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Innovative Paths for Song Dynasty Clothing: Velvet Flower Headpieces as Cultural Media in Narrative Design

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ABSTRACT

This study explores the integration of traditional cultural elements into modern fashion design through the reinterpretation of velvet flower headpieces, a key element from Song Dynasty attire. A "Cultural Meaning—Emotional Narrative—Visual Reinterpretation" triple design logic model was developed, which was tested through design practice and validated by a user survey (N=200), demonstrating a cultural retention rate of 65.8%. Expert evaluations confirmed the balance between cultural preservation and modern relevance in the design, specifically in how emotional design and visual transformation helped retain the cultural values of the velvet flower headpiece. This research also delves into the aesthetic features of Song Dynasty clothing, the symbolic role of velvet flowers, and the application of narrative design to heritage fashion. Traditional motifs such as peony patterns and colour schemes were effectively translated into contemporary fashion, reinforcing their relevance. The paper identifies a gap in the literature regarding the visual narrative transformation of intangible cultural heritage and proposes directions for future research to broaden participant scope and promote wider cultural and commercial applications.

KEYWORDS

narrative design, intangible cultural heritage, Song Dynasty clothing, velvet flower headpieces, cultural translation, emotional design

INTRODUCTION

With the revival of traditional culture becoming a core component of the national cultural strategy, clothing, as both a material carrier and spiritual symbol of Chinese culture, is increasingly receiving widespread attention. Against this backdrop, the modern transformation and innovative expression of traditional clothing, particularly design innovation based on traditional cultural elements, has become a key topic in contemporary design. In recent years, traditional aesthetic concepts, particularly those represented by Song Dynasty aesthetics, have emerged in modern fashion design, gradually forming a

trend toward symbolic daily aesthetics [1]. The style of Song Dynasty clothing, especially within an aesthetic context emphasising restraint, moderation, and ambience, showcases a profound cultural foundation, particularly highlighting the appreciation for the aesthetic trait of “subtlety and simplicity” [2]. Typical Song Dynasty clothing elements, such as short robes, hundred-fold skirts, and oxalis knots, along with hairstyles like cloud buns, red headbands, lotus crowns, and velvet flower headpieces (Figure 1), have not only been innovatively extended in contemporary designs but also imbued with a distinct modern sensibility. The pattern recognition process, based on computer-vision technologies like the improved YOLOv5, provides effective support for data-driven symbol extraction in the design process [3].



Figure 1. The Folding Flower Picture showcases the unique style of Song Dynasty women’s clothing and the camellia velvet flower headpiece [4]

The revitalisation and utilisation of intangible cultural heritage (ICH), particularly through design innovation to impart contemporary significance, has become a critical path to addressing the question of "how traditional culture enters modern life." Historical dyeing recipes from the Ming-Qing periods offer material-cultural context for colour narratives in apparel [5]. In the context of globalisation,

intangible cultural heritage serves as both a carrier of cultural identity and a representation of global cultural diversity. The evolution of ICH governance policies in China also influences design-led translation pathways [6]. In the field of fashion design, the modern transformation of ICH has become an important source of innovation [7]. Recent research has explored how AI supports the archiving, reinterpretation, and dissemination of fashion heritage.

Although this study focuses on traditional Chinese craftsmanship - particularly velvet flower headpieces - the integration of global design theories helps to enhance the theoretical depth and cross-cultural interpretability of the research. To this end, this study introduces Roland Barthes' semiotic theory, viewing velvet flower headpieces as a cultural sign system. The signifiers (such as shape, colour, material) and the signified (such as female identity, social rituals) together construct their mythological meaning in Song Dynasty clothing. Umberto Eco's theory of semiotic decoding provides the tools needed to interpret how velvet flowers are re-encoded as modern visual symbols with emotional significance in contemporary design contexts. Additionally, Valerie Steele's research on heritage fashion and cultural translation offers theoretical support and practical pathways for transforming traditional velvet flower craftsmanship into a globally readable contemporary design language.

By integrating Barthes' fashion as a sign system, Eco's semiotic decoding and re-encoding, and Steele's heritage translation perspectives, this study views velvet flower headpieces not only as decorative objects but also as narrative media that carry cultural meaning and identity. Velvet flower headpieces, with their unique visual language, exquisite craftsmanship, and deep cultural symbolism, carry the aesthetic of women's bodies and symbols of social identity. Moreover, the semiotic analysis of these cultural symbols can bridge the gap between Eastern and Western design interpretations. Velvet flower craftsmanship, originating in the Tang Dynasty and flourishing through the Ming, Qing, and Republican periods, traces its traditions back to the Song Dynasty. The Song Dynasty's flower-adorned hair culture conveyed personal emotions and social identity through floral ornaments. The core issue explored in this paper is how narrative design can transcend its "folkloric" appearance and transform it into a "cultural visual symbol" [8].

Narrative design, as a method that integrates cultural expression and emotional construction, emphasises conveying emotion through objects and building an emotional connection between users and design works. Applying narrative design to intangible cultural heritage elements not only facilitates the contemporary reinterpretation of traditional cultural symbols but also regenerates emotions, giving new life to traditional elements. Virtual garment platforms like CLO3D are increasingly being used for prototyping narrative translations of craft elements [9]. Specifically, by embedding velvet flower headpieces as narrative media into improved Song-style clothing designs, this study innovatively expresses intangible heritage craftsmanship, deepens its cultural connotations, and promotes the emotional regeneration of traditional aesthetics in contemporary contexts.

This paper, from a narrative design perspective, selects velvet flower headpieces as a cultural symbol to explore their application in improved Song-style clothing designs. By constructing a "Cultural Meaning - Emotional Narrative - Visual Reinterpretation" triple design logic model, this study provides innovative design methods and empirical references for the sustainable inheritance of traditional clothing culture in contemporary contexts. It aims to promote the widespread application of intangible heritage elements in modern fashion design and facilitate the innovation and dissemination of Chinese traditional clothing culture in a globalised context.

Compared to conventional narrative and emotional design frameworks, the "Cultural Meaning - Emotional Narrative - Visual Reinterpretation" model presents three notable differences: First, it explicitly separates cultural meaning extraction as an initial stage, whereas earlier models often embed this step within aesthetic or functional analysis. Second, it formalises emotional semantic transformation using empirical user preference data, whereas earlier studies largely relied on designer interpretation. Third, it integrates a quantitative cultural retention metric into the evaluation process, enabling designers to track heritage preservation across multiple iterations — something rarely emphasised in traditional frameworks. Table 1 compares the proposed model with conventional frameworks, illustrating its structured approach to cultural meaning extraction, data-driven emotional mapping, and integration of quantitative retention metrics (Table 1, Figure 2).

