



**SUDAN UNIVERSITY OF  
SCIENCE AND  
TECHNOLOGY**



**Total Quality Management And Excellence  
CENTER  
College Of Post Graduate Studies**

**Title: The Performance Measurement in Quality  
Management Systems and Excellence Models.**

**مقياس الأداء في أنظمة إدارة الجودة ونماذج الامتياز**

**Submit in Fulfilment of the Requirement for the  
M.Sc in the Department of Total Quality  
Management and Excellence.**

**Supervisor:**

**Mustafa Hamid**

**Elhakeem**

**Prepared By:**

**Alameldin Ibrahim**

**Mohamed Ali Ibrahim**

**MONTH.....12..... YEAR.....2014.....**



## الاستهلاكية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

( الَّذِي خَلَقَ الْمَوْتَ وَالْحَيَاةَ لِيُبَيِّنَ لَكُمْ أَيْتُّكُمْ أَحْسَنُ عَلَاءً وَهُوَ الْعَزِيزُ الْغَفُورُ )

الملك الآية (٢)

( وَقُلِ اعْبُدُوا فَسَبَّحُوا اللَّهَ عَالِمُ السَّمَاوَاتِ وَالْأَرْضِ وَرَسُولُهُ وَالْمُؤْمِنُونَ وَسَتُرَدُّونَ إِلَىٰ عَالَمِ الْعَقَابِ )

التوبة الآية (١٠٥)

( هُوَ الَّذِي جَعَلَ لَكُمُ الْأَرْضَ نَازِلًا فَامْشُوا فِي مَنَاكِبِهَا وَكُلُوا مِن رِّزْقِهَا )

الملك الآية (١٥)

وَكَرَّ فَإِنَّ التَّكْرَىٰ تَنْفَعُ الْمُؤْمِنِينَ (سورة الذاريات (٥٥))

صدق الله العظيم

# **DEDICATION**

**Dedication TO:**

**Sudan University for science and technology  
management and Excellence centre and Sudan**

**Doctors Teachers and employees in quality**

**The supervisor**

**My college's students of the fourth batch**

**My family**

**All that helps me**

## ABSTRACT

This Research is performance measurement in quality management system and Excellence model, the problem is due to need knowledge of performance on the organization for improve, build system and competence, what theory or literature review of performance measurement in performance measurement process and quality management system and excellence model (selected model are International Organization Standard (ISO 9001:2008), European Foundation for Quality Management (EFQM) and Balance Scorecard (BSC) by researcher) (Theory review), what are believed of quality management system and excellence model (the selected three above model) on seven selected organization as Electrical corporation for generators and distributors, Sudanese for Standard and Specifications corporation, Sudatel Company, Khartoum Bank and Faisal Islamic Bank(As case study), and which is significant and insignificant of ISO 9001:2008, EFQM and Balance Scorecard are implemented, deployed, assessed and refined. The question what the statics, significant and insignificant believed, implement deployment, assessment and refined on three selected above models.

The Research's aim and objective are an overview of theory Performance measurement in quality Management System and Excellence Models and processes thinking. Assurance selected standard are today performance measurement by believe, implemented deployed assessed and refined. Methodology used divided into three groups. Methodology first group collecting data used are Library Research (Recording of notes, Reference) and Field Research (Personal interview with questionnaire) techniques used interviewer use general and detail table with open and closed question. Second group statistical technique. Third group the method of accuracy of result (One way anova for hypothesis test used Spss application) Sample design selected Non-probability sampling type.

These are result from side view or perspective of theory review in chapter two as following we use standard ((Excellence Model and Quality Management system (ISO)) to do the right action or activity or

procedures from first time that led us to reduce the cost to appropriate cost of quality management and production and quality cost and improve and measure performance measurement, Built system and competence, these standards focus on familiar criteria and different criteria, so by different criteria on different standards we use standards. ((Excellence Model and Quality management system (ISO)) in business excellence to think and link them together, as theory of balance advise to use more than theory for performance measure. As performance measure is difficult to measure, so it's better to use different theory to measure performance (See balance Scorecard theory), be attention to the performance measurement not to be increasing bureaucracy but decreasing it, Blocking innovation and ambition, focusing on the easy-to-measure over the important-to-measure unless lead to economic change, killing system responsibility, by discouraging cooperation among organization, and sometimes punishing good performance by taking resources from efficient producers to deal with inefficient producers unless there are economic reasons, work with the performance measurement phase that appoint organization goals, criteria for measurement and extraction the results. Most compared with Islamic economic to not to be there any different with Islamic statutory and regulatory and Excellence Model's and Quality management system's statutory and regulatory and a process is improved by reducing the variance, from Visit Side (To seven Organization), work more with complementary system for ISO 9001:2008, more identify for EFQM with ISO 9001:2008, and avoid duplication, work with Balance Scorecard by named it on the procedure of work for manager department and division, also for other theory of quality Management, that mean balance scorecard are used but not named and prepared most of the organization with ISO by internal organization to decrease the cost of applying quality management system.

The seven organization are believe ISO 9001:2008, EFQM and balance scorecard.

ISO 9001: 2008, EFQM and balance scorecard are implemented, deployed, assess and refined on five organization, one organization is on phase implemented ISO and also one organization not implemented I

SO but have special system for it, this last two organization considered partially implemented Balance scorecard and EFQM.

Regarding hypothesis result, **Hypothesis tests result, and hypothesis One:** Believe to ISO 9001:2008 to ISO 9001:2008, Balance Scorecard, and EFQM, the means in all organization are equal together that mean the hypothesis believe are valid

**Hypothesis two:** The hypothesis balance scorecard implement, deployment, assessment and refine are valid significant.

The hypothesis balance scorecard implement, deployment, assessment and refine are valid significant.

The hypothesis EFQM implement, deployment assessment and refine are valid significant.

## الملخص

هذا البحث عن مقياس الأداء في نظام ادارة الجودة ونماذج الامتياز، والمشكلة نتيجة للحاجة لمعرفة المنظمات والشركات الخاصة والعامه لمقياس الاداء لتحسين اداء، وبناء الانظمة والمنافسة، ما إنشاء أو نظريات مقياس الاداء في نظم ادارة الجودة ونماذج الامتياز، تم اختيار المنظمة الدولية للمعايير ((International Standards Organization (ISO) و المؤسسة الاوربية لادارة الممتازة (European Foundation for Quality Management (EFQM) وبطاقة الاداء المتوازن (Balance scorecard (BLC) من قبل الباحث. ما الذي معتقد بالتصديق من نظام ادارة الجودة ونماذج الامتياز (النماذج اعلاه) في سبعة منظمات مختارة وهي الهيئة القومية للكهرباء شركة التوليد وشركة التوزيع والهيئة السودانية للمواصفات والمقاييس وشركة سودتل وبنك فيصل الاسلامي وبنك الخرطوم (دراسة حالة) وما الذي معنوي صالح لمنظمة الدولية للمعايير 2008 : 9001 و المؤسسة الاوربية لادارة الجودة وبطاقة الاداء المتوازن (BLC) من حيث التطبيق والانتشار هيكلياً بانتظام والتقييم والتحسين المستمر. والسؤال ما التحليل الاحصائي والذي معتقد بالتصديق ومعنوي صالح من حيث التطبيق والانتشار هيكلياً بانتظام والتقييم والتحسين المستمر في النماذج المختاره اعلاه.

واهداف البحث لعرض نظريات مقياس الاداء في نظام ادارة الجودة ونماذج الامتياز من خلال او في النماذج المختارة وتفكير العمليات. وتأكيد ان النماذج المختارة اعلاه هي النماذج المطبقة في المنظمات في الفترة الحالية لهذا البحث بالاعتقاد بتصديقها وتطبيقها وانتشارها هيكلياً بانتظام وتقييمها وتحسينها الى اعلى جودة باستمرار او جودة مطلوبة ذات قيمة عند الزبون او العميل. المنهجية المتبعة تقسم الى ثلاث مجموعات، المنهجية المستعملة للمجموعة الاولى بيانات الجمع المستعمل اولاً بحث مكتبة (تسجيل الملاحظات، والمراجع) والبحث الحقلية (مقابلة شخصية مع فورم الاستقصاء)، التقنية المستعملة هي جدول عام وجدول مفصلة تحتوي على اسئلة مغلقة ومفتوحة، والمجموعة الثانية من المنهجية هي التقنيات الاحصائية. والمجموعة الثالثة هي طريقة اختيار دقة النتيجة وهي اختبار الفرضيات عن حزمة من تطبيقات الكمبيوتر. (Hypothesis test, One way Anova by Spss Applications). وتصميم العينة المختارة في البحث هو نوع عدم الاحتمالية.

النتائج من وجهة النظريات ان انظمة الجودة العالمية ونماذج الامتياز لاداء العمل بالصورة الصحيحة من اول مرة وبناء الانظمة الادارية لكسب الزمن وبالتالي تقليل التكاليف المالية والتحسين المستمر والمنافسة المحلية والعالمية وذلك بنقل الخبرات والتكنولوجيا المتقدمة من الشركات الرائدة. وايضاً عدم جعل التحسين بالنظمة معيق للعمل الاداري، ومن وجهة بطاقة الاداء المتوازن ان نقوم بمقياس الاداء باكثر من طريقة اذا امكن ذلك. ويجب ان تسمى النظريات المعمول بها باجراء العمل.

والنتائج من الوجة الحقلية او الميدانية، نجد ان الاعتقاد بالتصديق لـ المنظمة الدولية للمعايير 9001:2008 ISO و المؤسسة الاوربية لادارة الجودة EFQM وبطاقة الاداء



المتوازن BLC من قبل جميع المنظمات السبعة مصدق والتطبيق والانتشار هيكلياً بانتظام والتقييم والتحسين المنتظم للمنظمة الدولية للمعايير ISO 9001:2008 منفذ ه من قبل خمسة منظمات والسادسة في طور التطبيق او الاعداد، اما السابعة لم تتناوله بعد ولديهم نظام جودة خاص بهم.

والتطبيق وانتشار هيكلياً بانتظام والتقييم والتحسين المستمر لبطاقة الاداء المتوازن BLC منفذ من قبل المنظمات السبعة ضمناً ويحتاج ان يسمى باجراء العمل. والتطبيق وانتشاراً هيكلياً بانتظام للمؤسسة الاوربية لادارة الجودة EFQM منفذ ضمناً ويحتاج ان يسمى في اجراء العمل.

بخصوص نتائج الفرضيات، الفرضية الاولى المتوسطات في كل المنظمات السبعة متساوية، فرضية الاعتقاد او التصديق بالمنظمة الدولية للمعايير ISO 9001:2008 والمؤسسة الاوربية لادارة الجودة EFQM وبطاقة الاداء المتوازن BLC معنوياً صالحة. والفرضية الثانية : ان انظمة المنظمة العالمية للمعايير ISO 9001:2008 طبقت او نفذت وشتاراً بهيكلياً بانتظام وقيمت والتحسين المستمر معنوياً صالحة. وفرضية ان المؤسسة الاوربية لادارة الجودة EFQM طبقت ونفذت بانتشار هيكلياً وبانتظام وقيمت وحسنت معنوياً صالحة. وفرضية ان بطاقة الاداء المتوازن BLC طبقت او نفذت وانتشاراً بهيكلياً بانتظام وقيمت وحسنت صالحة معنوياً.

وبحيث لا يوجد تعارض مع المعتقدات والعادات الاسلامية.

**INDEX:**

**CHAPTER ONE: INTRODUCTION AND METHODOLOGY**

1-1. Introduction..... 1  
1-2. Problem statement..... 2  
1-3. Aim and Objective..... 2  
1-4. Hypothesis..... 3  
1-5. Methodology..... 3

**CHAPTER (2): LITERATURE ERVIEW- PERFORMANCE MEASUREMENT, PERFORMANCE MEASUREMENT ORGANIZATIONS AND STANDARD**

**SECTION 1:** 2-1 Performance measurement definition and Performance measure

Process..... 5  
**2-2. Leading and Lagging..... 6**  
**2-3 Quality Management System definitions..... 6**  
**2-4 TQM definition..... 6**  
**2-5 Criterion definitions..... 9**  
**2-6.1 Financial Performance and Non-Financial Performance..... 12**  
**2-6.2 Profit Maximisation..... 15**  
**2-6.2.2 Board Reporting..... 16**  
**2-6.3 The Role of Accounting in Performance Measurement..... 17**  
**2-6.4 Financial Accountants..... 19**  
**2-6.5 Management account..... 19**  
**2-6.6 Financial Reporting Information..... 19**  
**2-6.7 Accounts and the balance Sheet..... 19**  
**2-6.8 Techniques of financial analysis ..... 21**

<b>2-7.1</b>	Performance measure Process.....	25
<b>2-7.2</b>	The individual Performance.....	25
<b>2-7.3</b>	Performance measure as process.....	26
<b>2-7.4</b>	Performace measure categories.....	26
<b>2-7.5</b>	An overview of performance measure process.....	27
<b>2-7.6</b>	System thinking.....	27
<b>2-7.7</b>	Function thinking .....	27
<b>2-7.8</b>	the concept of improvement .....	28
<b>2-7.9</b>	Deming's theory of profound knowledge.....	29
<b>2-7.10</b>	organization and systems.....	29
<b>2-7.11</b>	Customer.....	30
<b>2-7.12</b>	Principles for improvement .....	31
<b>2-7.13</b>	the PDSA cycle.....	32
<b>2-7.14</b>	Processes .....	32
<b>2-7.15</b>	Data and Variation .....	34
<b>2-7.16</b>	Data and its collections.....	36
<b>2-7.17</b>	Sampling Method and Techniques.....	37
<b>2-7.18</b>	Displaying Data.....	37
<b>2-7.19</b>	.0 Variation.....	38
<b>2-7.20-0</b>	Process Improvement techniques .....	41
<b>2-7.21</b>	Leadership and team working .....	42
<b>2-7.22</b>	A framework for improvement.....	42
<b>2-8.1</b>	Managing yourself .....	44
<b>2-8.2</b>	Notion of Management .....	48

2-8.3	Managing others.....	54
2-8.4	Team and Team effectiveness .....	54
2-8.5	learning about learning .....	54
2-8.6	Training and development .....	54
2-8.7	Human Resource Development (HRD).....	55
2-8.8	the quality Manager as internal consultant .....	55
2-8.9	organizational Development and change .....	55
2-9.1	Total Quality Management .....	57
2-9.1	principles of TQM.....	57
2-9.2	Core Principle of TQM.....	58
2-9.3	Total quality management culture .....	60
2-9.4	Key Element of TQM .....	60
2-9.5	Benefits of TQM .....	61
2-9.6	the Quality Gurus.....	61
2-9.7	Relationship of TQM to classical.....	61
 <b>SECTION TWO: PERFORMANCE MEASUREMENT ORGANIZATIONS AND STANDARDS</b>		
2-1.0	Performance Measure Organization .....	64
2-1.1	Performance Measure Organization from integrated system for performance perception.....	64
2-1.2	Performance measure phase .....	65
2-1.3	Performance Measure organization from financial analysis perception.....	66
2-1.4	Performance measure and the Public Sector.....	67
2-2.0	Quality Management systems and Excellence Models, or performance measure tools.....	70

<b>2-2.1</b>	Excellence Models .....	70
<b>2-3.0</b>	the balanced scorecard.....	71
<b>2-3.1</b>	the balanced scorecard perspectives.....	72
<b>2-3.2</b>	balance scorecards as strategy tool.....	78
<b>2-4.1</b>	EFQM excellence Model.....	80
<b>2-5.0</b>	Quality management systems.....	86
<b>2-5.1</b>	The ISO 9000 series.....	86
<b>2-5.2</b>	The ISO 9001 :2008.....	87
<b>2-6.0</b>	Assessment and scoring .....	90
<b>2-6.1</b>	Assessment and scoring methods for European & Baldrige .....	90
<b>2-6.2</b>	Self assessment methods.....	91
<b>2-6.3</b>	Principles of self- assessment .....	91
<b>2-7.0</b>	Quality system Auditing and improvement- Definitions.....	93
<b>2-7.1</b>	Reason or objectives of auditing .....	93
<b>2-7.2</b>	Audit Requirement of ISO 9001.....	94
<b>2-7.3</b>	ISO 10011.....	95
<b>2-7.4</b>	Fundamental of auditing .....	96
<b>2-7.5</b>	Audit Programme (internal) .....	97
<b>2-7.6</b>	Levels of Audit .....	99
<b>2-7.7</b>	Phase of an Audit .....	99
<b>2-7.8</b>	Roles responsibilities.....	100
<b>2-7.9</b>	Audit Cycle for Improvement.....	109
<b>2-8</b>	Quality management system audit , assessment and scoring .....	110
<b>2-9</b>	Other Research Finding.....	110

**CHAPTER THREE: ANALYSIS DATA AND INFORMATION**

**3-1.0** ANALYSIS data and information.....112

**3-1.2** Frequency for general table.....113

**3-3** organization one .....121

**3-4** Organization two .....124

**3-5** Organization three .....127

**3-6** Organization number four.....124

**3-7** Organization five.....131

**3-8** organization six.....134

**3-9** organization seven .....137

**3-10** Hypothesis one test.....140

**3-11** Hypothesis two test .....141

**3-16** Analysis Result.....154

**CHAPTER FOUR: CONCLUSION, RESULTS AND RECOMMENDATIONS**

CONCLUSION, RESULTS AND RECOMMENDATIONS.....157

**4-1** Conclusion.....157

**4-2** Results .....157

**4-3 RESULT** (THEORY AND FIELD PERSPECTIVE).....158

**4-4** Recommendations.....159

**Reference**.....161

## DIAGRAM INDEX

Diagram number	Address	Page
Diagram (1)	Account cycle	18
Diagram (2)	Phase of Kolb's learning cycle	45
Diagram (3)	Training Cycle	55
Diagram (4)	Customer –Driven Quality Cycle	58
Diagram (5)	Customer Core measurement group	74
Diagram (6)	Linked for core measurement	77
Diagram (7)	EFQM 1999.The Model registered trade mark of EFQM	81
Diagram (8)	Diagram (8) QMS Improvement Cycle	109

# GRAPH INDEX

Graph number	Address	Page
Graph (1)	Performance phase Histogram	116
Graph (2)	Financial analysis histogram	116
Graph (3)	Financial technique histogram	117
Graph (4)	Believe to EFQM histogram	117
Graph (5)	Believe to balance histogram	118
Graph (6)	Applying ISO 9001:2008 histogram	118
Graph (7)	Applying ISO EFQM histogram	111
Graph (8)	Applying balance scorecard histogram	111
Graph (9)	Think and link standard and excellence model	120
Graph (10)	ISO 9001:2008 org. one histogram	123
Graph (11)	EFQM org. one histogram	123
Graph (12)	ISO 9001:2008 org. two histogram	125
Graph (13)	Balance org. two histogram	126
Graph (14)	EFQM org. two histogram	126
Graph (15)	Balance org. three histogram	128
Graph (16)	EFQM org. three histogram	128
Graph (17)	ISO org four histogram	130
Graph (18)	EFQM org. four histogram	131
Graph (19)	ISO 9001 :2008 org. five histogram	132
Graph (20)	Balance org. five histogram	133
Graph (21)	ISO org. six histogram	133
Graph (22)	EFQM org. six histogram	135
Graph (23)	ISO org. seven histogram	136
Graph (24)	Balance org. seven histogram	138
Graph (25)	EFQM org. seven histogram	139
Graph (26)	Group frequencies	139
Graph (27)	EFQM org. 1,2,3,4,5,6 and seven histogram	146
Graph (28)	Balance scorecard/organizations 1,2,3,4,5,6,7	149
Graph (29)	EFQM for organization 1,2,3,4,5,6 and 7	153



## TABLE INDEX (1)

Table number	Address	Page
Table (1)	Frequencies for General table number one	113
Table (2)	Performance phase frequencies	113
Table (3)	Financial technique frequencies	113
Table (4)	Believe to ISO 9001:2008	114
Table (5)	Believe to ISO EFQM frequency	114
Table (6)	Believe to balance scorecard	114
Table (7)	Applying ISO 9001:2008	114
Table (8)	Applying EFQM	114
Table (9)	Applying balance scorecard	115
Table (10)	Think and link through standard and excellence Model	115
Table (11)	ISO 9001:2008, balance, EFQM frequency	121
Table (12)	ISO 9001:2008 org.1 frequencies	121
Table (13)	Balance scorecard org. one	121
Table (14)	EFQM org. one	121
Table (15)	Anova for org. one	122
Table (16)	Post Hoc test – Multiple Comparisons	122
Table (17)	Chi square test org.1	122
Table (18)	Frequencies for org. two	124
Table (19)	ISO 9001:2008 org two frequencies	124
Table (20)	Balance scorecard org. two frequencies	124
Table (21)	EFQM org. two frequencies	125
Table (22)	Frequencies for organization three	127
Table (23)	ISO organization three frequencies	127
Table (24)	Balance scorecard org. three	127
Table (25)	EFQM org. three frequencies	127
Table (26)	Organization four frequencies – statistics	129
Table (27)	ISO org. four frequencies	129
Table (28)	Balance org. four frequencies	129
Table (29)	EFQM org. four frequencies	130
Table (30)	Organization five frequencies -statistic	131
Table (31)	ISO org. five frequencies - statistic	132
Table (32)	Balance organization five frequencies -statistic	132
Table (33)	EFQM org. five frequencies-statistic	132
Table (34)	Organization six frequencies –statistic	134
Table (35)	ISO organization six frequencies	134
Table (36)	Balance organization six frequencies	134
Table (37)	EFQM org. six frequencies	135

## TABLE INDEX (2)

Table number	Address	Page
Table (38)	EFQM,BLCand ISO statics for org. seven	137
Table (39)	Frequencies for General table number one	137
Table (40)	Balance org. seven frequencies	137
Table (41)	EFQM org. seven frequencies	138
Table (42)	Hypothesis one test – Descriptive statistic	140
Table (43)	Org. one frequencies	140
Table (44)	Org. one three frequencies	140
Table (45)	Org. four frequencies	140
Table (46)	Org. five frequencies	140
Table (47)	Org. six frequencies	141
Table (48)	Org. seven frequencies	141
Table (49)	Test statistic	141
Table (50)	Hypothesis two test – test of normality	141
Table (51)	Hypothesis two anova	141
Table (52)	Hypothesis Post Hoc test – Muliple comparison	141
Table (53)	Test of homogeneity	142
Table (54)	Anova	143
Table (55)	Post Hoc test – Multiple comparisons	143
Table (56)	NPar test descriptive statistics	143
Table (57)	ISO org. one frequencies	143
Table (58)	ISO org. two frequencies	144
Table (59)	ISO org. three Frequencies	144
Table (60)	ISO org. four Frequencies	144
Table (61)	ISO org. five Frequencies	144
Table (62)	ISO org. six Frequencies	144
Table (63)	ISO org. seven Frequencies	145
Table (64)	Statistics	145
Table (65)	Group frequencies	145
Table (66)	Test statistic	145
Table (67)	Test of homogeneity of variances	146
Table (68)	Anova balance	146
Table (69)	Multiple comparisons	146
Table (70)	Balance org. one frequencies	147
Table (71)	Balance org. two frequencies	148
Table (72)	Balance org. three frequencies	148
Table (73)	Balance org. four frequencies	148
Table (74)	Balance org. five frequencies	148
Table (75)	Balance org. six frequencies	148

## TABLE INDEX (3)

Table number	Address	Page
Table (76)	Balance org. seven frequencies	148
Table (77)	Statistic frequencies	148
Table (78)	Balance org. 1,2,3,4,5,6 and 7 frequencies	148
Table (79)	Test statistic	149
Table (80)	Test of homogeneity of variances	150
Table (81)	Anova	150
Table (82)	Multiple comparison	150
Table (83)	EFQM org. one frequencies	150
Table (84)	EFQM org. two frequencies	151
Table (85)	EFQM org. three frequencies	151
Table (86)	EFQM org. four frequencies	151
Table (87)	EFQM org. five frequencies	152
Table (88)	EFQM org. six frequencies	152
Table (89)	EFQM org. seven frequencies	152
Table (90)	Test statistics	152
Table (91)	Statistics – EFQM 1,2,3,4,5,6 and 7	152
Table (92)	EFQ frequencies 1,2,3,4,5,6 and 7	152
Table (93)	EFQM org. 1,2,3,4,5,6 and 7	153

## APPENDIX INDEX

Appendix number	Address	Page
Appendix (1)	Questionnaire	163
Appendix (2)	Appendix two CIM	169
Appendix (3)	SCORING GUIDELINE three table	171
Appendix (4)	Content sheet of BS E ISO 9001:1994	173
Appendix (5)	Abbreviation	175
Appendix (6)	Arabic Definition	176