A Survey of Taiwan Skyscraper Architectural Characteristics

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Abstract
This paper investigates existing architectural projects and outlines the developing trends in architectural design. Currently, the skyscraper design issues in Taiwan tend to follow two completely different architectural trends: the first is architecture as a symbol of the society, technology and economy. This approach has generated some new struggles in such fields as esthetics and cultural representation. The second approach is the skyscraper as a public characteristic, to which citizens could relate to the physical aspects and usage. By studying typical projects in Taiwan, this paper aims to show that: 1. the Taiwanese skyscraper design trend has changed from an emphasis on technology to formalism, and finally to building image symbolism. 2. In Taiwan the role of architectural symbolism is relatively important, as these new skyscrapers aim to project the essential characteristics of Taiwan social culture. 3. Although skyscrapers are traditionally private buildings they share many important characteristics with the public as a quasi-public character.

Keywords: skyscraper; architectural character; building image; open space

Introduction
On July 1st, 2003 the Taipei 101 Financial Center (Fig.1.) held its beam-settlement ceremony, officially replacing Petronas Tower in Kuala Lumpur as the highest building in the world and setting a milestone for Taiwan's skyscrapers1. A practical step towards transforming Taipei into an Asian-Pacific financial hub, Taipei 101 Financial Center is the first B.O.T.2 development project launched by the Taipei City Government. With it, government officials hope to enhance Taiwan's international stature and capture the attention of the public everywhere with the announcement that "the highest building in the world will be built in Taiwan".

As a new Taipei landmark and a symbol of national modernization, Taipei 101 projects an image of economic strength and government achievement. It can be argued that the decision to build Taipei 101 reflects a general notion that skyscrapers are powerful instruments for projecting an image of economic prosperity and competent governance. The fruit of extensive urban planning, heavy economic investment, and countless intangibles, skyscrapers have become symbols of economic and social power. The main point of such buildings, it seems, is to capture the glory...
of being "number one in the world". Nevertheless, because they are highly visible urban landmarks, skyscrapers possess a strong public dimension.

Tracing the development of high-rise buildings in Taiwan, we can see that once architects moved beyond the early limitations of technical and financial considerations, they became increasingly focused on using building height and architectural imagery to create arresting landmarks that shape the urban skyline.

Given the dramatic visual impact of skyscrapers on the cityscape, several aspects of skyscraper design have been incorporated in public design strategies, in spite of skyscrapers being private buildings. Most notably, skyscrapers allow for increased open space, forcing architects to search for public domain as part of the design process.

During recent years, skyscrapers in Taiwan have grown in terms of their aesthetics, as well as their height (Table 1). Given their ambitious scale, it is not surprising that skyscrapers have always become symbols of their respective cities, having a large impact on the urban environment. However, little research has been done on this aspect of Taiwan's architectural history.

In this article we first outline the development and design trends in skyscrapers in Taiwan. We then look at Taipei 101 Financial Center as an example to illustrate that from the most mature engineering technology and interior space organization, skyscraper design development will progress from the structure, building form, spatial organization and international style to architectural imagery that stresses the autonomous cultural representation, and the arrangement and operation of public space. Finally, we describe the public aspects of the skyscraper in both 'building image' and 'open space'. Through a survey of architectural imageries and the skyscraper public realm, we state that the design agenda might aim for a symbolic representation of the public consciousness in Taiwan. The method for this study includes a review of past reports and relevant literature; and field investigations of some typical cases.

A survey of skyscrapers in Taiwan

The skyscraper is a significant index of urban modernization. It allows a relatively small plot of land to generate enormous amounts of floor space, revitalizing a city's image and skyline in the process. It is a very obvious expression of progress in architectural engineering technique, and is one of the main building types of the modern city. A skyscraper uses technology to overcome the limits of space and height; moreover, it satisfies one of the human desires to escape gravity and reach the highest space in the vicinity.

In the early stages of skyscraper design in Taiwan, the main spatial requirements were function and economics. Since the 1980's, as Taiwan has become more urbanized. Vertically constructed building developments have become the most effective way to address the limited space of urban zones. Skyscrapers offer the important advantage of increasing the amount of usable space economically and efficiently.

