RESEARCH ARTICLE

Building and human: how does the architecture in city development influence people: the case study of The Shard

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Abstract: What are the effects of skyscrapers on people? This paper provides clarity on the direction of the research on the subject. The research explores the macro and detailed effects of three types of skyscrapers on people. In addition, learning new thinking from the literature and argued. The three skyscrapers are explained in terms of their exterior, interior and surrounding areas to explain their psychological and physiological effects on people. In the second half of the article, some information collected using the questionnaire and the interviews. That information is for complete the study.

Keywords: Building; Human; Skyscrapers

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1 Introduction

1.1 Background

After year 2000, the world became accelerated development by technological generation innovation. Similarly, this development is not just about science and technology, it's also spread across other fields, such as modern architecture. The term 'modern architecture' is ambiguous. It can be understood to refer to all buildings of the modern period regardless of their ideological basis, or it can be understood more specifically as an architecture conscious of its own modernity and striving for change [1]. The main title of this project studies is mainly focusing on the relationship discussion between building and human being. The human being in this title means citizens, residents and people who live in the building. Obviously, the building here means modern architecture. However, according to the text above, 'modern architecture' is ambiguous, which means the title has not clarified the categories of which type of building itself. Here, the clarification of the word 'building' category will accord the case study, which is similar building style with The Shard (Fig. 1). The Shard (London Bridge Tower) is London's tallest building (2016), a tapering glass spire that reflects the city's changing skyscape. The Shard is a narrow pyramid, 309.6m high, with sides sloping at six degrees. Its tapered shape works hand-in-hand with the concept of a multifunctional vertical community. The building style similar with The Shard is the glass curtain wall skyscraper. So, this project studies will discuss the human influence of glass curtain wall skyscrapers.

Figure 1 The Shard

Following the modern architecture movement, many countries grew into a globalisation era, which means most countries were trying to develop the city. Starting from the capital and then span to the rest of the land [2]. The point is, people will get an impact since city developments in both developed and developing country. The second title of this article is: 'how does the architecture in city development influence people'. The phrase 'city development' does not only point to a particular city which developing or developed, even undeveloped. This phrase is meant to express a development process in multiple cities even though the time and method may vary.

American architects Fazlur Rahman Khan said that there are no practical difficulties in building the 190-storey building today. Whether to build skyscrapers or deal with them in the city is not an engineering problem, but a social problem. Therefore, this study will not only put the research direction on the surface impact, but also more explore the impact of skyscrapers on people's social and psychological aspects.

This study will first introduce the background of what the author will learn and discuss. Then explain the aims and objectives of what the author will achieve. The main body of this project will research the skyscraper in three different cities, which are The Shard in London, Burj Khalifa Tower in Dubai and Taipei Financial Centre (Taipei 101) in Taipei. Furthermore, the author's finding will explore more regarding the certain aspects impact, such as innovation of architecture technology and environmental to people. On the second part of main body will be the expert interview findings and questionnaire design and survey. Author has found two experts which in different age, gender and perspective to understanding more about the skyscraper. Finally, the author will draw a conclusion to talk though the overall study.

1.2 Aim and Objectives

The study aims to understand the definition of city developments and the relationship between buildings and people. First, study the precedent regarding the building in the city development to find what issues may influence people. Second, this study aims to understand the different advantages and disadvantages of architecture on people after comparing different timelines' building in urban development. Finally, by sorting out the primary and secondary research, these studies will give whether people can still accept the impact of more urban development buildings.

The objectives need to analysis and compare the influence of different times through buildings' history in city developments to people through historical sources reading. Also, the research needs to identify and explore case studies of contemporary developments, including The Shard, Burj Khalifa Tower and Taipei 101. Then, investigate and discuss with experts and professionals regarding the social impact of buildings in city developments. Finally, to evaluate findings from primary and secondary research to make recommendations and draw conclusions.

1.3 Research Methodology

In this chapter, the author will bring out the problems during the investigation of the study and explain how to solve those problems using different methods and techniques. The problems of this investigation were the particular uncertain building chosen, and because of the issue of the pandemic, the author could not visit the study case personally.

At the very first beginning, the author was trapped in the choice of architectural types. At the beginning of the study, the author did not think about the word 'architecture' in the title, resulting in an excessive range of topics. However, according to the case study, the author has decided to study similar buildings to The Shard to identify the general direction of the study of the subject.

