconic "Jharokha" windows (right) of the Hawa Mahal

Figure 3: Honeycomb structure created (left) inspired by "Jharokhas" used in the Hawa Mahal (right)

3.2 Fabric pattern design

The developed and scrutinized motifs were then printed on good-quality 100% cotton fabric purchased from the local market. When selecting printing techniques, digital printing was selected over to other printing techniques due to the desired print accuracy and good overall print quality on the fabric. Apart from digital printing, hand embroidery using basic stitches, such as a simple running stitch, cross stitch, etc. was also adopted for further fabric surface embellishment. Hand embroidery was also incorporated due to the huge demand for such products among the targeted consumers of the Jaipur region. A piece of the sample depicting the conversion of the developed motif to printed and embroidered fabric surface is shown in Figures 4–7.

Figure 4: Motif developed (left) depicting royal women gazing through "Jharokha"
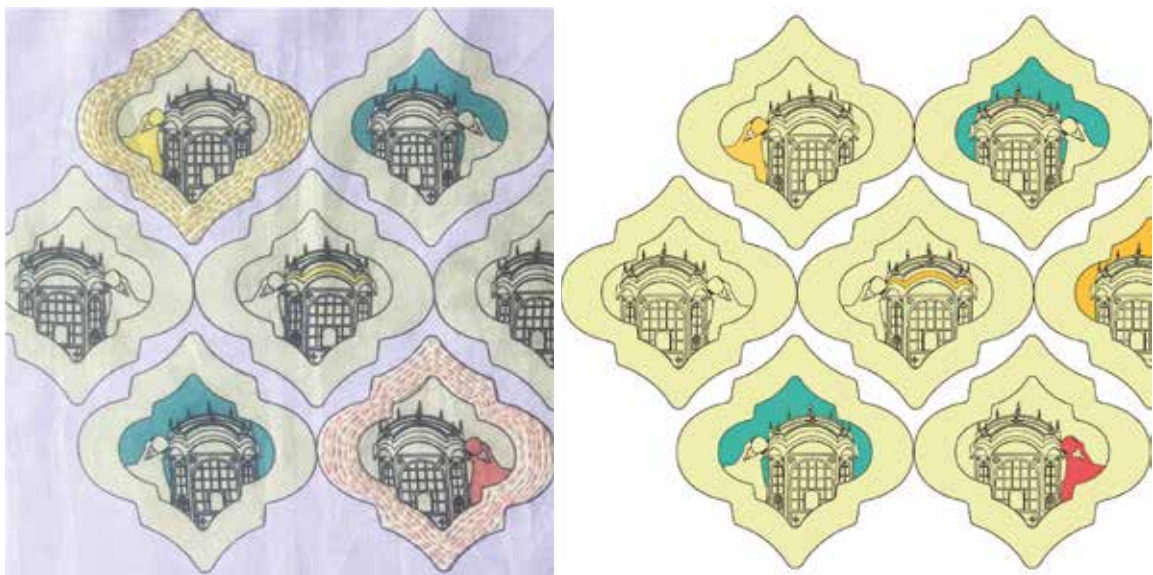

Figure 5: Pattern developed on fabric surface (left) using a developed motif (right)

Figure 6: Developed motif (left) and prepared fabric samples (right)

Figure 7: Pattern development using CAD (left) and fabric surface developed (right)

3.3 Garment collection planning and development

Garment collection planning was carried out meticulously and systematically through sufficient research and after incorporating suggestions from previous studies. A detailed study was conducted to select garment silhouettes, colour combinations, variations in products, fitting and drape, and the overall aesthetic features of the final garments. Initially, a garment collection was developed using basic computer-aided design solutions, such as Adobe Illustratorand Optitex PDS. Toile garment samples were prepared in order to determine the silhouette directions of the garments.

The final five garments of the women's summer wear collection were produced applying minimal variation from predefined styles and silhouettes, as shown in Figure 8. The garment collection was produced using 100% cotton fabric with a weight of 125 g/m², which is suitable for summer wear. The patterns developed using computer-aided designs were then printed using a Yuhan-Kimberly digital printer. The patterns of the printed fabrics were then cut and sewn using an industrial grade JUKI machine according to predefined sizes and silhouettes. Finally, hand embroidery was performed using different stitches on some selected motifs of different garments.

Figure 8: Garment collection developed using CAD (above) and developed garments (below)

It was observed that the use of computer-aided design helps in a more accurate visual interpretation of creative ideas by improving the originality and uniqueness of the designs. The use of digital printing for fabric surface development further improves design accu-racy using a Yuhan-Kimberly digital printer. Hand embroidery was used to enhance the attractiveness and emphasise parts of the developed fabric surface. A few enlarged motifs samples prepared using differ-ent stitches of hand embroidery are shown in Figure 9.

Figure 9: Hand-embroidered samples prepared using different stitches

3.4 Market potential of developed garment collection

In the process of new product development, the market product potential of a product should also be verified. Thus, all five garment styles were tested for responses, such as the acceptance of silhouettes, garment drape and fitting, and overall aesthetics among targeted consumers of the Jaipur region. Based on the collective mean score of an individual garment, it was found that garment G2 (shown in Figure 8) scored highest, followed by garment G1 and garment G4, as shown in Table 1. The lowest collective mean score was observed in the case of garment G3 due to inappropriate silhouettes, drape and fitting, and poor overall aesthetic features, which was confirmed from visuals and from experimental results. The reasons behind the exceptionally good market potential of garment G2 were attractive garment silhouettes, better drape and enhanced overall aesthetics, contributing to improved consumer satisfaction relative to other garments. The results of the observed mean score for different control variables is shown in Table 1.

Table 1: Control variables and observed mean scores of garments

Contributing factors	Mean score				
	Garment 1 (G1)	Garment 2 (G2)	Garment 3 (G3)	Garment 4 (G4)	Garment 5 (G5)
Silhouettes	78.14	76.47	49.66	68.56	61.43
Garment drape andfitting	81.67	84.11	51.91	76.77	67.58
Overall aesthetics	73.45	83.34	54.73	71.34	64.45
Total mean score of garment	77.75	81.30	52.10	72.22	64.48

4 Conclusion

The new product development process was adopted for a range of women's summer wear inspired by the Hawa Mahal architectural marvel and historical monument. It was observed that computer-aided design is an effective and efficient way of interpreting the visual idea of the creative mind of the designers. Scrutinised motifs and subsequent patterns were extracted from the front view of the honeycomb structure of the Hawa Mahal using computer-aided design solutions. It was found that a digital printing technique was an effective approach to fabric pattern development. Basic hand embroidery was also incorporated to satisfy the requirements of target consumers, and was found to have a significant impact on the overall aesthetic features of the garment. The findings pertaining to the market potential of the developed garments reveal that garment G2 (81.30) achieved the highest collective mean score, followed by garment G1 (77.75) and G4 (72.22). These garments thus have a positive impact on used control variables among targeted consumers and reflect product success. The factors contributing to the promising market potential of these garments were attractive silhouettes, good garment drape and fit, and the appealing overall aesthetic features of the garments. Garment G3 (52.10) achieved the lowest collective score, as the merchandise failed to attract target consumers due to inappropriate garment silhouettes, fit and poor overall appearance. The current study was primarily conducted to understand the garment range development process using computer-aided design and the possible marketing feasibility of the developed range of garments. When conducting the survey, only a few imperative factors were considered. However, many other equally important factors, such as colour combination and psychological factors, may also be included in further research.

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