



Ain Shams University
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Value Engineering Analysis in the Construction of Box-Girder Bridges

Thesis

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By

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STATEMENT

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

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

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ABSTRACT

Value Engineering Analysis in the Construction of Box-Girder Bridges

Bridges construction are one of the most challenging construction projects around the world as it necessitates a lot of engineering, experience, equipment, and a huge deal of money. Consequently, it is indispensable to consider appropriately how to direct the monetary total spent on such projects. Currently the selection process of bridge's superstructure construction methods in Egypt mainly depends on the experts' knowledge and experience without performing or applying a systematic procedure. Thus, the decision might not be the most suitable one as some important considerations could be neglected.

Recently, box-girder bridges are considered as one of the most common systems of Nile bridges constructed in Egypt and it is also widely used all over the world. There are many methods of the construction of box-girder bridges. Therefore in order to select the most appropriate construction method many factors should be well considered as site conditions, technology used, construction method characteristics and bridge physical characteristics.

In this study, a machine learning model is developed to determine the most appropriate box-girder bridge construction method, applying the spirit of Value Engineering technique. Value Engineering is used for comparing the different construction methods for achieving the required

basic function after considering the main significant factors and without affecting the desired quality.

Keywords: Box-girder - value - construction methods - Value Engineering - Egypt - artificial intelligence – classification - machine learning - analysis.

TABLE OF CONTENTS

	Page
Acknowledgement	I
Abstract	II
Table of Contents	IV
List of Figures	VII
List of Tables	XII
Chapter 1: Introduction	1
1.1 Background	1
1.2 Problem Statement	3
1.3 Research Objectives	4
1.4 Summary of Research Methodology	5
Chapter 2: Literature Review	7
2.1 Introduction	7
2.2 Value Engineering Literature Review	7
2.3 Bridges Construction Methods Literature Review	19
2.4 Artificial Intelligence Literature Review	25
Chapter 3: Box-Girder Bridges Construction Methods	28
3.1 Introduction	28
3.2 Benefits of using the Box-Girder Cross Section in Bridges	28
3.3 Box-Girder Bridges Construction Methods in Egypt and in the Middle East	28
Chapter 4: Definition, Principles and Methodology of the Value Engineering Technique	45
4.1 Introduction	45
4.2 Definition of Value Engineering	46
4.3 History of Value Engineering	47

4.4	Factors to be Considered When Applying Value Engineering Concept	48
4.5	Fundamentals of Value Engineering	50
4.6	Verb- Noun Approach	51
4.7	Methodology of Value Engineering	52
	Chapter 5: Artificial Intelligence	61
5.1	Introduction	61
5.2	Definition of Artificial Intelligence	61
5.3	Knowledge Representation	62
5.4	AI Application Areas	63
5.4.1	Machine Learning	63
5.4.1.1	Machine Learning Application	65
	Chapter 6: Developing the Artificial Intelligence Model	79
6.1	Introduction	79
6.2	Bridge Construction Industry in Egypt	79
6.3	Interviews	80
6.3.1	Results of Interviews	80
6.3.1.1	Main Box-Girder Bridge Construction Method used in Egypt and in the Middle East	80
6.3.1.2	The Factors Affecting the Choosing Criteria of the Most Appropriate Method	81
6.3.1.3	The Participants with this Research and the Needed Information for the Next Stages	84
6.4	Questionnaire Survey	85
6.4.1	Questionnaire Design	86
6.4.2	Questionnaire Results	87
6.5	Value Engineering Data Mining Software	96
6.5.1	WEKA Design and Implementation	97

6.5.2	Data Set Format	99
6.5.3	Machine Learning Schemes	101
6.5.4	Output Processing	104
6.6	The Graphical Interface System (IBCT)	104
6.7	The Evaluation Phase of the System	108
6.7.1	The Main Information of the Project	108
6.7.2	The Main Features of the Project	110
6.7.3	Testing the System	110
6.7.3.1	The Part Crossing the Nile	110
6.7.3.2	The Part Crossing the Highway	112
6.7.4	Results Analysis in WEKA (PREval)	114
Chapter 7: Summary, Conclusions and Recommendations		119
7.1	Introduction	119
7.2	Summary	119
7.3	Conclusions	121
7.4	Recommendations for Future Studies	123
Appendix (A): Survey on the Selection Criteria for		
	Construction Methods of Box Girder Bridges	124
Appendix (B): Questionnaires' Data in ARFF Format		139
References		150
Arabic Summary		
Arabic Abstract		