There is a question that why the Burj Khalifa Tower and Taipei 101? First of all, those three buildings are in the same era and same period. Taipei 101 was constructing a year before 2000, which is 1999. Burj Khalifa Tower was starting built in the year 2004. Then, The Shard was built in 2008. Comparing the three buildings reveals a maximum of nine

years between their construction and an average of four to five years between them. The second reason is that all three buildings were the tallest in their cities at the time when they were built. One of them, the Burj Khalifa Tower, is also currently the tallest building in the world. It is, therefore, more appropriate to study and compare the three buildings at this level.

2 Main Body of Studies

2.1 History of The Shard Influence on People

How does The Shard effect people? Maybe discuss in different way: how does skyscraper effect you? This question can be answered in many different kinds of ways, but the most prominent and conspicuous of which is: the height. The Shard height 309.6 metres, which is also the tallest building in the UK and the second tallest in Europe. It is difficult not to have an impact on people at such a height [3]. As London's tallest building, The Shard has almost become the most visible building that people raise theirs head from certain sections, Figure 1 clearly shows the contrast between The Shard and the rest of the city buildings. In the pictures, we can find out that The Shard is very visible compared to the other buildings, and if the public is on the top floor of The Shard, they can overlook almost the whole city. For the vast majority of people living in London, the impact of The Shard is only visual rather than physical, as it is not frequented by members of the public if they are not travelling to and from work.

Some people consider the height of The Shard to be abrupt for the society of the time and carry doubts about the location of the building, but in fact, these have to do with its history.

Southwark Towers (Fig. 2) is the building before The Shard, it also the history of The Shard. In July 1998, the British government issued a Parliamentary white paper, A New Deal for Transport: Better for Everyone, setting out policies for an integrated transport system. One of them was to encourage tall buildings at major transport hubs, such as railway stations. In November 1998, property developer and entrepreneur Irvine Sellar acquired the previous building. Southwark Towers was a three-winged, 100m high concrete frame office building south-west of London Bridge Station, on the south bank of the River Thames. The station is one of the city's busiest hubs, with about 54 million passengers annually. It operates national rail, London Underground and bus services, and a cycle park [4].

One of the Parliamentary white paper questions is: why should the government encourage the construction of high-rise buildings in major transport hubs such as railway stations? What impact will this proposal have on the public? The answers to these questions can find in the Parliamentary white paper, A New Deal for Transport: Better for Everyone (Fig. 3).

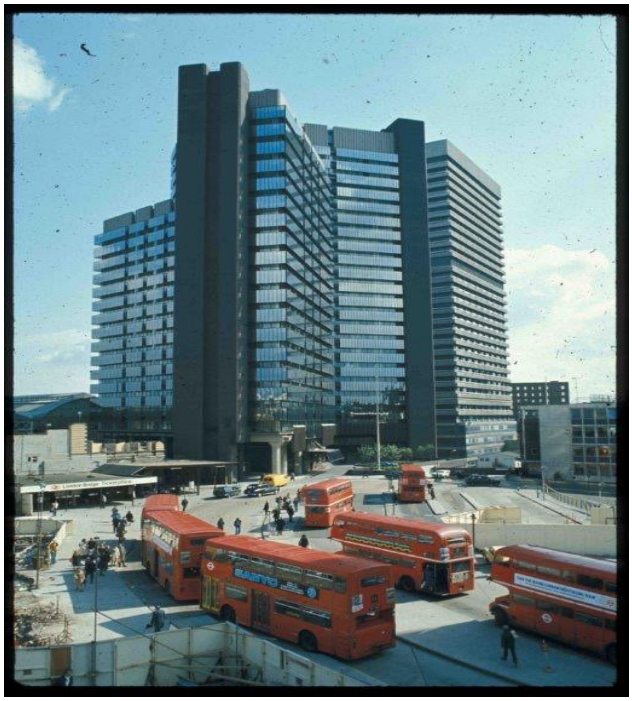
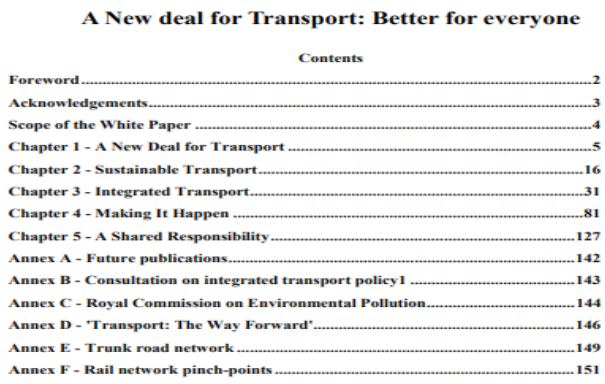


Figure 2 Southwark Towers



A New deal for Transport: Better for everyone

Contents

Figure 3 A New Deal for Transport: Better for Everyone

In the Parliamentary white paper, it can see that the majority of the government's proposals were on the subject of environmental protection. This is why the consideration of high-rise buildings in transport hubs is encouraged by adopting environmental protection strategies.

