

## Article

# Application and Research of Hakka Building Codes in Cultural and Creative Product Design

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**Abstract:** In the development of the cultural and creative industry, popular cultural and creative attractions are reviewed for integrating local architecture, history, and culture into products to promote local economy and culture. We conducted a field investigation at the Xiaojia ancient house in Jiadong Township, Pingtung County, and found that there was a cultural cognitive gap between local cultural and creative products and consumers, which was a dilemma in promoting the development of the local cultural and creative industry. Through the design thinking of cultural and creative products, the spirit of Hakka culture can be delivered and expanded into local specialty products. In the design of cultural and creative products, we used the KJ method to analyze, summarize, and extract the most representative architectural features as the source of design elements. At the same time, combined with the principles of design semiotics, deep cultural symbols were integrated into the product design of the pen holder with richer local spiritual meaning. The traditional and modern elements of the Xiao family's ancient house were combined to design a multi-functional cultural and creative pen holder. It brought a unique cultural experience and promoted the local cultural and creative industries and the Hakka culture of Xiaojia Ancient House to develop related culture and tourism. Semiotics and the KJ method in theory and practice were useful in product design and programming to develop local cultural and creative products. In the future, we apply this design method to different cultures and cross-domains to achieve wider research and application.

**Keywords:** Hakka architecture, Hakka culture, Product design, Design semiotics, Creative thinking KJ method

## 1. Introduction

The Xiao Family Ancient House is located in Jiadong Township, Pingtung County, Taiwan as a historic site displaying the characteristics, history, culture, and artistic value of Hakka residences. It is a representative Hakka resident in Taiwan. With an emphasis on the preservation and revitalization of cultural assets, the Xiao Family Ancient Residence began to be restored with the concept of a living museum. Today, it shows the best example of the preservation, revitalization, and reuse of historic sites. In Hakka culture, the kitchen was not only the carrier of Hakka culture but also the spiritual symbol of Hakka people (Lin and Lin, 2015). Therefore, the Xiaojia ancient house provides a glimpse of the connotation of the Hakka people and culture. However, the Xiao family's ancient residence currently lacks representative cultural and creative products. Therefore, we designed a representative or commemorative cultural and creative multifunctional pen holder with the theme of the Xiao family's ancient house, which highlighted the Xiao family's century-old culture and history and inherited the beauty of traditional architectural craftsmanship. Through the design and promotion of the cultural and creative multi-functional pen holder, tourists and the public are expected to more directly experience and feel its cultural meaning and value. Then, attention and awareness of the Xiao Family Ancient House can be increased to promote related tourism and local economic development.

## 2. Literature Review

### 2.1. *Xiao Family, the Richest Man in Jiadong, Pingtung Hakka Architecture*

Since ancient times, Zuodui Liugenzhuang has been a stronghold of cultural prosperity and the leadership center of Zuodui. Many famous families such as Luo, Lin, Yang, and Xiao settled here. The most well-known among them was the “Xiao family” known as the richest man in Jiadong. The origin of this legendary family was the ancestor who came to Taiwan - Xiao Damei (ancestral home in Meixian County, Guangdong, China), who crossed the sea to Taiwan in the 51st year of Qianlong’s reign in the Qing Dynasty (1786). In the early days, there was opened Xiao Xiexing Trading Company with the tribe and took advantage of the location of Jiadong (the only Hakka village in Liudui by the sea) to conduct trade activities with Donggang and Tainan Fucheng, gradually accumulating wealth and purchasing land (Xu, Xu, Zeng, Zeng, and Yang, 2018). It has a great influence on local economy and trade, hardware construction, and historical events. Xiao Wu Geng was designated as a Class III historic site in 1985. In the 92nd year of the Republic of China (2003), a management committee was established and opened to the public for visits. It is now an important local landmark and tourist attraction.

