Research on Optimized Design Paths for Wuhan Tourism Cultural and Creative Products Based on Regional Culture

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Abstract. Wuhan boasts abundant cultural resources and is a renowned national historic and cultural city. As a vital medium for Wuhan's regional culture, tourism cultural and creative products effectively contribute to the inheritance and development of local culture, enhancing Wuhan's cultural visibility. This study classified Wuhan's regional culture into three dimensions: material culture, behavioral culture, and spiritual culture. A cultural "gene map" was constructed, and the Analytic Hierarchy Process (AHP) was applied to analyze these cultural resources, calculate the weight of each cultural factor, and determine their rankings. The results showed that spiritual culture had the highest weight, with revolutionary histories identified as a key design factor. This indicated that conveying cultural meaning is central to cultural and creative design. In addition, material culture represented by ruins and sites and behavioral culture represented by traditional fine arts also held high design value, reflecting consumers' interest in the historical value, artistic value, and interactive experience offered by tourism cultural and creative products. Based on these findings, this study proposed optimization paths for the design of Wuhan's tourism cultural and creative products from three perspectives: cultural differentiation, contemporaneity, and interactivity, aiming to provide ideas for both the promotion of Wuhan's regional culture and the development of related creative design practices.

Keywords: Regional culture, Wuhan tourism cultural and creative products, Cultural structure, Analytic Hierarchy Process

1 Introduction

Regional culture refers to cultural content generated and continually evolving through various local social activities. Influenced by geographical environments and lifestyle habits, it typically exhibits distinctive regional characteristics and possesses the qualities of historical recording and inheritance. Regional culture represents an aggregate of historical traditions, social practices, and customs specific to an area. Actively exploring and utilizing regional culture can reveal deeper cultural meanings, foster a systematic and standardized cultural hierarchy, aid cultural dissemination, enhance national cultural identity, and strengthen cultural confidence.

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At present, academic research on Wuhan's tourism cultural and creative products has mainly focused on the design translation of representative cultural elements and their digital development. For example, Tian, Z. M. et al.[1] and Du, H. X. et al.[2] took Wuhan's iconic architecture, the Yellow Crane Tower, as the research object, extracting elements such as historical information and regional characteristics for design transformation. Song, Y. Q. et al. [3]explored the cultural connotations of Wuhan's bridge culture to build a distinctive bridge brand. Wang, L. Z. et al. [4] analyzed the artistic features of Wuhan's intangible cultural heritage—Han embroidery—and conducted related design practices. Chen, Q. [5] proposed applying digital technologies such as digital design tools, virtual prototyping, and digital printing and manufacturing techniques to red-themed cultural and creative products in Wuhan to promote the development of digital cultural creativity. A review of relevant literature revealed the following problems in existing research on Wuhan's tourism cultural and creative products: 1.Most design studies focused only on specific representative cultural elements, lacking a comprehensive sorting and summarization of Wuhan's overall cultural system; 2.The selection of design elements tended to be overly subjective and did not sufficiently consider users' psychological needs, with a lack of quantitative analysis and screening processes for cultural elements.

Through field research, this study found that the transformation of cultural resources in Wuhan's tourism cultural and creative products faced the following issues in real-life practice: 1.The products mainly focused on core elements such as the Yellow Crane Tower, cherry blossoms, and hot dry noodles, resulting in serious product homogenization and a lack of innovation; 2.The cultural content of existing Wuhan tourism cultural and creative products was often explored only at a superficial level, with insufficient expression of deeper cultural connotations such as local folk traditions and spiritual culture.

The Analytic Hierarchy Process (AHP), originally a method applied in operations research, quantifies the weight of various elements through expert scoring. This method assists designers in clearly identifying directions for product improvement, aligns designs with user psychological needs, offers diverse design inspirations, and helps prevent product homogeneity. Prior cultural analysis conducted before applying the AHP helps designers excavate deeper cultural meanings, mitigating the superficial representation of cultural content.

This study took Wuhan tourism cultural and creative products as the research object, deconstructed Wuhan's regional culture, constructed a cultural mapping of the region, and employed AHP to comparatively weigh regional cultural elements. Through understanding user demands, it proposed optimized design paths for Wuhan tourism cultural and creative products, ultimately aiming to promote their innovative development.