Firstly, one of the reasons for encouraging tall buildings at transport hubs: is to create more open space by building taller buildings, which can increase productive uses [5]. This proposal has contributed significantly to the growth of the urban population concentration. There has been a tendency for population build-up and growth to occur in many large cities in the past. This is because many people feel that there are many opportunities for work and money in big cities. Nevertheless, there are several reasons to cause this thinking, the most crucial of which is external indoctrination and visualisation.

External indoctrination means getting information that it is good to work in big cities through people and networks. For example, many people will hear stories from family members or friends about working in the big city when people gather for special holidays. Prolonged and repeated indoctrination of information can cause the information to persist in the brain and create obsessional thinking [6].

The second reason for visualisation relates to high-rise glass buildings. It is well known that the number of high-rise buildings in capital cities and first-tier cities is higher than in other second-and third-tier cities. As the number of high-rise buildings forms architectural complexes in large cities, this creates a disparity in appearance and economy with second and third-tier cities. The most significant impact for people living in second and third-tier cities is the appearance of the city. This is because the city's appearance is the most direct and visible way to make people perceive the difference in development between cities. So, the significance of constructing tall buildings for influence to people is therefore not singular, but diverse.

Secondly, the other of the reasons for encouraging tall buildings at transport hubs: is to make the working environment less crowded. This proposal has a direct impact on people. This is because smaller spaces can be inconvenient, both in the workplace and in the living environment, and can even impact the mental aspect of a person.

For example, smaller spaces may be perfect for young people in their twenties. However, it is unhealthy for middle-aged people in their thirties to forties. Because they face different stress factors, smaller spaces can cause this group of people to become more stressed. Also, for living environments, small spaces can give the impression of being trapped in a claustrophobic environment. In medical terms, there is a condition called claustrophobia. For these people, small spaces can become a nightmare. On the other hand, according to studies, crowded spaces increase domestic violence and substance abuse incidence [7].

Small spaces do impact not only the health of adults but also that of children. Children who live in small environments for long periods have difficulties in learning and concentrating. This can eventually cause the child to become withdrawn.

Therefore, expanding the workspace will have both physical and psychological benefits for employees. People will achieve a higher degree of freedom and happiness in large spaces.

From both of these perspectives above, the impact of tall buildings on people can attribute to the expanded space theory. In the Parliamentary white paper, both proposals imply that constructing taller buildings gives people more space. The difference is that one expands the space outside the building, and the other expands the space inside.

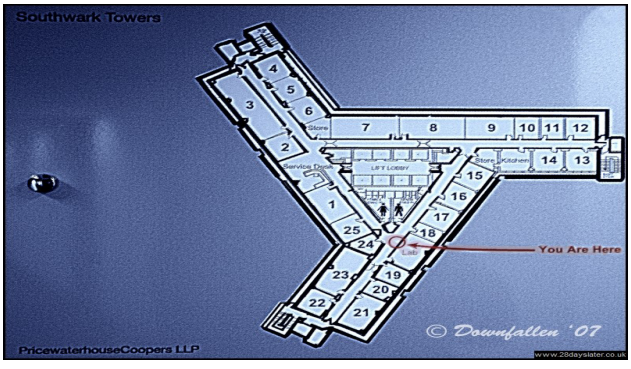


Figure 4 Plan of Southwark Towers

In Figure 4, Southwark Towers has achieved those two proposals from the constructed way and room layout. However, it still could not escape demolition. This is because 33 years have elapsed since it was built and then demolished. “Despite a modern-looking and lavish reception area, the building and its decorations became dated. Lifts in the building were slow and struggled to cope with traffic during peak hours” [8]. But it also gives The Shard and London Bridge Station a chance to meet the challenges of a fast-moving society.

2.2 The Shard Influence on People

Continuing from the previous chapter, a discussion of The Shard's impact on people still requires the perspective of architectural height. From the arguments in the first paragraph of the previous chapter, it is clear that the height of The Shard has a huge impact on people, such as the view (Fig. 5).

