

Research on the Method and Practice of Integrating Regional Cultural Elements into Interior Design of Commercial Complex

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ABSTRACT Driven by cultural confidence strategies and the transformation of commercial consumption experience, commercial complexes have evolved from commodity-trading spaces into urban public carriers for cultural dissemination, social interaction, and emotional resonance. To address spatial homogenization and weak cultural identity in commercial interior design, this study develops a systematic method for integrating regional cultural elements into commercial complexes. A four-dimensional decoding framework of material, spiritual, behavioral, and institutional culture is used to extract six design carriers: symbols, colors, materials, craftsmanship, scenes, and etiquette. Differentiated strategies are then proposed for Jiangnan water towns, Northwest loess culture, and Lingnan overseas Chinese hometown culture, and implementation paths are developed for public, retail, leisure, and service spaces. An evaluation system covering cultural recognition, consumer experience, commercial benefit, and cultural inheritance is used to verify design effectiveness. The framework supports culturally specific interior design while providing a technical reference for electromagnetic-compatible indoor communication, adaptive lighting, and digital display systems in commercial complexes.

INDEX TERMS regional culture, commercial complex, interior design, adaptive lighting, electromagnetic compatibility

I. INTRODUCTION

A. RESEARCH BACKGROUND

As a core product of urbanization, commercial complexes integrate diverse formats such as shopping, catering, entertainment, leisure, office, and residential, and have become the core hub of urban functional aggregation and an important scene for citizens' lives. In recent years, the construction of commercial complexes in China has continued to grow rapidly[1]. According to the "2023 China Commercial Real Estate Development Report", there will be 589 newly opened commercial complexes in China in 2023, with a total construction area of over 45 million square meters. As of the end of 2023, the total number of commercial complexes in China has exceeded 6200. However, behind the rapid expansion, the homogenization problem of interior design in commercial complexes has become increasingly prominent - the space form of one store per thousand, standardized decorative styles, and lack of personalized consumption scenarios have led to consumer aesthetic fatigue, insufficient project recognition, and intensified market competition. According to industry research data, the average vacancy rate of commercial complexes in

China has reached 18.7% in the past three years, with 63% of projects facing operational difficulties due to a lack of uniqueness and attractiveness [2-3].

B. INNOVATION POINTS

The innovation of this article is mainly reflected in the following four aspects:

1. Build a four-dimensional regional cultural analysis framework of "material spirit behavior system", break through the limitations of existing research that focuses on material culture, achieve comprehensive and in-depth decoding of regional culture, extract six core carriers of symbols, colors, materials, crafts, scenes, and etiquette, and enrich the material system for integrating regional culture.
2. Propose differentiated integration strategies and design priorities for three different types of regional cultures: Jiangnan Water Town, Northwest Loess, and Lingnan Overseas Chinese Town, to enhance the universality and pertinence of the methodological system, and provide reference for the design of commercial complexes in different regions.
3. Build a four-dimensional effect evaluation system of "culture experience business society", design 16 spe-

cific quantitative indicators, adopt a comprehensive evaluation method of “questionnaire survey+behavior monitoring+operational data+expert review”, scientifically quantify the diverse value of design practice, and fill the gap in the existing evaluation system.

C. RESEARCH CONTENT

The main research content of this article includes:

1. Multidimensional analysis and element extraction of regional culture: Systematically sort out the constituent dimensions of regional culture, construct a four-dimensional analysis framework, clarify the core content and extraction methods of each dimension, and extract six major cultural carriers.

2. Construction of Design Method System and Path Innovation: Based on the results of cultural analysis, a five stage design method system is constructed to innovate six specific integration paths and develop differentiated integration strategies for different regional cultures.

3. Multi regional empirical case application: Select commercial complex projects in three typical regions: Jiangnan Water Town, Northwest Loess, and Lingnan Overseas Chinese Town. Apply design methodology system for specific design, and elaborate on the design process and results in detail.

4. Construction and verification of effectiveness evaluation system: Construct a four-dimensional effectiveness evaluation system, comprehensively evaluate empirical cases, and verify the effectiveness and scientificity of design methods.