Table 1. Comparative features of the triple logic model vs. commonly used frameworks

Feature	Commonly used frameworks	Triple Design Logic Model (this study)
Cultural meaning extraction	Often implicit	Explicit and structured
Emotional transformation	Designer-driven	User-data supported semantic mapping
Quantitative retention metric	Rarely used	Core evaluation component
Iterative feedback	General guidance	Fully integrated in all stages

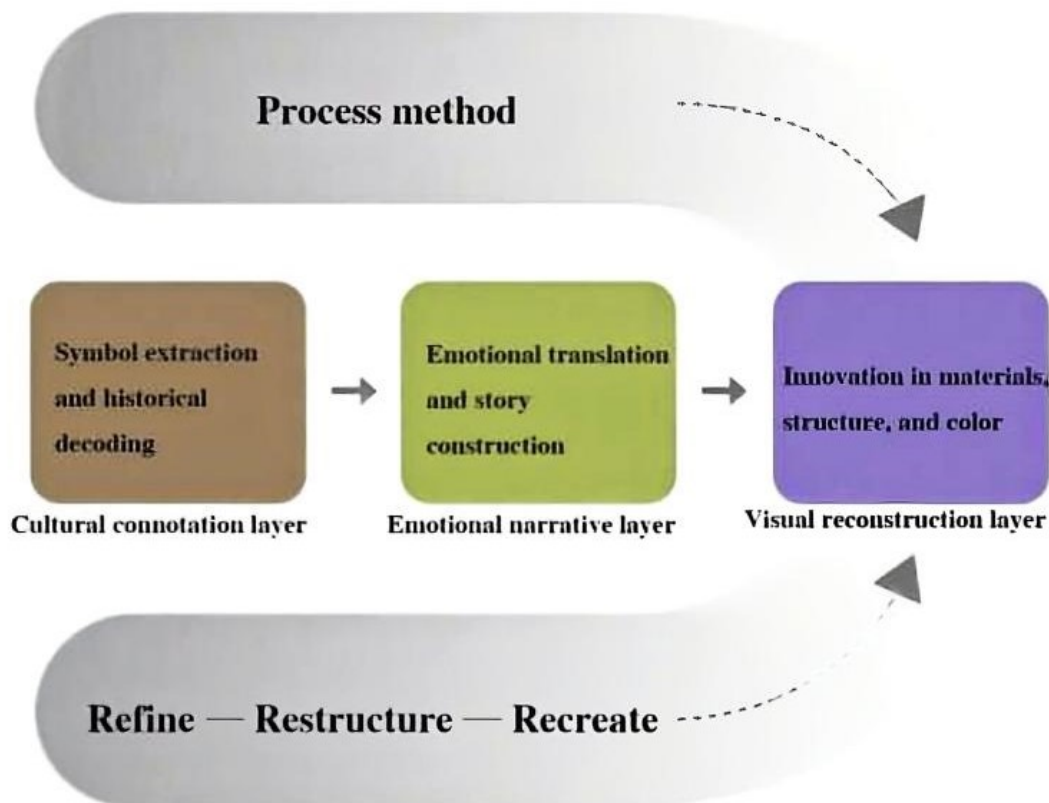


Figure 2. The Triple Design Logic of 'Cultural Meaning - Emotional Narrative - Visual Reinterpretation': This diagram shows the three layers of the design logic, including cultural meaning extraction, emotional transformation, and visual reinterpretation, with each layer interrelated to the others in the design process.

LITERATURE REVIEW

Application of Narrative Design in Fashion and Intangible Cultural Heritage

The application of narrative design in fashion, especially in the context of intangible cultural heritage (ICH), has gained significant interest in recent years. Narrative design is increasingly recognised as a method to embed cultural meaning into modern design, allowing designers to express emotions, identity, and tradition through material culture. Existing research highlights the role of narrative design in linking cultural identity with contemporary aesthetics, particularly in traditional Chinese elements, where designers are tasked with preserving cultural significance while adapting these elements to meet modern fashion needs.

Originating in digital media and interactive design, narrative design emphasises the use of design language to convey stories, enabling users to perceive the cultural and emotional meanings embedded in the design. This approach has expanded into fashion design, especially in areas related to cultural identity and emotional expression, showing considerable potential. However, there remains a gap in research regarding the visual narrative translation of specific intangible cultural heritage elements, such as velvet flower headpieces [10]. While there has been progress in cultural heritage narrative

research, East Asian studies remain underdeveloped, and existing works often focus on isolated aspects like symbolic meaning or aesthetic reproduction, lacking a unified design framework that integrates cultural meaning, emotional narrative, and visual transformation [11]. This paper seeks to bridge this gap by examining how narrative design can translate Song Dynasty cultural elements into modern fashion design [12].

Theoretical Framework: Semiotics and Heritage Fashion Perspectives

In addressing the modern expression of intangible cultural heritage elements, semiotics and heritage fashion theories provide essential perspectives to fill the gaps in existing research. Many studies focus on craftsmanship preservation or visual appropriation but lack systematic interpretations of the symbolic structures and cultural translation mechanisms behind these elements. Roland Barthes' semiotic theory in *Mythologies* views clothing as a symbolic system that conveys cultural ideologies, while Umberto Eco's semiotic decoding theory offers tools for analysing how symbols are encoded and decoded within cultural contexts. These theories form the foundation for analysing the transformation of "velvet flowers" from traditional ritual symbols into modern emotional symbols. Heritage fashion theory, as proposed by Valerie Steele, provides critical insights for the contemporary translation of traditional elements. Steele argues that heritage fashion is not merely about revival but involves reinterpreting traditional elements in modern contexts, thereby re-energising their cultural meanings. This theory supports the transformation of velvet flower craftsmanship into a globally accessible contemporary design language, providing both theoretical and practical pathways for this process. Integrating Barthes' "fashion as a sign system," Eco's "semiotic decoding and re-encoding," and Steele's "heritage translation" perspectives, this study views velvet flower headpieces not just as decorative objects but as narrative media that carry cultural meaning and identity. This theoretical integration forms the academic foundation for the proposed "Cultural Meaning Refinement - Emotional Semantic Reorganisation - Visual Language Reconstruction" triple design logic model, which provides a systematic approach to the symbolic transformation of intangible cultural heritage in contemporary design.

The Role of Emotional Design and Technological Integration

Emotional design in fashion, which connects deeply with users' personal experiences and cultural backgrounds, has become a significant area of research [13]. Emotional design not only enhances the aesthetic value of traditional elements but also strengthens the connection between the wearer and the cultural significance of the garments [14]. Integrating emotional resonance with the design of traditional elements requires a balanced approach that preserves cultural meaning while adapting to modern aesthetics. This approach is reflected in studies advocating user-centred design and

participatory methods, where designers incorporate feedback to ensure emotional relevance. Digital tools like CLO3D are increasingly used to prototype and visualise how traditional elements can be preserved and adapted for contemporary fashion needs [15]. This technological integration provides a precise and efficient way of translating cultural heritage into modern designs. The integration of global design frameworks with traditional Chinese cultural elements has proven valuable for enhancing the global appeal and understanding of these cultural symbols [16]. By applying semiotics and heritage fashion theories, this research offers valuable perspectives on how traditional elements like velvet flower headpieces can be reinterpreted as symbols carrying deeper meanings beyond their decorative function [17].

Aesthetic Features of Song Dynasty Clothing and Its Global Context

Song Dynasty clothing occupies an important place in the history of Chinese fashion with its simple and elegant aesthetic characteristics. In contrast to the boldness of the Tang Dynasty and the ceremonial attire of the Ming and Qing periods, Song Dynasty clothing pursued restraint and practicality, reflecting the cultural spirit of the literati. Women's clothing, such as the cross-collared tunics, narrow sleeves, and long skirts, emphasised natural lines and soft gender expressions, presenting the aesthetic ideal of "hidden yet refined, elegance in simplicity." However, modern designs often focus on formal retro styles, failing to fully recreate the spirit and cultural connotations of Song Dynasty clothing. As the process of globalisation advances, the uniqueness of Song Dynasty aesthetics has gradually attracted international attention, especially for its distinctive characteristics in colour systems, structural design, and cultural encoding [18]. However, contemporary adaptations often replicate these visual traits in a purely decorative manner, overlooking their embedded ritual meanings and emotional symbolism. This disconnect reinforces the need to embed Song-style elements - such as velvet flower headpieces - into a coherent narrative design logic that can preserve and reinterpret their cultural essence [19].

In the global context, there is a clear contrast between Victorian-era clothing and Song Dynasty clothing. Victorian clothing emphasised high contrast, complex structures, and luxurious decorations, which stands in sharp contrast to the restrained and minimalist style of Song Dynasty clothing. To further enhance the comparison, it is also valuable to explore other global heritage crafts. For example, the Japanese kimono and European Renaissance garments exhibit unique ways in which cultural identity and societal roles are represented through fashion [20]. These global comparisons can provide a broader context for understanding how different cultures use clothing to convey symbolism and identity. Victorian women's clothing, especially dresses and accessories, focused on displaying social status and class, often using rich colours, intricate decorations, and grand structures. In contrast, Song Dynasty clothing valued "simplicity and ritual," emphasising etiquette and a restrained aesthetic (Figures 3 and 4).



Figure 3. Song Dynasty 'The Eighteen Scholars' Painting [21]



Figure 4. Victorian Era Clothing [22]

Table 2. Comparison of Song Dynasty and Victorian Era Clothing

Principles	Song Dynasty	Victorian Era	Contemporary Style
Colour System	Low Lightness/High Grayscale	High Contrast	Soft Tones
Structural Design	Subtle Overlap	Hemline Design	Flowing Elegance
Cultural Encoding	Floral Symbolism	Floral Symbolism	Minimalism

Inheritance Status and Revitalisation Attempts of Velvet Flower Craftsmanship

A Velvet flower craftsmanship, a representative element of traditional Chinese craftsmanship, embodies deep cultural meanings. Historically, these flowers were used in women's hair ornaments to symbolise identity and social status. However, the transmission of this craft faces challenges, including a decline in younger generations' involvement and the shrinking of traditional application scenarios, leading to a bottleneck in cultural transmission. Similar issues are observed in the revitalisation of traditional crafts in Europe and Japan, suggesting the need for adaptable frameworks that integrate heritage with contemporary design. Some designers have attempted to incorporate velvet flower craftsmanship into modern design language to meet market demands [23].

Despite these efforts, innovative expressions of velvet flower craftsmanship in fashion design remain in the early stages. This study, through the narrative design framework, explores how to transform velvet flower headpieces into cultural symbols in modern fashion design. By applying the triple design logic of "Cultural Meaning Refinement, Emotional Semantic Reorganisation, and Visual Language Reconstruction," this study aims to breathe new life into these traditional elements and provide practical support for their contemporary innovation.

APPLICATION LOGIC OF NARRATIVE DESIGN IN INTANGIBLE CULTURAL HERITAGE FASHION

Narrative design, as a method of conveying culture and emotions through design, holds significant application value in the design of intangible cultural heritage fashion [24]. It not only focuses on the form and function of the design but also emphasises building an emotional connection and cultural resonance between the user and the design work through design language. In the application of traditional intangible cultural heritage elements, narrative design uses visual symbols, colours, and structures to convey deep cultural information, providing innovative paths for the modern translation of traditional craft elements. This chapter will discuss the application mechanism of narrative design in intangible cultural heritage fashion, particularly how to achieve the innovative expression of intangible heritage elements through the triple design logic of "Cultural Meaning Refinement, Emotional Semantic Reorganisation, and Visual Language Reconstruction."

Basic Concepts and Theoretical Foundations of Narrative Design

Narrative design (Narrative Design) originated in the fields of digital media and interactive design, emphasising that design not only meets functional requirements but also carries cultural or emotional significance. In the field of fashion design, narrative design transmits cultural identity, social status, and emotional expression by constructing visual symbols, making clothing a carrier of culture and emotions. This design method translates traditional intangible heritage elements, such as velvet flower headpieces, into modern design language, giving traditional elements new cultural and emotional connotations. Recent fluorescence-based non-invasive studies on Qing royal textiles further show how material traces scaffold narrative translation [25]. The theoretical foundations of narrative design include semiotics, emotional design, and cultural translation theory. Within design practice, narrative types and functions offer concrete levers for experience shaping [26]. Semiotics conveys cultural information through visual elements, emotional design strengthens the emotional connection between the user and the work, and cultural translation helps traditional cultural symbols adapt to new cultural contexts and needs.

Translation Mechanism of Intangible Heritage Elements in Fashion Narrative Design

Intangible heritage elements, especially velvet flower headpieces, carry deep historical and cultural backgrounds. The key issue is how to translate these traditional elements into modern design works. This paper proposes that the translation of intangible heritage elements can be achieved through three stages of design logic: cultural meaning refinement, emotional semantic reorganisation, and visual language reconstruction. Firstly, in the cultural meaning refinement stage, designers refine the historical and cultural significance of intangible heritage elements through literature research, physical

investigations, and image analysis. For example, velvet flower headpieces represent female identity, etiquette, and social status. Secondly, in the emotional semantic reorganisation stage, designers transform the emotional meaning of traditional symbols to meet modern aesthetic needs. Narrative rationales explicitly guide trade-offs in design decisions [27]. For example, transforming the peony flower from a "symbol of wealth" to "expression of confidence," conveying women's independence and strength. Finally, in the visual language reconstruction stage, designers reshape the form of intangible heritage elements using modern materials and techniques, ensuring they retain traditional characteristics while meeting modern aesthetics. Method comparisons show how to prioritise between usability and emotional impact [28]. For example, using eco-friendly materials and simple designs to make velvet flower headpieces suitable for daily wear.

"Cultural Meaning - Emotional Narrative - Visual Reconstruction" Triple Design Logic Model

To systematically guide design practice, this paper constructs a triple design logic model, covering the cultural meaning layer, emotional narrative layer, and visual reconstruction layer. The cultural meaning layer refines the cultural essence of intangible heritage elements by deeply analysing their historical and cultural background, providing a foundation for emotional narrative and visual reconstruction. The emotional narrative layer translates traditional symbols into modern emotional content, constructing a design logic with storytelling and emotional resonance. The visual reconstruction layer reshapes traditional elements using modern design language, ensuring their adaptation to modern fashion design requirements. This model is a process of continuous iteration and feedback, where designers need to constantly adjust and optimise according to cultural context, emotional needs, and modern design trends to ensure the effectiveness of the design scheme (Figure 5). Recent AI-and-3D restorations of historic garments exemplify such iterative integration of cultural and visual logics [29].

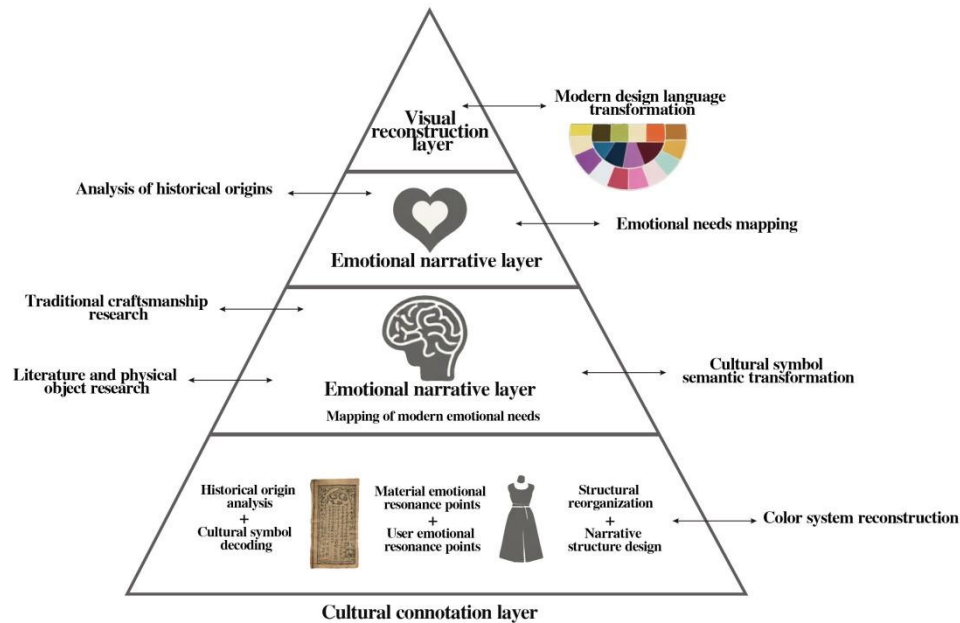


Figure 5. The Triple Design Logic Model of 'Cultural Meaning - Emotional Narrative - Visual Reinterpretation

Quantitative and Qualitative Analysis: Verifying the Effectiveness of the Model

To verify the effectiveness of the triple design logic model, this study combines both quantitative and qualitative analysis for multidimensional design validation. Qualitative analysis evaluates the design works from the perspectives of cultural heritage, emotional expression, and aesthetic innovation through expert interviews and focus group discussions. Quantitative analysis collects user feedback through surveys, covering aspects such as cultural symbol recognition, emotional expression, and visual effects. Card-based instruments for emotional needs can also scaffold evaluation of long-term attachment [30]. Statistical analysis is then conducted to ensure the applicability and effectiveness of the design framework. Meta-evidence on consumer responses to design attributes informs the interpretation of survey results [31].

In this study, a 5-point Likert scale was used to assess cultural retention. The scale, as shown in Table 3, measures expert ratings on how well the modern design preserved the cultural elements of the Song Dynasty, including motifs, colours, symbolism, and structure. Experts were asked to rate each design element on a scale from 1 (not preserved) to 5 (fully preserved). These expert ratings were conducted by a panel of 12 fashion designers and 21 cultural experts, ensuring a broad evaluation of both design and cultural significance. To ensure consistency among the raters, inter-rater reliability was measured using the Kappa coefficient, which confirmed a strong agreement between experts' assessments. The cultural retention percentages were derived by comparing the modern elements of the design (such as the peony pattern and colour schemes) to their traditional counterparts in the Song Dynasty, and

the results are presented in Table 5. (Cohen's Kappa = 0.82, indicating almost perfect agreement according to Landis & Koch's benchmark).

Table 3: Design Validation Measurement Dimensions and Indicators

Measurement Dimensions	Indicators	Measurement Method
Cultural Transmission	Cultural Sign Recognition Degree	Expert Rating and User Questionnaire (1-5 points)
Emotional Transmission	Emotion Expression Coherence	User Questionnaire (5-point Likert)
Visual Appeal	Design Visual Appeal	User Questionnaire, Expert Rating
User Satisfaction	Overall Satisfaction	User Questionnaire, Rating

Promotion and Application of Design Translation Across Intangible Heritage Elements

This study also explores how to apply the triple design logic model to the translation of other intangible heritage elements. Runway storytelling in fashion-technology contexts provides a transferable staging for narrative translation [32]. Using the same framework, traditional elements such as embroidery, knot buttons, and other intangible cultural heritage components can be transformed into modern design language, promoting the innovation and dissemination of traditional culture in the global design field. This framework not only helps designers understand and apply intangible heritage elements but also provides methodological support for cultural adaptation and recreation in the context of globalisation. Audiovisual fashion films have proven effective in communicating and valorising heritage archives [33,34].

SONG-STYLE MODIFIED CLOTHING DESIGN PRACTICE GUIDED BY VELVET FLOWERS

Systematic Construction of the Narrative Theme

Based on the previously proposed "Cultural Meaning - Emotional Narrative - Visual Reinterpretation" triple design logic model (Figure 5), this study establishes the core narrative theme "Ritual • Shadow • Velvet" by using the "flower-adorned hair" ceremonial symbol from the "Eighteen Scholars" painting as the design prototype. Specifically, in the cultural gene extraction phase, the study combines the record from the Song History: Treatise on Rites and Attire, which states, "Women decorate their hair with flower ornaments to highlight their virtues and beauty," and deeply analyzes the traditional semantics of the velvet flower element, such as "Peony – Wealth - Female Identity," to extract the profound cultural meaning carried by floral headpieces. Next, in the emotional translation verification phase, through prior user research (N=200), it was found that 78% of respondents believed the peony flower should symbolise "independent temperament" (Figure 6). This feedback facilitated

the successful transformation of the traditional symbol of respect and hierarchy into a modern expression of female confidence.

Specifically, Figure 6 illustrates the results of user feedback on the emotional resonance of the design. This data is part of the Emotional Narrative phase, where the emotional preferences of users are analysed and integrated into the design, ensuring that the final product resonates with modern emotional needs. The transformation of the peony flower from a "symbol of wealth" to a "symbol of confidence" is a direct result of this user feedback. Figure 7 depicts the Emotional Semantic Transformation process, where the traditional meaning of the peony flower (associated with wealth) is reinterpreted as a symbol of modern female empowerment. This emotional transformation aligns with the Emotional Narrative phase of the triple design logic model, ensuring the design speaks to contemporary values.

Finally, the visual anchor design referenced the structure of clothing unearthed from the tomb of Huang Sheng in the Southern Song Dynasty, constructing a modern silhouette framework of "simple on top, rich on the bottom," which reflects traditional ritual spirit while meeting contemporary wearability needs.