Figure 5 The view from The Shard

It was almost impossible for people to look down on the whole city in the old days, as in figure 5. There are also limited ways in which one can achieve an overlook of the city. For example, one might use a plane or a hot air balloon to view the whole city, but now they can go right up to the top of a building and do that. This change has helped people on a psychological level. When people start seeing new locations, they will feel more revitalized and more excited. The tedium of life starts to get easier as people visit more and more places every so often [9].

For example, the London Eye is a famous tourist attraction in the UK, and it carries around 10,000 visitors daily in its 32 capsules. It is officially the most popular paid-for visitor attraction in the United Kingdom and sees 3.5 million people rotate on its axis a year [10]. The reason causes these numbers is because that the height of the London Eye on its ascent is a great novelty to people. The Shard and the London Eye have something in common in some specific points, such as the ticket price to the viewpoint and the opening style. So, The Shard can attract many visitors and boost tourism. However, one most significant difference is that The Shard has regular people flow, such as the people who work in The Shard during the day and those who live there at night. This makes the Shard Building different from the usual tourist attractions facilities because it incorporates functionality into it. In fact, this also confirms from the side that humans are very much in search of height. From the ancient legends of the Tower of Babel to the more recent hot air balloons and aeroplanes, and now aerial photography, all testify to man's tendency to develop cities vertically.

However, the height of buildings not only has an impact on people but also has a huge impact on the appearance of the city and its social system. This brings us to the fixed population of The Shard mentioned in the previous paragraph. “With luxury apartments, upmarket boutiques and restaurants, premium offices and a five-star hotel, The Shard has attracted people and companies to the surrounding area, helping to establish Southwark as a core business district and leading to the £1 billion redevelopments of London Bridge station” [11]. The exceptional appearance of The Shard and the luxury of its interior spaces decided its fate as an economic driver from the moment it was built.

The Shard has a specific working system, and the whole building meets almost all the people's basic needs. From (Fig. 6) the spire to the view of The Shard (Levels 87-68) is the sightseeing area, the impact of which has been mentioned in the arguments above. Below the sightseeing area is the residential area, which has thirteen floors. Residents here still can enjoy the perfect high-rise views.

Below the residential area is the hotel area. The Shangri-La Hotel holds nineteen floors of the hotel area. Further down is the restaurant and bar area; from the section image, this area has only three levels of space. The remaining areas are the largest proportion of office areas and the lobby, where the floor heights are comparable to those of the surrounding high-rise buildings[12].

The arrangement of the function of the building's floors by the architect is also very clever. The arrangement of the floor functions combines masses psychology and social structure from the top to the bottom of The Shard. First, the view area at the top of the sixty-eighth to the eighty-seventh floor. For most visitors, the purpose of coming to The Shard is to look out over the whole of London. Therefore, the topmost floors are the best angle and position, also the preferred choice of most people. For example, placing the view level in the middle of the building would create a great deal of dissatisfaction from the visitor's perspective.

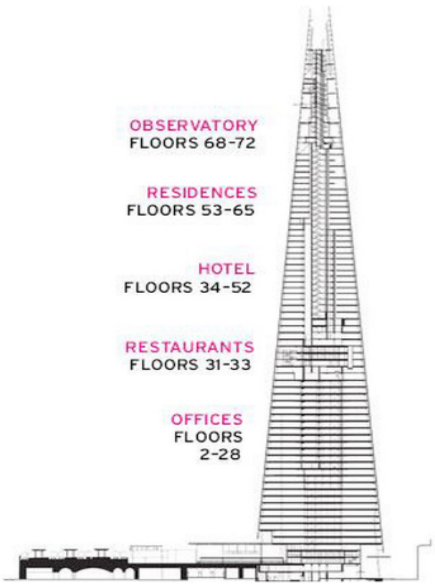


Figure 6 The layout of The Shard

Then, the next area is the residential area. Some views are sceptical about the residential area being built so high than the usual apartment. However, from the point of perspective of the occupants, it is necessary. As Property News Team puts it “Several agents have said the Shard's residential floors should attract prices of around £4,000 per square foot – valuing each apartment at around £20 million, which will inevitably create headlines once the first sales go through. Such lofty per square foot prices have already been reached in London “[13]. Residents will spend such a large amount of money on a property to get a different experience and feel from a standard flat.

The hotel area of Shangri-La is below the residential area and is also the middle part of The Shard. This arrangement is understandable, as these nineteen floors offered for short-term stay. So, it makes sense to place it below the property in terms of height.