### 2.2. *Geography and Feng Shui*

Xiaowu was built in the 10th year of Xianfeng in the Qing Dynasty (1860) and took three generations to be completed in the 6th year of Guangxu in the Qing Dynasty (1880). It was a double-chambered caged house with five halls and six courtyards. It has the typical cohesive and defensive functions of traditional Hakka architecture. The Xiao family once hired a geographer to find a geomantic treasure land to build a house. The current site was right on the Feng Shui dragon vein. The land was full of outstanding people. There was a large pond in front, and there was also a small stream flowing in front of it on the southeast side, forming an excellent natural defense boundary. The mountain behind (Dawu Mountain) and the water (Half Moon Pond) form a Feng Shui pattern of “Jade Belt Water” (Xu, Xu, Zeng, Zeng, and Yang, 2018). There are two thorny bamboo bushes planted between the Half-Moon Pond and the Qiancheng. Whenever the sun rises, the bamboo shadow is reflected on the ridge of the temple roof in front such as a pen placed on a pen holder. The Half-Moon Pond on the side seems to be the water of an inkstone, supplemented by the Shengting Pavilion (Jingzi Pavilion) on the left front forms the image of the four treasures of the study room. The Xiao family’s bamboo scroll windows and sunny farming and rain-reading decorations on the exterior of the building show the image of traditional Hakka culture, and the first hall gate shows a fusion of Western-style archways. It was built after being damaged by wind disasters in the Japanese and has also become a witness to the evolution of architectural styles of the era (Lin, Xu, Xu, and Zeng, 2022).

### 2.3. *Hakka People’s “Respect for Words and Cherishes Paper”*

In the Qing Dynasty, the Jingzi Pavilion was a symbol of the settlement’s literary style and a sacrificial object. The Xiao family constructed the “Shengting” (Jingzi Pavilion) during the Daoguang period of the Qing Dynasty, demonstrating status as a representative gentry family in Liugenzhuang, embodying the Hakka spirit of pursuing knowledge and fame, and advocating culture and education. The uniqueness of the holy pavilion presents the function of worshipping the ancestors of Cangjie, Emperor Wenchang, and Emperor Wenkuixing and burning calligraphy paper. The typical hexagonal tower-shaped four-story brick building of the Qing Dynasty was the only one among Liudui Guesthouses (Lin, Xu, Xu, and Zheng, 2022) for its gorgeous overall shape, private construction, and documented construction time.

## 3. Materials and Methods

We adopted the KJ method and semiotics in this study. The KJ method is effective in solving creative problems and analyzing product design. In the KJ method, messy concepts are collected in the form of cards and then analyzed for the correlation between the cards. Ideas or relevant relationships of solutions are collected first (Kawada, 1986; Huang, 1993, 1995; Spool, 2004; Xie and Pan, 2011). The basic steps of using the KJ method in this study were as follows.

- (1) Data Collection: First, keywords related to Hakka buildings were presented as an independent card.
- (2) Categorization and Grouping: Cards with similar content were grouped and a descriptive title was added to each group.
- (3) Visual Representation: To use a large poster paper as the background, an area on the paper was allocated to paste the cards and group labels on it. Next, lines were drawn to connect the groups, clearly marking their relationships to each other.
- (4) Narration and Elaboration: After completing the diagram, what was learned in a story, article, or verbal expression was transformed to explain and share the information in more depth (Fig. 1).

