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The Roles of the Project Management Office In The Execution of the Organizations Strategic Plan

Tareq Zeyad Awad Al Ameri

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United Arab Emirates University

College of Business and Economics

THE ROLES OF THE PROJECT MANAGEMENT OFFICE IN THE
EXECUTION OF THE ORGANIZATION'S STRATEGIC PLAN

Tareq Zeyad Awad Mohammed Al Ameri

This dissertation is submitted in partial fulfilment of the requirements for the Degree
of Doctorate of Business Administration

Under the Supervision of Dr. Maqsood Sandhu

April 2016

Declaration of Original Work

I, Tareq Zeyad Awad Al Ameri, the undersigned, a graduate student at the United Arab Emirates University (UAEU), and the author of this dissertation, entitled “*Roles of the Project Management Office in the Execution of the Organization’s Strategic Plan*”, hereby, solemnly declare that this dissertation is my own original research work that has been done and prepared by me under the supervision of Dr. Maqsood Sandhu, in the College of Business and Economics at the UAEU. This work has not been previously formed as the basis for the award of any academic degree, diploma or a similar title at this or any other university. Any materials borrowed from other sources, whether published or unpublished, and relied upon or included in my dissertation have been properly cited and acknowledged in accordance with appropriate academic conventions. I also declare that there is no potential conflict of interest in conducting this study regarding research topic, data collection, and presentation of findings, authorship, and publishing of this dissertation.

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Abstract

Many organisations in both public and private sectors are striving to discover new tools and strategies to streamline their project implementation. Among these was the *project management office* (PMO), which has been developed from the womb of the advanced project management methodology. This work is both exploratory and causal study, which concentrates on investigating the effectiveness of seven proposed PMO roles (as independent variables) in carrying out the strategic plan (as the dependent variable) of the public sector organisations in the UAE. The study aims also to derive some insights into coordinating pattern established between PMO entity and other departments involved in the project implementation within the context of the organization's strategic plan. A Likert-based questionnaire has been structured to cover all aspects of the research questions and hypotheses. The survey hyperlink emailed to 19 project-based public organizations in Abu Dhabi and Dubai Emirates (as business centres) prior to broadcasting among their 450 staff members who involved actively in the various project business. 366 participants viewed the survey link, whereas 268 of them responded with perfect and usable questionnaires. The received data analysed quantitatively by using multiple regression. The analysis outputs, as expected, have indicated that 95% of the targeted organizations established own PMO. The high visibility of PMO allowed robust investigation on the connections between various PMO roles in executing the strategic plan of the hosted organizations to reveal a number of statistically significant linkages between various variables. The top-five PMO roles involved in strategic plan execution were found to be **i)** Strategic Management, **ii)** development of project management competencies and methodology, **iii)** monitoring and controlling project performance, **iv)** organizational learning, and **v)** organization structure and communication improvement. Whereas 12 top metric criteria were identified to measure the effectiveness of the PMO unit. These findings utilized in developing a conceptual PMO model to be flexible and applicable with similar project management methodology in various business domains, and paving the way for more investigations. This study gives some implications for those involved in the PMO applications, and recommendations to further research studies.

Keywords: Public sector organization, PMO, strategic plan, exploratory study, causal effects, quantitative method, multiple regression, Abu Dhabi vision 2030, UAE.

Title and Abstract (in Arabic)

أدوار مكتب إدارة المشاريع في تنفيذ الخطة الاستراتيجية لمؤسسات القطاع العام في دولة الإمارات العربية المتحدة

الملخص

توجد هنالك العديد من المؤسسات في القطاعين العام والخاص تسعى إلى اكتشاف أدوات واستراتيجيات جديدة لإنجاح تنفيذ المشاريع على الوجه الأكمل. وإحدى هذه الأدوات مكتب إدارة المشاريع (PMO)، الذي تم تطويره من خلال منهجية متقدمة لتطبيقات الإدارة الحديثة للمشاريع. هذا البحث عبارة عن دراسة استكشافية وسببية، والتي تركز على التحقق في فعالية سبعة أدوار مقترحة لمكتب إدارة المشاريع (كمتغيرات مستقلة) في تنفيذ الخطة الاستراتيجية (كمتغير تابع) لمؤسسات القطاع الحكومي في دولة الإمارات العربية المتحدة. تهدف الدراسة أيضاً إلى استخلاص بعض الأفكار في تنسيق النمط المتبع بين مكتب إدارة المشاريع وغيرها من الإدارات المعنية في تخطيط وتنفيذ المشاريع في إطار الخطة الاستراتيجية للمؤسسة الحكومية. وقد تم إعداد الاستبيان على مقياس ليكرت (Likert) لتغطية جميع جوانب أسئلة البحث والفرضيات. بعد ذلك تم إرسال الرابط بالبريد الإلكتروني إلى 19 مؤسسة حكومية في إمارتي أبوظبي ودبي، والتي يمثل تنفيذ المشاريع إحدى مكونات أعمالها التجارية، على أن تقوم هذه المؤسسات بإعادة إرسال الرابط إلى 450 من موظفيها الذين يمارسون إدارة المشاريع في عدة قطاعات مختلفة. أُطلع 366 موظفاً على الرابط، بينما 268 منهم ردوا باستبيانات مكتملة وصالحة للتحليل الإحصائي. تم تحليل البيانات الواردة كميًا باستخدام الانحدار المتعدد. أشارت مخرجات التحليل على أن 95% من المؤسسات المستهدفة في القطاع العام أنشأت مكتب إدارة المشاريع الخاص بهم. هذا الحضور البارز لمكتب إدارة المشاريع سمح بإجراء دراسة مستفيضة عن أدوار مكتب إدارة المشاريع في تنفيذ الخطة الاستراتيجية والتي تجلت في الكشف عن وجود عدد من الروابط ذات دلالة إحصائية بين المتغيرات المختلفة. وحسب النتائج، جاءت أعلى خمسة أدوار لمكتب إدارة المشاريع في تنفيذ الخطة الاستراتيجية، وهم على النحو التالي (1) الإدارة الاستراتيجية، (2) تطوير الكفاءات ومنهجية إدارة المشاريع، (3) رصد ومراقبة أداء المشاريع، (4) التعلم المكتسب من إدارة المشاريع، و(5) الهيكل الإداري لمكتب المشاريع وتحسين قنوات الاتصال ما بين الإدارات المعنية. من جانب آخر، تم تحديد 12 محدد قياسي لتقييم أداء مكتب إدارة المشاريع. تم توزيع هذه النتائج من خلال استحداث نموذج تصوري لمكتب إدارة المشاريع بحيث أن يكون مرناً ويتلاءم مع تطبيقات منهجية مماثلة لإدارة المشاريع في بيئات العمل المختلفة، وكذلك يمهد الطريق لمزيد من الدراسات والأبحاث العلمية في هذا المجال الإداري. تعطي هذه الدراسة بعض المعارف التطبيقية للعاملين في مجال إدارة المشاريع لمساعدتهم في استدامة تطبيقات الأدوار الهامة للمكتب في مؤسساتهم، فضلاً عن اقتراح توصيات لتعزيز البحوث والدراسات المستقبلية في هذا المجال.

الكلمات المفتاحية: مؤسسات القطاع الحكومي، مكتب إدارة المشاريع، الخطة الاستراتيجية، دراسة استكشافية وسببية، التحليل الإحصائي الكمي، الانحدار المتعدد، رؤية أبو ظبي 2030، دولة الإمارات العربية المتحدة.

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Dedication

To my great country, the UAE to which I am proud to belong and serve it

To my parents who precipitated in me a love and deep interest in learning and self-confidence since early childhood, with grateful appreciation.

To my beloved family, wife, sons and daughters, whose care and encouragement has pushed me forward throughout the course of this DBA study

Table of Contents

Title.....	i
Declaration of Original Work	ii
Approval of the Doctorate Dissertation	iv
Abstract.....	vi
Title and Abstract (in Arabic)	vii
Acknowledgements	viii
Dedication	ix
Table of Contents	x
List of Tables.....	xiv
List of Figures	xvi
List of Abbreviations.....	xvii
Chapter 1: Introduction.....	1
1.1. An Overview.....	1
1.2. The UAE Public Sector – An Overview.....	6
1.2.1. An Overview	6
1.2.2. The Abu Dhabi Vision 2030	7
1.3. Foundation of the Study	12
1.4. The Research Problem.....	13
1.4.1. Background	13
1.4.2. Research Problem Statement.....	14
1.5. Nature of the Study and Research Issues.....	16
1.5.1. Aim.....	17
1.5.2. Objectives.....	18
1.5.3. Research Questions	19
1.5.4. Hypotheses	20
1.6. Research Limitations and Delimitations.....	22
1.6.1. Limitations	22
1.6.2. Delimitations	22
1.7. Rationale and Significance of the Study.....	23
1.8. Definition of Terms of Interest	23
1.9. Outline of the Dissertation Organization.....	26
Chapter 2: Literature Review	30
2.1. Introduction.....	30
2.2. Organization Strategic Plan	32
2.2.1. Project Business and Strategy	34
2.2.2. Business Strategy	36
2.2.3. Strategic Alignment.....	39

2.3. Project Management Office – Roles and Functions	45
2.3.1. Project Management.....	48
2.3.2. PMO Definition.....	54
2.3.3. State-of- the Art PMO	56
2.4. PMO Roles and Employment	59
2.5. Types of the PMO.....	62
2.6. The Potential PMO Roles	66
2.7. Levels of the PMO’s Roles.....	76
2.7.1. Strategic Level.....	77
2.7.2. Tactical level	78
2.7.3. Operational Level	78
2.8. Models of PMO Functionalities	80
2.9. PMO and Organizational Transformation	81
2.10. Project Management Methodology	82
2.11. Summary and Conclusion	84
Chapter 3: Conceptual PMO Framework.....	89
3.1. Introduction.....	89
3.2. Theoretical Ground.....	90
3.3. Framework Capabilities and Functions	93
3.3.1. Leadership and Organizational Commitment	93
3.3.2. Mandate of the PMO	96
3.3.3. Organization’s Culture	96
3.3.4. Governance Dimension	97
3.3.5. PMO Structural Changes.....	99
3.3.6. Environmental Scanning and Intelligence.....	100
3.4. Framework Design – Concept Development.....	101
3.5. Proposed Framework	103
3.5.1. Strategic Management (SM)	106
3.5.2. Project Management Competency and Methodology (PMCM)	107
3.5.3. Monitoring and Controlling Performance (MCP).....	109
3.5.4. Organizational Learning Promotion (OLP).....	112
3.5.5. Multi-Project Management (MPM)	113
3.5.6. Organizational Structure and Communication (OSC)	116
3.5.7. Project Value Sustainability (PVS).....	118
3.6. Summary.....	120
Chapter 4: Research Methodology.....	121
4.1. Introduction.....	121
4.2. Philosophical Assumptions and Research Approach	122
4.3. Research Methods- An Overview.....	123

4.4. Adopted Research Method	128
4.5. Research Framework	131
4.6. Data Collection and Field Access.....	133
4.6.1. Statistical Tools	133
4.6.2. Quantitative Cases in PMO Studies	134
4.6.3. Regression Analysis	136
4.7. Reliability and Validity.....	137
4.7.1. Reliability	138
4.7.2. Validity.....	139
4.8. Questionnaire Design.....	139
4.9. Questionnaire Pilot Test	142
4.9.1. Introductory Procedures	142
4.9.2. Data Collection and Analysis.....	144
4.10. Questionnaire Distribution	147
4.11. Some Considerations.....	148
Chapter 5: Data Collection and Analysis	150
5.1. Introduction.....	150
5.2. Demographic Description of the Participants and PMO	151
5.2.1. Respondent Profiles – Qualification, Gender and Nationality.....	151
5.2.2. Respondents’ Work Experiences	153
5.2.3. PMO – Existence, Functions and Services.....	158
5.3. Testing Reliability	160
5.3.1. Reliability Test of Dependent Variable.....	161
5.3.2. Reliability Test of Independent Variables.....	162
5.3.2.1. Strategic management	162
5.3.2.2. Development of project management competency and methodology	163
5.3.2.3. Monitoring and controlling project performance	164
5.3.2.4. Promoting organizational learning.....	165
5.3.2.5. Multi-project management	166
5.3.2.6. Organizational structure and communication improvement	167
5.3.2.7. Project value sustainability	168
5.4. Validity Test	169
5.5. Testing Modelling.....	173
5.5.1. Multiple Regression Coefficients – R and β	173
5.5.2. Multi-Regression Analysis of all Variables	174
5.5.3. Simple Regression Analysis for the Predicators with Criterion.....	178
5.5.3.1. PMO role of SM with SPE.....	178
5.5.3.2. SRA for PMO role of PMCM with SPE	180
5.5.3.3. SRA for PMO role of MCP with SPE.....	182
5.5.3.4. SRA for PMO role of OLP with SPE.....	184

5.5.3.5. SRA for PMO role of MPM predictor with SPE.....	186
5.5.3.6. SRA for the PMO role of OSC with SPE.....	188
5.5.3.7. SRA for the PMO role of PVS with SPE.....	190
5.5.4. One-Sample Test.....	192
5.6. Summary.....	193
Chapter 6: Discussion.....	195
6.1. Introduction.....	195
6.2. Revisiting the Research Questions and Objectives.....	198
6.3. Interpretation of Research Findings.....	200
6.3.1. Relationship between the Variables.....	204
6.3.2. Effects of individual PMO role on the dependent variable.....	205
6.4. Summary.....	214
Chapter 7: Conclusion and Recommendations.....	217
7.1. Conclusion.....	217
7.1.1. Delivery of the PMO Functions.....	217
7.1.2. Importance of the PMO Roles.....	219
7.1.3. Evolution of Contribution of the PMO Roles.....	222
7.2. Contribution to Existing PMO Knowledge.....	223
7.3. Implications for the UAE Organizations in Public Sector.....	227
7.4. Recommendations.....	228
7.5. Limitations.....	231
7.6. Future Studies.....	232
7.7. Reflections.....	233
Bibliography.....	234
Appendix: Questionnaire Survey.....	246

List of Tables

Table 1: Definitions of strategy in various concepts.....	34
Table 2: Different roles of the PMO types.....	47
Table 3: Approaches in project management research	54
Table 4: Demonstrates PMO types and suggested designations	64
Table 5: Management approach of portfolio, programme and project	69
Table 6: Shows the PMO's potential roles and functions	71
Table 7: Published research works on PMO	73
Table 8: The functioning of the PMO structures in an IT company	81
Table 9: The PMO descriptive model	92
Table 10: A comparison of the various concepts of the PMO roles	105
Table 11: A comparison between the three research methods	125
Table 12: The similarities between qualitative and quantitative research	130
Table 13: The differences between qualitative and quantitative research	130
Table 14: Statistical analysis of the variable interrelations.....	137
Table 15: The Cronbach alpha pilot test for PMO roles criteria.....	144
Table 16: Cronbach alpha pilot tests for PMO roles.....	145
Table 17: Pilot test validity for the PMO roles criteria communalities	145
Table 18: Pilot test of cumulative percentages of the total variance.....	146
Table 19: Pilot test of validity for PMO roles criteria of component matrix.....	146
Table 20: Cronbach alpha test for internal consistency of performance criteria	161
Table 21: Cronbach alpha test for each criterion of strategic plan execution.....	162
Table 22: Cronbach alpha test for strategic management variable	162
Table 23: Cronbach alpha test for the strategic management sub-criteria.....	163
Table 24: Cronbach alpha test for development competencies... variable.....	163
Table 25: Cronbach alpha test for the development of competencies... sub-criteria.....	164
Table 26: Cronbach alpha test for monitoring and controlling... variable	164
Table 27: Cronbach alpha test for the monitoring and controlling sub-criteria.....	165
Table 28: Cronbach alpha test for promoting organizational learning variable.....	165
Table 29: Cronbach alpha test for promoting organizational learning sub-criteria	166
Table 30: Cronbach alpha test for multi-project management variable.....	166
Table 31: Cronbach alpha tests for the multi-project management sub-criteria	167
Table 32: Cronbach alpha test for organisat'l structure & communication variable.....	167
Table 33: Cronbach alpha tests for the organizational structure... sub-criteria.....	168
Table 34: Cronbach alpha test for project value sustainability variable	168
Table 35: Cronbach alpha tests for the project value sustainability sub-criteria	168

Table 36: KMO and Bartlett's Test (<i>SPSS output</i>).....	170
Table 37: Cumulative percentages of the total variance explained.....	171
Table 38: Rotated factor loadings (Factor Pattern Matrix)	172
Table 39: MRA of the seven-proposed PMO roles.....	175
Table 40: Regression coefficient for the seven proposed PMO roles (predictors) ..	176
Table 41: ANOVA test of all predictors	176
Table 42: SRA for the PMO role of strategic management in SPE.....	178
Table 43: ANOVA test for SM predictor	178
Table 44: Regression coefficient <i>R</i> for SM with SPE.....	179
Table 45: SRA for PMO role of PMCM with SPE.....	180
Table 46: ANOVA test for PMCM predictor.....	180
Table 47 : Regression coefficient <i>R</i> for PMCM with SPE.....	181
Table 48: SRA for the PMO role of the MCP	182
Table 49: ANOVA test analysis for MCP predictor	182
Table 50: Regression coefficient <i>R</i> for MCP predictor	183
Table 51: SRA for the PMO role of the OLP.....	184
Table 52: ANOVA test analysis for OLP predictor	184
Table 53: Regression coefficient <i>R</i> for OLP predictor.....	185
Table 54: SRA for the PMO role of the MPM predictor	186
Table 55: ANOVA test analysis for the MPM predictor	186
Table 56: Regression coefficient <i>R</i> for OLP predictor.....	187
Table 57: SRA for the PMO role of the OSC predictor.....	188
Table 58: ANOVA test analysis for the OSC predictor	188
Table 59: Regression coefficient <i>R</i> for OSC predictor	189
Table 60: SRA for the PMO role of the PVS predictor	190
Table 61: ANOVA test analysis for PVS predictor	190
Table 62: Regression coefficient <i>R</i> for PVS predictor.....	190
Table 63: Mean and Std. Deviation for the PMO Measuring Criteria.....	192
Table 64: One-sample test value=3.....	193
Table 65: Top metric criteria for measuring PMO effectiveness.....	194
Table 66: Categorization of PMO roles (strategic or tactical)	200
Table 67: Comparison between this study results & those of Hobbs & Aubry	201
Table 68: Prominent functions of the five-top PMO roles.....	203

List of Figures

Figure 1: The Abu Dhabi Economic Vision 2030 Framework	11
Figure 2: Structure and layout of the dissertation fulltext	29
Figure 3: Linking individual projects with business strategy	37
Figure 4: Illustrates the sequences of the strategic alignment.....	42
Figure 5: Important features of the classical and rethinking PM concepts	50
Figure 6: The five PMO maturity stages.....	70
Figure 7: The PMO's roles to execute the organizational strategic plan	75
Figure 8: Mutual relationship between running projects and the PMO	79
Figure 9: Conceptual framework of the PMO transition process	86
Figure 10: Methodology function model	87
Figure 11: Initial proposed framework to define key factors affect the PMO	102
Figure 12: Practical framework of the study.....	104
Figure 13: Theoretical framework of the study.....	105
Figure 14: Project Control Cycle	111
Figure 15: Quantitative Method approach used for the research	143
Figure 16: Respondents academic qualification	151
Figure 17: Respondents gender.....	152
Figure 18: Respondents nationality.....	153
Figure 19: Respondents administrative positions	154
Figure 20: Respondents full-time experience with current organization.....	155
Figure 21: Respondents work PM experience in years.....	156
Figure 22: Number of teamwork members under respondent's supervision.....	157
Figure 23: Respondents PMO work experience.....	158
Figure 24: Existence of a PMO entity in the public organizations	159
Figure 25: The PMO attachment status.....	160
Figure 26: A plot of standardized residuals of predicators with criterion.....	177
Figure 27: Plot of standardized residuals of SM with SPE.....	179
Figure 28: Plot of standardized residuals of PMCM with SPE.....	181
Figure 29: Plot of standardized residuals for MCP predictor	183
Figure 30: Plot of standardized residuals for OLP predictor	185
Figure 31: Plot of standardized residuals for MPM predictor.....	187
Figure 32: Plot of standardized residuals for OSC predictor	189
Figure 33: Plot of standardized residuals for PVS predictor.....	191

List of Abbreviations

CEO	Chief Executive Officer
FPM	Factor Pattern Matrix
ICT	Information and Communication Technology
KMO	Kaiser-Meyer-Olkin Measure of Sampling Adequacy
MCP	Monitoring and Controlling Performance (predictor)
MPM	Multi-Project Management (predictor)
MRA	Multiple Regression Analysis
OLP	Organizational Learning Promotion (predictor)
OSC	Organizational Structure and Communication (predictor)
PBO	Project-Based Organization
PM	Project Management
PMCM	Project Management Competency and Methodology (predictor)
PMI	Project Management Institute
PMO	Project Management Office
PPM	Portfolio Project Management
PSO	Project Support Office
PVS	Project Value Sustainability (predictor)
SAM	Strategic Alignment Model
SM	Strategic Management (predictor)
SPE	Strategic Plan Execution (criterion)
SPM	Strategic Project Management
SPSS	Statistical Package for Social Science
SRA	Simple Regression Analysis
UAE	United Arab Emirates

Chapter 1: Introduction

1.1. An Overview

It is beyond dispute that the advent of the advanced technologies in today's business and industrial domains has drastically increased the complexity of managing the various phases of the project execution (Austin et al., 2002). This, in turn, has brought organizations to face unprecedented management challenges that have sparked strong interest in finding effective approaches and tools to streamline the implementation of their strategic plans and objectives. In an attempt to improve the performance and completion of their business projects, many project-based organizations are therefore turning to introducing and adopting innovative management solutions.

The present world business environment is characterized by powerful driving forces, such as globalization, financial markets, economic integration, and the tendency to remove all barriers to free global trading mechanisms, as monitored and regulated by the *World Trade Organization* (WTO). However, the rapid advances in information and communication technology (ICT), such as web-based and cloud computing applications have introduced powerful media, which have pushed further the project of making activities take place in virtual spheres.

The development of new innovative management approaches has changed the traditional landscape of the business activities to be webbed by complicated business relations to form different multinational patterns of business strategy and alliances for executing mega-projects worldwide. In the present complex business environment, an organization should respond positively to the emerging challenges. This means that the organization is always expected to be both reactive and proactive towards the new

challenges and threats triggered by its internal and external conditions (e.g., physical, socioeconomic, or political issues).

Potential challenges are, for instance the advent of new technology and methodology, organizational restructuring, or market competition with similar products and services. Nowadays, projects have become widespread organizational structures, which pave the way for the emergence of a new form of organization, namely the project-based organization, whose core business components are project-related activities.

Tjahjana et al. (2009) argue that the complexity of such a business situation has led to unfavourable challenges being created for many project-based organizations, which find it hard to handle their business projects in a proper and professional manner. Among these challenges are the following:

- a) *Scarcity of resources* – Every organization, regardless of its core business activities, faces a shortage in one of its vital resources, such as professional human resources, financial funding, efficient management approaches, etc. Therefore, the organization must effectively distribute its available resources between its projects to avert such limitations.
- b) *Inconsistency in the management process* – Inconsistency is usually found in an organization whose management capabilities are still immature; hence, it fails to manage parallel projects effectively, or to measure their actual performance.
- c) *Lack of coordination between various projects* – The inefficient coordination between multiple running projects usually causes a vital disruption in the

execution of these projects, yielding poor outcomes. Accordingly, an organization may face bankruptcy.

- d) *Improper selection of projects* – Many organizations find it hard to select projects that are aligned with the organization's vision and strategic plan. When this happens, improper project selection causes the organization's crucial resources to be dissipated.

Many organizations that deliver products and services in a project-based form have increasingly introduced a new integrated organizational entity known as the *Project Management Office* (PMO). The PMO emerged as a new concept of project management (PM) practices and also a business strategy to support innovatively the execution of the organization's business plans by integrating managerial and operational activities (Hobbs et al, 2008). Thus, the implementation of the PMO has become a global business phenomenon and growing trend in the way the organization proposes its objectives and strategic goals (Aubry, Hobbs, & Thuillier, 2007).

The impetus for introducing the PMO within the organization is often a desire to improve the management of projects and at the same time to reduce the number of running projects that fail to meet the expectations of customers and stakeholders due to budget overruns or unacceptable delays (Aubry et al., 2008). Therefore, the existence of a PMO has become necessary for organizations in both the public and private sectors whose core activities are project-based. Because the PMO unit can interact actively in the host organization with a project and a business environment, it is responsible for improving the project management capabilities of the host organization; although in the business environment, it is responsible only for liaising between the business partners and the project participants (Tjahjana et al., 2009).

In general, the primary intention in establishing a PMO unit within an organization is to help the host organization to plan strategic activities rather than to focus on a specific client. As a formal organizational structure, a PMO has several purposes which differ according to the organization's core activities; of these purposes, one is to support the project manager; another is to provide training for the teams involved in projects; a third is to establish methods, standards and forms; a fourth is to be a yardstick for excellence in project management; and assume responsibility for the project's results, etc., (Hobbs & Aubry, 2007).

A PMO could be established at, and associated with any one of several locations within an organization, where it appropriately serves an overall organization's support functions. Therefore, the PMO could play a key role in the creation of an organization's business environment for the efficient operation of its portfolio project management (PPM). Thus, the establishment of a PMO unit within a project-based public organization in the UAE meets the urgent organizational need to improve the managerial performance in carrying out multi-projects through the effective allocation and use of the available resources, and supports the coordinated operation of these multi-projects in order to development the strategic plan of an organization.

A thorough review of the PMO-related literature allows three common models to be extracted of the functioning of the PMO. The first model focuses on direct assistance in developing functions, systems, methods, and tools for the implementation and execution of individual projects or programmes in the parent organization. The second model the PMO functions as a centre of knowledge transfer, focusing on consulting, learning, and training activities. The third model is the

organizational PMO focusing less on issues of methodology and tools and more on supporting the business development of the parent organization (Mariusz, 2014).

Since this dissertation statement is an important guide to the contents of a literature review, the main research concerns in the present study focus on the link between the establishment of the PMO and the successful execution of a public organization's strategic plan within a particular business environment. It also explores the criteria that could be applied to measure the effectiveness of the various functions of a PMO in a business project.

The purpose of the present study is to shed light on the processes by which the functions of a PMO could support public sector organizations in the UAE in executing their strategic plans, and to learn from the previous experience of projects in order to improve continuously future project performance. Reviewing the scholarly published literature is expected to derive a PMO-specific framework model based on findings of relevance to the research questions and hypotheses, and to identify the factors that could keep the developed PMO model sustainable in practice.

This Chapter presents an overview of the motivation for conducting research on this topical theme. The Chapter consists of these sections **i)** an overview of the UAE public sector, **ii)** foundation of the study, **iii)** background and statement of the research problem, **iv)** research related issues (aim, objectives, and hypotheses), **v)** research limitations and delimitations, **vi)** rationale and significance of this study, **vii)** definition of interesting terms, and **viii)** dissertation organization. However, an outline schema of the dissertation structure and organization is presented in Figure 1.

1.2. The UAE Public Sector – An Overview

1.2.1. An Overview

The public sector in the UAE has been witnessing rapid changes with the advent of advanced ICT, along with a wide expansion of infrastructure projects as part of the nation's economic development. Those changes have greatly affected the path of the administrative processes and the way the public sector presents its projects and provision of services to the users, its citizens. The public sector in the UAE is at pains to coordinate with sub-governmental departments, as well as establishing partnerships with private bodies to improve the management of project execution and delivery through one-stop access that avoids managerial conflict within an organization.

The public organizations in the UAE are the major players in the economic theatre and therefore enjoy a relative abundance of resources (e.g., financial, political support, and human capital) that should help them to adopt as project management processes some advanced management approaches that were developed and advanced in the Western and such Asian countries as Japan. For instance, despite the boom in construction and related infrastructure projects at the beginning of the 21st century, the incidence of project and strategic management processes among the public organizations in the UAE was low; they seemed not to take project management seriously or practice it properly (Elbanna, 2013).

However, since 2000, major changes have taken place in the UAE public sector organizations; Abu Dhabi and Dubai, in particular, have begun to adopt innovative and internationally accepted standards and practices in their public administration. The recent vigorous expansion in infrastructure and core public utilities and related services has instigated project-based public organizations in the UAE. This emergence

of a new form of public organization has led to the adoption of advanced management approaches, which has prompted an intensive study of the practices of strategic management in UAE public sector organizations as they carry out their projects (Elbanna, 2013).

Developing public projects is considered a great challenge. They require much time for the implementation and great ability to manage them, using such typical methods as planning, procurement, monitoring and control. However, these elements are not as effective as the elements used in projects developed by private initiatives (Esquierro et al., 2014). The main problem concerned in this dissertation is the execution of the organization's strategic plan, and how this execution of the plan to be achieved successfully. The basic hypothesis of this study is that the PMO when properly implemented helps public sector organizations in managing their business projects.

1.2.2. The Abu Dhabi Vision 2030

In today's world dynamic economy, free trade, and active socio-political movements, many countries are foreseeing their forthcoming situations for keeping the momentum of their stability and economic progress. Consequently, the UAE Federal Government is planning to warrant the continuity of its achieved successful socioeconomic growth and state stability. Therefore, the Federal Government proposed a national plan, *namely* "The UAE 2021 Vision" as a roadmap for achieving national objectives and ultimate targets that would be paving the way for further progressive steps.

With reference to the 2021 Vision, the Abu Dhabi Emirate endeavours to make sure that its achieved success is dynamically continued to form a solid hub for more

development and growth. This study sheds light over the plan proposed by the Government of Abu Dhabi Emirate, *namely* “Abu Dhabi Economic Vision 2030”, in which the Emirate has set broad guidelines and top priorities for the Emirate’s socioeconomic advancements within its Policy Agenda. Moreover, the concerned vision is considered in this study, because some of the project-based organizations that have been targeted in the survey were among the major players in implementing the Economic Vision 2030 (Abu Dhabi Government, 2008).

Considering these proposed guidelines as the Plan’s evaluative parameters, the Abu Dhabi Economic Vision 2030 has been composed in the consultation with the private sector as an active partner. The Vision 2030 is considered as a 22-year strategy to accomplish the target objectives, and to make sure that all the stakeholders in the Emirate’s economic paradigm is being active in harmony, with the intention of reaching the long-term goals.

The Policy Agenda 2007/2008 of the Abu Dhabi Emirate clearly defines a set of the top priorities as a general public policy in the Emirate. These priorities have been proposed in accordance to what the Emirate considers as its core goals, particularly, the citizen safety and sense of security in the society, as well as sustaining a dynamic and attractive free economy. The Emirate has already identified nine areas to shape the future trends of the Emirate in the social, political and economic arenas:

- A large empowered private sector.
- A sustainable knowledge-based economy.
- An optimal, transparent, and regulatory public administration.
- A continuation of strong and diverse international mutual relationships.
- The optimisation of the Emirate’s natural resources.

- Premium education and healthcare provision
- Infrastructure assets
- Complete international and domestic security
- Maintaining Abu Dhabi's values, culture and heritage
- A significant and ongoing contribution to the federation of the UAE.

However, the abovementioned arenas are required concentrating on four key-priority areas:

- Local economic development
- Human resources and social development
- Infrastructure development and environmental sustainability
- Optimisation of Government operations.

The Emirate's drive for a more sustainable and diversified economy is intended to reduce the relatively high dependence on oil and the cyclical swings which accompany it. Moreover, the young National population presents the opportunity, as considerably as the challenge, to create attractive, high value-added employment opportunities for the emerging generation. The drive for diversification as well as the challenge of a burgeoning population delivers a larger need for Abu Dhabi to upgrade the quality of its educational scheme and to increase the educational attainment rates of the Nationals and the overall workforce to motivate the economy up the value chain. Moreover, a better educated workforce will be a key enabler to address the relatively low productivity rates found in much of the Emirate's enterprise base.

The Abu Dhabi Economic Vision 2030 sets out to cope with the current and future economic global situations by means of identifying the important domains for the crucial improvement for achieving the goals embedded within the Policy Agenda.

- Foremost, the status of the Emirate's economy has been ensured through an analysis of the available macroeconomic information. The Vision 2030 inquiries about which sectors and types of enterprise could contribute significantly to the ultimate economic output and growth, and in which regions most growth is taking place. However, various opportunities have been identified within the realm of these areas to furnish the desired economic diversity, sustainability, and equality throughout the regions.
- Second, the Vision 2030 examines the current business within local and global context to identify the major strengths that could be enhanced the Vision for employing an effective promotion of economic initiatives and competitiveness among the Emirate's enterprises against their existing peers, as well as the international ones. In especial, the Vision 2030 truly considers the business legislation, labour insurance, transparent fiscal and monetary policy as core regulatory and policy levers that could be controlled to improve the overall business environment.
- Finally, the Vision 2030 takes into account the Emirate's natural and human resources and the steps that need to be taken to ensure these can accommodate future economic growth. Infrastructure, including energy, transport and ICT, is a key area that requires continued investment to provide for a growing population and increased economic activity. The development of human capital and the workforce is another key area that is vital to the long-term success of the Emirate's economy. Assuring that the financial capital could be

employed safely and confidently as too fundamental to developing and spreading out the economic system.

These sectors are required to form the Emirate's engines of economic development and diversification, as illustrated in Figure:

- Education and Research Resource
- Energy- Carbon natural resources and renewable energy
- Petrochemicals and Metals industries
- Aviation, Aerospace, and Defence industries
- Pharmaceuticals, Biotechnology, & Life Sciences
- Public Health, and Healthcare Equipment & Services
- Financial Services and Investment Facilities
- Transportation, Trade, Tourism, and Logistics
- Media and Telecommunication Services

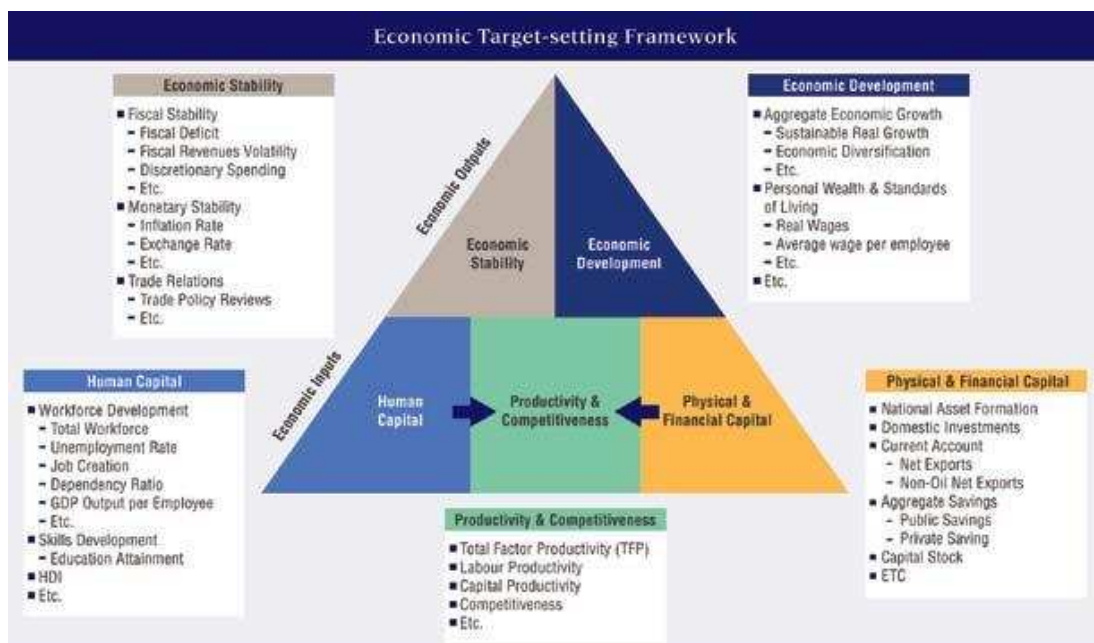


Figure 1: The Abu Dhabi Economic Vision 2030 Framework

1.3. Foundation of the Study

The PMO is recognized in the scholarly literature as a recent but increasingly widespread issue of investigation in engineering and management studies. The literature review (see Chapter 2) presents the scholarly research and academic literature conducted in the area of the PMO, along with its potential applications. A cursory literature survey generally reveals.

However, that little has been written about the potential roles of the PMO, or on ways to align it with the objectives and the execution processes in the strategic plans of a public sector organization. The research studies in this area are still scarce, meaning that the topic is still insufficiently investigated, in particular in the context of the professional practices in the UAE business environment. This scarcity of PMO related literature and the lack of practical experience in the UAE public sector organizations are both considered seen as challenges by this study.

The study tackles what potential challenges might be put to the core functions of an organization in the public sector, and how the PMO can be kept constantly effective. At the same time, the review seeks suitable models from the existing literature and professional practices to apply to the PMO in any UAE public sector organization. Although the PMO as a member of a dedicated business unit, is considered essential for enhancing the organization's performance, it is necessary to build a comprehensive and clear understanding of the ways in which the introduction of a PMO in an organization could effectively help in achieving its strategic objectives and plan. Therefore, this review covers a wide range of PMO-related applications and services in various settings, where academics debate about the efficiency of PMOs, and ask organizations to evaluate theirs.

1.4. The Research Problem

1.4.1. Background

Establishing a PMO within an organization in the public sector has been considered a potential solution to the problem of carrying out a business project within the context of an organization's strategic plan, and of minimizing failed projects. Little has been written on the relationship between the strategic plan of public sector organizations and the known roles and functions of the PMO.

The importance of having a PMO within a public organization is reinforced by the need to exert greater and more efficient control over any organization's projects. When several on-going projects run simultaneously within an organization, the creation of a PMO becomes an essential hygienic factor rather than an extravagance. The PMO helps both project managers and host organizations to understand and apply professional practices in their project management (Singh et al., 2009).

Over the past 10 years, the UAE has witnessed a dynamic development in the infrastructure projects, in particular in Abu Dhabi and Dubai Emirates, which are becoming two of the most attractive business hubs in the region. Several mega-projects exemplify the progress of their economic development and infrastructure, including the construction of the world's tallest building (Burj Khalifa) and largest shopping complex (Dubai Mall), and numerous artificial islands, such as Yas Island, Palm Dubai, and a largest artificial archipelago *The World*.

In addition, the UAE has an expanding manufacturing base with advanced materials and energy technology, oil industries, and machine and automotive industries, all of which help the UAE to contribute significantly to international

business. Recently, Dubai won the competition to host EXPO 2020 to entail a great expansion of infrastructure projects activities. Despite the execution of all those mega-projects, the PMO is rarely to be seen in many project-driving organizations where it should feature. Therefore, the immature practical experience of the PMO, particularly in the UAE public sector is considered a challenge facing proper methodology for completing a project.

This lack of PMO experience has raised strong interest in the researcher to conduct the first research study investigating possible roles for the PMO in following strategic plans by public project-based organizations in the UAE. The PMO could provide UAE-based organizations with a bundle of managerial functions and services ranging from furnishing standards to advanced executive management skills to bring to the organization's projects (Kutsch et al., 2015; Pellegrinelli & Garagna, 2009).

1.4.2. Research Problem Statement

The concept of the PMO's maturity level and effectiveness has recently been introduced to both the academic and professional communities. Potentially, the PMO has a higher level of effectiveness and positive influence on organizations as it grows older. To ensure that an organization setting up a PMO invests enough resources, it should understand whether a higher level maturity in the PMO could result in improved organizational performance (Aubry et al., 2010b).

The study aims to gain some insight into the PMO's specific roles in helping a public sector organization to execute its ultimate strategic plan through developing frameworks for improving the effectiveness and maturity level of the project's management. This study speculates on the key roles of the PMO in executing the

strategic plan of a public organization in the UAE. It attempts also to tackle the challenges that might interrupt the core functions of the target organization, and to show how the PMO could be effective in the long-run.

The study investigates whether a PMO contributes significantly in developing an effective project management to enhance the execution of the strategic plan in terms of the project success. The purpose of this quantitative and exploratory study is examining relationships between the seven factors of the PMO framework (X_{1-7}) designated as independent variables, and the execution of the organizational strategic plan (Y_1) designated as a dependent variable (Hobbs & Aubry, 2007).

The purpose of this quantitative and exploratory study is to examine the relationships between the seven factors of the PMO framework (X_{1-7}) designated as independent variables, and the execution of the organizational strategic plan (Y_1) designated as a dependent variable (Hobbs & Aubry, 2007). The framework is based on the findings of the quantitative analysis of collected data; it looks for the factors that could keep the developed PMO model sustainable in practice. The research statement argues that the lack of an effective PMO within a project-intensive organization may contribute to increased numbers of failed projects.

The PMO roles may be related to the core components and processes for carrying out the strategic plan. Therefore, the research works cited in the present study were chosen from the perspective of the proposed PMO framework to shed light on the following seven factors as independent variables:

- Strategic Management (X_1).
- Monitoring and controlling project performance (X_2)

- Development of project management competencies and methodologies (X₃).
- Multi-project management (X₄)
- Organizational learning (X₅).
- Organization structure and communication improvement (X₆).
- Project values sustainability (X₇).

1.5. Nature of the Study and Research Issues

This section covers the fundamental research issues related to the development of the proposed research framework before building a functional PMO model. The research background and motivations, along with the significance of the research theme, are discussed. The research aim, objectives, questions, and hypotheses are identified.

Many project-oriented organizations in the public sector consider the effective execution of their strategic plan to be what success means, although it is a robust challenge in the current business environment. This study examines the relationships between the selected independent variables and thus fits perfectly the approach of the quantitative research method, which analyses the results of examining relationships between variables (Johnson & Harris, 2002).

The use of a quantitative research method fits the central purpose of this study, and allows the required empirical evidence to be elicited from the target participants. On this basis, the study discusses the correlation and potential association between the roles of the PMO (as independent variables) and the execution of the organization's strategic plan (as the dependent variable). The data interpretation is performed by incorporating multiple regression analysis into the quantitative research method, using SPSS (version 20).

The study examines also the relationship between the major independent variables and their roles in completing the organization's strategic plan within the proposed PMO framework. The early intention of this study was to design the framework of a model representing three major components: **i)** the PMO's organizational structure, **ii)** the PMO's roles, and **iii)** the way in which these variables correlated with the execution of the organization's strategic plan. However, the screening of published works and further discussions with PMO leaders later resulted in the selection of appropriate PMO-related roles as independent variables; the study now seeks to verify their roles in executing strategic plan of the public organizations.

1.5.1. Aim

The study aims to look at identifying the possible roles of the PMO in accelerating and maintaining the successful execution and achievement of public organizations' strategic objectives and plans. It specially highlights the distinctive added-values, prospective outcomes, and the uncertain drawbacks, if any. The study also investigates how great an influence the PMO could exert on an organization's strategic options, in particular, those related to its project plans. Moreover, the findings of the study could be used to achieve the strategic goals and objectives of many UAE-based public organizations working on similar projects.

Business Improvement Architects *BIA* (2008) published an independent research study assessing the importance of the PMO in addressing the strategic priorities of the organization; it found that the PMO's short span of influence as a department based faction rather than a corporate level one hinders it from addressing the priorities. In connection with this study core aim, the following questions have lately been raised:

- 1) Is there evidence for a connection between the implementation of the PMO and the appropriate achievement of the organization's objectives regarding its strategic plan?
- 2) Can an overall and holistic view be taken of the importance of the PMO in terms of the strategic benefits of the organization?
- 3) Can the relationships between the PMO factors involved in achieving a successful implementation of an organization's strategic objectives could be defined?

1.5.2. Objectives

As project-based organizations have become more aware of the importance of project management approaches and tools, they have acknowledged a need of a systematic method of the implementation and support for project management applications in practice. However, many public organizations in the UAE are treating the project execution as a business strategy and tool in market competition. Moreover, many mega-companies (i.e., intercontinental) have made their way to the Emirati project market and brought a range of management applications and tools. Among these applications was the PMO, which represents a welcome, if little studied, trend in project management.

The objectives of the present research are to investigate which-of-which PMO roles are involved significantly in the successful execution of public organizations' strategic plans when they engage in project business. Many scholars have studied the functionality of the various PMO roles in different business conditions. The following objectives were proposed to fit with the research issues investigated in this study:

- a) The collection of relevant data sets before identifying the scope of the requirements of the organization's strategic plan.
- b) Defining the various PMO roles investigated in the related existing literature and how could be linked to the organization nature.
- c) Determining key PMO variables and their interrelationships to build a model.
- d) Developing metric reference for the evaluation the success of the PMO implementation.

1.5.3. Research Questions

Research-related questions are important since they serve as a blueprint for meeting the needs of the research design and established research objectives. Lim (2012) considers many divergent perspectives that define the functionality of the PMO models, such as:

- How to structure an effective PMO unit?
- What effective roles a PMO might play within an organization?
- What appropriate framework should be used to measure the maturity level of the PMO?