Further down is the restaurant and bar level. Again, it is just the right design for the people in the whole building, whether a visitor who has just finished overlooking the city view or a resident who lives on the upper floors.

The rest of the office area is also very carefully located. Firstly, the office areas should not locate in the prime locations in the building, the aim being to control rents and make way for other important areas. Secondly, if the number of floors is too high, it can make it difficult for employees to concentrate.

From the analysis, it is clear that every floor of The Shard is generating profits. As stated at the beginning of the paragraph: the construction of The Shard predestined it to be an economic driver. But, on the other hand, it also emerges that the building and the people influence each other.

All of the above discussions are about the effects of the interior and exterior of The Shard on people. What about the impact of The Shard on the people around the building?

There is something to think about: What does the tower give to the city? What is it like to approach it at street level? The answer has given in the article "The Shard: What is it like to live near a skyscraper?", taken from the BBC. The height of The Shard has briefly mentioned in the article as causing significant problems for the neighbouring occupants. For example, during the daytime, it casts a long shadow that obscures the surrounding buildings.

One of the ideas mentioned in the article. "Wind creates several kinds of problems for tall buildings. In general, the

higher people go, the faster the wind speed. Furthermore, as wind speed doubles, the pressure exerted on a building quadruple. But there's something else that happens - strong winds that would normally stay well above street-level can be forced groundwards, travelling at 20m a second"[14]. The literature shows that the base of The Shard can create strong winds because of its structure. Therefore, if people walk around The Shard in windy weather, they can feel the wind more strongly than elsewhere. For those living in the surrounding area, it is not so much the strong winds but the noise generated by the wind that affects them. The wind speed hitting the building facade will bring the noise, which means that the lower floor resident will hear the sound louder. Furthermore, the London Bridge railway station is on the side of The Shard. The noise from the train and the wind create a double noise which can cause hearing damage to the residents over time.

2.3 Technology impact by Burj Khalifa

What other effects do skyscrapers have on people? For some architects and engineers, skyscrapers bring a technical challenge to construction to people. The Burj Khalifa (Fig. 7), known as the Burj Dubai before its inauguration in 2010, is a skyscraper in Dubai, United Arab Emirates. With a total height of 829.8 m and a roof height (excluding antenna but including a 244 m spire) of 828 m, the Burj Khalifa has been the tallest structure and building globally, topping out 2009 (preceded by Taipei 101).

Before the Burj Khalifa was built, the tallest building in Dubai was only thirty-three storeys. So, the significance of the Burj Khalifa to the people of Dubai is huge, as it makes Dubai the city with the tallest skyscraper in the world [15]. But height also brings new problems. In addition to the tourists who visit, thousands of people work and live in the Burj Khalifa. The building can provide a capacity of up to 35,000 people, which is like a small city. The most important facility for a city is the transport network, which is equally crucial for a vertical city such as the Burj Khalifa. The most critical issue in the impact of high-rise buildings on human life is how quickly people can transport to a different floor level. Although the Burj Khalifa has around three thousand stairs, it is impractical to transport crowds by stairs alone. So, when talking about life in a vertical city, the lift becomes the most crucial part. However, the Burj Khalifa is so high that the design solution for the lifts is not like that of a regular building.

Figure 7 Burj Khalifa

In the past, it would have been straightforward to design a lift system for a building, which simply ensures that the lift could reach each floor. However, this solution cannot use on the Burj Khalifa. For example, the lifts would be very slow and crowded if passengers were to take the lifts from the Burj Khalifa hotels level during the holidays. This is because the lift is likely to stop on every floor. So, it can be a very waste of the time it takes for people to get through. To avoid the bad effects of Burj Khalifa's transport system on people, the designers needed to find a solution.

There are fifty-seven lifts in the Burj Khalifa in order to

keep the building functioning correctly.

