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DESIGN DEVELOPMENT OF UPHOLSTERY INSPIRED FROM KATARMAL SUN TEMPLE MOTIFS (ALMORA, UTTARAKHAND)

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ABSTRACT

India is referred to as the "land of temples." The Hindu temple is a landmark with ornate architectural details and sculptures. One of the oldest temples in the Kumaun Himalayas is the Katarmal Sun Temple in Almora. It is renowned for both its architectural styles and religious elements. Textile product design can be developed using the temple's architectural designs. As a result, an effort was undertaken to investigate Katarmal Sun Temple motifs in textile items like upholstery. Using computer-aided design, various motifs from the Katarmal Sun Temple were chosen and modified for design development. Heat transfer printing was used to print the chosen cushion cover pattern and color combination. The judges assessed the finished printed cushion cover for acceptability and found it to be very satisfactory. This paper aims to raise awareness of Uttarakhand's ancient architectural legacy so that people prioritize it and take action to protect it.

Keywords: Motif, Katarmal Sun temple, Computer Aided Designing, Heat transfer printing

I. INTRODUCTION

The Sun has long held a prominent place in ancient cultures. In earlier times, man was fascinated by it since the Sun provided him with warmth, light, life, and served as a clock. As a result, man worshipped the Sun and made him their god and goddess. The Sun is still revered in many nations and faiths in the present era. Numerous temples honoring the Sun deity had been constructed **(Bhatnagar & Livingston, 2005).**

From the Rig Veda to the Vishnu Purana, the Mahabharta, the Bhavisya Purana, the Chandogya Upanishad, the Markandaya Purana, the Taittiriya Upansihad, the Nilarudra Upanishad and the Varaha purana, all sacred texts mention the Sun, the source of light and solar energy, and the origin of all life. The Sun is referred to as the world's king in the *Adityahridayastotram*, which is mentioned in the Balmiki Ramayana **(Bangroo & Kamboj, 2013).**

In India, the Sun has long been revered as a prominent deity. The Hindu Vedic traditions make reference to the Sun, which is the source of life, vigor, and energy and determines how life unfolds. This primordial fountain of divine effulgence is where our conceptions of life, time and death, good and evil, happiness and suffering originate. Numerous Indian temples are solely devoted to the Sun, including the Martand Temple in Kashmir, the Osia Temple in Rajasthan, the Konark Temple in Orissa, the Modhera Temple in Gujarat, and the Katarmal temple in Almora (Uttarakhand) **(Ashraf & Nisar, 2009).**

Situated at 2,116 meters above sea level, Katarmal Sun temple is roughly 17 kilometers away from Almora. The distance to cross the Hawalbagh and Matela rivers close to the Kosi river is roughly three kilometers on foot. The unique quality of Katarmal Temple is that it is the only Sun temple in Kumaon region. In the Almora, a region known as Katarmal stands for the historic Katarmal Sun temple, which belonged to Lord Surya Dev. This temple is located in the village of Adheli Sunar, Almora **(Amrit Vichar, 2022).**

It is thought that the magnificent Katarmal Sun temple was built somewhere between the sixth and ninth centuries. Uttarakhand was ruled at this time by the Katyuri dynasty. The reason this temple was named Katarmal Sun Temple was that King Katarmal of the Katyuri dynasty was credited with building this temple in this particular scenario. Another legend surrounding this temple was that King Katarmal had it built in a single night. This Katarmal Sun temple is located amid tall deodar trees, amid verdant foliage, after one crosses the terraced fields of the Himalayas **(Tiwari, 2021).**

In the present study an attempt was made to adopt motifs of Katarmal Sun Temple to promote the traditional motifs into home furnishing products by introducing new designs. In the present study, cushion cover was selected as the home furnishing products on the basis of its utility and fashion use. This will also help in promoting the cultural heritage and take measures to preserve it.

II. METHODOLOGY

Adaptation and selection of motifs

Twenty five motifs of Katarmal Sun Temple were selected from primary sources. Among these twenty five motifs, eleven motifs were buti, eight motifs were border motifs and six motifs were center motifs. Collected motifs were adapted by using CorelDRAW-2021 software. Adapted motifs were evaluated by thirty judges on a five-point raring scale.

Development of layouts

Two layouts for cushion cover were developed in three categories i.e. of border-buti (Bb), border-center (BC) and center-buti (Cb) through CorelDRAW-2021 software. These layouts were evaluated by thirty judges according to their overall appearance. Assessment of layouts was done by using five-point rating scale.

