The Open and Adaptive Tradition: Applying the Concepts of Open Building and Multi-Purpose Design in Traditional Chinese Vernacular Architecture

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Abstract

The concepts of Open Building and Multi-purpose Design are generally considered as the latest innovative trends in contemporary architecture in addressing the current globalization, rapidly-changing market and requirements of sustainability. However, based on extensive research on examples of surviving ancestral halls in villages, in particular on analysis of their functional programme and configurational desire, this paper attempts to demonstrate that such concepts are already inherent in Chinese traditional vernacular architecture. This hypothesis is in line with the basic essence of Chinese architecture: maximization of modular components and standard plans to suit most functions. This explains why traditional Chinese architecture appears to have been mostly in the hands of master craftsmen without the design by architects. To lead the way forward, this paper further studies the roles of Open Building and Multi-purpose Design in the current age, in particular the possible application of Indefinite Space and Flexible Programme in Adaptive Re-uses of Chinese vernacular architecture in the contemporary context.

Keywords: Open Building; Multi-purpose Design; flexible Programme; Chinese vernacular architecture; Adaptive Re-use

1. Introduction

With the passing of time, few brick and timber structured Chinese traditional vernacular public buildings have survived. Years of field investigation reveal that those that do remain were mostly adapted to uses other than originally intended, and that change ironically facilitated their survival. Building on field investigation and documental research, an analysis of the original functional program and the evolution of uses of these buildings inspires an analogy between the traditional Multi-purpose Concept of Chinese architecture with the contemporary Open Building Concept. This paper explores the theoretical affinity between these two concepts, and further suggests how such understanding facilitates the possible application of such concepts in the Adaptive Re-use designs for these vernacular public buildings.

2. Evolution of Functions of Vernacular Chinese Buildings

2.1 Renewal of Vernacular Chinese Buildings Based on Field Investigation

Field study in China reveals that the walls of most previous ancestral halls (Ci Tang, family temple) now often bear inscriptions such as "XXX Primary School" (Fig.1.). Indeed apart from ancestral halls, most traditional public vernacular buildings like Study Halls (Shu Yuan), Confucian Temples (Wen Miao), Guild Halls (Hui Guan), and even Mansions (Zhuang Yuan) in villages and townships were adapted to teaching rooms or ancillary rooms for museums or schools. The

Fig.1. An Ancestral Hall has even been Used for Primary School which Name is Painted on the Doorhead, Liuyang, Hunan

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buildings shown in Figs.2. and 3. are separately used as a museum and kindergarten. Many memorial relics (also called Red Heritage Buildings in mainland China nowadays), were in fact the premises of revolutionary operations, and were often adapted from various village vernacular architecture. The pie chart in Fig.4. shows the proportion of the original functions of Red Heritage Buildings in Huanggang, Hubei. Public vernacular architecture, which accounts for about 30%, is the original function of these memorial relics nowadays. Furthermore, a small percentage of former dwellings were combined with ancestral halls. From the chart it can be concluded that almost all the Red Heritage Buildings were renewed with different functions. Either this was because years of Japanese invasion and civil wars shattered the clanships, leaving these extensive vacant public buildings and local gentry' houses as ideal premises for the revolutionaries, or villagers simply offered these buildings for use by the revolutionaries to show their support. Such honorary association ironically protected these selected traditional vernacular buildings from destruction in the subsequent years of cultural upheaval.

2.2 Evolution of the Functions of Vernacular Chinese Buildings: Using Ancestral Halls as Archetypes

Consider ancestral halls, which were premises for the worships of ancestors or the ancient virtuous. Movements in the 60s in China branded them as "old customs" destined for destruction or transformation into other public functions. Incinerated with the ancestral tablets was also the knowledge concerning the original function of the place. Field studies reveal that many old ancestral halls are now used for the following functions.