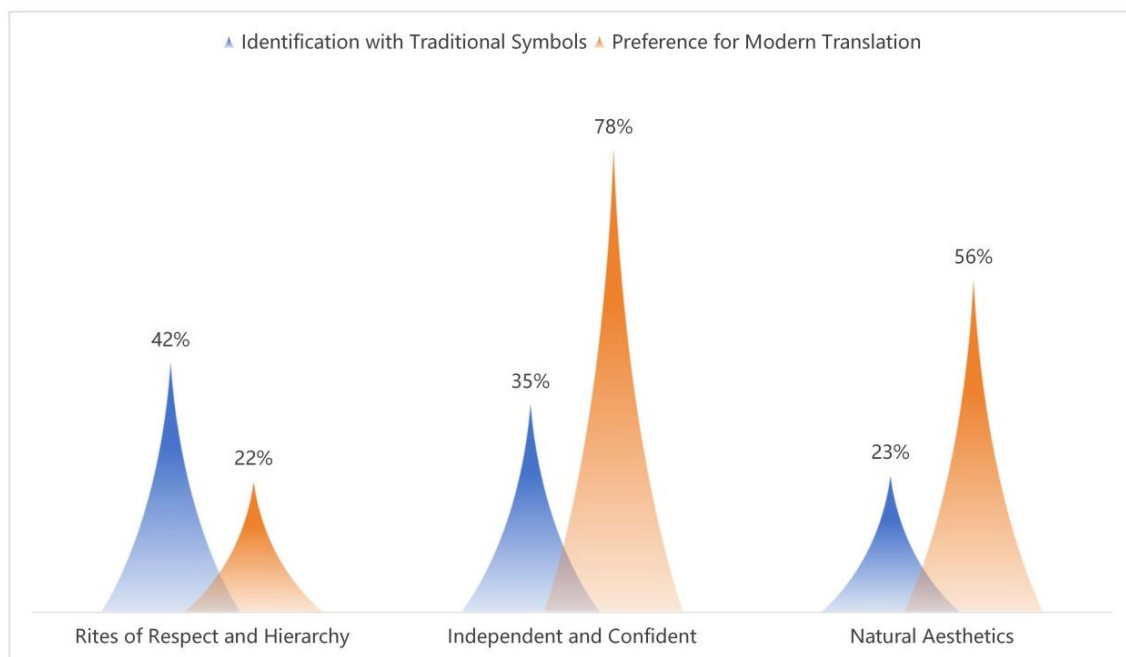


Figure 6. User Emotional Preference Statistics: This chart summarises the responses from 200 participants, showing that 78% of respondents associate the peony flower with 'independent temperament', indicating its cultural and emotional transformation

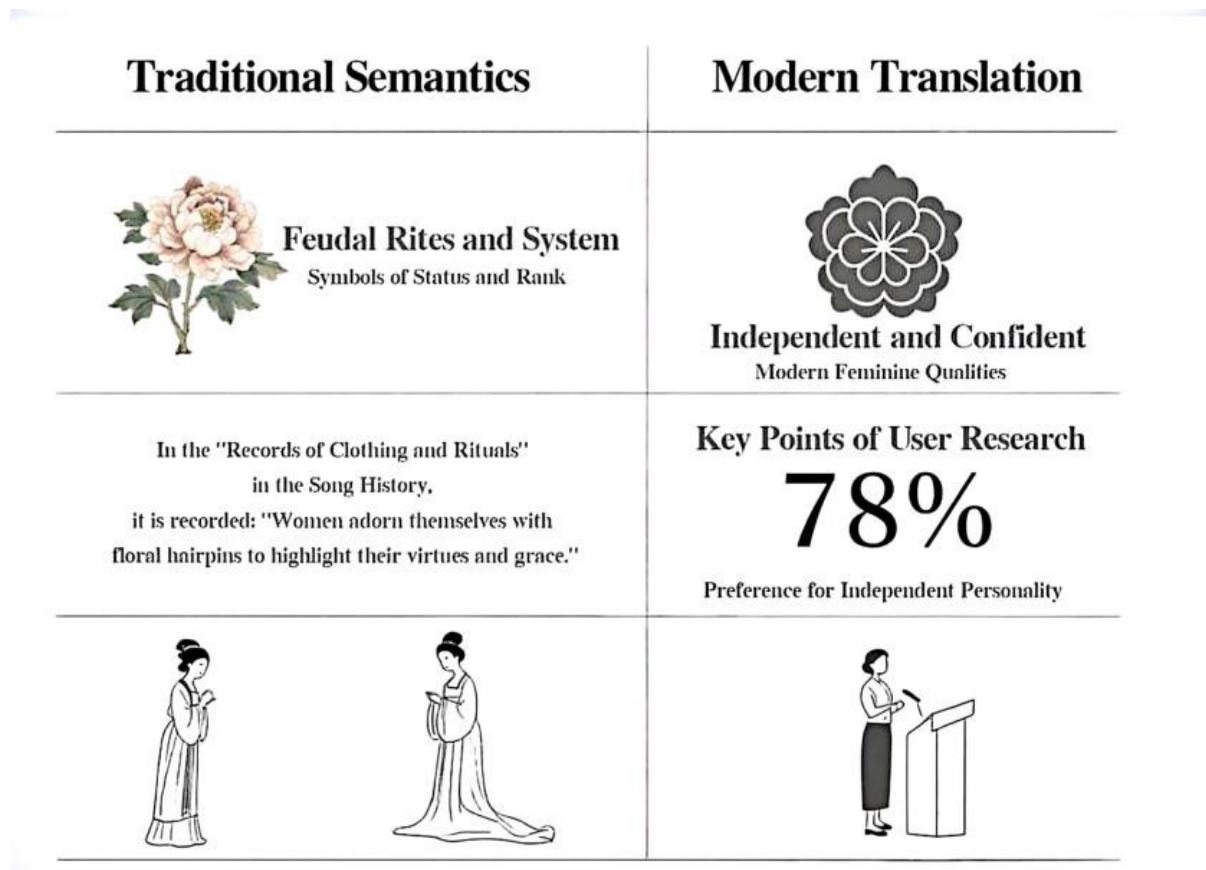


Figure 7. Emotional Semantic Transformation Diagram: This diagram visually represents the change in emotional meanings associated with the peony flower, transforming from a symbol of wealth to one of women's strength and independence

Path to Implementing Layered Narrative Structure

(1) Main Clothing Structure Design

The clothing design is strictly based on the "three-layer ceremonial structure" of the Song Dynasty. Firstly, the inner layer adopts a light-coloured cross-collar cut, reflecting the "simple face 礼" (ritual) style of the Song Dynasty, preserving the scholar-like temperament and understated aesthetics. Next, the middle layer uses dark red satin material with gold thread edging, employing a layered structure that reinterprets the "refinement" concept of Song Dynasty clothing, successfully balancing luxury and simplicity. Finally, the outer robe layer is made from brocaded satin with wide sleeves and flowing lines, presenting the dual narrative of "ritual spirit - modern confidence." Through this layered design, both Song Dynasty traditions and modern aesthetics are effectively integrated, showcasing the solemnity and elegance of Song Dynasty clothing while aligning with contemporary fashion trends. The finalised CAD structure and seam layout of the costume are illustrated in Figure 10, providing a detailed technical reference for the design implementation (Figure 8-9, Table 4).