Development of designs using selected motifs in selected layout

Thirty designs were developed for cushion cover in three categories i.e. border-buti (Bb), center-buti (Cb) and border-center (BC) in CorelDRAW-2021 software. Fourteen border-buti (Bb) designs, ten center-buti (Cb) designs and six border-center (BC) designs were developed for cushion cover. A panel of fifty judges assessed these designs based on their overall appearance on a five-point rating scale.

Development of coloured designs in selected design

Twelve different 3D colour combinations for cushion cover were developed in Adobe Illustrator-2021 software. Developed colour combinations were visually evaluated by fifty judges according to their overall appearance on five-point rating scale.

Printing of cushion cover and assessment of printed cushion cover

Cushion cover was printed by heat transfer printing. After printing, thirty judges visually assessed these cushion cover on various parameters like appropriateness of motifs according to the product, placement of motifs, colour combination and overall appearance. Evaluations were done on a five-point rating scale.

Cost estimation of printed cushion cover

For the marketing of printed cushion cover in the future, its cost was also estimated.

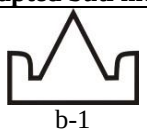
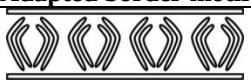
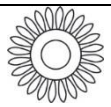
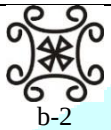
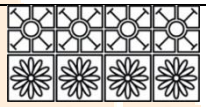
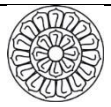
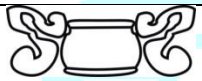
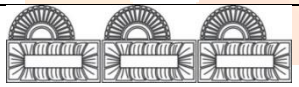
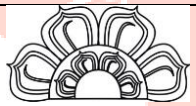
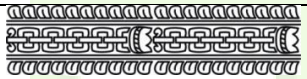
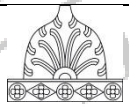
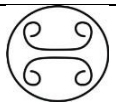
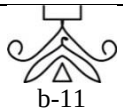
Sale price of the printed product = Product cost + Printing cost + 10 % profit margin

III. RESULTS AND DISCUSSION

Selection of adapted motifs

It is clear from the Table 1 that seven buti (b) motifs numbered as b-3, b-4, b-5, b-6, b-8, b-9 and b-10; four border (B) category motif B-3, B-4, B-7 and B-8; and three center (C) motifs as C-2, C-3 and C-4 obtained highest weighted mean score (WMS). Hence, these fourteen motifs were selected for further work.

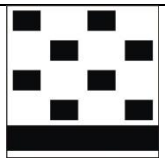
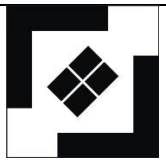
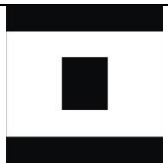
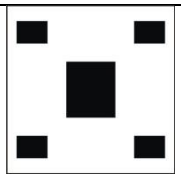
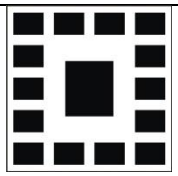
Table 1: Weighted mean score (WMS) of adapted motifs

Adapted buti motif	WMS	Adapted border motif	WMS	Adapted center motif	WMS
 b-1	2.6	 B-1	3.0	 C-1	3.4
 b-2	2.1	 B-2	3.6	 **C-2 ***	**4.1***
 **b-3 ***	**3.8***	 **B-3 ***	**4.0***	 **C-3 ***	**4.1***
 **b-4 ***	**3.7***	 **B-4 ***	**4.4***	 **C-4 ***	**4.3***
 **b-5 ***	**4.1***	 B-5	3.9	 C-5	3.6
 **b-6 ***	**4.1***	 B-6	3.9	 C-6	3.7
 b-7	3.0	 **B-7 ***	**4.1***		
 **b-8 ***	**3.6***	 **B-8 ***	**4.2***		
 **b-9 ***	**4.1***				
 **b-10 ***	**4.1***				
 b-11	3.1				
*Selected adapted motif					

Evaluation and selection of layout

Table 2 shows layouts of cushion cover along with their weighted mean score (WMS). It is clear from the table that layout Bb-2, BC-1 and Cb-2 of cushion cover secured highest weighted mean score (WMS).

Table 2: Weighted mean score (WMS) of layouts of cushion cover

 (Bb-1) WMS= 3.6	 **(Bb-2) * WMS= 4.3**	 **(BC-1)*** WMS=4.3
 (BC-2) WMS=3.4	 (Cb-1) WMS=3.8	 **(Cb-2)* WMS=4.1**
*Selected cushion cover layout		

Selection of designs after evaluation

Table 3 shows the weighted mean score obtained by the developed thirty designs of cushion cover. After final evaluation, design B3-b6, B3-C3 and C2-b8 of cushion cover were selected after scoring highest weighted mean score (WMS).

