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Assessment of Facility Management Candidates by Applying Game  
Theory

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### Abstract

Changing economic conditions impact on private property, real estate market and pursuit for business investments. Subsequent to in the process of building design and construction, the services provided for management of facilities are crucial to the quality of life of numerous inhabitants. The study findings on the importance, performance and cost-effectiveness of such facility management (FM) services have yet to be seen. A number of evaluation criteria are proposed that could significantly impact on the successful selection of FM services. The main factors to consider are general management (GM); security (S); cleaning (C); building characteristics (B), which are the key success factors in the process of choosing FM services. The game theory was used to rank the best candidate of FM services for commercial estates. The case-study demonstrated that the presented model can be used for practical problem solving.

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### Introduction

In the last decade, construction was one of the most important industrial branches. The quality of buildings highly depends on rational selection of the construction process, planning, technical and management problem in the aspects considering the aspects of the building's lifecycle [1].

#### 1. Facility management in building's lifecycle

The duration of construction is considerably short. The longest period in the building's lifecycle is facility management (FM). The lifecycle of a building in the view of FM services is presented in the Figure 1.

In terms of commercial buildings, facility management services are relevant for the entire duration of the ROI period [2]. Rational facility management services can significantly reduce the ROI period. Facility management services for commercial buildings comprise the general management system, cleaning (territory and building), repair and maintenance, and security.

The best strategy for facility management services is to choose the same company that constructed the building. If this strategy is not possible to realise, another service provider must be selected. In order to ensure efficient FM, is very important to find the right FM services provider. First of all, the selection is implemented from the point of view of strategic

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management [3-5]. For a service provider, it is a great challenge to efficiently manage and operate FM services of numerous buildings, which are of different structural types, ages, locations and functional purposes.

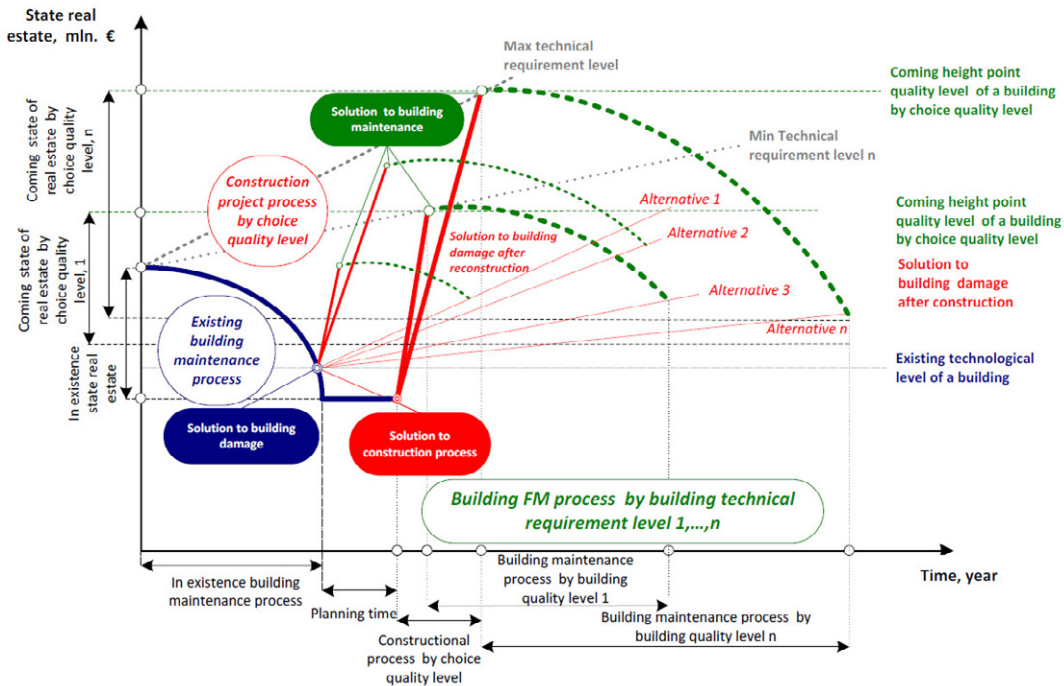


Fig. 1. FM services in the building's life cycle

For this reason, the model for assessment of FM services must be developed. Modelling is especially important, because every building is unique in terms of its FM processes and conditions. Such models are especially important for engineers, planners, organizers and managers, especially those, who have never encountered similar situations.

FM service providers have to operate considering the set and type of buildings and a number of technical and economic constraints. The life-cycle management policies are established for both infinite- and finite-time planning horizons [6]. The types of buildings are also comparable, implying that the design, quality of construction and facilities are similar. Another determining factor behind the selection is willingness of the management personnel to provide information on the relevant expenditures, without which the cost-effectiveness of FM services could not be evaluated. During the first stage of the study, before designing a suitable data collection tool, a focus group discussion in a group of experienced FM practitioners was convened. The discussion together with a thematic content analysis [7] on samples of questionnaires used by the leading management companies for soliciting users' satisfaction with FM services, as, enabled the identification of five main aspects, i.e. security (SEC), cleaning (CLN), repair & maintenance (R&M), leisure and landscape (L&L), and general management (GEN), which cover a wide range of attributes associated with the FM services typically provided for housing estates [9].

Each FM service provider must be centred on customer requirements and use them in the process of FM service development. The use of customer views in the process of FM service development is presented in Figure 2.

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