2 Literature Review

Tourism cultural and creative products are supported by cultural resources, transformed through human creativity and wisdom into perceptible cultural symbols. These prod-

ucts, characterized by practical functions and cultural identity, aim to disseminate culture and possess high added value. Recently, due to increased national emphasis on cultural industries, many scholars have researched tourism cultural and creative products, exploring methods to translate regional culture into product design. For example, Zheng, J. et al. [6] focused on Hainan regional culture, categorizing local cultural elements such as Li brocade, Eld's deer culture, and island elements, integrating them into creative products to create historically and culturally distinctive tourism products. Wu, J. [7] analyzed symbolic meanings, cultural connotations, and situational experiences that modern users value, extracting visual design elements from traditional Xiyang folk activities for tourism products. Li, W. et al. [8] approached Hunan needlework culture from user emotional experiences, branding, and aesthetic design, proposing three creative methods—"three environments" creative, series thinking, and form innovation—to develop innovative, culturally rich tourism products. The design of tourism cultural and creative products based on the unique charm of regional culture can strengthen the emotional connection between consumers and tourist places, and at the same time meet the multiple objectives of cultural heritage, market demand and user experience.

While design is inherently rooted in affective processes, systematic investigation and analytical methods are imperative to mitigate designers' cognitive biases in interpreting user needs. Scholars such as Sun, B. B. et al.[9], Huang, W. J. et al.[10], and Yu, L. et al.[11]employed qualitative and quantitative methods to analyze factors influencing consumer purchase behavior. They found that consumers are typically attracted to novel, aesthetically pleasing products that distinctly reflect local cultural characteristics, thus designing products aligned with these preferences. The Analytic Hierarchy Process (AHP) is widely used to investigate user requirements and guide designers to optimal decisions. For instance, Pant, S. et al. [12] used AHP to analyze factors impacting weight management, developing suitable monitoring systems. Qi Y. et al. [13] applied AHP to assess technical and market feasibility improvements for health kettles, transforming user expectations into visual data. Researchers like Chen Y. et al.[14], Vadivel S.M. et al.[15], and Yu S. et al.[16] utilized AHP in furniture and interior design to produce ideal products tailored to consumer preferences.

In conclusion, tourism cultural and creative products significantly drive local cultural industry growth. As souvenirs typically given as gifts, these products create a dynamic transmission chain of "people-object-people", facilitating the continuous cross-temporal spread of regional culture. Combining qualitative and quantitative research methods to create tourism cultural and creative products that clearly reflect regional characteristics and meet consumer demands enhances urban visibility and positively impacts regional cultural dissemination.

3 Research Processes and Methodology of Optimized Design Paths for Wuhan Tourism Cultural and Creative Products

3.1 Research Process

The design elements of Wuhan tourism cultural and creative products originated from Wuhan's regional cultural resources. Given the complexity of these resources, scientific methods were essential for detailed analysis and research. This study adopted the Analytic Hierarchy Process (AHP) to rank design elements based on Wuhan's tourism cultural resources. For Wuhan tourism cultural and creative product design, AHP assessed the development value of Wuhan's regional cultural resources, assisting designers in choosing design elements. The specific steps included (as shown in Figure 1.) :

1) Conducting field surveys and reviewing literature such as papers and books to collect and organize Wuhan's cultural resources, building a regional cultural resource map for subsequent research.

2) Categorizing design elements into four hierarchical layers—target, comprehensive evaluation, evaluation items, and evaluation factors—based on the cultural resource map, creating a model map of design elements for Wuhan tourism cultural and creative products.

3) Establishing an expert panel to compare and score the importance of each design element in the hierarchical model, forming a judgment matrix for evaluation indicators and performing consistency tests.

4) Ranking the calculated weights of elements, drawing conclusions, and developing optimized design paths for Wuhan tourism cultural and creative products.

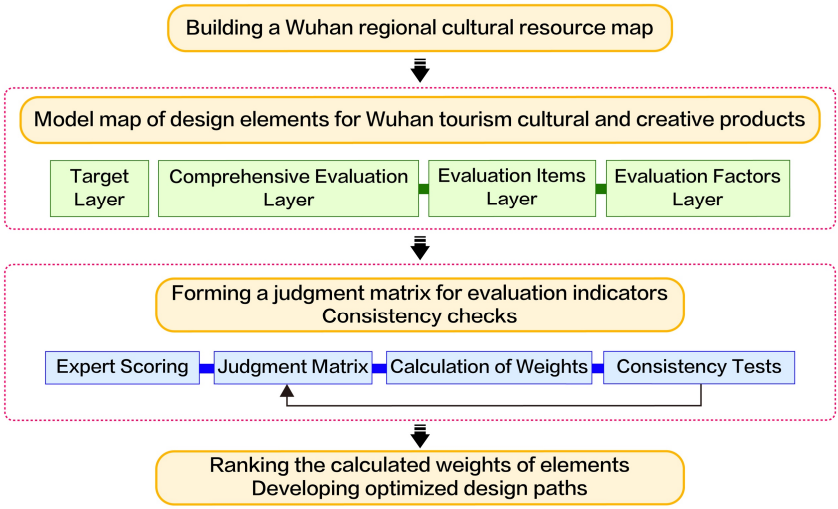

Fig. 1. Research framework (self-drawn by the author).

