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Exploring the challenges to housing design quality in China: An empirical study

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ABSTRACT

The housing problem in China has shifted from a quantity to a quality problem, and it is time to take into consideration design quality in addition to housing delivery. This paper aims to explore and understand the challenges to improving housing design quality in China, helping to identify areas for future improvement and necessary corrective measures to be taken. A series of critical factors in housing design quality are identified by using a triangulation of a comprehensive literature review, qualitative interviews and a questionnaire survey administered to experienced practitioners in the Chinese housing industry. It is substantiated by a case study of two real-life housing projects, conducted to manifest the hindrances and the benefits achieved. This study has identified seven critical challenges: inadequate building technologies, lack of design accuracy, insufficient time and uncertain high cost, lack of consideration for end-users, insufficient collaboration, lack of public facilities, and insufficient incentives of quality design. Some key benefits related to housing design quality are also summarised in this study, including, but not limited to, enhanced brand recognition, regulatory incentives, improved customer satisfaction, reduction in operation and maintenance costs, and less construction time.

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1. Introduction

Although housing quality has witnessed constant improvement along with the worldwide trend, voluntary adoption of design quality practices is not as ideal as expected within the Chinese housing industry. According to RIBA (2009), high quality housing is surely 'well-designed', and design quality is 'fundamental to the development of new high quality housing, which contributes to the creation of sustainable, mixed communities'. In view of such a background, housing design quality is considered by many to be the key to improving the performance of housing industry, and numerous studies have discussed the implementation of a quality strategy and its values. For example, it has been found that housing design quality can not only improve the quality of the existing environment and reduce energy consumption, but also can bring about other tangible benefits such as investment in design. Interest in housing design quality has been growing as part of a worldwide trend in an increasingly competitive property market. People expect higher design quality and are no longer satisfied in making purchasing decisions based just on colour plans and square footage. Thus, we witness an urgent need for the dissemination of the concept of design quality and its implementation in the context of Chinese housing development to improve the competiveness of the construction enterprises and to satisfy the rising expectations of end-users.

China has become the largest construction site in the world, where numerous housing estates have been and are still being built. For example, according to the National Bureau of Statistics of China (NBS, 2009a), a total of RMB 2208.1 billion (US$ 323 billion) was invested in the housing industry in 2008, an increase of 22.6% from the previous year. However, excessive urbanisation within a short time span has brought about a series of challenges, such as poor quality, environmental pollution, and lack of infrastructure. Over the past few years, for example, low-quality housing has been accepted as the market standard for most housing projects in China. In fact, it is a common problem in most developing countries because quality issues are overshadowed by quantity problems which will not be effectively addressed until quantity problems are solved (Okpala, 1992).

Although China's poor housing quality has been documented, very few studies have concentrated on the reasons behind such a phenomenon. A possible reason for such under-performance can be

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attributed to the fact that the Chinese housing industry was growing too fast to get things right in the first place. In addition to that, although housing quality issue was frequently discussed in official forums and newspapers, very few practitioners were willing to take action, probably due to inconveniences and possible risks involved in doing so. Unless the business and the wider community as a whole can determine what is hindering better housing quality and related innovative technologies, the industry will have no incentives to move out of its comfort zone and aspire to achieve the mainstream standard. This study therefore seeks to bridge the knowledge gap between Chinese and advanced international standards by examining and identifying the critical factors in housing design from the perspective of industry practitioners.

The remainder of this paper is organised as follows: Firstly, existing studies on design quality and housing research in China are reviewed. An initial checklist of the hindrances to housing design quality is given based on the literature review. These hindrances are then developed through qualitative interviews and a questionnaire survey administered among experienced practitioners in the Chinese housing industry. A series of critical factors are identified through this mixed approach of various methods. To further verify the research findings, a case study of two real-life housing projects is conducted to manifest these constraints. Then, seven critical challenges to improving the housing design quality are identified through a comparison of the two housing projects, together with five key benefits. Finally, research contributions and directions for future research are presented.