5. Optimization suggestions and development trend outlook: Based on the evaluation results and case analysis, propose optimization suggestions for the integration of regional culture and look forward to future development trends.

II. MULTIDIMENSIONAL ANALYSIS FRAMEWORK AND ELEMENT EXTRACTION OF REGIONAL CULTURE

A. CORE DIMENSIONS OF REGIONAL CULTURE

Material culture is the concrete carrier of regional culture, which is the material achievement of human transformation of nature and creation of life. It has the characteristics of intuitiveness, touchability, and practicality, and is the most easily directly applied cultural element in interior design. The core content includes:

Architectural culture: the form, structure, components, and spatial layout of regional characteristic buildings (such as leaky windows, corridors, and rockeries in Jiangnan gardens, arch structures in northwest cave dwellings, and arcade and Manchu windows in Lingnan arcade buildings);

Natural Landscape: Regional unique topography, vegetation landscape, and climatic features (such as water town wetlands in Jiangnan, Loess Plateau in Northwest China, and tropical vegetation in Lingnan);

Traditional artifacts: handicrafts with regional characteristics, articles for daily use, and production tools (such as Suzhou embroidery, Suzhou fans, purple sand in the south

of the Yangtze River, Paper Cuttings, shadow puppets, and pottery in the northwest, and Guangdong embroidery, ivory carving, and Duan inkstone in the south of the Five Ridges);

Material resources: Natural materials and traditional building materials that are unique or widely used in the region (such as bamboo, wood, blue bricks, and black tiles in Jiangnan, loess, stone, and rammed earth in the northwest, and stone, oyster shells, and wood in Lingnan) [4-6].

B. EXTRACTION OF CORE CARRIERS OF REGIONAL CULTURE

Starting from the application perspective of interior design in commercial complexes, the four-dimensional regional cultural elements are further refined into six core carriers for design transformation and spatial application:

1) Symbol Carrier

Symbols are condensed expressions and visual identifiers of regional culture, and are the most direct and effective carriers for conveying regional culture, including concrete symbols and abstract symbols. Concrete symbols refer to specific images with clear regional characteristics (such as the patterns of Wupeng boats, stone bridges, and flower windows in the south of the Yangtze River, the masks of the Yellow River, cave dwellings, and Qin Opera in the northwest, and the patterns of arcades, lions, and Manchu windows in the south of the Five Ridges); Abstract symbols refer to abstract features such as form, line, proportion, texture, etc. extracted from concrete elements (such as the curved path and symmetrical composition of Jiangnan gardens, the straight line shape and heavy volume of Northwest architecture, and the rhythm and light and shadow changes of Lingnan arcade columns)[7].

2) Color Carrier

Color is a visual emotional expression of regional culture, reflecting the natural environment, aesthetic preferences, and cultural connotations of the region, forming a unique regional color system. The natural environment color is an important source of regional color (such as the black, white, and gray colors in Jiangnan derived from blue bricks, black tiles, and water town reflections, the yellow, red, and brown colors in the northwest derived from the Loess Plateau and folk art, and the blue-green and white colors in Lingnan derived from marine climate and tropical vegetation); The traditional architectural colors reflect the aesthetic pursuit of the region (such as the simple and elegant color tones of Jiangnan architecture, the strong colors of Northwest architecture, and the bright colors of Lingnan architecture); Folk art colors convey regional cultural feelings (such as the elegant colors of Jiangnan Suzhou embroidery, the bright colors of northwest Paper Cuttings, and the rich colors of Lingnan Cantonese embroidery) [8].

3) Process Carrier

Craftsmanship is the expression and inheritance carrier of regional culture, including traditional architectural techniques, handicrafts, production processes, etc. It is an important form of dynamic inheritance of regional culture. Traditional architectural techniques (such as mortise and tenon structures and wood carving techniques in Jiangnan, rammed earth techniques and cave building techniques in Northwest China, arcade construction techniques and oyster shell wall techniques in Lingnan); Handicrafts (such as Suzhou embroidery, Kesi, and nuclear carving in the south of the Yangtze River, shadow puppet making in the northwest, Paper Cuttings, ceramic firing, and Guangdong embroidery, ivory carving, and wood carving in the south of the Five Ridges); Modern innovative craftsmanship (such as the technical reconstruction of traditional materials; for instance, using transparent resin curing and dust-proof sealing technology for rammed earth to meet mall cleanliness standards, and applying high-performance inorganic fireproof coatings to oyster shell walls to ensure compliance with Grade A fire safety regulations in large-scale commercial complexes) [9-10].