3.2 Research Methodology

Proposed by American operations researcher Thomas L. Saaty in the 1970s, AHP decomposes decision-related elements into different layers, conducting qualitative and quantitative analysis to derive effective and scientific decisions by calculating weights and comparisons [17]. It is especially suitable for complex decision-making problems involving multiple criteria and alternatives. The specific steps taken in this study were as follows:

1)Construction of the hierarchical model for design elements of Wuhan tourism cultural and creative products: the model was structured into four layers — target layer, comprehensive evaluation layer, evaluation items layer, and evaluation factors layer.

The target layer represented the ultimate objective of the decision-making process—namely, the problem that the study aimed to address or optimize—and was placed at the top of the hierarchy. The comprehensive evaluation layer included the main criteria influencing the decision, while the evaluation items layer further subdivided these criteria into typical forms of expression for each type of cultural resource. These two layers formed the middle layers of the hierarchy. The evaluation factors layer included specific, operable design elements of Wuhan's tourism cultural and creative products. The analysis results at this level directly guided the extraction of design elements, the selection of content, and the visual presentation, and were positioned at the bottom of the hierarchical structure.

2)Construction of the judgment matrix:

Several experts were invited to independently complete questionnaires, in which they performed pairwise comparisons of the importance of elements within each hierarchical layer. These evaluations were then converted into quantifiable numerical relationships, serving as the basis for subsequent weight calculations. This study adopted the 1–9 scale method proposed by Saaty for pairwise comparisons, as shown in Table 1. In this method, a_{ij} represents the relative importance of element i compared to element j, and the scoring results were used to populate the values in the judgment matrix.

Table 1. Scale tables of levels 1 to 9 (self-drawn by the author).

Scale	Element i Compared to Element j
1	Equally important
3	Slightly more important
5	Clearly more important
7	Strongly more important
9	Extremely more important
2,4,6,8	Intermediate values
Reciprocal	The ratio of element j to element i is $1/a_{ij}$

3)Normalization of the judgment matrix

First, the sum of each column in the judgment matrix was calculated. Then, each element was divided by the total of its corresponding column to obtain a normalized column vector. This step was taken to eliminate the influence of differing scales. The calculation is shown in Equation (1):

$$\overline{C_{ij}} = \frac{C_{ij}}{\sum_{k=1}^{n} C_{kj}} \quad (i, j = 1,2,\ldots,n) \tag{1}$$

In the equation:

C_{ij} represents the original value at the i-th row and j-th column of the judgment matrix.

$\overline{C_{ij}}$ represents the normalized value after processing

n represents the order of the judgment matrix.

4)Calculation of the weight vector:

Next, the sum of each row in the normalized matrix was calculated. This step served as preparation for averaging to determine the final weights. The computation is shown in Equation (2).

$$\overline{W_i} = \sum_{j=1}^{n} \overline{C_{ij}} \, (\mathrm{i} = 1,2,\ldots,\mathrm{n}) \tag{2}$$

The average value of the elements in each row was then calculated to process the normalized matrix, as shown in Equation (3). This resulted in the relative weight of each factor, reflecting its importance within the corresponding hierarchical level. Based on these relative weights, all factors were ranked accordingly.

$$W_i = \frac{\overline{W_i}}{\sum_{j=1}^{n} \overline{W_j}} (\mathrm{i} = 1,2,\ldots,\mathrm{n}) \tag{3}$$

5) Consistency test:

To prevent logical inconsistencies in the judgment matrix (such as situations where A > B, B > C, but C > A), a consistency check was performed to ensure the accuracy and reliability of the data.

First, Equation (4) was used to calculate the value of λmax, which is the largest eigenvalue of the judgment matrix and reflects the relative consistency of the matrix.

$$\lambda_{max} = \sum_{i=1}^{n} \frac{(CW)_i}{nW_i} \tag{4}$$

In the equation:

C represented the original judgment matrix.

W represented the weight vector.

$(CW)_i$ denoted the i-th component of the product of matrix C and vector W.

To test the consistency of the judgment matrix, it was necessary to calculate the Consistency Index (CI) and the Consistency Ratio (CR). The CI value was calculated using Equation (5), where n represented the order of the judgment matrix. The CR value was then obtained based on Equation (6), in which RI referred to the Random Consistency Index, with specific values shown in Table 2. If the final CR value was less than 0.1, the judgment matrix passed the consistency test; otherwise, the matrix needed to be re-evaluated and adjusted until it met the consistency requirement.

$$CI = \frac{\lambda_{max} - n}{n-1} \tag{5}$$

$$CR = \frac{CI}{RI} \tag{6}$$

Table 2. Table of RI values for judgment matrices (self-drawn by the author).

