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Maintenance Management for the Replacement of the Governmental Heavy Service Equipment

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نموذج التفويض

أنا عمار محمود خليل، أفوض جامعة الاسراء بتزويد نسخ من رسالتي للمكتبات أو المؤسسات أو الهيئات أو الأشخاص عند طلبهم حسب التعليمات النافذة في الجامعة.

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بسم الله الرحمن الرحيم

﴿ يَرۡفَعِ ٱللَّهُ ٱلَّذِينَ ءَامَنُواْ مِنكُمۡ وَٱلَّذِينَ
أُوتُواْ ٱلۡعِلۡمَ دَرَجَٰتٖۚ وَٱللَّهُ بِمَا
تَعۡمَلُونَ خَبِيرٞ ﴾

[سورة المجادلة: 11]

DEDICATION

To my mother

To the soul of my father

To my brothers and sisters

To my wonderful wife

To my children Mustafa , Noor Al-Huda and Abd Al-Rahman

To my great family

With love

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TABLE OF CONTENTS

COMMITTEE DECISION II

DEDICATION IV

ACKNOWLEDGEMENT V

TABLE OF CONTENTS VI

LIST OF TABLES IX

LIST OF FIGURES X

LIST OF ABBREVIATIONS XII

ABSTRACT XIV

Chapter: One Introduction 1

1.1 Background 1

1.2 Problem Statement 2

1.3 Research Importance 2

1.4 Research Aim and Objectives 3

1.5 Research Methodology 3

1.6 Research Hypotheses 4

1.7 Thesis Structure 4

Chapter: Two Literature Review 5

2.1 Introduction 5

2.2 Maintenance 5

2.3 Maintenance Objectives and Benefits 6

2.4 Maintenance Types 7

2.5 Maintenance Challenges 10

2.6 Maintenance Policies 11

2.7 Equipment Replacement 14

2.7.1 Equipment Costs 14

2.7.2 Operating Costs 15
2.8 Conventional Replacement Problem 16
2.9 Equipment Renewal 17
2.10 Impact of Fuel Volatility on Equipment Economic Life 18
2.11 Optimal Economic Life-cycle Analysis 21
2.12 Previous Related Studies 23
2.13 Summary 31
Chapter Three: Equipment Replacement Methodology 32
3.1 Introduction 32
3.2 The Adopted Methodology 33
3.3 Data Collection Method 34
3.4 Specifications of Utilizing Equipment in Governmental Service Departments 35
3.5 Salvage Value of Equipment 36
3.6 Theoretical Mathematical Model for Replacement 37
3.7 Equipment Ownership Cost 38
3.8 Depreciation 39
3.9 Investment Cost (Interest) 42
3.10 Insurance Costs, Taxes and Storage Cost 42
3.11 Equipment Operating Costs 43
3.11.1 Maintenance and Repair Cost 44
3.11.2 Cost of Tires' Maintenance and Replacement 45
3.11.3 Fuel Cost 47
3.11.4 Lubricating Oil Cost 48
3.11.5 Equipment Operator Cost 50
3.11.6 Special Items Cost 51
3.12 Data Analysis 51

Chapter Four: Results and Discussion **53**
4.1 Introduction 53
4.2 Analysis and Replacement Management of Municipality Equipment 53
4.2.1 Averaging of Actual Input Data 54
4.2.2 Input Data Clustering and Predication Data Generation 60
4.2.3 Generation of the Periodic Data 63
4.2.4 Time of replacement Calculations 66
4.3 Times of Replacement of Other Equipment 69
4.4 Administrative Rules for Heavy Equipment Economic Replacement 84
Chapter Five: Conclusions and Recommendations **87**
5.1 Introduction 87
5.2 Aim and Objectives Achieved 87
5.3 Research Conclusions 88
5.4 Recommendations 89
5.5 Limitations 90
5.6 Suggestions for Future Research 90
References **91**
Appendices A-E ..... **A-E**
Appendix A: Equipment Actual Collected Cost Data (ID) A1
Appendix B: Average Modified Data (ID) B1
Appendix C: Data Resulting from Clustering for 6-month Periods C1
Appendix D: Input Data Clustering and Predication Data Generation D1
Appendix E: Equipment Average Salvage Value E1
ملخص باللغة العربية ..... **I**

LIST OF TABLES

Table 3.1: Maintenance and repair cost Mrc 45

Table 3.2: Cost of tires' maintenance and replacement 47

Table 3.3: Fuel cost 48

Table 3.4: Cost of oil 50

Table 3.5: Lubrication cost for each year 50

Table 3.6: Operator cost 51

Table 3.7: Special items cost 51

Table 3.8: Equipment details 52

Table 4-1: Kawasaki 80z Shuffle data cost (ID) 55

Table 4-2: Sum of average operating cost for Kawasaki Z80 shuffle (ID) 56

Table 4-3: Kawasaki 80z shuffle data after modification (ID) 57

Table 4-4: Sum of average of operating cost of the modified data of Kawasaki 80z shuffle data (ID) 58

Table 4-5: Fourier's series of modified actual input data 59

Table 4-6: Data resulting from clustering for 6-month periods 61

Table 4-7: Actual modified and predicated data for the 2.5- year periods 63

Table 4-8: values concluded from the Fourier series analytical program 66

Table 4-9: Average Salvage value Shuffle 80z Kawasaki 67

Table 4-10: Results of time of replacement for all considered equipment 84

LIST OF FIGURES

Figure 2.1: Forms of maintenance (Handbook,2013) 8

Figure 2.2: Planned and unplanned maintenance forms(Handbook,2013) 9

Figure 2.3: Maintenance policy and its influential factors (International Journal of Software Engineering & Applications (IJSEA), Vol.2, No.3, July 2011) 12