The first noticeable high-rise building in Taiwan was the Tai-Power Building, built in 1982. It was the first building over 100 meters (114.5 meters). It has a boxy shape with standard windows. During this period, this simple architectural scheme was considered more than adequate given the building's function, available engineering technologies, and the economic constraints. In the late 80's, architects abandoned these boxy masses using technical improvement in favor of more complex geometric forms.

Spurred on by rapid economic development, the number of skyscrapers built in urban zones rapidly increased. From a technical viewpoint, an overall understanding of skyscraper design offers both a record of the evolution of modern architectural technology, and a reference point for future projects on how to use technology to meet the demands of society. During the 1990's, skyscraper design in Taiwan focused on height and sheer engineering skill. In 1993, the Chang-Gu World Trade Center in Kaoshung (221.6 meters) was the first building in Taiwan to boast over 50 floors. Later in 1993, the Shin-Kong Life Tower overtook the Chang-Gu World Trade Center in Kaoshung with a recorded height of 244.1 meters above ground to become the highest building in Taiwan. Building forms have also begun to emerge from under the shadow of the West to incorporate oriental architectural styles.

In Carol Willis' book Form Follows Finance,
she traced the development of skyscraper design in New York and Chicago. She described skyscrapers as artificial environments whose use of space was dictated by merchandising needs. She further stated that within capitalist societies, cities are complex commercial environments where space and buildings are considered commodities and economic conditions are the chief factor in determining the shape of architectural forms and land-use patterns. Economic and financial conditions are the major factors affecting building height and other decisions in its design. During this period, Taiwanese skyscraper design was characterized by the same design mentality as that particular period in the history of the American skyscraper. The features of skyscrapers in Taiwan were dictated by market formulas, financial considerations and municipal regulations. When the quantity of skyscrapers approaches saturation, Willis states, the focus on building height will give way to the use of architectural imagery as a means of creating a design "advantage." Architects will sense that solely pursuing the advantage of building height is not enough. This formal expression will attempt to convey an image of entrepreneurialism, economic success, and national achievement.

The T&C Tower (348 meters), built in 1997, is an excellent example of just such a transformation. This building broke the 300-meter height threshold in Taiwan. A new landmark, the T&C Tower integrated spatial design, architectural imagery, and engineering skills and equipment. In addition to its record-breaking height and display of technology, it was designed as a unique expression of the entrepreneurial spirit. An emphasis on building height and ideological orientation was common among architects attempting to display an entrepreneurial image through architectural style in the late 90's.

If we examine as compared with the development of skyscraper design in the U.S., we see that once the architect is freed from basic technical and economic limitations, he or she will pursue one of two goals: the first is to pursue formalistic aesthetics; the second is to create a design that reflects the overall nature of society, bringing a sense of public consciousness to the design process (Dupré, 1996). The design trend of skyscrapers in Taiwan has apparently moved in the former direction. As Paul Goldberger noted, development of the trend towards aesthetic form in architecture determines the appearance of a skyscraper, which is the main expression of skyscraper design (Goldberger, 1981). However, designers still have trouble freeing themselves from technical limitations and confined formalism.

Surveying the development of skyscrapers in Taiwan, we can also see certain trends in the transformation of building styles (Table 2). From the development research of high-rise buildings in Taiwan over the past 50 years, we divided the trends in skyscraper design into four periods and three inclinations. Following the progress of new construction technology, economic growth, historicalism, and advocating local consciousness, we have concluded that the building style has demonstrated a selective transformation process. Statistically, the expressions of architectural styles and building forms can be recognized as the conservative technology tendency, the expressional formalism tendency, and the historical-vocabulary application tendency (Shih, 1997). This transformation represents the developing background and interactions among various styles and characters (Table 3).

Table 2. The Development of Building Styles in Taiwan.

| Trends | Period | 1945–1965 | 1966–1978 | 1979–1987 | 1988–1997 |
|--------|--------|------------|------------|------------|------------|
| Technology | structural | | | | |
| Formalism | regular | | | | |
| Style | Oriental | | | | |

Table 3. The Trend in Design Issues of Skyscrapers in Taiwan.

