Ain-Shams University
Faculty of Engineering
Department Of Architecture

Integrating Value Engineering and Facility Management as an Approach to Face Risks

By

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DEDICATION

I dedicate this thesis to…

My Grandmother's soul…

My loving, caring, supportive, and great "Mother" who has never left my side… with a very special feeling of gratitude for her… for her kind heart and beautiful smile…

My supportive and loving "Father"...

My very special, cheerful and loving "Sister"...

And

All my loving Friends and Everyone who supported me and helped me through the way of this success…

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Success is only by Allah…

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Title**: Integrating Value Engineering and Facility Management as an Approach to Face Risks**

Degree**: Master of Science Degree in Architecture**

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Approval Stamp

The Research was approved on:

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Title Sheet

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Faculty	: Faculty of Engineering.
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Abstract

This research is concerned with a main problem that is demonstrated in: "The absence of a comprehensive tool that is capable of facing risks and uncertainties problems through building life cycle"; where ignoring risks during any phase through building life cycle leads to the evolution of various problems such as, (increasing cost, low space performance, lack of design efficiency, demolition during construction phases or after operation … etc.)

The research focuses on Public Service Building, which is considered a very important type of projects that serve hundreds of people every day whilst costing millions to be built. It also highlights the need for integrating value engineering and facility management to provide a tool to face risks through building life cycle. The main concern is to avoid increasing cost, low space performance, low design efficiency, demolition during construction phases or after operation … etc.

The thesis aims at introducing an approach through a tool and coherent aspect to face risks and uncertainties that face the building throughout its life cycle by integrating Value Engineering and Facility Management. The research illustrates the importance of integrating Facility Management and Value Engineering and clarifies the problems and the risks which may face the building through its life cycle. It also aims at improving the ability of facing risks through pre schematic phase, construction phase, testing and commissioning and operation and maintenance phases in addition to achieving best quality and avoiding problems through building life cycle.

The objective of this thesis is fulfilled through the following:

- *The Theoretical Background* which discusses the evolution of risks throughout the building life cycle and how to face these risks by integrating Facility Management and Value Engineering. The Theoretical Background is covered in chapters one and two.

- *The Analytical Study* which analyses some projects, evaluates them, assess the role of correlating VE and FM, and points out the conclusions and the recommendations of the study. The Analytical study is covered in chapters three and four.

The thesis contains four chapters and the conclusion as follows:

Chapter One: Introducing the concepts of Both Value Engineering and Facility Management:

It deals with the definitions of Facility Management and Value Engineering and their role through building life cycle. Chapter one focuses on the most comprehensive definitions of both value engineering and facility management, it also stood on the main common points, the involved tasks and the best phases of applying and integrating both tools to achieve the required targets of facing risks and adding value to the building. The chapter ends with a simple comparison between VE and FM and points out and illustrates the main common points between the two approaches. The chapter concludes that VE and FM are two approaches with common targets and six integrated parameters, where the both approaches aim at saving time and effort, facing risks and problems and adding value to a project. In order to achieve the previously mentioned targets, both VE and FM shall be applied through the whole life cycle of a building starting from early design phases to provide better solutions and results in addition to avoiding the evolution of uncertainties problems or unplanned risks.

Chapter Two: Risks Incurred in the Design and Implementation of Service Buildings:

This chapter defines and highlights different types of risks that may face a building during its life cycle starting from the design phase till the operation and maintenance phase. It Examines and analyzes some public service buildings and highlights the different types of risks and problems that faces the buildings through different phases due to the lack of understanding to the FM and VE roles and responsibilities which can have a negative impact on projects,

especially in terms of both budget and value. Chapter two focused on illustrating the differences between in-house and outsourced services and the risks that may occur as a result of depending on in-house services instead of outsourcing. The chapter ends with highlighting the percentages of different types, phases and causes of risks that may face a building during different phases through its life cycle. It concludes that approximately all risks can be easily controlled in the same phase of evolution in case of applying the FM approach. The severity of risk and the ability of controlling it differ from one project to another according to the phase of evolution, the consequences and the degree of preparedness to face the problem.

Chapter Three: The Status of Applying Facility Management:

The chapter's target is to clarify and determine the application status of facility management both nationally and internationally. This is achieved through a comparative analysis between the services provided by FM companies in Egypt and the international FM companies in addition to a questionnaire that was distributed among general construction projects managers, FM practitioners and academics ….etc. who are involved in the field of FM. The target of the questionnaire was to gather data and to conclude the current status and progress of FM in Egypt; where five main aspects to evaluate the performance of FM provided services were identified; vision, efficiency, flexibility, quality and scope of services. The chapter concludes two time lines that represent the progress of FM codes, status and provided services nationally and internationally. The chapter also presents a check list that clarifies the percentages of FM services that are provided by the national FM companies compared to that provided by the international companies and as determined by the "International Facility Management Association".

Chapter Four: Case Study:

It analyzes a case study "Dar project" and evaluates it to assess the role of integrating Facility Management and Value Engineering on facing risks through

the building life cycle. Chapter four stood on all the details of applying facility management and value engineering on Dar project. It focused on the effect of applying both tools on solving the different risks that faced the project in addition to achieving the aim of the previously mentioned aspects (vision, efficiency, flexibility, quality and scope of services) by applying some agreed KPIs that were determined in a general contract which was signed with a FM supervision service provider to manage and supervise the service providers selected by Dar in order to fulfill the scope and performance of all FM services to the highest level and achieve maximum satisfaction to the users.

Conclusions and Recommendations:

The results of both theoretical and analytical studies are presented and compared to the research hypotheses to prove them and the recommendations are pointed out.

Author's Declaration

I the undersigned, hereby declare that this dissertation submitted to Ain Shams University, Faculty of Engineering, Department of Architecture; is my original work and no part of it was submitted to any other institution or university to achieve any degree and that all the references to the work of other authors have been duly acknowledged.

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Samar El Motasem