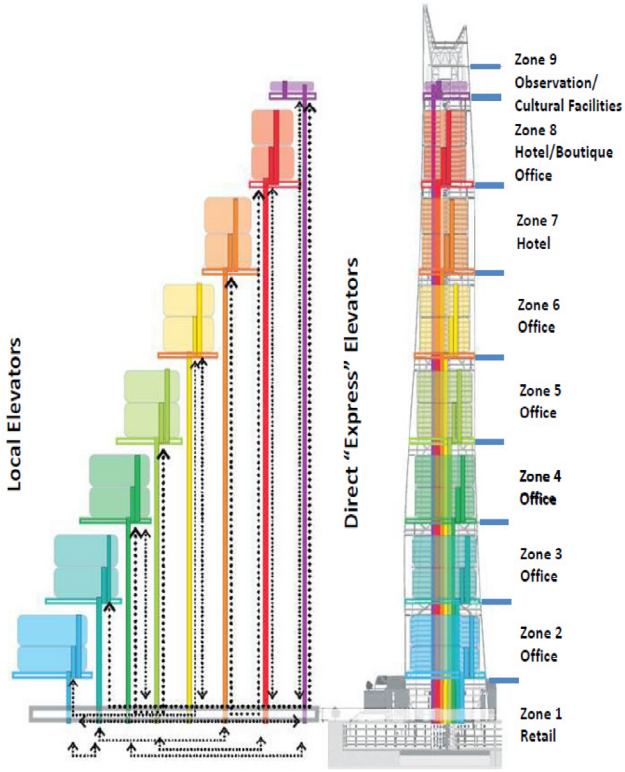


Figure 8 Elevator systems of Burj Khalifa

Image 8 shows the eight express lifts system of Burj Khalifa, which belongs in fifty-seven lifts. From the picture, the lift lines are divided into eight different zones. These eight express lifts can only stop at the corresponding colour floor, significantly increasing the convenience for people. The designers get inspiration from urban traffic. There will be emergency fast lanes on the city roads and main roads leading directly to several places. Near the main roads, there will have side roads that lead to other places. The lift system in the Burj Khalifa uses this inspiration [16]. At the same time, to make lift transport more efficient, the designers have designed the eight express lifts as double-deckers. This means that when a visitor takes the lift to their hotel room, the person on the upper deck arrives at the office just in time for work.

The example of the Burj Khalifa shows that people also influence architecture in several ways. This also validates the theory that architecture and people influence each other in the previous chapter. The theory is also discussed in Gutman's book: People and buildings. The book points out the influence of the space within a building on human behaviour patterns, for example, psychological stress, mental illness, family disorganization, urban violence, and delinquency. But also, human behaviour patterns can unwittingly change architectural spaces [17].

2.4 The cultural impact of skyscrapers on people

When it comes to the relationship between the human and architecture, has to mention the world's tallest skyscraper during 2004~ 2010— Taipei 101 (Fig. 9). Expected to capture the title of the world's tallest building when completed in 2004, the Taipei Financial Centre will present a new model for the Asian skyscraper, one explicitly evocative of traditional Chinese architecture. Designed as a segmented shaft of eight outward-sloping segments, the tower resembles a giant glass pagoda. The green-tinted glass cladding is meant to mimic the colour of jade. The segments, consisting of eight floors, lean out slightly, creating a distinctly stacked or tiered silhouette [18].

The name "Taipei 101" stands for Taipei and means technology, art, innovation, people, environment, and identity. It is located in Taipei, Taiwan. It is a small island with abundant environmental resources, surrounded by the sea and mountains. In 1624~1662, it was Dutch Colonial Taiwan, and the island is commonly known as "Formosa". In between the period, the Spanish had occupied the north of Taiwan for 16 years until Dutch had dispelled them in 1642. In 1895, Taiwan was cession to Japan by the Qing Dynasty. After 50 years of the Japanese-occupied Period, it became an asylum for a part of the Chinese who had to evaded political infighting.

Furthermore, besides, indigenous people were living on the island for a long time during those periods. It has a complex historical background, lead to the remained historical buildings and culture are diversified. Although Taiwan is a controversial place from a political point of view, this has not blocked the development of the city residents. Meanwhile, they are developing, the awareness

of the importance to maintain the cultural heritage that has left behind is continuing in the spirit of each people on this island. Due to its geography, Taiwan is affected by typhoons, rainy seasons, and often earthquakes. As a result, the people of Taiwan have become more religious, it is heavily influenced by Chinese culture and religions during the Qing Dynasty, and they believe this keeps them safe after being through several natural disasters. Despite this, Taiwan was hit by the worst earthquake in the country on 21st September 1999— the Chi-Chi Earthquake aka 921 Earthquake, which devitalise countless lives, not least of reasons was the large number of houses that collapsed and half-collapsed. After that experience, Earthquake-resistant structures is a mandatory norm for Taiwan when building construction.