1) Storage
As the clanship factor recedes from public activities, and the tight filial system loses its influence, the ancestral hall, originally considered as the clan's property, now becomes a public asset, and thus can appropriately bear the function of holding public processions (Fig.5.). Even those few ancestral halls that manage to remain so, are now often unavoidably required to function as temporary barns for grain or other agricultural produce.
2) Exhibition

These larger ancestral halls where the spatial layout is favorable for exhibition purposes are often so used (Fig.6.). Indeed those well preserved and with artifacts like exquisite carvings are themselves good exhibits. While the esteemed Chen Clan Ancestral Hall (Fig.7.) is one such perfect example in Guangzhou, many ancestral halls in villages are used as folk museums.

3) Schools

Being adapted into a school is probably the most common phenomena for ancestral halls. One example is the Gan Clan Ancestral Hall in the Zhuxi County of Hubei Province, now adapted into the Gan Clan Primary School (Fig.8.). A comparison of the images of the original and current status reveals that the smaller wing-room are appropriately converted into classrooms while the grander Hall of Worship (Xiang Tang) and Hall of the Bedchamber (Qin Dian) have now become an auditorium and covered playground respectively (see Figs.9., 10. and 11.). Another good case in point is the Liang Jia Manor (Fig.12.) in Luoding County in Guangdong Province, where the ancestral hall portion has also been converted into a school.
4) Living Hall and Dormitory
Associated with schools, some ancestral halls are used as dormitories for students. One example is the Zhu Clan Ancestral Hall in Shangshan Village of Xiushui County in Jiangxi Province, now used as the community hall of the pupils' dormitory of the primary school (Fig.13.).

5) Community or Cultural Activities
Nevertheless, many ancestral halls retain the original function as places of assembly for either village meetings, or rituals such as marriages, funerals, birthdays or other celebrations, where banquets may be held. The Lu Clan Ancestral Hall in Congha County of Guangdong Province is such an example (Fig.14.).

Some ancestral halls are spacious, and thus appropriate facilitates for gatherings and conferences for villagers (Fig.15.). The removal of dividing screens allows the integration of successive rising courtyards and halls into an ideal conference venue (see Fig.16.).

Fig.11. Classroom in the Rear of Gan Clan Ancestral Hall

Fig.12. Part of Liang Jia Manor was Changed into a School

Fig.13. Zhu Clan Ancestral Hall has become the Community Hall of a Primary School Pupils’ Dormitory, Jiangxi

Fig.14. Banquet in Lu Clan Ancestral Hall, Conghua, Guangdong

Fig.15. An Ancestral Hall has become an Entertainment Center for the Elderly, Yangxin, Hubei
2.3 Delineating Functions of the Ancestral Hall and Guild Hall: Based on Documental Research

The primary function of an ancestral hall for the traditional Chinese community is for ancestor worship, and the space aims to fulfill such purposes. It is also the place for the clan to meet, confer, carry out communal rituals, and for leaders to deliberate or even expulsion in the case of offenses, making it also a place of feudal court. Some ancestral halls also provide tuitions for clan members. The layout of an ancestral hall itself demonstrates the functional disposition (Fig.17.).

An ancestral hall may also perform the function of exaltation. Hangings inscribed by esteemed calligraphers usually glorified scholarly achievements or virtuous widows and the flag masts at doors fulfilled a similar function. The number and hierarchy of these exhibit the status of the clan. Indeed the size, quality, delicacy of decoration, and choice of material all contribute towards glorification of the family, while the architecture itself function as an exhibition.

Therefore, while the patent programme of an ancestral hall is worship and assembly, its potential programme include education, habitation for elders, and honouring achievements. This represents either a transformation of function or an expansion of the programme.

Similarly, whereas the patent programme of a guild hall should be for the assembly of clan industrialists and merchants, the potential programme includes hospitality and recreation for tradesmen. Thus a guild hall may be built with guest rooms, conference rooms and opera towers.

As the documents described, the programme of a Guild Hall does not need to specify the activities, but simply to prescribe the general purpose of "promoting clanship bonds and harmony as if back in the home village"; therefore festive gatherings, deity worshiping, and even dining and operas are all natural elaborations of such general purpose. A diversification of activities would not require a change of programme.