Figure 2.4: Economic life of equipment based on the cost minimization method (Kauffman, 2012) 19

Figure 2.5: Historical fuel costs (U.S. Department of Energy, 2014) 21

Figure 2.6: Fuel impact on equipment life-cycle cost (Edward Patrick O connor,2014) 22

Figure 3.1:Flowchart of the research methodology 33

Figure 3.2: Comparison of depreciation methods, Akeel A. Mohamed. (2016) 40

Figure 4-1: Modified actual input data 59

Figure 4-2: Input data and Fourier series approximation 60

Figure 4-3: Input data for the first six month 61

Figure 4-4: 2nd order polynomial fitting for all six months 64

Figure 4-5: from 2nd –order polynomial fitting for the six months average 65

Figure 4-6: Periodic function of the average function 65

Figure 4-7: extrapolation data and Fourier series approximation 66

Figure 4-8: Time of replacement plot for Shuffle 80z Kawasaki 68

Figure 4-9: Periodic function of the operation costs for the Caterpillar grader 69

Figure 4-10: Time of replacement plot for Caterpillar grader 70

Figure 4-11: Periodic function of the operation costs for the Steel Roller 71

Figure 4-12: Time of replacement plot for Steel Roller 71

Figure 4-13: Periodic function of the operation costs for the Dump Truck 72

Figure 4-14: Time of replacement plot for Dump Truck 73

Figure 4-15: Periodic function of the operation costs for the Water Tanker 73

Figure 4-16: Time of replacement plot for Water Tanker 74

Figure 4-17: Periodic function of the operation costs for the Garbage Compactor Truck 75

Figure 4-18: Time of replacement plot for Garbage Compactor Truck 75

Figure 4-19: Periodic function of the operation costs for the small Terex Shuffle 76

Figure 4-20: Time of replacement plot for small Terex Shuffle 77
Figure 4-21: Periodic function of the operation costs for the Shuffle Cams 78
Figure 4-22: Time of replacement plot for Shuffle Cams 78
Figure 4-23: Periodic function of the operation costs for the Ham Rubber Roller 79
Figure 4-24: Time of replacement plot for Ham Rubber Roller 80
Figure 4-25: Periodic function of the operation costs for the Asphalt spreader 81
Figure 4-26: Time of replacement plot for Asphalt spreader 81
Figure 4-27: Periodic function of the operation costs for the Sweeper NISSAN 82
Figure 4-28: Time of replacement plot for Sweeper NISSAN 83

LIST OF ABBREVIATIONS

Symbol	Meaning	Units
BV_n	Book value (market value) at n^{th}year	ID
$C_{(T,I,S)}$	Cost of tax, insurance and storage	ID
Ta_r	tax rate	ID
In_r	insurance rate	ID
St_r	storage rate	ID
C_{ol}	Cost of oil per liter	ID
D_f	Depreciation factor	-
D_n	Depreciation amount	ID
DB_f	Decaying balance factor	-
C_{fh}	Hourly fuel cost	ID
F_{cl}	Cost of fuel per liter	ID
I_C	Initial cost	ID
L_c	Lubricator consumption	Liter/hour
L_{rc}	Lifetime repair cost	ID
LCC_n	Expense cost	ID
M_{rc}	Maintenance and repair cost per hour	ID
O_c	Hourly operator`s wage cost	ID
P_{avg}	Average annual cost	ID
T_{HTWC}	Total tire wear cost for all positions	ID
T_{LF}	Tire life factor	-
T_{rc}	Tire repair cost	ID
T_{wc}	Tire wear cost separately calculated depending on position (front, rear, middle)	ID
T_{wf}	Tire wear factor based on the position of the tire	-
TT_c	Total tire cost per hour	ID
W_h	Working hours per year	Hour

AFC	Average fuel consumption	-
C	Capacity of crankcase	Liter
CF	Combined factor	-
N	Time variable	Year, month, day
Kw	Rated power of engine	Kilowatt (kW)
P	Useful life	Year
S	Salvage value	ID
Sy	Sum of year digits	-
T	Number of hours between oil changes	Hour
TF	Time factor (operating efficiency)	-

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ABSTRACT

It is the responsibility of engineers at the Machinery Division and the Central Workshop Division in the municipality to decide on determining the appropriate time for machinery or equipment replacement. The criterion of replacement states that the annual deterioration of machinery and equipment in the governmental sector is 10%. After that, machinery and equipment are sold or leased according to the applicable law of sale and lease of state assets. The selection of machinery and heavy equipment as well as specialized machines occurs according to complex economic analysis and operations, since the selection process plays an important role. It is essential in the success of municipal service projects, which are vital for the whole community in the city. The focus is on correct maintenance procedures and economic analysis in order to determine costs and optimize operations .The aim of this research is to identify the economic life of heavy and specialized machinery and equipment. This is achieved through designing and applying an integrated model covering all expenses and maintenance costs. The proposed model is then applied using real data, which are obtained from Al-Fallujah Municipality- a town in west of Iraq.

The proposed model has been developed using MATLAB and is intended to provide engineers and workshop managers with confidence in relation to the point when machinery or equipment approach the end of their optimal economic life and should be partially or completely replaced.