Figure 9 Taipei 101

Figure 10 Tuned Mass Damper

Back to Taipei 101, in the centre of the building, suspended from the 92nd floor to the 87th floor, there is a giant damper, which the full name is "Tuned Mass Damper" (Fig. 10). Its function is to counterbalance the shaking caused by earthquakes of Taipei 101 by 40% [19]. As Chinese culture is deeply rooted in Taiwan, the design of the building is closely related to Chinese culture. In the West, a towering building symbolises the reverence for the conquest and the pursuit of the unknown. The Eastern perspective represents a broader understanding and inclusion of the future. In tradition for Asians, the purpose of climbing is to 'look beyond', which is not something that can be achieved overnight but grows gradually and naturally, like a flower blossoming, reaches the peak of wealth, prosperity in stages. Taipei 101 reaches a height of 508 metres, the top of the building is a copy of the Chinese character " 鼎 " (pronounce: dǐng) styling, it is a kind of food container for cooking, serving, and decoration usage in ancient China, usually made by ritual bronze or ceramic, and the character itself is derived from the oracle script. Also, the metaphor for a high position such as a third minister, a chancellor or a critical minister. The top of the building was inspired by the Chinese character and the building itself. The building has eight layers inverted square bowl, the sides resemble the Chinese character " 八 " ("eight", pronounce: bā), which in Asia means 'lucky' and harmonise with the word for fortune. Taipei 101 has more of a cultural impact on people living in Taiwan than the impacts mentioned in the article.

3 Expert Interview

3.1 Interview with ZHAN Zhen

The information obtained from the interviews is recorded and collated in this section.

Mr ZHAN Zhen has a double master's degree in landscape architecture and urban planning from Iowa State University, USA. He is a Registered Landscape Architect in the USA (RLA, ASLA).

All the questions revolve around what effect skyscrapers have on people.

The first point that was raised was about the impact

of skyscrapers on modern society. Modern architecture originated in the United States and spread to the world. Then skyscrapers began to emerge because of the sophistication of construction techniques. But the emergence of skyscrapers has also brought with it several problems. One of the more obvious ones is the urban heat island effect caused by the concentration of people.

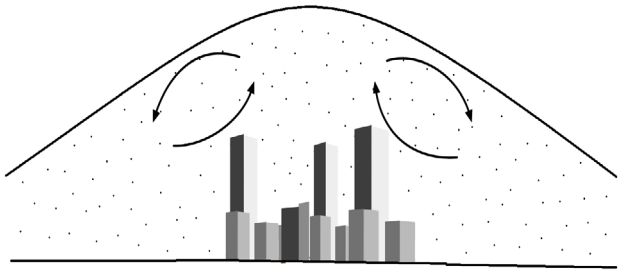


Figure 11 Urban heat island effect

The urban heat island effect (Fig. 11) means the temperature in the centre of a city is higher than the temperature in the city's periphery. The urban heat island effect is caused by many factors, such as human body temperature, vehicle emissions and light refraction from glass skyscrapers. However, add these factors up together will bring high temperatures to a city. So that is why people find it hot and stifling in the city. The skyscrapers play a role in the urban heat island effect by attracting people to gather.

On the other hand, the skyscraper is a solution to the past pattern of dispersed offices. It is a good thing for economic development that offices are clustered. However, the large number of people working in the same place means that there are problems with traffic congestion in the city and slow commutes.

Skyscrapers also have an impact on people in terms of social isolation. However, isolation here does not refer to the physical isolation of people. Instead, it refers to class isolation, which means the gap of wealth. The three buildings studied in the article show that people who work and live-in skyscrapers have a higher economic level. This means that people with a higher economic level are less likely to intersect with the more indigent population. In a way, the presence of skyscrapers alienates the population.

Then is the problem that skyscrapers can happen at night. When busy skyscrapers at night, which can create a concept called urban hollowing. Urban hollowing is the phenomenon of empty buildings at night when people leave the skyscrapers after a long day's work. The direct impact of urban hollowing is safety issues. For example, the number of pedestrians around buildings and streets will decrease at night. The level of security at night is also reduced because the buildings are empty. As a result, more homeless people will choose to spend the night in the vicinity of the building. This is a threat to pedestrians travelling at night. However, the development and renovation of skyscrapers in today's society have solved the above problems. The Shard and Burj Khalifa, for example, both have residences and hotels inside, which has effectively improved urban hollowing. This approach is known by the term New Urbanism. New Urbanism is a new urban model that mixes flat, commercial, hospitality and restaurant functions with high-rise buildings. This is a good development for people and society.

A philosophical question about skyscrapers: do tall buildings cause crowds to gather first, or do crowds gather before tall buildings? The answer to this question was also answered in the interview. The opinion is that it is the existing tall buildings that cause the crowds to gather. The reason is that without the technology to build tall buildings, it would be useless if the crowds gathered.