Before implementing a PMO unit in a project-based organization, some questions are usually raised, such as whether the PMO fulfils the organization's needs and whether the PMO fits the organization's goals and strategic objectives. However, a major motivation for choosing this topical theme was that little thorough research has investigated whether a PMO unit contributes significantly to success of a strategic plan execution. Thus, the purpose of this study is to enhance understanding and knowledge of these issues for the sake of those involved in project management.

This study aims also to design an effective and functional PMO model to address some research questions by examining the interrelationship between the PMO roles (independent variables) in the framework for achieving strategic plan execution (dependent variable) within the context of public project-oriented organizations. The researcher proposed two research questions to drive this study for meeting the stated objectives; these questions are as follows:

- 1) *Is there any link between the implementation of the PMO and the execution of the strategic plans of project-based organizations in the public sector?*
- 2) *How can the success of implementing PMOs within the public sector organizations be measured?*

1.5.4. Hypotheses

Hypotheses are frequently used in modelling to find rational relationships between the candidate components of functional and reliable models. The hypotheses formulated for the present study are based largely on the works of Hobbs and Aubry (2007).

The formulation of the hypotheses originates from the research questions. Each hypothesis is divided into sub-questions (positive/negative), namely:

1. ***H₁₀***: The PMO role of strategic management is not related to the execution of the strategic plan within the context of public organization environment.
2. ***H_{1a}***: The PMO role of strategic management is related to the execution of the strategic plan within the context of the public organization.
3. ***H₂₀***: The PMO role of developing project management competencies and methodologies is not related to the execution of the strategic plan within the context of the public organization.

4. ***H_{2a}***: The PMO role of developing project management competencies and methodologies is related to the execution of the strategic plan within the context of the public organization.
5. ***H_{3o}***: The PMO role of monitoring and controlling performance is not related to the execution of the strategic plan within the context of the public organization.
6. ***H_{3a}***: The PMO role of monitoring and controlling performance is related to the execution of the strategic plan within the context of the public organization.
7. ***H_{4o}***: The PMO role of organizational learning is not related to the execution of the strategic plan within the context of the public organization.
8. ***H_{4a}***: The PMO role of organizational learning is related to the execution of the strategic plan within the context of the public organization.
9. ***H_{5o}***: The PMO role of multi-project management is not related to the execution of the strategic plan within the context of the public organization.
10. ***H_{5a}***: The PMO role of multi-project management is related to the execution of the strategic plan within the context of the public organization.
11. ***H_{6o}***: The PMO role of organizational structure and communication is not related to the execution of the strategic plan within the context of the public organization.
12. ***H_{6a}***: The PMO's role in organizational structure and communication is related to the execution of the strategic plan in the context of a public organization.
13. ***H_{7o}***: The PMO role of project value sustainability is not related to the execution of the strategic plan within the context of the public organization.
14. ***H_{7a}***: The PMO's role in project value sustainability is related to the execution of the strategic plan in the context of the public organization.

1.6. Research Limitations and Delimitations

1.6.1. Limitations

This research study is conducted within the following limitations:

- Although some PMOs are hosted by private organizations, the present study is limited to project management offices in the government and semi-government organizations of the UAE.
- The participants in the study survey are all from public organizations in Abu Dhabi. This may not be typical of the PMO personnel in other emirates and hence limits the generalizability of the findings and results.
- The study focuses only on the PMO's roles in implementing public organizations' strategic plans, regardless of the PMO's structure or its integration within a public organization.
- The study is challenged by the yet immature experience of the PMOs and by the scarcity of PMO experts in the UAE's public organizations.
- The study came across few published works tackling the relationship between the introduction of PMOs and the execution of strategic plans by organizations in either the public or the private sector.

1.6.2. Delimitations

- The formulated research hypotheses, based on previous related research and literature, are the bounds of the study.
- The functions, roles, and integration of the PMO unit within the public sector organization are included in the framework of the conceptual model.
- Follow-up to assess how successful the implementation of these suggestions might be is not within the scope of this study.

1.7. Rationale and Significance of the Study

The rationale for this study stems from the need for organizations in the UAE public sector to use more effectively state-of-the art project management approaches and methodologies. They should gain more professional knowledge than what can be generated as lessons learned from past successes and failures, since project managers and PMO leaders are important to carry this knowledge from one project to the next.

The significance of this study is twofold. First, it is intended to contribute to the literature on project management approaches by identifying the actual problems facing the execution of projects as part of an organization's strategic plan, and selecting appropriate roles for PMOs in supporting plans in process of execution. Second, this research may show PMO managers what their peers are doing to facilitate cross-project learning and their associated challenges. This information may help them to improve project management practices.

The project managers, stakeholders and the like of the professional community are looking for reliable standards and guidelines to help their organizations in establishing and maintaining effective PMO units, while the academic community is looking for theoretical bases that could be used to expand the body of knowledge related to PMOs (Aubry et al., 2010b). The findings from this study will, it is hoped, help to reduce gaps in knowledge by offering practical perspectives for executives who used the PMO models in their work.

1.8. Definition of Terms of Interest

The PMI publishes a reference work of project management terminology entitled *Project Management Book of Knowledge* (PMOBOK®), which contains all the proven

traditional project management practices that are widely applied, together with updates of innovative practices now emerging in the profession of project management (PMI, 2008). In addition, the researcher considers the term ‘definition’ as proposed by reputable PMO researchers.

In this context, the researcher selected some interesting terms that frequently appeared in his investigation and discussion of the PMO roles and quoted their definitions; among them:

- *Critical Success Factors (CSFs): Those factors that are identified as necessary to meet the desired deliverables of the end-customer on a project. The CSFs might include the adherence to project schedules, budgets, quality, and change control and monitoring process along with the appropriateness and timing of signoffs (Kerzner, 2003).*
- *Methodology: A set of practices, techniques, procedures, processes, template and rules are being used by those professionals who work in a specific discipline (PMI, 2013).*
- *Organizational Project Management: The management practices where dynamic structures in an organization are articulated as vehicular means to implement organizational objectives through project execution to maximize and sustain project value (Aubry, Hobbs, & Thuillier, 2007).*
- *Programme: A group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually. Programmes may include elements of related work outside of the scope of the discrete projects in the programme (PMI, 2013).*

- Programme Management: *The centralized management of a program to achieve the program's strategic objectives and benefits (PMI, 2013).*
- Project: *A temporary created activity, which purposely undertaken to produce a unique product, service, or result (PMI, 2013).*
- Project Management: *The application of appropriate knowledge, skills, tools, and techniques to various project-related activities to meet the requirements of the project execution and implementation (PMI, 2013).*
- Project-based Organization (PBO): *An organizational form that creates temporary systems for carrying out its work. PBO conducts the majority of its work as projects and/or provide project rather than functional approaches. Therefore, PBO could be created by different types of organizations (i.e., functional, matrix, or projectised, etc.). The use of PBO may eliminate the hierarchy and bureaucracy inside the organization whilst the success of the work is measured by the results (PMI, 2013).*
- Project Management Information System (PMIS): *An information system consisting of the tools and techniques used to gather, integrate, and disseminate the outputs of project management processes. It is used to support all aspects of the project from initiating through closing, and can include both manual and automated systems (PMI, 2013).*
- Project Management Knowledge Area: *An identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques. Areas include integration, time, cost, scope, quality, risk, communication, human resources, and procurement (PMI, 2013).*

- *Project Management Lifecycle: A collection of generally sequential project phases whose name and number are determined by the control needs of the organization or organizations involved in the project. A life cycle could be documented with a methodology (PMI, 2013).*
- *Project Management Maturity: The progressive development of an enterprise-wide project management approach, methodology, strategy, and decision making process (PMI, 2013).*

1.9. Outline of the Dissertation Organization

This dissertation consists of seven chapters; each chapter is devoted to cover a specific area of the study and to cover the topic of research interest. The structure of the dissertation text is designed as follows:

1) *Introduction and overview* (Chapter 1)

This chapter provides a brief account of the PMO, the foundation and background of the study theme, a statement of the research problem, the nature and methodology of the study, research questions and related hypotheses, the rationale and significance of the research topic. The nature and characteristics of the UAE business environment are highlighted.

2) *Review of related literature* (Chapter 2)

This chapter focuses on the scholarly works related to the topic and theme of this study. The literature review begins by presenting a brief account of the evolution of project management as a discipline and its significance in academia and business. This chapter also covers the historical background of the PMO and seeks to shed light on the roles and functions of the PMO and related entities in improving management approaches and its maturity in executing the organization's projects.

Other related works on the portfolio and strategy of organizations for business projects are considered. Thus, the chapter argues that the project management is responsible for providing tools, templates and procedures for assessing the process of project execution and outcomes and also, through appropriate project management methodology, for determining the factors involved in the success or failure of a project.

3) *Conceptual framework design* (Chapter 3)

The conceptual design of the model framework is based largely on the relationships between the roles of the independent variables and the dependent one within the context of PMO theories and applications. Seven independent variables are selected from proven records of PMO roles as they have featured in research publications.

4) *Research methodology* (Chapter 4)

This chapter describes in detail the research design used in this study. It positions it within a quantitative framework, and justifies its use in investigating what roles are possible when executing the strategic plan of a public sector organization. This chapter assesses the data analysis of the pilot survey to find the strengths and weaknesses online before sending it to target participants. Multi-regression is used in analysing the data collected from them, which later contributes to the conceptual framework.

5) *Data collection and analysis* (Chapter 5)

This chapter presents the findings generated from the statistical analysis of the collected data, which employed SPSS and regression methods. The data cover the demographic description of the respondents and the PMO, along with tests conducted on the reliability of the dependent variable (taking strategic plan execution as a criterion) and the independent variables (PMO roles as predictors). Validity and

modelling are tested by applying both multiple and simple regression analyses to highlight the established reciprocal relationships between the criterion and each predictor.

6) *Discussion* (Chapter 6)

This chapter discusses the tested and validated findings of this explanatory study. It focuses especially on explaining the interrelationships found between the independent variables (the PMO roles) and those between each PMO role and the dependent variable (strategic plan execution). Such relationships would indicate how far each PMO role is involved in the plan's execution. Moreover, this involvement could help to decide whether each PMO role was either *strategic* or *tactical*, and to sort out the PMO roles in accordance with each one's level of effectiveness.

7) *Conclusion and recommendations* (Chapter 7)

The dissertation closes by highlighting the consistency of the generated findings with the proposed research questions and hypotheses. The findings are compared with existing empirical studies in the PMO domain (such as Aubry, Hobbs, Hill, etc.). The researcher in his recommendations seeks to use the significant results of the project business in practice. Recommendations for further studies are made to fill the knowledge gap in the PMO literature, in particular, the possible role of the PMO in sustaining the phases of the strategic plan.

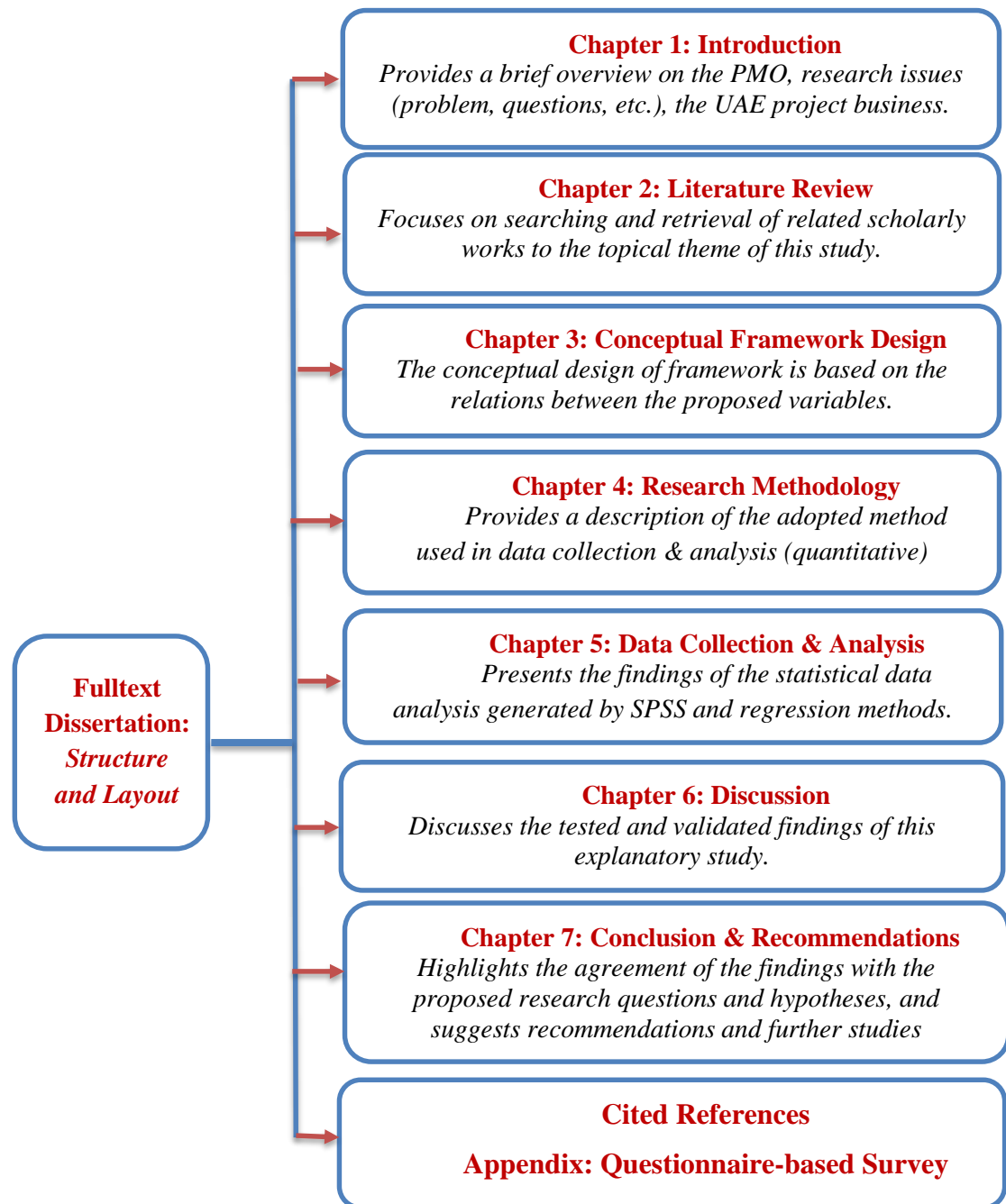


Figure 2: Structure and layout of the dissertation fulltext

Chapter 2: Literature Review

2.1. Introduction

The primary contribution of the established PMO unit encompasses multiple organizational perspectives, such as its interactions with managerial and operational activities for integrating them (Aubry, Hobbs, & Thuillier, 2007), and to enhancing performance (Dai & Wells, 2004). However, Desouza and Evaristo (2006) argue that the PMO unit encourages an innovative managerial approach in organizations because management must rely on complicated planning and process procedures to accomplish its goals, while the operations area relies on procedures and experience. The primary role of the PMO thus is to advance the integration between projects and mandates, becoming an integrator for functional and operational areas.

Although the PMO is a recent organizational phenomenon, it has a substantial impact on an organization's performance, thus, it is considered a key player supporting those who managing project execution within the framework of an organization's objectives and strategic plan. Consequently, the PMO could promote great changes in the organization, as it becomes embedded in the organizational structure to service the social and community dimensions of the host organizations (Aubry, 2015).

Given the wide variety of mandates and structures, Aubry (2015) argues that the *PMO* is hence loosely defined as “*an organizational entity assigned a variety of roles or functions in executing the coordinated management of projects under its domain*”. It could, however, be generally defined by using the three components of the descriptive model developed by Hobbs and Aubry (2010), which are i) organizational

context, ii) structural characteristics, and iii) functionality; their model was empirically validated using 500 single PMO descriptions (Hobbs & Aubry, 2010).

This literature review was conducted to help identify any related information that could be used to improve awareness of a gap in the current research. The related literature is reviewed to establish the theoretical basis of this. The collected literature speculates on the key roles of the PMO entity in achieving the objectives, and the execution of the ultimate strategic plan of the host organizations. The literature search largely focuses on the possible applications of the PMO approaches in different organizational settings, in particular in the public sector. These scholarly references provide a wide range of practical and business perspectives on the PMO's roles.

Special emphasis is placed on retrieving the published works that tackle the alignment of the PMO with the objectives of an organization-adopted strategy. This would accordingly provide better insights into the key roles in, and benefits of the PMO in the execution of the organization's strategic plan. The findings of these works are used to design the conceptual framework of the study theme. The task of showing how the retrieved literature relates to the theme of the dissertation is retrospective.

The review is devoted to highlighting the possible roles for the PMO in creating project management benefits, besides adding value to the host organization. The relevant citations are drawn primarily from the scholarly journals, dissertations, PMI books, and technical documents of authenticated bodies. The search and retrieval of the related sources has largely focused on the works of reputable researchers and authors in the domain of the PMO, such as Dai and Wells (2004), Hobbs and Aubry (2007-2015), and Hill (2004), etc.

2.2. Organization Strategic Plan

It is the genuine interest of many companies and organizations to strive to develop an effective mechanism to monitor, at some level, what goes on in their internal and external environments in order to assess the strength, weakness, potential opportunities and threats, i.e. make a SWOT analysis (Abels, 2002), and also to gather comprehensive environmental intelligence (Majid & Khoo, 2009). Nevertheless, strategic planners could answer a substantial question: “*where we now and where will we be in the near future?*”

As the landscape of business activities becomes more globalised, the business strategy of an organization becomes its driving force to gain as much business privilege as possible for the parent organization. Mintzberg (1991) formulates a broad definition of *strategy* as “*A deliberate search for a plan of action that will develop a business’s competitive advantage and compound it. The pattern of objectives, purposes, or goals and major policies and plans for achieving these goals stated in such a way as to define what business the organization is or the kind of organization it is or is to be*”.

Furthermore, Mintzberg distinguishes two types of strategy, namely, “*deliberate*” and “*emergent*”. Deliberate strategy is intentionally initiated by the organization to achieve its ultimate goals, whereas emergent strategy is an *ad hoc* attention to the need to manage an unexpected problem arising in the course of normal operations. Vancil (1976) explains that the organization strategy is “*a conceptual framework proposed by the organization’s leader for i) the long-term objectives or purposes of the organization, ii) the broad constraints and policies, either self-imposed by the leader or accepted by him from his superiors, that currently restrict*

the scope of the organization's activities, and iii) the current set of plans and near-term goals that have been adopted in the expectation of contributing to the achievement of the organization's objectives".

The distinct concept of *strategic planning* is defined as "*The process by which an organization evaluates its current position in the marketplace and against its competitors, sets goals, and determines the actions and resources necessary to capture and maintain a competitive advantage*". This process exhibits at least one of the following elements: *perspective, plan, pattern, position, and ploy* (i.e., gaining advantages); this definition is known as "*The Five Ps*" (Mintzberg, 1991; Stretton, 2013).

Büchel and Probst (2000) describe strategic planning as "*A process of learning about where the future prospects of a company might lie*" and as "*A learning process undertaken by a group of people who get together to think about the future of the company*". The key components of an organization's strategic plan are considered *vision, mission, values, and strategy*.

The vision states what the organization is striving to be; the mission describes the entity, philosophy, culture, and contributions of the organization in its domain; the values reflect the morals and ethics that are shared by shareholders, customers, and the suppliers, whereas strategy itself is a roadmap to achieve the target vision and mission of the organization (Stretton, 2013). Endlich (2001) gives a historical background showing the evolutionary development of the strategy concept, which has been discussed in the following works in the field, detailed in Table 1.

Table 1: Definitions of strategy in various concepts

Author(s)	Definition	Attributes
Ansoff (1965)	“The rules and guidelines required for a firm to make decisions and to have profitable growth”	Decision-making support
Mason (1969)	“An approach to set formal guidelines and constraints for the behaviour of the firm, which involves a choice of goals and alternative behaviour patterns for attaining them”	Maintaining organizational behaviour and stability
Mintzberg (1991)	“The pattern or plan that integrates major goals, policies, and action sequences of an organization into a cohesive whole”	Achievement of the core objectives

2.2.1. Project Business and Strategy

The rapid accelerations in technological applications, economic activities, project business diversity, and social demands have motivated a series of initiatives to find new approaches to manage such changes. *Project business* commonly denotes the collective activities of a project-based organization (PBO) in delivering or executing projects to its clientele; in addition, the PBO could act as a supplier for some parts of the project components. Thus, *project business* is considered the interaction of inter/intra-organizational activities in the framework of project implementation.

However, Artto and Wikström (2005) define *project business* as “*The part of business activities which are related directly or indirectly to the proposed projects purposely to achieve the objectives of an organization*”. The concept of *project strategy* is still debatable; a project strategy could be understood by deriving its elements from the organization’s project management practices.

Artto et al. (2008) define three tracks of the project strategy that are dominantly treated in the project management literature, namely:

1. The project, *as an image of the parent organization*, focuses on the formulation of the project strategy through a *top-down* process starting at the organization's business strategy. Therefore, the elements of the project strategy could be interpreted by means of the organization's project management standards,
2. The project, *as an autonomous entity*, focuses on its subordination to the strategy of its parent organization. This strategy gives the project team some room for independence in choosing an appropriate management approach, execution direction, implementation schedule, and self-assessment.
3. The project, *as a complex entity*, focuses on the extent to which the self-governance scheme of a project is authorised in a complex business domain, which involves many powerful stakeholders as well as the power of the parent organization. In this case, the project strategy is assumed to be self-originated and associated with the governance structure of the project management team.

Patanakul and Shenhar (2012) state that “*any human activity in changing the existing situation is considered a proposed project*”. Accordingly, the ties between project management and strategic plan are not exceptional, and many attempts have been made to advance and improve their components. These writers incorporated the three “P” concepts to define the project strategy through the three elements of strategy in general, i.e., perspective, position, and plan. Thus, the project strategy is “*An employment of the background, reason, and ideas (perspective), what is to be achieved (position), and proposed guidelines and outlines (plan) to achieve the highest advantages and best values from the project*”.

This *strategic project management* (SPM) is based ultimately on the fact that most projects are purposely initiated to achieve business value-added results, so long as the implementation of the project management is better aligned, with higher-level concerns, to the enterprise strategy. Accordingly, the SPM approach could successfully coexist with the traditional one; in other words, the SPM aims to expand and modify the traditional approach instead of discarding it; however, the main concern of both approaches is to meet the operational goals for performing efficient and successful project implementation (Shenhar, 2004).

2.2.2. Business Strategy

The new business paradigm has motivated many organizations (private and public) to adopt an appropriate business strategy for helping the managers, leaders, and stakeholders of the organization to make the right decisions and policies in order to avoid unpredictable administrative and business challenges wherever possible. However, the business strategy pervades different levels of the organization in the forms of tactical or strategic planning, diversity in investment, and involvement in some sorts of strategic alliance (Ghezzi, 2013).

Giannoulis et al. (2011) defines business strategy as a goal-driving force that stems from the vision and mission of an organization expressing its future core goals, which carefully steer the execution of the strategy adopted. Thus, the constant efforts of an organization are aimed largely at enabling it to communicate its business strategy efficiently by linking the decision makers and executives with the professional employees to promote its products and services well in competitive markets.

Srivannaboon and Milasevic (2006) find that a business strategy realizes its influence on PM via its competitive attributes (time-to-market, quality, and cost) across the organizational hierarchy at the corporate, business unit, and functional levels. Thus, the business strategy of many organizations has been drastically changed to fit the new emerging business paradigms (Cerasale, 2004). However, both new and old strategies identify the intention in the organization to take necessary action. Their hierarchy of linking and aligning corporate strategy to the project strategy level is shown in Figure 3.

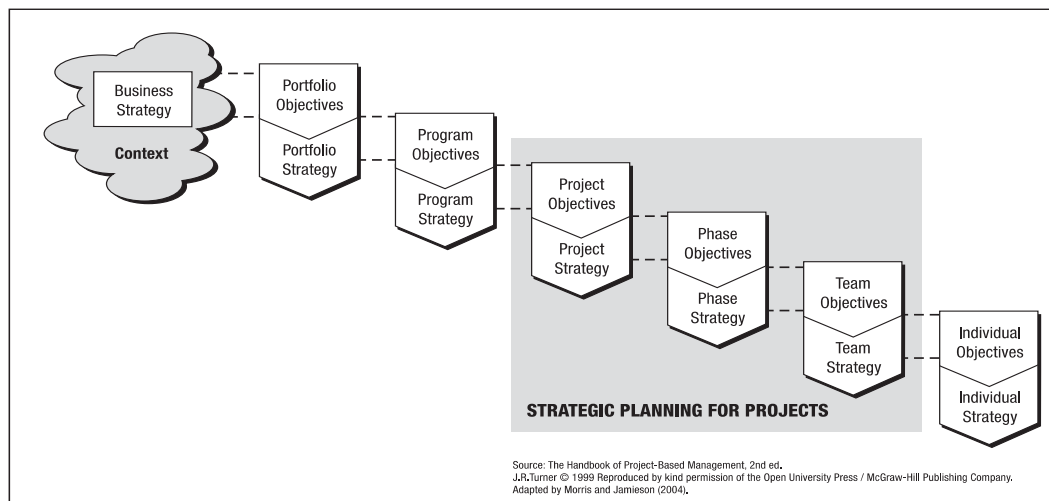


Figure 3: Linking individual projects with business strategy

(Source: Morris & Jamieson, 2005)

The related goal formulations business may pose serious administrative challenges in the implementation of an organization's projects. Meskendahl (2010) states that a new approach is needed to settle the obstacles to the success of a project; this approach is termed *project portfolio management (PPM)*, which is defined as "*the management approach to control simultaneously a set of projects as one large entity*

[sharing] limited resources". Meskendahl also sheds light on the relationship that may be established between the PPM and strategic planning (SP).

The strategic plan paves the way for a set of processes to bring suitable conditions for connecting with the portfolio concerned. Therefore, strategic planning serves as a catalyst for making a rational decision on the allocation of available resources in order to pursue a specific business strategy. Therefore, the focus of the business strategy of an organization is not merely on predicting unexpected events, but on making better strategic or tactical decisions in the effort to reach the desired business goals.

Consequently, some managers agree upon adapting to unexpected environmental and strategic changes through webbing and aligning the relevant administrative units to preserve the high-level strategic goals of the organization stably in the long term (Young et al., 2012). One of the most important factors supporting the implementation of a successful business strategy is the ability of the organization to achieve coherence between sets of internal and external competitive factors.

Such an ability may enhance the power of the organization's top managers to facilitate good performance and strategic achievements in both business innovations and competition (Blumentritt & Danis, 2006). Moreover, the organization should adopt a range of project strategies and business plans generated from environmental factors to overcome any unexpected interruption to its plans. Gray and Larson (2006) state that the project management process sometimes fails to provide the strategic plan of the host organization with sufficient support.

Therefore, aligning project management with business strategy could be an asset to the project management team as it refines and implements the business strategy of its projects. Nevertheless, the growing popularity of the PMO has been gained through organizations' recognising that their business strategy is essentially achieved by the successful implementation and execution of projects; here, project management is a critical factor as is competence, which should be kept in continuous development (Hurt & Thomas, 2009).

At the same time, the roles of the project management tools in the organization's business strategy are considered the core components of the project strategy. PMO often seeks to amend the project work in the organizations via harmonizing the tools of established *project knowledge management* (PKM) in preparing and managing project plans in collaboration with project teams. However, in the project business arena, business strategy needs to be linked with project-based organizations if they are to achieve the targeted objectives. This will be done through bringing in related governance, procedures and policies to a form of strategic alignment. Hence, the failure of such an alignment might lead to the unexpected delivery of projects to customers (Yeong & Lim, 2010).

2.2.3. Strategic Alignment

This section reviews the scholarly works devoted to generating a comprehensive technical definition that would improve our understanding of the relationships between organizational strategies and business processes. Over 30 years ago, there was an increasing concern with the concept of strategic alignment in terms of organization strategy and project implementation. Alignment is usually associated with the need to join disparate programmes and projects to make them more efficient

and coherent. Thus, strategic alignment must be functional throughout the whole organization (Aubry et al, 2010b).

In today's business world, many organizations face challenges and difficulties in establishing a relationship between a set of business processes and a set of strategies. The strategic alignment approach may enable project directors and decision-makers to attain further meaningful insight into the progress of their projects, which are based on the current business processes. Yet the organization's strategy is often aligned systematically and continuously with project execution and process execution, whereas its governance is devoted to monitoring the adopted strategy and facilitating the alignment with project execution and process execution.

Over recent years, the alignment of strategic priorities has become a cardinal topical theme in the strategic management literature. Gutierrez (2011) states that defining alignment is a challenge, since multiple definitions have been put forward, many authors emphasizing certain aspects of it, such as integration, fitting, strategy harmony, bridging, fusion, and IT involvement. Walentowitz (2012) states that alignment is considered a key driver of business value. With this in mind, the author conducted a comprehensive literature survey to shed light on the various definitions of alignment and produce a map of alignment types.

This survey extracted 61 technical definitions widely used in business processes, such as the *strategic alignment model* (SAM), which describes the multivariate alignment of its four elements (strategic integration, strategic fit on the business side (i.e., business strategy and business structure), strategic fit on the project

side (i.e., project processes and structure), and functional integration). Walentowitz also argues that the SAM could be applied to other business projects.

All these definitions generally focus on ways to improve organizational capabilities through appropriate information technology (Martin et al., 2007). Strategic alignment is generally known as “*a mechanism by which an organization could link its overall goals with the core goals of each administrative unit that contribute to achieve the organization strategic plan in the surrounding environment of the business activities*” (Walentowitz, 2012).

Strategic alignment, as a strategic option for an organization, has received recently much attention across the management literature. However, the business processes consider a critical mechanism to be via an organization achieving its own specific strategies. Therefore, business processes themselves need a strategy to pave the way to good performance. Alignment functions as a catalyst for achieving synergy between strategy, the organization, processes, technology and people, in order to sustain the quality of “interdependence” and thus achieve competitive advantage (Jeston & Nelis, 2008).

Currently, new trends in the execution and implementation of the proposed strategies, partially fuelled by ever-increasing business competition, have emerged to guide organizations in effectively re-assessing and re-adjusting their strategy. Hence, the strategy formulation and execution are becoming more and more management processes. This shows that strategic alignment is a suitable platform for the new genres of business initiative (Zadeh & Ching, 2007).

The alignment of strategy to the organization's business processes should be a continuing activity embedded in the specific approaches of an organization's working style. The alignment approach involves four elements: process, information, service, and technology and should be an organic component of the organizational strategy to guarantee its completion in a uniform, predictable, sustainable, and logical pattern. This prevents strategic alignment from becoming a reflection of individual viewpoints and experiences. However, the intervention of the organization's own governance greatly assists in solving any conflicts (Jeston & Nelis, 2008). Andolson (2007) illustrates the sequences of establishing a successful strategic alignment, as demonstrated in Figure 4.



Figure 4: The sequences of the strategic alignment
(Source: Andolson, 2007)

Baker et al. (2011) describe five types of strategic alignment, as follows:

- *Business alignment*- aligning business resources with the business strategy, which is based on the concept that the business structure and business resources should evolve in parallel, to maintain the strategic mission of the organization's businesses.
- *IT alignment*- the ubiquitous applications of IT in various business processes have created a sort of alignment between the IT entity and the business resources, which in turn enables the organization to achieve its business strategies.

- *Environmental or contextual alignment*- the organization should strive to align its business strategy in the present competitive context, which includes industrial and macroeconomic contexts.
- *Structural alignment*- describes the harmony between the business resources and IT infrastructure.
- *Strategic alignment*- this type of alignment has received great attention in business research; it is described as “*the degree to which the IT entity's mission, objectives, and plans could support and are being supported by the organization's business mission, objectives, and plans*”.
- *The researcher added social or community alignment*- the organization should put in the account the social dimensions of its community-oriented services or projects, along with other national and socio-cultural factors.

Karayaz and Gungor (2013) argue that the following obstacles support the vital roles of strategic alignment:

- The workforce does not fully understand the strategy.
- The organization fails to execute core components of its proposed strategies.
- The executive teams waste considerable time in discussing strategy without reaching a common viewpoint.
- The organization does not link middle management incentives with its own business strategy.
- The organization does not link its budget to the proposed strategies.

Morrison et al. (2011) propose a general mathematical framework for business strategic alignment, which helps to develop a clear understanding of the optimal set of business processes that can facilitate the working of these strategies in the

organization. This framework could answer such problems as *what strategy does this business process seek to satisfy? How will this strategy be realized?* The co-authors assume that their results bring many benefits for project managers and other professionals who want to apply a reliable strategic alignment, which focuses most on saving costs, solving work conflicts and overlapping responsibilities to reflect the capabilities and competencies of the project-based organization.

Baker et al. (2011) conceptualise competency in dynamic strategic alignment with reference to their developed operational approach. They describe how the sustained strategic alignment could provide business value for an organization based on the dynamic capability framework (DCF) and conclude, *“The ability of an organization to develop a strategic planning process that fosters alignment along several key dimensions is an enduring competency that can be a source of competitive advantage”*.

Moreover, Baker provides a measure of competency in dynamic strategic alignment to assess the organization’s tendency towards alignment, and also the maturity level of the processes that enable business structure to integrate and coexist with the business strategies. The implications of their study encourage the researchers and practitioners to use a theory-linked metric to evaluate strategically their firm’s alignment and the processes that support it.

Karayaz and Gungor (2013) investigate the relationships that may exist between strategic alignment and the PMO department in an organization’s business environment. These establish a PMO system that manages to face the harder changes predictably taking place in the global business markets. Karayaz and Gungor also

highlight the two major types of PMO role as strategic and operational, and say that these should be implemented simultaneously.

It may be useful at this point to examine the historical employment of the PMO in the organization's strategic plans, business strategy, and project operations. The various recognised roles of PMOs have been found to carry major responsibilities and play key roles in supporting the execution of an organization's strategic plans, from the project management perspective (Bates, 1998). Other benefits of the PMO are further recognized as the formalization and consistency of project selection and management and the efficient coordination of multiple projects, improvement in the performance of projects in terms of cost, schedule, scope and people, and improvement in organizational profitability (Rad, 2001).

The next section seeks to shed light on the PMO, since it has come into prominence in recent years as a dynamic managerial entity with many uses in enhancing an organization's power to introduce and adopt new practical approaches to effective project management. This, in turn, may increase the capabilities and competitiveness of the organization in the business market (Aubry et al., 2008).

2.3. Project Management Office – Roles and Functions

Many organizations relentlessly search for the best set of management practices and tools to ensure successful project execution, and to strengthen their ability to build internal structures to support projects in accordance with its business strategy. Therefore, they implement an administrative body with the aim of managing ongoing parallel projects to ensure that these projects receive sufficient management support

and uphold standards. This administrative body is termed as the *Project Management Office* (PMO).

Once the creation of the PMO is authorised, the organization should pay serious attention to the start-up issues, which must be resolved in advance. This raises questions, including **i)** *what functions the PMO should carry out*, **ii)** *how the PMO will be staffed*, and **iii)** *where the PMO will be situated, as an individual department or associated unit*. The PMO was actually developed in the discipline of project management studies. Thus, the PMO functions as a strategic enabler to answer the needs of organizations in meeting their strategic objectives.

Ever since the PMO was found in theory and practice to be an appropriate solution, it has served as a central post for organizing and disseminating best management practices. However, project management research nowadays shows that the PMO could serve systematically to guide different project management disciplines in aligning project management processes with the organization's overall objectives. However, the PMO implementation life cycle consists of:

- i.** *Initiation* (mission & vision, strategy, objectives, measures etc.)
- ii.** *Planning* (planning, risk assessment, and budget),
- iii.** *Execution* (recruiting staff, defining roles and responsibilities, drafting a governance plan, and conducting a pilot study),
- iv.** *Control and monitoring* (marketing, communications, measurement, and encouraging community involvement)
- v.** *Maintenance and transition* (pilot/roll-out, marketing and communication).

As the scope of the PMO's functions increase in the organization, more management roles are found. Salameh (2014) defines the roles in the various types of PMO, and then lists its various services and functions, as shown in Table 2. The table records that the functions of administration support delivery, define standard project-management methodology (PMM), and portfolio management, and manage project delivery management. All types of PMO provided these. However, some types provide specific services and functions. For instance, the Enterprise PMO and Excellence Centre offer specific strategic planning and talent management; these two functions focus on the strategic aspects of organizations, and the ways to align them to prioritize project execution with the organization's strategy and objectives.

Table 2: Different roles of the PMO types

Functions	Depart'l PMO	PSO control	Enterprise PMO	Excellence centre	Project-specific MO
Administrative support	√	√	√	√	√
Knowledge management	X	X	√	√	X
Organiz'l change management	X	X	√	X	X
Performance management	X	X	√	√	√
Portfolio management	√	√	√	√	√
Project delivery management	√	√	√	√	X
Standard PMM and processes	√	√	√	√	√
Strategic planning	X	X	√	√	X
Talent management	X	X	√	√	X

√=Does service X=Doesn't

(Modified from Salameh, 2014)

Despite the short lifespan of the PMO, this managerial phenomenon has drastically changed the way that project management has been monitored and practiced. Consequently, the characteristics, roles, and various types of PMO have attracted a great deal of attention in the scholarly research activities related to the field

of project management. Now the maturity of project management practices is becoming increasingly accepted in a variety of project businesses and industries as a source of competitive advantage for companies.

In their study, Pennypacker and Grant (2003) record that their survey of a considerable number of respondents, affiliated to 123 project-based organizations, indicated that the organizations they represented were not mature in terms of project management performance. Since the PMO has become a dominant part of the project-based organizational structure, it could provide effective solutions through standardizing the delivery of projects.

2.3.1. Project Management

Since the dawn of the industrial revolution in the eighteenth century, many have been concerned with inventing and designing new and unique products, which have brought many significant value-added benefits for improving and advancing human activities. Such endeavours are achieved primarily by means of *projects* (Hanisch & Wald, 2011).

The project, as a business activity, has become an important way to structure work in many organizations and has constituted one of the most widespread organizational developments in both business and industry. Therefore, the management of projects is of considerable economic importance; moreover, a dramatic growth has occurred in project work across different domains and sectors of industries and countries (Turner, 2009).

The Project Management Institute (PMI, 2008) defines the term 'project' as "A *temporary purposeful activity or attempt, which is planned to deliver specific outputs*

(e.g., *produce innovative product, service or method*) in applicable constraints (e.g., *a defined time, cost, and quality*) with which this attempt achieves its ultimate expected goals”. In other words, a *project* is created as a means to respond to business changes inside and outside organizations, taking into account such threats as risk and shortages of resources.

The subject of project management has grown from interdisciplinary academic studies in economics, technology, and behavioural studies. This subject continuously advances with the recognition of professional bodies in the business and industrial domains, along with governments and academic institutions. The project management discipline provides modern-day organizations with a theoretical basis for becoming more effective and constantly proactive despite the challenges from an unpredictable business environment and from running multiple projects at the same time, each project posing different challenges. Furthermore, this discipline also helps to develop new products and new skills and knowledge through the lessons learned from experience (Bredillet, Yatim, & Ruiz, 2010).

The PMI defines the art of project management as “*An application that blends professional knowledge, expertise, strategic thinking, and techniques for executing a proposed project in an efficient and effective manner, as well as meeting the ultimate goals of the project and its sponsoring organization*”. Hence, project management has strongly gained ground as an important strategic approach enabling organizations to achieve competitive advantage. This definition has recently been revisited, since the conceptual base of project methodologies and models has remained static over years.

Consequently, many management researchers have initiated debate on the “*classical concept*” of project management in order to rethink their concepts in accordance with the responses of current projects to the business challenges and lessons learned from previous projects. Meanwhile, classical management is still finding its approach adopted by some business and industrial organizations. Thus, a new management paradigm of multiple approaches has been developed, under the umbrella of *strategic project management* (Patanakul & Shenhar, 2012).

Svejvig and Anderson (2015) conducted a literature review of 74 contributions and demonstrated a new concept: *rethinking the project management components*. They present the results of their study as a comparison between the *classical* and *rethinking* concepts of project management, as shown in Figure 5.

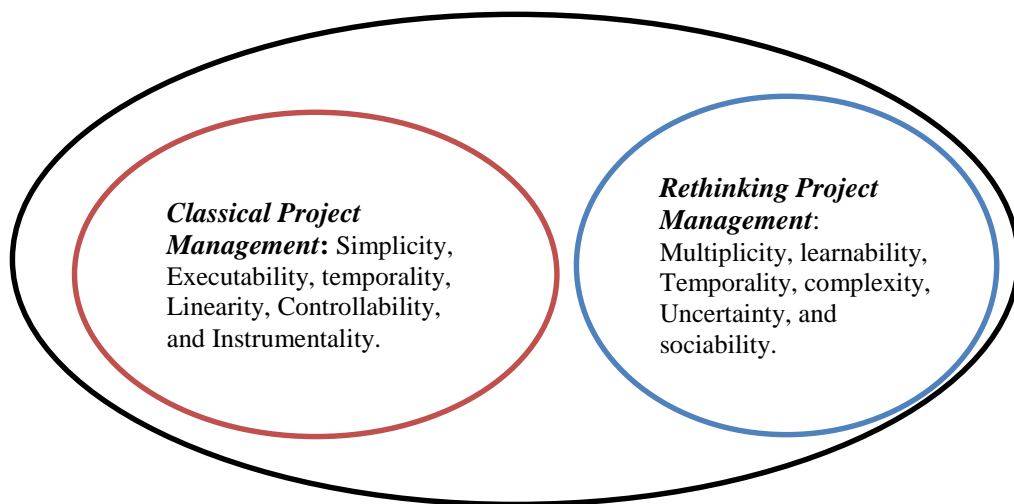


Figure 5: Important features of the classical and rethinking PM concepts

(Modified from Svejvig & Anderson, 2015)

Svejvig and Anderson group the 74 contributions into the six following categories:

- 1) *Contextualisation*: Expanding the conception of the project to encompass elements such as the environment and organizational strategy.
- 2) *Social and political aspects*: How social and political processes shape projects, e.g. power structures, emotionality and identities.
- 3) *Rethinking practices*: Offering/suggesting alternative methods, perspectives and ways to rethink practice, e.g. through education or reflective practice.
- 4) *Complexity and uncertainty*: Outlining the complexity of projects, their environment, etc. and new methods to cope with complexity.
- 5) *Actuality of the project*: Outlining the need to study the way that projects are carried out in practice, or consulting empirical studies of projects in practice.
- 6) *Broader conceptualisation*: Offering alternative perspectives on projects, project management and project success or outlining how the field is broadening beyond its current limits.

Bredillet, Yatim, and Ruiz (2010) trace the development track of the project management discipline through the analysis of two different aspects of growth:

1. *Project management advancement*, describing and analysing the theoretical and practical knowledge of the arts of project management.
2. *Project management deployment*, describing and analysing the size and extent of the involvement of human resources, to indicate the adoption by individuals and groups of project management as an academic and professional discipline.

This new business paradigm however increases the complexity of projects; many organizations have increasingly responded to these emerging challenges by developing various innovative and flexible entities, which emphasize managing projects as a business activity (Vidal et al., 2011). As the nature of projects has become

more complex, it seems that the traditional approach, which highlights abiding by schedules and meeting deadlines, auditing budgets, and the ultimate attainment of project goals, is no longer sufficient to meet organizational objectives.

Therefore, the methodology for managing the projects today needs innovative approaches to negotiate the various aspects of project execution. Project managers should realize that the project has become **i)** more complex and vulnerable to high risks, which could be unpredictable during the approval phase and need efficient incident control, **ii)** more uncertain, because the anticipated outcomes may be at risk without any concrete guarantee of the final value, and **iii)** more closely linked with the firm's environment, whether internal or external (Kerzner, 2003).

Project management deals extensively with two core components, programme and portfolio. The Project Management Institute of America (PMBOK, 2013) defines *program* as “A structured process of managing multiple ongoing projects in an organization”. Programme management is the “alignment of ongoing projects with the goals and objectives of an organization to group similar projects that warrant optimum coordination of resources at the most beneficial allocation for the organization”. A portfolio is defined as “A collection of ongoing programmes, whereas portfolio management is a selection of a combination of programmes that would give the organization the most optimised profits at least risk”.

Thus, managing a project in any field is considered a typical challenge to management arts and practices. Consequently, the members of an organization's project team (e.g., senior managers, executives, and technicians) must know how to direct the project's execution towards satisfactory business results, in turn earning

more investment profits, additional growth, an improved market position, and thorough competitive capability (Patanakul & Shenhar, 2012).

Sodade (2011) gives more insights into the task for project management, naming five discrete processes: *initiation, planning, execution, controlling and monitoring, evaluation and closing*. The components of the project naturally vary depending on its nature and purpose. In the business environment, intense economic stress, accelerated competition, rapid technological change, and an increased webbing of communities and individuals in expanding cyberspaces have been witnessed.

Söderlund (2004) argues that project management research in the past was concerned with describing the success or failure factors in projects, while the foundations of project management did not receive the attention that they deserved. A theory of project management is the next logical step on the research agenda of project management studies. Söderlund states that universal theories of projects do not in fact apply to all cases, for projects are too heterogeneous. Söderlund also states that a theory of project management should have to answer the following questions:

- Why do project organizations exist?
- Why do project organizations differ?
- How do project organizations behave?
- What is the function of, or value added by, the project management unit?
- What determines the success or failure of project organizations?