Table 3: Weighted mean score (WMS) obtained by thirty designs of cushion cover

Border-buti (Bb)	WMS	Border-Center (BC)	WMS	Center-buti (Cb)	WMS
1) B3-b4	4.14	1) B3-C2	4.12	1) C2-b6	3.38
2) B3-b6	**4.32***	**2) B3-C3**	**4.34***	**2) C2-b8**	**3.82***
3) B3-b9	4.22	3) B3-C4	3.76	3) C2-b9	3.32
4) B4-b4	3.92	4) B7-C2	3.74	4) C3-b4	3.20
5) B4-b9	3.68	5) B7-C3	3.96	5) C3-b5	3.44
6) B7-b4	3.88	6) B8-C2	3.92	6) C3-b6	3.70
7) B7-b5	3.58			7) C3-b9	3.70
8) B7-b6	3.76			8) C4-b5	3.60
9) B7-b8	3.32			9) C4-b6	3.58
10) B7-b9	3.56			10) C4-b9	3.40
11) B8-b4	3.82				
12) B8-b6	4.20				
13) B8-b8	3.50				
14) B8-b9	4.00				
*Selected design of cushion cover					

Selected three designs i.e. design B3-b6, B3-C3 and C2-b8 were again evaluated by the judges. After evaluation, design-B3-C3 and design-C2-b8 was selected for cushion cover after scoring highest weighted mean score (WMS) of 4.5 and 4.5, respectively.

Selection of colour combination

As illustrated in **Fig. 1**, six different colour combinations of category-A (design-C2-b8) were developed for cushion cover. Among these six different colour combinations in category-A (design-C2-b8), colour combination-3c (4.02) obtained highest weighted mean score (WMS). In category-B (design-B3-C3) of cushion cover, highest weighted mean score (WMS) of 4.52 was scored by colour combination-C1. Therefore for final printing, colour combination-3c (for design-C2-b8) and colour combination-C1 (for design-B3-C3) were selected for cushion cover.

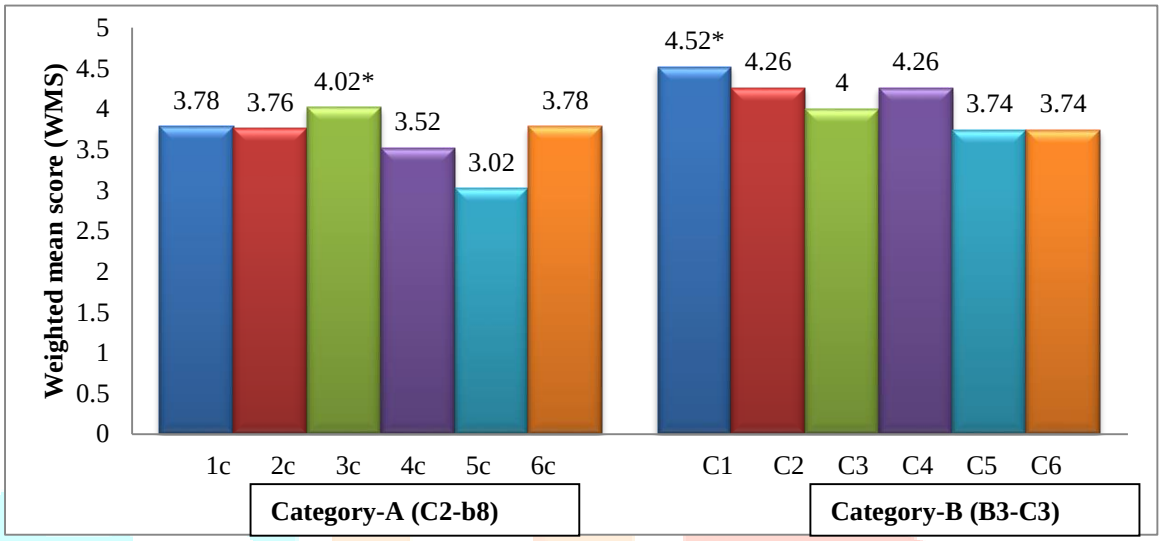


Fig. 1: Weighted mean score (WMS) obtained by colour combinations of cushion cover

*Selected colour combination for cushion cover

Assessment of printed cushion cover

Cushion cover was printed by heat transfer printing method. After printing, thirty judges visually assessed these cushion covers on various parameters like appropriateness of motifs according to the product, placement of motifs, colour combination and overall appearance. Evaluations were done on a five-point rating scale.