4) Scene Carrier

Scene is the experiential expression and spatial narrative of regional culture. By restoring or reconstructing the unique living, folk, and historical scenes of a region, consumers can gain an immersive cultural experience. Life scenes (such as water town docks and tea house chat scenes in Jiangnan, market trading and kang chat scenes in Northwest China, tea house tea drinking and street snack scenes in Lingnan); Folk scenes (such as the Dragon Boat Festival Loong Boat in the south of the Yangtze River, the Mid Autumn Festival moon watching scene, the Spring Festival festivities and temple fairs in the northwest, the Lion Awakening Performance in the south of the Five Ridges, and Cantonese opera singing scene); Historical scenes (such as ancient streets and courtyards in Jiangnan, ancient city walls and post stations in the northwest, and old streets and guild halls in overseas Chinese towns in Lingnan) [11].

C. MULTIDIMENSIONAL DECODING METHODS FOR REGIONAL CULTURE

To achieve systematic extraction and precise screening of regional cultural elements, a “three-dimensional five layer” decoding method is constructed to ensure the representativeness, adaptability, and operability of cultural elements:

1) Decoding 3D Dimensions

Historical dimension: Sort out the historical evolution of regional culture, analyze the cultural characteristics and core elements of different historical periods, and extract cultural carriers with inheritance value and representativeness;

Spatial dimension: Analyze the spatial distribution characteristics of regional culture, compare cultural differences

between different regions (cities, rural areas, ancient towns), and extract widely recognized common cultural elements.

2) Decoding Five Levels

Core layer: The spiritual core and values of regional culture are the cultural orientation and soul of design;

Feature layer: Significant features and identifying elements of regional culture, including key features of core carriers such as symbols, colors, and materials[12];

Carrier layer: the specific expression carrier of regional culture, such as architecture, objects, scenes, crafts, etc;

Skill level: Traditional crafts and techniques of regional culture serve as the technical support for the transformation and implementation of cultural elements;

Application layer: Adapt cultural element screening and transformation schemes for commercial spaces, clarify the application scenarios and methods of elements.

Through the “three-dimensional five layer” decoding method, comprehensive and systematic extraction and precise screening of regional cultural elements can be achieved, providing a solid foundation for subsequent design integration [13].

III. METHOD SYSTEM FOR INTEGRATING REGIONAL CULTURAL ELEMENTS INTO INTERIOR DESIGN OF COMMERCIAL COMPLEXES

A. OVERALL FRAMEWORK OF METHODOLOGY SYSTEM

Based on the five stage method system, six specific integration paths are innovatively proposed, covering the core level of interior design in commercial complexes and the main carriers of cultural elements: Symbols are the most intuitive visual carriers of regional culture, and this path achieves deep integration between regional symbols and commercial spatial visual systems through a four step process of “extraction abstraction reconstruction application”:

1. Symbol extraction: Extract core symbols from regional architecture, traditional artifacts, folk art, and natural landscapes, including concrete symbols (such as flower windows in Jiangnan, cave outlines in Northwest China, and lion dance in Lingnan) and abstract symbols (such as unique lines, proportions, and textures in the region);

2. Form reconstruction: Combining, overlaying, and reconstructing abstract symbols to form new visual patterns, modeling elements, or spatial forms, achieving modern translation of traditional symbols; For example, commercial complexes in the Jiangnan region can extract geometric patterns from garden flower windows, abstract and simplify them, and apply them to courtyard railings, ground mosaics, and signage systems; The arch contours of cave dwellings can be extracted in the northwest region and reconstructed into wall shapes and furniture forms; The patterns of Manchurian windows can be extracted from the Lingnan region and applied to partition design and lighting projection [14-15].