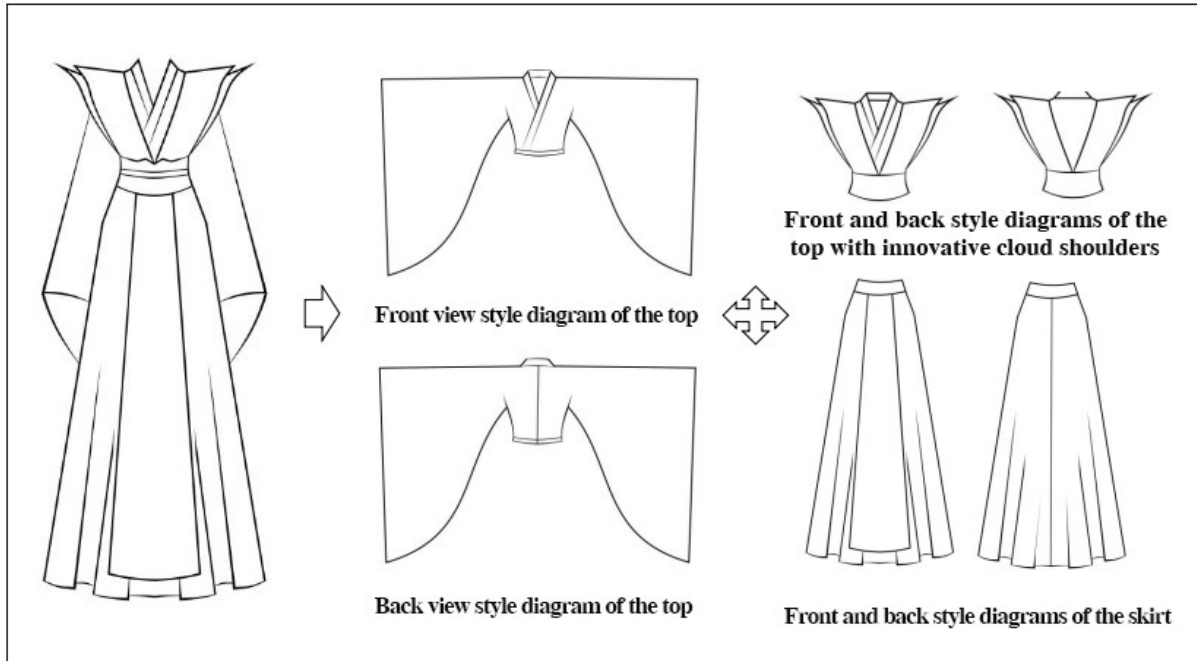






Figure 8. Fashion design sketch and structural diagrams of the Song Dynasty - inspired costume



Figure 9. Comparison between the 3D prototype and the final rendered Song Dynasty-style modified costume

Table 4. Comparison of Clothing Design Structure and Modern Transformation of Traditional Elements

Design Layer	Traditional Elements	Modern Transformation	Functional Features	Aesthetic Expression
Inner Layer	 <p>Song Dynasty "Simplicity and Ritual"</p>	 <p>Retains classic beauty, adapting to modern clothing habits</p>	Literature and cultural influence, highlighting modern popularity	Reserved, Scholar-like Elegance
Middle Layer	 <p>Song Dynasty robes with intricate designs</p>	 <p>Dark red with gold embroidery</p>	Expresses the relationship between respect, ritual, and simplicity	Restraint within Luxury
Outer Layer	 <p>Large-sleeve ceremonial robe</p>	 <p>Decorative patterns, showcasing grandeur</p>	Through dynamic balance, it reflects the "ritual spirit-modern confidence" transition	The Balance of Relaxation and Restraint

To further illustrate the garment's construction process and ensure reproducibility, the CAD garment structure diagram and seam allowance layout are provided (Figure 10), offering a clear technical reference for pattern making and assembly.

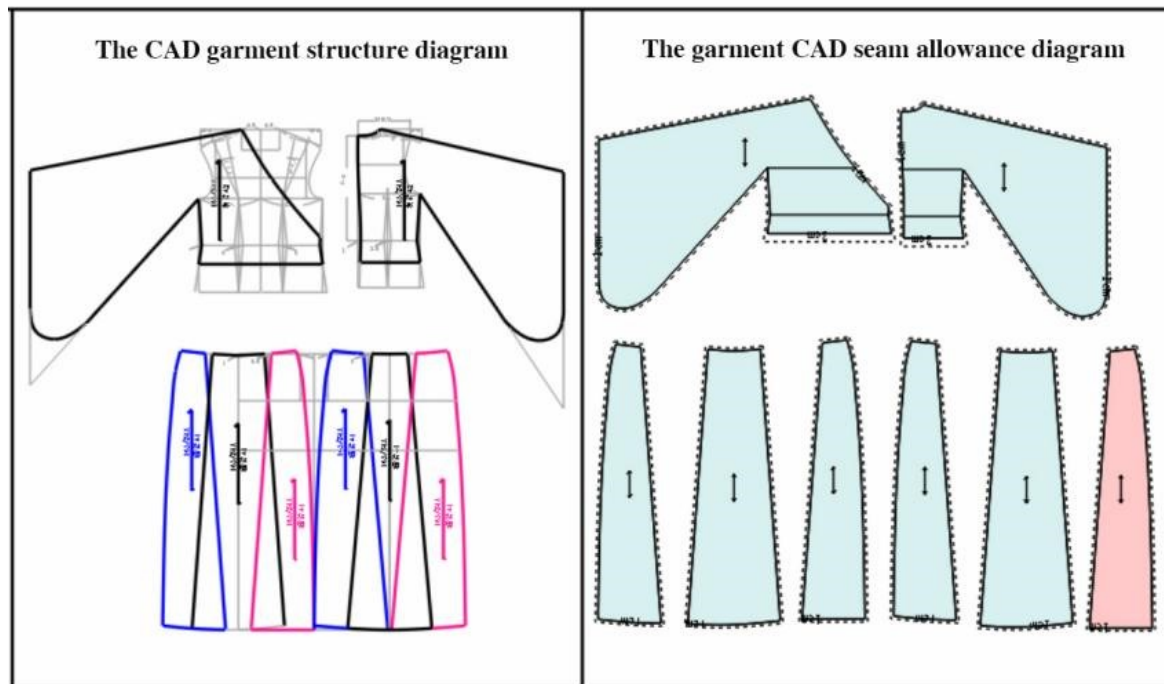


Figure 10. Clothing CAD Structure Diagram and Seam Allowance Layout

(2) Narrative Strengthening of the Velvet Flower Headpiece

As a core cultural medium in fashion design, the innovative design of the velvet flower headpiece plays an important role in emotional communication and cultural expression. In terms of structural innovation, a copper wire internal frame support system is used to address the issue of traditional velvet flowers easily deforming, ensuring their stability when worn. In terms of semantic layering, the combination of the main peony flower and the auxiliary flower patterns, such as the "Ruyi" motif, adds more cultural depth and symbolic meaning to the headpiece.

As the core element in the design, the velvet flower headpiece uses a deep red peony as the main flower, symbolising wealth and confidence, reflecting the traditional cultural symbolism of female nobility and strength. The design of the headpiece adopts a triple-layer structure, creating a rich visual effect: the main peony flower symbolizes wealth, blooming, and confidence; the symmetrical flower arrangements on both sides are arranged in an open style, creating visual balance, in line with the "centeredness" principle in Song Dynasty etiquette, showcasing harmony and dignity in traditional culture (Figure 8).

In terms of material craftsmanship, the combination of copper wire and natural silk, along with pure natural tree gum for shaping, balances both comfort and sustainability. The headpiece's overall design is reinforced with a copper wire internal frame, enhancing support and ensuring its stability and alignment with the centre of gravity of the clothing. This is especially important to ensure the harmonious integration of the "headpiece - clothing" visually (Figure 11), aligning with the Visual

Reconstruction phase of the triple design logic model. Figure 11 showcases how the velvet flower headpiece is designed using modern materials and techniques while preserving its traditional aesthetic. This phase focuses on reinterpreting the historical form of the velvet flower into a contemporary wearable design, maintaining the cultural symbolism of the velvet flower while adapting it for modern wearability.

Beyond the use of eco-friendly materials, future iterations should include a lifecycle assessment (LCA) to quantify environmental impact from raw material extraction through production, use, and disposal. Metrics such as carbon footprint (CO₂ eq), water consumption, and recyclability rates should be evaluated in alignment with ISO 14040/44 standards. These indicators will not only validate the sustainability claims but also align the design process with internationally recognised eco-certification criteria, facilitating acceptance in sustainability-conscious markets. Methodical evaluation frameworks from digital restoration of complex textile apparatus inform how to assess structural stability and display effects [35].