The new image of skyscrapers — the Taipei 101 Financial Center
The latest issue in skyscraper design is no longer technology but how to create new images that reflect local culture and identity (Wu, 1997; and Lee, 2005). As the first B.O.T. development project of the Taipei city government, the highest building in the world, Taipei 101 took on substantial technical challenges as well as the challenge of symbolizing oriental culture. The resulting image lies somewhere between local culture and internationalism. The Taipei 101 Financial Center is 508 meters
sections are designed to create a symmetrical rhythm. The exterior walls of each section are embellished with a "Ruyi", a traditional Chinese symbol of fulfillment and contentment; the figure of ancient coins; and cloud-shaped patterns (Fig.4.).

The segmented section represents a progressive idea with the concept of "numbers" meaning repetitive growth and vitality. The exterior of this building, the tinted glass, provides a crystal vision that reflects the city. The height of this building is reached step by step. The building figure looks like petals unfolding, heightening our eagerness to climb to see further. Moreover, in philosophical terms, the building image correlates with the Buddhist belief that eight platforms represent the eight stages required to reach enlightenment. With Taipei 101, the architect attempted to use modern techniques to create a traditional Chinese image incorporating concrete figures and symbolic idiosyncrasies.

The public character of non-public building

Architecture has always reflected the culture from which it springs, and the skyscraper is no exception. It is an expression of economic power in a commercial society. Due to its superior height, the skyscraper forms an obvious landmark in the cityscape. It attracts a certain level of public consciousness first in this visual respect: urban dwellers can hardly ignore the presence of a skyscraper that is visible throughout their city. Many entrepreneurs take advantage of this fact, attracting public attention through facades, advertisements, and architectural imagery. Currently the main concern of skyscraper design in Taiwan is the formalistic expression of architectural imagery. However, simply embellishing a construction with wrapping paper that suits the architect or some investors only degrades the artistic value and professional status of architecture. Secondly, current policies and laws encourage the use of this particular "tool" as a way of displaying power and projecting a commercial and symbolic message. Although fairness based policies liberate height restrictions in return for the addition of open spaces, architects take advantage
of these policies to create more floor area by adding height. We may say that the structure can be built taller so that it can be more appealing and utilized as the driving force in the architect’s or investors’ vision.

Since these policies have provided the public with a substantial opportunity to share in the resulting open spaces, we should reflect on current design agendas from the visual level of architectural imagery shifting to the spatial level of the openness to the public. The characteristic of open space around skyscrapers not only passively helps to reduce the building’s negative impact on the environment and reach its functional goals through the interaction of a sense of territory and recognition. Space also provides room for urban activities that increase the quality of urban life with the principle of mutual benefit in mind. This aspect has focused attention on basic design issues such as how to connect the street, sidewalk, open space and building on the ground level, attempting to introduce activity and function to enhance the relationship between a city’s inhabitants and its architecture (Chen, 2003). By tracing certain significant skyscraper projects in Taiwan, we selected seven cases in the section ‘a survey of skyscrapers in Taiwan’. Each case represents a Taiwanese high-rise building in a different historical period. The trend with regards to openness to the public from the open-space layout principle on the ground level is discussed (Tables 4. and 5.).

Table 4. The Connection Type of the Open-Space

| Connected | Case 1 | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 | Case 7 |
|-----------|--------|--------|--------|--------|--------|--------|--------|
| Public    | •      | •      | •      | •      | •      | •      | •      |
| Isolated  | •      |        |        |        | •      | •      | •      |
| Attached  |        | •      | •      | •      | •      | •      | •      |
| Enclosed  |        |        | •      |        |        |        |        |