1.1. Literature review

1.1.1. The concept of design quality

The main prerequisite for producing a built environment is to have a well-developed understanding of housing design quality. Gann and Whyte (2003) identify three approaches to help explain the real meaning of design quality. Their judgment-based approach focuses on an expert's intuitive ability to make creative adjustments in design. The manage-measure approach is a system for improvement based on defining parameters, measuring design processes, and measuring the value of the final product. The rational-adaptive approach is in the middle of the spectrum between the judgment and the manage-measure approaches. Macmillan (2004) argues that designers need to make buildings that are seen as a means rather than an end only. He claims that one of the most important determinants of design quality is the recognition of the long-term financial cost of owning and using buildings. Emphasis should be placed on the ratio between the cost of construction and the cost of maintaining and operating the business. In this background, Ornstein and Ono (2010) discuss the possibility of using post-occupancy evaluation to improve design quality, especially in architecture, and also its application in the management of entire design process.

1.1.2. Housing research in China

There is a fair amount of available literature on China's housing reform. However, most of this concentrates only on qualitative analyses of policies or history. *Modern Urban Housing in China 1840–2000*, edited by Lü, Rowe, and Zhang (2001), provides an introduction to how the housing industry has developed and how housing needs have been met. Through a comprehensive record, the book presents a variety of efforts undertaken to resolve China's housing problems during three periods: 1840–1949, 1949–1978 and 1978–2000. Xue's book *Building a Revolution: Chinese Architecture since 1980* (2006) gives an overview of the evolution of housing planning and design since 1978. This book points out that most of the main problems with existing housing result from the short-sighted housing development philosophy prevalent in China. A few relevant articles have also been published. Chen et al. (2005) examine seven critical environmental pressures in Beijing, to address the environmental concerns in urban planning and housing design. Gao and Asami (2010) propose an empirical framework to identify the preferred housing size for people in Beijing, which is 50–60 square meters or 80–90 square meters. Zhang et al. (2011), on the other hand, examine the benefits and barriers related to the application of green strategies to Chinese housing development and facilities management.

1.1.3. Research gap

According to existing literature review, the effectiveness in improving housing design quality depends largely on the willingness of industry practitioners. However, confronted with the complex decision-making situations of housing design quality, key industry practitioners often lack the willingness to balance benefits, burdens and long-term goals, and the readiness to take into consideration others' perspectives and reconcile differences. In this background, it is essential to seek co-understanding of practitioners in the housing supply chain. By conducting an empirical study, this research intends to establish a consensus on critical challenges to housing design quality, which will fill the research gap correspondingly.

1.2. Challenges to housing design quality

1.2.1. List of challenges to housing design quality according to the literature review

The potential critical challenges to housing design quality were explored through a review of the existing literature, which includes journals and books on housing development and online sources related to housing design management and performance measurement. Fourteen indicators highlighting the key issues in housing design quality were derived and compiled in Table 1.

1.2.2. Qualitative interviews

Although the fourteen challenges in the analytical protocol were identified in the literature review, further adjustment and confirmation were needed from professional interviews before a questionnaire could be developed. Interviews are considered to be the most efficient and practical way of accessing the views of practitioners. According to Liamputtong and Ezzy (2005), a careful selection of information-rich participants can provide a thorough and sophisticated understanding of a subject matter from all dimensions. Therefore, the criteria used for the sampling should include the participants' willingness to participate in the research, their knowledge and experience in housing design, and their positions in respective organisations. In order to achieve this, a specially designed sampling method was applied, narrowing down the participants willing to be studied to a specific group with rich and in-depth information of housing design quality issues in China.

Finally, a total of 24 participants were chosen for interviews conducted between July and August 2014 in addition to two focus group meetings. All the participants had been involved in housing development or housing business for more than ten years. All held directorship or top management positions with influence and decision-making power over housing development. The composition of high-ranking professionals and their extensive experience ensured strong data-input validity and a holistic representation of housing industry perceptions. Nineteen face-to-face interviews were conducted among the nineteen participants, with government agents (3), developers (4), architects (4), other consultants (3), builders (3), real estate agents (1), and property managers (1). Two focus group meetings were organised for other real estate

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