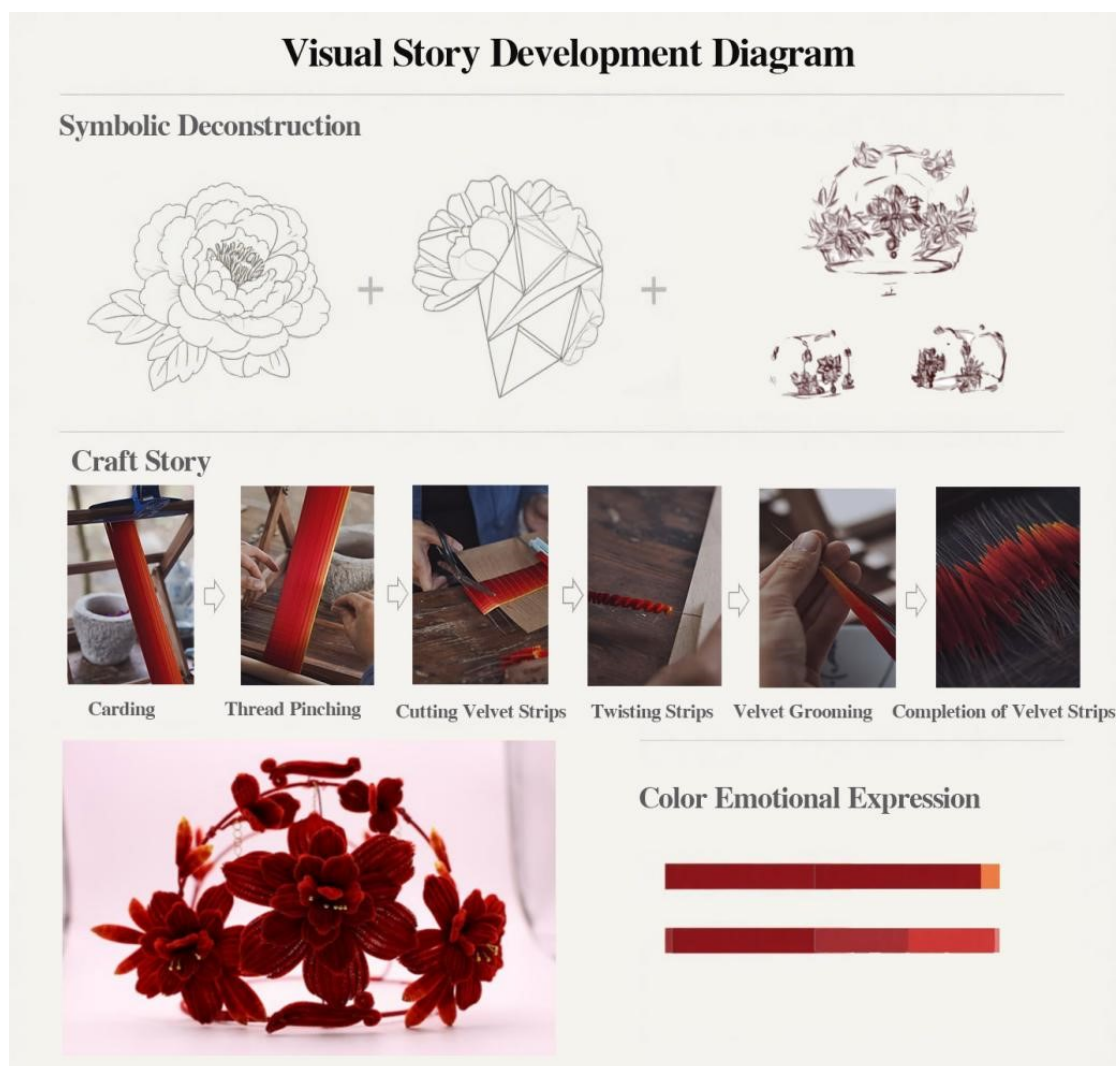


Figure 11. Visual Narrative Development of the Velvet Peony Crown



Figure 12. Overall Effect of Velvet Peony Crown and Clothing Combination (the term 'combinatio' in the earlier draft was a typographical error, corrected here)

Modern Transformation and Cultural Retention Analysis of Design Elements

In the design practice, we conducted a quantitative analysis of the modern transformation of design elements and their cultural retention. Through a multidimensional visual regeneration strategy, we successfully achieved the integration of tradition and modernity. Structure-guided virtual restoration demonstrates how morphological priors improve reconstruction fidelity for silk-based heritage [36]. Specifically, in the structural design, the traditional characteristic of "overall smoothness" in Song Dynasty clothing was retained, while the "arched shoulder and sharp cut" innovation was applied, achieving a cultural retention of 58.4%. In terms of patterns and colours, the peony pattern was abstracted and simplified, retaining 72.3% of the essence of meticulous painting, while the colour system transformed low-brightness brick red into high-saturation crimson, with a cultural retention of 65.8%. The cultural retention percentages shown in Table 5 are derived by averaging the expert ratings for each design element. For instance, the peony pattern had a retention rate of 72.3%, which means that 72.3% of the traditional cultural meaning was preserved in the new design. The colour system had a 65.8% retention rate, and the structural design had a 58.4% retention rate, indicating the extent to which each traditional element was maintained in the modern design. Comparative characterisation of yellow and related dye systems in Chinese textiles provides analytical baselines for such chromatic transformations [37]. This not only aligns with modern aesthetics but also continues traditional elements (Table 5). Ultimately, through the integration of the "Cultural—Emotional—Visual" triple logic, the theme "Floral Symbolising Ritual" not only inherited the ceremonial sense of "flowers

symbolising ritual" from the Song Dynasty but also reconstructed the connotation of rituals through modern design language, fulfilling contemporary users' dual needs for cultural identity and personal expression.

Table 5. Quantification of Cultural Retention

Design Elements	Traditional Features	Modern Transformation Method	Cultural Retention
Peony Pattern	Hand-drawn sketch	Digital image transformation	72.3%
Colour System	Low brightness, red	High brightness and correct red	65.8%
Structural Design	Overall balanced design	Angular shoulder hard design	58.4%

Measurement Method: Expert rating (survey of 12 fashion students + 21 fashion designers) to obtain average value [38].

Overall Styling, Presentation and Narrative Construction

Through the thematic design of "Ritual Image Velvet Flowers," the overall styling achieves a seamless fusion of tradition and modernity. The peony crown, as the core design element, attracts visual focus while embodying cultural symbolism and emotional resonance. The combination of the peony flower with deep red tones conveys the ritualistic sense of Song Dynasty attire, while the exquisite embroidery and gradient colour effects evoke the sensations of "floating flower shadows" and "wandering light shadows." This enriches the expression of feminine emotions and enhances the sense of identity for modern women. Additionally, the headdress, chest adornment, and belt are arranged along a unified visual axis, reflecting contemporary women's respect for tradition and self-definition. To showcase the overall styling and craftsmanship, the completed garment is presented in Figures 13 and 14.