Table 5. The Open Space of Skyscrapers in Taiwan

| Case 1 | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 | Case 7 |
|--------|--------|--------|--------|--------|--------|--------|
| Date   | 1981   | 1982   | 1992   | 1993   | 1995   | 1998   | 2003   |
| Building Name | First Bank headquarters | Taipower Building | Chang-Gu World Trade Center | Shin Kong Life Tower | Fubon Banking Center | T&C Tower | Taipei 101 Financial Center |
| Height | 87.7 M | 114.5 M | 221.6 M | 238.1 M | 124.6 M | 348 M | 508 M |
Case 1, as the First Commercial Bank Headquarters Building, built in 1981, left the majority of the open space on the backside of the building where it shared space with a parking lot. It thus restricted the opportunity for public sharing and violated the spirit of the open-space law, which demands that builders leave a larger ratio of open space on the ground level in exchange for allowing them to increase their vertical height. These laws require certain height to space ratios. We saw the application of these ratios in later cases, such as the Tai-Power Building (case 2) and the Chang-Gu World Trade Center (case 3). However, the distribution and usage of the open space in both cases was poor and failed to meet the legal requirements.

However, with the Shin-Kong Life Tower (case 4), built in 1993, architects and investors gradually awakened to the public requirements of open-space. The architect designed a passive shrink-back around the building site and left over 1,800 square feet of open space in the form of a square on the front side of the building. The architect also connected the open space with an entrance to a sub-market on the northeastern corner of the square. Lastly, the backside of the building left space to accommodate the outlet of an underground parking lot to reduce the traffic impact on road lanes behind the building.

The Fubon Banking Center (case 5), constructed in 1995, also made progress in open space design, although it is just 124.6 meters in height. Besides fully conforming to legal and policy requirements, the architect considered the relationship with the nearby boulevard, arranging plantings on the northern part of the building in such a way as to allow the backside residential area beside it to enjoy more green cover. On the front side of the building, the architect cooperated with lighting utilities to create wider sidewalks. Nevertheless, the courtyard garden on the southeastern side of the building has a relatively weak connection to the structure as a whole.

In comparison, the T&C Tower (case 6) did not provide much public accessibility to its open space. The preserved open space on the east side of the building, which is the only side that is not facing any main street, is used as a parking space. With the long and narrow landscape on the west side, this building added nothing to the openness of city space.

The fundamental of open space in Taipei 101 (case 7) is comparatively simple. The building is located in the centre of the site in order to surround it with open space and maintain the completeness of its podium. The architect attempted to bring the idea of a plaza into the commercial zone and create an interior "social plaza and urban street". The podium portion utilized a modern space imbued with city activity, with the prospect of becoming a specific space for citizens to share a collective memory of the city (Lee, 2005). However, it is not an open-to-public space. The architect also applied a high-rise sidewalk using an overpass to connect the outward space and commercial buildings nearby. Multiple layered pedestrian spaces were built vertically to incorporate a circulation system in the central business district (Fig.5.).

Skyscrapers require tremendous labor, accommodate enormous crowds, dominate urban landscapes and reflect the society in which they are built. As such, they actually possess a quasi-public character that often goes overlooked. The public aspect of skyscraper design means that architects bear a social responsibility to design effective open spaces and well-considered structures.

Conclusion

Having surveyed the architectural imagery and openness to the public in Taiwanese skyscrapers, several conclusions can be drawn. First, design trends have shifted over the years, emphasizing technology, then formalism, and a new focus on architectural imagery. With its dominating height, the skyscraper can serve as an advertising or promotional device. Eye-catching architectural imagery further helps the skyscraper to attract public attention, making them 'quasi-public buildings' that loom large in the public consciousness.

In the general North American phenomenon, a skyscraper reflects economic power guided by commercial society. In Asia, architects attempt to develop a reverse symbolic language to convey a certain local cultural understanding. As the development of skyscraper design shifts to the East, architects face new challenges in terms of technology and also in terms of design. To become a landmark and effectively display the economic power of corporations or government, the focus of architectural design must shift from building height to the symbolism of architectural imagery.