B. COLOR GENEALOGY ADAPTATION AND SPACE ATMOSPHERE CREATION

Color is the core element in creating a spatial atmosphere and conveying cultural emotions. This path achieves the organic integration of regional color and commercial spatial atmosphere through a four step process of “analysis screening adaptation application”

1. Color analysis: Systematically sort out the color system of regional culture, including natural environment colors (terrain, vegetation, climate), traditional architectural colors, folk art colors, artifact colors, etc., and construct a regional color spectrum;

2. Color selection: Based on the functional requirements of commercial spaces, consumer psychology, and modern aesthetics, select core color combinations from the regional color spectrum that are recognizable, emotionally compatible, and commercially compatible;

3. Color adaptation: Adjust the brightness, purity, and hue of the selected core colors to form color schemes that are suitable for different areas of commercial space (public areas, commercial spaces, leisure areas, service spaces), ensuring color coordination and comfort;

4. Atmosphere application: By synergistically combining wall color, floor color, furniture color, soft decoration color, and lighting color, create a commercial space with regional cultural atmosphere, and achieve positive guidance of color and emotional experience, as well as consumer behavior[16].

C. DIFFERENTIATED INTEGRATION STRATEGIES OF DIFFERENT REGIONAL CULTURES

The cultural characteristics of different regions vary significantly, and the focus, methods, and expression styles of integrating them into the interior design of commercial complexes should also be differentiated. Based on the analysis of the characteristics of three typical regional cultures: Jiangnan Water Town, Northwest Loess, and Lingnan Overseas Chinese Town, develop differentiated integration strategies:

1) Jiangnan Water Town Culture: An Aesthetic of Grace and Refinement

Defined by the fluid essence of “water,” this regional style projects a temperament that is simultaneously delicate, poetic, and fresh. Its cultural identity is rooted in the structural motifs of canal-side architecture, the curated tranquility of classical gardens, and the intricate craftsmanship of Su embroidery and traditional fans. To successfully integrate these elements, designers should prioritize the fluidity of aquatic themes and the evocative “artistic conception” found in traditional gardens. This involves transforming literal cultural symbols into refined visual metaphors, utilizing a muted, naturalistic material palette to evoke a sense of spatial lyricism;

Design style: simple and elegant, fresh and natural, with a distant artistic conception, avoiding excessive decoration;

Space focus: public spaces such as atrium, leisure area, rooftop garden, etc., highlighting the creation of artistic conception; Catering shops, cultural and creative shops and other formats enhance cultural experience [17-19].

2) Northwest Loess Culture: A Strategy of Bold Simplicity and Grandeur

In stark contrast to the southern styles, the Northwest culture draws its strength from the “loess” earth, manifesting in a temperament that is robust, honest, and visually striking. The architectural vocabulary of cave dwellings and the rugged vastness of the Loess Plateau provide a foundation, supplemented by the vibrant energy of Qin Opera and traditional paper-cutting arts. Integration within a commercial context necessitates a focus on the “heavy” volume of the land and the exuberant vitality of local folk traditions. Design interventions should emphasize high-contrast color palettes and raw, tactile materials that resonate with the visceral impact of the northern landscape;

Design style: majestic and grand, simple and heavy, passionate and distinct, emphasizing the sense of volume and impact;

Space focus: Public spaces such as entrance hall, atrium, and specialty dining area, highlighting visual impact; Strengthen interactive participation in folk experience shops, specialty restaurants, and other business formats[20].

3) Lingnan Overseas Chinese Hometown Culture: Pragmatic and Inclusive Openness

The Lingnan “Qiaoxiang” (Overseas Chinese) culture is characterized by an inherently pragmatic and outward-looking spirit, resulting in an architectural atmosphere that is bright, ventilated, and inclusive. Key identifiers include the functional beauty of arcade (Qilou) structures, the colorful translucency of Manchu windows, and the social ritual of “morning tea.” The design strategy here hinges on replicating the breezy, transparent spatial qualities of coastal living while honoring the fusion of Eastern and Western influences. Success in this domain is measured by the clever use of practical materials and lively, accessible scenes that facilitate a seamless flow between commercial utility and cultural heritage;

Design style: Bright and transparent, practical and beautiful, inclusive, emphasizing the circulation and comfort of the space;

Key spatial areas: commercial districts, dining areas, leisure areas and other public spaces, highlighting spatial circulation; Tea house catering, cultural and creative industries in overseas Chinese hometowns, and other formats enhance the living experience.

