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# An analytical method to evaluate facility management services for residential buildings

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ABSTRACT

Besides constructed quality and environmental quality, the quality of facilities in residential buildings is influential to the living quality of numerous residents there. The functional quality of the facilities, in turn, is dependent on the quality of their operation and management. A review of the relevant literature and a focus group discussion with Facility Management (FM) practitioners, which were parts of the study reported here, unveiled that prior performance evaluation studies focussed on assessing the outcome of FM services whereas an analytical method suitable for holistic evaluation of the services is lacking. An interview survey with 297 users of a typical residential estate in Hong Kong was carried out to solicit their perceived levels of importance and performance of FM services. The responses were tested using the Analytical Hierarchy Process (AHP) to isolate those with inconsistent judgments, followed by computing the weightings for various aspects of FM services based on the consistent responses. The calculation of a weighted performance score for benchmarking purposes and a critical evaluation of the cost-effectiveness of FM services, which are crucial for achieving a quality and sustainable built environment, are illustrated.



## 1. Introduction

Urban cities are typically crowded with high-rise buildings, many of which are residential buildings. Apart from the constructed quality of these buildings and their surrounding environmental quality, the quality of Facility Management (FM) services such as cleaning, repair and maintenance and so on is critical to the operation of the facilities including building fabric, ventilation systems, electrical installations, leisure and landscape facilities, etc. The performance of these facilities, in effect, is influential to the health, safety and enjoyment of the residents.

A lot of research efforts had been devoted to studying user satisfaction with construction services and products. For instance, Ahmed and Kangari [1] attempted to identify the factors important to construction client satisfaction. Maloney [2] examined the relationship between construction product/service and customer satisfaction. On the satisfaction of home buyers, Torbica and Stroh [3] proposed a model for assessing the design, quality and service dimensions of houses. More recently, Yang and Peng [4] reported on the development of a customer satisfaction evaluation model for construction project management.

Realizing the huge impacts that buildings can incur to the environment, numerous assessment tools have been developed for evaluating environmental performance of buildings [5,6]. The well-known ones include, *inter alia*, the Leadership in Energy and Environmental Design (LEED) assessment scheme in the US, the Building Research Establishment's Environmental Assessment Method (BREEAM) in the UK, the Comprehensive Assessment System for Building Environmental Efficiency (CASBEE) in Japan, and the Building Environmental Assessment Method (BEAM) in Hong Kong.

As to tools for assessing performance of FM services, the leading Post-Occupancy Evaluation (POE) tools for measuring building performance, according to an earlier review [7], include the Building Quality Assessment (BQA) in New Zealand, the Serviceability Tools and Methods (STM) in Canada, and the Post-occupancy Review Of Buildings and their Engineering (PROBE) in the UK. In the US, a web-based occupant survey has been developed for quantifying building performance, which focuses on employee's satisfaction with their workplace environment [8]. Asian examples include the Yeh's Index Number of Satisfaction [9] used in Singapore for investigating users' satisfaction on the management of public housing and a Korean model developed for evaluating the environment, function and comfort of residential buildings [10].

In Hong Kong, multi-storey residential buildings account for the majority of the building stock. The amount of residential flats has

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