



Ain Shams University

Faculty of Engineering

Civil Engineering Department

Factors Affecting Success of Construction Projects in Egypt

By

Zeinab Yousef Al Zarrugh

Structural Division –Civil Engineering Department

Faculty of Engineering – Tripoli University

A Thesis

Submitted in Partial Fulfillment of the Requirements
of the Degree of Master of science in Structural Engineering

Under the Supervision of:

Prof.Dr.Ayman Hussein Hosny

Professor at Structural Engineering Dept.

Faculty of Engineering

Ain Shams University, Egypt

Dr.Mohamed Badawy Abd El-Mejid

Lecturer at Structural Engineering Dept.

Faculty of Engineering

Ain Shams University, Egypt

January 2016

Cairo - Egypt

بسم الله الرحمن الرحيم

وبه نستعين

وعليه نتوكل

قال تعالى

"سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم"

"وقل ربي زدني علماً"

صدق الله العظيم

اللهم صلي وسلم على أشرف المرسلين

سيدنا محمد عليه الصلاة وأزكى سلام



AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING

APPROVAL SHEET

Thesis : Master of science in Structural Engineering
Researcher Name : Zeinab Yousef Al Zarrugh
Thesis Title : Factors Affecting Success of Construction Projects in Egypt

Examiners Committee

Signature

Prof.Dr.Mohamed Mahdy Marzouk
Professor of Construction Engineering and
Management
Structural Engineering Dept.
Faculty of Engineering - Cairo University

Prof.Dr.Ahamed Hasan Ghallab
Professor of Reinforced Concrete Structures
Structural Engineering Dept.
Faculty of Engineering- Ain Shams University

Prof.Dr.Ayman Hussein Hosny
Professor of Reinforced Concrete Structures
Structural Engineering Dept.
Faculty of Engineering- Ain Shams University

Date : 27 /1 /2016

STATEMENT

This thesis is submitted to Ain Shams University in partial fulfillment of the requirements for the degree of Master of Science in Structural Engineering.

The work included was carried out by the author in the Department of Civil Engineering (Structural Division), Faculty of Engineering, Ain Shams University.

No part of this thesis has been submitted for a degree or a qualification at any other university or institution.

Date: 27th Jan.2016

Name: Zeinab Yusef AlZarrugh

Signature:

AUTHOR

Name	:	Zeinab Yusef AlZarrugh
Date of birth	:	28/02/1972
Place of birth	:	Tripoli - Libya
Academic Degree University	:	B.Sc. Civil Engineering
Date	:	June 1996

ACKNOWLEDGEMENT

First of all, I thank ALLAH who guided and helped me to finish this work in the proper shape.

I would like to thank my father, mother and my whole family for their continuous support.

Special thanks to my husband Eng. Abdul Raouf Mohamed Duzan for his marvelous support and continuous encouragement of my son Mohamed, and my daughters Rana, Rayan, and Yara.

I would like to express my deep appreciation to my dear Prof. Dr. Ayman Hassan Khalil, Professor of Reinforced Concrete Structures , faculty of engineering, Ain Shams University, EGYPT, for his experienced advice, valuable suggestions, and continuous support and deep through all phases of the work.

I am also extremely grateful to Dr. Mohamed Badawy Abd El- Mageed, Lecturer at Structural Engineering Dept. faculty of engineering, Ain Shams University, EGYPT, for his experienced advice, deep support through all phases of the work.

ABSTRACT

Title: Factors Affecting Success of Construction Projects in Egypt

Submitted by : Zeinab Yousef AlZarrugh ¹

Supervised by Prof. Dr. Ayman Hassan², and Dr. Mohamed Badawy²

^{1,2} Structural Department, Faculty of Engineering, Ain Shams University

The construction industry is one of the most important economic activities that contribute to the economic growth of any nation. The real estate market in Egypt increased by demand due to high rates of population growth. It has been fluctuating, especially in recent years. The Egyptian real estate market is one of the strongest sectors in which investors feel safe to inject money and increase their investment. However, the current situation casts doubts on the sector, but it is still one of the most important sectors that are seen by investors to have hope and positivity. The goal of all parties involved in construction projects (Owners, Contractors, Engineers and Consultants) in either the public or private sector is to successfully complete the project on schedule, within planned budget, with the highest quality and in the safest manner. Construction projects are frequently influenced by either critical success factors that help project parties reach their goal as planned.

The purpose of this research is to identify, investigate, and rank critical success factors which can help project parties reach their intended goals with greater efficiency. The adopted methodologies to accomplish this study are review of literature related to factors affecting success in construction projects and questionnaire to collect the data and perspectives of the respondents. Total of ninety-four (94) factors were short-listed made part of the questionnaire survey and were identified and categorized into twelve (12) major categories. The survey was conducted with experts and representatives from private, public of local general construction firms. The data were analyzed using Relative Importance Index (RII), ranking. Ranking of factors and categories was demonstrated according to their importance level on success. According to the highest percentage of Relative Importance Index, the top ten factors are prioritized for owners, consultants, and contractor's every alone and for all of them which express the top ten factors affecting success of construction projects in Egypt.