3. Comparing Chinese Architecture and Open Buildings

The above analysis of the evolutions of these traditional Chinese public buildings demonstrates that such ongoing transformation and diversification of functions do not diminish the significance of their traditional purpose. Instead, their capabilities to be revitalized are mere manifestations of their potential programmes. Furthermore, inherent flexibility and the standard layout pattern are aligned with the modern concept of Open Buildings.

3.1 Defining the Programme with Multi-faceted Functions

This coincidence of characteristics between traditional Chinese architecture and new modern Open Buildings can be explained by the definition of "programme". In Chinese architecture, forms and typologies are defined not by specific "functions", but by general "purpose" leading to possible combinations of "modes of behavior".

In Chinese architecture, the "software" defines the "hardware", meaning "pattern of living" defines "organization of space". Thus the process of such architectural design begins with establishing the pattern of possible activities, and then, determining the spatial composition to satisfy such activities, by either a multi-purpose or inter-changeable functional spatial planning.

"Architecture is also about a mode of life; it both reflects and shapes the society in which it exists. It reinforces social, cultural and economic conditions in both a positive and/or negative sense." (Bernard Tschumi, 1990)

Multi-purpose planning is best illustrated by a traditional courtyard dwelling where the same disposition of halls and courtyards normally used for habitation can be adapted for maturing and matrimonial occasions (see Fig.18.).

In the case of typical traditional dwellings, apart from spaces for habitation, there are also ancillary...
spaces for poultry, production, and even ancestral worship, which are known as "Integration of Dwelling with Ancestral Hall" for some larger dwellings (Fig. 19.). For example, the Tu Clan Mansion in Yangxin, Hubei combines the dwelling with an ancestral hall and Ritual Opera Platform, representing the "Co-existence of Super-being and Ego" in Chinese beliefs (Fig. 20.). Such traditional philosophy of co-existence forms the basis of the multi-purpose spatial programme, allowing functions to evolve with living. This is in line with the Open Building theory where "the potential for unprecedented combinations of events and programs is there, suggesting new lifestyles within new architectural and urban spaces" (Bernard Tschumi, 1990).

3.2 Flexible Design

Flexible design has been adopted by the Chinese since ancient times. The successive screens along the central axis of a courtyard dwelling can be dismantled to integrate the front hall through the courtyards to the successive halls to suit occasions of large gatherings such as banquets. A good case in point is the above mentioned traditional courtyard dwelling with inherent flexibility.

Even furniture can be adapted. The best example is the Yan Ji (banquet table), initiated in the Song Dynasty, which can be re-assembled at will based on a modular design, into various sizes and shapes to suit the number of guests. Some texts explain that it "has up to 76 combinations" (Fig. 21.). Yan Ji evolved into Die Ji in the Ming Dynasty (Fig. 22.), which "can be assembled to be a triangle, rectangle, pentagon, hexagon or other forms according to the number of people". It is said to be the origin of Combination Furniture and later evolved into the well-known Chinese jigsaw puzzle of Tangram. Kuang Ji (Fig. 23.) is similar to them and was drawn by Zhu Qiqian, the founding member of The Society for Research in Chinese Architecture (The Society For Research In Chinese Architecture, 1983).

Taking the following standard layout pattern into consideration, it can also be seen that it resulted from the multi-faceted functions and need for flexibility to a certain extent.
3.3 Designing following the Standard Layout Pattern

From grand palaces, to general temples or modest quadrangle courtyard dwellings, all traditional Chinese architectural compounds manifest similar established structural systems and spatial dispositions, resulting in similar designs. This design concept is comparable to the axial, formal, and hierarchical aesthetic considerations in Western architecture. This concept facilitates all-purpose design using similar forms for multiple functions (Li, 1982), and demonstrates the alignment between Chinese traditional architectural and Open Building Design.

Conventional design theory cites that the functions and managements established by the programme determine the basis of design. The designer needs to translate the programme into spatial requirements. However, as usage may evolve over time, just in the case of the changing uses of an ancestral hall, such conventional pre-established programme inevitably changes, resulting in multiple patterns of programmes for the same building.

Contemporary architectural theory concerning categorization according to functions, such as living, religious, public and industrial appears not to be applicable in Chinese ancient architecture. As cited by Mr. Li Yunhe, Chinese ancient architecture only differentiates according to size and hierarchy, but not by functions (Li 1982, p77).

This is best illustrated by "Comparable Dispositional Layouts in Chinese Architecture" by Chuta Ito (Fig.24.) where he cited that "no matter in palaces, monasteries, temples, Confucian temples, imperial tombs, government courthouses, or dwellings, most Chinese buildings display similar configurations: the largest main block in the middle, central courtyard at its front, symmetrical ancillary wings on two sides of the courtyard, linked with covered verandahs. This concept is similar to Japanese architecture imitating Chinese Tang Dynasty rules, except that Japanese architecture has evolved whereas Chinese architecture follows such symmetry strictly, probably due to the cultural differences". One can also trace such rules through the ancient "Twenty-four Books of History" where all-purpose formulas on vehicles, costumes, sacrificial vessels, and dwellings set according to rites are similarly applicable to architecture. Although Ito listed eight types of Chinese buildings, they are in fact only the same type since they are derived from the same basic form of the same multi-purpose programme.

In Chinese culture, composing a piece of architecture is analogous to structuring a piece of a traditional novel. Ancient novels were all made up of ten rolls of ten chapters each. Most famous classics were actually no more than clever compositions of short written versions of oral folk tales based on similar backgrounds, illustrating one grand achievement in Chinese literature (Pu Andi, 1996). Chinese architecture is similarly re-composed from small components. All elements ranging from blocks, structures, colour, material, dimension, and proportion, are modularized. Like a classic novel, these episodes are re-composed according to a theme along the central governing spine. Details can be explored in the modular units while the unity is apparent from the axial disposition.

This concept of multi-composition according to hierarchical requirements was achieved by standardization of structure and modularization of
components in Chinese traditional architecture. Once
the programme is established, the building design
becomes a matter for the builder or the operator
(sometimes the same party), without a designer as
such, and even allows room for subsequent adaptations,
which is very much aligned with the idea of Open
Building.

4. Contrasting Chinese Architecture and Open
Building
The aim of the Open Building is to design for
multiple functions or activities, which is demonstrated
by the ability of Chinese architecture to adapt through
"renovation" or re-organization of furniture. Open
Design appears to be inherent in all aspects of Chinese
culture ranging from dwellings to costume, vehicles
and ritual artifacts, which may have derived from the
Doctrine of the Mean (Li, 1982, p.78).

The only major difference is the relinquishment of
ideology in the Open Building Concept as opposed
to Chinese architecture based on strict hierarchy.
For example, women used to be strictly forbidden
from entering ancestral halls, whereas modern Open
Buildings should be designed for all members of
society.

5. Way Forward
Chinese tradition views the principle of adaptability
according to circumstances as a virtue. The strict pre-
fixation of the building form according to a temporary
requirement will render inappropriateness or imply a
necessity to alter, which is a waste of resources. This
can be illustrated in the change of east-west staircase
forms to suit changes in lifestyles (reference to
Fig.18).

Western societies are now entering the age of all-
purpose architectural design. In this era of "mass-
production" and "resource scarcity", architecture
can no longer be specifically designed for the direct
users. Architecture has become a "commodity" made
of standardized shells, allowing the expression of
"content" or "character" of users via their own final
manipulation. No creativity of the initial design can
envisage all potential future living modes, leading to
the inevitable juncture when "Life is right, and the
architecture is wrong" (Le Corbusier, 2007).

"Design" is actually the materialization of
programme. But as circumstances change, as in the
case of Chinese traditional societies, programme
inevitably evolves. This phenomenon known as
unpredictability of the programme has always been
inherent in Chinese architecture.

The voluntary successive adaptations of traditional
Chinese buildings in the modern age, as illustrated
in examples of modern re-uses of ancestral halls
mentioned at the beginning of this paper, should
provide us with useful insights.

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