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Macro thinking and micro action
A digital simulation example for the southern part of Beijing, China

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ABSTRACT

This paper aims to discuss innovative plan models for Chinese cities that are currently under rapid development. The study considers Complexity Theories of Cities as the theoretical basis and applies a holistic approach in city planning by recognizing the complex nature of city. It strives to integrate the diverse local structure in social and spatial aspects with the ambition and demand of city's expansion. Digital sequence simulation is used as an innovative tool to represent local activities, promote interventions and predict possible self-organization process in the future. The study arrives at an open scenario, the feasible prospect. A conclusion is drawn to reflect the process and achievement and propose future works for this research.

1. Introduction

The 21st century marked a major watershed of human settlements driven by globalization and urbanization. For the first time in the human history, more than half of the world's population is living in cities. Chinese cities are not exempt from such trends. Instead, they have rather consolidated and accelerated the process — over the past 30 years, the urbanization rate in China rose from 20% to more than 40%. Underneath the prosperous construction, however, there may be some hidden dangers. The most severe one may be the loss of cities' identity and diversity, as identical cities are planned and developed despite their distinctive natures.

Facing such problems, Complexity Theories of Cities [1] are considered as the theoretical base. According to this theory, one may consider a city as an emerging system with its internal growing force — the city's self-organization. In this sense, plans do not determine the evolution of cities but rather participate in their dynamics [2]. Following this idea, the identity and diversity of a city cannot be achieved by simply imposing external intervention, but integrating its dynamic emergence. Therefore, rather than following the traditional top-down approach, this work investigates a new design strategy, in which the self-organization process of cities can be involved as an important design parameter, affecting decision-making in the design. Although this idea is a generalized approach which could be applied to all kinds of cities, this work takes a specific case – Da Hong Men (DHM), a southern district in Beijing – as the starting point. A flexible and adaptable spatial strategy is provided to facilitate the interaction between intervention and self-organization. Computer aided design program is essential to support the spatial analysis, strategy and design. A simulation algorithm is being developed as a parameterization and simulation tool, which assists city planners and policy makers to identify the existing urban emergences and predict the future scenarios.

2. Macro-thinking: case study on DHM, Beijing

Da Hong Men which can be literally translated to the “big red gate”, is located at the urban fringe of Beijing, between the 3rd and the 4th city ring roads in the south. As is shown in Fig. 1, it is on the southern extension of the city's historical central axis, next to the Beijing South Train Station. Because of its strategic location, DHM became an important city access for national immigrants. Moreover, due to the inexpensive rental price at the urban periphery, the immigrants settled down in DHM and brought business from their hometown to this area. Eventually, DHM has grown into an important commercial cluster in Beijing, and it is now the biggest clothing wholesale center in the North China.

DHM can be treated as the most representative example of the self-organized commercial clusters in Chinese cities. This work starts with the analysis of DHM, and utilizes its characteristics as the context of the proposed design strategy.

2.1. Quality of DHM

The main quality of DHM is its diversity at both the spatial and the social level. Without being influenced by massive top-down

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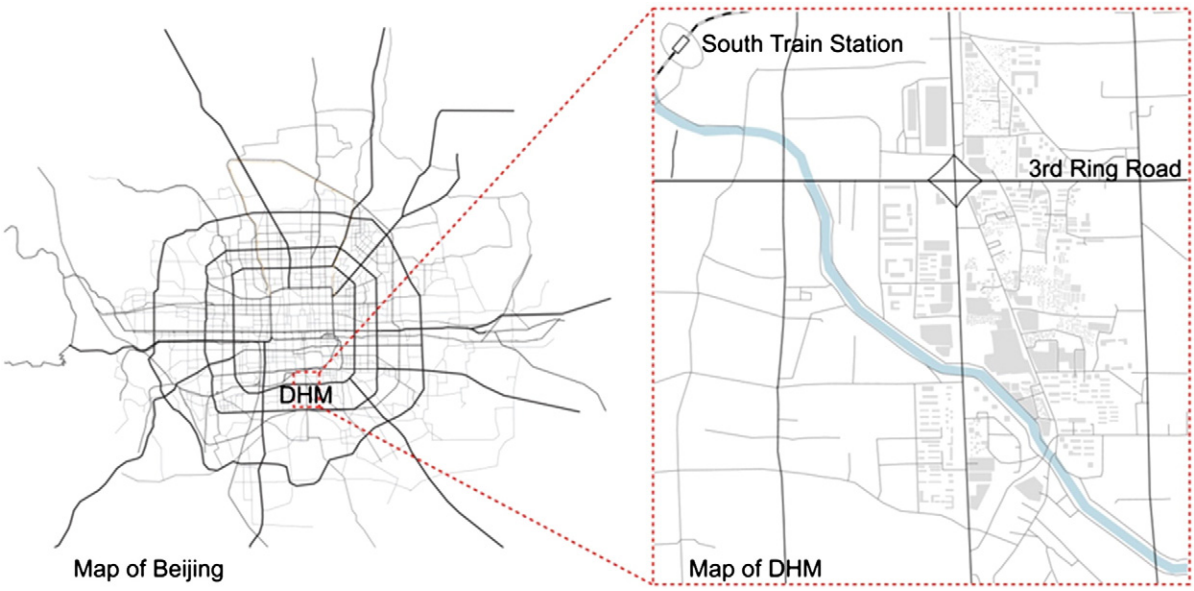

Fig. 1. Location and map of DHM.

interventions, DHM shows a strong internal force to develop itself and a high level of tolerance which accepts and supports varieties. This is how the diversity is achieved during the transformation.

On the spatial level, DHM has a unique urban fabric that combines rural villages and modern buildings together, which can be observed in Fig. 2. This spatial phenomenon is called urban–rural syndicate. It reveals the pressure of the city's expansion on the rural area. When the city high-rises keep bringing Beijing a more and more monotonous image, the spatial identity of the villages is gradually recognized as a certain quality. The villages show a typical Chinese architectural pattern of low rise and high density. They have flexible structures and can be freely adapted for various functions, such as storage, factories and studios.

In addition to the spatial diversity, DHM also holds various activities and lifestyles which exhibit diversity in the social aspect. As an urban rural syndicate, as well as a city gateway, the demographic composition in the area is complex. There are urban citizens, who live in apartments in DHM and work in other parts of Beijing. There are also national immigrants, who came to Beijing in searching for better opportunities and higher income. Furthermore, there are urban villagers, the original residents in DHM, who used to live on agriculture. Nowadays, however, they have quitted farming

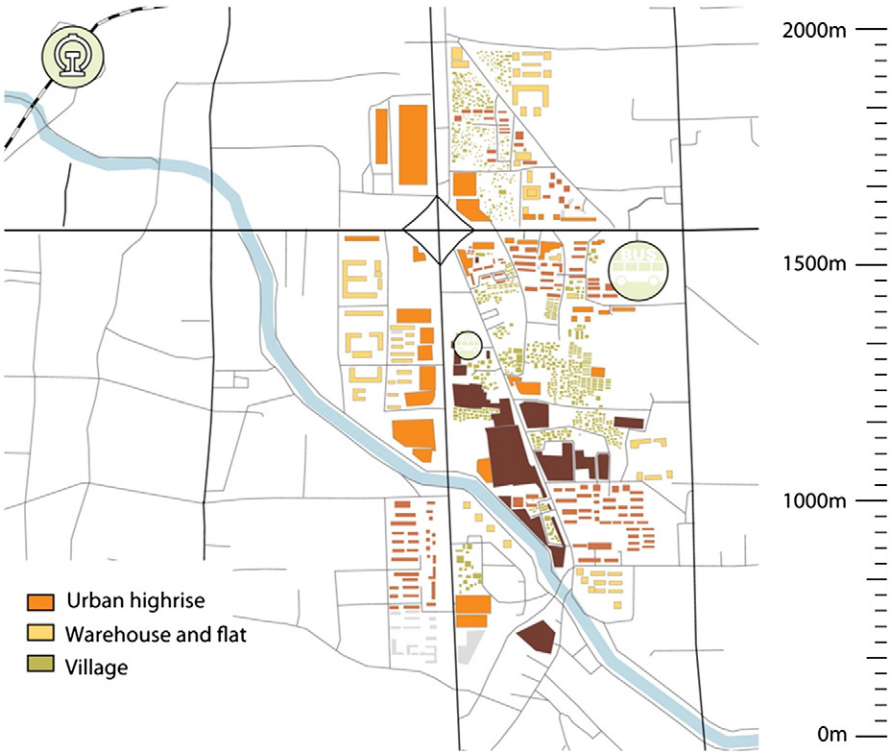

Fig. 2. Existing spatial composition in DHM.