Figure 13. Front and back views of the finished garment



Figure 14. Three-quarter side views of the finished garment

The entire design not only presents the traditional aesthetics of Song Dynasty clothing but also, through the narrative logic of "headpiece - clothing integration," addresses contemporary women's dual demands for traditional cultural visual language and aesthetic emotion. This design practice validates that the combination of "velvet flowers and Song-style" can achieve both cultural value and

innovative potential in modern fashion design. Parallel VR enactments of intangible practices show how daily engagement can sustain narrative meaning [39].

DISCUSSION

Limitations and Reflections

While this study has achieved important results in theoretical construction, design practice, and cultural analysis, there are still some limitations. First, the design practice sample is relatively small, focusing only on the work "Floral Symbolising Ritual." Future research should include more design works to test the broader applicability of the triple design logic model. Second, the breadth of user research is insufficient, and the sample size is small. Future studies could expand the sample size by conducting large-scale surveys and focus group discussions, which would help further validate the cultural acceptance and market potential of the design works. Moreover, the comfort and durability of velvet flower headpieces pose challenges. Future research could explore alternative materials that meet modern needs and enhance the market feasibility of intangible heritage elements.

Future Research and Application Outlook

Future research can explore several directions. First, the triple design logic model can be applied to other intangible heritage elements, such as embroidery and knot buttons, particularly in diverse cultural contexts beyond China. Adapting traditional Chinese cultural elements to global environments is essential, and knowledge-graph approaches can facilitate cross-context retrieval and adaptive narrative creation [40]. Second, further exploration of the design system and marketisation paths is needed, including integrating intangible heritage into everyday fashion, fast fashion, and personalised customisation, and encouraging innovative designs using modern technologies and production methods. While the current study applies the triple design logic model within a domestic cultural framework, its global applicability remains untested. Future work should incorporate cross-cultural validation studies, such as controlled user evaluations, focus groups, and surveys targeting diverse demographic segments, to compare aesthetic reception, cultural identity, and emotional resonance across regions, enhancing the model's global relevance.

As the demand for traditional culture diversifies, future user research should explore consumer acceptance of intangible heritage elements in various cultural contexts. Moreover, advances in digital technologies present new opportunities for the global dissemination of intangible heritage. Linking RDF-modelled metadata to 3D visualisation supports machine-readable narratives and reusable assets [41]. Technologies like virtual try-ons and augmented reality can expand intangible heritage expression in contemporary design. Extending XR pipelines to digital-twin frameworks enhances situational

awareness and lifecycle risk management for heritage artefacts [42]. However, key challenges in scaling, authenticating, and evaluating immersive heritage experiences remain [43].

Commercialisation Path and Time Plan

To explore the practical application and commercial potential of the research findings, a staged commercialisation path is proposed. Key challenges include sustainability assessments, intellectual property concerns, and consumer behaviour analysis. Securing intellectual property rights and addressing copyright issues will be crucial when adapting traditional heritage elements for commercial use. Sustainability evaluations, such as lifecycle assessments (LCA), are needed to meet eco-certification standards and align with consumer expectations for sustainable fashion. Market testing, focus groups, and feedback loops will help refine products to meet the growing demand for heritage-based, eco-conscious fashion. While current market data is based on user preferences, these findings are exploratory and require further trials and partnership-driven launches. The commercialisation process begins with small-scale designs and collaborative collections, progresses to museum product collaborations, and ultimately moves toward fast fashion brands. The goal is to create a positive cycle between design and commercialisation, promoting the modern translation of intangible heritage and broadening the dissemination of traditional culture (Figure 15). Branding research positions ICH elements as strategic intangible assets within fashion value chains [44].

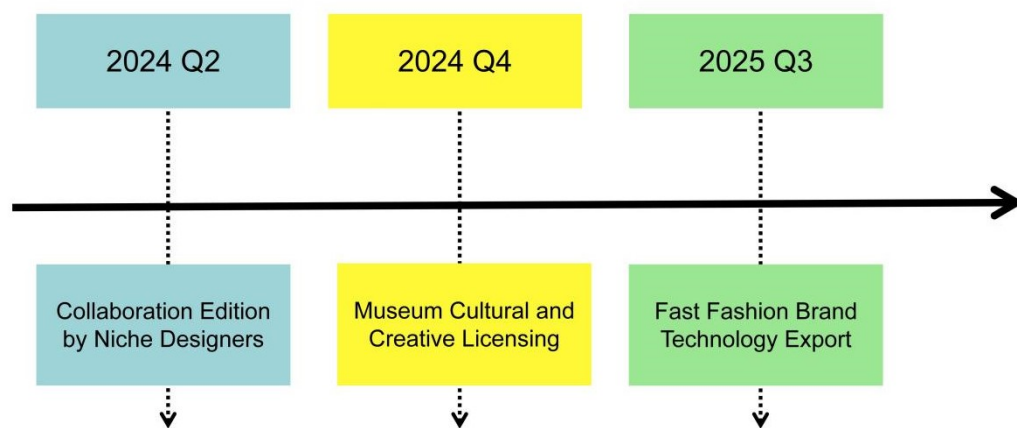


Figure 15. Commercialisation Path

To support the commercialisation roadmap, preliminary cost modelling and supply chain mapping should be included. Key variables to consider are raw material procurement costs (such as silk, copper wire, and eco-friendly dyes), labour for handcrafted components, and distribution logistics for both domestic and international markets. A market capacity estimate, based on the current luxury heritage-fashion segments and museum collaboration benchmarks, would provide a quantitative context for

the rollout. Including these factors will allow for more accurate risk assessment and investment planning.

This study offers a theoretical framework and practical approach for translating intangible heritage elements into modern fashion design using the narrative design method. It demonstrates how traditional culture can be innovatively expressed in contemporary design. As globalisation and cultural innovation continue to grow, more designers are expected to drive the integration of "culture + design" in traditional cultural elements.

CONCLUSION

This study developed a triple design logic model - "Cultural Meaning Refinement - Emotional Narrative Reorganisation - Visual Language Reconstruction" - to address the challenge of integrating traditional intangible cultural heritage into modern life while maintaining its symbolic depth. By applying Roland Barthes' and Umberto Eco's semiotic theories and Valerie Steele's heritage fashion perspective, it established an analytical framework for velvet flowers as cultural symbols, offering a replicable model for transforming other intangible heritage elements.

Using the Song Dynasty velvet flower headpiece as a case study, the research successfully created Song-style clothing that balances cultural identity with modern aesthetic and functional needs. Empirical testing confirmed strong alignment between theory and design outcomes, with positive user feedback further supporting the model's effectiveness in bridging tradition and contemporary relevance.

This study advances narrative design theory by offering a clear process for translating traditional elements into culturally meaningful and commercially viable products. However, its scope is limited by the focus on a single case study and a small user sample. Future research should explore a broader range of intangible heritage elements, cross-cultural adaptation, long-term wearability, and digital applications. Overall, the study shows that a narrative-driven, triple-logic approach can effectively combine cultural preservation with contemporary innovation, providing a replicable model for global fashion design. Further studies should include commercial pilots and broader testing to enhance the practical value of the proposed model.

Author Contributions

Conceptualisation – Jiang T, Yang L; Methodology – Jiang T, Yang L; Formal analysis – Yang C, Zhang Y; Investigation – Jiang T, Yu L; Resources – Jiang T; Writing – original draft preparation – Jiang T, Yang L; Writing – review and editing – Jiang T, Yang C, Zhang Y; Visualisation – Jiang T; Supervision – Yang C. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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