Since skyscrapers have provided substantial opportunities for the public to enjoy open space areas, the public character of skyscrapers is also an important issue in the current design agenda. Regardless of the architectural imagery, architects can help create skyscrapers that reflect the essential character of a society by incorporating a public consciousness into the design process. Although private skyscrapers are not traditionally considered public buildings, they have a quasi-public character that continues to challenge architects to innovate in the fields of aesthetics and cultural representation.
Appendix — photographs of cases 1 to 6

Fig.6. The First Bank Headquarters
Fig.7. The Tai-Power Building
Fig.8. The Chang-Gu World Trade Center
Fig.9. The Shin-Kong Life Tower
Fig.10. The Fubon Banking Center
Fig.11. The T&C Tower

Notes
1. The term 'skyscraper' here is a compendium of every high-rise building which is speaking without specific reference to building height or meanings.
2. The Build-Operate-Transfer (B.O.T.) process to accomplish the expensive and enormously challenging task—allowing private developers to design, finance, construct, and operate revenue-producing public projects, and then turn them over to the community at the end of an agreed payback period (see, for example, Levy, 1996, Build, Operate, Transfer: Paving the Way for Tomorrow's Infrastructure).
3. See, for example, Carol Willis, Form Follows Finance, pp. 67-72.
4. By surveying Chi-chin Lin's thesis on the development of building styles in Taiwan, we can see certain trends in the transformation of building styles from 1945 to 1997 (see Lin, 1998, pp. 120-123).
5. Table 2 is recharted by the authors.
6. Table 3 shows that the flow of design concepts in Taiwan is recharted by the authors in according with one of the authors' previous research findings in The Skyscraper's Image in Taiwan, Taipei: National Science Council of the Republic of China in 1997.
7. As Martin Pawley dubbed "the Asian decade" in the early 1990s and the tremendous rate of growth of the "Tiger" economies of Hong Kong, Singapore, South Korea and Taiwan, etc. in the early 1990s, Martin Pawley dubbed the tremendous rate of growth of the "Tiger" economies of Hong Kong, Singapore, South Korea and Taiwan, etc. as the "Asian Decade". Pawley stated that the politicians, financiers and developers in these countries seized upon the symbolic and psychological significance of possession of the world's tallest buildings, just as their North American predecessors had done a century before them (see Pawley, 1998: 74-77). However, we have argued the statement from a different viewpoint in this paper.

References
1) Paul Goldberger (1989) The Skyscraper, New York: Alfred A. Knopf.
2) Piera Scuri (1990) Late-Twentieth-Century Skyscrapers, New York: Van Nostrand Reinhold.
3) Ada Louise Huxtable (1992) The Tall Building Artistically Reconsidered: the search for a skyscraper style, New York: Pantheon Books.
4) Carol Willis (1995) Form Follows Finance, New York: Princeton Architecture Press.
5) Judith Dupin (1996) Skyscrapers—a history of the world's most famous and important skyscrapers, New York: Black Dog & Leventhal Publishers, Inc.
6) Sidney Levy (1996) Build, Operate, Transfer: Paving the Way for Tomorrow's Infrastructure, New York: John Wiley & Sons.
7) Chih-Ming Shih (1997) The Skyscraper's Image in Taiwan, Taipei: National Science Council of the Republic of China.
8) Guang-Tin Wu (1997) 'Presence of Tradition—Interview with C. Y. Lee', in Dialogue, 1:58-67.
9) Martin Pawley (1998) Terminal Architecture, London: Reaktion Books, pp. 71-92.
10) Chi-Chin Lin (1998) The Development of Office Buildings' Style in Taiwan during 1945-1997, Taipei: National Taiwan University of Science & Technology.
11) Shu-Mei Chen (1999) 'Creating City Style—Tall Stories an Interview with Skyscraper Architect C. Y. Lee', in Sinorama, Vol. 24, 8:34-43.
12) Eric Höeler (2003) Skyscraper: Vertical Now, New York: Universe Publishing.
13) Lin-Wei Chen (2003) ‘The Public Consciousness of High-rise Buildings in Taiwan’, in Taiwan Architect, 347:86-89.
14) Chu-Yuan Lee (2003) Taipei 101 Financial Center [online], available from http://www.ftc101.com.tw/taipei/taipei101.htm [accessed 25 October 2003].
15) Chu-Yuan Lee (2004) ‘Taipei 101’, in Dialogue, 82:26-37.
16) Chu-Yuan Lee (2005) ‘An Alternative Orientalism’, in Taiwan Architect, 361:56-59.