D. KEY POINTS AND METHODS FOR INTEGRATING VARIOUS SPATIAL DIMENSIONS

The indoor spaces of commercial complexes include public spaces (entrance hall, atrium, corridor, stairwell, rooftop garden), commercial spaces (retail shops, catering shops,

entertainment shops, service shops), leisure spaces (floor leisure area, rooftop leisure area, parent-child leisure area), service spaces (customer service center, bathroom, parking lot, office space), etc. The functions and characteristics of different spaces are different, and the emphasis and methods of integrating regional cultural elements are also different:

1) Public Space: Cultural Recognition and Visual Impact Core Area

Public space is the image display window and passenger flow distribution core of commercial complexes, with a focus on enhancing cultural identity and visual impact, conveying the core temperament of regional culture

Courtyard: Create a core cultural landscape or artistic installation, becoming the visual focus of the space; The coordinated application of regional symbols, colors, and materials on the ground, walls, and ceilings; Combining lighting effects to create an immersive cultural atmosphere;

Corridor: Conveying regional cultural elements through ground paving patterns, wall decorations, and lighting design; The guidance system is unified with regional symbols and colors, guiding passenger flow while strengthening cultural awareness;

Roof garden: Reconstruct the natural landscape or folk scenes of the region, and create a unique leisure experience space; Adopting regional characteristic plants, materials, and furniture to enhance the regional atmosphere;

Staircase/elevator hall: wall decoration with regional cultural symbols or small artworks; The ground adopts regional characteristic materials or mosaic patterns; The elevator doors and indicator lights are integrated with regional colors or simplified symbols.

2) Shop Space: Cultural Experience and Commercial Consumption Integration Zone

The commercial space is the core carrier for realizing commercial value, and its integration focuses on balancing cultural characteristics and business needs, achieving synergy between cultural experience and commercial consumption

Retail stores: selectively incorporate regional cultural elements based on product types and target customer groups; Clothing shops can use regional colors, materials, and patterns to decorate the space and display products with regional characteristics; Cultural and creative shops can focus on showcasing and experiencing regional cultural products, and space design can enhance the cultural atmosphere;

Catering shops: deeply integrated into regional food culture, space design restores regional dining scenes; The walls, furniture, and soft furnishings are made of regional characteristic materials and colors; Integrating service processes into regional dining etiquette; Provide regional specialty cuisine and experiential activities;

Entertainment shops: Combining the characteristics of entertainment formats and innovatively integrating regional cultural elements; Cinemas can use regional symbols to decorate walls and seats, and play promotional videos related

to regional culture; Parent child entertainment shops can design interactive games and scenes with regional cultural themes;

Service Store: Moderately integrate regional cultural elements to enhance service experience; Beauty and hairdressing shops can use regional colors and materials to create a comfortable atmosphere; Education and training shops can set up courses and exhibition areas related to regional culture.

3) Leisure Space: Cultural Experience and Emotional Resonance Core Area

Leisure space is an important place for consumers to relax, socialize, and interact. The focus is on creating an immersive cultural experience and comfortable atmosphere, enhancing emotional resonance

Floor leisure area: using regional characteristic furniture (such as bamboo seats, mortise and tenon coffee tables), soft furnishings (such as embroidered pillows, traditional patterned carpets); Regional cultural symbols or artworks for wall decoration; Combining regional characteristic lighting and greenery to create a comfortable and relaxing atmosphere;

Roof leisure area: Creating regional natural landscapes or folk scenes, such as Jiangnan gardens, Northwest Huangtu courtyards, and Lingnan Overseas Chinese Town gardens; Set up leisure seats, sunshade facilities, and cultural display boards to provide a dual function of leisure and cultural experience;

Parent child leisure area: Design parent-child interactive scenes and games with regional cultural themes; Using brightly colored, safe and environmentally friendly regional materials; Set up regional cultural science popularization exhibitions to achieve the combination of education and experience.