Matrix Order	1	2	3	4	5	6	7	8	9
RI Value	0	0	0.52	0.89	1.12	1.26	1.36	1.41	1.46

4 Analysis of Optimized Design Paths for Wuhan Tourism Cultural and Creative Products

4.1 Classification of Wuhan Regional Cultural Resources

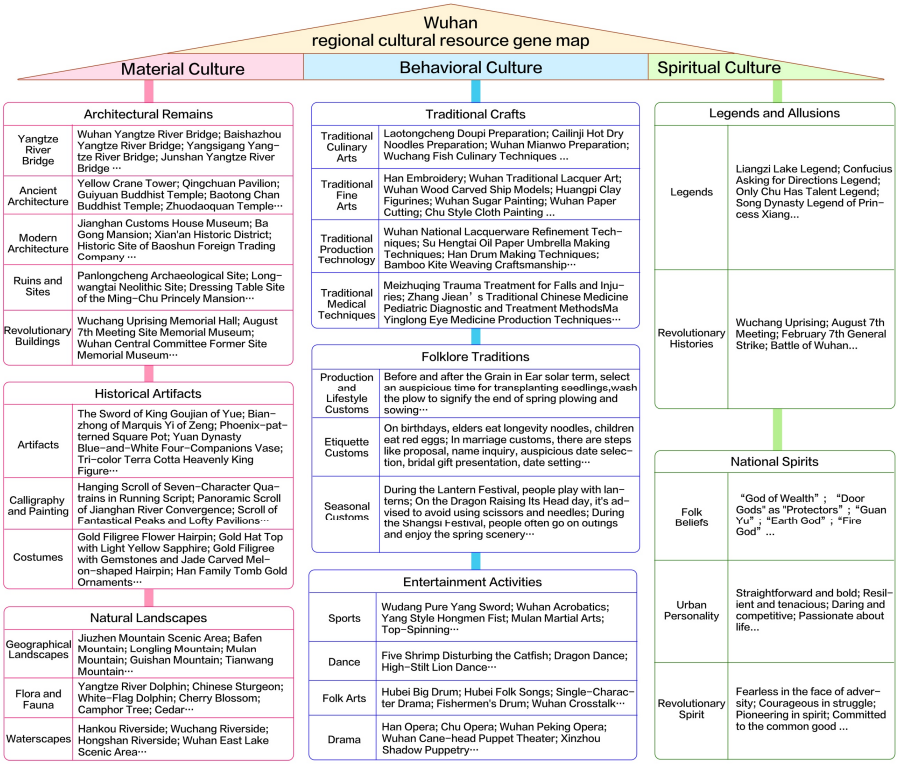

Fig. 2. Wuhan regional cultural resource gene map (self-drawn by the author).

Wuhan, also known as Jiangcheng ("River City"), is the capital city of Hubei Province. In 1986, it was designated by the State Council as one of China's second batch of national historic and cultural cities. Wuhan is rich in cultural resources, necessitating systematic categorization and compilation to form a regional cultural resource map that serves as a reference for designing Wuhan tourism cultural and creative products.

This study categorized Wuhan's regional culture into three types based on the three-tier cultural structure: material culture, behavioral culture, and spiritual culture. Mate-

rial culture encompasses tangible elements such as architectural remains, historical artifacts, and natural landscapes. This type of culture arises from basic human needs for food, clothing, housing, and transportation and varies regionally due to ecological environments, social systems, and levels of economic development. Behavioral culture includes intangible traditions developed through social interactions and production activities, such as traditional crafts, folklore traditions, and entertainment activities, closely linked to daily life. Spiritual culture involves unique values shaped by geographical environments and historical events, often encapsulated in distinctive local legends and national spirits. Based on these classifications, a regional cultural resource gene map of Wuhan was constructed (as shown in Figure 2).

4.2 Construction of Design Element Model for Wuhan Tourism Cultural and Creative Products

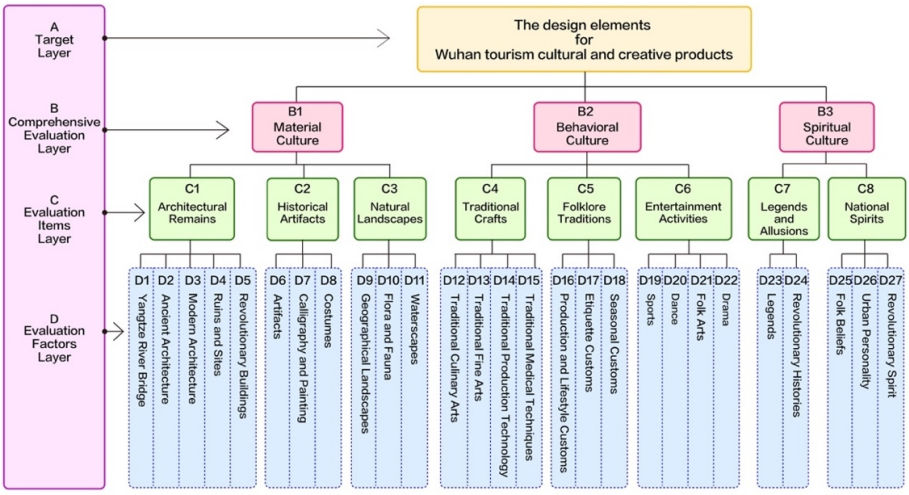

Fig. 3. Model map of design elements for Wuhan tourism cultural and creative products (self-drawn by the author).

The design element model for Wuhan tourism cultural and creative products was structured into four hierarchical layers: target layer, comprehensive evaluation layer, evaluation items layer, and evaluation factors layer (as shown in Figure 3.). The first layer, target layer A, represents the design elements for Wuhan tourism cultural and creative products. The second layer, comprehensive evaluation layer B, includes material culture, behavioral culture, and spiritual culture. The third layer, evaluation items layer C, comprises architectural remains, historical artifacts, natural landscapes, traditional crafts, folklore traditions, entertainment activities, legends and allusions, and national spirits. Further analysis of evaluation items layer C resulted in 27 evaluation factors, categorized as evaluation factors layer D. These include the Yangtze River Bridge, ancient architecture, modern architecture, ruins and sites, revolutionary buildings, arti-

facts, calligraphy and painting, costumes, geographical landscapes, flora and fauna, waterscapes, traditional culinary arts, traditional fine arts, traditional production technology, traditional medical techniques, production and lifestyle customs, etiquette customs, seasonal customs, sports, dance, folk arts, drama, legends, revolutionary histories, folk beliefs, urban personality, and revolutionary spirit.

4.3 Construction of the Evaluation Indicator Judgment Matrix

To ensure the reliability of the data, this study invited a panel of experts composed of 20 target consumers and 30 design practitioners to evaluate the design elements. Based on their scores, judgment matrices were constructed for the four hierarchical layers: the target layer (A), the comprehensive evaluation layer (B), the evaluation items layer (C), and the evaluation factors layer (D), as shown in Table 3.

Table 3. The judgment matrix of evaluation indicators (self-drawn by the author).

A		B1	B2	B3		
	B1	1	5	1/3		
	B2	1/5	1	1/7		
	B3	3	7	1		
B1		C1	C2	C3		
	C1	1	3	6		
	C2	1/3	1	3		
	C3	1/6	1/3	1		
B2		C4	C5	C6		
	C4	1	5	6		
	C5	1/5	1	5		
	C6	1/6	1/3	1		
B3		C7		C8		
	C7	1		3		
	C8	1/3		1		
C1		D1	D2	D3	D4	D5
	D1	1	1/3	4	1/5	1/4
	D2	3	1	3	1/5	1/3
	D3	1/4	1/3	1	1/9	1/8
	D4	5	5	9	1	3
	D5	4	3	8	1/3	1
C2		D6		D7		D8
	D6	1		3		5
	D7	1/3		1		3
	D8	1/5		1/3		1
C3		D9		D10		D11
	D9	1		6		3

	D10	1/6		1	1/3
	D11	1/3		3	1
		D12	D13	D14	D15
	D12	1	1/5	1/3	3
C4	D13	5	1	3	7
	D14	3	1/3	1	5
	D15	1/3	1/7	1/5	1
		D16		D17	D18
C5	D16	1		1/5	1/7
	D17	5		1	1/3
	D18	7		3	1
		D19	D20	D21	D22
	D19	1	1/3	1/5	1/7
C6	D20	3	1	1/3	1/5
	D21	5	3	1	1/3
	D22	7	5	3	1
			D23		D24
C7	D23		1		1/3
	D24		3		1
		D25		D26	D27
C8	D25	1		5	3
	D26	1/5		1	1/3
	D27	1/3		3	1

4.4 Consistency Test Results

Table 4. Consistency test results (self-drawn by the author).

Layer	λ_{max}	CI	CR	Consistency Result
A	3.066	0.033	0.063	Passed
B1	3.018	0.009	0.018	Passed
B2	3.096	0.048	0.092	Passed
B3	2.000	0.000	null	Passed
C1	5.307	0.077	0.068	Passed
C2	3.039	0.019	0.037	Passed
C3	3.018	0.009	0.018	Passed
C4	4.118	0.039	0.044	Passed
C5	3.066	0.033	0.063	Passed
C6	4.118	0.039	0.044	Passed
C7	2.000	0.000	null	Passed
C8	3.039	0.019	0.037	Passed

After performing the calculations according to the formulas described in the research methodology, the consistency test results for the above judgment matrices are presented

in Table 4. All CR values were found to be less than 0.1, indicating that the judgment matrices demonstrated a high level of consistency.

4.5 Evaluation Results and Conclusions of Design Elements for Wuhan Tourism Cultural and Creative Products

4.5.1 Analysis of Design Element Weighting Evaluation Results.

Based on the calculations using the aforementioned formulas, the weights of each factor were obtained and ranked. The resulting weight ranking of design elements for Wuhan's tourism cultural and creative products is shown in Table 5.

Table 5. Weight ranking of design elements for Wuhan tourism cultural and creative products (self-drawn by the author).

Comprehensive Evaluation Layer	Weight (%)	Rank	Evaluation Project Layer	Weight (%)	Rank	Evaluation Factor Layer	Weight (%)	Rank
B1	28.284	2	C1	65.299	1	D1	8.630	4
						D2	12.582	3
						D3	3.603	5
						D4	48.679	1
						D5	26.507	2
			C2	25.100	2	D6	63.335	1
						D7	26.050	2
						D8	10.616	3
			C3	9.601	3	D9	65.299	1
						D10	9.601	3
						D11	25.100	2
B2	7.377	3	C4	70.706	1	D12	12.187	3
						D13	55.789	1
						D14	26.335	2
						D15	5.689	4
			C5	20.141	2	D16	7.377	3
						D17	28.284	2
						D18	64.339	1
			C6	9.153	3	D19	5.689	4
						D20	12.187	3
						D21	26.335	2
						D22	55.789	1
B3	64.339	1	C7	75.000	1	D23	25.000	2
						D24	75.000	1
			C8	25.000	2	D25	63.335	1
						D26	10.616	3
						D27	26.050	2

The analysis revealed the following:

1)In the comprehensive evaluation layer, the weight ranking of the three main factors was: spiritual culture (B3) > material culture (B1) > behavioral culture (B2).

The weight of spiritual culture (B3) reached 64.339%, accounting for more than half of the total, indicating that consumers place the greatest emphasis on the expression of spiritual culture when selecting tourism cultural and creative products. The weight of material culture (B1) was 28.284%, showing it still held significant importance, though clearly lower than that of spiritual culture. Behavioral culture (B2) had the lowest weight at 7.377%, suggesting it had the weakest appeal to consumers in the context of cultural and creative product design.

2) In the evaluation items layer under material culture (B1), behavioral culture (B2), and spiritual culture (B3), the weight rankings were as follows:

①Under material culture (B1): architectural remains (C1) > historical artifacts (C2) > natural landscapes (C3). The weight of architectural remains (C1) was 65.299%, significantly higher than the other two factors, indicating its strong recognizability and communicative power as a symbol of urban culture, and its high popularity among consumers. Although Wuhan has abundant natural landscapes, their lack of distinct cultural identity led to relatively low consumer interest, with natural landscapes (C3) holding a weight of only 9.601%.

②Under behavioral culture (B2): traditional crafts (C4) > folklore traditions (C5) > entertainment activities (C6). Traditional crafts (C4) accounted for 70.706% of the weight in this category, making it the most representative design element within behavioral culture.

③Under spiritual culture (B3): legends and allusions (C7) > national spirits (C8). The weight of legends and allusions (C7) reached 75.000%, comprising three-fourths of the total weight of spiritual culture, indicating it was the primary mode of expression within this category.

3) The comprehensive weight ranking of cultural factors was as follows:

①Within the architectural remains (C1) category of material culture: ruins and sites (D4) > revolutionary buildings (D5) > ancient architecture(D2) > Yangtze River Bridge (D1) > modern architecture (D3). Ruins and sites (D4) had a weight of 48.679%, significantly higher than the other four factors and accounting for nearly half of the total weight in the architectural heritage category. In contrast, modern architecture (D3) had the lowest weight at 3.603%, due to its relatively weaker regional identity, cultural connotation, and historical information, making it less attractive to consumers.

Within the historical artifacts (C2) category: artifacts (D6) > calligraphy and paintings (D7) > costumes (D8). Artifacts (D6) accounted for over half of the total weight in the cultural relics category, indicating that three-dimensional objects offer a stronger sense of historical authenticity and visual impact, effectively meeting consumer expectations for experiencing Wuhan's historical culture.

Within the natural landscapes (C3) category: graphical landscapes (D9) > waterscapes (D11) > flora and fauna (D10). Wuhan's identity as the "River City" gives it distinctive geographical features, which drew significant consumer attention, resulting in a weight of 65.299% for graphical Landscapes (D9). On the other hand, flora and fauna (D10) lacked distinctiveness and therefore received the lowest weight at 9.601%.