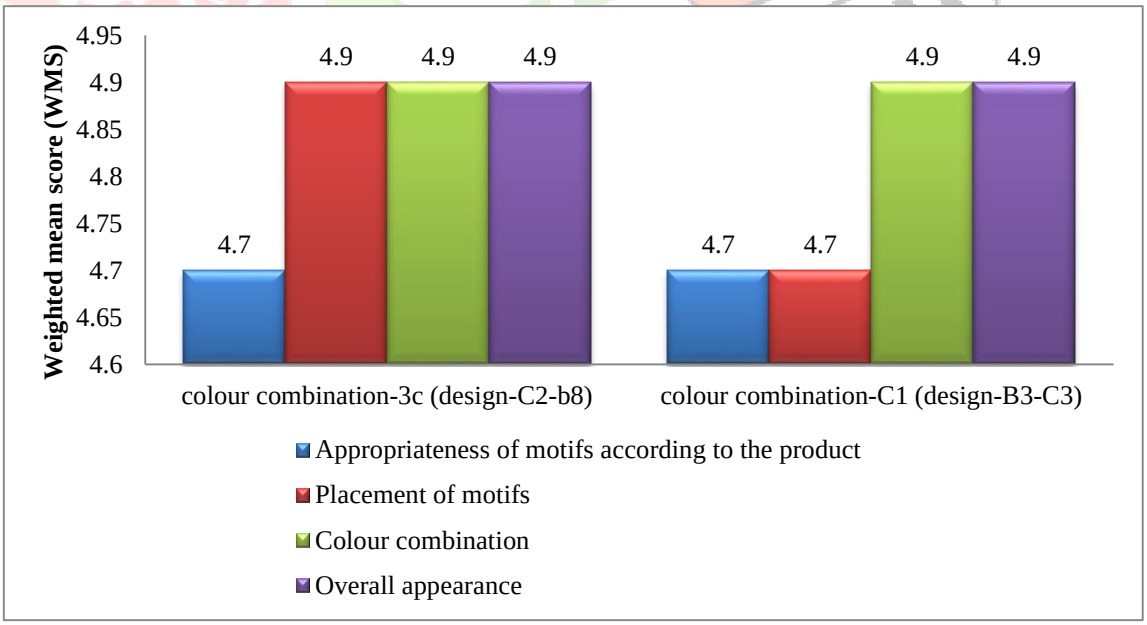


Fig. 2: Weighted mean score (WMS) obtained by heat transfer printed cushion cover according to different parameters

It is displayed in **Fig. 2** that highest weighted mean score (WMS) of 4.9 was secured by parameters like placement of motifs, colour combination and overall appearance each in heat transfer printed cushion cover of colour combination-3c (design-C2-b8). Heat transfer printed cushion cover having colour combination-3c (design-C2-b8) got 4.7 weighted mean score (WMS) in parameter of appropriateness of motifs according to the product.

In heat transfer printed cushion cover of colour combination-C1 (design-B3-C3), highest weighted mean score (WMS) of 4.9 was obtained by colour combination and overall appearance each. Both parameters appropriateness of motifs according to the product and placement of motifs got 4.7 weighted mean score (WMS) for heat transfer printed cushion cover having colour combination-C1 (design-B3-C3).

Cost estimation of printed cushion cover

For the marketing of all the products in the future, their cost was also estimated. ₹ 322/- and ₹ 325/- as the selling cost was finalized for heat transfer printed cushion cover having colour combination-3c (design-C2-b8) **(Plate 1)** and heat transfer printed cushion cover of colour combination-C1 (design-B3-C3) **(Plate 2)**, respectively.

IV. CONCLUSION

The walls, ceilings, and pillars of the Katarmal Sun Temple in Almora were carved with traditional, exquisite designs. These motifs can be useful to the textile designers as they search for fresh inspiration. Thus, the purpose of this study was to investigate the Katarmal Sun Temple motifs on various textile and clothing items. It was thought that Katarmal Sun Temple motifs may be adapted. CorelDRAW-2021 and Adobe Illustrator-2021 tools were used to alter motifs and produce their coloured designs. Coloured designs of different products were printed by heat transfer printing method. The judges expressed great appreciation for all of the printed products, and the majority of respondents said they would buy them if they were offered for sale.

Plate 1: Heat transfer printed Cushion cover (colour combination-3c) (design-C2-b8)

Plate 2: Heat transfer printed Cushion cover (colour combination-C1) (design-B3-C3)

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