The results of the questionnaire reveal that important factors affecting success of construction projects in Egypt were: contractor experience, payments on time, client financial capability, changes in tax and accounting system, type of client (private vs. public), decision making effectiveness, project manager's experience, overall managerial actions, adequacy of plans and specifications, and project size and value. The top five groups of factors affecting success of construction projects in Egypt for all respondents were: contractor related factors, financial related factors, project manager related factors, client related factors, and project management factors.

According to the feedback of owners, consultants, and contractor's respondent's opinions using statistical analysis, there was a good correlation between parties with respect to most of success factors discussed. There was no significant difference between owners, consultants, and contractors regarding factors affecting success of construction projects.

Keywords: Egypt, Critical Success Factors, Construction Projects, Relative Importance Index (RII).

Table of Contents

	Page
Acknowledgment.....	II
Table of Content.....	II
Appendix	II
List of Tables	VI
List of Figures	VIII
List of Abbreviations	XI
Abstract	XII
CHAPTER ONE	1
1-INTRODUCTION	1
1.1 General	4
1.2 Research Objectives	4
1.3 Thesis Layout	4
CHAPTER TWO	5
2-LITERATURE REVIEW	5
2.1 General	5
2-2 A Successful Project	6
2.3 Critical Success Factors for Construction Projects	6
2.4 Factors Affecting Project Success	7
2.4.1 Project Management Factors	7
2.4.2 Procurement-related Factors	7
2.4.3 Client-related Factors	7
2.4.4 Design team-related Factors	8
2.4.5 Contractor related a factor	8
2.4.6 Project -Manager-related Factors	8
2.4.7 Business and Work Environment-relate Factors	9
2.4.8 Project-Related Factors	10
2.5 Significance of Project CSFs	10
2.6 Critical Success Factors for Construction Projects in General	10
2.7 History of Project Success Research	17
2.7.1 Determinants of Construction Project-Success	19
2.7.2 Critical Success Factors for Construction Projects	22
2.7.3 Checklist of Critical Success Factor for Building projects	23
2.7.4 Critical Success Factors for Different Project Objectives	24
2.7.5 Success Factors in the Construction Process	27
2.7.6 Critical Success Factors over the Stages in the Project Life Cycle	28
CHAPTER THREE.....	28
3- RESEARCH METHODOLOGY.....	28
3.1General	28
3.2 Research Population	30
3.3 Sample Size	30
3.4 Pilot Study	33
3.5 Questionnaire Design and content	33
3.6 Data Processing and Analysis	34

3.6 Data Processing and Analysis	34
--	----

	page
3.7.1 Content Validity of the Questionnaire.....	36
3.7.2 Statistical Validity of the Questionnaire	36
3.7.2.1 Criterion Related Validity	36
3.7.2.2 Structure Validity of the Questionnaire	42
3.8 Reliability of the Research Questionnaire	43
3.9 Questionnaire Distribution	44
CHAPTER FOUR	45
4- DATA ANALYSIS AND DISCUSSION	45
4.1 General	45
4.1.1 Type of work	46
4.1.2 Class of classification	47
4.1.3 Position of Respondents.....	47
4.1.4 Respondent's year of Experience	48
4.2 Factors Affecting success of affecting construction project in Egypt	48
4.2.1 Questionnaire Feedback from all respondent's	49
4.2.1.1 Factors Related to Contractor	49
4.2.1.2 Factors Related to Project Manager	50
4.2.1.3 Factors Related to Procurement	50
4.2.1.4 Factors Related to Design Team	50
4.2.1.5 Factors Related to Project Management	52
4.2.1.6 Factors Related to Client.....	53
4.2.1.7 Factors Related to Work Environment.....	54
4.2.1.8 Factors Related to Materials.....	54
4.2.1.9 Factors Related to Labor and Productivity.....	55
4.2.1.10 Factors Related to Financial	55
4.2.1.11 Factors Related to Environment	56
4.2.1.12 Factors Related to Project Characteristic	57
4.2.2 Questionnaire Feedback from (Owner –Consultant- Contractor)	57
4.3 Ranking Factors According to the Relative Important Index	58
CHAPTER FIVE	61
5- ANALYSIS OF DATA USING STATISTICAL TEST (ANOVA)	61
5.1 General	61
5.2 Frequency of success factor	61
5.3 Comparison of factors between Owner, Consultant, and contractor	69
5-3-1 median and range for success factors	69
5-3-2 Summary	70
CHAPTER SIX	76
6-CONCLUSIONS AND RECOMMENDATIONS	76
6-1 Summary	76
6-2 Conclusions	76
6-3Recommendations for Future Studies	77
References	78
Appendix A – Questionnaire	84
Appendix B - Questionnaire Feedback from Owner's Respondent	92
Appendix C - Questionnaire Feedback from Consultant's Respondent	99
Appendix D - Questionnaire Feedback from Contractor's Respondent	106

