The Theory and Method of Architectural Planning Under the Popularization of Smart City

Zhongche Shen[1], Jiaqing Wang[1], Yongxin Wang[2], Shudan Liang[3(✉)], and Jialin Xie[3(✉)]

[1] University College London & Imperial College London, London, UK
[2] Southwest Jiaotong University Leeds Joint School, Chengdu, China
[3] Hainan Normal University, The University of Melbourne, Melbourne, Australia
asderty67rtyasd@gmail.com

Abstract. Humanity is timeless, but technology is limitless. The development of China's future cities urgently needs to shift from merely pursuing technology to returning to the true needs of people in the new era of ecological civilisation, in this era of technology-driven exuberance, impatience, and confusion, as China's urbanisation development enters a new phase.

Future city research is mostly concentrated on technical innovation and intelligent intelligence, but there are few findings from studies that look at future cities from the standpoint of human-based liveability. Human-centred liveability should, however, become an important perspective for future city study as liveability has become an important aspect to boost the appeal and overall competitiveness of future cities since the turn of the 21st century. The focus of current research on the liveability enhancement initiatives and liveability index systems for future cities is human-centred liveability. Based on an analysis and summary of currently liveable cities, Zhang Wenzhong et al. proposed five evaluation criteria for urban liveability, including the ecological environment, urban safety, public services, social environment, and economic environment. They also suggested that future cities should be safer, more convenient, more pleasant, and more harmonious.

This study suggests building standards and tactics for the resurgence of people-oriented cities in the near future through research and analysis of the futuristic development trend of future cities in terms of their focus on people. Additionally, while it is challenging to anticipate the future growth accurately, this study's concentration is on judging the development trend, with a particular emphasis on the development trend and construction strategy of the future city that returns to being people-oriented.

Keywords: smart city · landscape design · urban planning · architectural planning theory

1 Introduction

The growth of wisdom in urban waterfront area is another unavoidable tendency since it is a significant activity space and landscape space in the city. This study combines

the literature research technique, case study method, discipline integration method, field investigation method, and practical research method to suggest the method and strategy of urban waterfront landscape design based on the research status, development trend, and practical application of the smart city idea and urban waterfront landscape design. This study also extends on the concepts for designing a smart city landscape and offers a theoretical foundation and practical guide for designing an urban waterfront environment.

This study identifies smart city effect elements, covering five dimensions: smart economy, smart infrastructure, smart management and services, smart humanities, and smart soft environment. In this paper, the role that smart cities play in enhancing inhabitants' perception of accessibility is also emphasised for further discussions. The residents' sense of access is at the top of the ISM model's six tiers, which are followed by the smart economy and the smart soft environment at the bottom. Building a smart city should respect the value of "people" and make the area more hospitable, diverse, and humanistic [1]. To understand the general situation, variables affecting smart cities are utilised to create a survey questionnaire, conducted statistics, collected and evaluated the survey findings.

The design of functional, ecological, ornamental, and cultural landscapes can finally realise the ideal fusion of technology and art, as well as the harmonious landscape effect of people and landscape, under the guidance of the urban landscape design strategy of the smart city concept.

2   Literature Review

Future public space renovations in smart cities should focus once more on the needs of people. To build a bustling area that satisfies inhabitants' requirements, impersonal building of extensive demolition should be abolished and switch to a humanised approach. The old buildings in Qianmen Hutong were renovated without extensive demolition by combining the brick façade with glass curtain walls to form an open interface to the hutong. This created a multipurpose public space that combines housing, commerce, and business, enhancing the appearance of the old city and fostering urban vitality.

2.1   Reflection of Humanity Through Design Intervention in Smart Cities

Employing refined design is becoming a key strategy for improving public spaces. In the past, the design of public space frequently neglected the specific consideration of space and instead concentrated mainly on broad factors like plan composition and functional layout. The building facades, landscape elements, and urban furniture have evolved under the influence of human-oriented thinking into the key to enhancing the quality of public areas. Public spaces are created using sophisticated design approaches with the goal of meeting people's requirements in terms of material, spiritual, psychological, and behavioural aspects [2]. This boosts the vitality of public spaces and adds to the allure of cities.

Fig. 1. Oslo Harbour City in Norway (Picture Credit: Google)

Fig. 2. Urban interface formed by the building façade of Oslo Harbour City (Picture Credit: Google)

2.1.1 Aesthetics of Macro-scale Architectural Façade

A polished and rich building façade contributes to the stimulation of spatial energy. A sophisticated external design and a variety of window openings help Oslo Harbour City in Norway (Fig. 1) create a coherent and diversified urban interface while maintaining a relatively constant building height, façade material, and colour.

The ground floors of buildings facing the street or the shoreline are changed into active functions to boost the neighborhood's vibrancy with a variety of retail and restaurant companies. To provide spots for pedestrians to sit and socialise, continuous grey spaces have been added to the front of the buildings. Harbour City transforms the building facades along the street into a widely varied, appealing, and intriguing urban interface that boosts the vibrancy of the area through exterior design, ground floor opening, and the addition of grey spaces (Fig. 2).

2.1.2 Environmental Landscape for the Demonstration of Human-Centred Interests

Delicate, diversified, and human-centered landscaping and paving design can give appeal to the environment. The streets of Oslo Harbour City are extremely well-designed, with unique bicycle parking areas, designer corner flowerbeds, and uniform and different

Fig. 3. Millennium Park, Chicago, United States (Picture Credit: Google)

street paving that provide a joyful and peaceful public environment that draws a younger demographic. A crucial tool for transforming public space into something more empathetic is integrated design - in the past, the design of public space frequently neglected the specific consideration of space and instead concentrated mainly on broad factors like plan composition and functional layout. The micro-level building facades, landscape elements, and urban furniture have evolved under the influence of human-oriented thinking into the key to enhancing the quality of public areas [3]. Public spaces are created using sophisticated design approaches with the goal of meeting people's requirements in terms of material, spiritual, psychological, and behavioural aspects. This boosts the vitality of public spaces and adds to the allure of cities.