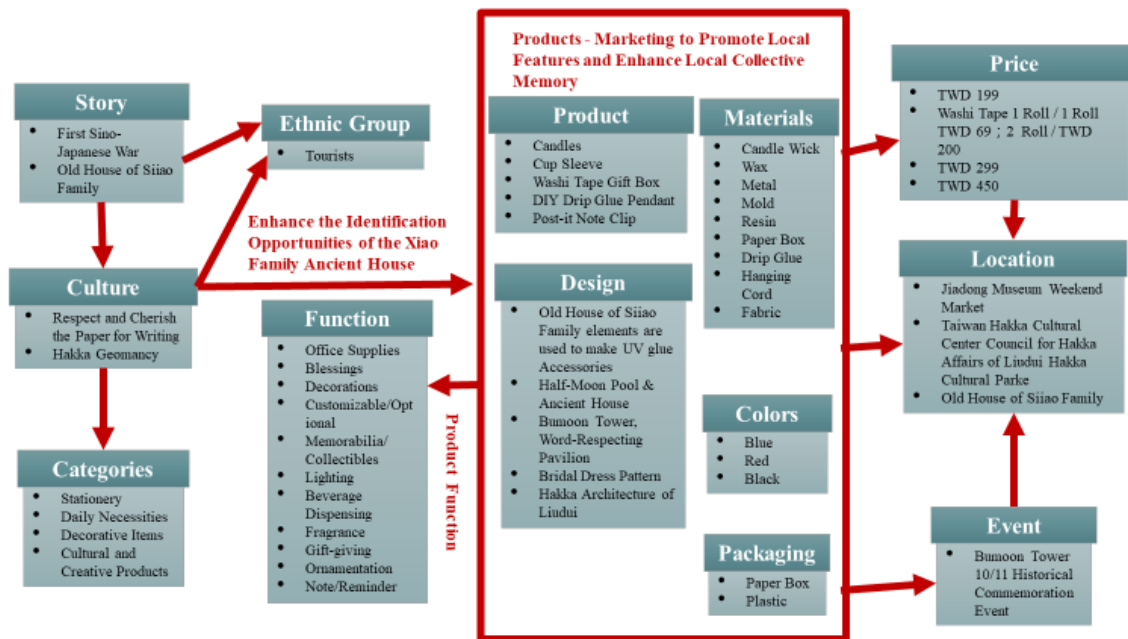


Fig. 1. Summary diagram of application of KJ method in Hakka architecture (data source: compiled by this study).

In this study, for the application of semiotic theory, in addition to taking the results of the KJ method as a reference, the ternary semiotic theory proposed by Charles Sanders Peirce was also used. The theory emphasized that symbols were composed of the following three basic elements. “Representamen” represents the external intuitive presentation of the symbol, “Interpretant” represents the meaning, and “Object” conveys the symbol. Represented the object pointed by the symbol (Wang, 2022). In addition, symbols were also classified into psychological properties, including “firstness”, which represented the direct emotional feeling of the symbol. “Secondness” represents the relationship between symbols and facts. “Thirdness” represents the universality and symbolic nature of symbols (Chen, Xie, Wu, and Yang, 2019).

There were three levels of semiotics, including “Icon”, which refers to the presentation of things with the appearance of symbols. “Index” implies or refers to the object represented by the symbol. “Symbol” required learning to understand the meaning behind it, and usually carries cultural significance (Wang, 2020 ; Wang, 2023a and Wang, 2023b). In this study, we observed the architectural features of the Xiao Family Ancient House, Banyuejike, and Jingzi Pavilion, and used the observed symbolic aspects to analyze and apply them in the following three parts.

- (1) In characterization, we paid attention to the architectural appearance and details, especially the facade of the Xiao family’s ancient house, the shape of the Half-Moon Pond, the stacked architectural appearance of the Jingzi Pavilion, and the eaves of the small temple on the top of the pavilion.
- (2) In interpretation, we understood the Hakka culture and the symbolic meaning of the Xiao family represented by the architectural appearance. For example, the lion carving on the gable wall of the Xiao family’s ancient house represents the Xiao family’s “protection of the homeland” and “expectation of their descendants to be low-key and impartial.” The Jingzi Pavilion symbolized the attitude of “respecting characters and cherishing paper”. Banyuechi is a metaphor for children to enter Pan and become officials in high school. Hakka Feng Shui - “Mountain on the back and water on the side” symbolized having a backing behind, which means indestructibility, and a water source (Half Moon Pond) in front, which means wealth.
- (3) In target, these symbols and cultural meanings are delivered to tourists through design for them to have a deeper understanding and experience of Hakka culture (Fig. 2).



Fig. 2. Application diagram of Hakka architectural semiotics (data source: compiled by this study).

















We applied two theories to summarize the main axis of design, transform architectural features into meaningful cultural symbols and design products to attract tourism and promote cultural education.

#### 4. Results

According to this research method, the product items developed were classified, and the final keywords were proposed as Xiaojia ancient house, Jingzi Pavilion, Half Moon Pond, office supplies, multi-function, calendar, pen holder, and paper material for the main design. In conjunction with semiotics, lion statues, facade Baroque carvings, half-moon shapes (half-moon pools), water ripples, cascading appearance of Jingzi Pavilion, eaves of small temples on the top of the pavilion, and mountain shapes on the back were symbolically used. The overall function was combined with Hakka culture and also echoes the image of paper (Beishan bookshelf), pen (Jingziting pen holder), and inkstone (Half Moon Pond storage platform and the water ripple pattern above), forming the image of the four treasures of the study.