List of Tables

	Page
Table 1-1 GDP Sectoral Breakdown (Q1 2014/2015).....	2
Table 2.1 Critical success factors (CSF) summarization refining from literature survey.....	16
Table 2.2 Factors affecting the success of construction project (Chan, 2004).....	20
Table 2.3 Critical Success Factors for Different Project Objectives (Chua et al, 1999).....	24
Table 3.1 Lekart scale.....	34
Table 3.2 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Contractor-Related Factors).....	37
Table 3.3 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Project Manager Related Factors).....	37
Table 3.4 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Procurement Related Factors).....	38
Table 3.5 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Design Team-Related Factors).....	38
Table 3.6 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Project Management Factors).....	39
Table 3.7 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Critical Success Factors Related to Client).....	39
Table 3.8 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Factors Related to Work Environment).....	40
Table 3.9 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Factors Related to Materials).....	40
Table 3.10 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Factors Related to Labor and Productivity).....	40
Table 3.11 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Financial Factors).....	40
Table 3.12 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Environmental Factors).....	41

Table 3.13 Correlation coefficient between each paragraph in one field and the whole field for factors affecting success of housing projects in Egypt (Project Characteristic Factors).....	41
Table 3.14: Correlation Coefficient between each filed and all the fields for factors affecting success of housing projects in Egypt.....	42
Table 3.15: Cronbach's Coefficient Alpha Test for factors affecting success of housing projects in Egypt (Contractor-Related Factors).....	43
Table 4.1: Type of work.....	44
Table 4-2Class of classification (According to contracting union for the building fields).....	47
Table 4.3: position of respondent.....	47
Table 4.4 Respondent's years of experience	48
Table 4.5: Factors Related Contractor.....	49
Table 4.6: Factors Related to Project Manager.....	50
Table 4.7: Factors related to procurement.....	51
Table 4.8: Factors Related to Design Team.....	52
Table 4.9: Factors related to project Management.....	52
Table 4.10: Factors Related to Client.....	53
Table 4.11: Factors Related to Work Environment.....	54
Table 4.12: Factors Related to Materials.....	55
Table 4.13: Factors Related to Labor and Productivity.....	55
Table 4.14: Factors Related to Financial.....	55
Table 4.15: Factors Related to Environment.....	56
Table 4.16: Factors Related to Project Characteristic.....	57
Table 5.1: Percentage of Respondents for Contractor Related Factors.....	61
Table 5.2: Percentage of Respondents for Project Manager Related Factors.....	62
Table 5.3: Percentage of Respondents for Procurement Related Factors.....	63
Table 5.4: Percentage of Respondents for Design Team-Related Factors.....	64
Table 5.5: Percentage of Respondents for Project Management Factors.....	64
Table 5.6: Percentage of Respondents for Critical Success Factors Related To Client.....	65

Table 5.7: Percentage of Respondents for Critical Success Factors Related To Work Environment.....	67
Table 5.8: Percentage of Respondents for Critical Success Factors Related To Materials.....	66
Table 5.9: Percentage of Respondents for Critical Success Factors Related To Labor and Productivity.....	67
Table 5.10: Percentage of Respondents for Financial Factors.....	67
Table 5.11: Percentage of Respondents for Environmental Factors.....	68
Table 5.12: Percentage of Respondents for Project Characteristic Factors.....	69
Table 5.13: Median and Range for total Factors Affecting success.....	70
Table 5.14: Median and Range for Owner Respondents.....	71
Table 5.15: Median and Range for consultant Respondents.....	72
Table 5.16: Median and Range for Contractor Respondents.....	72
Table 5.17 Average median and Rang of factors affecting success group.....	73
Table 5.18: Average of median value and range of each success factors group.....	74
T able 5.19: Comparison of Grand total between Owner, consultant and contractor.....	74
Table 5.20: One-way analysis of variance (ANOVA)	74
Table 5.21: Kruskal-Wallis Test (non-parametric ANOVA test)	75

List of Figures

Figure 1.1 Egypt Growth rates of economic sectors for the fiscal years 2013-2014.....	3
Figure 1.2 Relative contributions of sectors in Egypt economic growth for the fiscal years 2013-1014.....	3
Figure 3.1 Flow Chart of the Research Methodology.....	29
Figure 4.1: Type of work.....	46
Figure 4.2: Class of Classification.....	46
Figure 4.3: Position of respondents.....	47
Figure 4.4: Respondent Years experience.....	48
Figure 5.1: Median Score of all responses to the frequency factors success.....	70
Figure 5.2 Median score of all responses to the success factors.....	70

List of Abbreviations

Statistical Package for the Social Sciences	(SPSS)
Analysis of variance	ANOVA
Gross domestic product	(GDP)
Critical success factors	(CSFs)
Sample size	SS
Value (e.g. 1.96 for 95% confidence level)	Z Z
Percentage picking a choice (0.5 used for sample size needed)	P
Confidence interval, expressed as decimal (e.g. 0.05 = ± 5 or 0.10= ± 10)	C
Population	Pop
Relative importance index	RII
Degree of freedom	df