2.2 Participation in Art Enhancement Activities in Smart Cities

The involvement of urban citizens can be increased by urban culture. Urban culture, art, and public life all have an impact on and support one another in cities. The pursuit of urban culture will become more critical for the creative individuals living in cities as material living standards rise.

2.2.1 Artisticization of Plaza Space

An essential attempt to improve the city's future vibrancy is the artisticization of plaza area. Combining art with function can successfully increase the attraction of the space, draw attention from the audience, and create a more vibrant plaza space, with public art facilities as the focus of implantation. Chicago's Millennium Park is a typical example of the artistic renewal of a plaza (Fig. 3).

The region was formerly used as a parking lot for the Central Railroad, but urban redevelopment has successfully increased the neighbourhood's liveliness by adding art amenities such an outdoor performance venue, the Cloud Gate sculpture, and the Crown Fountain, which have drawn numerous locals and tourists [4]. In 2009, Millennium Park was one of Chicago's top tourist destinations because to these creative additions.

Fig. 4. Broadway, Capitol Hill, Seattle, United States (Picture Credit: Google)

Fig. 5. Faret Tachikawa public art area, Tokyo, Japan (Picture Credit: Google)

2.2.2 Artisticization of Street Facilities

The placement of creative amenities can significantly enhance the street area. Traditional roadways lack energy and popularity since they primarily serve the purpose of moving traffic, with few people stopping to remain. A more humane street environment can be created by using artistic street furniture to entice people to linger and even engage with them. A graffiti art campaign changed Seattle's Broadway neighbourhood (Fig. 4).

2.2.3 Artisticization of Negative Stereotypes

Facilities with a poor urban image can be artistically improved to improve space quality. Areas where the city lacks energy are frequently seen to include public manhole covers, building air vents, and other undesirable urban settings [5]. Essential facilities can be turned into creative living spaces that are integrated into inhabitants' life by fusing artistic design with these unfavourable associations, significantly boosting the urban vitality as a whole and producing a lively and humane environment.

The FARET public art district in Tachikawa, Japan, is a successful example of the artistic transformation of negative images (Fig. 5).

The bridge' pillars, building corners, air vents, and public amenities like fireboxes and water taps have all been aesthetically constructed to significantly improve the vibrancy of the streets, making it one of the most well-liked gathering spots in the city [6].

3   Discussion

Smart city is a novel concept that evolved with the development of information technology and its application in the urban operation system, while other urban concepts such as digital city, smart city, knowledge city, inventive city, creative city, ecological city, and so on have emerged in recent years. Understanding these new urban notions enable better analysis and comprehension of smart cities [7]. This section examines in detail the relationships between smart cities, digital cities, smart cities, knowledge cities, and other related topics, then examine and explain these urban notions.

3.1   Digital and Smart Cities

Similar to digital cities, Al Gore also presented the "Digital Comfort Community Building" initiative. Digital cities are one of the primary characteristics of applications for a digital earth. Digital cities are also known as e-cities, digital ports, information ports, digital cities, etc., however the term "digital cities" is used more frequently in academic contexts.

The condition of the city in the information era is portrayed by the concept of the "digital city." Each area of the city is described in the digital city using a variety of resolutions, sizes, spatial and temporal dimensions, and categories. Information from every area of the city can be collected, structured, and summarised in the digital city, and a complete spatial data model based on geographic coordinates can be built. A digital city is sometimes referred to as a good-natured city with "complete information infrastructure, rich information and data resources, highly developed information application and information industry, continuous coordinated development of industrialisation and informationization, and comfortable living environment" [8].

Applications for the digital city in urban administration, construction, and planning are significant. Urban planners can more easily observe their design solutions in the actual world, assess them rationally, and immerse themselves in the virtual environment of their design with the aid of visualisation and computer simulation technology. Using remote sensing technology, the digital city can quickly examine the fundamental geographic data of the city and information on urban development, making it convenient for the scientific management of the city [9]. In addition, the digital city's information technology and information system can be used more effectively and affordably in the field of catastrophe prevention and mitigation.

3.2   Low-Carbon Cities

One of the key factors contributing to ecological degradation is the enormous amount of glasshouse gases produced by the widespread use of fossil fuels. These gases cause global warming and endanger the ecological balance of the planet, and the energy crisis

brought on by this excessive energy use is getting progressively worse. Building low-carbon cities to alter lifestyles, reduce glasshouse gas emissions, and maximise output with the least amount of energy consumption has thus become the primary method for resolving the energy and climate crisis brought on by carbon emissions. Creating low-carbon cities is best accomplished through the growth of low-carbon economies. The low-carbon economy is a strategy for economic growth based on technological and institutional innovation in the energy sector. It continuously improves energy efficiency, structures, and usage of clean energy while also reducing consumption and pollution.

4 Conclusion

In this paper, on the basis of the analysis of the connotation of smart city, the construction and development of smart city is studied and certain results are obtained:

This study takes a theoretical and practical approach to the smart city assessment index system, starting with an examination of urban performance and urban landscape architecture. It then suggests the impact factors of smart cities, considering the effect factors of smart cities on inhabitants' subjective feelings, which, to a certain extent, enriches the theoretical accomplishments of smart city research. Future advancements in information technology may lead to the development of smarter cities, such as the promotion and upgrading effects of 5G on the commercial manufacturing sector, which were not taken into account while choosing the elements impacting smart cities in this article.

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