At the end of the interview, the interviewees gave their views on the future of skyscraper development. The interviewees believe that the number of skyscrapers will decrease in the future. Instead, there will be more skyscrapers that will appear with better design. For example, skyscrapers combine with ecology and landscaping.

Skyscrapers were mentioned in the interview as the key to people's concentration, but they also have various impacts, such as increasing the gap between the rich and the poor and separating people from each other. This situation is likely to lead to a massive number of people return to rural areas. The depiction of this phenomenon in the book Urbanization and Counterurbanization is called

counter-urbanisation. Urbanization is the process of the concentration of population in cities. Counter-urbanization, by contrast, is the process by which more people move back to smaller cities. Counter-urbanization initially shows as a result of intra-urban impoverishment. Counter-urbanization is now happening in different countries and regions [20].

3.2 Interview with BI Wenhui

Miss BI Wenhui, who is the architect working in Architect of Plasma+ Studio. Master degree from Chalmers Technology University.

The questions prepared in this interview were the same as in the previous one.

This interview began with the same question of what effect skyscrapers have on people. The interviewee gave two examples of cities with many skyscrapers, Hong Kong and New York (Fig. 12, Fig. 13). Too many skyscrapers can be overwhelming, and people can feel that they cannot see the sky when looking up. In addition, in some cases, the roads become narrower because of the building developments. The impact on pedestrians is that narrow pavements cause walking limitations. From this perspective, Hong Kong is better than New York because it has mountains, which will create a buffer in people's senses.

The reason for the excessive number of buildings is the high population density. One of the arguments of this article: skyscrapers are built to create more space for people. Both Hong Kong and New York have adopted this method, but it has had the opposite effect, creating less and less space. The situation in Hong Kong is more complex and contains many political and human factors. The vast majority of Hong Kong people are reluctant to work outside Hong Kong. However, the excessive number of skyscrapers is also a reflection of the industrialisation of the city. This has a lot to do with the level of urban development. For the city in the past, it was a source of great pride.

When asked why there are not many skyscrapers in Europe, the interviewee said that it is because many urban areas in Europe and many historical buildings are well protected. On the other hand, it is because the population of European countries is relatively more minor.

At the end of the interview, the interviewees also gave the views on the future of skyscrapers. In the future, the number of skyscrapers in first-tier cities will decrease because they are already saturated. Instead, skyscrapers will be found more often in certain cities in the Middle East or Africa in the future.

Figure 12 Hong Kong

Figure 13 New York

4 Questionnaire

The questionnaire was designed in the form of multiple-choice questions. A total of sixty-three responses were collected on this occasion. Of these, 38.71% of men and 53.23% of women and 8.06% of others answered the questionnaire. In the question "Do you think skyscrapers have an impact on you?", 63.49% of the respondents thought that skyscrapers would affect them, while the remaining 36.51% thought they would not. In the third

question, 41.27% of people live in skyscrapers, while the rest do not. Of the sixty-three respondents, 58.73% preferred skyscrapers, while 41.27% disliked it. The fifth question aimed to examine whether the respondents' liking and aspiration for skyscrapers were proportional. In this question, 53.97% of the responses wanted skyscrapers to exist in their city. The other 46.03% did not want skyscrapers in their city. The sixth question was designed to examine public perceptions of future urban development and the future trend of skyscrapers. There are 71.43% of respondents believing that skyscrapers are still the key to future urban development. In contrast, 28.57% thought otherwise. Question seven has 53.97% of people going to the skyscraper regularly and 46.03% infrequently. The last question shows that most respondents chose to go to a skyscraper for a living, accounting for 23.81% of the total. 22.22% of people go to skyscrapers regularly for work. Those who stayed in a hotel accounted for 19.05%. On the other hand, restaurants and others accounted for the smallest proportion, both at 17.46%.

5 Conclusion

The starting point of this study has been to find the effects of skyscrapers and high-rise buildings on people. However, as the study progressed, some examples diverged from the arguments made at the beginning of the study. For example, the argument that people also impact buildings can be found in the middle of the article. So the conclusion of this article, based on the research, is that the influence created between buildings and people is mutual.

The spatial impact of skyscrapers on people is largely positive, as the building is built so that the structure expands the space. As a result, people can mentally and physically benefit more from a larger space. Moreover, people living inside the building also unconsciously change the interior space of the building to make it more active.

Skyscrapers have also had a more significant impact on the development process of society, for example, in terms of economic development and technological development.

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