



Identifying the critical factors affecting schedule performance of public housing projects

Bon-Gang Hwang^a, Xianbo Zhao^{a,*}, Si Yi Ng^b

^aDepartment of Building, National University of Singapore, Singapore 117566, Singapore

^bRetails Operations Department, Far East Organization, Singapore 228213, Singapore

A B S T R A C T

Keyword:
Public housing
Building
Schedule
Singapore

With the increasing demand for public housing, the Singapore government decided to reduce the waiting time of future public housing owners, which requires these projects to be completed on time. As a result, this study aims to identify the critical factors affecting schedule performance of public housing projects in Singapore, compare the factors affecting schedule performance of public housing projects and other building projects in Singapore, and provide recommendations to respond to these factors. The survey conducted with 36 industry experts revealed that “site management”, “coordination among various parties”, and “availability of laborers on site” were the top three factors affecting schedule performance of public housing projects performed in Singapore. In addition, the results of the Spearman rank correlation coefficient implied that there was statistically significant agreement on the ranks of the player-related factors between HDB and other building projects. Furthermore, based on the interviews conducted with experienced practitioners, recommendations to deal with these factors are proposed. The findings from this study will help practitioners involving public housing projects to take measures to assure the achievement of project schedule objectives.

© 2012 Elsevier Ltd. All rights reserved.

Introduction

According to the Building and Construction Authority (BCA, 2012), Singapore’s construction demand, measured by total value of construction contracts awarded, increased by 16% year-on-year from S\$27.6 billion (US\$22.1 billion) in 2010 to S\$32 billion (US\$25.6 billion) in 2011. The great increase was backed by strong public sector construction demand of S\$15.2 billion (US\$12.1 billion), of which the increasing demand for public housing projects was an important element.

Public housing in Singapore is currently managed by the Housing and Development Board (HDB), which was established in 1960 in order to develop public housing and improve the quality of living environment for its residents. Thus, the public housing projects in Singapore are generally called HDB projects, which are attractive and affordable to Singaporeans and provide them with assets that can appreciate in value. Public housing has been the rising issue in Singapore in order to provide sufficient homes for all. The demand for public housing flats is also increasing. To better meet the demand, the Singapore government decided to reduce the waiting time of future owners for HDB flats, which needs their

completion on time and thus poses more schedule pressures to parties involved in the construction of HDB projects.

Delay would lead to incapability of achieving the schedule objectives of a project, and late completion and delivery tend to result in cost overruns, client dissatisfaction, and other consequent problems. Assurance of project schedule has been considered as an important indicator of project success, and factors associated with project schedule have been recognized to be critical to project success (Chua, Kog, & Loh, 1999; Ling, Low, Wang, & Lim, 2009). Hence, there is a need to identify critical factors that affect schedule performance of HDB projects. While causes of construction delay and factors affecting project schedule performance were identified in various literatures, few studies have been conducted to investigate such critical factors for building projects in Singapore, not to mention public housing projects. Hence, this study aims to fill this knowledge gap by achieving the following objectives:

- (1) To identify critical factors affecting schedule performance of public housing projects in Singapore;
- (2) To compare the factors affecting schedule performance of public housing projects and other building projects in Singapore; and
- (3) To provide recommendations to respond to these critical factors.

The findings from this study will provide a better understanding of the critical factors and help practitioners involving public

* Corresponding author. Tel.: +65 9345 2665; fax: +65 6775 5502.
E-mail address: zhaobx1984@gmail.com (X. Zhao).

housing projects to take measures to assure the achievement of project schedule objectives.

Background

The Singapore construction industry

Singapore's construction demand has fluctuated from 2003 to 2011. As Fig. 1 describes, during the period 2003–2008, the demand dramatically increased from S\$10 billion (US\$8.0 billion) to S\$35.7 billion (US\$28.4 billion). However, the value reduced by approximately 37% to S\$22.52 billion (US\$17.9 billion) in 2009 because of the 2008 financial crisis and the shrink in private sector construction demand. Then, the total demand rebounded in 2010 and increased to about S\$32 billion (US\$25.5 billion) in 2011, when the public construction demand represented 47.5% and the private construction demand accounted for 52.5%. More specifically, the construction demand from HDB projects was approximately S\$6 billion (US\$4.8 billion) in 2011, representing 18.75% of the total construction demand (BCA, 2012). The BCA (2012) also forecasted that Singapore's construction demand would be S\$21–27 billion (US\$16.7–21.5 billion) in 2012, and that the construction demand of public housing would slightly increase to S\$6.3 billion (US\$5.0 billion).