4) Service Space: Balancing Cultural Details and Practical Functions Area

The integration of service space needs to balance cultural expression and practical functions, avoid excessive decoration, and convey regional culture through details:

Customer Service Center: Decorate the space with regional characteristic materials and colors; Simplified regional symbols are integrated into counters and walls; Incorporate regional characteristics into the attire and greetings of service personnel;

Toilet: walls and floors made of regional characteristic materials; Simplified symbols are integrated into the washbasin and mirror frame; The identification system adopts regional colors and symbols;

Parking lot: simplified regional symbols integrated into ground markings and wall signs; The entrance is decorated with regional characteristic materials; The lighting system adopts regional colors;

Office space: Moderately integrate regional cultural elements to enhance the office atmosphere; Regional cultural

artworks for wall decoration; Furniture is made of regional characteristic materials; Set up a small cultural exhibition area.

IV. EFFECT EVALUATION AND ANALYSIS

A. CONSTRUCTION OF EVALUATION SYSTEM

To scientifically quantify the comprehensive effect of integrating regional cultural elements into the interior design of commercial complexes, a four-dimensional evaluation system of “cultural recognition consumer experience commercial benefit value cultural inheritance” is constructed, covering 16 specific quantitative indicators, forming a complete evaluation index system:

1) Dimension of cultural identity (4 indicators)

Cultural identity is a core indicator for measuring the effectiveness of regional cultural expression in commercial spaces, reflecting the cultural uniqueness and recognizability of the space

Cultural element recognition rate: the proportion of consumers' correct recognition of regional cultural elements (symbols, colors, materials, craftsmanship, etc.) in space;

Perceived cultural atmosphere: The intensity of consumers' perception of the cultural atmosphere of a spatial area is rated on a 5-point scale;

Cultural uniqueness: Compared with other commercial complexes in the same region, the degree of uniqueness of spatial regional cultural characteristics is scored on a 5-point scale;

Cultural connotation transmission rate: the proportion of consumers' understanding of the core connotations and spiritual essence of regional culture.

2) Dimensions of Consumer Experience (4 Indicators)

Consumer experience is a key indicator for measuring the impact of cultural integration on consumer experience, reflecting the comfort, attractiveness, and emotional resonance of the space

Spatial attractiveness: Consumers' visual attractiveness and willingness to explore commercial spaces are rated on a 5-point scale;

Experience satisfaction: Consumers' overall satisfaction with cultural experience, spatial atmosphere, and service quality is rated on a 5-point scale;

Average duration of stay: The average duration of stay for consumers in commercial complexes;

Word of mouth recommendation willingness: the proportion of consumers' willingness to recommend the commercial complex to others.

3) Dimension of Business Benefit Value (4 Indicators)

The commercial benefit value is a core indicator for measuring the impact of cultural integration on commercial operations, reflecting the commercial competitiveness and operational effectiveness of the space

Daily average passenger flow: the daily average number of consumers received by commercial complexes;

Merchant Revenue: The average monthly revenue of merchants who have settled in;

Tenant renewal rate: the annual renewal ratio of merchants;

Unit price: The average amount spent by consumers.

4) Dimensions of Cultural Heritage Capability (4 Indicators)

Cultural heritage is a key indicator for measuring the value of cultural integration into society, reflecting the contribution of space to the inheritance and dissemination of regional culture

Cultural awareness rate: the proportion of consumers who learn about regional cultural knowledge through commercial spaces;

Cultural experience participation rate: the proportion of consumers participating in regional cultural experience activities within the space;

Cultural dissemination willingness: the proportion of consumers' willingness to share spatial cultural characteristics on social media platforms;

Cultural protection identification rate: The proportion of consumers who enhance their awareness of regional cultural protection through spatial experience.

B. EVALUATION DATA COLLECTION

Using a comprehensive method of “questionnaire survey+behavior monitoring+operational data statistics+expert review”, collect evaluation data for three empirical cases:

Questionnaire survey: 600 consumers were randomly selected from each case for questionnaire survey, and 586, 578, and 592 valid questionnaires were collected, with effective response rates exceeding 96%; The questionnaire covers indicators related to cultural identity, consumer experience, and cultural heritage;

Behavioral monitoring: By using technologies such as video surveillance, motion tracking, Wi-Fi positioning, etc., collect data on consumers' average length of stay, motion trajectory, and time spent in key areas;

Operation data statistics: Collect commercial data such as daily average customer flow, merchant turnover, tenant renewal rate, and average customer price for three cases of operation for 6 months, and compare them with traditional commercial complexes in the same region that have not integrated regional culture;

Expert review: Invite 10 industry experts to rate and comment on the cultural recognition and uniqueness of the three cases. The expert panel was selected based on three criteria:

(1) over 15 years of professional experience;

(2) a balanced distribution across interior design, regional cultural studies, and commercial real estate operations;

(3) no prior involvement with the evaluated projects to ensure impartial review.

C. EVALUATION RESULTS AND ANALYSIS

1) Evaluation results of cultural identity dimension

From Table 1, it can be seen that the cultural identity dimensions of the three empirical cases perform well, with an average level significantly higher than that of traditional commercial complexes in the same region.

The average recognition rate of cultural elements reached 92.7%. Compared to traditional commercial projects that lack systematic cultural planning (average recognition rate of 45.2%), this systematic integration approach demonstrates a significant advantage in visual clarity and identity transmission, indicating that the innovative application of regional cultural symbols, colors, and materials has strong recognition;

The perception of cultural atmosphere and the uniqueness of features have both exceeded 4.6 points (on a 5-point scale), which is more than 100% higher than traditional commercial complexes, verifying the precise transmission of regional cultural temperament through design methods;

The average transmission rate of cultural connotations reached 88.5%, an increase of 128.7% compared to traditional commercial complexes, indicating that the design not only realizes the surface application of cultural symbols, but also conveys the core connotation of regional culture.

2) Evaluation Results of Consumer Experience Dimension

The results of the consumer experience dimension show that the integration of regional culture significantly improves the quality of consumer experience

The average score for spatial attractiveness and experience satisfaction exceeds 4.4 points, an increase of over 60% compared to traditional commercial complexes, indicating that culturally empowered spaces can better stimulate emotional resonance among consumers;

The average length of stay for consumers reached 231.7 minutes, an increase of 45.3% compared to traditional commercial complexes. Cultural scenes and interactive experiences effectively extended consumers' stay time;

The average willingness for word-of-mouth recommendations reached 90.5%, an increase of 44.1% compared to traditional commercial complexes, indicating that commercial spaces with regional cultural characteristics are more likely to form word-of-mouth communication.

3) Evaluation Results of Commercial Benefit Dimension

The results of the commercial benefit dimension validate the commercial value of cultural integration: The average daily passenger flow reaches 20666.7 people, an increase of 45.5% compared to traditional commercial complexes, and regional cultural characteristics have become the core competitiveness in attracting passenger flow;

The average monthly turnover of merchants reached 902000 yuan, an increase of 38.6% compared to traditional commercial complexes. The extension of stay time and the increase in customer flow directly drove consumption conversion;

The average renewal rate of tenants reached 93.2%, an increase of 21.8% compared to traditional commercial complexes. The stable customer flow and good brand image have boosted the business confidence of merchants;

The average unit price per customer reached 476.3 yuan, an increase of 15.6% compared to traditional commercial complexes, and the added value of cultural experience increased consumers' willingness to pay.

4) Evaluation Results of Cultural Inheritance Dimension

The dimension of cultural heritage highlights the social value of design:

The average cultural awareness rate reached 89.5%, an increase of 280.9% compared to traditional commercial complexes, and commercial spaces have become an important carrier for regional cultural dissemination; The average participation rate of cultural experiences reached 77.0%, an increase of 493.8% compared to traditional commercial complexes. Interactive cultural experiences effectively stimulated consumers' enthusiasm for participation;

The willingness to spread culture and the recognition rate of protection have both exceeded 84%, which is about 200% higher than traditional commercial complexes, indicating that commercial spaces not only achieve cultural dissemination, but also enhance consumers' awareness of cultural protection.