First of all, we set the functions of the pen holder as having drawers, vertical pen holders, storage platforms, bookshelves, and perpetual calendars. For the main image visual design, we used the lion above the main facade of the first hall at the Xiao family building, the Baroque carvings on the main facade, the half-moon pool, the Jingzi Pavilion, and the mountain design elements. Using elements of the Xiao family's ancient residence, two symmetrical lion statues symbolizing the spirit of the Xiao family were used on the platform's appearance. In Hakka architecture, the gorgeous Baroque carvings were a very rare architectural combination on the facade of Xiao's ancient house. Therefore, the appearance was presented as a front design. The elements of the Half-Moon Pond were used in the design of the storage platform, and the three-dimensional carvings with water echoed the symbolic meaning of the Half-Moon Pond in Feng Shui. At the same time, the effect of resistance was given to placing objects, making them stable and difficult to fall. On the right side, the vertical pen holder with the elements of the Jingzi Pavilion was first captured to capture the layered features of the appearance, and then the eaves of the small temple above the Jingzi Pavilion were added. The small temple was mentioned in the literature as enshrining gods related to documents, so it was preserved. It also echoed the Hakka spirit of respecting calligraphy and cherishing paper. The application of detailed design elements is shown in Table 1, and the front view of the finished product is shown in Fig. 3a. In the color plan, warm colors were used - orange on the red bricks in the inner courtyard of the Xiao family's ancient house, brick red on the walls, brick red, sapphire blue, and off-white on the exterior of Jingzi Pavilion, and sapphire blue at the same time. It was also the representative color of Hakka indigo dyeing and echoed the Hakka culture.

**Table 1.** Design element application table (data source: compiled in this study).

Design Elements	Code	Finished Design	Illustrate
	A		Symmetrical lion statue
	B		Baroque carvings on the facade
	C		Baroque small carving on the side
	D		Half Moon Pond
	E		The eaves of the small temple
	F		Eaves corrugated
	G		The pavilion has a layered appearance
Color scheme			
	Main	The orange color produced by sunlight	
	Auxiliary	The red brick color of the building	
	vice	The red brick color of the building	
	vice	The blue color of the Hakka blue shirt culture	
	Auxiliary	The off-white color of the building	

In the back design, the meaning of backing in Feng Shui was used and a more abstract mountain shape was adopted, which was more low-key and did not overwhelm the guest. In addition, a movable perpetual calendar was designed (Fig. 3b), which was a metaphor for the spirit of Hakka cultural heritage that was passed down for thousands of years. The actual storage effect is shown in Fig. 3c,d. The design details were as follows:

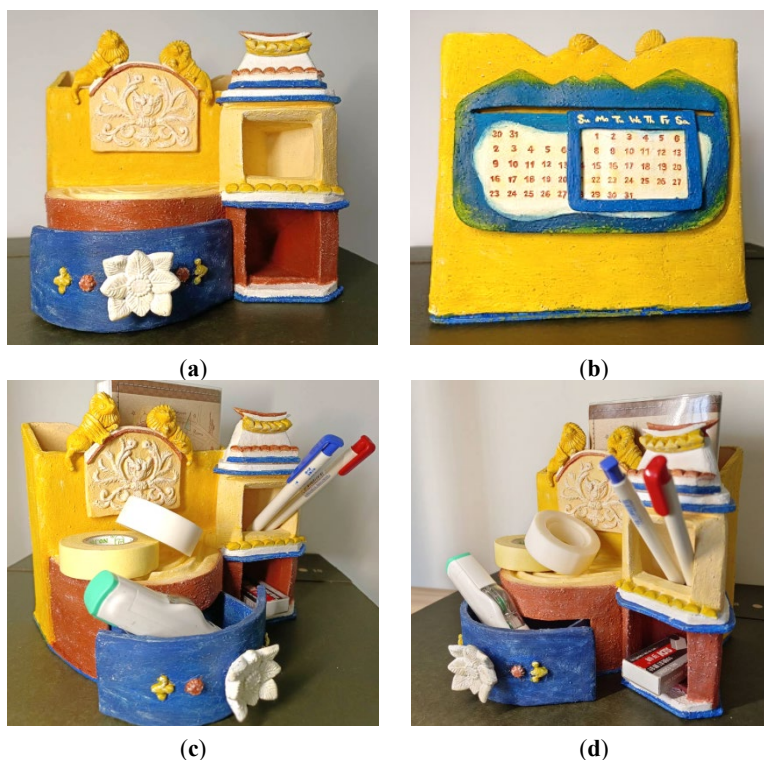
(1) Mezzanine storage space

- Main visual image: the main facade of the first hall.
- The lion on the gable protects the home and expects descendants to be low-key, impartial, and blessing
- Space: The Feng Shui pattern design from low to high means that rises step by step.

(2) Separate pen holders: The Jingzi Pavilion has a special meaning of burning calligraphy paper and conveys the attitude and spirit of “respecting characters and cherishing paper”. In the design part, the tip also looked like a standing pen, which was transformed into a detachable pen holder.

(3) In the drawer space, the elements of the Half-Moon Pond in front of the courtyard are retained. In its culture, there is the image of inkstone water. The depth extends to the rear to store deep and rich ink knowledge. The contents are stored and used by the user. In addition to the implication of accumulating more knowledge, enriching imagination, and creating inspiration, the space is unrestricted with unlimited possibilities.

(4) Perpetual Calendar: Hakka houses are closely related to Feng Shui, so we designed the image of a mountain on the back, so that the entire storage group was a presentation of a “mountain behind the water” and retained it as a metaphor for the children in the family to advance to higher schools. It has the meaning of becoming an official in the imperial examination, drinking water in the winding river, and embodying the spirit of the land and outstanding people. It is also attached with a perpetual calendar, which showed that the well-preserved culture, architecture, and history have a long history and have been passed down for thousands of years.



**Fig. 3.** (a) Front view of the finished product (b) Back view of the finished product (c) Left side view of the actual placement effect (d) Right side view of the actual placement effect (Picture source: Photographed in this study).

We transformed the characteristics of Hakka architecture and Feng Shui elements into inspiration for product design. The theory of semiotics was applied in this process, including the pen holder, perpetual calendar, and storage platform, which not only reflected the architectural features of the Xiao family’s ancient house, Banyue Pond, and Jingzi Pavilion but also carried the essence of Hakka culture. This not only allowed buyers to gain an in-depth understanding of Hakka culture in the goods but also provided tourists with a profound cultural experience and left indelible memories to ensure the accurate communication of cultural value. By designing this cultural and creative product with cultural value, the values, symbols, and spirit of Hakka culture were conveyed to more people.

In addition to the Hakka culture of the Xiao Jiadong family, the Hakka people also have a long history and tradition in Taiwan, with unique elements in architecture, food, clothing, arts and crafts. These rich inspirations and story elements were explored and

combined to become cultural and creative product design inspirations, making the products more attractive and unique. We designed a pen holder and materials to improve its functionality, aesthetics, and durability. More practical functions were added such as multiple mezzanines or night light designs, to meet the needs of different users and provide reference directions for subsequent designs.

## 5. Conclusions

The KJ method with design semiotics and creativity was used in the product design of local specialty products. The result of A local cultural and creative product was designed as a tangible and intangible cultural carrier for promoting local Hakka culture, inspiring more people to become interested in this research and contributing to the tourism development of Hakka culture in Taiwan. Finally, The designed product won the Bronze Medal Award and the Special Jury Award in the design category of the 5th Green Idea International Invention and Design Competition in 2023.

**Author Contributions:** M. Zhong and Q. Zhang collected and analyzed Hakka culture and architectural documents; S. Qiu, planned field trips and creativity; M. Wang, creatively thought about the introduction and application of KJ methods and design semiotics; F. Xu and Y. Li analyzed design elements and studied the results; Y. Lin produces sports cultural creative products. All authors have read and agreed to the published version of the manuscript.

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