②Within the traditional crafts (C4) category of behavioral culture: traditional fine arts (D13) > traditional production technology (D14) > traditional culinary arts (D12) > traditional medical techniques (D15). Traditional fine arts (D13) held the highest weight at 55.789%, surpassing the other three factors. This is because traditional fine arts combine both cultural meaning and aesthetic value, aligning well with consumers' preferences for cultural and artistic attributes in creative products.

Within the folklore traditions (C5) category: Seasonal customs (D18) > Etiquette customs (D17) > Production and lifestyle customs (D16). Seasonal customs (D18) had a weight of 64.339%, far exceeding the other two. Traditional celebrations such as Spring Festival, Lantern Festival, and Dragon Boat Festival are rich in ritual meaning and widely participated in by the public, creating strong emotional resonance with consumers and making them highly attractive in cultural terms.

Within the Entertainment Activities (C6) category: drama (D22) > folk arts (D21) > Dance (D20) > Sports (D19). As a highly integrated cultural form that combines language, performance, costume, and visual art, drama (D22) serves as a core medium for the transmission and display of regional culture. Therefore, it held the highest weight in this category, accounting for over 55%.

③Within the legends and allusions (C7) category of spiritual culture: revolutionary histories (D24) >legends (D23). Revolutionary histories (D24) held a dominant weight of 75.000%, making it the most prominent factor in this category. This indicates that such events serve as a powerful channel for emotional connection with consumers and possess strong cultural appeal.

Within the national spirits (C8) category: folk beliefs (D25) > revolutionary spirit (D27) > urban personality (D26). Folk beliefs (D25)—representing the traditional values, beliefs, and collective wisdom formed during Wuhan's urban development—had the highest weight at 63.335%, indicating a high level of cultural recognition among users. Although revolutionary spirit (D27) ranked second, it still demonstrated strong emotional and value-based resonance with consumers. Urban personality (D26), being relatively abstract and less concrete in representation, had the lowest weight at 10.616%.

4.5.2 Evaluation and Analysis Conclusions.

Based on the ranking of weights, the following conclusions were drawn:

First, in the comprehensive evaluation layer, spiritual culture (B3) held the highest weight—more than twice that of material culture and eight times that of behavioral culture. This result indicates that consumers are no longer primarily focused on the aesthetic or refined appearance of products. Instead, they are increasingly seeking the spiritual and cultural meaning embedded within the product. Due to its strong emotional appeal and ability to convey values, spiritual culture has become the primary factor influencing the attractiveness of cultural and creative products. Consumers are gradually shifting from a preference for "formal symbols" to a focus on "cultural expression." Therefore, the spiritual content conveyed by Wuhan's tourism cultural and creative products should be a central consideration in design, with efforts made to enhance their role in cultural expression.

Within the material culture (B1) category, the factor with the highest weight was architectural remains (C1). Cultural elements related to architectural remains were the most direct and effective means for consumers to perceive the historical culture of a city. As a nationally recognized historical and cultural city, Wuhan possesses a wealth of physical heritage, including ancient architecture, historical sites, and revolutionary landmarks. Consumers are eager to understand the historical development of Wuhan through these architectural remnants. Among the elements of architectural remains, ruins and sites (D4) received the highest level of consumer attention. These sites carry rich historical information that satisfies consumers' desire for knowledge and exploration. Therefore, designers should consider this type of cultural element as a key visual component, actively collecting and organizing relevant resources, extracting visual elements, and conducting symbolic reconstruction to inform creative product design.

In the behavioral culture category (B2), traditional crafts (C4) had the highest weight. This finding showed that consumers considered traditional crafts the most representative forms of Wuhan's behavioral culture and an important expression of the city's regional identity. It implied that consumers hoped to learn about Wuhan's unique craft system and modes of practice. Within traditional crafts, traditional fine arts (D13) ranked first in consumer preference, indicating that consumers valued not only cultural meaning and substance but also the artistic value and aesthetic qualities embodied in the culture. As a core form of traditional crafts, traditional fine arts offered advantages in artistry, aesthetics, and audience participation, making them a rich source for cultural-and-creative design transformation. Designers should therefore explore ways to integrate traditional fine-arts elements into Wuhan tourism cultural and creative products so that the products display Wuhan's distinctive artistic character. By incorporating digital interaction and experiential installations, designers could also enhance the interactivity and educational value of these products, helping to promote Wuhan's cultural heritage.