Hanisch and Wald (2011) conducted a meta-analysis generated from the works of three authors. Their findings support the call for an integrated approach to fulfil the following requirements: i) Support of research in *projects* (temporary organizations)

and *project management*, and ii) Integration of theory and practice; and differentiation of design/independent variables, context factors, and dependent variables. Table 3 provides an overview of the current approaches in project management practices.

Table 3: Approaches in project management research

Theory-based	Bredillet, 2010	Söderlund 2004	Shenhar 2004	Turner 2009
<i>Considered perspectives</i>	-Optimization -Modelling, -Governance -Decision making	-Project (single / multiple) -Organization (single / multiple)	-Strategic Business -Operational process -Team leadership	-People (owner, stakeholders) -Value creation
<i>Research focus</i>	-Trends in project management research	-Trend in project management theory	-Trends in project management research	-Project management theory
<i>Methodology</i>	-Literature review	-Literature review	-Case study	-Conceptual theory development
<i>Proposed research trends</i>	N/A	-Existence of project organizations -Behaviour of project organization	N/A	N/A
<i>Specific features</i>	-Considering project context	-Introducing queries for further research	N/A	N/A

(Source: Hanisch & Wald, 2011)

2.3.2. PMO Definition

The PMO is considered a recent managerial phenomenon, and has newly been developed as a multi-functional tool for the effective management of various projects to achieve the organization's objectives and goals. There are several definitions of the term "*Project Management Office*". The Project Management Institute (PMI) of America indicates that the PMO can generally be defined through its core activities in project management (PM) scenarios regarding project activities, objectives, and

portfolio management. Depending on these components, the PMO definition can be stated, as “*A project management office is a management structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools, and techniques*” (PMI, 2013).

According to the *Dictionary of Project Management Terms* (2013), a PMO is “*An organizational entity established to assist project managers throughout the organization in implementing project management principles, methodologies, tools, and techniques. In most implementations, the project management office is a support function and is not responsible for project execution. Its main objective is implementing effective project management practices throughout the organization.*”

The Project Management Institute (PMI, 2013) defines the PMO as “*An organizational entity entrusted with various responsibilities concerned with the centralized and coordinated management of those projects under its custody, with full-time resources to provide and support managerial, administrative, training, consulting, technical services for project-driven organizations, as well as a formal, centralized layer of control between senior management in the organization and the project management*”.

There is no consensus among research papers on the definitions or even the names for the PMO. This may be because there are broad discrepancies in terms of its size, structure, objectives, and functions. Therefore, no universal definition of a PMO can be reached, since each organization has its own definition of the term; hence no “one size fits all” regarding the functions of a PMO. Hobbs and Aubry (2007) point to three factors that make for debate over definitions: **i)** The PMO is a relatively recent

phenomenon, **ii)** The PMO takes on a great variety of forms and functions, and **iii)** There has been a lack of a systematic investigation into the PMO as an organizational entity. Thus, a universal definition of a PMO is still difficult and a matter for discussion.

In turn, there is “no one size fits all” agreement about the way in which the PMO should function to provide appropriate solutions for an organization’s management problems. There is no blueprint for setting up a PMO, either; the only requirement of a PMO is that its structure should be as closely aligned as possible to the organization’s corporate culture. Thus, since it involves an exercise of both customization and sustained effort from individual organizations to streamline the management of projects, there can be no universal definition of a PMO (Desouza & Evaristo, 2006).

2.3.3. State-of- the Art PMO

The PMO is considered one of the dynamic managerial entities that enhance the power of organizations to open new opportunities for introducing and adopting new ways of monitoring and managing their current projects, which in turn may increase the capabilities and competitiveness of organizations in the business market (Aubry et al., 2008).

The PMO makes use of established and developed project management techniques, methods and procedures to implement a project management system and tools. Such methodology components are suitable for the project’s environment and help it to ensure a supportive consistency of approach across the portfolio of projects to improving each one’s performance (Mankins & Steele, 2005).

However, the PMO department could be incorporated into the project management processes, whereas many project-based organizations consider it an organizational innovation recently introduced to management practices; it is unstable, but continues to evolve in an organization in response to its ever-changing nature and continuous adaptation to changes in the external and/or internal environment or as an answer to internal tensions (Owen, 2008).

Srivannaboon and Milosevic (2006) find evidence of the PMO's strengths in "*instilling structured leadership, methodology, and infrastructure across all programmes to make the best use of the company's time, money and human resources*". Accordingly, one of the primary PMO responsibilities is to examine all the management practices, old and new, to determine which of them will work best for the host organization.

According to Pellegrinelli and Garagna (2009), the PMO in an organization is perceived to have the potential to nurture innovation and advance effective management, while embracing leadership across the functions of the organization's business. Therefore, the PMO is considered a managerial phenomenon, and as an innovative multi-functional tool for effectively managing various projects.

The PMO bears a wide spectrum of responsibilities, ranging from providing project management support to being responsible for the direct management of a project. Moreover, the roles that a PMO might play in an organization are quite varied in terms of organizational strategy, maturity, structural configurations, and core activities. The definition of the PMO that has been proposed by the PMI (2008) is "*An organisational entity*". Therefore, it may be inferred that the organization's PMO

structure generally adhere to the organization's strategic goals as a substantial component in the organization's strategy.

Many scholarly works discuss the survival of the PMO in the organization's administrative structure. *Project Management Solution Research* (2014) identifies three key factors playing major roles in the current state of PMOs:

- *The growing strategic value of the PMO-* The growing strategic value of the PMO is seen in the growth of higher-level strategic functions, portfolio management in particular. We expect to see continued growth in the strategic value of the PMO, now that portfolio management has more traction.
- *The increased roles of PMO in the training and development of competencies-* These roles are significant in showing that project management skills are a critical success factor for organizations. The survey shows that less mature organizations lacking in project management skills, and training will continue to be a significant focus of the PMO.
- *The ever-present challenge of resource management-* Resource management continues to be a challenge that PMOs will focus on. As the research shows, the priority for PMOs over the next year is to improve their resource planning and forecasting processes. Resource management is a significant challenge, even to the most mature PMOs, and will continue to be a focus for improvement for years to come.

Understanding these factors will help us explain how today's PMOs provide value to their organizations. The *PM Solution*TM conducted a global survey, and received 432 usable responses. This survey revealed that PMOs are responsible for the following activities and performance:

- Improvement in aligning of projects with the organization's objectives - 45%
- Improvement in customer satisfaction - 31%
- Improvement in delivering projects under budget - 28%
- Decreased in failed projects - 27%
- Improving productivity - 18%
- Increasing resource capacity - 13%.

At the same time, this global survey reported the role of the PMOs in offering the following types of project management training and related activities:

- Putting a project management-training programme in place - 54%
- Evaluating the project management competency of project managers - 65%
- Installing project management basics - 84%
- Developing advanced project manager skills - 57%
- Training in the use of project management software tools - 55%
- Training in soft skills (e.g., teambuilding) - 47%
- Leadership training - 39%
- PMP preparation - 33%
- Setting up project management certificate or degree programmes - 12%

2.4. PMO Roles and Employment

It is beyond dispute that certain drawbacks encountered the successful implementation of the PMO entity in the organization may reduce trust in the PMO approach. Aubry et al. (2008) argue that, despite the key roles of the PMO as discussed above, the PMO might not be appreciated by stakeholders and practitioners as an added-value entity whereby the organization improves its performance and profitability; in particular, during a business crisis.

In contrast to the traditional approach to overseeing the project cycle (e.g., *initiation, planning, implementation, completion, and monitoring*), the PMO could provide a one-stop package of meaningful technical and administrative assistance in implementing projects. Hence, the importance of having a PMO in an organization has been reinforced by the pressing need to have greater control over many projects running simultaneously in organizations. Moreover, the organization could also use the professional knowledge and practical experience generated from work on previous projects, to improve the implementation of current and future projects. The PMO could take part in projects that further the ultimate goals of project managers (Duggal, 2006).

Therefore, the PMO is either an organic part of the main administrative structure of an organization or a partner of the organization, which outsources it. The scholarly literature and the technical information highlight the key roles of the PMO as top functions in the following applications:

- Project/Programme Monitoring and controlling
- PM methodology, Standards implementation/management
- Project policies, procedures, templates implementation/management
- PM coaching and mentoring
- Project/programme initiation
- Project/programme planning
- Project/programme closing
- Multi-project coordination
- Portfolio tracking (performance monitoring)
- Alignment of projects with strategic objectives

With these significant roles, the PMO could offer a reliable approach to sustain organizations as they strive for better project performance (Bates 1998; Rad, 2001; Duggal, 2007; Magnúsdóttir, 2012).

In the continually changing business environment, many organizations are bound to face new challenges, market threats, new strategic options, and new ways of completing projects, increased competition, and emerging opportunities. Meanwhile, the expansion of organizations' activities in the project business has obviously increased the complexity of project implementation throughout the phases of project execution, which in turn has led to a new pattern of centralization in managing simultaneous and multiple projects under the organizational umbrella (Baccarini, 1996). Therefore, many organizations have positively responded by placing special emphasis on more flexible organizational forms; one motivation for the creation of the PMO as a new entity has been the need to take a practical approach to gaining such flexibility (Do'Valle et al., 2008).

Many scholarly studies have been conducted to explore the various types of PMO and the core elements involved in its successful implementation in a wide range of projects, a new phenomenon in project management practices. Many scholars have described the mechanism of the PMO as an entity. Do'Valle et al. (2008) note that the first academic work on the PMO was published by Kerzner in 2003 (Hobbs & Aubry, 2010b), but the earliest emergence of the PMO is in fact quite controversial. The controversy concerns when the PMO first came into the business world, emphasizing the diversity of the former. Thus, the PMO is an entity developed in many forms and is therefore difficult to describe.

However, Kerzner (2003) illustrates the historical evolution of the PMO with its various roles in a series of time spans: i- The project office (1950s-1980s), where it was a separate specialised unit inside the firm providing customer-devoted services; ii- The project office (1990-2000), where the office gained importance through its modern project management techniques for reaching the desired professional efficiency and effectiveness level; and iii- The project office (2000- present), where the office is part of most large organizations, and has more roles and responsibilities than ever before, taking on vital tasks and responsibilities such as strategic planning.

PMOs of some kind have existed since the early 1940s: the Joint Project Office (JPO), was used to implement short-term projects for developing a new generation of fighter and bomber aircraft for the USA's Air Forces (Dai & Wells, 2004). PMO applications were for a long time limited to military projects, but the typical civilian concept of the PMO was technically defined in the 1990s as the mature concept took shape, and rapidly expanded thereafter into the forms with which the business world is familiar today (Aubry et al., 2008). Since then, the PMO has been recognized as a reliable means of improving project performance; it has mushroomed therefore in many business organizations.

2.5. Types of the PMO

The functions and roles of a PMO may differ from one organization to another. In one organization, the PMO may be devoted to a single project or programme, while in another, might be a discrete entity that acts as custodian for the methodology of the corporate project management. In some business-oriented organizations, the PMO may be deployed as a business unit responsible for the strategic selection and prioritisation of projects and programmes (Tony & Woods, 2012). According to Aubry

et al. (2009), the PMO should not be isolated from the surrounding changes in the organization and business environment, but should adapt its structure in accordance with these changes in order to discharge its proper roles and functions.

Hobbs and Aubry (2008) outline the following common characteristics of the PMO, which vary according to the organizations' core strategic and business plans:

- 1) ***The place of PMOs in the organizational structure:*** The debate is on centralisation *versus* decentralisation. The central-based PMO could be established to manage all the projects of the organization at a one-stop location. Such a placement helps to bring the PMO to maturity in executing the organization's plans, and facilitating the exchange of information and expertise among the organization staff. In contrast, decentralised PMOs are less mature in project management.
- 2) ***Size of the PMO Staff:*** The PMO leaders frequently encounter a variety of project-related problems of entrusting knowledgeable staff with the jobs that are anticipated by the PMO, since project managers cannot do them all. There should be sufficient personnel to carry out the work: the size of the PMO staff should have a direct relationship to the number of projects and their size. This point is of financial importance, since the PMOs should justify the number of their staff to ensure that there is no waste of money and resources.
- 3) ***Level of Authority of the PMO:*** it is known that the PMOs having an adequate decision making authority are called *empowered PMOs*; they can manage projects effectively providing qualified PMOs managers are available. In contrast, if a PMO has too little power – a main reason of PMOs failure –it is called a *passive PMO*.

- 4) **Number of Project Managers in the PMO:** This is concerned with the allocation of managers in the PMO. Managers are sometimes all allocated to the PMO, or are sometimes placed either in the PMO or outside, or the PMO may have no project managers of its own.
- 5) **Number of Projects under Responsibility of the PMO:** Many organizations entrust their own PMOs with considerable responsibility. In this case, the organizations should impose standards and criteria for choosing which projects should be managed by the PMO. It is worth mentioning that this characteristic has a significant association with certain others, such as the level of authority of the PMO and the number of project managers in the PMO.

The various types of PMO have a dynamic nature in respect of their roles and functions, which eventually change with time in response to new tasks and/or to the changes taking place in the business environment, which require upgrading from one definite structure to another. Tony and Wood (2012) list nomenclature and types of PMO to show their administrative levels and responsibilities, as briefed in Table 4.

Table 4: Demonstrates PMO types and suggested designations

PMO Type/Functions	Suggested Nomenclature/Deployment
Type1 - Project office: Controls and monitors of schedule and budget functions of large and complex single project	Project Admin Office (PAO): -Each large/complex project has its own PAO -Reports directly to the project director.
Type2 – Departmental Level Office: Integrates projects into one or more portfolios of projects; it may also take on some or all of the functions of the Project Office	Project Management Office (PMO): -One for each department maximum. -Might be shared by many departments. -Reports directly to the departmental manager Programme Management Office (PgMO): -One PgMO per programme maximum. -Reports directly to the programme manager
Type3 – Enterprise/Strategic Office: Facilitates corporate and senior management decision-making in the prioritisation and strategic alignment of the projects	Enterprise Project Management Office (EPMO) <i>Alternative designations:</i> i-Portfolio Management Office, ii-Strategy Execution Office -One EPMO per enterprise maximum. -Reports directly to the executive manager

The spread of PMO applications throughout the business sphere has generated a number of entities described in the scholarly and technical literature. In general, three main types of PMO have been detailed and classified according to the extent to which the PMO is typically involved (Wood & Shelbourn, 2012); these are:

- 1) ***Supportive PMO*** or *Project Office*, which provides a total package of administrative support in terms of professional expertise, best management practices, creating channels of access to technical information of current projects and those in other organizations. This entity is workable in an organization whose projects are implemented successfully with minimal control and supervision.
- 2) ***Controlling PMO*** or *Departmental-Level PMO*, which controls the scheduling of the project plan; therefore, it monitors a set of necessary functions required by the project to reach completion successfully; among these requirements are the adoption of appropriate methods, budget auditing, continual plan revision, and evaluation of progress and the risk of delays.
- 3) ***Directive PMO*** or *Enterprise PMO*, which integrates multiple projects into one or more portfolios; it may ultimately take over the primary concerns and functions of both the supportive and controlling PMO. However, the organization benefits from the directive PMO because it develops a specific organizational entity, helps to standardise the methods and experience of projects, and enhances the organization's capacity to implement similar projects successfully. Thus, the directive PMO is strategically suitable for large organizations managing multiple projects simultaneously.

2.6. The Potential PMO Roles

Many researchers acknowledge the contributions and roles of the PMO as a strategic management tool in organizational performance, so long as the project activity tends to be concentrated and more visible in its host organizations (Aubry et al., 2009). However, the management of the project activities of a public sector organization could be more readily evaluated by the use of various PMO tools. Furthermore, Aubry argues that an integrating link at the organizational level that brings together all parts of the project management is still missing.

Thus, the concept of the PMO as a field of organizational strategic management still needs further investigation, since many organizations in the private and public sectors tend to consider critical planning when pursuing organizational initiatives or implementing strategic business programmes. Such initiatives or programmes may be complex, consisting of interrelated tasks, which may need advanced administrative tools to integrate them as projects. Therefore, many organizations in the business world consider the PMO to be one of the management strategies responsible for centralized control over the execution and integration of the multiple projects that are essential for implementing a successful initiative (Kaufman & Korrapati, 2007).

Kerzner (2003) illustrates principal roles for PMOs in the 1990s as an escalating importance of the PMO's roles over time. The following period-based roles reflect the obvious co-evolution of PMO with project complexity as significant business assets:

- Maintaining the ability of the organization to carry out extra project works in a short time and with cost-effective resources.
- Monitoring the scope of planned project works to prevent undesirable change.

- Minimising the probability of risk, and overcoming expected obstacles.
- Enhancing the ability to manage parallel projects of various sizes.
- Enhancing the quality of the project's outcomes.
- Minimizing the internal conflicts between managerial levels.
- Creating a pool of knowledge and information exchange.
- Leveraging the organizational revenues through increasing the profits by effectively using the organization's available resources
- Targeting customer satisfaction.

The PMO's roles, equally, after the year 2000 were:

- Involving itself effectively in the organization's strategic planning.
- Formalizing a consistent and appropriate management process.
- Enabling the organization's staff to become involved in participating in decision- making processes.
- Enhancing the generation of reliable administrative and technical information.
- Sustaining appropriate organizational re-structuring.
- Approaching different works at various levels.
- Delivering the necessary training to improve the management skills of candidate managers

Dai and Wells (2004) extract from the literature other key PMO roles, as:

- i.** Monitoring and control project performance via providing technical support.
- ii.** Developing project management methods through formulating a set of project management standards.
- iii.** Managing multiple simultaneous projects while offering highly technical support through a network of project offices across current projects.

- iv. Enhancing the management of the strategic plan.
- v. Promoting organizational learning through providing and arranging technical training programmes on project management techniques.
- vi. Formalizing the consistency of project selection by providing project management consultancies and mentoring.

Hill (2004) also sheds light on the evolutionary pathway and the increasing importance of the PMO role in managing and overseeing project management control, support, and alignment to the strategic plan of an organization. Moreover, the roles of the PMO extended to helping project managers in various organizations (such as enterprises, business units, and government departments) to understand and use the appropriate professional practices of project management, and also to adapt business interests to project management activities and integrate them there.

Despite the short lifespan of the PMO, this phenomenon has dramatically changed the way that project management has been supervised and implemented. Letvec (2006) enumerates some of the consulting functions that the PMO may perform in the project life cycle, namely:

- 1) Project initiation and planning,
- 2) Proposal and business case development,
- 3) Rationalising project priorities,
- 4) Proving project kick-off guidance/workshops,
- 5) Execution of the various project phases,
- 6) Project tracking and reporting to top management,
- 7) Remedies for problems that might obstruct the project pathway,
- 8) Project implementation and closeout,

9) Development of further lesson-learning sessions.

It is also suggested that a PMO at any stage can pursue activities at any level to highlight the needs of an organization. Moreover, it is critical to detect the appropriate level of PMO competency that the organization actually needs to match its structure and activities. PMOs, as noted above, work at three levels: portfolio, programme, and project. The different competencies of the PMOs at these three levels are shown in Table 5 (PMI, 2013).

Table 5: Management approach of portfolio, programme and project

Aspects	Portfolios	Programmes	Projects
Scope	Changes with the organization strategic objectives	Having a larger scope to provide many significant benefit	Promoted throughout the project life cycle
Change	The managers constant monitor changes in internal and external environment	The managers expect change from inside and outside prior to preparing suitable management	The managers expect changes to be kept under management and control.
Planning	Managers create and maintain necessary communication and processes in relevance to aggregated portfolio	Managers developing a high-level programme plan to guide detailed plan at component level	Managers elaborate high-level information into detailed plans at different phases of project life cycle.
Management	Managers coordinate management staff that may have reporting responsibility.	Managers manage both programme and project managers to provide vision and leadership	Managers managing the project team to meet the project objectives
Success	It is measured in terms of the aggregate investment performance and benefit realization of portfolio	Success is measured by the degree to which the program satisfies the needs and benefits for which it was undertaken	It is measured by quality of product, project, timeliness, budget compliance, degree of customer satisfaction
Monitoring	Portfolio managers monitor strategic changes and aggregate resource allocation, performance results, and portfolio risk	Program managers monitor the progress of program components to ensure the overall goals, schedules, budgets, and benefits of the program will be met	Project managers monitor and control the work of producing the products, services, or that the project was undertaken to produce

Hill (2004) defines a series of five empirical stages of PMO capabilities, along with a competency continuum, namely, **i) Project Office**, **ii) Basic PMO**, **iii) Standard PMO**, **iv) Advanced PMO**, and **v) Centre of Excellence**. These five successive stages (shown in Figure 6) represent the progressive maturity of competency, as well as the advancement of the PMO functionality to meet the core needs of the project management goals, which in turn may be associated with the business objectives of the organization.

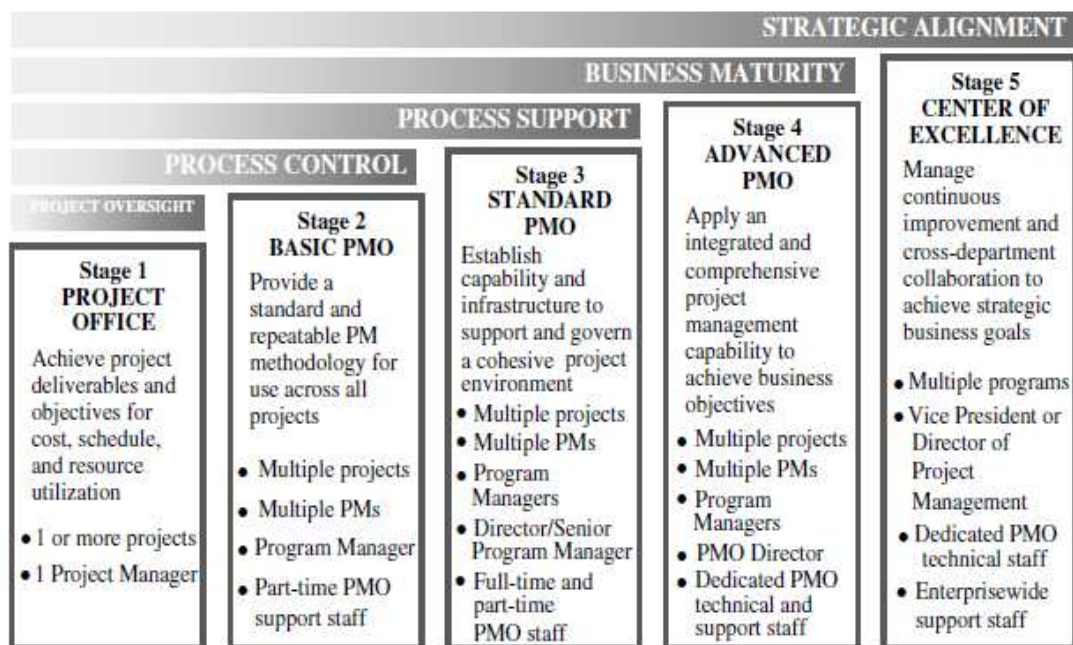


Figure 6: The five PMO maturity stages
(Source: Hill, 2004)

The variations in the PMO's functions and roles have equipped the PMO with dynamic flexibility over a wide range of organizational responsibilities. Hobbs and Aubry (2007) identify about 27 functions and roles that the PMOs can adequately perform. Although not all the identified functions can be performed by every PMO, the performance is PMO-specific. Yet the survey of Hobbs and Aubry reveals that

about 21 of the 27 roles and functions are important for at least 40% of the surveyed PMOs. The potential PMO roles and functions are listed in order of their importance to each project management's activities, as shown in Table 6.

Table 6: Shows the PMO's potential roles and functions

	PMO Functions & Roles	Importance
1	Reporting to upper management about the project status	83%
2	Developing and implementing an appropriate standard methodology	78%
3	Controlling and monitoring the process of the project performance	65%
4	Developing standard of staff competency and vocational training	65%
5	Taking care of implementing and operating information commons	60%
6	Providing consultancy and advice to senior managers	60%
7	Coordination between simultaneous and multiple projects	59%
8	Developing and enhancing a project scoreboard	58%
9	Promoting culture of project management within the organization	55%
10	Self-monitoring and controlling of the PMO performance	50%
11	<i>Participating and involving in organization's strategic planning</i>	49%
12	Providing mentor for the project managers	49%
13	Managing multiple portfolio	49%
14	Participating in the selection process of new projects with priority	48%
15	Managing the project documentation archive	48%
16	Managing single or multiple projects	48%
17	Project auditing	45%
18	Managing customer interfaces	45%
19	Providing standardized set of tools	42%
20	Execution of special tasks as per request of the project managers	42%
21	Allocation of organization's resources between the various projects	40%
22	Post-project investigation	38%
23	Implementing learning and training databases	34%
24	Management of risk databases	29%
25	Benefit management	28%
26	Networking and environmental scanning	25%
27	Recruitment, evaluation of the project managers' performance	22%

(Source: Hobbs & Aubry, 2007)

Dai and Wells (2004) investigate the establishment and use of the PMO in the business environment in which they operated. They found that among the most important concerns for establishing a suitable PMO entity was that of incorporating the process of project management with its strategic goals for raising the ceiling of competitive advantage. Moreover, they identified and assessed an array of PMO functions and services, along with their influence on the target project performance. However, they comment that the establishment and use of a PMO entity to improving the execution of an organizational project was sometimes found to be insignificant.

Therefore, the PMO entity needs to receive administrative support from the decision-makers, training programmes, consultants and the technical staff involved in project implementation. The core functions of the PMO, as recognised in the study of Dai and Wells, also reflects the potential capacity of the PMO to develop and maintain a set of standards and methods, provide a centralized archival repository to systematically collect and store project knowledge, provide administrative support, provide human resource criteria for recruiting the right personnel, provide project management consulting and mentoring, and provide or arrange PM training. Thus, the PMO is considered a key influence between project management strategy and overall business strategies.

Hobbs et al. (2008) demonstrate that the expansion, diversity, and complexity of an organization's project activities are among the main driving forces behind the successful implementation and reconfiguration of the PMO in a host organization. The study also shows that the PMO is put in place to oversee the implementation of multiple projects, which is part of a management system for playing an important role in the organization's strategies.

It is worth tracing the scholarly works of known authors in the PMO field. Although there has been an increasing body of published studies on PMOs, there is still no common understanding or mutual agreement about the PMO as an entity. The major works by Dai and Wells (2004), Desouza and Evaristo (2006), Hill (2004), Hobbs and Aubry (2007), Hobbs et al. (2008), and Martin et al. (2007) have been attempts to identify the possible roles of the PMO in various settings, as shown in Table 7.

Table 7: Published research works on PMO

Author(s)	Research outlines	Methods
Dai & Wells (2004)	<ul style="list-style-type: none"> ▪ Empirical study on establishment and use of PMO. ▪ Two samples of 234 (targeted) and 96 (random) samples. ▪ Identified different functions and services of PMOs. ▪ Assessed these against project performance for both samples 	<i>Quantitative</i> (Likert-type questionnaire)
Hill (2004)	<ul style="list-style-type: none"> ▪ Describes continuum of PMO competency 	<i>Review</i>
Desouza & Evaristo (2006)	<ul style="list-style-type: none"> ▪ Outlines nature and characteristics of PMOs. ▪ Blends project management and knowledge management concepts. ▪ Classifies PMO archetypes with respect to administrative vs. knowledge-intensive dimensions. ▪ Identifies critical success factors for PMOs. ▪ Interviews with senior managers and directors of PMOs in 32 IT organisations. 	<i>Qualitative</i> (Interview-based survey)
Martin et al. (2007)	<ul style="list-style-type: none"> ▪ Use of formal project management practices on IS projects. ▪ Identification of which specific project management practices, including PMOs, provide most value for IS projects. ▪ Survey responses from 129 IS project managers who PMI members. 	<i>Quantitative</i> (Likert-type questionnaire)
Hobbs & Aubry (2007)	<ul style="list-style-type: none"> ▪ Three-phase research programme to get better understand of PMOs and their perceived value. ▪ Descriptive survey of 500 PMOs. ▪ Development of classification typology. ▪ In-depth study of four PMOs through 11 transformations. ▪ Confirmatory study to validate findings. 	<i>Quantitative</i> (Likert-type questionnaire)
Hobbs et al. (2008)	<ul style="list-style-type: none"> ▪ In-depth qualitative and quantitative analysis of four PMOs, whose life spans were 4, 8, 10, and 12 years old. ▪ Each organisation reconfigured its PMO every three to four years, resulting in 11 organisational transformations. 	Mixed method

(Source: Spalek, 2012)

With the significant roles of the PMO in the above applications, the PMO could reliably sustain organizations in improving project performance and executing their strategic plans (Bates 1998; Rad, 2001; Magnúsdóttir, 2012). Therefore, the PMO should identify any gap in its collaboration with its end-customers and stakeholders to providing a satisfactory level of “*leadership, support, coaching, mentoring, training, monitoring and information in each of the people, process and tools aspects*”. Thus, the PMO, in collaboration with top management, will enable organizations to manage effectively multiple projects.

Engle (2005) argues that one of the core purposes of the PMO is to ensure consistency between multiple projects, a consistency, which also yields improvements in project performance and formalizes the process of selecting appropriate projects; he adds that many business organizations find it difficult to select projects or prioritize them. The PMO is therefore considered a helpful tool for big corporations in prioritizing projects in portfolio management.

Due to the complexity of the PMO’s functions, the host organization is required to devote special training and skill development processes to its personnel, with the aim of enhancing the power of the PMO department to achieve the project goals in alignment with the organization's strategy and vision (Blažević, Mišić, & Šimac, 2014). The purpose of such alignment is primarily to guarantee the expected return-on-investment (ROI) in the organization, as well as satisfying the stakeholders (Desouza & Evaristo, 2006). These PMO roles leverage the capacity of the organizations to improve their project performance (e.g., cost, schedule, quality, etc.) Moreover, the PMO could help in furnishing crucial information for better decision making.

Duggal (2006) states that the PMO achieves its defined objectives by focusing on the integration of three main organizational resources, namely, People, Process and Tools (PPT), which are considered significant drivers in the effective execution of the organization's strategic plan. Duggal extends his argument to define the PMO as “A *facilitating and enabling force that could help in realizing the potential objectives, business and proposed strategic plan of the organizations by means of the interpretation of the organization's strategies into a portfolio of both projects and programmes*”, as illustrated in Figure 7.

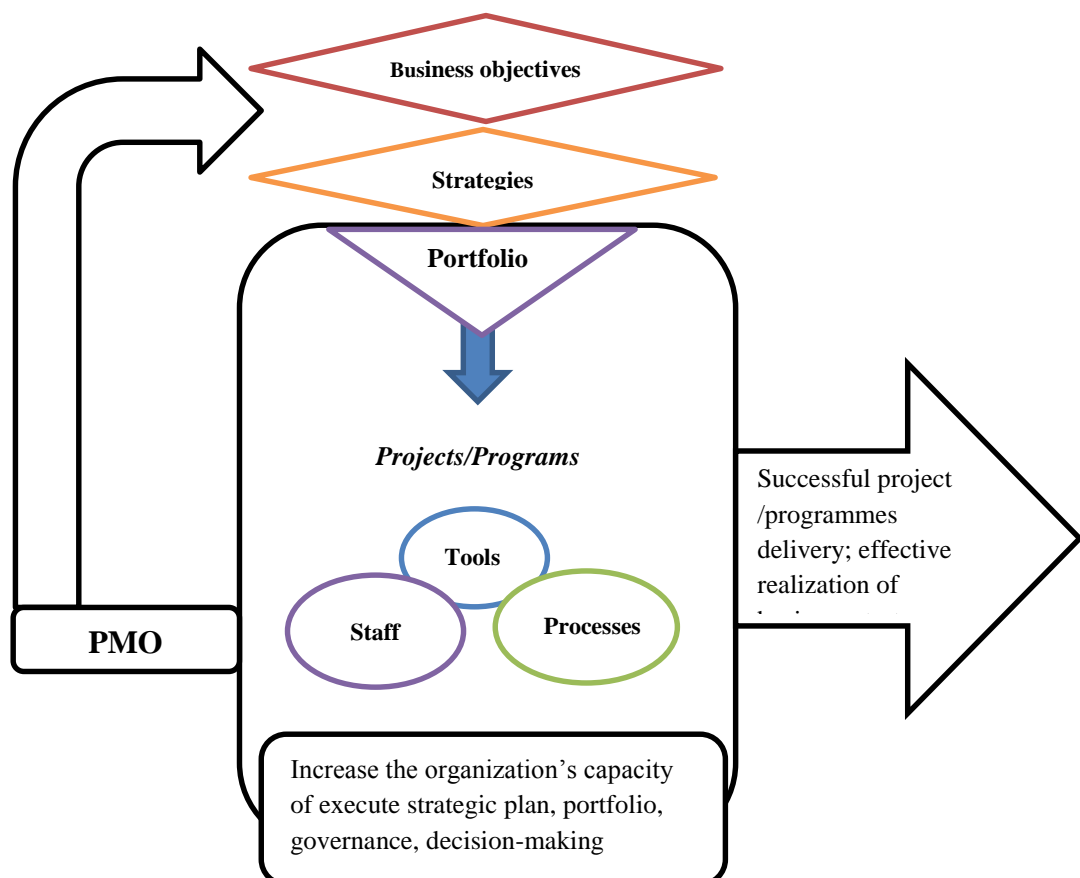


Figure 7: The PMO's roles to execute the organizational strategic plan

(Adapted from Duggal, 2006)

The top functions of the various PMO as discussed in Duggal's work could be summarised as follows:

- Project/Programme Monitoring and controlling
- PM methodology, Standards implementation/management
- Project policies, procedures, templates implementation/management
- PM coaching and mentoring
- Project/programme initiation
- Project/programme planning
- Project/programme closing
- Multi-project coordination
- Portfolio tracking (performance monitoring)
- Alignment of projects with strategic objectives

Young et al. (2012) conducted a survey for evaluating how far strategic management is effective in the execution of multiple projects in the state of Victoria in Australia. Their interviews with senior administrators reveal that the monitoring of the organization's strategic goals is too difficult because the organization policy may suddenly change in response to associated internal or external factors and thus disturb the initiatives and execution of strategic projects. Young et al.'s study argues that the unexpected causes of policy changes should be stated as assumptions leading to the modification of the programmes when evidence indicates that these assumptions were wrong or incomplete.

2.7. Levels of the PMO's Roles

Over the past two decades, many organizations in both the public and private sectors have implemented one or more PMOs as part of their project management, attributing

a variety of both operational and strategic roles to their PMOs (Dai & Wells, 2004). Desouza and Evaristo (2006) classify the core roles of the PMOs on three different levels: *strategic*, *tactical*, and *operational*, which are maintained largely by the knowledge management, as follows:

2.7.1. Strategic Level

The main responsibility of the PMO at this level is entirely to verify how well the projects that are run by an organization comply with the three key targets, below:

- a) *Strategic goals of the organization*: PMOs should ensure that the projects that are carried out by the organization are aligned with the strategic goals and objectives of the organization. Moreover, PMO staff should ensure that the project managers and their project teams are fully aware of the strategic objectives of the parent organization and manage the projects according to the approved plan and processes of the project management with respect to the agreed priorities and phases.
- b) *Strategic growth of the organization*: The PMOs should ensure that the current approved projects properly support the development of the organization in practice; this in turn helps to extend the steady progress of the organization's strategic objectives.
- c) *Effective and efficient knowledge management*: The PMOs should develop and enhance the policies, procedures, templates, tools and techniques of project management by using standard procedures for facilitating the efficient exchange and transfer of professional knowledge and experience among the various levels of the project teams across multiple projects.

2.7.2. Tactical level

The functions of the PMOs at this level are to ensure that the following objectives are met sufficiently:

- a) *Close integration among project initiatives*, where the PMOs generally facilitate the communication between the project management teams to make sure that all the project workers are properly coordinated with each other, using similar technical language to manage effectively their individual projects. Such clear vision and communication channels in the organization are believed to play significant roles in the PMO's success through executing the strategic plans and achieving the target goals of the organization. However, setting up a PMO without clear vision and defined plans and functions is the major cause of failure for the PMO or its loss of status.
- b) *Appropriate quality of the product and service delivered by the project* The PMOs could efficiently improve the quality of the outcomes of the projects (i.e., final services or products) by supervising and controlling the progress of the project throughout the definite procedure and policies.
- c) *Knowledge sharing*, which is a key role of the PMOs at the tactical level since it enables all the project's members in the different projects to gain new experience and knowledge from other personnel's mistakes and successes (Müller et al., 2013).

2.7.3. Operational Level

The roles of PMOs at this level, as illustrated in Figure 8, are as follows:

- a) *Performing project assessments*: This objective is purposely assigned to make sure that the current projects are carried out according to the approved

baselines (budget, schedule, scope, etc.), and to ensure that any deficit in the project budget or additional resources is carefully studied and approved.

- b) *Integration of lessons learned from other projects*: This target should confirm that the necessary information is accessible to all project members so that project management can make the right decision on a particular management issue.
- c) *Expert knowledge on project management*: the PMO should be seen as the focal point for knowledge transfers, lessons learned, and the historical database sharing knowledge and experience in various projects.
- d) *Continuous monitoring of customers' satisfaction*: The satisfaction of the end customers is considered one of the key functions of the successful PMOs since it provides project managers with the required feedback and responses from customers. Such customer satisfaction is made possible through the appropriate communication channels inside or outside the organization.

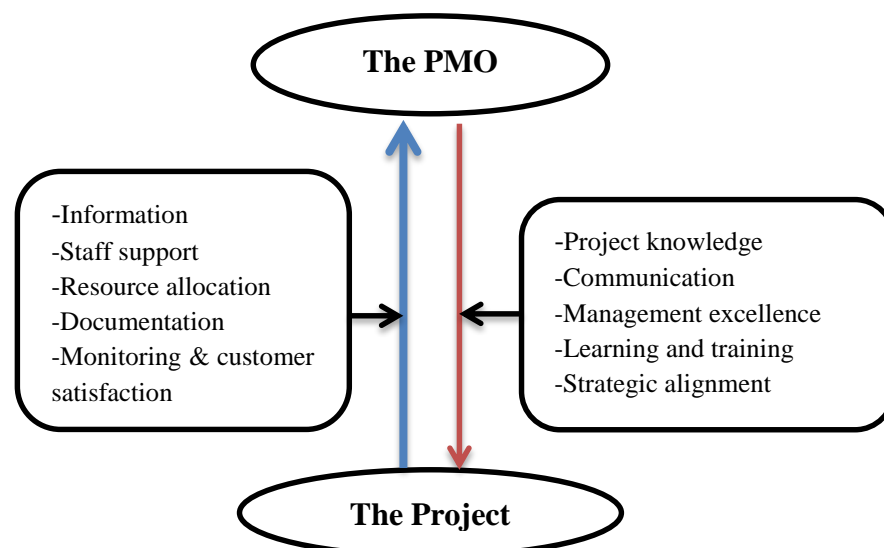


Figure 8: Mutual relationship between running projects and the PMO

(Author's own design)

2.8. Models of PMO Functionalities

Analysis of the PMO literature paves the way to extracting and describing the three models of the common functioning of the PMO entity (Mariusz, 2014), these are:

- i)** The model that focuses on direct support for the implementation of the organization's project. This functioning PMO develops various functions, systems, methods, and tools, which allow it to support effectively the implementation of individual projects or programmes planned by in the parent organization.
- ii)** The model of the PMO functioning as a centre of knowledge transfer. In this case, the operation of the PMO model is more focused on consultation and education/training activities. The scope of operation of such a PMO is broader; it can cover all or part of the parent organization.
- iii)** The organizational model of the PMO, where the activity is focused less on issues that relate to methodology and tools, and more on supporting the business development of the parent organization.
- iv)** In analysing the core functions of an organization or company in the context of the PMO framework, there are two independent entities: **i)** the Project Support Office (PSO), whose main task is to manage the flow of ideas and initiatives, and convert them into projects, and **ii)** the Project Management Office (PMO), whose main task is to support the implementation of projects, arranged in the frameworks of programs and portfolios. Below, detailed in Table 8 (Mariusz, 2014) are the elements drawn from a case reflecting the various PSO and PMO functionalities in an IT-intensive company.

Table 8: The functioning of the PMO structures in an IT company

Functionalities	PSO	PMO
Organizational roles	Management of the stream of ideas, initiatives and converting them into projects	-Support for projects arranged within the framework of the programmes -Supporting portfolio management
Implemented functions	- Acquisition and development of ideas in the business development division - Development and shaping of the portfolio of initiatives. - Conversion of initiatives into projects	- Methodological/administrative support for portfolio management - Development of tools supporting the management of the portfolio. - Conducting trainings/ education -Methodical support for affiliates

2.9. PMO and Organizational Transformation

The performance of activities of PMOs in the host organizations varies according to their mandates. Subsequently, the PMO may play a vital role in promoting the element of organizational transformation in terms of facilitating changes in the way that the organization attains its ultimate goals and strategic objectives.

However, Aubry (2015) raises the question of the pattern of this PMO-based transformation: *“How do the PMO’s controlling and supportive roles affect performance and maturity in the context of PMO transformation?”* Pettigrew, Woodman, and Cameron (2001), shed light on the link between the capacity for change and action and organizational performance. In the context of PMO change, Aubry (2015) adopts performance as the *outcome* of PMO change, referred to as a threefold component: *project management performance, business performance, and project management maturity.*

Aubry (2015) isolates four main variables to capture the context of organizational transformation:

- 1) *Organizational size* is one of the most common elements mentioned in the organizational management, due to its impact on organizational operation.
- 2) *Project management maturity at the organizational level* may have a significant influence on project management in general, and on PMOs in particular (Hobbs & Aubry, 2010). This variable relates to the context and can have a moderating effect on the relationship between the surrounding conditions for change and the effect of change on performance and maturity as a whole.
- 3) The sociocultural environment also contributes to the overall transformation context. The *supportiveness of the organizational culture* has been shown to have an important impact on PMO implementation and is considered in this study to be an organizational contextual variable (Hobbs & Aubry, 2010). This variable reflects change in the organizational culture supporting the PMO before and after the PMO transformation.
- 4) Changing a PMO's involvement in organizational changes and the effectiveness of any organizational change can be influenced by the use of accompanying change management practices. The last variable describes *the extent to which a change in management is used to support change in the PMO*.

2.10. Project Management Methodology

It seems that the concept of project management becomes more important every day. Through improving the project management methodology, the PMO has become a dominant part of the organizational structure when it comes to standardizing the professional practices of the project-based organization (PBO) to deliver their projects (Blažević et al., 2014).

Methodology, in particular in terms of project management as such are vital, because it provides acceptable and agreed upon standards, and also the repeatable procedures for boosting project performance, from the initial concept to final completion (Hill, 2004). Apart from the technical methodology; the Project Management Methodology (PMM) in the PMO is commonly designed to contain a set of the processes which can be applied of regardless the types of project in the host organization; this is done without ceasing to provide an all-in-one use of single or multiple technical processes.

A project management methodology generally applies accepted project management techniques and patterns that meet in the culture and business enterprise demands of the host organization. It includes recognition of the functions, specifications and responsibilities that are associated with each process step, along with its inputs and outputs. A project management methodology conveys to project managers and project team members what to practice, yet, how to practice it.

The organization can initiate the needs of complying with the methodology through introducing at the beginning a series of simple processes for use in the project management environment. This step ensures that the completing the activities of the project management are the most important task for the host organization. Then, with this foundation, the organization should aim to develop a more comprehensive and successful process by which to specify the core activities for all five phases of the project management life cycle, as mentioned by Sodade (2011).

It is vital for PMOs to be based on the project management methodology that is well integrated in the context of every single organization. PMOs, as noted above,

are not standardized. Thus, it is relevant to take all the necessary steps in establishing a project methodology. For instance, it is of great importance for PMOs to ensure that individuals with business and technical interests along with project managers are properly presented and engaged in the effort to develop a methodology (Hill, 2004).

The project management methodologies are simply considered the backbone of the PMO host by virtue of various organization-specific activities. This “project management methodology” enables the PMO to:

- Put in place some standard approaches to the project management that can be used by all the project managers in the adopting organization.
- Promoting effectively innovative management practices to place the greatest impact on project and business success.
- Achieve consensus in implementing a common project management life cycle across the relevant organization’s technical and business areas.
- Provide for the collection of project data to be used in individual and aggregate analyses of project performance.
- Identify technical and business processes and incorporate them into the project management methodology (Hill, 2004).

2.11. Summary and Conclusion

Project management has come to play a major role in the management of organizations in almost all fields of human activity. Over the last decade, many organizations have implemented one or more PMOs as part of their project management innovation, attributing a variety of both operational and strategic roles to their PMO departments. The PMO is now a prominent feature in the domain of organizational project

management. However, the underlying logic that leads to their implementation or renewal is still not fully understood (Aubry et al., 2010b).

The new project management approached in the present global businesses has promoted concern to initiate a dynamic transformation of projects into powerful and competitive assets. Therefore, many projects call on a leading entity to carry out implementation; hence, the dynamic transition from traditional project management in the new era of strategic project leadership has become the concern of many researchers and managers, while the strategic project management generally directs projects towards the creation of competitive privileges and excels in the marketplace (Shenhar, 2004).

The reviewed works on the PMO recognise the contribution of the PMO to organizational performance as a continuous quest and find it a strategic instrument in achieving the organization's initiatives in terms of successful project implementation, and providing a platform for improving the competency of the organization. Turner (2009) lists the applicable criteria for assessing and evaluating the success of the project's maturity:

- The project increases the shareholder value of the parent organization.
- The project generates a profit, and the contractors can make a profit
- The project provides the desired performance improvement.
- The new asset produces a product or a service that consumers want to buy.
- The new asset works as expected, and is easy to operate.
- The project is finished on time, to budget, and with the desired quality.
- The project team has satisfactory experience and the project meets their needs.

Although the PMO is considered an essential value-added entity in an organization's performance, it is necessary to build a broad understanding of the critical factors for the successful implementation of a PMO entity, and the help that the PMO can effectively give in achieving the strategic objectives of the organization. Therefore, this review cites references of many authors to highlight the debates about the PMO's roles and efficiency in the execution of the organization's strategic plan.

In the rapid advances in management knowledge and practices, Aubry et al. (2010) sought to trace the transitions and changes, along with the associated drivers, that might be observed during the life span of a PMO. These writers propose some questions to reveal the pattern of change, such as **i)** *“why does the PMO change?* **ii)** *What are the potential drivers involved?* **iii)** *How does the change take place?* **iv)** *What are the characteristics or functions that are subject to change?* **v)** *Is there any specific pattern of change?”* The answers to these questions appeared in a proposed schema of PMO transition, as shown in Figure 9.

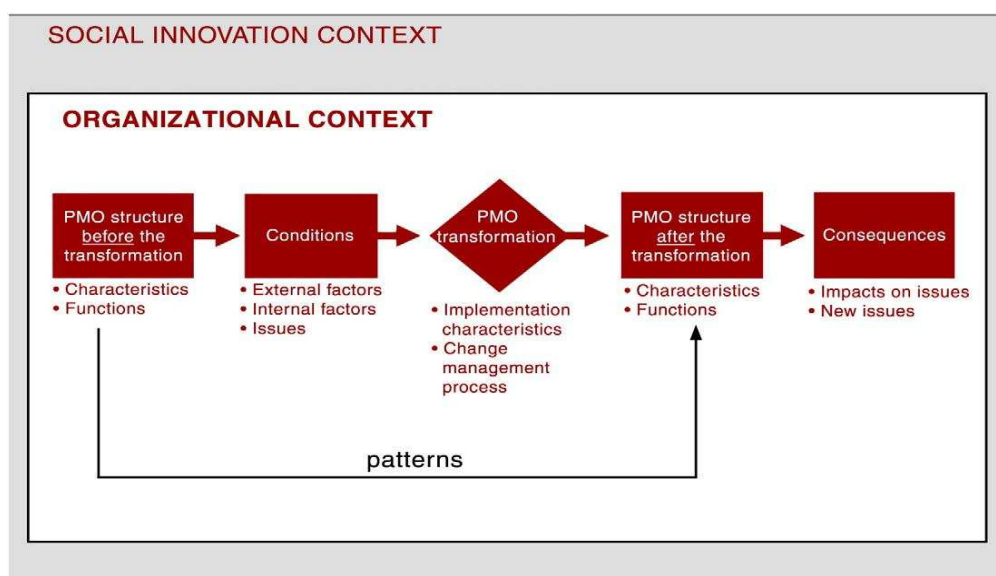


Figure 9: Conceptual framework of the PMO transition process

(Adopted from Aubry et al., 2010)

Hill (2004) traced the evolutionary phase of the project management methodology. His conceptual framework was built upon a set of characteristics defining various stages of a gradual maturity development. The initial phase is establishing base for project management methodology to pass on through developing suitable solution to determine the implementation phase, which leads to maturity of project management methodology. The conceptual framework describes; however, the effect of the transition related drivers in each phase; the characteristics maturity set is illustrated in Figure 10.

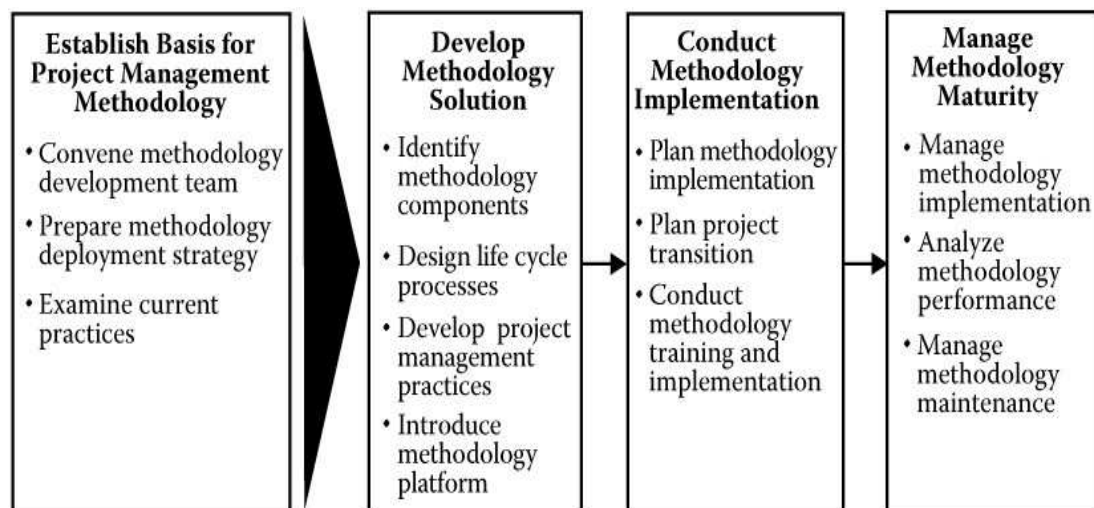


Figure 10: Methodology function model
(Source: Hill, 2004)

Aubry et al. (2010) reviewed 17 case studies that looked into the stability of the PMO department in some project-based establishments. Their review indicates the nature of the PMO as a temporary arrangement with little continuity. Moreover, the substantial changes in PMO functionalities that they detected could be tied in with the organization's internal and/or external environment. Crawford (2011) and Duggal (2006) identified about 75 significant PMO functions; some of them are traditionally practiced, while others provide innovative services.

In conclusion, even though many scholarly researchers have been empirically sought to understand the importance of the PMO, there is still a gap in the literature in terms of understanding the PMO's relationship to other aspects of an organization. In the case of our study, the PMO concept was intended to cover project independence, innovation, flexibility, and leadership. With reference to experience, the practice of project management by means of a PMO entity is rapidly evolving in response to the dynamic expansion of businesses worldwide, the availability of new technologies, and continuing social change with increasing demands. For this reason, the current and future project business management processes will be completely different from those practiced over the past few decades.

Moreover, PM Solution Company (2014) recognised top five challenges the PMO unit may face in the future: **i)** Organizational resistance to change, **ii)** PMO processes seen as overheads, **iii)** Reserving enough time/resources to devote to strategic activities, **iv)** Demonstrating the added value of the PMO, and **v)** Inadequate capacity to manage the available resources of the project-based organization.

Chapter 3: Conceptual PMO Framework

3.1. Introduction

Rodman (1980) defined the conceptual framework as “*An analytical tool with several variables and contexts that aim at processing a critical analysis of the interrelationships between these variables to capture the PMO implementation as it is proposed*”, whereas Oxford Dictionary defines it as “*A conceptual structure that aims at illustrating the actual mutual relationships between the core components involved in building a set of functions, principles, ideas, etc., within the system*”.

The term “conceptual framework” is frequently used interchangeably with such terms as *conceptual model, theoretical orientation, conceptual approach, and frame of reference*. The conceptual framework of the present work is designed to involve the project business environment in the UAE. The description of the PMO was the starting point for incorporating several variables in building its conceptual framework.

Letvec (2006) acknowledged several types of conceptual framework identified in the management literature, which largely line up with the research purpose of one of the patterns of scholarly study listed below:

- Working hypothesis for the exploration or exploratory research
- Descriptive categories for descriptions or descriptive research
- Practical approach for the measurement of standard quantity or capacity.
- Models of operations research for making a decision.
- Formal hypothesis for forecasting, explanation, and prediction.

However, Patanakul et al (2012) defined the *strategic project leadership* as the framework of the strategic project and include five planning elements in it (namely,

strategy, spirit, organization, processes, and tools) and seven principles that can be flexibly implemented by project managers in organizations in the stages and phases of project planning and execution; these seven principles were:

- i. **Leadership** providing project managers with responsibilities to be leaders.
- ii. **Project strategy**, which defines possible competitive advantages of an organization's products incorporated into a detailed project strategy.
- iii. **Strategic project portfolio management** integrates various projects into a single unit concerned the organization's strategic policy for project selection.
- iv. **Project spirit** inspires an organization's project vision to develop a specific project culture.
- v. **Adaptation** applies new approaches and applications to assess the project business environment in selecting a suitable project management style to fit the project type.
- vi. **Integration** articulates a hierarchical plan of the five strategic project elements.
- vii. **Learning**, which creates suitable project learning in an organization's context.

3.2. Theoretical Ground

Hobbs and Aubry (2007) further categorised the 27 recognized PMO functions and roles generated from their global survey into five major groups, as follows:

- a) **Monitor, control and report on running projects:** Reporting the status and stages of the running projects to top management. The reporting usually covers related tasks to the monitoring and controlling function. It provides also administrative tools and advisory support to enhance the efforts to the organization to manage its own projects.

- b) ***Project management excellence:*** The incorporation of innovative approaches and tools in managing the different phases of the project, the programme, and the portfolio is intended to make sure that the implementation of project management is consistent and sustainable for the sake of delivering a successful project.
- c) ***Develop project management competency and methodology:*** The various stages of the project execution generate many new experiences and much professional knowledge, which could be further used to develop the existing project management methodologies and standards for improving the capability of the organization in the field of project management activities, and also in exchanging and sharing technical information with other projects in the organization or between it and similar organizations.
- d) ***Strategic alignment & benefits achievement:*** Modifying the processes of the decision making of the senior project managers to ensure that the running projects are strategically aligned to the strategic goals and plans of the organization. In this regard, the purpose of such strategic alignment is to achieve the most benefits that can be expected from the project outcomes.
- e) ***Organizational learning and culture:*** Since the project is considered a production of professional information and experience, the organization will build up a specific culture, and will develop and disseminate a typical learning pattern, which becomes one of the organization's characteristics.

Hobbs and Aubry (2007) developed a PMO standard model using 500 descriptions of PMOs generated from a global survey conducted in 2005. They proposed describing the PMO entity as a set of characteristics and functions. The set

of characteristics were further grouped under three headings: i) *organizational context*, ii) *PMO descriptions* and iii) *PMO performance*; as shown in Table 9.

Table 9: The PMO descriptive model

Category	Data Sources	Data Elements
<i>PMO context</i>	Organizational context	<ul style="list-style-type: none"> ▪ Economic sector ▪ Public or private ▪ Organization size ▪ Percentage of resources that report to the same management as the PMO leaders, or project managers throughout the organization ▪ Internal or external project clients ▪ Single or multiple project customers ▪ Level of organizational project management maturity ▪ Supportiveness of organizational culture
	Project type in the PMO mandate	<ul style="list-style-type: none"> ▪ Scope expressed in terms of the number of team members working on the project ▪ Scope in terms of project duration ▪ The type of product or service delivered ▪ The primary performance criteria of PMO's projects ▪ The inclusion of post-delivery activities within project scope ▪ Involvement in outsourcing contracts
<i>PMO description</i>	Structural characteristics	<ul style="list-style-type: none"> ▪ The name used to identify the PMO ▪ Time allows for implementing the PMO ▪ Location within the hosted organizational hierarchy ▪ Relationship(s) with other PMO(s) in the same organization, if any. ▪ Staff of PMO ▪ Size expressed in terms of number of team members working on the project. ▪ Age of the PMO ▪ Percentage of projects in the mandate of the PMO ▪ Percentage of project managers in the PMO entity ▪ Decision-making authority of the PMO ▪ Project management methodology status ▪ The adequacy of funding of the PMO ▪ The funding pattern as billing for services
	Roles or Functions	<ul style="list-style-type: none"> ▪ Monitoring and controlling project performance ▪ Developing and implementing standards and competencies ▪ Multi-project management ▪ Strategic management ▪ Organizational learning ▪ Management of customer interfaces ▪ Recruiting, selecting, evaluating and determining salaries for project managers ▪ Executive task for project managers
<i>PMO performance</i>	Perceived performance	<ul style="list-style-type: none"> ▪ Reporting in response to the question the need for a PMO since “<i>seriously questioned in recent years?</i>” ▪ Contribution to project/programme performance.

3.3. Framework Capabilities and Functions

The intended framework is concerned merely with defining the main independent variables and related factors (such as the dimensions of leadership, organizational commitment, PMO entity, the organization's culture, and governance) that would affect the efficiency of the PMO functions and roles, along with its possible alignment with the execution of the organization's strategic plan. The framework is expected to develop organization-specific pattern of the kind detailed below.

3.3.1. Leadership and Organizational Commitment

Leadership is described as the accumulated characteristics of a person, which entitle him/her to an influential position in leading, controlling, making decisions, and taking actions. In psychology, leadership is traced in a person who shows powerful behaviour and significant capabilities over other members of the community. But the type of leadership that is needed for the success of a project is concerned with building a vision, promoting effective collaboration, enhancing fruitful performance, motivating learning, and ensuring meaningful results (Juli, 2011).

The management of new projects in a dynamic business environment transforms projects into powerful and competitive assets. Therefore, many projects call successful implementation a leading quality in performance; this transition from traditional project management in the new era of *strategic project leadership* has become the concern of researchers, managers, and shareholders. Strategic project leadership generally directs projects towards creating competitive privileges and excellence in the marketplace (Shenhar, 2004)

The leadership and commitment shown in relation to organizational change have been issues of growing interest among scholars and practitioners, above all in a dynamic business environment. Leadership in organizations can take many forms. The full-range leadership theory distinguishes between two general forms of leadership, namely, *transformational* and *transactional* (Jackson et al., 2013). However, most traditional forms of leadership combine three common elements, emphasized in the following definition: “*Leadership is the ability to influence the activities of a group of followers in their efforts to set and achieve target goals*”.

This definition recognises the five core roles of the manager: commanding, organizing, planning, controlling and implementing. Where the manager influences the teamwork members, these activities constitute *transactional leadership* (Partington, 2007). In contrast to the traditional ideas of transactional leadership and management, new trends in leadership have emerged to emphasize the *transformational leading* role of the manager in bringing about organizational change.

For example, the transformational manager may change the way that the employees think about what is desirable, possible and necessary; in this sense, transformational leadership has a distinctive orientation towards identity, purpose and change. Increasingly, project managers are concerned not only with setting and with pursuing goals, but also largely concerned with managing meaning and changing the way that the members of the project team think. This concern is part of *inspirational motivation* and involves encouraging project personnel to strive for difficult goals, with the confidence that they can attain these goals (Jackson et al., 2013).

Furthermore, the top managers of an organization usually need great enthusiasm and loyalty in their involvement with creating and developing the strategic plan for each department in the organization. Such involvement aims at closely aligning the proposed plans with the project objectives. At the same time, the members of the top management need to be updated in each project charter to share the responsibilities with the project team, based on the authority matrix, in order to define the benefits to be earned, reduce the risks, and increase the return on the project and portfolio investments.

Meyer and Herscovitch (2001) developed the *Three-Component Model* (TCM) for investigating the employees' commitment to the affiliated organization (i.e., organizational commitment). Hence, organizational commitment was extensively investigated, in particular in the context of leadership. Employee commitment in the workplace is a multidimensional construct; it could take various forms and be aimed at several targets, including organizations, workplace teams, project leaders, and the organization's strategic goals.

Commitment is given various definitions in different contexts. Organizational commitment is **i)** *"The relative loyalty of an employee identified in his/her involvement in a particular organization"*, **ii)** *"The psychological attachment or link felt by an employee for the organization"*; whereas job commitment is *"The likelihood that an employee adheres to a job, and feels psychologically attached to it, whether it is satisfying or not"*. Commitment to organizational change is defined as *"A psychological state that binds an employee to a course of action necessary for the successful execution of a change initiative"* (Meyer & Herscovitch, 2001).

3.3.2. Mandate of the PMO

The establishment of a PMO entity in an organization would be an effective approach to enable project management to improve overall and create successful project outcomes. It should be positioned as a neutral entity to avoid any administrative conflicts with other departments. Therefore, the PMO should be equipped with clear processes, standards, procedures, and tools. The PMO mandate defines the purpose, for which the PMO exists, i.e., it is considered the mission statement of the PMO.

One of the driving forces of the PMO changes is *the scope of the control mandate*, which allows the control nature of the PMO to increase through variables related to the scope of its mandate in terms of the percentages of projects and project managers, and higher rank in the reporting hierarchy. Together, they form a consistent image of increasing control and scope of mandate (Aubry et al., 2010a). Thus, a good mandate will identify what the roles of the PMO are; the end-customers whom it serves, and the needs that it fulfils in the organization. Like the mission of a public organization, it keeps the staff of the PMO focused on the roles they enact, and clearly communicates to the customers of the PMO what are the services and support they can expect to receive (Mullaly, 2004)

3.3.3. Organization's Culture

While there is little consensus about the meaning of 'organizational culture', it is considered one of the key variables in the success of any strategy and it is agreed that this signifies the core elements represented in its vision, mission, and values. The elements of organizational culture are interpreted through the PMO's objectives and functions. This specific culture should be transparent and positive-thinking, sharing and exchanging information and knowledge, supporting new ideas and constructive

feedback and building trust between the organization's employees to avoid inter-department clashes in the organization and build supportive integrity.

The organization's culture develops in large part from the womb of its leadership; also, it can affect the development of its leadership. For example, transactional leaders work in their organizational cultures following the tendency of the current rules, procedures, and norms. Therefore, transformational leaders change their culture by first understanding it and then realigning the organization's culture with a new vision and revising its shared assumptions, values, and norms. Therefore, effective organizations require from its leaders both tactical and strategic thinking as well as culture building.

Organization-specific cultures are often created by their entrepreneurial founders. The founders often create an organizational culture through an initiative of a "*cultural scheme*". Typically, entrepreneurial founders would like to share the developed culture and related values with their employees. This intention of sharing culture and values aims at maintaining the organization's integrity, as well as its leadership (Bass & Avolio, 1993). The success or failure of an organization depends on the relevance of the founder's outlook to the business opportunities and constraints currently facing the organization. Leaders who are concerned about organizational renewal will seek to foster organizational cultures that are conducive to creativity, problem solving, risk taking, and experimentation (Hogan & Coote, 2014).

3.3.4. Governance Dimension

The past five decades have witnessed the emergence of new paradigms of management, which have shifted, from functional and bureaucratic approaches to

project and process-based approaches. This shift has been in response to the changing nature of work, from mass production, with essentially stable customer requirements and slowly changing technologies, to the current situation, where every product supplied may be specifically designed to suit the customer's choice, supported by continuous and rapid technological change (Turner & Keegan, 2001)

Today, organizations must engage in complicated interdependent business transactions if they are to deliver large projects successfully. Thus, the governance literature places special emphasis on focusing largely on the problems of business transactions, often under conditions of high uncertainty, asset specificity and bounded rationality. Accordingly, project leaders may face the problems of safeguarding, monitoring, and adapting the focal business transactions of their organizations in the most efficient way (Ahola et al., 2014).

Turner and Keegan (2001) describe project governance as a "*central tool for controlling the risk exposure of individual projects*". To carry out project governance effectively, these authors suggested two specific interface roles – the broker and the custodian. The former is responsible for the relationship with an external project and a client, whereas the latter focuses on the relationship between the parent organization and the project team. Governance is considered responsible overall for accelerating the execution of the proposed plans by means of introducing the policies that are required for the organization's projects and for organizing the requirements of the new initiative, such as confirming the relationship of each project to the strategic plan. This is intended to help assess the projects and programme advancement, as well as supervising its operation.

3.3.5. PMO Structural Changes

As the PMO is considered a dynamic entity, it is frequently replacing one structural pattern by another. Aubry et al. (2010) discuss the driving forces initiating these transitions; their study reveals that the transition of the PMO's configuration is not a matter of its being established on the right or wrong basis. Furthermore, the process of such transition is not fully understood yet; however, many research works are striving to define the factors in this process (Muller et al., 2013).

The study of Aubry et al. (2010a) focuses on the possible factors driving the structural transition of the PMO unit, such as:

- *Portfolio management and methods*, which consists of four variables: resource allocation, project selection, availability of information for decision-making, and aligning projects with strategy.
- *Collaboration and accountability*, which consists of four variables related to the collaboration of the stakeholders as deployed in the project management processes, customers and stakeholder relationship, project accountability, and cooperative interaction between project managers.
- *Project management maturity and performance*, which consists of three variables: **i**-project management skill level, **ii**- organizational commitment to the management of the project's implementation, **iii**- maturity of the project management.
- *Working environment*, which consists of two variables: work-family balance and the conditions of work (internal and external).

3.3.6. Environmental Scanning and Intelligence

Environmental scanning is a process that aims to gather some vital information to use in improving the performance and competitiveness of an organization; however, the amount of information collected depends upon the extent to which an organization succeeds in relation to its business environment. An important step in a meaningful environmental scanning is to identify the main external factors, such as competition, market stability, social networking, and available technologies, all of which might directly influence the survival of the organization in the business world.

Therefore, environmental scanning often includes the continual monitoring and prediction of environmentally related issues through constant surveillance of the business community (Abels, 2002). At the same time, environmental intelligence focuses largely on the identification of emerging technological issues, business trends, social events, and the risks that may directly affect an organization's future. The information collected through environmental intelligence can be used for evaluating the organization's strengths and weaknesses in response to external threats and opportunities. In other words, environmental intelligence is a process of identifying, collecting, and processing information about external influences, and translating it into useful plans and decisions.

Continuous and systematic environmental scanning eventually enables an organization to predict and avoid market surprises, and in turn gains competitive advantages through timely and effective decision-making. The major players of the organization's environmental business domain may be competitors, suppliers, target customers, or usable technologies (Shaheen & Khoo, 2009). Many organizations

frequently collect interesting information about external events to improve their capacity to develop future business strategies.

Thus, environmental knowledge management (EKM) has recently become a crucial approach in the information society. The significance of EKM has increased as today's business world has become more competitive, and unstable due to such factors as the rapid advance of globalization, technological innovation, and frequent financial crises across many economies, changing lifestyles, threats of terrorism, and epidemics and natural disasters (e.g., climate change).

Therefore, organizations need to regularly monitor their micro and macro environment, and use the resulting knowledge to make modifications in their operations and strategies that adjust to the new business paradigms. Thus, environmental intelligence could also help organizations to identify the possible opportunities and threats from their physical setting (Kamoun, 2007).

3.4. Framework Design – Concept Development

One of the major issues for data and information management in a project setting environment is the lack of proper documentation and poor use of the lessons learned from the results of the previous projects in analysing the chances of success for current projects running (Todorović et al., 2015). The concept of the research framework of this study took the form of ascending developmental stages that made it possible to continuously search, retrieve and review published works that had been cited in peer-reviewed sources.

After reviewing the project management literature in the area of the PMO, it was easy to detect a growing interest in defining the wide spectrum of applications

and roles of the PMO in the execution of the organization's strategic plan; it was defined through successful instances of project implementation, which also determined the factors and criteria of this success. Having noted the lack in the scholarly literature of works defining the roles of specific variables through conducting investigating and reviewing. The researcher initially proposed research objectives related to the two questions, these are:

- a) *How could the PMO's success in implementing projects in the organization be defined and measured?*
- b) *Is there any link between the PMO's implementation and the achievement of the organization's strategic plan?*

These questions explore the existence of a relationship between the PMO entity and other departments in the organization in order to demonstrate whether they have an active direct link with it or not. An initial framework (*prototype*) was proposed in order to define the main factors that affect the PMO entity; it based on the following elements: *leadership support, organizational culture, environmental scanning, human resources capability, and IT infrastructure*. These elements were incorporated to explain how the interrelationships of the variables could help the PMO in its roles to execute the strategic plan successfully, as shown in Figure 11.

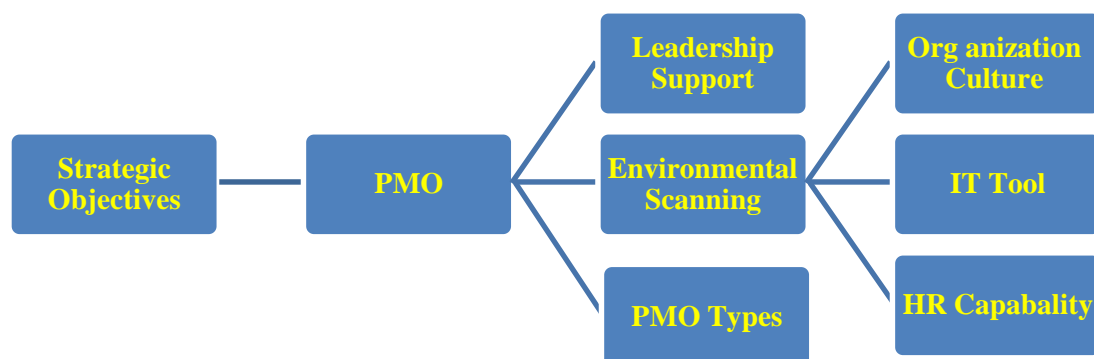


Figure 11: Initial proposed framework to define key factors affect the PMO

As the development of a robust and functional framework for the PMO's - strategic plan continued, the initially proposed conceptual PMO framework was subjected to many revisions and much updating with the help of new evidence from the literature and the author's observations. The works of Hobbs and Aubry (2007) finds the elements of the *prototype* framework insignificant. Therefore, the researcher redefined the PMO-Organization's strategic plan with reference to the significant PMO roles, as mentioned and recommended by reliable authors in PMO research field.

3.5. Proposed Framework

Many existing studies report the inherent challenges and complexities of multi-partner collaboration. The present study presents a conceptual framework that explains the focal collaboration of interrelated variables and their interdependencies in executing the strategic plan of a public organization. The variables in the framework and relations between them are derived from current empirical and theoretical studies of the PMO's roles, integration of variables, and project success.

The structure of the proposed conceptual framework for this study is largely based on both Dai and Wells (2004) and Hobbs and Aubry (2007), whose works define the exclusive roles of the PMO. The conceptual framework incorporates a dependent variable, which is defined as the "*Execution of the strategic plan of the public sector organization*", while seven independent variables were drawn from the findings of these works. Using conceptual analysis of the current literature, the researcher identified five variables, two of which are suggested.

He incorporated two independent variables in the proposed framework: **i)** *organizational structure and communication*, and **ii)** *sustainability of project values*.

The adopted PMO-Organization's strategic plan aims to illustrate the interrelationships between the dependent and independent variables connected with the execution of the strategic plan, with reference to the potential roles of the PMO entity established in public sector organizations in the business environment of the UAE and its future initiatives in economic development.

The researcher initially proposed a theoretical framework, which would be applied as a model from which to assess the outcomes of a study to test a set of hypotheses. However, the independent variables listed above could be at risk if they received too little care and consideration from the upper management of a project-based public organization. The theoretical framework consists of five independent variables (E) and two new ones (N), as shown in Figure 12 and Figure 13.



Figure 12: Practical framework of the study

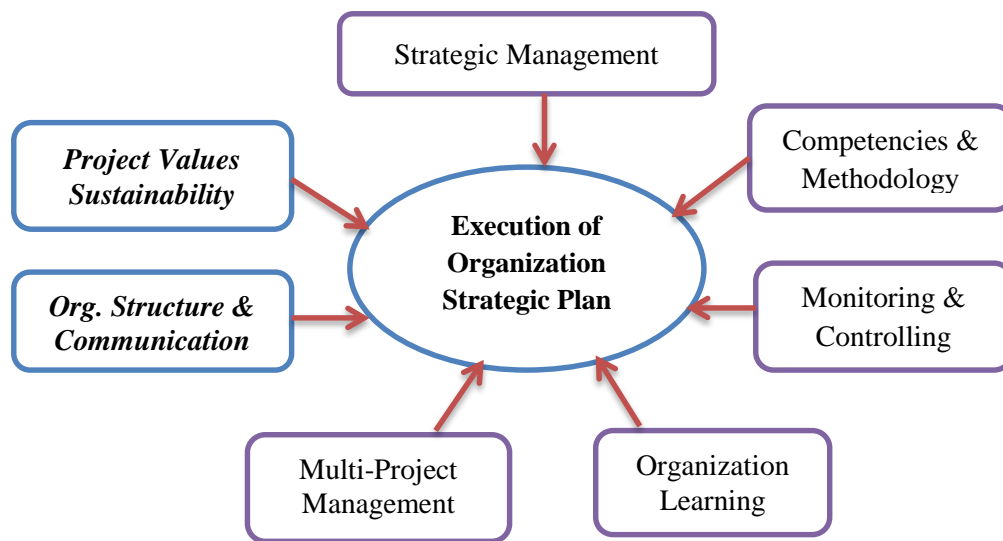


Figure 13: Theoretical framework of the study

However, the established PMO entity in a project-based organization could play a vital role, as discussed in the works of Dai and Wells (2004), and Hobbs and Aubry (2007). A comparison between the findings of their two studies is recorded in Table 10. Moreover, the core functions and capabilities of the variables in the proposed conceptual frameworks are detailed in the next subsections.

Table 10: A comparison of the various concepts of the PMO roles

Roles	Dai & Wells (2004)	Hobbs & Aubry (2007)
Control/Monitor	Providing project administrative support	Controlling/monitoring project performance
Method/Competency	-Developing/maintaining PM standards. -Providing consultancy -Delivery of training	-Developing and promoting PM competencies & methodologies
Multiple projects	Providing project HR and staffing	Ability to control multi-projects
Strategic PM	-----	Participant in PM strategy
Learning	Maintaining project documentation and archives	Developing organizational learning and culture

3.5.1. Strategic Management (SM)

Projects are generally different from standard organizational processes. Therefore, projects are often characterized by discontinuous personal constellations and work content, due to their individual and unique nature. The execution of projects is generally carried out beyond an organization's hierarchical administrative lines; it therefore requires specific strategic management, leadership skills, coordination mechanisms, and incentive schemes (Hanisch & Wald, 2011).

Many authors use the terms 'strategic management' and 'strategic planning' interchangeably as synonyms. The former term is more often used in academia, whereas the latter is often used in the business domain. However, there is an appreciable demarcation between the two terms. 'Strategic management' is a more inclusive concept than 'strategic planning', because in addition to strategic planning it includes both the implementation and the evaluation of strategic plans (David et al., 2011).

Despite the popularity of the processes of strategic management worldwide, little academic knowledge has been sought or gained about the application of strategic management in the UAE public sector (Elbanna, 2013). Consequently, Elbanna has depicted possible practices in strategic management in UAE public sector organizations by casting light on five related issues. These are: **i)** the characteristics of strategic planning, such as its age and time horizon, **ii)** the development of the strategic plan, including the role of expertise, interaction, whether intended or emergent, and typical strategic tools and actions, **iii)** the activities of strategic plan implementation, **iv)** strategic plan evaluation; and **v)** strategic planning outcomes and success factors.

Elbanna concluded that the study findings revealed that there is great interest in using various strategic management processes in the UAE's public organizations, in particular in their individual project activities. This shows that the best practice of strategic management in the UAE public organizations has been widely adopted, and has gained great benefits, despite the recentness of this approach.

The flourishing of strategic management practices in UAE public organizations could be attributed to many reasons, such as the availability of resources, talents and experts, and the support received from higher authorities (e.g., the Executive Council of Abu Dhabi Emirate). Moreover, it should be noted that strategic management practice was not at the same level of efficiency in all the sampled public organizations.

The conceptual framework adopts this variable to tackle its effectiveness in supporting the initiation and implementation of projects in terms of PMO roles. This variable is often concerned with interim investigations, planning, consultation services, environmental scanning, and developing effective networks. Thus, this independent variable could efficiently enhance the ability of the organization to identify and cultivate the required components of efficient project management and excellence.

3.5.2. Project Management Competency and Methodology (PMCM)

This variable is concerned with implementing the standard methods and processes of project management, promoting project culture in organizations, conducting professional training, developing competency, mentoring, and providing suitable tools for project management. Therefore, managers could use this variable to devise a better

and more cost-effective approach to linking the project deliverables with the strategic objectives of the host organizations.

Project resources and capabilities are considered key factors in creating, deploying, and maintaining the organization's programme and project strategies. The competency is seen by some to be role-specific; it covers the knowledge, skills, and behaviours needed to perform the various roles in project execution. Therefore, many organizations in both the public and private sectors are using competency frameworks to define their respective competency requirements for all the key project-related jobs in the organization (Turner, 2007).

Turner (2007) conducted a survey-based study to show that many organizations defined the personal project management competencies required to develop their project strategy. In addition, several organizations gave special concern to the leadership qualities that they expected of their executives and project leaders in shaping and delivering this strategy, at both the project level and the corporate level.

Projects, in a strategic framework, modify the work conditions of the hosted organization in terms of its business environment, because through such conditions, the organization's resources and personnel competencies can be mobilized to create market competitive advantage, along with other sources of value (Turner et al., 2007). However, the link between an organization's strategy and successful projects is close; the project outputs produce results that lead to the expected business benefits and this, in turn, lifts the pressure from the marketplace and the community.

Nonetheless, the personnel in the project management domains require special professional competencies to manage the sub-processes of a project. Among these are,

project start, continuous project coordination, project controlling, project close-down and possibly resolving project discontinuity. The success of project management is assessed based on the professional performance of these processes, not only on a project handbook that meets all the formal demands (Jamieson & Morris, 2007).

The *Project Control-Cycle* process is not sufficient to run and implement successful programmes on its own. Thus, developing innovative approaches and methodologies is necessary for the sustainability of programme management, along with a cultural change from a project approach to a management approach (Thierry, 2007). Moreover, with the rapid growth of structured project management, the use of recognized methodologies by project practitioners and project-driving organizations is now well established.

However, PRINCE2™ and the PMBOK® have been introduced as manuals for project management procedures, covering best practice guides and templates and guidelines to assist project managers. However, every project is unique and it is the experience and understanding of individual project managers that allows them to apply methods to their particular project (Thierry, 2007).

3.5.3. Monitoring and Controlling Performance (MCP)

This variable is concerned with reporting project status and performance, self-monitoring, maintaining scoreboards, project governance, operating information and a communication system to simplify the execution of running projects according to the scheduling of the project phases.

Over the past few years, the project-based business environment has become more complex in parallel with task-management theories and their underlying tools,

in the form of cognitive operations, methodologies, procedures and techniques (Klein et al., 2015). During the course of project execution, many unpredictable events may ensue which alter the initial plan. Therefore, proposing a good project plan is not quite enough to ensure the execution of successful projects. Accordingly, the project manager should have appropriate means for monitoring for detecting, measuring and controlling possible deviations from planning goals.

Pierce (2013b) defined three phases of robust monitoring process, these are:

- 1) *Monitoring progress* - This step is concerned with collecting detailed data for measuring the progress and updating the planned schedule of current projects. These collected data are analysed to represent accurately the status of the current work. Monitoring progress corresponds with the *Project Control Cycle* at step three (collecting data on actual work done) and step four (comparing collected data against the work plan)
- 2) *Comparing progress to goals* - This step is concerned with comparing the actual progress of the work with the progress scheduled in the project plan. This step corresponds with step five in the *Project Control Cycle* aiming to display the collected data in the updated plan.
- 3) *Corrective action* – This step aims at taking any necessary action to correct and remedy any problem that conflicts with the scheduled plan. The correction is based on all the available data and information related to the project objectives and timeline. This step corresponds with step six in *Project Control Cycle*.

At the same time, control of the project processes largely depends upon effective communication at the project site or workplace. In this case, the project

manager (whether on-site or from a remote desk) often uses intra-communication channels to closely monitor the project control cycle. Thus, effective controlling through communication requires him to **i)** consult the project teamwork personnel, **ii)** display the collected data and information in an understandable way to all project staff, and **iii)** keep up regular communication with the project partners and stakeholders; hence, monitoring and controlling practices are considered methods of updating. The *Project Control Cycle* is shown in Figure 13 (Pierce, 2013a).

Pierce (2013b) identified some causes that might interrupt the schedule of the proposed projects; among these are **i)** changes in contractual dates, such as an extension of delivery time, **ii)** changes in work sequences by the project personnel on-site without reporting them to the direct project manager or supervisor, and **iii)** changes in delivery dates of the project material, since delay has a disproportionate effect on project execution and delivery.

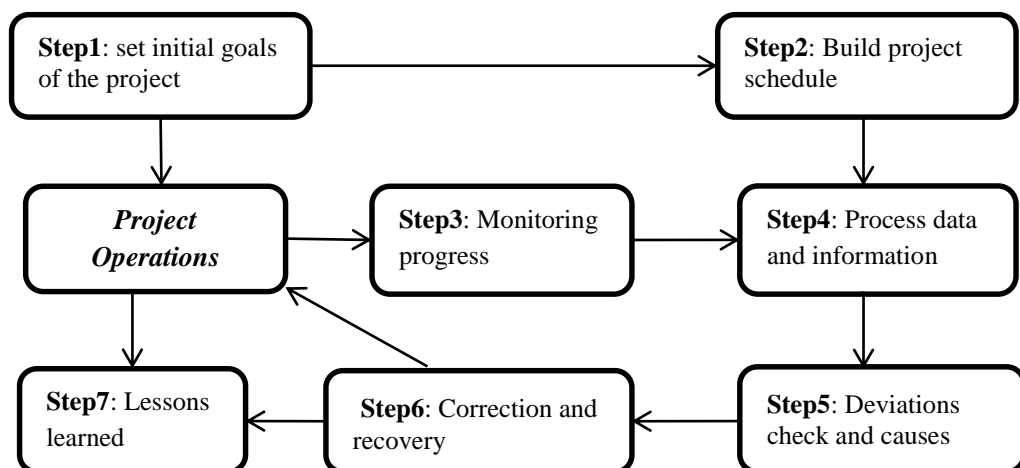


Figure 14: Project Control Cycle

3.5.4. Organizational Learning Promotion (OLP)

In project-based organizations, learning lessons from past projects and implementing the learning successfully on future projects is commonly acknowledged as difficult. Thus, a key enabler for improving project delivery is the ability to learn from current activities and use this learning to continually improve and innovate whilst delivering a quality service or product to clients (Fuller et al., 2011). This variable enables loyalty and an organization-specific experience to develop; it is also concerned with post-project reviewing, auditing, evaluating PMO performance, and managing the lessons learned, risks, and archive databases.

Although, projects have the potential for generating further professional learning, whether or not the learning is applied depends on the learning activities and patterns of the wider organization. In an investigation into project-based learning practices in a number of European companies, Keegan and Turner (2001) found that three of the key barriers to learning in project-based firms are i) time pressures, ii) centralization, and iii) postponement and delay. This raises the important issue of learning across organizational boundaries, both in and between organizations. These writers suggested that boundary objects provide a means of “*translation*” whereby the same knowledge and information can be used by many project leaders who may possess from diverse perspectives hold different views about the quality and further use of such information.

The links between knowledge management and project learning in the context of project review processes were investigated by Anbari et al. (2008). They examined “*why post project reviews in the literature are generally believed to be beneficial, but in practice is not conducted in a consistent manner*”. They concluded that the regular

collection of lessons learnt in projects, their careful storage in the organizations archive database, and their meaningful use in subsequent projects are vital elements for successful project execution, and in turn organization competitiveness.

3.5.5. Multi-Project Management (MPM)

This variable is concerned with the use of the available resources to maintain the execution of parallel-executed projects by means of efficient coordination and the allocation of resources between them. Many organizations in the public sector are structured in a way that achieves their goals and objectives, in particular in the context of strategic planning.

There are two basic organizational structures: the *bureaucratic structure* that is arranged in a pyramidal hierarchy, where authority increases from one level to the one above. The authority lies in the position rather than in the people who occupy it; and the *matrix structure* that breaks the unity of command where every employee has to report to the *direct head*. This structure allows flexibility and involvement, which leads to greater motivation and more teamwork activities. Moreover, most project-driving organizations in the multi-project context have a matrix structure (Talukhaba et al., 2011).

Managing multiple projects as a practical ability has a long history, mostly in the domain of the construction industry. However, since the middle of the 20th century, more attention to project management studies has been paid by practitioners and academics alike. Therefore, project management has grown over the past three decades as a discrete academic discipline (Andersen, 2010). Projects were initially managed as

separate entities. It was rarely noticed that any organization managed more than a couple of projects over many years.

A sharp increase in the number of multi-projects implemented and executed by both public and private organizations was observed from the 1980s and continued through the 1990s. The new project paradigm generated new challenges related to operating in the multi-project environment and the efficacy of organizations in managing concurrent projects (Spalek, 2012). A number of authors (e.g., Formentini & Romano, 2011; Salameh, 2014; Singh et al., 2009; Spalek, 2012, etc.) assumed that a major challenge facing project management approaches nowadays would be the unpredictable trends in the rate of successful and failed projects.

However, many attempts have been made to find the reasons behind this embarrassing situation for the global project industry. The unpredictability may be attributed to the inability of many project-oriented organizations and companies to face new organizational problems related to their operations in the multi-project environment. Moreover, project portfolio management has become dramatically more important, because it must operate in a new paradigm requiring many projects at once (Spalek, 2012).

Many different ways have been proposed to increase the operational efficacy of multi-project enterprises; among these is establishing the organization-specific PMO as an entity of interest (Singh et al., 2009). Andersen (2010) traced the progress of project management over the last decade to reveal that practices for improvement were developed, such as **i)** defining project objectives, **ii)** adapting the organization to the project's needs through establishing a PMO, and **iii)** improving teamwork.

Improving the management of multiple projects has been assumed the priority of many organizations in both the private and public sectors. Payne (1995) screened the literature on the topic to shed light on some concepts, grouping under the following headings:

- *Capacity* - This is concerned with the ability of the project-based organization to manage the execution of multiple projects simultaneously. When this is the case, a major challenge is considered as an appropriate allocation of available resources (human, finance, tools, etc.) between the projects being executed. Various methods have been tried to maintain the organization's capacity, such as staff outsourcing, rational budgeting, and fixed deadlines.
- *Conflict*- Conflict often arises in a multi-project environment over the three main issues arising from a project (i.e., workers, managerial issues, and system variation issues). The workers' conflicts could be effectively solved through the promotion of a professionally motivating working environment, the engagement of the project members in decision-making, and performance appreciation. The conflicts in both project management and systems could be resolved by applying standard methods, templates, and tools to negotiations.
- *Context*- This concept is related to the project setting including the administrative culture, norms of personnel behaviour, commitment, and standard procedures. In general, the project context is related to the nature of the organizational structure, and positioning of the project structure in the overall organization structure.

3.5.6. Organizational Structure and Communication (OSC)

Managing a project requires the constant exchange of ideas, explaining the scope and methodologies of the project to diverse groups of people (the public, management, functional departments and other stakeholders), threatening and bargaining with service providers and suppliers, negotiating to settle disputes and interpersonal conflicts as they arise between project team members or other stakeholders. Communication is considered therefore as an essential component of the project success. The members of the project team need to collaborate, share, and integrate information and knowledge to realise the project objectives.

Thus, it is necessary to understand the process of communication in this context. At its most basic level, communication consists of three components, namely **i)** a transmitter/sender, **ii)** a transmission channel/medium and **iii)** a receiver. Moreover, the media of communication are the codes in which a message is transmitted (Zulch, 2014). But a major constraint, as many scholarly works have perceived is the project boundary “*interface*” which withstands the inter-communication between the project itself and its parent organization.

Consequently, ineffective communication could lead to misunderstanding of the scope and objectives of the project plan. This may cause tasks and critical processes to be inadequately defined, and may prompt uncertainty over the responsibilities of the team members. It may even cause projects to fail (Zulch, 2014). Talukhaba et al. (2011) outlined a project communication plan to follow in the following paradigm:

- *Who?* Those in the lines of communication (sender and receiver) and in charge of specific functions and tasks.

- *What?* Determining the scope of communication and format.
- *When?* Scheduling communication sending and receiving.
- *How?* The media of conveying the communicated messages (e.g., email, document, telephone, meeting, presentation, etc.).
- *Feedback-* Confirming the message received and understood.
- *Filing-* Controlling document management (e.g., retrieval, storing, and disaster recovery).

Dow and Taylor (in Zulch, 2014) reported that various methods of internal communication in projects might be used in the following patterns:

- *Oral communication* takes place in the form of meetings, discussion groups, talks, interviews, announcements and conversation (face-to-face; by phone).
- *Written communication* takes place by means of letters, emails, circulars, memoranda and minutes of meetings.
- *Non-verbal communication* may convey powerful messages in the business world by means of gestures and appearance or attitudes.
- *Electronic communication* makes it possible to send messages all over the world in a real-time. These messages might be sent and received by using web-based devices and applications such as email, fax facilities, and recently introduced such social media as *Facebook*, *Twitter*, etc.
- *Visual communication* takes place by means of videos, internal TV network.

Zulch (2014) identified the most common “*Interfaces*” where project communication plans encounter obstacles:

- Between organizations (e.g., supplier-customer line).
- Between units/departments within an organization (e.g., Finance-PMO).

- Between members of project teams (project manager-project supervisor).
- Between parallel projects in different sites and locations.

This variable is concerned with establishing effective tools for communicating about PMO functions and missions. The communication patterns in the organization often answer its needs and the objectives of strengthening the channels to the project stakeholders, updating prompt information channels, and assisting in project continuity by transferring the required technology and innovative methods.

However, the administrative structure of the organization itself could engage in operating a project inter/intra-communication patterns. The present researcher argues that communication in projects often integrates project professionals who have different competencies, backgrounds, and professional experience in order to achieve complex and innovative project outcomes in the form of either products or services. Thus, the proposed framework tests the interrelated role of this variable in maintaining project communication as a key component of project success in implementing the strategic plan of a successful organization.

3.5.7. Project Value Sustainability (PVS)

Value and value creation are the central elements of a project's strategic objectives. However, the success of an organization depends on the extent to which it creates for customers what they value. The PMO plays an important role in creating and sustaining an organization's values. In many project-based industries, there has recently been an increased tendency for collaborating with customers and stakeholders in the co-creation of value.

The concept of creating project value starts with the sustainability processes needed to encourage innovative approaches and assess the viability of ideas, through managing the implementation of the initiated organizational change in response to the business's circumstances. Weaver (2012) argued that in the context of managing projects two elements are interlinked in the concept of value creation. The first focuses on the development of an idea to value the realization via proposed and current projects. The second key element is the pattern of management processes needed to manage effectively the organization's infrastructure for project management with an innovative approach.

Desouza and Evaristo (2006) classified project failure due to professional ignorance of project management techniques into two categories **i) Primary reasons:** failure in estimating project cost, inaccurate deadlines, inadequate communication, and failure in learning from previous experience and lessons learned; and **ii) Typical reasons** include inconsistency, inadequate formal tracking, and the lukewarm involvement of stakeholders and professional experts. Desouza and Evaristo argued that the introduction of the PMO would help to find appropriate remedies for these failures.

These PMO problem-solving approaches are considered value-added assets in the host organizations. Thus, this variable maintains the sustainability of the organization's value, vision and mission through deploying an efficient project management approach to maximize the delivery of value to ensure that a project's outcomes add to the social values of the community. In other words, any type of organization is considered part of a large complex of interrelated systems, such as a socio-economic or political system.

3.6. Summary

However, all these PMO changes coincide with the philosophy of management since it wants to clarify what the PMO entity looks like, whether supportive, controlling or directing. Any one of these roles would change management thinking with regard to the current situation of the organization's projects. The approach is based on the PMO managers' way of thinking; they can play various roles, whether strictly controlling, supporting or facilitating (Aubry et al., 2008).

It cannot be denied that most of directors would like to have power and authority in their domain of responsibility without interference from other units, but this preference is not appreciated by most executives. This approach supports a constructive methodology in some organizations where complex social entities, such as specific project-based organizational management structures exist. However, the proposed conceptual framework could be modified on purpose to align it to the requirements of the research methodology of the present work, as is discussed in the next chapter.

Chapter 4: Research Methodology

4.1. Introduction

Over time, an enormous range of methodologies has been developed to address specific factors relating to project success and failure. This chapter gives details of some methodological perspectives in the research from which to investigate possible roles for the PMO entity in the execution of the proposed strategic plans of public sector organizations (i.e., government and semi-government) in the UAE business environment. In addition, the survey information will be stratified to examine demographic differences or relationships between the independent and dependent variables of interest to answer the guiding research questions:

- 1) *Is there any link between the implementation of the PMO and the execution of the organization strategic plan?*
- 2) *How could the success of PMO implementation in the organization be measured?*

As indicated in the introductory chapter, the PMO functions as a strategic enabler to answer the needs of organizations in seeking to achieve their strategic objectives and plans; consequently, the characteristics, roles, and the various types of PMO have attracted a great deal of attention in the scholarly research relating to project management. Thus, the research study in this area is more likely to reveal the PMO roles in terms of highlighting the positive and negative issues that could either be consolidated or improved upon.

An online questionnaire-based survey was administrated to reach the target samples including project managers and PMO leaders in project-based organizations. The survey focused on investigating their perceptions of the PMO's roles in their own

organizations, in particular in achieving the organization's strategic plans and related ultimate goals.

The objective of detailing the adopted research method is to discuss how this study has been conducted; how it gathered and analysed the data and information related to the research questions of this study. Thus, the method adopted in of this study sought to establish facts, make predictions, and test hypotheses about the relationship between the proposed variables in the theoretical framework.

4.2. Philosophical Assumptions and Research Approach

Understanding philosophical issues is a necessity, since it could assist in guiding researchers about the kind and form of data to be collected, as well as an appropriate approach to tackling the research problems. In order to ensure satisfactory outcomes, researchers should thoroughly understand certain philosophical issues before conducting their research (Hair 2006). Moreover, his/her philosophical assumptions help the researcher to find an appropriate methodology for addressing the research questions. The nature of the present study was considered relevant to social science research (and management research in particular) in the field of strategic plan execution in the project management context.

In the realm of social science research, there are two prevailing and contrasting philosophical traditions, namely, positivism and social constructionism. Positivism is the approach of the natural sciences, which emphasises the use of organised methods combining the deductive logic of existing theory with precise empirical observations of individual behaviours, in order to formulate and confirm hypotheses that can be used to predict general patterns of human activity (Hair, 2006).

Social constructionism, in contrast, focuses on understanding and explaining why people, individually or collectively, have different experiences and perceptions, rather than searching for external causes and fundamental laws to explain their behaviour (Hair, 2006). The reasoning behind social constructionism is inductive. In other words, it proceeds from systematically analysing socially meaningful actions through the detailed observation of people in a natural setting, to arrive at general principles/laws governing the way that people create and maintain their social worlds (Hair, 2006).

The current study adopted the *positivist* approach. It began by consulting well-established theories and literature related to the PMO entity and project management, and from them deduced a conceptual model that contains a set of hypotheses logically linking the proposed variables. The model was assessed by using a series of quantitative analyses, and subsequently refined to produce a final version that best explains the public-sector business environment in the UAE.

4.3. Research Methods- An Overview

It is beyond dispute that the new scientific knowledge is known to operate only through the application of appropriate research methods for tackling the research problem under investigation. Therefore, the research methods fall into three broad categories, namely, **i-** design issues, **ii-** measurement issues, and **iii-** analysis issues; however, the research method adopted here often outlines the core features and elements in each of these three categories.

The proposal of the planned study must have sufficient power to probe effectively the problems raised in the research objectives. The power is exemplified in

the interaction of three factors related to data collection and analysis, namely, **i-** sample size, **ii-** inquiry formulation (hypotheses, questions, interviews, etc.) and **iii-** error estimation during the analysis. The above elements are involved in the selection of a suitable research method, as well as a specific instrument for data collection and analysis (Wu & Little, 2011).

A research approach is a discipline in which knowledge is acquired by different research methods. Many research methodologies are used in the research studies from the project management domain. Research methods can be classified according to a number of dimensions into: qualitative-quantitative, exploratory-confirmatory, descriptive-inferential, manifest-latent, and metrical/non-metrical (Wu & Little, 2011).

However, Blaxter et al., (2010) examined the difference between the two terms: 'methodology' and 'method'. The term *method* refers to a specific means of collecting data, whereas *methodology* refers to the strategies surrounding the use of the multiple methods of data collection as required by different types of attempts to achieve higher degree of reliability and validity. Thus, initial consideration prior to designing a research proposal is to identify a framework for conducting the study.

Three approaches to research are frequently adopted, depending on the nature of the study. These approaches are *quantitative*, *qualitative*, and *mixed* methods research, which are widely used in conducting research on a broad spectrum of social studies (Creswell, 2002). It is useful to illustrate the major components of each research method, such as their use of closed-ended versus open-ended questions, and

their focus on numeric versus non-numeric data analysis (Wu & Little, 2011). Table 11 gives details about these three research methods.

Table 11: A comparison between the three research methods

Type	Quantitative	Qualitative	Mixed
<i>Knowledge claims</i>	Post-positivist assumptions	Constructivist assumptions	Pragmatic assumptions
<i>Instrument</i>	Questionnaires with mostly closed-ended questions	Open-ended questions	Open/closed questions
<i>Data collection</i>	Performance, observation, attitude, and census data.	Interview, document, and observational data.	Multiple forms of data drawn from all sources
<i>Inquiry design</i>	Experimental	Narrative/observation	Questions / interview
<i>Approach</i>	Measuring/rating attitudes	Field observation	Measures/ observations
<i>Analysis</i>	Statistical	Statistical/ opinion	Statistical and text

The above approaches each have their own philosophical assumptions about knowledge claims, strategies of inquiry, and specific research methods. When the philosophy, strategies, and methods are integrated, they furnish a range of frameworks for conducting research. However, the relevant research literature may also emphasise other characteristics of research such as being reliability-, validity-, and information-orientated.

By combining previously developed theories with new empirically derived insights, the following research methods can be briefly detailed (Hassan, 2011).

- **Quantitative** research method was originally developed to answer the needs in studying natural phenomena. Moreover, the quantitative approach has

always incorporated numerical analysis of the data collected from the topic or entity under investigation. Special emphasis has been placed on the measurement and analysis of causal relationships between the variables concerned between two states that of the population sample of interest and the survey conditions under control. This highlights some key features of the quantitative approach, which is that the process of data collection is distinct from the data analysis. Some areas where quantitative methods are essentials are surveys, laboratory experiments, and the mathematical modelling of natural and social phenomena.

- **Qualitative** research method was developed in the social science context, which sought to enable researchers to investigate social and cultural phenomena. The qualitative approach implies an emphasis on the quality of entities and on the processes and meanings that are not subject to experimental examination or the metrical analysis of their quantity, amount, intensity or frequency. Therefore, qualitative approaches may be defined as '*an array of interpretative techniques, which aims to describe, decode, translate, the phenomena taking place in the social world*' (Hassan, 2011).

Qualitative sources may include personal observations, field surveys, interviews and questionnaires, documents and texts, and the researcher's impressions and reactions. Qualitative research is perceived to be any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification. Since the PMO is considered one of the emerging subjects in the research field, the qualitative method would be a researcher's preference in focusing on interviewees' views and understanding of the PMO and strategic objectives.

- **Case study** approach can be defined as “*an empirical inquiry that investigates a contemporary phenomenon in its real-life context, especially when the boundaries between phenomenon and context are not clearly evident*” Yin (2003). The case study may cope with situations in which there will be many variables of interest other than data points. The case studies usually combine the methods used in data collection such as the analysis of internal documents and archives, interviews, questionnaires, and observations. The evidence may be qualitative, based on *words* or quantitative, based on numbers or both approaches combined.
- **Mixed** research method does not generally undertake qualitative and quantitative research at the same time; however, it is possible for a study to be divided into various phases, in which either a qualitative or a quantitative approach is applied. Moreover, a major difference between qualitative and quantitative research is that researchers who adopt the qualitative approach rely on a few variables and many cases, whereas researchers adopting the quantitative approach work with many variables and a few cases. For this reason, it is hard to take a quantitative approach in the study of a social case or phenomenon, since there are many variables that are out of the researcher’s control (Johnson & Harris, 2002).

Thus, the choice of which appropriate method to be used is entirely based on the nature of the research problem, personal experiences, and the audiences for whom the researcher seeks to convey own ideas, opinions, and findings by means of scholarly communication (Creswell, 2002).

4.4. Adopted Research Method

In order to establish how to propose, plan and tackle a research problem, one should adopt a particular methodological approach. The data must be of a kind to provide appropriate answers to the research questions. Thus, various approaches have been taken to choose a suitable framework and method for gathering the required data.

Yasin et al. (2013) conducted a meta-analysis of the current research trends to highlight frequently adopted methods in the field of social studies through reviewing the related literature as it appeared in scholarly journals. Their data analysis shows that 31.0% of the researchers employed questionnaires (quantitative), 31.9% used interviews (qualitative), and 26.4% used mixed method and secondary sources (i.e. document analysis) in data gathering and analysis, whereas experiments (7.2%) and observation (1.8%) showed the lowest use.

This suggests that the use of related research literature is very helpful in deciding which methodologies are most suitable for collecting reliable information to conduct and complete a study. This in turn assists the researcher to make a rational choice of research method to fit the nature of the research problems under investigation. Concerning the theme of the present study, many published works have employed questionnaires more often than interviews (Blaxter et al, 2010).

The quantitative method is considered an empirical research approach in which the data take the form of numbers. Moreover, quantitative research tends to involve relatively large-scale and representative sets of data, and is often, perhaps mistakenly, presented or perceived as concerned to gather *facts*. It tends also to focus on exploring small numbers of cases or examples, which are perceived to be interesting through

offering details in depth rather than breadth (Creswell, 2002). However, the literature on research methodologies usually involves a debate over the adoption of an appropriate research methodology, which so far has reflected on the dilemma of whether to select a qualitative or quantitative approach and whether they can be integrated in a mixed method (Caniato et al., 2011).

There has been some controversy in recent years among social scientists concerning the relative significance of quantitative and qualitative strategies for conducting research. The views taken by individual researchers vary considerably, from those who see the two research strategies as essentially separate, to a considerable number of others who adopt a mixed method as a standard instrument for generating richer results. Yet quantitative strategies are still seen as more scientific or *objective*, although qualitative research has become increasingly popular. In spite of this, qualitative researchers have felt compelled to argue their case strongly.

The debate continues over the distinction between qualitative and quantitative forms of research. At first glance, the use of a questionnaire as a research tool might be seen as a quantitative strategy, whereas interviews and observations might be thought of as qualitative. In the field, however, things are often more complicated. Thus, interview-based data may be structured and analysed in a quantitative manner, for example, when numeric data are collected or when non-numeric answers are categorized and coded in numeric form, as the SPSS software makes possible. Similarly, survey data might allow for open-ended responses and lead to in-depth study of individual cases (Blaxter et al., 2010). It may be useful to demonstrate the similarities and differences between the two research strategies in Table 12 and Table 13, respectively (adapted from Oakley, 1999).

Table 12: The similarities between qualitative and quantitative research

Qualitative	Quantitative
It could be used in testing hypotheses and theories	It used also in exploring, generating, and testing hypotheses and theory
Qualitative data often includes quantification	It collects qualitative data through open-ended questions

Table 13: The differences between qualitative and quantitative research

Qualitative	Quantitative
Seeks to understand the behaviour of the participants	Seeks both facts and causes of the social phenomena
Naturalistic and uncontrolled observation	Obtrusive and controlled measurement
Subjective	Objective
Close to the data- the 'insider' perspective	Removed from the data- the 'outsider' perspective
Grounded, discovery oriented, exploratory, expansionist, descriptive, inductive	Ungrounded, verification oriented, reductionist, hypothetical-deductive
Process-oriented	Outcome-oriented
Valid- real, rich, deep data	Reliable hard and replicable data
Not generalizable as single case studies	Generalizable as multiple case studies
Holistic	Particularistic
Assumes a dynamic reality	Assumes a stable reality

The aim of the present study is to emphasise a development of theory from the events reality rather than hypothetical generation. Moreover, the literature review revealed that the nature of this study is similar to that of many other PMO studies using quantitative methods. Therefore, this study adopted a *quantitative-based questionnaire* approach, which was built on the refinement of existing research works in the PMO research domain. In addition, the questionnaire-based survey allowed the required data to be gathered remotely from a large sample of participants. Such

accumulated data have been quantitatively analysed for measuring and rating the validity and stability of the proposed PMO roles-strategic plan framework.

However, multi-regression analysis (MRA) was selected primarily to measure statistically the significant relationship between the constructs of the framework. MRA is a statistical method of data analysis that is frequently used when a quantitative variable is examined in relation to any other factor. The research design for this study is therefore based on a positivist epistemology whereby the variables of interest can be measured through survey instruments and a single reality is assumed.

4.5. Research Framework

The appropriate quantitative research method for this study managed to reach the research objectives. The researcher primarily used post-positivist methods for developing knowledge (i.e., reduction to specific variables, hypotheses and questions, the use of measurement and observation, and the testing of theories), by employing a strategy of inquiry, namely, a questionnaire survey, to collect the required data.

The survey is usually associated with a research approach specifically intended to put structured questions to the groups of people concerned (Blaxter et al., 2010). However, the factual status of some related outcomes of the survey are questioned by the researcher. Many studies reveal the advantages and disadvantages of surveys in quantitative research as detailed below:

- ***Advantages***

- 1) With an appropriate sample, surveys may aim at representation and provide generalized results.
- 2) Surveys can be relatively easy to administer without need for any fieldwork.

- 3) Surveys may be repeated in the future or in different settings to allow comparisons to be made.
- 4) With a good response rate, surveys can provide many data relatively quickly.

▪ ***Disadvantages***

- 1) The data, in the form of tables, pie charts and statistics, become the focus of the research report, and lose connection to wider theories and issues.
- 2) The data provide snapshots of points in time rather than focusing on underlying processes and changes.
- 3) The researcher is often not in a position to check first-hand the understandings among of the respondents of the questions asked.
- 4) The survey relies on breadth rather than depth for its validity. This is a crucial issue for small-scale researchers (Blaxter et al., 2010).

Thus, conducting a research investigation should involve a structure or a method in a planned procedural framework. The present research study and its related fundamental concepts require a valid research problem, an aim, objectives, and research questions to be methodology-driven. Furthermore, the following study characteristics are considered pertinent to the nature of this study and the expected response rates:

- a) ***Sampling method:*** The method is either probability or convenience sampling. Probability sampling is achieved through random, stratified, and cluster sampling designs. In contrast, convenience sampling is a nonprobability method of including sampled individuals or groups in such settings as universities and workplaces. The three most common contact methods are a face to face interview, phone interview, and by e-mail.

- b) **Target population characteristics:** Demographic variables such as gender, age, educational level, job position and responsibilities should be considered.
- c) **Questionnaire length:** The length of the instrument is stated in the number of items in the questionnaires to be answered. However, the questionnaire length, whether short or long, does not necessarily reflect the quality of the research under investigation, i.e., short forms in some studies could be equal to long forms in others.
- d) **Response facilitators:** Response facilitators include a preliminary notification of the participants before distributing the printed questionnaire by post or on line. Furthermore, it is necessary to follow up the completing of the distributed questionnaires to ensure a satisfactory response rate.
- e) **Appeals:** Participants may be encouraged by the contents of the covering letter, which accompanies a questionnaire. Thus, different approaches in such appeals may be used to help motivate the respondents to reply promptly; for instance, telling the participants that their feedback would be valuable for completing the research objectives (Blaxter, 2010).

4.6. Data Collection and Field Access

This section presents the detailed procedures of data collection that were undertaken to assess the conceptual model developed in Chapter 3. The section gives an overview of the statistical tools used in analysing the collected data, along with the analysis, following the confirmed validity, reliability and unidimensionality of model variables.

4.6.1. Statistical Tools

The statistical analysis of the data received from the returned questionnaires was performed by using the SPSS (*Statistical Package for the Social Sciences*). The SPSS

included a data reliability test, frequencies, percentages and cross-tabulation between the independent and dependent variables. According to Blaxter et al. (2010), reliability refers to how well a research project is conducted, with obvious advances in improving the research methodologies, both qualitative and quantitative.

Moreover, the advent of statistical analysis software such as SPSS has been widely welcomed in a range of social studies and related subjects, in particular the health sciences, market trends, consumer attitudes, etc. In addition to statistical analysis, the SPSS is involved also in data management (e.g., case selection, file reshaping, creating derived data), as well as data documentation (e.g., metadata descriptions, as stored in the data files). These functional features are considered the basis of the software.

The survey took the form of a structured questionnaire, which as a rule generates a variety of datasets (i.e., compiling numbers in tables) as raw information. These datasets are considered the heart of the quantitative data analysis. SPSS datasets have a two-dimensional table structure, where the rows typically represent cases (e.g., individuals, customers, etc.) and the columns represent measurements (e.g., Biodata such as age, gender, experience years, etc.). Only two types of data are defined: numeric and text (or “string”). All data processing occurs sequentially case-by-case through the file. Files can be matched one-to-one and one-to-many (Connolly, 2007).

4.6.2. Quantitative Cases in PMO Studies

Various research methods have been employed in studying the functional roles of the PMO unit, because it is a key factor in successful implementation in various organizational settings. Nakamura and Osada (2013) applied a quantitative research

method and analysis to identify some important strategic PMO functions in maintaining PM maturity, which directly affects the organization's performance. Accordingly, the role of the PMO should not be to rely on insight in applying modern PM practices, but to integrate and adapt the organization's business interests to its PM efforts.

Dai and Wells (2004) explored the PMO features in relation to project performance by means of the functions and services provided by the PMO entity. Among these functions were **i-** developing and maintaining PM standards and methods, **ii-** developing and maintaining project historical archives, **iii-** providing project administrative support, **iv-** providing human resource and staffing assistance, **v-** providing PM consulting and mentoring, and **vi-** providing or arranging PM training. Among the functions and services mentioned, some were embodied in a questionnaire research instrument to characterize the PMO presence associated with a project outcome.

Abdi and Kaddoura (2011) carried out a case study to investigate IT project management with a PMO structure in the Group IT Office at Dubai Holding, which is a group of seven subsidiaries running a number of mega projects. Their study focused on the impact of the PMO structure on the IT project lifecycle with deliverables through six identified phases. The case study employed a structured survey questionnaire consisting of six parts; the questionnaires circulated to five target groups whose members deal directly with the functions and services of the PMO entity, in addition to their experiences of PM concepts and standards. The authors concluded that the quantitative research method yields a high response rate and informative data, which answered the research questions of their case study.

4.6.3. Regression Analysis

Regression analysis is a branch of mathematical statistics, which aims to unify various data analysis methods for interpreting the dependence that could be established between the proposed variables using statistical data. In the statistical modelling technique, regression analysis is a statistical approach to investigating the relationships between a *dependent variable* (a criterion, denoted as Y) and one or more different *independent variables* (or predictors, denoted as $X_1, X_2, X_3 \dots X_\infty$). The statistical interpretation of these linear relationships is termed *Multiple Regression Analysis*. The *Multiple regressions* approach is a technique that allows additional factors to enter the analysis separately allowing the effect of each to be estimated.

The researcher usually seeks to ascertain the causal effect of one variable upon another. In other words, the interrelations between the two types of variable could give some insight into the way in which the typical *value* or *effect* of the dependent variable changes when any one of the independent variables is held fixed (Rawlings et al., 1998); for instance, the effect of the PMO structure upon project performance. In this case, the regression is employed to estimate the quantitative effect of the causal independent variables that have a direct influence upon the dependent variable. Therefore, the researcher also typically assesses in the investigation the statistical significance of the estimated relationships, i.e., whether the degree of confidence in the actual relationship is close to the estimated relationship (Sykes, 1993).

Rawlings et al (1998) described two approaches of the regression analysis. It can be performed in various ways such as the *Simple regression approach*, which formulates some hypotheses about the possible relationships between the variables of interest, here the PMO and project performance. Thus, the hypotheses should state as

clearly as possible the existing causal relationships between the concerned variables. It is valuable for quantifying the impact of various simultaneous influences upon a single dependent variable. Further, because of the bias of the omitted variables in simple regression, multiple regressions are often essential, even when the investigator is interested only in the effects of one of the independent variables.

This study aimed at identifying the exploratory and causal relationships between the seven independent variables with the dependent one, as previously discussed in Section 4.5., which is indebted to the findings in the work of Hobbs & Aubry (2008). Regression analysis would also incorporate the formulated hypotheses. However, the questions proposed in the present research were answered in accordance with the analysis of the causal effects between the variables, as indicated in Table 14.

Table 14: Statistical analysis of the variable interrelations

Research Questions	Variables	Statistical Analysis
<i>Q.1 Is there any link between the implementation of the PMO and execution of the strategic plan of the project-oriented organizations</i>	<u>Dependent (Criterion)</u> Organization's strategic plan execution	Multiple and single regression analysis
<i>Q.2 How the success of the PMO implementation within the public sector organization could be measured?</i>	<u>Independent (Predictors)</u> PMO roles	Sample <i>t</i> -test

The appropriateness of the research method that has been adopted in this study needs further testing as an essential step to demonstrate the reliability and validity of the research method.

4.7. Reliability and Validity

Achieving perfect reliability and validity is the core part of the statistical analysis in the qualitative method; however, it demands a complicated approach to achieve

acceptable results (Neuman, 2011). The general concepts of reliability and validity are covered in the following discussion. The particular techniques selected for the present study are included also in the discussion.

4.7.1. Reliability

The general concept of reliability is to focus on the dependability and consistency of the research instruments (Weathington et al., 2010). The two main types of reliability are stability reliability, or stability over time, and representative reliability, or stability across groups (Neuman, 2011). Kumar (2011) outlined some of the main factors that influence the reliability of research instruments, including the wording of the questions, physical setting, the respondent's mood, nature of interactions, and regression effect of an instrument.

Based on the suggestions proposed by Neuman (2011), several factors could help to improve the reliability of the present study, namely,

- i)** Having a clearly conceptualized construct because reliability increases when the measurement involves only one concept (i.e., the concept of a PMO model).
- ii)** Using the level of measurement of the instrument by having more detailed questions to cover the attributes of the PMO model (PMO roles and functions, PMO organization structure, and PMO maturity level) and then using several questions to measure each attribute, using the appropriate scaling.
- iii)** A peer review using PMO personnel, which served to obtain feedback on the research instruments.

4.7.2. Validity

Validity is related to measuring the fitness of the empirical indicator and the conceptual definition of the construct (Neuman, 2011). Some measurable areas of validity are face validity, content validity, concurrent and predictive criterion validity, and convergent and discriminant construct validity (Neuman, 2011). In relation to face and content validity, the researcher scrutinized the instrument through conducting a peer review to maximize the logical links between the questions and the research objectives, to be sure that the coverage of the topics researched was balanced.

In terms of criterion validity, the researcher compared the instrument to other studies to establish the concurrent and predictive validity of the study. Validity can be threatened internally and externally (Creswell, 2009). Internal threats include history, maturation, regression, selection, treatment diffusion, mortality, compensatory demoralization, compensation rivalry, testing, and instrumentation (Creswell, 2009). In the present study, selection was the only internal threat that might be relevant. Making sure that the targeted participants satisfied the selection criteria for the study mitigated the selection threat. Creswell (2009) and Kumar (2011) highlighted the external threats to validity that relate to the ability to generalize the study results. To mitigate this external threat, in the present study the researcher selected the sample of respondents based on the characteristics of the GSD environments to ensure that the study results could at least be generalized in similar settings or companies in GSD environments.

4.8. Questionnaire Design

The primary instrument of the quantitative approach in social studies is the *questionnaire*, which is considered one of the most widely used social research

techniques. The idea of formulating precise written questions for those whose opinions or experience you are interested in seems an obvious strategy for finding the answers to issues that are of great interest (Creswell, 2002). The initial questionnaire (prototype) was developed with reference to the work of Hobbs and Aubry (2007). The structure of the questionnaire was based on the proposed conceptual framework that consists of 7 independent variables and one dependent one.

As regards this study, the questionnaire wanted to elicit an evaluation of the PMO roles involved in performing the strategic plan of an organization. For the purposes of this study, a questionnaire was developed in order to collect data from the members of a target sample population who had dealt directly or indirectly with PMO activities in their own organization. Many researchers in the social sciences who are interested in questionnaire research draw attention to making the wording of the questions as clear, direct, and understandable as possible.

According to Blaxter et al. (2010), such wording should not be ambiguous or imprecise. Observing clarity, the questionnaire was designed to include both open-ended and closed questions; both kinds of question are important for collecting data, and therefore they ask for both words and numbers to analyse the participants' perceptions, and to present them quantitatively. This being the case, a significant advantage of open-ended questions as a tool for gathering data is that "*They provide the space for thinking so that the respondents can express their ideas according to the question given by the researcher*", Blaxter et al stated.

This instrument could help to gain rich and usable information, which supports the analysis and reliability of the gathered information and data. Many researchers

indicate that the questionnaire technique provides reliable research information because the target participants are keen to respond to the questions explicitly in confidence. The literature identifies that an effective questionnaire is clear, simple to respond to, with the qualities of significance, consistency, anonymity and reliability, and the research should not be expensive to conduct (Creswell, 2002; Blaxter et al., 2010). The proposed questionnaire uses a Likert five-point scale with options ranging from very effective (5) to not effective (1); if the respondent is in agreement with the statements, judging them *Very effective to somewhat effective*, while if the respondent is in disagreement with the statements, judging them *Not effective*.

The questionnaire contains five parts, asking for **i)** demographic information, **ii)** type of PMO services in the respondent's organization, **iii)** assessment of the execution of the organization's strategic plan in the presence of PMO entity, **iv)** assessment of the effectiveness of suggested PMO roles in the respondent's organization, and **v)** a selection of attributes that could be used as criteria for the evaluation of PMO roles, in general (see Appendix). The five parts consist further of 61 sub-questions to cover primary demographic information about the target participants and public organizations to get as many benefits of the PMO roles as possible.

Part Four is particularly dedicated to gathering a wide array of participants' attitudes in rating the effectiveness of the PMO roles, as well as the interrelationship between the seven independent variables and the dependent one. The questionnaire covers the PMO roles from the perspective of this exploratory study: **1)** Strategic management, **2)** Developing project management competencies and methodologies, **3)** Monitoring and controlling performance, **4)** Multi-project management, **5)**

Organizational learning, 6) Organizational structure and communication, and 7) Project value sustainability.

The emergence of the Internet has popularised the use of web-based surveys in conducting intensive quantitative research over a wide spectrum of social studies, into business and end-customer attitudes, since it is believed that a high proportion of participants respond to such surveys (Shih & Fan, 2008). The proposed questionnaire of this study was web-based, written in the online form *Quartile*TM.

4.9. Questionnaire Pilot Test

4.9.1. Introductory Procedures

The principal supervisor of this dissertation initially revised thoroughly the structure and clarity of the questionnaire and similarly checked the relevance of its set of proposed questions to the research problem and hypotheses before a pilot test was held. A pilot test of the questionnaire is necessary to highlight the strength and weakness of its content, concerned primarily with eliciting the required data from respondents whose work experiences were relevant to the subjects of the questionnaire. Therefore, it was important to pre-test the research technique and appropriateness of the questions.

The researcher held a series of meetings with senior managers in four project-based organizations hosting a PMO unit; these were Al Ain Municipality, Abu Dhabi Department of Economic Development, Abu Dhabi Food Control Authority, and Abu Dhabi Education Council. The discussions focused merely on giving them further explanation about the research topic, which ended by the researcher being given permission to conduct a pilot survey.

The pilot questionnaire was sent to a selected sample of 50 PMO experts who were asked to answer the questions and return their feedback. The experts were also asked to make any comments and/or any suggestions that might improve the questionnaire. Such comments were used to restructure and modify the prototype in order to produce the final and valid version of the questionnaire as a data collection instrument. The pilot test ran from 20th April to 25th May 2015. All the 50 participants (100%) responded and returned complete and usable answers. Their responses to the pilot survey were used to modify the final version of the questionnaire. Moreover, in their feedback no issues of ambiguity were reported by the participants. Figure 15, shows a graphic representation of the quantitative method used in the analysis of the final questionnaire data.

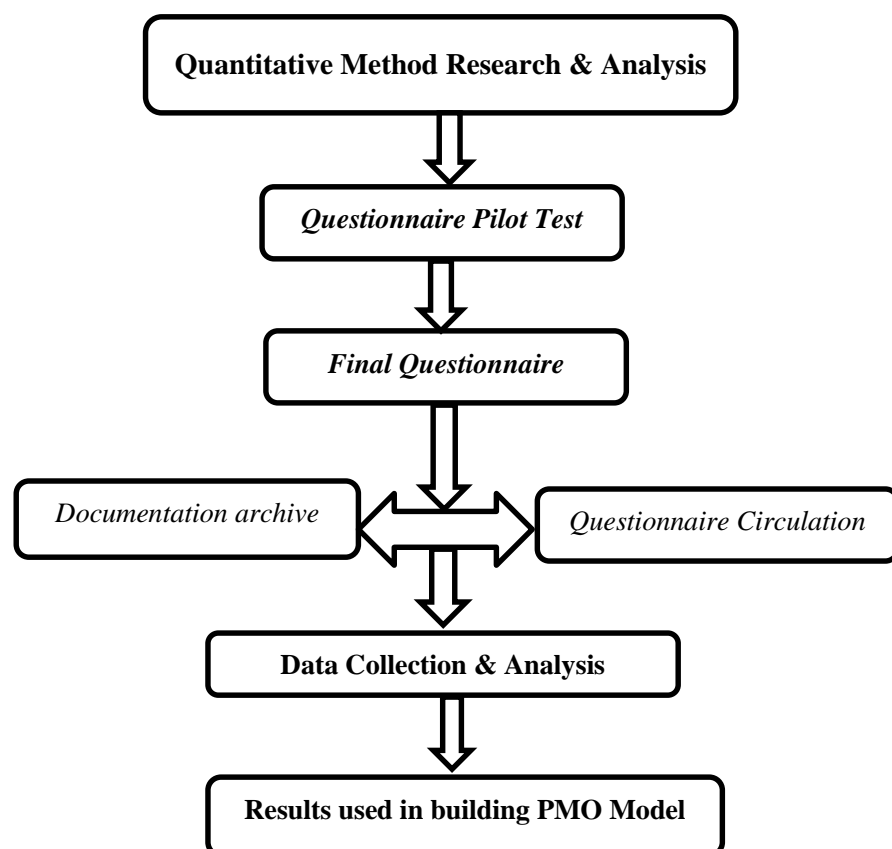


Figure 15: Quantitative Method approach used for the research

4.9.2. Data Collection and Analysis

The accumulated data from the 50 respondents were entered into SPSS for the statistical analysis to be performed. Cronbach alpha tests were performed to determine the internal consistency of the criteria for the seven proposed PMO roles; each variable handled a set of 4-5 factors. The Cronbach alpha for PMO roles criteria at 0.955 showed adequate consistency for the study, as shown in Table 15.

Table 15: The Cronbach alpha pilot test for PMO roles criteria

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.955	.953	8

The values of the Cronbach alpha tests for the seven PMO roles (as independent variables) were found to be as follows: **i)** *Strategic Management* (0.952), **ii)** *Development of Project Management Competencies and Methodologies* (0.947), **iii)** *Monitoring and Controlling Project* (0.945), **iv)** *Organizational Learning Promotion* (0.945), **v)** *Multi-Project Management* (0.945), **vi)** *Organizational Structure and Communication Improvement* (0.943), and **vii)** *Project Value Sustainability* (0.947). Likewise, the result of the same test for the *Strategic Plan Execution* (the dependent variable) was found to be 0.963. Accordingly, the generated values proved an adequate consistency for the study, as shown in Table 16.

Table 16: Cronbach alpha pilot tests for PMO roles

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q18	15.5894	31.350	.774	.661	.952
Q19	15.5917	30.371	.854	.780	.947
Q20	15.4280	30.029	.887	.846	.945
Q21	15.2235	29.343	.894	.849	.945
Q22	15.3280	28.681	.889	.833	.945
Q23	15.3394	29.496	.919	.882	.943
Q24	15.4568	29.657	.853	.803	.947
Dependent	15.5667	34.785	.568	.483	.963

The analysis of the factors was also carried out in the pilot study using the *Extraction Method of Generalized Least Squares*; it confirmed that the validity of the criteria for the seven PMO role communalities ranged from 0.681 to 0.884, as shown in Table 17. These results of the reliability and validity pilot test confirmed that the instrument was clear and understandable. These findings gave the researcher the green light to move to the next stage, the surveying of a large sample of participants.

Table 17: Pilot test validity for the PMO roles criteria communalities

	Initial	Extraction
Q18	1.000	.681
Q19	1.000	.795
Q20	1.000	.841
Q21	1.000	.851
Q22	1.000	.844
Q23	1.000	.884
Q24	1.000	.793
Dependent	1.000	.406

Table 18 lists the cumulative percentages of the variances that were accounted for by current and preceding factors. The model reveals that, for instance, the 1st row in this table shows a cumulative value of 76.18%, which indicates that the first factor accounted collectively for 76.18% of the total variance.

Table 18: Pilot test of cumulative percentages of the total variance

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% Variance	Cumulative%	Total	% Variance	Cumulative%
1	6.095	76.183	76.183	6.095	76.183	76.183
2	.689	8.610	84.793			
3	.425	5.312	90.105			
4	.247	3.085	93.190			
5	.207	2.586	95.776			
6	.164	2.046	97.822			
7	.095	1.184	99.006			
8	.080	.994	100.000			

Total Variance Explained

An analysis of the factors was also performed in the pilot test, using the *Extraction Method of Generalized Least Squares* to confirm the validity of the criteria for the seven PMO roles of the component matrix ranging from 0.940 to 0.825, as shown in Table 19.

Table 19: Pilot test of validity for PMO roles criteria of component matrix

	Component 1
Q23	.940
Q21	.922
Q22	.919
Q20	.917
Q19	.892
Q24	.891
Q18	.825
Dependent	.637

Extraction Method: Principal Component Analysis
a. 1 Component extracted

4.10. Questionnaire Distribution

The online questionnaire version was sent to participants drawn from the following project-based organizations:

- 1) General Secretariat of the Executive Council (Abu Dhabi)
- 2) Abu Dhabi Department of Economic Development (ADDED)
- 3) Abu Dhabi Educational Council (ADEC)
- 4) Abu Dhabi Food Control Authority (ADFCA)
- 5) Department of Municipal Affairs (DMA)
- 6) Al Ain City Municipality
- 7) Abu Dhabi City Municipality
- 8) Abu Dhabi Police
- 9) Abu Dhabi Systems & Information Centre (ADSIC)
- 10) Abu Dhabi Sewerage Services Company (ADSSC)
- 11) Abu Dhabi Water & Electricity Authority (ADWEA)
- 12) Family Development Foundation (FDF)
- 13) Abu Dhabi Tawteen Council
- 14) Dubai Municipality
- 15) Road & Transportation Authority (RTA) of Dubai
- 16) TAWAZUN Company - (semi-government)
- 17) Khalifa Fund
- 18) Abu Dhabi Oil Refining Company (TAKREER)
- 19) Abu Dhabi Gas Industries, Ltd. (GASCO)

It is worth mentioning that an Arabic translation accompanied the English version in case some of the participants preferred to answer the Arabic version. The

online questionnaire is introduced by a covering letter and a statement that promises anonymity and confidentiality. The revised online questionnaire was sent on 21 July 2015 to 450 participants working in project management domains. The target sample includes:

- Managers of Portfolios, Programmes, and Projects
- Quality Assurance Managers
- Strategic Planning Managers
- Project Coordinators.
- Project-support Specialists (e.g. IT specialists, statisticians, accountants, etc.)

The participants were asked to specify their level of agreement with a series of statements that focused entirely on the importance of the PMO. The online participation closed on 2nd November 2015 to reveal that the e-questionnaire was viewed by 366 people, and that 268 participants completed and submitted usable questionnaires. The data and relevant information were collected using an online e-questionnaire-based survey. The collected data were extracted from the responses before statistical analysis using the multi-regression analysis. The most of the questionnaire (see Appendix).

4.11. Some Considerations

Generally, every research study often faces certain limitations relating to time, physical location, sample population, and official approval for conducting the field study. Thus, the possible limitations that might face this research study are the following:

- The geographical locations of the selected PMO host organizations are scattered, making it rather difficult to reach them all simultaneously.

- Therefore, it was difficult to conduct face-to-face interviews with the PMO personnel.

Therefore, an online questionnaire was found to be more practical. However, there was no conflict of interest for the researcher in the research topic, data collection, or use of the collected data. Official permission made it possible to reach the desired sample with the covering letter and ask the members to participate in the online survey; this allowed the researcher to make it clear to the respondents that all the information obtained would be treated in confidence. Nevertheless, the collected data, analysed quantitatively, could be applied to the central problem of the research: identifying the link between the project outcomes and the objectives of the strategic plan.

Chapter 5: Data Collection and Analysis

5.1. Introduction

The structured questionnaire was designed as a survey instrument to gather the required data for gaining better understanding about the PMO roles through analysing the feedbacks of 268 respondents completed the questionnaire. The presentation of the analysed data follows the course of the online questionnaire structure. The online questionnaire is Likert-Five scale, where 1 is low to 5 as high, with midpoint neutral 3 (i.e., *somewhat*).

Despite the background and demographic data of the participants (Part one) are not directly related to the research questions and/or the model being studied; however, the answers to demographic questions would be useful in providing a better context in the analysis of the study results. The descriptive background of the existing PMO is presented in (Part Two) to give an overview of the actual and potential roles and functions that the PMO unit could play within its project-based organizations.

Execution of the strategic plan of an organization (Part Three) with enhancement of the PMO has raised a question “*Was the proposed strategic plan of your organization executed successfully in the presence of a PMO entity?*” Measuring a successful execution is reflected as effectiveness of involved PMO roles. The important data were those related to 7 variables that focus on the roles and functions of the existing PMO (Part Four) to be used in developing the PMO model proposed in this study. We proposed criteria for weighing the effectiveness as (in Part Five) that could be used as metric factors in measuring the PMO implementation success within a project-oriented organization.

5.2. Demographic Description of the Participants and PMO

5.2.1. Respondent Profiles – Qualification, Gender and Nationality

The questionnaire part of the demographic section includes questions about the academic qualification, nationality, gender, work experience in project management domains, project roles, PMO experience, working years with the current affiliated organization, and team size. The academic qualification of the participants is reported as follows: 10 respondents hold higher diploma (3.7%), 98 respondents hold Bachelor degree (36.3%), 136 respondents hold Master degree (50.7%), 24 respondents hold Doctorate or professional degree (9.0%), as shown in Figures 16.

1. Your academic qualification is:

	Frequency	Percent	Valid Percent	Cumulative Percent
Higher Diploma	10	3.7	3.7	3.7
Bachelor	98	36.6	36.6	40.3
Valid Master	136	50.7	50.7	91.0
Doctorate	24	9.0	9.0	100.0
Total	268	100.0	100.0	

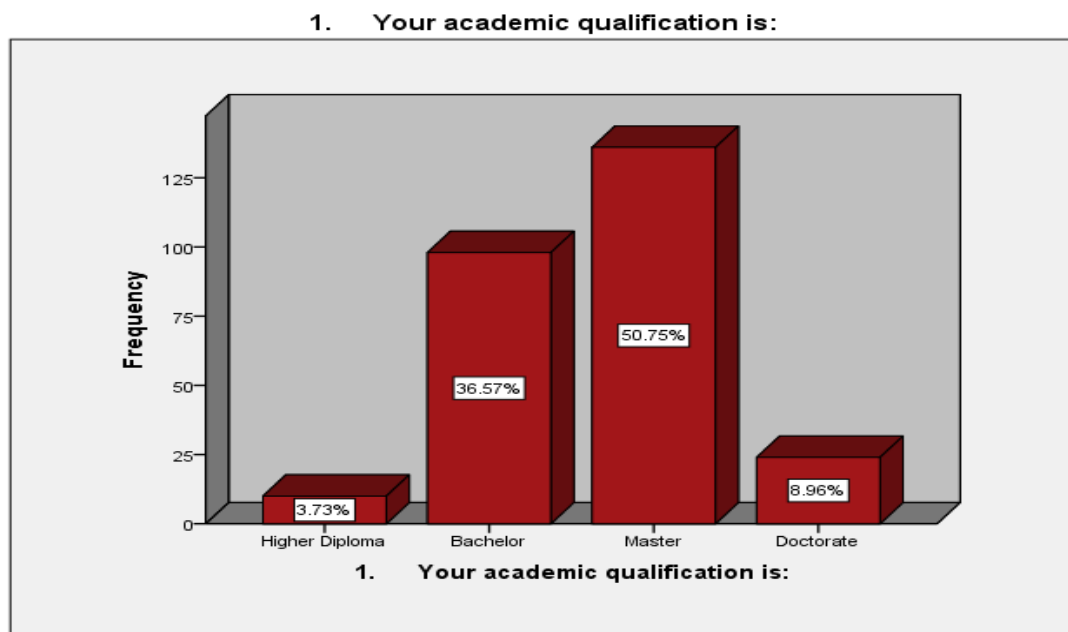


Figure 16: Respondents academic qualification

Moreover, both genders are involved in PMO activities as 171 respondents were male (63.8%), and 97 were female (36.2%), as shown in Figure 17.

2. Your Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	171	63.8	63.8	63.8
Female	97	36.2	36.2	100.0
Total	268	100.0	100.0	

2. Gender

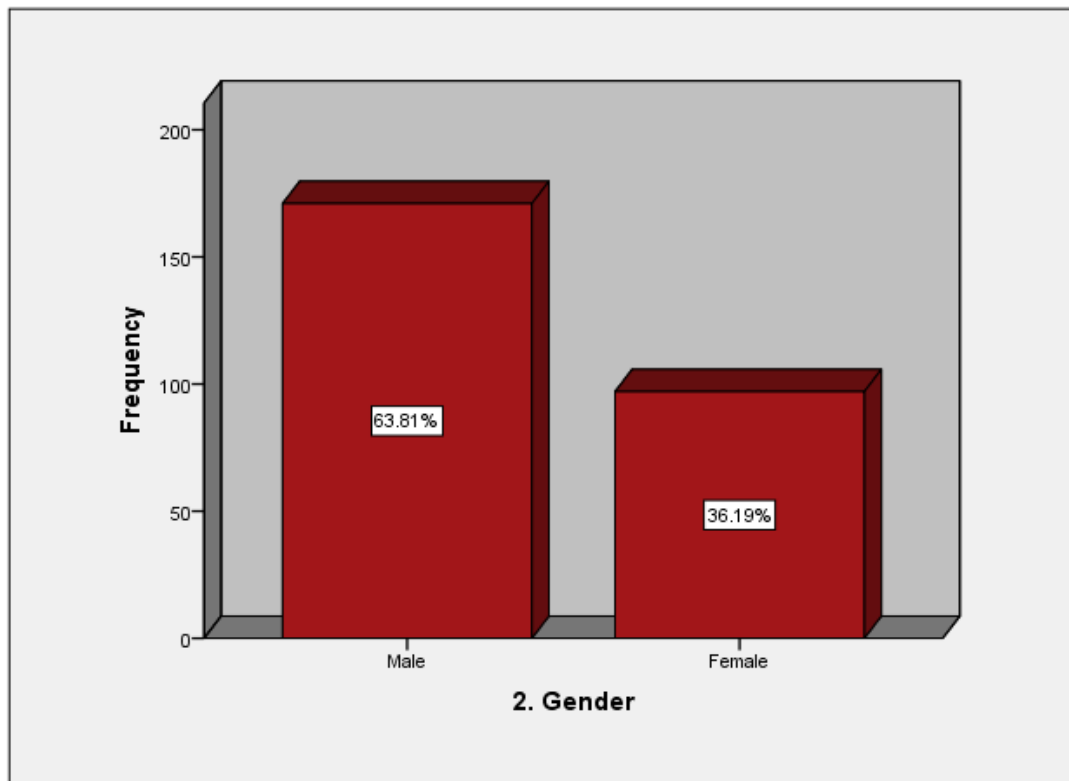


Figure 17: Respondents gender

Concerning the nationality of the PMO personnel, 168 respondents were Emirati (62.7%), 84 respondents were Arab (31.3%), whereas 16 respondents were from other countries (6.0%), as shown in Figure 18.

3. Your Nationality

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Emirati	168	62.7	62.7	62.7
Arab	84	31.3	31.3	94.0
Others	16	6.0	6.0	100.0
Total	268	100.0	100.0	

3. Nationality

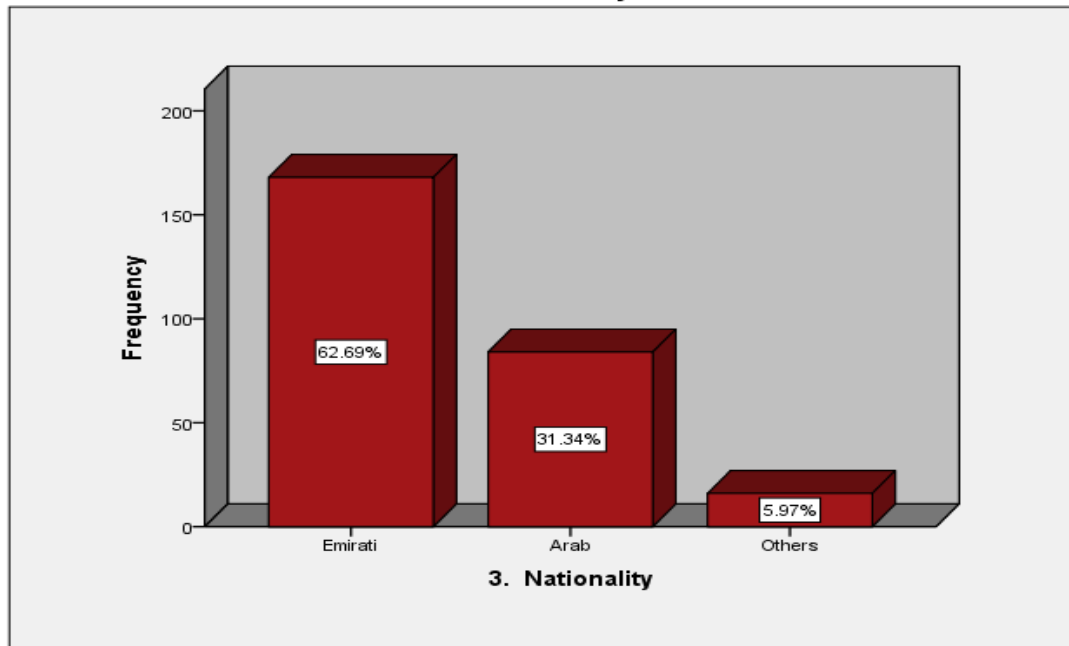


Figure 18: Respondents nationality

5.2.2. Respondents' Work Experiences

The participants were asked to indicate the individual role that best described the project(s), the years of experience with the current affiliated organization, and their project professional experience as they considered for this study. The individual's administrative position of the respondents revealed that 13 were Portfolio Managers (4.9%), 53 were Program Managers (19.8%), 65 were Project Managers (24.3%), 27 were Strategic Planning Managers (10.1%), 8 were Quality Assurance Managers (3.0%), 33 were Project Coordinators (12.3%), whereas 69 respondents were working in other project-related positions (25.7%), as shown in Figure 19.

4. One of the following is best describing your current position:

	Frequency	Percent	Valid Percent	Cumulative Percent
Portfolio Manager	13	4.9	4.9	4.9
Program Manager	53	19.8	19.8	24.6
Project Manager	65	24.3	24.3	48.9
Strategic Planning Manager	27	10.1	10.1	59.0
Quality Assurance Manager	8	3.0	3.0	61.9
Project Coordinator	33	12.3	12.3	74.3
Other (Please specify)	69	25.7	25.7	100.0
Total	268	100.0	100.0	

4. One of the following is best describing your current position:

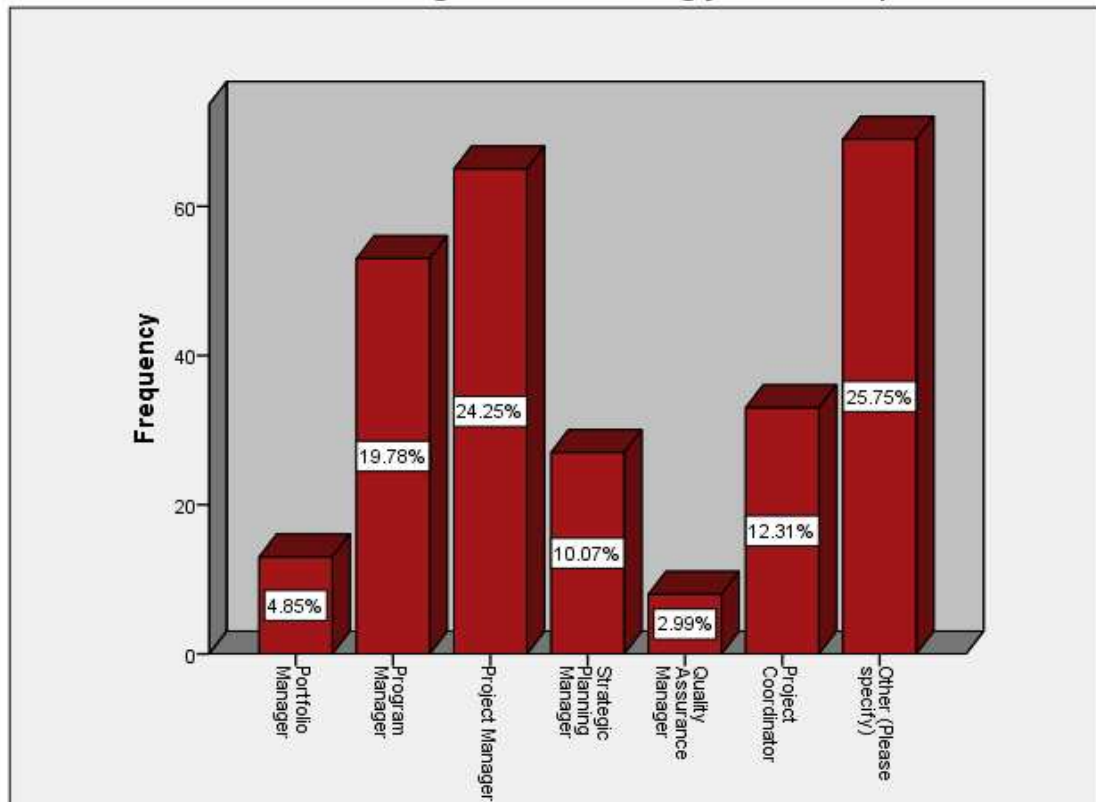


Figure 19: Respondents administrative positions

The current work of the respondents revealed a wide range in the number of years pertinent to full-time professional experience in their position at the current public organization. 89 respondents had less than five years of full-time work experience in their current position (33.2%), 128 respondents had 5-9 years in their

current position (47.8), 39 respondents had 10-14 years of full-time work experience with their current organization, whereas 12 respondents had more than 15 years in their current position, as shown in Figure 20.

5. Your work with this organization is:

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 5 years	89	33.2	33.2	33.2
5-9years	128	47.8	47.8	81.0
Valid 10- 14Years	39	14.6	14.6	95.5
15 years and more	12	04.5	04.5	100.0
Total	268	100.0	100.0	



Figure 20: Respondents full-time experience with current organization

On the other hand, the professional experience of the respondents in the project management related domains is also varied among the respondents. 87 respondents had less than 5 years of professional project experience (32.5%), 96 respondents had 5-9 years of professional project experience (35.8%), 62 respondents had 10-14 years

of professional project experience (23.1%), whereas 23 respondents had more than 15 years of professional project experience, as shown in Figure 21.

6. Your work experience in project management is:

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 5-years	87	32.5	32.5	32.5
5-9years	96	35.8	35.8	68.3
Valid 10 - 14Years	62	23.1	23.1	91.4
15 years and more	23	8.6	8.6	100.0
Total	268	100.0	100.0	

6. Your work experience in project management is:

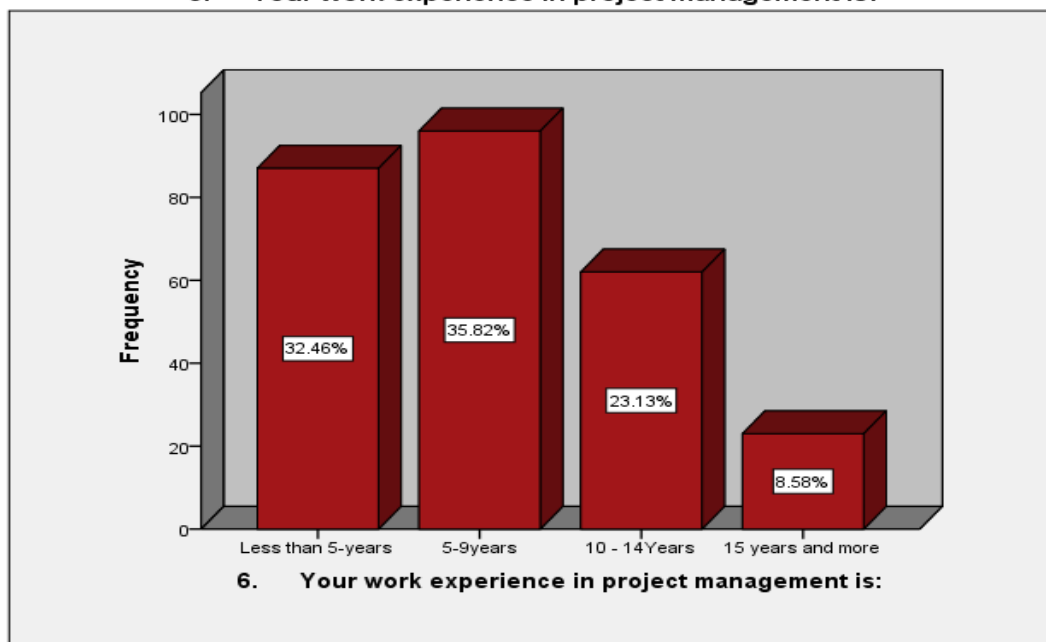


Figure 21: Respondents work PM experience in years

However, the average number of the project team members under the supervision of the project leaders varied greatly, which is ranging from less than 10 members to more than 20. 172 respondents supervised a teamwork of less than 10 members (64.2%), 36 respondents supervised a teamwork of 10-14 members (13.4%),

18 respondents supervised a teamwork of 15-19 members (6.7%), whereas 42 respondents supervised a teamwork of more than 20 members, as shown in Figure 22.

7. The average number of the team members under your supervision is:

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 10	172	64.2	64.2	64.2
10-14	36	13.4	13.4	77.6
Valid 15 - 19	18	6.7	6.7	84.3
20 and more	42	15.7	15.7	100.0
Total	268	100.0	100.0	

7. The average number of the team members under your supervision is:

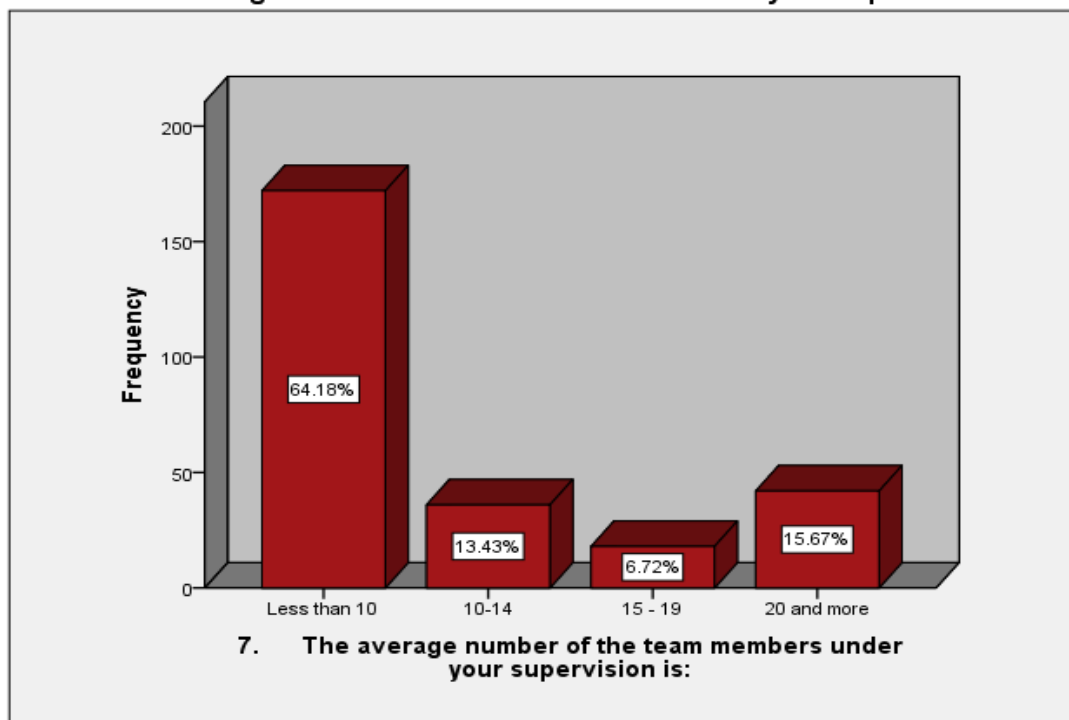


Figure 22: Number of teamwork members under respondent's supervision

The participants were also asked if they had any work experience in the PMO-related activities currently and/or before joining the current organizations. 172 respondents reported that they had PMO work experience (64.2%), whereas 96 respondents had not (35.8%), as shown in Figure 23.

8. Have you ever worked with the PMO, currently or previously?

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	172	64.2	64.2	64.2
Valid No	96	35.8	35.8	100.0
Total	268	100.0	100.0	

8. Have you ever worked with the PMO, currently or previously?

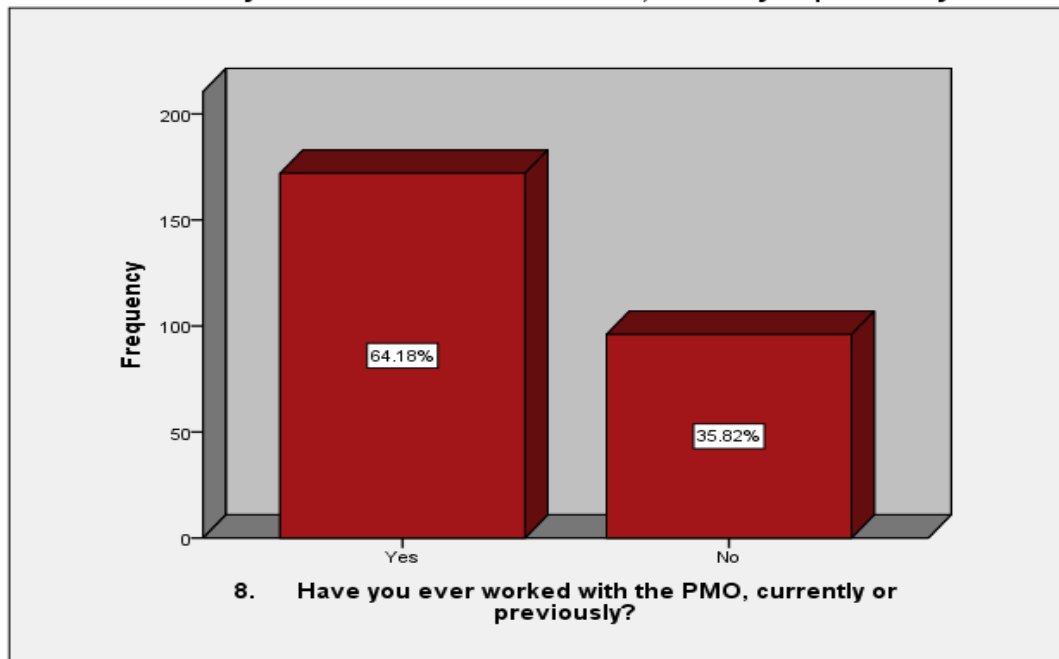


Figure 23: Respondents PMO work experience

5.2.3. PMO – Existence, Functions and Services

The participants were asked about existence of a PMO entity within their respective affiliated organizations. 253 respondents informed that their organizations hosted a PMO entity (94.4%), whereas 15 respondents reported no PMO is hosted by their organizations (5.6%), as shown in Figure 24.

9. Does your organization host a PMO?

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	253	94.4	94.4	94.4
Valid No	15	5.6	5.6	100.0
Total	268	100.0	100.0	

9. Does your organization host a PMO?

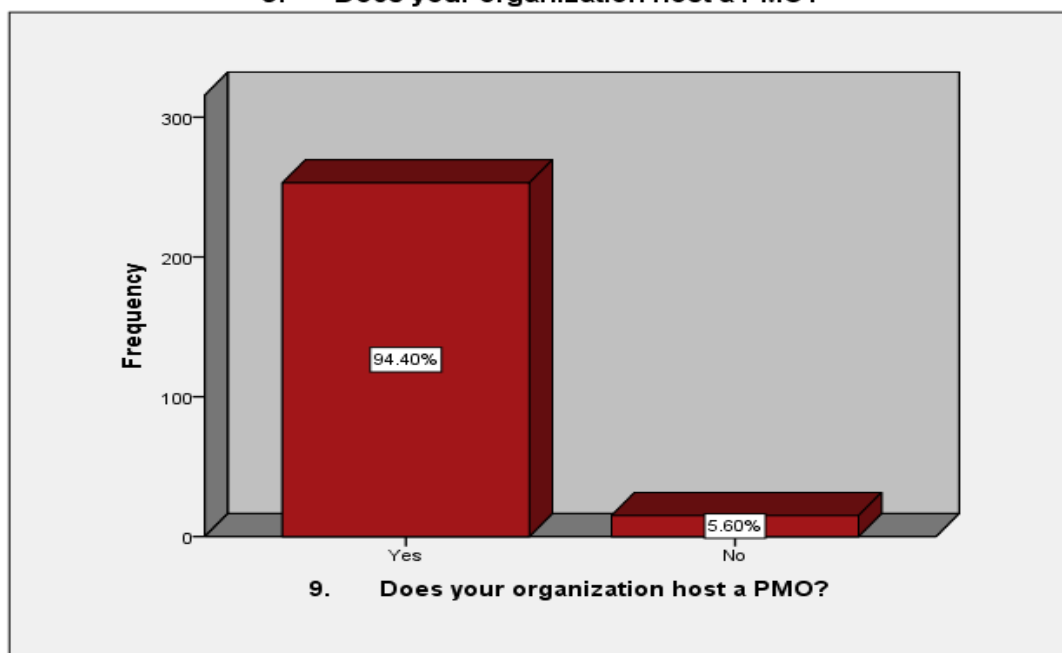


Figure 24: Existence of a PMO entity in the public organizations

Those whose organizations established a PMO entity asked thereafter to describe the actual functions of the existing PMO, and whether the PMO stands as individual entity or associated with a sector. The respondents reported the status of the PMO within the organization. 19 respondents indicated the existing PMO is adhered to Chief Executive Officer *CEO* (7.1%), 68 respondents reported the PMO is adhered to General Manager (25.4%), 52 respondents reported the PMO is adhered to Projects Sector (19.4%), 90 respondents reported the PMO is adhered to Strategic Planning Sector (33.6%), 24 respondents reported the PMO is an individual entity (9%),

whereas the analytic system reported also 15 participants whose organizations had no PMO to represent (5.6%). The descriptive data are shown in Figure 25.

10. If yes, under which sector or department is the PMO adhered?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid CEO	19	07.1	7.5	7.5
General Manager	68	25.4	26.9	34.4
Projects Sector	52	19.4	20.6	54.9
Strategic Planning Sector	90	33.6	35.6	90.5
Other (Please specify)	24	9.0	9.5	100.0
Total	253	94.4	100.0	
Missing System	15	5.6		
Total	268	100.0		

10. If yes, under which sector or department is the PMO adhered?

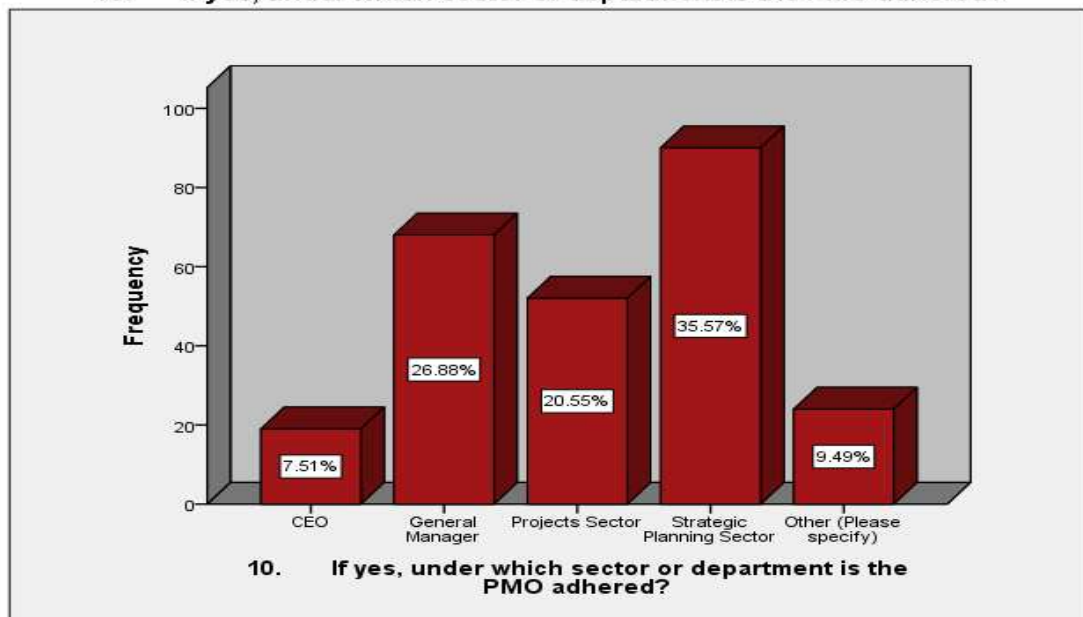


Figure 25: The PMO attachment status

5.3. Testing Reliability

The core question raised in this regards is that “Does the presence of the PMO enhance successful execution of the projects within the context organization’s proposed strategic plan?” Six criteria were proposed to measure the successful execution of

organization's strategic plan within the range not effective (1) to very effective (5), with midpoint neutral (3).

5.3.1. Reliability Test of Dependent Variable

A series of Cronbach alpha tests was performed to determine internal consistency on the 6 proposed performance criteria, along with each of the six sets of strategic plan execution. The Cronbach alpha for strategic planning execution criteria gave 0.954 to show an adequate consistency for the study as highlighted in Table 20.

Table 20: Cronbach alpha test for internal consistency of performance criteria

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.954	.954	6

However, the Cronbach alpha tests for each criterion belonging to the strategic plan execution including meeting scope of the strategic plan, developing stakeholders' trust and satisfaction, completed within the estimated cost, achieved with timeline, alignment of the initiative outcomes to organizations' objectives, and meeting community needs were found to be at 0.942, 0.947, 0.946, 0.946, 0.944, and 0.948, respectively. These results showed an adequate consistency for the study, as shown in Table 21.

Table 21: Cronbach alpha test for each criterion of strategic plan execution

Item-Total Statistics					
<i>Based on your work experience, kindly evaluate the effectiveness of each criterion that could be...</i>	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
13. Meeting scope of the strategic plan	18.27	27.628	.890	.806	.942
14. Developing stakeholders' trust and satisfaction	18.32	28.797	.844	.750	.947
15. Completed within the estimated cost	18.33	28.109	.850	.769	.946
16. Achieved with timeline	18.35	28.392	.850	.766	.946
17. Alignment of the initiative outcomes to organizations' objectives.	18.30	27.672	.872	.772	.944
18. Meeting community needs	18.39	28.921	.836	.726	.948

5.3.2. Reliability Test of Independent Variables

5.3.2.1. Strategic management

The Cronbach alpha test for strategic management variable was found to be at 0.949 to show an adequate consistency for the study as highlighted in Table 22.

Table 22: Cronbach alpha test for strategic management variable

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha based on Standardized Items	N of Items
.949	.950	4

Whereas, the Cronbach alpha tests for the sub-criteria including providing advisory services to the upper management, participating in strategic planning, ensuring effective benefits management, and ensuring effective networking and environmental scanning were found to be at 0.935, 0.932, 0.922, and 0.946,

respectively. These test results showed an adequate consistency for the study, as shown in Table 23.

Table 23: Cronbach alpha test for the strategic management sub-criteria

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q18_1	10.63	10.863	.877	.772	.935
Q18_2	10.59	10.865	.885	.797	.932
Q18_3	10.64	11.138	.917	.843	.922
Q18_4	10.72	12.223	.842	.721	.946

5.3.2.2. Development of project management competency and methodology

The Cronbach alpha test for development of project management competencies and methodologies variable was found to be at 0.968 to show an adequate consistency for the study as highlighted in Table 24.

Table 24: Cronbach alpha test for development competencies...variable

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.968	.968	5

Whereas, the Cronbach alpha tests for the variable's sub-criteria including developing and Implementing standard project management methodologies, promoting project management culture within organization, developing competency of project team including professional training, providing mentoring for project managers, providing a set of suitable tools as processes, procedures, templates, etc., were found to be at 0.958, 0.960, 0.960, 0.963, and 0.958, respectively. These test results showed an adequate consistency for the study, as shown in Table 25.

Table 25: Cronbach alpha test for the development of competencies... sub-criteria

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q19_1	14.34	21.724	.919	.864	.958
Q19_2	14.38	21.953	.907	.833	.960
Q19_3	14.37	21.903	.905	.825	.960
Q19_4	14.43	23.137	.887	.792	.963
Q19_5	14.27	22.281	.922	.860	.958

5.3.2.3. Monitoring and controlling project performance

The Cronbach alpha test for monitoring and controlling variable was found to be at 0.967 to show an adequate consistency for the study as highlighted in Table 26.

Table 26: Cronbach alpha test for monitoring and controlling ... variable

Reliability Statistics		
Cronbach's Alpha	Cronbach's alpha based on standardized items	N of Items
.967	.967	5

Whereas, the Cronbach alpha tests for the variable's sub-criteria including reporting project status to the top management, monitoring and controlling project performance, implementing and operating project information system (e.g., Primavera, PMIS, etc.), developing and maintaining a project scoreboard, supporting project governance functions etc., were found to be at 0.961, 0.957, 0.959, 0.957, and 0.961, respectively, these results got an adequate consistency, as seen in Table 27.

Table 27: Cronbach alpha test for the monitoring and controlling sub-criteria

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q20_1	14.48	19.696	.897	.831	.961
Q20_2	14.54	19.605	.920	.859	.957
Q20_3	14.66	19.927	.904	.824	.959
Q20_4	14.68	20.322	.919	.847	.957
Q20_5	14.71	20.902	.892	.808	.961

5.3.2.4. Promoting organizational learning

The Cronbach alpha test for promoting organizational learning variable was found to be at 0.962 to show an adequate consistency for the study as highlighted in Table 28.

Table 28: Cronbach alpha test for promoting organizational learning variable

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.962	.962	5

Whereas, the Cronbach alpha tests for the variable's sub-criteria including conducting post-project reviews, conducting project audits, establishing and managing database of lessons learned and document archives, implementing and managing database of project risks, evaluating PMO performance were found to be at 0.955, 0.950, 0.951, 0.952, and 0.955, respectively. These test results showed an adequate consistency for the study, as shown in Table 29.

Table 29: Cronbach alpha test for promoting organizational learning sub-criteria

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q21_1	13.93	18.710	.879	.802	.955
Q21_2	13.87	18.471	.906	.839	.950
Q21_3	13.84	18.799	.899	.821	.951
Q21_4	13.91	18.618	.896	.820	.952
Q21_5	13.86	18.706	.877	.776	.955

5.3.2.5. Multi-project management

The Cronbach alpha test for multi-project management variable was found to be at 0.955 to show an adequate consistency for the study, as highlighted in Table 30.

Table 30: Cronbach alpha test for multi-project management variable
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.955	.955	4

Whereas, the Cronbach alpha tests for the variable's sub-criteria including coordinating between running projects, identifying, selecting, and prioritizing new projects, managing one or more portfolios and programmes, allocating organization's resources between the running projects were found to be at 0.939, 0.939, 0.935, and 0.949, respectively. These test results showed an adequate consistency for the study, as shown in Table 31.

Table 31: Cronbach alpha tests for the multi-project management sub-criteria

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q22_1	10.49	10.558	.894	.804	.939
Q22_2	10.43	10.703	.896	.806	.939
Q22_3	10.57	10.485	.907	.825	.935
Q22_4	10.57	10.808	.861	.743	.949

5.3.2.6. Organizational structure and communication improvement

The Cronbach alpha test for organizational structure and communication improvement variable was found to be at 0.955 to show an adequate consistency for the study, as shown in Table 32.

Table 32: Cronbach alpha test for organisat'l structure & communication variable

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.953	.953	4

Whereas, the Cronbach alpha tests for the variable's sub-criteria including establishing PMO structure related to organization needs and objectives, strengthening communication with projects' stakeholders, updating on the spot the project information correspondences, and assisting project continuity in transfer technology and innovative methods were found to be at 0.942, 0.939, 0.936, and 0.937, respectively. These test results showed an adequate consistency for the study, as shown in Table 33.

Table 33: Cronbach alpha tests for the organizational structure... sub-criteria

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q23_1	10.82	10.834	.876	.771	.942
Q23_2	10.76	11.109	.882	.783	.939
Q23_3	10.84	11.186	.896	.813	.936
Q23_4	10.85	11.131	.890	.804	.937

5.3.2.7. Project value sustainability

The Cronbach alpha test for project value sustainability variable was found to be at 0.963 to show an adequate consistency for the study, as highlighted in Table 34.

Table 34: Cronbach alpha test for project value sustainability variable

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.963	.963	3

Whereas, the Cronbach alpha tests for the variable's sub-criteria including managing projects for maximum values delivery, assuring projects' outcomes to be with social values of the community needs, delivering sustained values to organization were found to be at 0.951, 0.942, and 0.943, respectively. The test results showed an adequate consistency for the study, as shown in Table 35.

Table 35: Cronbach alpha tests for the project value sustainability sub-criteria

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q24_1	6.92	5.667	.914	.835	.951
Q24_2	6.97	5.454	.925	.857	.942
Q24_3	6.93	5.382	.924	.855	.943

5.4. Validity Test

Validity is arguably the most important criteria for the quality of a reliability test. The term validity refers to the extent to which a test could precisely measure what it is supposed to be measured. Therefore, many methods are being used to estimate the validity of a test including content validity, concurrent validity, and predictive validity.

In this study, prior to extracting the factors, several tests should be used to assess the suitability of the respondent data for factor analysis. These tests include Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity, communalities, the total variance explained and rotated component matrix was incorporated to confirm validity (Williams et al., 2010).

The KMO measure varies between 0 and 1, and values closer to 1 are better and the value of 0.6 is a suggested minimum. The generated value of KMO measure in this study was 0.975 to represent a great score of the test. Moreover, for the 30 PMO functions, the communalities ranged between 0.858 and 0.929, with nine functions having greater than 0.90, as shown Table 36.

Table 36: KMO and Bartlett's Test (*SPSS output*)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.975
	Approx. Chi-Square	11727.265
Bartlett's Test of Sphericity	Df	435
	Sig.	.000

Communalities

	Initial	Extraction
Q18_1	1.000	.867
Q18_2	1.000	.897
Q18_3	1.000	.914
Q18_4	1.000	.874
Q19_1	1.000	.900
Q19_2	1.000	.903
Q19_3	1.000	.891
Q19_4	1.000	.858
Q19_5	1.000	.906
Q20_1	1.000	.898
Q20_2	1.000	.906
Q20_3	1.000	.882
Q20_4	1.000	.916
Q20_5	1.000	.868
Q21_1	1.000	.868
Q21_2	1.000	.884
Q21_3	1.000	.886
Q21_4	1.000	.889
Q21_5	1.000	.858
Q22_1	1.000	.890
Q22_2	1.000	.899
Q22_3	1.000	.914
Q22_4	1.000	.895
Q23_1	1.000	.870
Q23_2	1.000	.878
Q23_3	1.000	.891
Q23_4	1.000	.887
Q24_1	1.000	.915
Q24_2	1.000	.929
Q24_3	1.000	.918

Extraction Method: Principal
Component Analysis

On the other hand, Table 37 lists the cumulative percentages of the variance that were accounted by the current and preceding factors. For instance, the 7th row in the mentioned Table shows a cumulative value of 89.17%, which indicates that the first-seven factors accounting collectively for 89.17% of the total variance.

Table 37: Cumulative percentages of the total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	22.116	73.722	73.722	22.116	73.722	73.722	5.209	17.363	17.363
2	1.172	3.906	77.627	1.172	3.906	77.627	4.799	15.998	33.361
3	1.021	3.403	81.031	1.021	3.403	81.031	3.939	13.132	46.492
4	.780	2.599	83.629	.780	2.599	83.629	3.932	13.106	59.598
5	.702	2.341	85.970	.702	2.341	85.970	3.751	12.505	72.103
6	.552	1.841	87.812	.552	1.841	87.812	3.150	10.498	82.601
7	.408	1.360	89.172	.408	1.360	89.172	1.971	6.571	89.172
8	.281	.937	90.110						
9	.244	.815	90.924						
10	.238	.792	91.716						
11	.216	.719	92.435						
12	.190	.633	93.068						
13	.181	.604	93.672						
14	.172	.574	94.246						
15	.160	.534	94.780						
16	.153	.511	95.291						
17	.148	.493	95.784						
18	.142	.472	96.256						
19	.129	.428	96.685						
20	.122	.405	97.090						
21	.117	.390	97.479						
22	.110	.367	97.847						
23	.103	.342	98.189						
24	.098	.328	98.516						
25	.089	.295	98.812						
26	.084	.281	99.092						
27	.078	.260	99.352						
28	.074	.246	99.599						
29	.066	.222	99.820						
30	.054	.180	100.000						

Whereas, Table 38 shows the rotated factor loadings (factor pattern matrix), which represent both how the variables are weighted for each factor, but also the

correlation between the variables and the factor. Because these are correlations, possible values range from -1 to +1. On the /format subcommand, we used the option blank (.40), which tells SPSS not to print any of the correlations that are 0.4 or less. This makes the output easier to read by removing the clutter of low correlations that are probably not meaningful anyway.

Table 38: Rotated factor loadings (Factor Pattern Matrix)

	Component						
	1	2	3	4	5	6	7
Q18_1			.636				
Q18_2			.736				
Q18_3			.714				
Q18_4			.731				
Q19_1		.685					
Q19_2		.762					
Q19_3		.727					
Q19_4		.653					
Q19_5		.665					
Q20_1					.650		
Q20_2					.637		
Q20_3					.616		
Q20_4					.695		
Q20_5					.586		
Q21_1	.663						
Q21_2	.736						
Q21_3	.764						
Q21_4	.760						
Q21_5	.717						
Q22_1				.689			
Q22_2				.685			
Q22_3				.741			
Q22_4				.672		.406	
Q23_1		.428					.475
Q23_2							.536
Q23_3							.571
Q23_4						.457	.512
Q24_1						.649	
Q24_2						.705	
Q24_3						.641	

5.5. Testing Modelling

5.5.1. Multiple Regression Coefficients – R and β

Statistical analysis with multiple regression analysis (MRA) technique provides a means of assessing objectively the potential magnitude and direction of relationships of each independent variable (predictor) to its outcome variable (Tabachnick & Fidell, 2007). Therefore, this statistical technique is a powerful tool being used to determine which-of-which independent variables could predict the variance of dependent variables that selected for developing a research framework (Hair, 2006).

The interpretation of the multiple regression analysis (MRA), however, reflects the understanding of the multiple Pearson's product moment correlation coefficient (R) whose value ranges from (0) to (1). The value (0) means that there is no a linear relationship existing between predicted scores (independent variable) and criterion scores (dependent variable). While a value of (1) implies the linear relationship of the independent variables could perfectly predict the dependent variable. Thus, the generated values ranging between (0) and (1) indicate a less than perfect linear relationship between predicted and criterion scores (Hair, 2006).

However, R^2 could be adjusted for correcting the overestimated value (inflated) of the target sample population (Hair, 2006; Tabachnick & Fidell, 2007). Therefore, the adjusted R^2 values reported in this section indicating the degree (in percentage) to which particular constructs/factors were predicted and explained by others prior to conducting a comparison of the prediction degree between the constructs/factors. Both standardised and unstandardized regression coefficients are also reported for the significant regression models.

The standardised regression coefficient (β) is the coefficient resulted from the standardisation of the collected data; it eliminates the problems dealing with different units of measurement. Thus, they reflected the relative impact on the PMO role of a change in one standard deviation in either variable. In other words, based on the value of the β coefficient, the predicting power of independent variables within a multiple regression model could be compared, i.e., the larger the β coefficient value, then the larger effect the predictor had in predicting (Hair, 2006). β coefficient is used herein to construct a regression equation for calculating the predicted values for each variable, as well as to probe the expected change in the dependent variable for each unit change in the independent ones.

5.5.2. Multi-Regression Analysis of all Variables

The proposed variables (both dependent and independent) were subject to survey and embedded in Part IV of the online questionnaire. The interrelationships between the proposed PMO roles and strategic plan execution could be revealed by answering the research question *“Is there any link between the implementation of the PMO and execution of the strategic plan of the project-oriented organization in the public sector?”* within the context of the UAE business environment, in particular.

A MRA was conducted to determine whether the PMO roles were statistically significant to function as predictors of strategic planning execution; in other words, to identify the potential predicting power of the PMO roles, as independent variables, on the strategic planning execution (SPE) as dependent variable. The MRA of the seven-proposed PMO roles revealed that the constructs predicted and explained 72.9% of variance of SPE construct with adjusted R^2 values significant at the 0.05 level, as presented in Table 39.

Table 39: MRA of the seven-proposed PMO roles

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.858 ^a	.736	.729	.55058

a. Predictors: (Constant), PV, SM, Learning, MPM, PMC, MC, OS

b. Dependent Variable: EXECUTION

Based on significance of each PMO role as interpreted from the generated results of the regression coefficients, the PMO role of strategic management (SM) was found to have a $t = 5.88$, $\beta = 0.374$, $p < 0.001$; thus, this predictor was significant and the alternative hypothesis (H1_a) was supported. The PMO role of project management competencies and methodology (PMCM) was found to have $t = 3.294$, $\beta = 0.234$, $p < 0.001$; thus, the predictor was significant and the alternative hypothesis (H2_a) was supported. The PMO role of monitoring and controlling performance (MCP) was found to have $t = 2.087$, $\beta = 0.158$, $p = 0.038$. This predictor was significant and the alternative hypothesis (H3_a) is supported.

The regression coefficient of the PMO role of organizational learning promotion (OLP) was found to have values of $t = -0.190$, $\beta = 0.012$, and $p = 0.849$; this means that, this predictor was not significant and the null hypothesis (H4₀) could not be rejected. The PMO role of multi-project management (MPM) was found to have values as $t = 0.749$, $\beta = 0.050$, and $p = 0.455$; this means that this predictor was not significant and the null hypothesis (H5₀) could not be rejected. The PMO role of organization structure and communication (OSC) was found to have values of $t = 1.978$, $\beta = 0.163$, and $p = 0.049$.

So, this predictor was significant and the alternative hypothesis (H6_a) was supported. Whereas, the PMO role of project value sustainability (PVS) was found to

have these values as $t = -0.651$, $\beta = -.047$, and $p = 0.515$; this means that this predictor is not significant and the null hypothesis (H_{70}) could not be rejected. The generated results of regression coefficient for the seven proposed PMO roles (predictors) are presented in Table 40, whereas the generated results from ANOVA analysis are presented in Table 41.

Table 40: Regression coefficient for the seven proposed PMO roles (predictors)

Coefficients ^a							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	β	Std. Error	β			Tolerance	VIF
(Constant)	.546	.124		4.390	.000		
SM	.357	.061	.374	5.881	.000	.250	3.994
PMCM	.211	.064	.234	3.294	.001	.200	4.988
1 MCP	.150	.072	.158	2.087	.038	.177	5.658
OLP	-.012	.064	-.012	-.190	.849	.237	4.224
MPM	.049	.065	.050	.749	.455	.227	4.399
OSC	.157	.079	.163	1.978	.049	.149	6.721
PVS	-.043	.066	-.047	-.651	.515	.196	5.113

a. Dependent Variable: EXECUTION

Table 41: ANOVA test of all predictors

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	220.183	7	31.455	103.762	.000 ^b
1 Residual	78.817	260	.303		
Total	299.000	267			

a. Dependent Variable: EXECUTION

b. Predictors: (Constant), PV, SM, Learning, MPM, PMC, MC, OS

The variance inflation factors and tolerance levels did not indicate multicollinearity (i.e., independent variables in a regression equation are not correlated) in the conceptual model of this study. This might indicate that the correlations between the independent variables did not have an undue impact on the

model's standard error. A plot of standardized residuals indicated a linear model to reveal some evidence of model having different variances (i.e., heteroscedasticity), as represented in Figure 26.

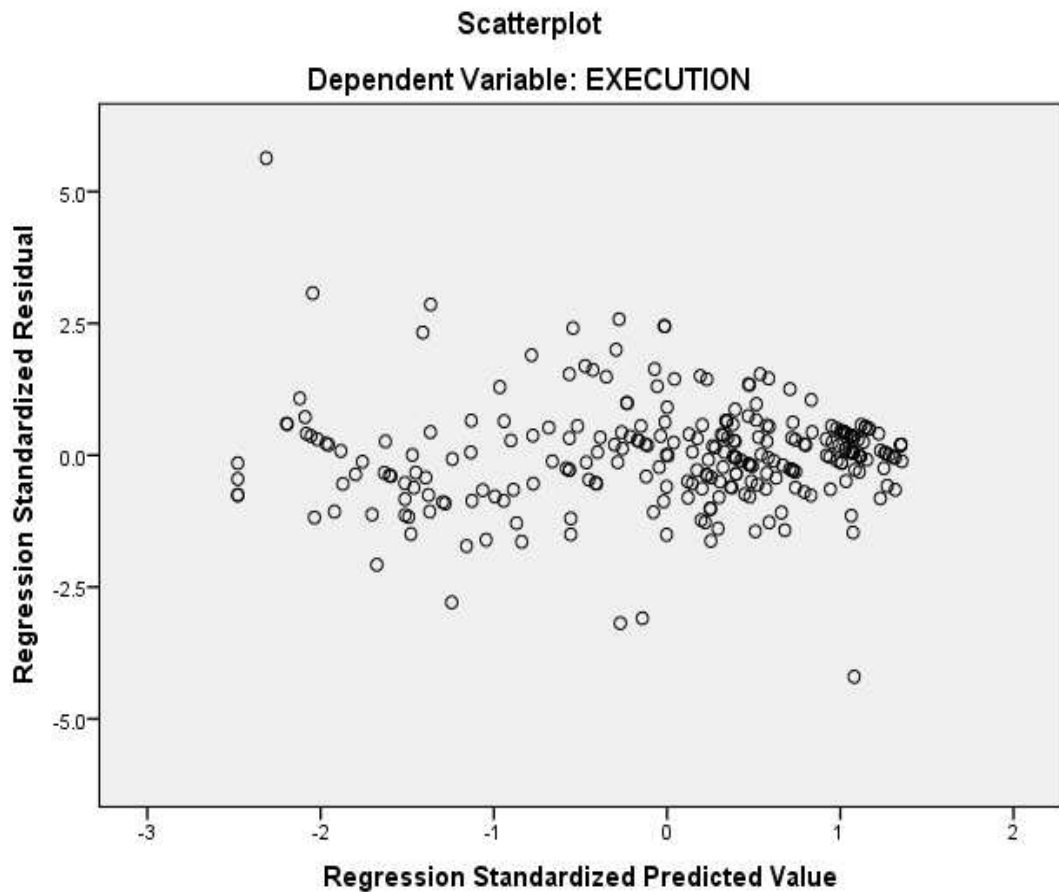


Figure 26: A plot of standardized residuals of predictors with criterion

The results have shown that three independent variables were found to be not significant according to the generated result from the multi-regression test. However, the next step would be doing the simple regression test for each independent variable of the PMO roles and the dependent variable (SPE).

5.5.3. Simple Regression Analysis for the Predicators with Criterion

5.5.3.1. PMO role of SM with SPE

The generated results from the simple regression analysis (SRA) for the PMO role of strategic management (SM) revealed that this construct predicted and explained at 66.3% of variance of SPE construct with adjusted R^2 significant value at the 0.05 level. This finding suggests as this role of strategic management was positively related to SPE, as well as its association was quite strong to support statistically the significant predicting power of the SM upon the variance of SPE, as illustrated in Table 42, whereas, the ANOVA analysis results are shown in Table 43.

Table 42: SRA for the PMO role of strategic management in SPE

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.815 ^a	.665	.663	.61400

a. Predictors: (Constant), SM

b. Dependent Variable: EXECUTION

Table 43: ANOVA test for SM predictor

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	198.718	1	198.718	527.109	.000 ^b
Residual	100.281	266	.377		
Total	299.000	267			

a. Dependent Variable: EXECUTION

b. Predictors: (Constant), SM

The regression coefficient for the PMO role of SM predictor was found to have R value of $t = 22.9$, $\beta = 0.815$, and $p < 0.001$. This indicated that the predictor is significant, whereas the alternative hypothesis (H_{1a}) is strongly supported (Menard, 1995). Yet, multicollinearity was absent from the regression model, where the tolerance value was 1.000 (> 0.1), and the VIF was 1.000 (< 10.00), as presented in Table 44.

Table 44: Regression coefficient R for SM with SPE
Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	β	Std. Error	β			Tolerance	VIF
1 (Constant)	.907	.126		7.207	.000		
SM	.777	.034	.815	22.959	.000	1.000	1.000

a. Dependent Variable: EXECUTION

The variance inflation factors and tolerance levels did not indicate multicollinearity in the proposed model. This indicates that the correlations among the independent variables did not have an undue impact on the model's standard error. Plot of standardized residuals indicated a linear model; however, the plot also revealed some evidence of model heteroscedasticity, as illustrated in Figure 27.

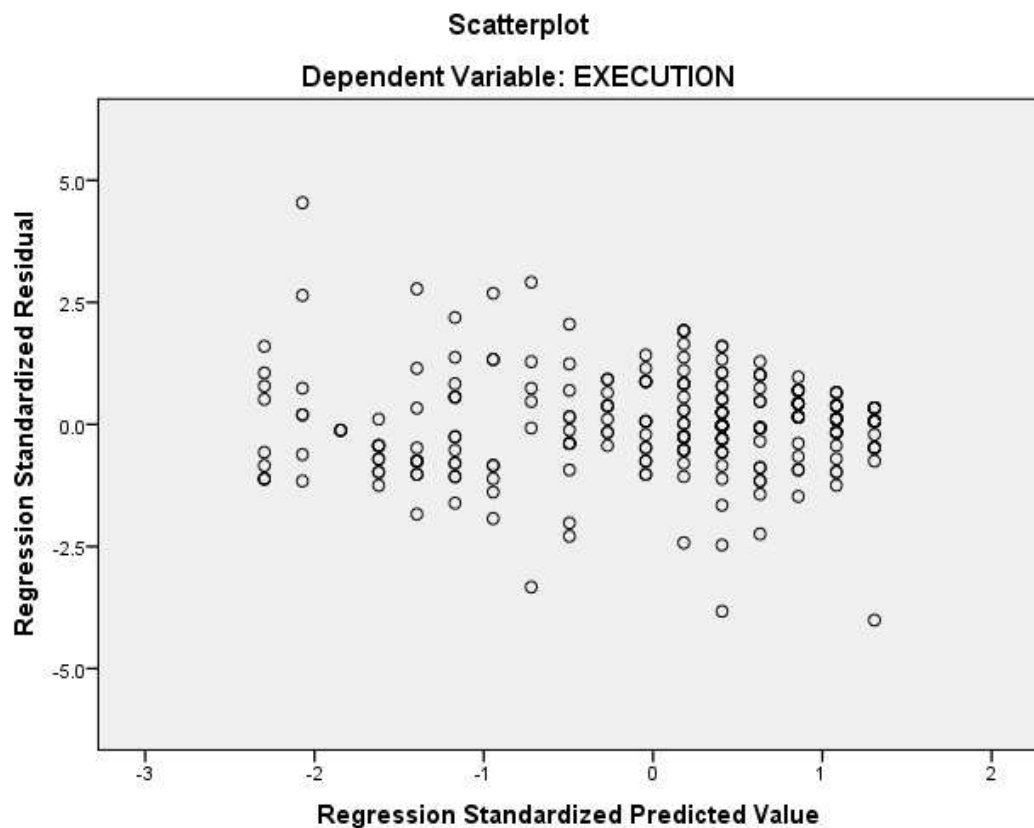


Figure 27: Plot of standardized residuals of SM with SPE

5.5.3.2. SRA for PMO role of PMCM with SPE

The generated results from the SRA for the project management competency and methodology (PMCM) role revealed that this construct predicted and explained at 63.8% of variance of SPE construct with adjusted R^2 significant value at the 0.05 level. The findings suggest as well this role was positively related to SPE, and the association was strong enough to support statistically a significant predicting power of the PMCM upon the variance of SPE, as presented in Table 45, whereas ANOVA test analysis is presented in Table 46.

Table 45: SRA for PMO role of PMCM with SPE

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.800 ^a	.640	.638	.63651

a. Predictors: (Constant), PMC

b. Dependent Variable: EXECUTION

Table 46: ANOVA test for PMCM predictor

ANOVA ^a					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	191.232	1	191.232	472.016	.000 ^b
1 Residual	107.767	266	.405		
Total	299.000	267			

a. Dependent Variable: EXECUTION

b. Predictors: (Constant), PMC

The regression coefficient R for the PMO role of the PMCM predictor was found to have values of $t = 21.7$, $\beta = 0.8$, and $p < 0.001$. This predictor is significant and the alternative hypothesis (H_{2a}) is strongly supported. In addition, multicollinearity was absent from the regression model, whereas the tolerance value was found to be 1.000 (> 0.1) and the VIF was found to be 1.000 (< 10.00), as shown in Table 47.

Table 47 : Regression coefficient R for PMCM with SPE**Coefficients^a**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	β	Std. Error	β			Tolerance	VIF
1	(Constant)	1.076	.125	8.583	.000		
	PMC	.721	.033	21.726	.000	1.000	1.000

a. Dependent Variable: EXECUTION

The variance inflation factors and tolerance levels did not indicate multicollinearity in the proposed model; yet, it indicates that the correlations among the independent variables did not have an undue impact on the model's standard error. A plot of standardized residuals indicated a linear model; however, the plot also revealed some evidence of model heteroscedasticity, as illustrated in Figure 28.

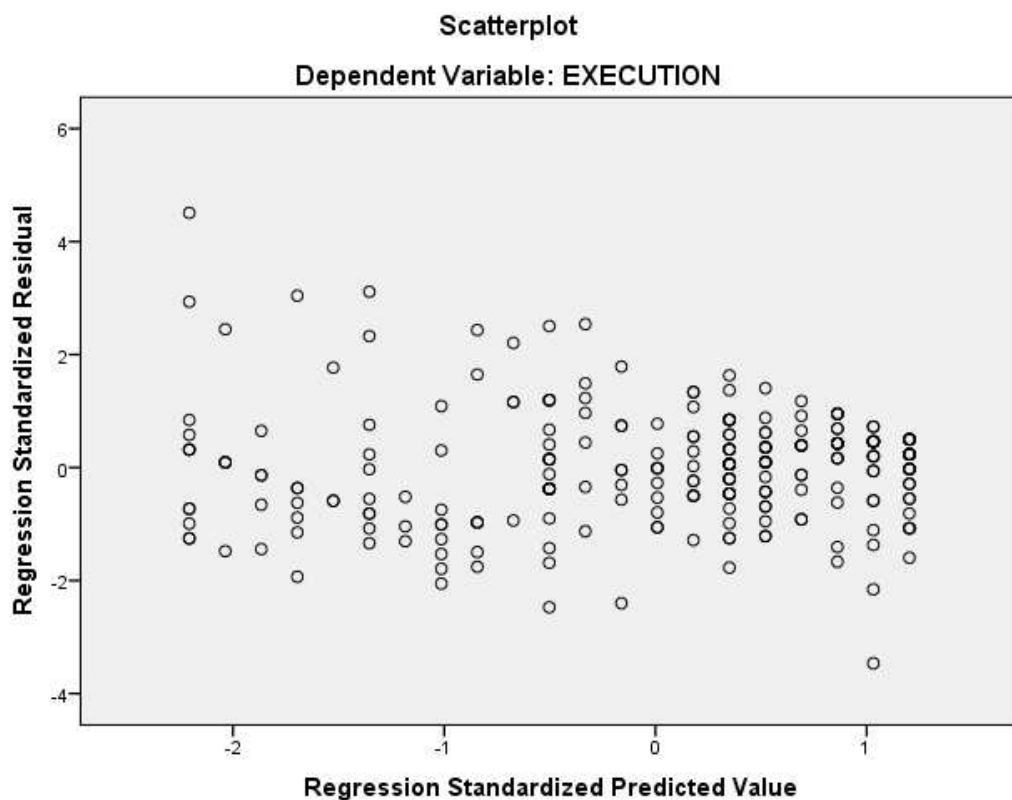


Figure 28: Plot of standardized residuals of PMCM with SPE

5.5.3.3. SRA for PMO role of MCP with SPE

The simple regression analysis R for the PMO role of the monitoring and controlling performance (MCP) revealed that this construct predicted and explained at 62.1% of variance of SPE construct with adjusted R^2 significant value at the 0.05 level. The findings suggest that this role was positively related to SPE; with strong association would be enough to support statistically a significant predicting power of the monitoring and controlling upon the variance of SPE, as presented in Table 48, whereas ANOVA test analysis for the predictor is presented in Table 49.

Table 48: SRA for the PMO role of the MCP

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.789 ^a	.623	.621	.65107

a. Predictors: (Constant), MC

b. Dependent Variable: EXECUTION

Table 49: ANOVA test analysis for MCP predictor

ANOVA ^a					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	186.243	1	186.243	439.359	.000 ^b
1 Residual	112.757	266	.424		
Total	299.000	267			

a. Dependent Variable: EXECUTION

b. Predictors: (Constant), MC

The regression coefficient R for the PMO role of the MCP predictor was found to have values of $t = 20.96$, $\beta = 0.789$, and $p < 0.001$. This predictor is significant, whereas the alternative hypothesis (H_{3a}) is strongly supported. In addition, multicollinearity was absent from the regression model, where the tolerance value was 1.000 (> 0.1) and the VIF was 1.000 (< 10.00), the R values are presented in Table 50.

Table 50: Regression coefficient R for MCP predictor
Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	β	Std. Error	β			Tolerance	VIF
1 (Constant)	.931	.136		6.826	.000		
PMC	.748	.036	.789	20.961	.000	1.000	1.000

a. Dependent Variable: EXECUTION

The variance inflation factors and tolerance levels did not indicate multicollinearity in the proposed model. This indicates that the correlations among the independent variables did not have an undue impact on the model's standard error. A plot of standardized residuals indicated a linear model; however, the plot also revealed some evidence of model heteroscedasticity, as presented in the Figure 29.

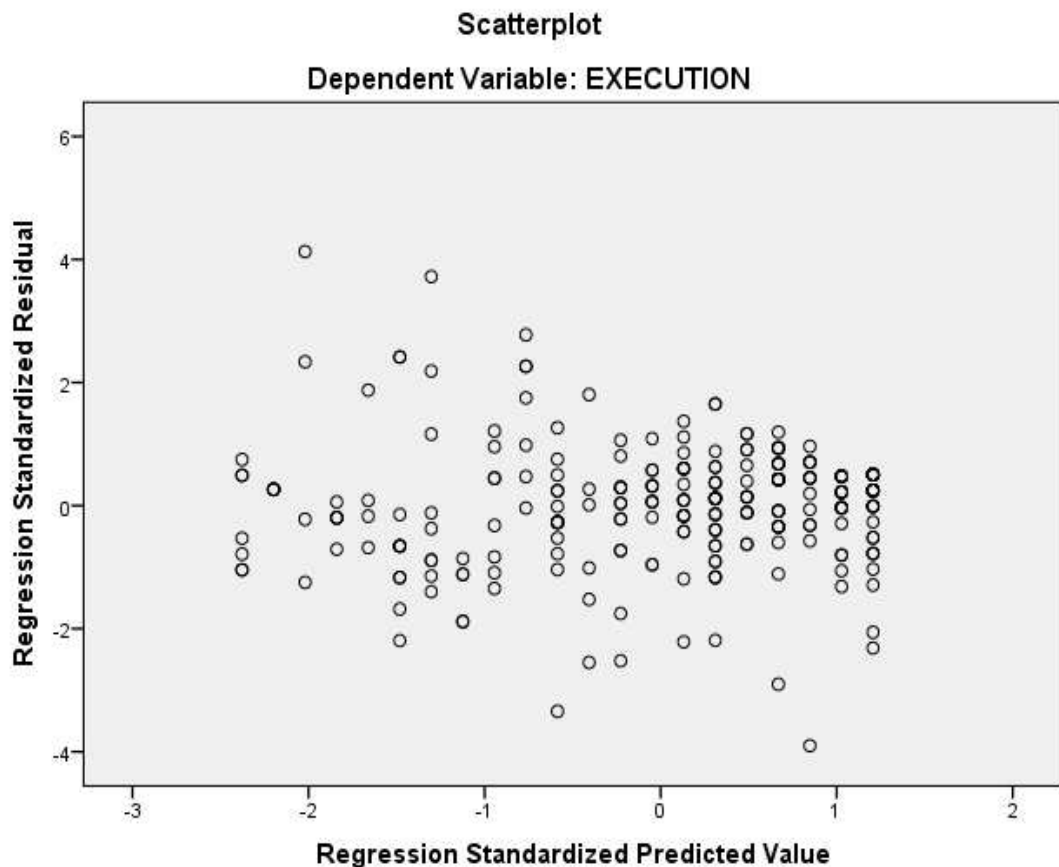


Figure 29: Plot of standardized residuals for MCP predictor

5.5.3.4. SRA for PMO role of OLP with SPE

Simple regression analysis R for the PMO role of the organizational learning promotion (OLP) revealed that this construct predicted and explained at 51% of variance of SPE construct with adjusted R^2 significant value at the 0.05 level. The findings suggest that this role was positively related to SPE, with strong association enough to support statistically the significant predicting power of the monitoring and controlling upon the variance of SPE, as presented in Table 51, whereas ANOVA test analysis for the predictor is presented in Table 52.

Table 51: SRA for the PMO role of the OLP

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.716 ^a	.512	.510	.74056

Table 52: ANOVA test analysis for OLP predictor

ANOVA ^a					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	153.118	1	153.118	153.118	.000 ^b
Residual	145.882	266	.548	9.193	
Total	299.000	267			

a. Dependent Variable: EXECUTION

b. Predictors: (Constant), OLP

The regression coefficient R for the PMO role of the MCP predictor was found to have values of $t = 16.7$, $\beta = 0.716$, and $p < 0.001$. This predictor is significant, whereas the alternative hypothesis (H_{4a}) is strongly supported. However, when the multi-regression was run in the previous section, the predictor was not significant where the null hypothesis (H_{4_0}) could not be rejected. This result is an indication that despite four predictors together accounted for a significant amount of variation in the criterion, the predictor of promoting learning (H_{4a}) on its own is a significant

predictor. In addition, multicollinearity was absent from the regression model, where the tolerance value was 1.000 (> 0.1) and the VIF was 1.000 (< 10.00), the R values are presented in Table 53.

Table 53: Regression coefficient R for OLP predictor

Coefficients ^a								
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		
	B	Std. Error	β			Tolerance	VIF	
1	(Constant)	1.220	.153		7.964	.000		
	OLP	.705	.042	.716	16.709	.000	1.000	1.000

a. Dependent Variable: EXECUTION

The variance inflation factors and tolerance levels did not indicate multicollinearity in the model. This indicates that the correlations among the dependent variables did not have an undue impact on the model's standard error. A plot of standardized residuals indicated a linear model; however, the plot also revealed some evidence of model heteroscedasticity, as presented in Figure 30.

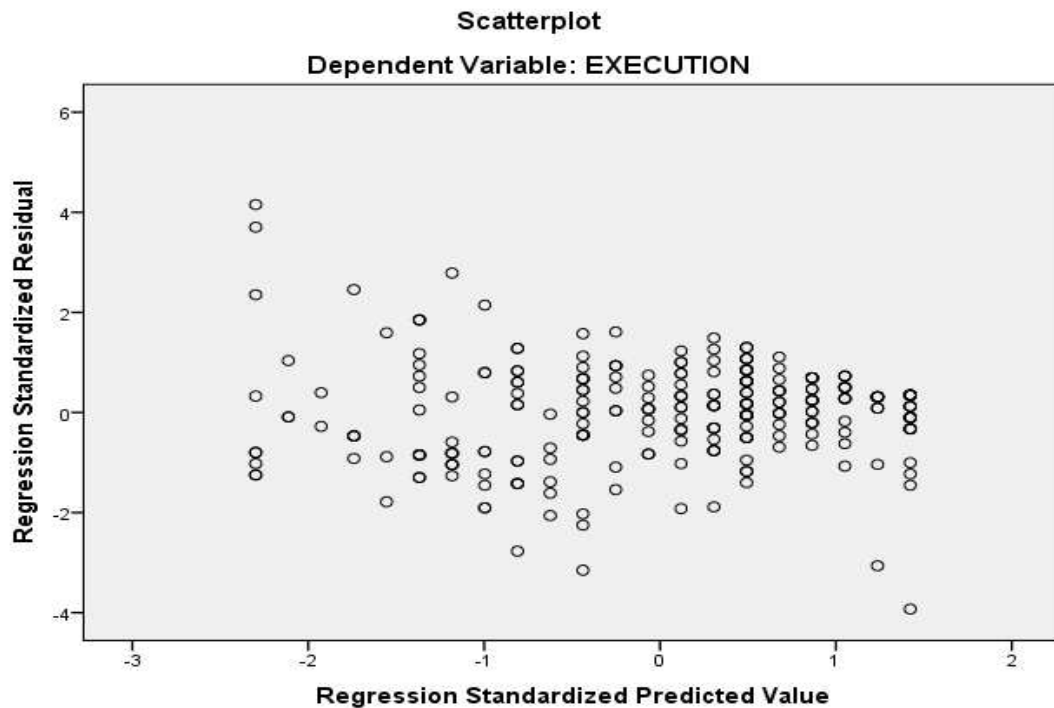


Figure 30: Plot of standardized residuals for OLP predictor

5.5.3.5. SRA for PMO role of MPM predictor with SPE

Simple regression analysis R for the PMO role of the multi-project management (MPM) revealed that this construct predicted and explained at 54.2% of variance of SPE construct with adjusted R^2 significant value at the 0.05 level. The findings suggest that this role was positively related to SPE, with strong association enough to support statistically the significant predicting power of the monitoring and controlling upon the variance of SPE, as presented in Table 54, whereas ANOVA test analysis for the predictor is presented in Table 55.

Table 54: SRA for the PMO role of the MPM predictor

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.737 ^a	.543	.542	.71646

a. Predictors: (Constant), MPM

b. Dependent Variable: EXECUTION

Table 55: ANOVA test analysis for the MPM predictor

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	162.458	1	162.458	316.487	.000 ^b
Residual	136.542	266	.513		
Total	299.000	267			

a. Dependent Variable: EXECUTION

b. Predictors: (Constant), MPM

The regression coefficient R for the PMO role of the MPM predictor was found to have values of $t = 17.7$, $\beta = 0.737$, and $p < 0.001$. This predictor is significant, whereas the alternative hypothesis ($H5_a$) is strongly supported. However, when the multi-regression was run in the previous section, the predictor was not significant where the null hypothesis ($H5_0$) could not be rejected. This result is an indication that despite four predictors together accounted for a significant amount of variation in the criterion, the predictor of promoting learning ($H5_a$) on its own is a significant

predictor. In addition, multicollinearity was absent from the regression model, where the tolerance value was 1.000 (> 0.1) and the VIF was 1.000 (< 10.00), the R values are presented in Table 56.

Table 56: Regression coefficient R for OLP predictor

Coefficients ^a							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	β			Tolerance	VIF
1 (Constant)	1.132	.149		7.600	.000		
MPM	.723	.041	.737	17.790	.000	1.000	1.000

a. Dependent variable: EXECUTION

The variance inflation factors and tolerance levels did not indicate multicollinearity in the model. This indicates that the correlations among the dependent variables did not have an undue impact on the model's standard error. A plot of standardized residuals indicated a linear model; however, the plot also revealed some evidence of model heteroscedasticity, as presented in Figure 31.

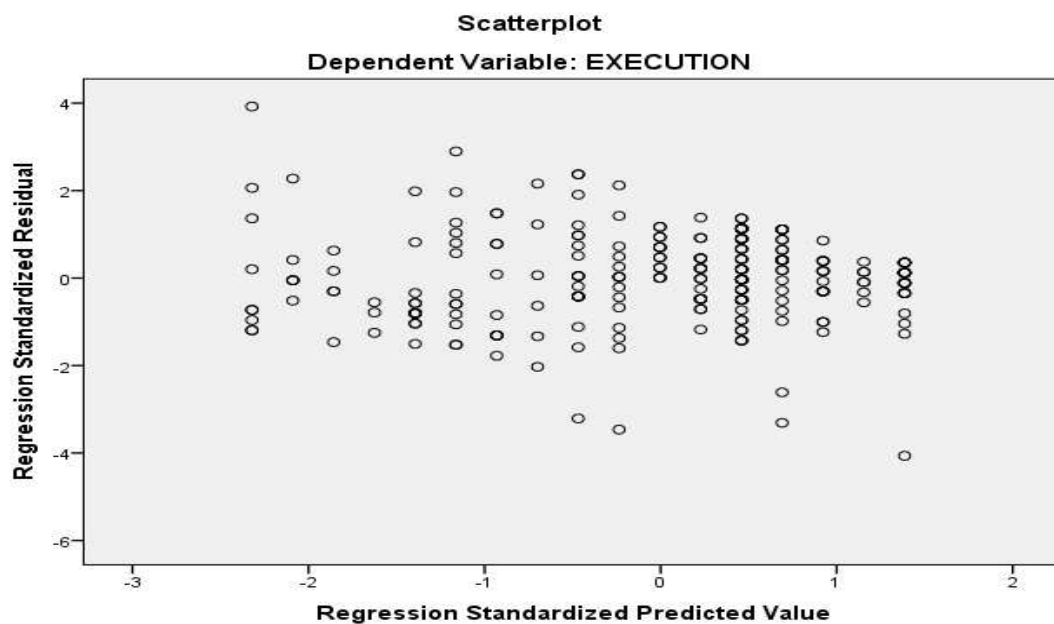


Figure 31: Plot of standardized residuals for MPM predictor

5.5.3.6. SRA for the PMO role of OSC with SPE

Simple regression analysis R for the PMO role of the organizational structure and communication (MPM) revealed that this construct predicted and explained at 59% of variance of SPE construct with adjusted R^2 significant value at the 0.05 level. The findings suggest that this role was positively related to SPE, with strong association enough to support statistically the significant predicting power of the monitoring and controlling upon the variance of SPE, as presented in Table 57, whereas ANOVA test analysis for the predictor is presented in Table 58.

Table 57: SRA for the PMO role of the OSC predictor

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.769 ^a	.591	.590	.67768

a. Predictors: (Constant), OSC

b. Dependent Variable: EXECUTION

Table 58: ANOVA test analysis for the OSC predictor

ANOVA^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	176.839	1	176.839	385.062	.000 ^b
Residual	122.160	266	.459		
Total	299.000	267			

a. Dependent Variable: EXECUTION

b. Predictors: (Constant), OSC

The regression coefficient R for the PMO role of the OSC predictor was found to have values of $t = 19.62$, $\beta = 0.769$, and $p < 0.001$. This predictor is significant, whereas the alternative hypothesis (H_{6a}) is strongly supported. In addition, multicollinearity was absent from the regression model, where the tolerance value was 1.000 (> 0.1) and the VIF was 1.000 (< 10.00), the R values are presented in Table 59.

Table 59: Regression coefficient R for OSC predictor**Coefficients^a**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	β			Tolerance	VIF
1 (Constant)	.998	.142		7.022	.000		
OS	.740	.038	.769	19.623	.000	1.000	1.000

a. Dependent Variable: EXECUTION

The variance inflation factors and tolerance levels did not indicate multicollinearity in the model. This indicates that the correlations among the dependent variables did not have an undue impact on the model's standard error. A plot of standardized residuals indicated a linear model; however, the plot also revealed some evidence of model heteroscedasticity, as presented in Figure 32.

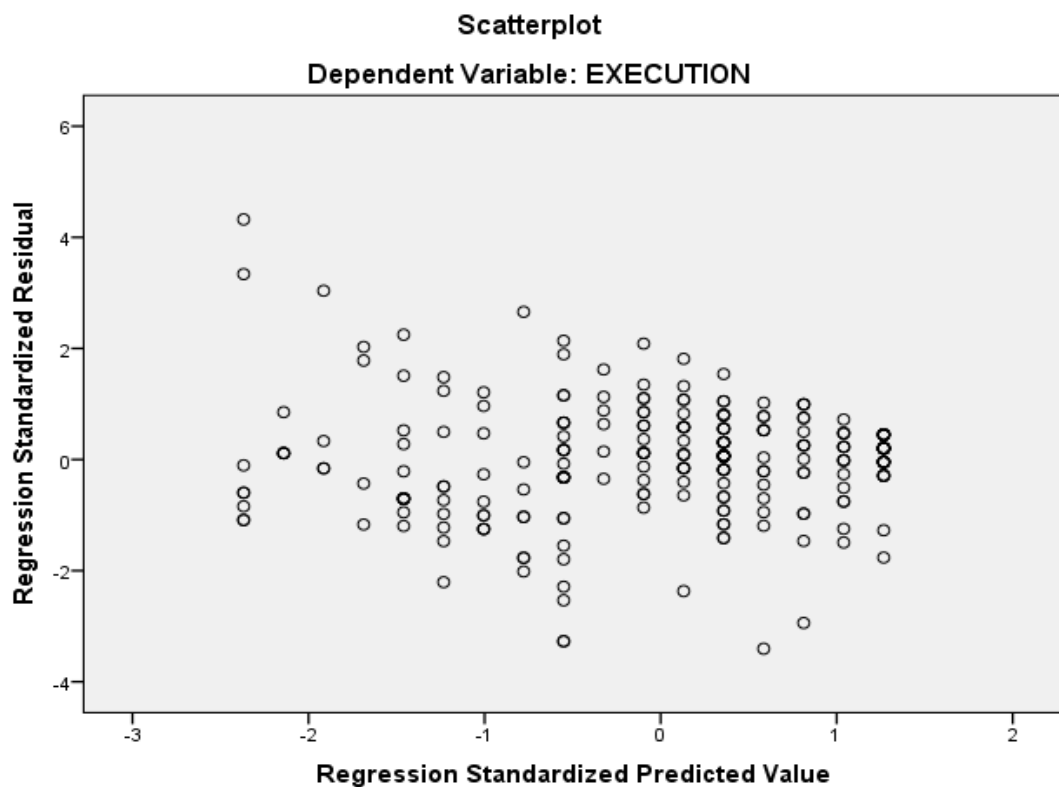


Figure 32: Plot of standardized residuals for OSC predictor

5.5.3.7. SRA for the PMO role of PVS with SPE

Simple regression analysis R for the PMO role of the project value sustainability (PVS) revealed that this construct predicted and explained at 53.2% of variance of SPE construct with adjusted R^2 significant value at the 0.05 level. The findings suggest that this role was positively related to SPE, with strong association enough to support statistically the significant predicting power of the monitoring and controlling upon the variance of SPE, as presented in Table 60, whereas ANOVA test analysis for the predictor is presented in Table 61.

Table 60: SRA for the PMO role of the PVS predictor

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.731 ^a	.534	.532	.72401

a. Predictors: (Constant), PVS

b. Dependent Variable: EXECUTION

Table 61: ANOVA test analysis for PVS predictor

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	159.566	1	159.566	304.408	.000 ^b
1 Residual	139.433	266	.524		
Total	299.000	267			

a. Dependent Variable: EXECUTION

b. Predictors: (Constant), PVS

The regression coefficient R for the PMO role of PVS predictor was found to have values of $t = 17.44$, $\beta = 0.731$, and $p < 0.001$, as shown in Table 62.

Table 62: Regression coefficient R for PVS predictor

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	β	Std. Error	β			Tolerance	VIF
1 (Constant)	1.353	.140		9.678	.000		
PVS	.666	.038	.731	17.447	.000	1.000	1.000

a. Dependent Variable: EXECUTION

This predictor is significant and the alternative hypothesis (H_{7a}) is strongly supported. However, when the multi-regression was run in the previous section, the predictor is not significant and the null hypothesis (H_{7_0}) could not be rejected. This result is an indication that although four predictors together accounted for a significant amount of variation in the criterion, the predictor of the project value sustainability (H_{7a}) on its own is a significant predictor. In addition, the multicollinearity was absent from the regression model, where the tolerance value was 1.000 (> 0.1) whereas the VIF was 1.000 (< 10.00).

The variance inflation factors and tolerance levels both did not indicate multicollinearity in the model. This indicates that the correlations among the dependent variables did not have an undue impact on the model's standard error. A plot of standardized residuals indicated a linear model; however, the plot also revealed some evidence of model heteroscedasticity, as presented in Figure 33.

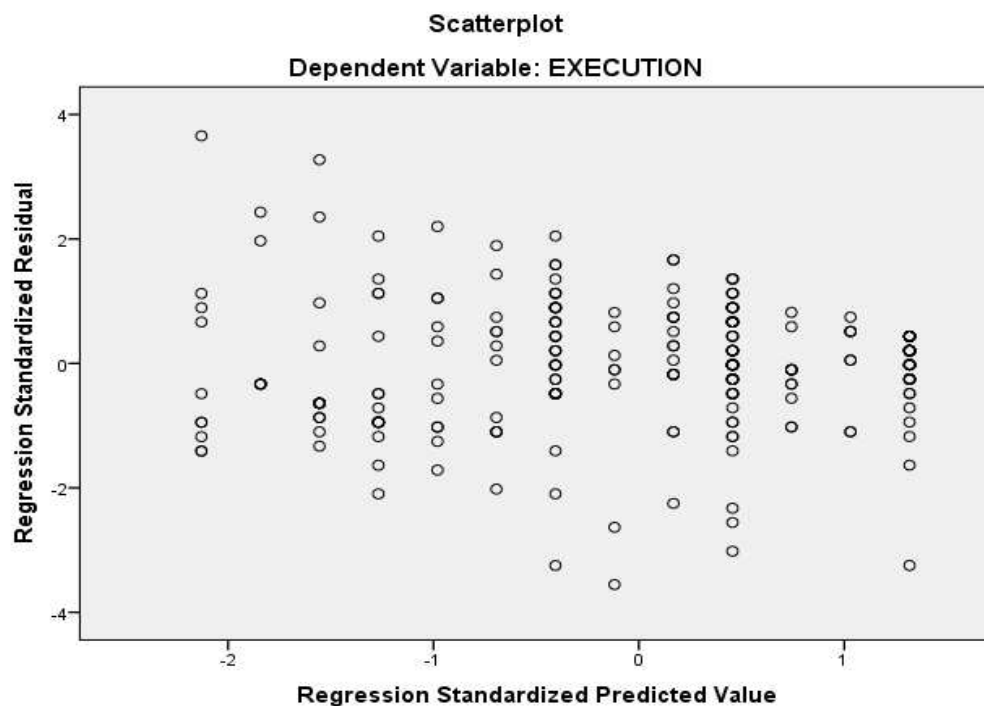


Figure 33: Plot of standardized residuals for PVS predictor

5.5.4. One-Sample Test

A sample *t*-test was performed for determining the extent to which an individual PMO role could be measured through 12 measures that may contribute to strategic planning execution. This test will answer research question no.2 “*How the success of the PMO implementation within the project-oriented organization could be measured*”. The *t*-value is defined by calculating the average of the Likert scale from 1-5 and taking the average $(1+5)/2 = 3$.

Therefore, the value has been added into the *t*- test through the SPSS. Based on the one sample *t*-test outcomes, the successful implementation of PMO within a project-led organization could be measured based on the highest *t* values. The below Tables show the descriptive analysis and the one sample test. Table 63 and Table 64 illustrating the measures of role functions as strong significant interrelations.

Table 63: Mean and Std. Deviation for the PMO Measuring Criteria
One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Q26_1	268	3.75	1.315	.080
Q26_2	268	3.56	1.212	.074
Q26_3	268	3.59	1.228	.075
Q26_4	268	3.47	1.216	.074
Q26_5	268	3.57	1.247	.076
Q26_6	268	3.59	1.213	.074
Q26_7	268	3.59	1.156	.071
Q26_8	268	3.43	1.176	.072
Q26_9	268	3.53	1.182	.072
Q26_10	268	3.38	1.123	.069
Q26_11	268	3.51	1.166	.071
Q26_12	268	3.39	1.167	.071

Table 64: One-sample test value=3

One-Sample Test

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Q26_1	9.383	267	.000	.754	.60	.91
Q26_2	7.562	267	.000	.560	.41	.71
Q26_3	7.909	267	.000	.593	.45	.74
Q26_4	6.330	267	.000	.470	.32	.62
Q26_5	7.541	267	.000	.575	.42	.72
Q26_6	8.009	267	.000	.593	.45	.74
Q26_7	8.294	267	.000	.586	.45	.72
Q26_8	5.919	267	.000	.425	.28	.57
Q26_9	7.341	267	.000	.530	.39	.67
Q26_10	5.492	267	.000	.377	.24	.51
Q26_11	7.178	267	.000	.511	.37	.65
Q26_12	5.494	267	.000	.392	.25	.53

5.6. Summary

The nature of this research work is exploratory and causal study. Therefore, its primary quantitative analysis of the collected data was figure out the potential roles of the existing PMO entity in executing successfully the strategic plan of a project-based organization in public sector. The applications of regression analysis method in the analysis and interpretation of the collected survey data have generated significant findings to answer the raised research questions and associated hypotheses proposed in this study.

This chapter details the approach of data collection by using structured online questionnaire. It likewise describes the demographic background information of the 268 respondents who participated in completing the online questionnaire, along with shedding much light over the nature of the PMO units of their respective public organizations using SPSS. The data created from answering the given questions that

concerned primarily with the functions and roles of the PMO were analysed by employing regression analysis (simple and multiple) methods. The reliability tests (Cronbach alpha tests) were applied to all variables to highlight the effectiveness of each of them for justifying the existence of a PMO unit in enhancing a project-driven public organization. In addition, validity tests, including Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy, were performed to support the interpretations of test scores entailed by testing the suitability of the data provided by the respondents.

Testing modelling, involving multiple regression coefficients (R and β), was applied to all variables to measure their respective effectiveness. Moreover, this testing revealed that a plot of standardized residuals of each PMO role indicated a linear model to give an evidence of a model having different variances (i.e., heteroscedasticity). Sample regression test was done for each PMO role to determine its own significant contribution in executing the strategic plan. Table 65 gives a brief summary of the top metric criteria that could be applied to measure the effectiveness of a PMO unit in a project-based organization (Kendall & Rollins, 2003).

Table 65: Top metric criteria for measuring PMO effectiveness

Item No.	PMO measure	T value	Mean
1	Tracking the project progress	9.383	3.75
2	Supporting the projects steering committees	8.294	3.59
3	Mentoring, coaching and training the projects teams	8.0	3.59
4	Prioritizing project portfolio	7.9	3.59
5	Optimizing project schedule	7.56	3.56
6	Choosing the right projects for the organization	7.54	3.57
7	Developing organizational learning	7.341	3.53
8	Communicating with internal and external stakeholders	7.17	3.51
9	Recovering delays in projects	6.33	3.47
10	Allocating the resources between the projects	5.91	3.43
11	Archiving & documenting lessons learned	5.494	3.39
12	PMO being as a help-desk	5.492	3.38

Chapter 6: Discussion

6.1. Introduction

One of the major challenges facing the academic research in project management field that concerned the organization's strategic plan derives from its interdisciplinary nature. This Chapter discusses the results generated from the quantitative analysis of the survey data. It highlights likewise the key findings that are expected to be a significant value-added knowledge to the existing body of the PMO scholarly literature.

The sections of this Chapter are organized as follows: it starts with an overview of the proposed research questions and objectives to be answered by the findings of the statistical analysis. This is followed by the justification of the proposed roles and functions, which represented as independent variables (predictors) in relation to the dependent variable (criterion) in the framework of the proposed PMO model.

The project business sector is nowadays considered one of major activities among the public sector organizations in the UAE. Due to their temporary and specific nature, the projects are rather dissimilar in their purpose or justification, work contents, controlling mechanism, and alignment to the strategic plan of the parent organisation. In many cases, projects might be executed beyond the hierarchical lines of organizational authority; hence, monitoring their execution and implementation requires specific leadership skills and abilities, efficient management coordination mechanisms, and incentive schemes for project professionals (Hanisch & Wald, 2011).

The present global environment of the project business and industries has turned to be more complex and diversified; consequently, many project-based organizations are currently facing a wide range of challenges that have come across the execution plans of their own proposed projects. Among these challenges are:

- 1) Improper selection of the right executable projects.
- 2) Insufficient resources.
- 3) Lack of effective coordination between on-going multiple projects, and
- 4) Incompatibility between the adopted management processes (Tjahjana et al., 2009).

The above-mentioned project-related challenges have sparked deep interest in many project-based organizations in both the public and private sectors to striving in incorporate innovative tools and strategies to streamline their project execution. Among these approaches has been the PMO, which has been developed, and thereafter has progressed from the pool of modern theories and methodologies of the project management discipline.

This new project management entity could provide a wide range of technical supports in terms of project management methodologies and techniques for facilitating the approach to an acceptable level of maturity in the project management, and assisting in creating a management-specific culture in project-based organizations; however, about 72% of them have been recorded as immature or underdeveloped to some extent (Kutch & Hall, 2005).

Thus, the PMO has been nominated as an authentic means to lead effectively in improving project success in the public sector organizations, in particular. Thus, this

study treated some topics related to the PMO functionalities, such as: **i)** organization strategic plan based on project strategy, business strategy and strategic alignment, **ii)** potential roles within the hosted organizations (i.e., strategic, tactical, operational, etc.), **iii)** types of established PMO units, and **iv)** newly developed and existing PMO models.

The public organizations in the UAE are the major players in the national economic development; therefore, they are enjoying a relative abundance of government-based resources, such as financial and political support, and skilled human capital. Accordingly, the UAE public organizations have taken the lion's share of the projects that were executed or on process of execution. These projects are part of the strategic plans that concerned with development and expansion of the UAE infrastructure. Despite such intensive project business, the UAE, the PMO is still playing a minor role in project management and execution operations. Therefore, very few scholarly studies have investigated the impacts of the PMO on success or failure of project execution and implementation in the UAE.

The research sites of this study were restricted to the project-based public organizations in Abu Dhabi and Dubai Emirates, because:

- 1) The two Emirates earn a high proportion of the UAE gross national production (GNP), i.e., Abu Dhabi contributes with its oil industries, while Dubai contributes through its business services and tourism.
- 2) The two Emirates witness extensive construction activities as a strategic element of their infrastructure development.
- 3) Their public organizations in partnership with the international project-based companies are the driving force in their project business.

- 4) Their public organizations are required to develop their own strategic plans.
- 5) About two-thirds of the UAE's population (citizens and expatriates) live in these two Emirates and run a wide range of business activities.

The next section inquires whether the research questions and the proposed hypotheses have met the study objectives, or some of the objectives need further investigation.

6.2. Revisiting the Research Questions and Objectives

It will be useful to revisit the research questions and the research objectives prior to summing up the major findings generated from the study survey. The raised questions that have led this research study were:

- Q.1)** *is there any link between the implementation of the PMO and execution of the project-based organization's strategic plan.*
- Q.2)** *how can the success of the PMO implementation in the organization be measured?*

The study also proposed the following objectives to identify the possible roles of the PMO unit in the project-based organizations:

- 1) Developing a metric reference for measuring the success of the execution of the strategic plan.
- 2) Gaining some insights into the specific roles of the established PMO, and the way by which the PMO could help a project-based public organization to execute its own strategic plan in the long-term.
- 3) Investigating whether a PMO contributes significantly in developing an effective project management mechanism to enhance the strategic plan execution in terms of the project success.

- 4) Revision of the proposed model, along with the accumulation of major references that are related to the domain of the PMO research and studies.

A conceptual model was proposed to incorporate both the dependent variable (the strategic plan execution or criterion) and seven independent variables (PMO roles or predictors) to find, which of the proposed PMO roles are effective in the execution of the organization's strategic plan successfully. However, the researcher added two predictors that at the time had not been investigated on the PMO literature, namely: **i) *Organizational structure and communication improvement***, and **ii) *Project value sustainability***.

The first candidate predictor could play a key role in adapting the interdepartmental communication to administrative hierarchy and structure; this in turn would assist in deciding on which projects should be selected and executed in accordance with priorities of the organization. However, developing a specific value from its project business is considered the core goal of a project-based organization. Such developed and sustained value helps the organization to gain a great deal of business and market confidence for the project-based organizations.

The interrelationships between the dependent and independent variables were probed by using multi-regression analysis. This step aimed at keeping the developed PMO model sustainable in practice. The next sections of this Chapter discuss and seek to justify the results generated from the quantitative analysis of the collected survey data, with a view to propose a set of helpful recommendations for further studies.

6.3. Interpretation of Research Findings

A project failing because it deviated from its initial schedule plan; this failure would be a great waste of resources, and might directly affect the market reputation and competitiveness of project-based organizations; these organizations have become well-acquainted with the best use of project management theories, and accumulated professional experiences to prevent project failure, at the same time to furnish the elements of successful execution.

In the failure and success cycle of the project business, it is supposed that each of the proposed seven independent variables in the conceptual model have a direct effect upon the strategic plan execution (a dependant variable). However, the survey helped to categorise the seven independent variables into two discrete levels as *strategic* or *tactical*. This categorisation (as shown in Table 66) was aimed at measuring the effectiveness of each predictor based on its nature, functional roles, and pattern of its interaction with other predictors in the conceptual model.

Table 66: Categorization of PMO roles (strategic or tactical)

Strategic factors	Tactical factors
Strategic Management	PM Competency and Methodology
Multi-Project Management	Monitoring and Controlling
Organizational Structure and Communication	Organizational Learning
Project Value Sustainability	-----

The seven proposed hypotheses were associated directly with the independent variables to incorporate in the conceptual model as it developed. The constructs were thereafter operationalized so that they could be accurately measured. Thus, a set of measurable independent variables was developed to gauge the model constructs according to the effectiveness of each role in maintaining the dependent variable.

As regards the interaction between the proposed PMO roles and the strategic plan execution, the analysed data revealed the extent to which each role contributes significantly in executing the strategic plan of the hosted public organization. With reference to the work of Hobbs and Aubry (2007), which presented findings of global survey conducted on the PMO roles in various business and industrial domains worldwide, similar results about the PMO roles in the UAE project business were obtained from this study, which in contrast considered *local* or *national* specific roles.

The top-five PMO roles that scored the highest values in the study of Hobbs and Aubry were **i)** Monitoring and controlling project performance, **ii)** Development of project management competencies and methodologies, **iii)** Strategic management, **iv)** Multi-project management, and **v)** Organizational learning. However, the top-five roles identified in the present study were **1)** Strategic management, **2)** Development of project management competencies and methodologies, **3)** Monitoring and controlling project performance, **4)** Organizational learning, and **5)** Organization structure and communication improvement. A comparison between the top roles investigated in this study and of Hobbs and Aubry (2007) is illustrated in Table 67.

Table 67: Comparison between this study results & those of Hobbs & Aubry

PMO roles	This study	Hobbs & Aubry
Strategic management	3.79	3.06
Developing PM competencies & methodologies	3.72	3.54
Monitoring & controlling of project performance	3.68	3.82
Organizational learning	3.66	3.00
<i>Organization structure & communication</i>	3.61	Not investigated
Multi-project management	3.59	3.23
Project value sustainability	3.49	Not investigated

Moreover, the variations in the results of both studies regarding the common top-five variables may be attributed to the nature of each study. Thus, this study focused entirely on project-based public organizations in the context of the UAE business environment, whereas, the work of Hobbs and Aubry focused globally on the possible PMO roles in different project-based organizations, mostly in the private sector, working in various business environments.

The potential PMO role of *Organization Structure and Communication Improvement* has not been investigated in the PMO literature that has been reviewed for this study. However, the researcher demonstrated in present study that this proposed predictor contributes significantly in the execution of the strategic plan of the project-based public organizations in the UAE. Since it was the first investigation of this PMO role, its functionality had re-tested worldwide in other project business environments, worldwide.

Overall, the results generated from this exploratory and causal effect study give a convincing evidence that the findings supported the interrelationships of four PMO roles in the execution of a public organization's strategic plan; these roles were *Strategic Management, Development of Project Management Competencies and Methodologies, Monitoring and Controlling Project Performance, and Organization Structure and Communication Improvement*.

However, the prominent functions of the top-five PMO roles were found to be **i)** Reporting project status to upper management (Q20.1), **ii)** Monitoring and controlling project performance (Q20.2), **iii)** Providing a set of suitable tools such as processes..., etc., (Q19.5), **iv)** Strengthening communication with projects'

stakeholders (Q23.2), and v) Implementing and operating a project information system (Q20.3), as shown in Table 68.

Table 68: Prominent functions of the five-top PMO roles

	N	Minimum	Maximum	Mean	Std. Deviation
Q20_1	268	1	5	3.79	1.243
Q20_2	268	1	5	3.72	1.229
Q19_5	268	1	5	3.68	1.222
Q23_2	268	1	5	3.66	1.171
Q20_3	268	1	5	3.61	1.208
Q18_2	268	1	5	3.60	1.248
Q19_1	268	1	5	3.60	1.287
Q23_1	268	1	5	3.60	1.221
Q23_3	268	1	5	3.59	1.146
Q22_2	268	1	5	3.59	1.133
Q20_4	268	1	5	3.59	1.147
Q19_3	268	1	5	3.58	1.283
Q23_4	268	1	5	3.57	1.160
Q18_1	268	1	5	3.56	1.257
Q19_2	268	1	5	3.56	1.275
Q20_5	268	1	5	3.56	1.105
Q18_3	268	1	5	3.56	1.174
Q22_1	268	1	5	3.53	1.159
Q19_4	268	1	5	3.52	1.163
Q21_3	268	1	5	3.51	1.130
Q21_5	268	1	5	3.50	1.163
Q24_1	268	1	5	3.49	1.172
Q21_2	268	1	5	3.48	1.163
Q24_3	267	1	5	3.48	1.227
Q18_4	268	1	5	3.47	1.075
Q22_4	268	1	5	3.45	1.149
Q24_2	268	1	5	3.44	1.209
Q22_3	268	1	5	3.44	1.158
Q21_4	268	1	5	3.44	1.155
Q21_1	268	1	5	3.43	1.160
Valid N (list-wise)	267				

However, only tenuous interrelationships were found between the three PMO roles of *Organizational Learning Promotion*, *Multi-Project Management*, and *Project Value Sustainability* and the strategic plan execution. However, applying simple regression for the above three roles showed that the relationships between variables are significant, which means that the effect of other roles can reduce its importance when it comes as a single group.

6.3.1. Relationship between the Variables

Analysis of the survey data revealed that there is an obvious variation regarding the significance, and importance of each proposed independent variable (predictor). Consequently, investigating how far each predictor affects the execution of the organization's strategic plan would assist greatly in identifying and measuring the magnitude, as well as the significant role of each predictor, along with its interrelationship with the other predictors in the conceptual model that are involved in the strategic plan execution. In other words, this investigation would help in the classification (i.e., active or passive) of the independent variables according to their predictive power.

Finding the possible relationships between the independent and dependent variables is a research task of the present study. Thus, the analysed data gave reliable evidence of the existence of direct interrelationships between independent variables for achieving the strategic plan execution (dependent variable). This finding implies that the PMO unit could add to its host organization the value generated from the multi-regression analysis, which was found in this study to be equal 0.736.

This value means that 73.6% (considered a high percentage) of the execution of the organization's strategic plan could be left to the various PMO roles, whereas the significance of this relationship could be demonstrated through the values of F and P, where $F= 103.762$, and $p < 0.001$, as detailed in Chapter 5, section 5.5.2. This finding is considered a significant result of this study, since it clearly shows that if the project-based organization successfully carries out the proposed schedule of its strategic plan execution, the value that could be added by the PMO roles would be a significant boost to their organizations. Moreover, this finding supports the statements of four proposed hypotheses, namely, H_1 , H_2 , H_3 , and H_6 .

About 15.5% of the strategic plan execution, however, cannot be performed by the proposed PMO roles; this may be attributed to some internal and external factors associated with the executed project contents, such as project size, the deflection of the project's priorities, financial issues, stakeholder conflict, and deadline violation. Nevertheless, studying the possible roles of the PMO unit has recently become an interesting research topic in the project management field.

6.3.2. Effects of individual PMO role on the dependent variable

This section aims at exploring the nature and significance of the interrelationships of each PMO role with other roles and the strategic plan execution. The use of multi-regression analysis in the interpretation of the survey data unveiled the nature of the interrelationships of the PMO roles, and the significance of their pattern of action.

However, the interrelationships of the concerned variables were found to be strong, and the pattern of their action in contributing to the strategic plan varied. At the same time, hypotheses H_4 , H_5 , and H_7 displayed significant relationships in a single

mode; yet, in multiple regression analysis the findings were not significant. The reason for this may be attributed to the view of the respondents, who considered that the objectives behind establishing the PMO entity were not crucial in the execution of their respective organization's strategic plan. Moreover, the PMO role of organizational learning was found to contrast with what Desouza and Evaristo (2006) confirmed that this PMO role was significant. The effects of each PMO role are illustrated in Chapter 5 (Table 39 and Table 40).

Still, the linear regression analysis method confirmed the following findings:

- The PMO role of *Strategic Management* gained the highest value of *R Square* as (0.665), which indicated that the functions that could be added by this PMO role are strongly affected by meeting the strategic planning execution. Hence, the upper management should realize the importance of this role, because it includes both the implementation and evaluation of the strategic plan (David et al., 2011). Thus, this PMO role is significant for project-based organizations in that it encourages their project staff to know more about the various sets of procedures and processes that will achieve their own objectives.

The strategic plan objectives of a project-based organization may include the different projects (portfolio) in the approved budget, the project schedule and the quality, which will boost the reputation and competitiveness of the organization in the project business market. Therefore, this would lead to the improvement of the organization's revenues and benefits in the long term.

- The PMO role of the *Project Management Competency and Methodology* has gained the value of *R Square* as (0.640) affecting the execution of strategic

plan. Thus, the PMO leaders could easily guide their own PMO unit to success or failure according to their acquired competency and project management skills. Regarding the results related to this role, the entire organizational performance and same observation were confirmed by Hurt and Thomas (2009).

Consequently, the project-based organization should conduct a series of appropriate approaches to select suitable PMO leaders and staff and thus ensure that the PMO performance would support the organization's own strategic goals and performance. Hence, it is crucial for an organization to impose a clear policy of career promotion, and effective criteria to evaluate the qualifications of both its PMO leaders and staff before defining and assessing their work goals. Therefore, the PMO unit of the project-based organization is required to recommend and provide essential training and professional development programmes to enhance the management and communication skills of the members of the project team, as stated by Hill (2004).

- The PMO role of *Monitoring and Controlling Project Performance* has gained the value of *R Square* as (0.623) to affect significantly the execution of the strategic plan. This PMO role is concerned with a bundle of functions including reporting the project's status and performance, self-monitoring, maintaining the scoreboard, project governance, an operating information and communication system for enhancing the execution of the running projects in line with the schedule of the various project phases.

The PMO role of monitoring and controlling related functions could help in focusing on all other elements of the PMO roles and thus provide the means for the PMO unit to demonstrate its value to other parts of the

organisation, in particular to the upper management. These findings are associated with the findings of Hobbs & Aubry (2007) and Dai & Wells (2004), whose works have identified this role as the most commonly performed function of this PMO role.

This role delivers PMO value, not simply by demonstrating the value of concern to the upper management, but by enforcing appropriate practices in project management activities by means of identifying the actual needs of the project staff members. Such enforcement could help to promote a suitable type of project management culture for creating a sustainable PMO unit, as well as identifying the need to introduce professional project management practices in terms of sustainable competency (Hurt & Thomas, 2009).

Hill (2004) also describes the established PMO entity as “*The interface between the business environment and the project management environment*”, while Rajegopal et al. (2007) described the PMO unit as “*The bridge between the operational and strategic divides in a project business domain*”. Thus, this PMO role provides both interface and bridge functions as part of the monitoring and reporting functions of the first PMO value framework role.

This research draws attention to the importance of this role as a PMO-in-practice, where the PMO unit provides independent governance for projects, which is considered a critical element in the provision of accurate information and advice to upper management, as well as insisting that the organization should apply best project management practices.

This result is inconsistent with the findings of Hobbs and Aubry (2008), who confirmed that this group includes both a monitoring and controlling role and the reporting of the performance outcomes of the project management

practices. This PMO role with its related functions meets the need of the project managers to have information to maintain and control the performance of the projects for which they are responsible.

- The PMO role of *Organizational Learning Promotion* has obtained the value of *R Square* as (0.512), which indicates that establishing and managing a database of lessons learned and document archives concerning the strategic plan has a strong effect. This finding is in agreement with the result reported by Desouza and Evaristo (2006). Thus, the effective organizational learning practices also help to ease communication and the sharing of information with other parts of a project-based organisation.

The body of knowledge that could be gained through organisational learning would furnish resources of continuous improvement in the project management practices and performance of the organisation. For project management activities, the PMO unit should act as a central repository and disseminator of the gained and accumulated knowledge (Dai & Wells, 2004; Desouza & Evaristo, 2006; Hobbs & Aubry, 2007; Kerzner, 2003). In contrast, Hobbs and Aubry (2007) found that the organisational learning related functions of the PMO unit were its least performed functions.

Moreover, the finding of this study concerned with the PMO role of organizational learning supports the previous mentioned works in the opinion that this role is considered an insignificant part of duties of the PMO unit, and is similarly an inactive function of many PMO units in project-based public organizations. To be sure, this role would not generally be a priority of the PMO unit at an early stage of its establishment; but when the PMO has become well-established, this role, along with many other roles that have been

performed to a level that would allow the effective capture of generated knowledge, takes on greater importance.

In one mature project-based public organization, the projects sector was responsible to disseminate regularly the data of the lessons learned, while the PMO unit developed a share-point gate through the Intranet to make it easier to access and share the lessons learned. Both documentation and the exchange of lessons learned are continuous processes that continue throughout the lifecycle of project execution, and are not restricted to a specific phase.

However, there is a culture of learning in any project-based organisation, even though performing this role was not directly considered critical to the PMO unit. Moreover, a few of these PMO host organizations frequently conducting a series of post-project reviews over all projects to capture the lessons learned of interest, which are thereafter used as input to change the project contents, where the PMO managers assist in the continuous improvement of the project management practices in the organisation.

This research likewise shows a general agreement among many PMO units that organisational learning is considered an important role, which should be carried out effectively. Once a project management methodology has been established, and the established PMO unit effectively monitors and controls the activities in it, it will be well placed to implement effective organisational learning best practices.

The value of this PMO role in the project-based organisation lies in its ability to drive continual improvement in project management practices and performance. However, most project management knowledge (PMK) is wasted as recorded in many previous studies on the topic (Sandhu &

Naaranoja, 2009). Therefore, the PMO could play a major role in considering this function an important one.

- The PMO role of *Multi-Project Management* has gained *R Square* value as (0.543), classified as a high enough percentage (54.3%) to explain the dependent variable. However, in the present study, the role was not significant when combined with other roles, as explained in Chapter 5; the nature of the concerned variable is affected by other roles that have a similar function in its importance. This is concerned with the coordination of interdependencies in a multi-project environment. The core functions of this PMO role include coordination between projects, identifying and prioritising new projects, managing one or more portfolios or programmes, and allocating the organization's resources between projects.

The sharp increase in the number of multi-projects implemented and executed by both public and private organizations, began in the 1980s and continued through the 1990s. The new project paradigm generated new challenges related to operating in a multi-project environment and the efficacy of the organization in managing parallel running projects (Spalek, 2012). A number of authors (e.g., Formentini & Romano, 2011; Salameh, 2014; Singh et al., 2009; Spalek, 2012, etc.) assumed that a major challenge to project management approaches nowadays would be the unpredictable trends in the rates of successful and failed execution of projects.

However, many research questions have sought the reasons behind such an embarrassing situation for the global project business; it may be attributed to the inability of many project-based organizations and companies to tackle the new organisational problems related to their operations in the

multi-project environment. At the same time, the importance of project portfolio management has dramatically increased because of the operation in a new paradigm of the multi-project environment (Spalek, 2012).

- The PMO role of the *Organizational Structure and Communication Improvement* had *R Square* value (0.591), which is considered a significant individual independent variable that decisively affects strategic planning execution. The findings generated from the present study found to be consistent with those of Hobbs and Aubry (2008) to confirm that there is no standard PMO structure that could be established for all types of project-based organization since the PMO structure itself differs according to the nature of the organization, whether in the private or public sector.

For this reason, the structure of the PMO should be established according to the organization's structure, nature, needs and requirements. This variable is concerned with establishing effective communication tools related to the PMO functions and missions. Communication patterns in the organization often met its needs and objectives in strengthening communication channels with the project stakeholders, updating the prompt information correspondence and assisting project continuity in transferring the required technology and innovative methods.

- The PMO role of *Project Value Sustainability* had *R Square* (0.543) to establish a strong relationship with the dependent variable (strategic planning execution). However, the finding of this study revealed that the PMO role of project value sustainability was not significant when combined with other roles, as explained in Chapter 5; the nature of this variable is affected by other roles that have a similar function in its importance.

The PMO unit plays an important role in creating and sustaining the organization's values. However, in today's global project-based business and industries, the tendency to collaborate and co-create value with the customers and stakeholders has sharply increased. The concept of creating project value starts with sustainability processes, which are needed to encourage innovative approaches and assess the viability of business ideas, e possible through managing the implementation of the initiated organizational changes in response to the needs of the project business.

Weaver (2012) argued that there two key elements, which could be interconnected with the concept of value creation in terms of the project management processes. The first key element focuses on "*The development of an idea to value the realization via proposed and running projects*". The second one is "*The pattern of the management processes that are needed to managing the organization's project management infrastructure effectively with incorporating innovative approaches*".

Under the P3M3™ OGC of the maturity model (Khoshgoftar et al., 2009), it is not enough to ensure that the projects, programmes, or portfolios are merely strategically aligned to the strategic plan of the organization; the realization of the rewarded benefits will be an "*integral part to the development of decision making processes of the business strategy*" (Aubry, 2015). This extends the PMO role to making sure that the running projects are being managed correctly to achieve the benefits expected from the project execution (Bennington & Baccarini, 2004; Ward & Peppard, 2002).

6.4. Summary

- This chapter demonstrated the overall findings of this research study, and sought to connect the generated findings with the research questions raised and the proposed hypotheses.
- The present study discussed the challenges that could arise and disturb the stability of the UAE project business and industries leading to project failure.
- This study presented a strong evidence that the PMO units have introduced effective methodology and approaches to the project-based public organizations with which these organizations could achieve a successful project execution as a part of their entire strategic plan.
- The researcher conducted a comparison between the top PMO roles identified in this study and those found by Hobbs and Aubry (2007) to declare that the top-five roles in both studies are in a good agreement.
- Demographic analysis revealed that an increasing number of Emirati project professionals are currently working in the PMO-related activities representing 62.7% of all projects population staff. Such an increase of the national cadre implies that the UAE Government paved the way for them to take upper management positions.
- The potential relationships between independent and dependent variables have indicated that the PMO unit could add to its host organization the value generated from the multi-regression analysis, which was equal 0.736. This value means that 73.6% (considered as a high percentage) of the organization's strategic plan execution can be performed in the course of the various PMO roles.

- In contrast, about 15.5% of the strategic plan execution cannot be performed within the proposed PMO roles; this may be attributed to some internal and external factors associated with the executed project contents, such as project size, the deflection of project priorities, financial issues, stakeholder conflict, and deadline violation.
- The interrelationships of the concerned variables were found to be strong in nature, and varied in the pattern of their contribution to the enactment of the strategic plan. However, hypotheses H₄, H₅, and H₇ display significant relationships in a single mode; yet, in multiple regression analysis the findings were not significant, which may be referred to the respondents' view that the objectives behind establishing the PMO entity were not crucial in the execution of their organization's strategic plan.
- The PMO role of *Strategic Management* gained the highest value of *R* Square (0.665), which indicated that the functions that could be added by this PMO role are most strongly affected by meeting the strategic planning execution.
- The PMO role of the *Project Management Competency and Methodology* gained the value of *R* Square (0.640), which affects the execution of the strategic plan. Thus, the PMO leaders could easily guide their own PMO entity to success or failure according to their acquired competency and project management skills.
- The PMO role of *Monitoring and Controlling Project Performance* gained the value of *R* Square (0.623) to affect significantly the execution of the strategic plan. This PMO role is concerned with a bundle of functions including reporting project status and performance, etc.

- The PMO role of *Organizational Learning Promotion* obtained the value of *R Square* (0.512) to indicate that establishing and managing the database of lessons learned and document archives has a strong effect on the strategic plan.
- The PMO role of *Multi-Project Management* gained *R Square* value of (0.543), which is classified as a high enough percentage (54.3%) to explain the dependent variable. However, in this study, the role was not significant if combined with other roles, whereas the nature of the concerned variable was affected by other roles that have a similar function in its importance.
- The PMO role of the *Organizational Structure and Communication* had an *R Square* value of 0.591, which makes it a significant individual independent variable that decisively affects the strategic planning execution.
- The PMO role of *Project Value Sustainability* had an *R Square* value of 0.543, establishing a strong relationship with the dependent variable. However, the findings of this study revealed that the PMO role of project value sustainability was not significant when combined with other roles; the nature of this variable is affected by other roles, which diminish its importance.
- The members of the project executing team, beside project engineers, included various specialists, such as administrative personnel, accountants, ICT engineers, planners, etc. Such a mixture of specialists would be an asset to an organization in executing its projects successfully.
- The PMO-related working years of the respondents reflected rich professional experience, about 69% of those involved in PMO activities having had more than 5 years' accumulated experience. Such professional experience would give a good range of work performance, project delivery, and project outcomes.

Chapter 7: Conclusion and Recommendations

7.1. Conclusion

7.1.1. Delivery of the PMO Functions

The primary research questions focused on exploring the nature and pattern of the relationship between the PMO and the strategic plan execution, as well as developing evaluative criteria for measuring the PMO performance. The conceptual PMO model revealed that the significant contributions involved in the strategic plan execution come from specific predictors; each predictor (i.e., each PMO role) varies in importance depending upon the historical phase of the PMO establishment, along with the maturity level of the project management and the organizational culture of the project-based public organisation.

The researcher argues that the operation of each PMO role could improve the capacity of the public organisation to manage its own projects effectively, and to deliver successful projects consistently. With reference to, the hypotheses that were presented in Chapter 1 (1.5.4), and in connection with the results and findings, which were discussed in Chapter 5, this study can confirm the strong interrelationships between meeting and achieving an organization's strategic plan execution. Moreover, the emerging values from the project execution could be an advantage for the project-based governing bodies of the PMO units.

Regarding the data analysis results, the multi-regression analysis highlighted the solid relationship between the organization's strategic plan and the proposed PMO roles and functions. Hence, the concerned analysis likewise revealed that these roles predict and explain about 72.9% of the variances of the strategic plan execution with

adjusted R^2 values of significant benefits for the PMO unit. Therefore, the findings of the statistical analysis were shown to be coherent with the findings recorded in the earlier PMO research works, in particular those of Hobbs and Aubry (2007; 2010).

Several PMO research works argue that the effective and consistent project management can be obtained by employing a suitable set of standard methodologies. Thus, developing a project-specific management methodology is a decisive element in the initial stages of the PMO development. Consequently, project management approaches have become a platform for establishing robust methodologies fitting the actual demands of project-based organisations.

These findings generally suggest that, if the proposed strategic plan is executed successfully, the PMO unit can be promoted to enhancing the overall organizational performance. This answer to the first research question is regarded as the most obvious and significant outcome of the findings of the present research. Another key finding was the strong direct relationship between achieving the major objectives of the public organization and the values that could be provided by the PMO functions.

Such a relationship shed light on the importance of accomplishing the organization's objectives with the purpose of leading the upper management to acknowledge the true importance of the PMO unit as a cost-effective and value-adding asset. A mutual relationship between the strategic management functions (i.e., *providing advisory services to the upper management, being involved in strategic planning, ensuring effective benefits to management, ensuring environmental scanning, and effective networking*) and the strategic plan was found to be a crucial

factor in executing a successful strategic plan, which would satisfy the organization's vision and mission.

Moreover, the results of the research showed also a positive relationship between the PMO structure and the organization's needs and proposed objectives. This finding is, however, a value-added function of the PMO role. Therefore, the proposed PMO structure should be appropriate to the structure and activities of the host organization, since there is no common and acceptable standard structure of the PMO unit that would suit all types of project-based organization.

Scrutinising the proposed PMO roles in this study was found to be useful in relation to the strategic management, monitoring and controlling of the project performance, and building up performance evaluation criteria and standards. Moreover, the well-developed PMO unit was able to capture knowledge of project management and lessons to be disseminated in the host organization. Still, the weak point of the operation may be ascribed to the poor strategic alignment to the PMO and project business, particularly when it arrives at the project management benefits issue.

7.1.2. Importance of the PMO Roles

Equally, it is well known that the values gained from the PMO role of monitoring and controlling, in addition to its reporting functions, originated from fostering the PMO unit in helping the project managers to performing their allotted tasks and likewise in providing reports to the upper management. Since the PMO unit acts as a bridge between the upper management and the project management activities at remote sites, the PMO unit could be put in a situation of facing unfavourable project business conditions unaided (Hill, 2004; Rajegopal et al., 2007).

Developing the PMO role of the project management competencies and methodologies would provide solid ground for the effective performance of all other activities that could be involved in the project management processes. Nevertheless, establishing a standard methodology is one of the core tasks for the PMO to perform (Keating, 2009). However, the developed standard methodologies, if appropriately applied, would help to create a reliable basis for improving the project business environment, and in turn ensure the consistent success of the project management activities.

Hence, Hurt and Thomas (2009) preferred “*more focus on immediate project needs rather than organisational competency development*”. In this case, the PMO could furnish relevant training programmes for developing some of the competencies needed for successful management approaches in project-based organisations. The project managers and other personnel could attain recognised professional qualifications through joining continuing professional training and development programmes, which are designed specifically to provide project trainees with the required competency, since most project-related methodologies rely deeply on the best practices.

However, it is appreciated that the PMO unit needs to attain some expertise and authority in actual project management activities. Although the PMO unit provides a convenient corridor between the upper management and the running projects at the sites, this status does not extend to providing a strategic link between the activities of the two domains. As soon as the required competencies were sufficiently developed, the PMO unit could perform its specific roles directly.

In general, the PMO is able to encourage the elements required for managing decision-making processes through deploying its reporting functions. This mediating capacity of the PMO unit goes further in providing project review processes, notably in the starting phases of projects. Fundamentally, though, the PMO unit needs to be sure that the capacity of the project management approaches of public sector organisations is in alignment with their project portfolios. The project-based organisations are expected to give most benefit to the end-users by executing successful projects.

The research work of Hobbs and Aubry (2007) revealed that the PMO role of promoting organisational learning has been reported as an insignificant function carried out by the PMO unit. In contrast, the results of the present research demonstrate that, in the UAE project-based public organizations, organisational learning is considered one of the key roles performed by the PMO unit, since this PMO role could raise the standard of the continually developed project management competencies and heir maturity in the host public organisations.

Nonetheless, an efficient execution of this PMO role must be involved with other roles; therefore, it should be established first. However, once this role is firmly established, then the organisational learning-related activities become associated with other roles, i.e., from planning the project activities, executing the work packages, monitoring progress, quality assurance and control, recording the lessons learned, and providing a close-out report; these all raise the competency level of individuals, which in turn raises the maturity of the organization's project management (OPMM). Thus, the organization's performance would enable it to meeting its strategic objectives better (Kendall & Rollins, 2003).

7.1.3. Evolution of Contribution of the PMO Roles

The evolutionary pattern of the contribution of each PMO role is largely based upon the way in which each PMO role evolves over time in the course of its existence in the project-based organization. As the PMO unit becomes more effective in carrying out various functions in the project execution, it learns to add new functional roles (Pemsel & Wiewiora, 2013).

Because the effectiveness of this role increases progressively, it allows other peer PMO roles to develop simultaneously without reducing the importance of their established functions. But a directional relation was found to exist between the growing effectiveness and steady increases in the importance of the PMO functions that could be delivered to the host organisation; this in turn could increase its strategic influence (Aubry, 2015).

Many research studies stated that the PMO unit is considered a relatively new component in the organizational structure, which has undergone frequent functional changes in relatively short periods in accordance with the start-up point of the PMO unit, as well as its success and sustainability (Hobbs, Aubry, & Thuillier, 2008). However, as Hobbs et al. (2008) reported, "*Many of the PMO roles have initially a short life-span before they are restructured and their functions refocused*". These writers imply that it would be a negative finding to perceive that the PMO units ultimately added little sustainable value to a project-based organization.

However, building an efficient PMO unit is not necessarily a guarantee of reliably attaining sustainable project management competencies, as expected, or project management value. Therefore, particular ingredients should to be involved in

the project management process, and specific PMO-related activities should regularly to be engaged in, to ensure the sustainability of both project values and project management competencies. Hence, qualified PMO managers and leaders are the major players in building up and sustaining an efficient PMO unit (Hobbs et al., 2008).

Moreover, the continuous efforts and concern of an organization should be involved in sustaining only the latest level of project implementation. Therefore, it is necessary to identify the new strategies and procedures that are required for the strategic plan to be executed through successful project implementation. Moreover, to deliver project values continuously, organizations must build project management competency and monitor the effective functioning of the PMO roles.

7.2. Contribution to Existing PMO Knowledge

This section presents an overall concluding review of the topical theme underpinning this research study. Project management is an interesting research domain, which could provide effective problem-solving approaches to deal with a wide spectrum of project business issues. Thus, the project-based organizations got most benefits from the techniques developed from the research outcomes of project management studies.

In evaluating these findings, from the evidence of existing linkages between external and internal organisational factors with the specific characteristics of the potential PMO roles and functions, it was found that some PMO roles (as organisational enablers) are still poorly understood in leadership and management studies in general, and in the UAE in particular.

To supplement these studies in the PMO literature, this study developed a conceptual model aimed at blending the existing relevant findings of the previous

studies with possibly the most important factors influencing the organisational objectives for strategic planning. Yet the results obtained from the statistical analysis yielded a model in which pathways linked the organisation's strategic plan to the PMO roles and functions, which would be expected to satisfy the organization strategic plan. The findings were subject to a validity test employing multi-regression analysis and a one-way sample *t*-test of the pathways and interrelationships among the various variables.

These findings could greatly contribute to the existing literature in several ways, such as:

- 1) Providing in UAE project business context some insights into the coordinating pattern established between the PMO unit and departments of other organizations involved in the execution of the proposed projects in the framework of the organization's strategic plan.
- 2) Supporting previous research that shows the linkage between strategic plan factors and possible PMO roles and functions.
- 3) Addressing the knowledge gap regarding regression analysis and one-way sample *t*-test as the methodological approach to a sample obtained from the UAE public sector. Few studies so far have done this.
- 4) Criticising the PMO roles that have not been considered in the organisational context.

This study speculates on the key roles of the PMO entity in the execution of the strategic planning of public organizations in the UAE. It attempts also to tackle the potential challenges that may come to interrupt the core functions of the target organizations, and asks how the PMO can be an effective entity in the long term.

The study investigates whether a PMO in developing an effective project management contributes significantly to enhancing the execution of the strategic plan so that it succeeds.

The purpose of this exploratory and causal-effect study was to examine the relationships between the seven factors of the PMO framework (X_{1-7}) designated as independent variables, and the execution of the organizational strategic plan (Y_1) designated as a dependent variable (Hobbs & Aubry, 2007). Finally, a conceptual framework was built upon the findings of a quantitative analysis of the collected data. This pointed out the factors that would keep the developed PMO model sustainable in practice. It concurs with previous studies, which argue that the lack of an effective PMO in a project-intensive organization may contribute to an increased rate of project failure (Desouza & Evaristo, 2006).

By paying close attention to various aspects of the PMO roles and noting that they are composed of many factors, this study offers significant contributions along different dimensions. Among these are the following:

- 1) Its primary intention was to make a meaningful contribution to the PMO literature and related project management approaches to identifying the problems facing the execution of projects as a part of an organization's strategic plan, and selecting what roles of the PMO should play in supporting the success of the plan's execution.
- 2) This research study, it is hoped, offers information needed by the PMO managers and project leaders about what their counterparts are doing to make cross-project learning and the associated challenges easy to confront. These

data may be useful in the effort to improve the practices in project management activities processes, in particular in UAE public sector organisations.

The results generated from this exploratory study indicate that some PMO roles and functions could exert a significant impact on the strategic plans. Hence, the PMO roles of **i)** strategic management, **ii)** project management competency and methodology, **iii)** monitoring and controlling, and **iv)** organizational structure and communication improvement were found to have the most influence of all variables. The study results may be used to develop the PMO model implemented in the selected public organizations as part of the continuing effort to improve project success.

In the remaining entities in the UAE, regardless of the nature of the project business domain where the project is implemented, these findings may be used to improve the PMO model that other project-based organizations may execute, adopting the same activities in the effort to reduce the failure rate of projects. Moreover, PMO practitioners appreciate the use of acceptable standards or guidelines to help them found and maintain functional PMO units. Meanwhile the members of the academic community are looking for theoretical bases that could be used to expand the current body of the knowledge related to PMO practices (Aubry et al., 2010).

The findings of this study could help in shrinking the gaps in knowledge by offering practical perspectives that could be implemented in professional settings by project managers and project leaders working in various project management domains, since these project personnel want to use suitable PMO models to maximize the possibility of project success by improving the means of managing their projects and programmes.

Academics who are interested in either the PMO or the strategic plan environment may use the study findings as practical points of reference for further studies. This study likewise would be of value to help improve the project business practices in the project management discipline by helping to reduce the gaps, notably regarding the practical perspectives.

The determinations of the present work indicate that PMO-related research should extend to other parts or functions that lie beyond the functions identified in this survey. Note, however, that three PMO functions from previous lists of groups have been excluded, because their presence is not related statistically nor conceptually to the present study (Hobbs & Aubry, 2007).

The study also provides empirical evidence for discussing the correlation and potential association between the PMO roles (as independent variables) and the execution of the organizational strategic plan (as the dependent variable). The findings provide further insights that the competency and methodology of the strategic management and project management have the most power of all PMO functions.

7.3. Implications for the UAE Organizations in Public Sector

Apart from theoretical contributions, this research also provides practical contributions to the UAE project business through incorporating the developed model, which was derived from rigorous variable assessment and establishing interrelations. This could serve as a framework in which project-based organizations could take on suitable applications of PMO in practice. This model in particular offers a number of factors that could help organizations to improve their strategies and thereby achieve their vision and mission and, ultimately, show acceptable business performance.

This study reflects the key functions of the PMO unit in maintaining the strategic plan of the project-based public organizations in the UAE. It attempts also to tackle the challenges that may seek to interrupt the core functions of the target organizations, the long-term effectiveness of the PMO, and their relationship with the values that can be added by the PMO. It is apparent from the findings of this study that it has some important implications for the public sector organizations in the UAE if they wish to gain the utmost value from their own PMO units.

This research was undertaken out to examine the relationship between successfully executing strategic planning and the roles of PMOs, and to identify which variables have a significant effect. Moreover, the relationships between successful execution and PMO implementation in public sector organizations could be observed and measured. It should be noted that this survey is the first to test these relationships using empirical data in the area of project management, since this was not tackled in any previous surveys.

7.4. Recommendations

The key recommendations that emerged from the determinations of this exploratory and causal-effect study are grounded in the significance of some PMO roles. Consequently, project-based organizations in the UAE public sector are advised to execute their own strategic plans through applying the PMO roles that are appropriate to the nature and content of their proposed projects.

Moreover, the proposed recommendations are expected to enhance the various project activities in terms of efficient implementation and successful execution. Investigating the roles of the PMO unit determined how far each role could contribute to the strategic plan in the proposed model. In addition, this study developed evaluative

criteria for measuring the performance of the PMO units in the host organizations. Kutsch et al. (2015) argued, “*The durability of a PMO entity is dependent on establishing and focusing on the purpose of it as an internal service organization; particularly, articulating knowledge in project-based organizations and industries*”.

In accordance with the above-mentioned results, the project-based organizations in the UAE public sector are recommended to:

- 1) Customise the PMO model developed by this study in accordance with their structure and the needs of their project business; this may include the selection of the appropriate PMO type, and application of the functions that significantly carry out specific tasks to improve their project business so as to prioritise the objectives with reference to specific criteria for achieving them by providing innovative solutions. This will lead the maturity of the baseline management office to develop gradually through an advanced PMO to establish a centre of excellence. However, there is no common standard structure for a PMO that is believed to be compatible with every organization’s structure.
- 2) Incorporate knowledge management approaches into the various phases and processes surrounding the execution and implementation of the proposed projects through connecting an efficient knowledge management system (KMS) to the PMO unit to streamline and compile the required data between the various current projects, i.e., establish a knowledge base. This would hasten the maturity of the project management in the organization.
- 3) Monitor and control concurrently the various phases and stages of the project execution in terms of exchanging information, evaluating the risks entailed, and sharing ways of finding suitable solutions and alternatives, etc. Moreover,

this monitoring and control function of the PMO over projects' milestones and activities should make sure that these activities are aligned to the original project plan, since this PMO function was found to be significant in this study.

- 4) Establish a project management committee or panel in the project-based organization, consisting of senior members drawn from the departments of the PMO, strategic planning, performance management, finance, and legal. The committee should be responsible for evaluating the requests for various projects before obtaining budget and for investigating the purpose and justification of each project against the organizational objectives and targets to be accomplished.
- 5) Provide training and coaching sessions for the project and programme managers in order to develop their managerial best practices and related technical skills. The managers could transfer their acquired knowledge to their project staff. This role has been shown to be significant in this study as part of the PMO role of competency and methodology.
- 6) Select and recruit professionals of various capacities whose qualifications and skills match the roles and activities for project management according to their job descriptions.
- 7) Establish a network for the current PMOs in the project-based organizations across the UAE. This would be a cost-effective paradigm for the exchange of information and lessons learned, project experiences, best practices, accumulated technical information and data, dissemination of the latest project advances and challenges, etc., and overall, it would take the form of discussions in annual forum meetings to increase the visibility and awareness of the PMO in organizations.

- 8) Develop sets of standards, processes, procedures, templates, and authority metrics for enhancing project management performance, defining suitable PMO methodology, and implementing a project management information system (PMIS) as an effective IT tool (e.g., Dashboard) to be used further in monitoring the project status, and dealing with the actual project business needs. This role was found by the present study to be significant.
- 9) Encourage the PMO leaders in the public sector organizations to give special attention to the potential risks in managing multiple or parallel programmes or projects proposing effective strategies for improving the maturity of the PMO. However, the multi-project management function was not found significant in this study.
- 10) Develop effective communication and stakeholder plans for avoiding conflicts in roles and functions between the various departments and units in the project-based organizations.
- 11) Consider the PMO function for developing project values in terms of managing projects for delivering maximum values and assuring that projects' outcomes are aligned to the social values of the community. This function would deliver sustainable values to the project-based organizations.

7.5. Limitations

The findings produced from this research study were limited by the following factors:

- 1) The researcher conducted the online survey only among the public project-based organizations in the Abu Dhabi and Dubai Emirates. The results do not necessarily reflect PMO cases in other emirates of the UAE.

- 2) Findings are restricted to the public sector organizations in the UAE business context alone.
- 3) The study examined only seven PMO roles, whereas there are more than 75 (Crawford, 2011) affiliated roles that have been identified and investigated in the PMO literature. Therefore, the PMO roles that are not investigated in this study would be an interesting topic for future research.
- 4) The data were obtained by using an online questionnaire-based survey, which may have been affected by the respondents' attitudes towards the survey questions.
- 5) The time for conducting personal interviews was a limitation, since more than two hundred participants were scattered in remote places.

7.6. Future Studies

- a) Because about 75 PMO functions have been identified, further research inquiries should be conducted to ascertain which of these functions suit the project business environment of the UAE.
- b) Future studies might also ask whether this developed PMO model could be applied in other business environments in the GCC countries, which are similar to the UAE and whether it might promote to other MENA countries.
- c) Future studies might also investigate the customisation of the PMO model developed in this study by incorporating more mature PMO roles, such as controlling financial issues and investment in alternative sectors.
- d) This developed PMO model could be applicable in other business environment within the GCC countries (similar to the UAE's); might be promoted to MENA countries.

- e) Future studies might also develop the advisory role of the PMO in formulating a strategic plan or objectives for a rational organization in accordance with UAE business conditions.
- f) Future studies might also investigate the possible obstacles to promoting the PMO in a wide range of project-based firms in the UAE private sector.

7.7. Reflections

The journey of postgraduate study in the DBA programme has rewarded the researcher with knowledgeable professional qualifications which have been progressively built up by blending his work experience with the theoretical and research knowledge gained from the doctorate programme, in such areas as analytic approaches, from different PMO experiences reported in meetings with PMO leaders in various project-based organizations, and from differentiating project values, etc. The findings of this study will, it is hoped, pave the way for the researcher to continue to develop his capacity to conduct further research in the domain of project management and organizational strategic plans.

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Appendix: Questionnaire Survey

Dear Esteemed Participant,

Survey Participation Request

This letter is an invitation to participate in a **questionnaire** survey for an academic research study as a part of Doctorate Degree at College of Business and Economics, of the United Arab Emirates University. My current study aims at investigating “*The Roles of the Project Management Office (PMO) in the Execution of Strategic Plan of Public Sector Organizations*” within the context of the UAE business environment. This study is under supervision of Dr Maqsood Sandhu.

The filling of the questionnaire is voluntary and there are no known or anticipated risks to participate in this survey. Moreover, the collected information is of no conflict, and does not reflect the opinion of your affiliated organization, rather than your own professional expertise.

The collected information through the questionnaire would be treated confidentially, not transferred to a third party and merely used for the research purposes of this study; no reference to you or your organization is mentioned in any part of this study. For the sake of anonymity, your email address or organization’s website will not be mentioned.

I appreciate your willingness if you could kindly share your expert opinion in enriching my doctorate dissertation. The questionnaire takes roughly about 20 minutes to complete.

Thank you in advance for your interest and assistance in this research,

Tareq Zeyad Al Ameri, MSc

DBA Programme,

College of Business and Economics

The UAE University

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PART - I
Demographic Information

1. Your academic qualification is:

Higher diploma Bachelor Master Doctorate Other

2. Gender: Male Female

3. Nationality: Emirati Arab Other

4. One of the following is best describing your current position:

Portfolio Manager Program Manager Project Manager Quality Assurance
Manager Strategic Planning Manager Project Coordinator Other role-

Please specify _____

5. Your work with this organization is:

Less than 5 years, 5-9 10-14 15 years and more

6. Your work experience in project management is:

Less than 5-years 5-9 10-14 15 years and more

7. The average number of the team members under your supervision is:

Less than 10 10-14 15-19 More than 20

8. Have you ever worked with the PMO, currently or previously?

Yes No

If yes, how many years? _____

PART - II

Type of your PMO Services

9. Does your organization host a PMO?

Yes

No

(If the answer is No, please do not proceed)

10. If yes, under which sector or department is the PMO adhered?

CEO General Manager Projects Sector Strategic Planning Sector

Other _____

11. The below statements could describe your organization's PMO functions. (You can select more than one functions)

Criterion	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Delivering project-related support services to an organization's division	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enabling processes to enhance management of organization's programmes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ensuring strategy alignment and benefits realization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supporting project work with relevant methodologies, standards and tools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outsourcing projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Considered as a temporary unit to supporting specific project/programme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Considered as a temporary unit to support specific programme / project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Name your Organization (Optional):

PART – III**PART - III****Execution of the Organization’s Strategic Plan**

This Part raises a question “*Was the proposed strategic plan of your organization executed successfully in the presence of a PMO entity?*”

Based on your work experience, kindly evaluate the effectiveness of each criterion that could be used in the measurement of a successful execution of the strategic plan

Criterion	Not Effective	Little Effective	Somewhat Effective	Effective	Very Effective
13. Meeting scope of the strategic plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Developing stakeholders trust and satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Completed within the estimated cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Achieved with timeline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Alignment of initiative outcomes to organization objectives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Meeting community needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART - IV

Roles and Functions of the Existing PMO Entity

Based on your experience with the project-related activities, please indicate the **effectiveness** of the PMO roles and functions in the success and performance of the project execution within the realm of organization strategic plan.

Roles	Not Effective	Less Effective	Somewhat Effective	Effective	Very Effective
Strategic Management					
19. Providing advisory services to the upper management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Participating in strategic planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Ensuring effective benefits management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Ensuring effective networking and environmental scanning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Development of Project Management Competencies & Methodologies					
23. Developing and Implementing standard project management methodologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Promoting project management culture within the organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Developing competency of project team including professional training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Providing mentoring for project managers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Providing a set of suitable tools as processes, procedures, templates, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring & Controlling Project Performance					
28. Reporting project status to the top management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Monitoring and controlling project performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Implementing and operating project information system (e.g., Primavera, PMIS, dashboard, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Developing and maintaining a project scoreboard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32. Supporting project governance functions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promoting Organizational Learning					
33. Conducting post-project reviews	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Conducting project audits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Establishing and managing database of lessons learned and document archives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Implementing and managing database of project risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Evaluating PMO performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multi-Project Management					
38. Coordinating between running projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Identifying, selecting, and prioritizing new projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Managing one or more portfolios and programmes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Allocating organization's resources between the running projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organizational Structure & Communication Improvement					
42. Establishing PMO structure related to organization needs and objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Strengthening communication with projects' stakeholders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Updating on the spot the project information correspondences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Assisting project continuity in transfer technology and innovative methods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project Value Sustainability					
46. Managing projects for maximum values delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Assuring projects' outcomes to be with social values of the community needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Delivering sustained values to organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART - V

This part is concerned with weighing the effectiveness of the following criteria that could be used as metric factors in measuring the success of the PMO implementation within the organization.

Based on your experience, weigh the following criteria in terms of the effectiveness

Criterion	Not Effective	Little Effective	Somewhat Effective	Effective	Very Effective
49. Tracking the project progress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Optimizing project schedule	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Prioritizing project portfolio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. Recovering delays in projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Choosing the right projects for the organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. Mentoring, coaching and training the projects teams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. Supporting the projects steering committees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Allocating the resources between the projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. Developing organizational learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. PMO being as a help-desk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. Communicating with internal and external stakeholders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Archiving & documenting lessons learned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

61. Relative to other organizations that using PMO concept, your organization performance is excellent in:

Criterion	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Service delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customer satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Projects success and efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organizational learning and culture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost, budget, and profitability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project management standards and methodology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

62. Should you have further comments and notes:

Thank you for your time and valuable participation