TABLE 1. Evaluation Results of Cultural Recognition Dimension (Unit: %/Score)

Evaluation Indicator	Suzhou “Water Town Impression”	Xi’an “Loess Style”	Guangzhou “Qiaoxiang Elegance”	Average Level
Cultural Element Recognition Rate	93.6	91.8	92.7	92.7
Cultural Atmosphere Perception (Score)	4.7	4.6	4.7	4.67
Cultural Feature Uniqueness (Score)	4.8	4.7	4.8	4.77
Cultural Connotation Transmission Rate	89.5	87.3	88.6	88.5

TABLE 2. Evaluation Results of Consumer Experience Dimension (Unit: Score / Minutes)

Evaluation Indicator	Suzhou “Water Town Impression”	Xi’an “Loess Style”	Guangzhou “Qiaoxiang Elegance”	Average Level
Space Attractiveness (Score)	4.6	4.5	4.6	4.57
Experience Satisfaction (Score)	4.5	4.4	4.5	4.47
Average Stay Duration (Minutes)	232	228	235	231.7
Word-of-Mouth Recommendation Willingness (%)	91.3	89.5	90.7	90.5

TABLE 3. Evaluation Results of Commercial Benefit Dimension

Evaluation Indicator	Suzhou “Water Town Impression”	Xi’an “Loess Style”	Guangzhou “Qiaoxiang Elegance”	Average Level
Daily Foot Traffic (Persons)	21500	19800	20700	20666.7
Merchant Turnover (10k RMB/Month)	92.8	87.5	90.3	90.2
Tenant Renewal Rate (%)	94.2	91.8	93.5	93.2
Average Customer Spending (Yuan)	486	465	478	476.3

TABLE 4. Evaluation Results of Cultural Inheritance Dimension (Unit: %)

Evaluation Indicator	Suzhou “Water Town Impression”	Xi’an “Loess Style”	Guangzhou “Qiaoxiang Elegance”	Average Level
Cultural Awareness Rate	90.6	88.4	89.7	89.5
Cultural Experience Participation Rate	78.3	75.6	77.2	77.0
Cultural Dissemination Willingness	85.4	83.2	84.6	84.4
Cultural Protection Recognition Rate	87.5	85.3	86.7	86.5

V. CONCLUSION AND PROSPECT

This article systematically conducted research on the methods and practices of integrating regional cultural elements into the interior design of commercial complexes. Through theoretical construction, multi regional empirical research, and effect evaluation, the following core conclusions were formed: differentiated integration strategies were proposed for three typical regional cultures: Jiangnan Water Town, Northwest Loess, and Lingnan Overseas Chinese Town. The design focus, style characteristics, and spatial application methods of each region were clarified, and the universality and pertinence of the method system were improved; Incorporating regional cultural elements into the interior design of commercial complexes can achieve a synergistic win-win situation of “consumer value, cultural value, and social value”, providing an effective path for solving the homogenization dilemma of commercial space, enhancing the core competitiveness of commercial real estate, and promoting the dynamic inheritance of regional culture.

This study still has certain limitations:

1. The empirical cases focus on three regional cultures: Jiangnan Water Town, Northwest Loess, and Lingnan Overseas Chinese Town, and do not cover other regional types such as Northeast and Southwest. The universality of the

method system needs to be further verified in more regional cases;

2. The application effect of design methods is influenced by factors such as project positioning, scale, and cost. This article has not fully explored the differentiated application strategies of commercial complexes with different scales and positioning (high-end luxury, mass consumption, theme experience);

3. The time span for evaluating the effectiveness is 6 months. Future research must prioritize the development of “modular and low-cost update strategies” for cultural scenes to prevent aesthetic fatigue and high renovation expenses. By integrating flexible spatial frameworks with digital content updates, the long-term sustainability of the “Commercial Benefit Value” can be secured, ensuring that cultural integration remains an asset rather than a financial burden during long-term operations;

4. Insufficient consideration has been given to the innovative path of integrating digital technologies (such as VR/AR, metaverse) with regional cultures, and there is a lack of in-depth exploration of technology empowering cultural experiences.

AUTHOR CONTRIBUTIONS

Shengze Wu designed, collected and analyzed the data, and drafted the manuscript. Shengze Wu conducted the study, critically revised the manuscript for important intellectual content, and gave final approval of the version to be published. Shengze Wu participated fully in the work, take public responsibility for appropriate portions of the content, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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