In the category of spiritual culture (B3), legends and allusions (C7) held the highest weight. This type of culture reflects Wuhan's spiritual outlook and core values, characterized by strong narrative qualities that stimulate consumers' imagination and creativity. By using storytelling structures, it guides consumers toward a deeper understanding of cultural content, evokes emotional resonance, and enhances both comprehension and memorability. As a result, consumers tend to prefer learning about Wuhan's spiritual culture through legends and allusions. Within this subcategory, the most representative cultural factor identified by consumers was the revolutionary histories (D24). This indicates a strong consumer interest in Wuhan's revolutionary traditions and a desire to experience the city's unique cultural charm. Designers should place emphasis on the cultural translation of these narratives, making cultural and creative products an effective medium for conveying the spirit of revolution and fostering a sense of cultural pride. Through thoughtful design, consumers can be encouraged to connect with the Wuhan spirit of resilience, courage, and determination.

5 Optimized Paths for Integrating Regional Culture into Wuhan Tourism Cultural and Creative Products

Integrating regional culture into cultural and creative products helps designers effectively explore Wuhan's cultural characteristics, enabling consumers to better understand and interpret the city's cultural spirit, enhancing cultural awareness and emotional identification.

5.1 Highlighting Distinctive Spiritual Culture Themes for Differentiation

Based on evaluation results, this study proposed using revolutionary historical events from spiritual culture as the central theme, adopting narrative design methods. Narrative design conveys core cultural ideas effectively and builds emotional bridges between products and consumers, thus fulfilling consumers' spiritual pursuits. For example, in designing narrative board games, revolutionary historical events were selected as the narrative theme. Cultural elements such as historical figures, buildings, and environments associated with these events were extracted for visual design. Subsequently, storylines were structured around the timing, locations, and characters involved, connecting the narratives seamlessly with game content. This immersive approach combines sensory and emotional experiences. Additionally, embedding sensors and NFC chips into tourism cultural products translates user interactions into visual dynamic feedback, creating real-time interactivity and enhancing consumer engagement. Through narrative board games, consumers deeply experience the resilient and unyielding spirit of revolutionary figures, meeting their spiritual and emotional expectations aligned with their demands for Wuhan tourism cultural products.

5.2 Innovating Material Culture Through Digital Technology to Emphasize Modernity

Rapid advancements in digital technology transform material culture from flat, singular representations into vivid, three-dimensional digital presentations, breathing new life into material culture. Digital innovation in cultural and creative product design signifies regional modernity and rapid development. Consumers exhibit great interest in Wuhan's ruins and sites. Designers can use high-precision scanning technology to digitally archive these cultural assets, creating databases from which accurate design elements are extracted. Specialized online apps dedicated to Wuhan's ruins and sites can be developed using software like Figma, Adobe Illustrator, and Mastergo. Employing computer graphics and deep learning, virtual digital humans representing historical figures connected to the ruins serve as virtual guides interacting with users. Augmented reality (AR) technology overlays virtual cultural information onto real-world settings, allowing consumers to scan products with mobile devices and access virtual imagery and hidden cultural meanings. Such digitally-driven creative transformations enable con-

sumers to experience Wuhan's heritage beyond the confines of time and space, enhancing cultural experiences and strengthening consumer attachment to Wuhan tourism cultural products.

5.3 Emphasizing Multi-dimensional Behavioral Culture for Interactive Engagement

Modern consumers prefer experiencing the creative process firsthand rather than merely purchasing finished products. Multi-dimensional interactive designs use various creative methods to provide sensory, behavioral, and cognitive experiences, effectively communicating behavioral culture and naturally captivating consumers with its cultural charm. Traditional fine arts, a highly favored category among traditional crafts, offer multiple interactive approaches through product forms and combinations, stimulating consumer purchase decisions. By viewing consumers as active participants, products can engage them deeply in the essence of traditional arts. For example, elements from Wuhan's traditional arts, such as the silk threads and stitching techniques (pu, ping, zhi, jian, ya) used in Han embroidery, can be simplified into small interactive installations that engage visual, tactile, and cognitive interactions. Throughout this experiential learning, consumers can incorporate personalized designs according to their aesthetic preferences. This approach not only satisfies consumers' curiosity about Wuhan's traditional crafts but also aligns personalized content with their artistic pursuits. This increases the connection between consumers and Wuhan's traditional fine arts, forming lasting cultural memories and embedding Wuhan's traditional arts more deeply into public consciousness.

6 Conclusion

Wuhan's regional culture is effectively disseminated and developed through tourism cultural and creative products. This study utilized the Analytic Hierarchy Process (AHP) to analyze design element weights, providing designers with scientific data references and frameworks. This approach helps designers deeply understand consumer preferences, continuously optimizing design paths for Wuhan tourism cultural products and effectively integrating regional culture. Ensuring these products meet diverse consumer demands supports both the growth of Wuhan's tourism industry and the regional economy. Furthermore, incorporating regional culture into product designs facilitates multi-dimensional cultural development and sustainable dissemination, strengthening consumer identification with regional culture and achieving synchronous economic and cultural advancement.

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