LIST OF FIGURES

Figure	Title	Page
Figure 1.1	Map of Egypt showing the planned box-girder bridges projects up to 2017, (General Authority for Roads, Bridges and Land Transport (GARBLT), 2007)	2
Figure 1.2	Goals of implementing Value Engineering technique (Abdul-Aziz S. Al-Yousefi, 2010)	3
Figure 1.3	Summary of research methodology	6
Figure 2.1	Value graph with importance vs. cost (bridge component evaluation), (GangaRao et al, 1988)	11
Figure 2.2	Best time for implementing Value Engineering (Dell' Isola, 1997)	13
Figure 2.3	Memorial Causeway Bridge during construction (William R. Adams III, 2004)	25
Figure 3.1	Different construction methods of box girder bridges	29
Figure 3.2	Construction of Superstructure Interchanges /Bridges at Sultanate of Oman (Muscat) - (Staging Erection using Global Scaffolding System), (Alexander Artamonov et al (2008))	30
Figure 3.3	Balanced cantilever construction (Gunnar Lucko, 1999)	32
Figure 3.4	Balanced cantilever method during	34

	construction”, Kanawha river bridge / West Virginia”, (Santiago Rodriguez and T.Y. Lin International, 2008)	
Figure 3.5	Incremental Launching Technique (Gunnar Lucko, 1999)	36
Figure 3.6	Launching nose during erection of the Gebergrund Bridge in Germany (Boldi Kisch and Per Langefors, 2005)	38
Figure 3.7	The general construction sequence of the Mobile Scaffolding Method (Construction Stage Analysis of MSS tutorial, Project Reference Catalogue, 2007)	39
Figure 3.8	Taiwan High Speed Rail Project during construction using mobile scaffolding system (Project Reference Catalogue, 2007)	41
Figure 3.9	Traveler Profile in Taiwan High Speed Rail Project (Project Reference Catalogue, 2007)	41
Figure 3.10	Post-tensioning ducts in a box girder (Dr. Amlan K Sengupta and prof. Devdas Menon, 2008)	43
Figure 3.11	Steel box girder bridge (K.C.Chauhan et al, 2006)	44
Figure 4.1	Major decision-makers of facility costs (Barton, 2000)	48
Figure 4.2	Life Cycle Costing- Typical Office Building (Barton, 2000)	49
Figure 4.3	Cost Impact of Principal Disciplines (Barton,	50

	2000)	
Figure 4.4	The three Stages of Value Engineering (Abdul-Aziz S. Al-Yousefi, 2010)	52
Figure 4.5	The Seven Phases of the VE Job Plan (Abdul-Aziz S. Al-Yousefi, 2010)	53
Figure 4.6	Why/How Logic Diagram of Rules for Brainstorming (Menno Huiser, 2007)	57
Figure 5.1	The process of supervised Machine Learning (Kotsiantis, 2007)	67
Figure 5.2	A decision tree (Kotsiantis, 2007)	68
Figure 5.3	A multi-layer neural network (Donalek, 2011)	70
Figure 5.4	Example for supervised learning: Classification in two dimensions. Labels are binary Red and Blue. The black line is the decision boundary for future predictions (Adams, 2011)	77
Figure 5.5	Example for unsupervised learning: Clustering in two dimensions. There are no labels for data points; however, data can be easily classified into three groups indicated by x, Δ, o (Adams, 2011)	78
Figure 6.1	Percentage of Responses to the sent questionnaires	87
Figure 6.2	Percentage of responses according to years of experience	88
Figure 6.3	Percentage of responses with respect to the decision makers of the selected construction	89

	method	
Figure 6.4	Percentage of respondents having a specific procedure for the selection process verses other don't have one	90
Figure 6.5	Percentage of respondents about whether they apply VE or not	91
Figure 6.6	Percentage of respondents according to the savings achieved due to applying VE	92
Figure 6.7	Percentage of respondents who apply the VE technique using a specialized team verses those who don't have one	93
Figure 6.8	The first interface window of WEKA	99
Figure 6.9	The ARFF format of the questionnaires' data (Information Phase)	100
Figure 6.10	The data is presented in WEKA (Function Analysis Phase)	102
Figure 6.11	The data visualization in WEKA	103
Figure 6.12	The graphical interface system IBCT	105
Figure 6.13	The first window appears after selecting the new file button	106
Figure 6.14	This figure shows the range given for the span of bridge	106
Figure 6.15	The data required for the surrounding environment characteristics	107
Figure 6.16	The data required for the construction method characteristics	108
Figure 6.17	The location of the bridge	109

Figure 6.18	The information of the physical characteristics	111
Figure 6.19	The information of the surrounding environment	111
Figure 6.20	The information of the construction method characteristics and the most appropriate method is revealed	112
Figure 6.21	The information of the physical characteristics	113
Figure 6.22	The information of the surrounding environment	113
Figure 6.23	The information of the construction method characteristics and the most appropriate method is revealed	114
Figure 6.24	The PREval screen showing probabilities of each construction method (using Naive Bayes classifier)	115
Figure 6.25	The PREval screen showing probabilities of each construction method (using Multi-Layer Perceptron (Neural Network))	116
Figure 6.26	The PREval screen showing probabilities of each construction method (using Naive Bayes classifier)	117
Figure 6.27	The PREval screen showing probabilities of each construction method (using Multi-Layer Perceptron (NN))	118

LIST OF TABLES

Table	Title	Page
Table 5.1	Comparing learning algorithms (**** stars represent the best and * star the worst performance), (Kotsiantis, 2007)	75
Table 6.1	Responses sorted by profession	88
Table 6.2	Responses sorted by the experts' place of work	89
Table 6.3	Calculations of the average rank for each level in the hierarchy	94
Table 6.4	Recalculations of the average rank after performing the required modifications	95

CHAPTER

1

INTRODUCTION