Public housing in Singapore

Public housing in Singapore is not generally viewed as a sign of poverty or lower living standards as compared to that in other countries. The housing sector in Singapore is dominated by HDB projects. Over 80% of Singaporeans live in HDB flats, and about 90% of them own their HDB flats (HDB, 2011). HDB flats are located in housing estates, which are self-contained satellite towns with schools, supermarkets, clinics, hawker centers, as well as sports and recreational facilities. HDB flats are built to provide affordable housing for the masses, and their purchase can be financially-aided by the Central Provident Fund.

The HDB provides more varieties and choices in housing design to cater to various groups of people by involving the private sector in the design and construction of HDB flats (HDB, 2011). In addition, the HDB plans and develops dynamic towns to provide adequate homes and a cohesive community for people to live in. With the increasing number of HDB flats to be built in years to come, there is an urgent need to strictly monitor and look out for the project schedule to ensure that housing is delivered to new owners on time. The Singapore government has set a target to reduce the waiting time of future owners from the current three years to two and a half years by streamlining the internal processes of HDB to award tenders of projects earlier. However, delay of the HDB

projects would hinder the achievement of this target. Delay happened in most construction projects (Sweis, Sweis, Abu Hammad, & Shboul, 2008) and it is better to identify causes of delay at the early stage of a project. As a result, it is meaningful to identify the critical factors affecting schedule performance of HDB projects.

Factors affecting construction project schedule performance

There are a variety of previous studies that analyzed factors affecting construction project schedule performance. Most of these studies focused on identification of major causes of delays in various construction projects. Table 1 provides a summary of previous studies on construction delays in a wide variety of countries or regions. However, few studies have been conducted to investigate factors affecting the schedule performance of building projects in Singapore. This study identifies 18 factors that can affect the schedule performance of public housing projects in Singapore.

(1) *Site management*

Site management is related to material distribution, commitment of site employees, project monitoring, and communication between parties (Enshassi, Al-Najjar, & Kumaraswamy, 2009), and thus affects project schedule performance. Long, Lee, and Lee (2008) found that poor site management was the most important cause of construction delay in Vietnam large construction projects. Similarly, Chan and Kumaraswamy (1997) identified poor site management and supervision as the most important cause of time overruns in Hong Kong construction projects.

(2) *Financing by contractors*

Hatush and Skitmore (1997) identified financial stability and financial status among the top ten criteria for contractor prequalification and bid evaluation. El-Razek, Bassioni, and Mobarak (2008) found that the owners and consultants considered financing by contractor during construction as the top cause of delay in Egyptian building projects. Aibinu and Odeyinka (2006) found that contractors' financial difficulties were the most important cause of construction delay in Nigeria.

(3) *Coordination among parties*

Cooperation and coordination among different parties involved in a project facilitates its completion on time. In contrast, conflicts are detrimental to the smooth progress of work and thus cause time overruns (Iyer & Jha, 2006). Coordination among parties was found to be among the top ten causes of delay in construction projects in Lebanon (Mezher & Tawil, 1998), Malaysia (Abdul-Kadir, Lee, Jaafar, Sapuan, & Ali, 2005) and Egypt (El-Razek et al., 2008).

(4) *Preparation of schedule plans and updates*

Sweis et al. (2008) found that the owners and consultants recognized poor planning and scheduling as the most critical delay cause of construction projects in Jordan, and demonstrated that this cause was relevant to shortage of technical professionals in contractors, insufficient coordination among parties, as well as ineffective quality control by contractors. In addition, planning and scheduling problems were also perceived as an important source of construction delay in Thailand, where project plans were not in sufficient detail and regularly updated (Ogunlana, Promkuntong, & Jearkjirm, 1996).

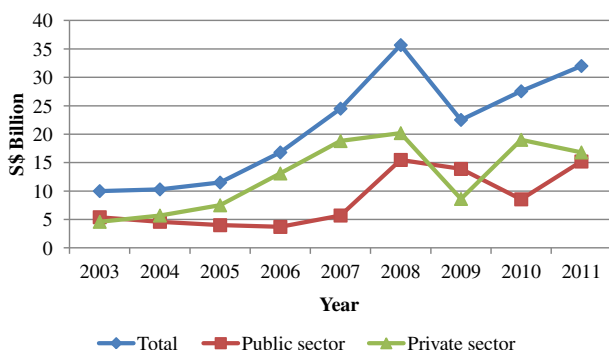


Fig. 1. Singapore's construction demand (2003–2011). Source: BCA (2012).

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات