

**A Study on Impact of Change in Contractor's Project
Organization Structure on Project Performance**

دراسة حول تأثير التغيير في الهيكل التنظيمي للمقاول على أداء المشروع

**British University in Dubai
MSc Construction Management
BUID Faculty of Business**

Dissertation submitted in partial fulfilment of
MSc Construction Management

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October, 2016

DISSERTATION RELEASE FORM

Student Name Sameh Said Mohammed	Student ID 2013122149	Programme MSc Construction Management	Date October, 2016
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Abstract

Project organization structure is considered the most important tool that used by senior management of construction organizations for communication, staff evaluation, decision making and achieving the project objective. Moreover, introducing change in project organization structure during the project life cycle for any reasons whether in response to internal or external influences is perceived as one of the critical processes that influence on the project performance. Meantime, involvement of senior management in establishment, management and change management of the project organization structure are generally recognized as one of the important factors in determining its success, since the organizations use its various projects in order to achieve their goals and objectives. On the other side, U.A.E economy is considered from the most rapidly growing economies in the Middle East and the construction industry in U.A.E represents great portion of U.A.E economy which requires more focus to investigate the most problems related to this vital sector in order to gain the potential benefits behind growing this sector among other U.A.E markets.

The purpose of this study is to investigate a particular problem occurred in completed construction projects in U.A.E market. The problem appeared as a result of unnecessary changes and due to slow or inadequate response to change by senior managers in contractor's project organization structure. These unnecessary or inadequate changes had negative impact on the project management roles and responsibilities, additional cost and time impact. Furthermore, there were negative consequences on the performance of the project's team and their effort to create new ideas as well as their innovation inside the construction project that they are involved. The qualitative methodology is used in this study through investigating five case studies for construction projects that completed in U.A.E market along with extensive literature review that focused on the different sides of the problem as well as an interview with ten members of contractor's project management and senior managers to examine the impact of the problem on project performance and team effectiveness. The results of this study will be used to illustrate the recommendations and suggestions that may help in providing better solutions, in order to avoid such unnecessary changes in the future.

The major findings from this research indicate that establishment of contractor's project organization structure with clear and defined roles and responsibilities has positive impact on project performance and team effectiveness. Moreover, contractor's senior managers play an essential and a vital role in establishing and management the project organization structure,

consequently any unnecessary changes and slow or inadequate response to the project organization structure change will lead to negative impact on the project performance like increase the project activity reworks; weak communication between project team; increase of material wastages; time delay and cost overrun. Furthermore, the study shows that unsuitable change management by senior managers has considerable impact on the team effectiveness and coherence between the project team and also on their innovation.

On the other side, the research revealed the most common reasons behind the change in the project organization structure such as economical and financial market conditions; termination and resignation of staff; internal relocation due to internal priorities; clients and consultants request and improper establishment of project structure in the early stage of the project.

Keywords: Project organization structure; project organization structure change; Impact of change on performance; project organization structure change and innovation, the role of contractor's senior managers during change.

ملخص البحث

يعد الهيكل التنظيمي للمشروع الأداة الأكثر أهمية المستخدمه من قبل الادارات العليا لشركات البناء ، وذلك للتواصل بين قطاعات الشركة المختلفة ، وكذلك تعد أداة مهمة لتقييم الموظفين وصنع القرار وتحقيق أهداف المشروع. لذلك إحداث اي تغيير في الهيكل التنظيمي المشروع خلال دورة حياة المشروع لأي سبب سواء كان ذلك في استجابة لمؤثرات داخلية أو خارجية ينظر إليها على أنها واحدة من العمليات الحيوية التي تؤثر على أداء المشروع. وعلاوة على ذلك، يلعب الإدارات العليا في شركات المقاولات في تأسيس وإدارة التغيير في هيكل تنظيم المشروع عموما باعتباره واحدا من أهم العوامل في تحديد نجاحها، لأن المنظمات تستخدم مشاريعها المختلفة من أجل تحقيق أهدافهم وغاياتهم. من ناحية أخرى ، يعتبر الاقتصاد الإماراتي من الاقتصادات الأسرع نموا في الشرق الأوسط، و صناعة البناء والتشييد في الإمارات العربية المتحدة يمثل جزءا كبيرا من اقتصاد دولة الإمارات العربية المتحدة والتي تتطلب المزيد من التركيز للتحقيق في معظم المشاكل المتعلقة بهذا القطاع الحيوي من أجل الحصول على الفوائد المحتملة وراء تنامي هذا القطاع بين أسواق الإمارات الأخرى.

والغرض من هذه الدراسة هو دراسة مشكلة معينة وقعت في مشاريع مكتملة البناء في سوق البناء في دولة الإمارات العربية المتحدة. ظهرت المشكلة نتيجة لتغيرات غير ضرورية أو استجابة بطيئة للتغيير في هيكل المقاول التنظيمي بالمشروع من قبل كبار المديرين. وكان لهذه التغيرات تأثير سلبي على أدوار ومسؤوليات إدارة المشروع و بالتالي على أداء المشروع أيضا. وعلاوة على ذلك ، كانت هناك عواقب سلبية على أداء فريق المشروع و جهودهم لخلق أفكار جديدة وكذلك الابتكار داخل المشروع.

تم إتباع المنهج النوعي في هذه الدراسة من خلال دراسة خمسة مشاريع انشائية والتي أنجزت في سوق الإمارات العربية المتحدة جنبا إلى جنب مع مراجعة شاملة للدراسات السابقة التي تركز على جوانب مختلفة من المشكلة وكذلك مقابلة مع عشرة أعضاء من إدارة المشروع و كبار المديرين للشركات التي تم دراسة المشكله فيها لدراسة تأثير هذه المشكلة على أداء المشروع و فعالية الفريق. مع العلم انه سيتم استخدام نتائج هذه الدراسة لتوضيح وإبراز التوصيات والمقترحات التي يمكن أن تساعد في توفير أفضل الحلول، من أجل تجنب مثل هذه التغييرات الغير ضرورية في المستقبل .

النتائج الرئيسية من هذا البحث تشير إلى أن تأسيس هيكل تنظيمي للمشروع مع أدوار ومسؤوليات واضحة ومحددة له تأثير إيجابي على أداء المشروع وفعالية الفريق. بالإضافة إلى ذلك ، كبار المديرين للمقاول يلعبون دورا أساسيا وحيويا في تأسيس وإدارة الهيكل التنظيمي المشروع، وبالتالي أي تغييرات غير ضرورية أو بطء استجابة لتغير الهيكل التنظيمي لمقاول المشروع سوف يؤدي إلى تأثير سلبي على أداء المشروع مثل زيادة إعادة الأنشطة بالمشروع ؛ ضعف التواصل بين فريق المشروع ؛ تأخير بوقت المشروع وكذلك تكاليف إضافية . وتشير الدراسة أيضا إلى أن الإدارة الغير فعالة من قبل كبار المديرين لتغير الهيكل التنظيمي للمشروع لديها تأثير كبير على التماسك بين فريق المشروع وأيضا على الابتكار لديهم.

وكذلك فقد كشف البحث الأسباب الأكثر شيوعا وراء التغيير في الهيكل التنظيمي المشروع مثل ظروف السوق الاقتصادية والمالية؛ إنهاء و استقالة الموظفين؛ التنقل الداخلي على حسب أولويات المشاريع للشركة؛ وكذلك قد يكون نتيجة طلب الإستشاري أو المالك لتغيير أعضاء من الهيكل التنظيمي للمقاول لعدم كفاءتهم ، وأيضا قد يحدث التغيير في الهيكل التنظيمي للمشروع نتيجة مشاكل في إنشاء الهيكل التنظيمي في بداية المشروع.

الكلمات الرئيسية : الهيكل التنظيمي للمشروع ، تغيير الهيكل التنظيمي للمشروع ، تأثير تغيير الهيكل التنظيمي على أداء المشروع ،
تغير الهيكل التنظيمي للمشروع والابتكار ، دور الإدارات العليا أثناء التغيير

Acknowledgement

I would like to take this opportunity to express my appreciation and thankful to my dissertation supervisor **Professor Mohamed Dulaimi** for his support and help during my study in the British University in Dubai and his great effort and guidance during this dissertation. Moreover, I appreciate the effort and support of all staff and members of the British University in Dubai for their support during my study.

Many thanks to my wife and my daughter for their endless support and I would like to thank my mother, my mother in law and my father for their continuous encouragement all time.

I would like to appreciate also the support I received from all my class mates, my close friends and my work colleagues to complete my master degree.

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Abbreviations

U.A.E	United Arab Emirates
GDP	Gross Domestic Products
PMI	Project Management Institute
WBS	Work Break down Structure
Dhs	U.A.E Dirham
M	Million
P.P.P	Private Partnership Projects

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CHAPTER ONE

1. Introduction

Construction industry is a major industry around the world and shows importance to any nation's economy with GDP contribution ranges between 5-9%. On the other hand, UAE economy is considered from the most rapidly growing economies in the Middle East. The construction industry in UAE alone contributes 10.3% GDP of UAE economy in 2011 and projected to reach to 11.1% by end of 2015 with expectations to increase to 11.5% by 2021 (DUBAI CHAMBER, 2012) and illustrated by figure (1.1). This situation makes the construction sector in UAE as dominant for the UAE's economy development. This industry also significant not only in U.A.E but also in most of the countries globally which increase the necessity to focus on challenges face construction development.

Construction companies use different projects to achieve their goals, and these goals are adversely affected without effective management of the organization structure of different firm projects within the organization. According to PMI (2013), a project is defined as a temporary endeavour undertaken to create a unique product, service or result with definite start and completion, furthermore projects are often deployed as a way of directly or indirectly to achieve objectives within an organization's strategic plan, on the other hand project is considered another organizational forms that set out non-permanent systems for carrying out organization different jobs. The project management is the implementation of different tools, knowledge, skills and technique to the activities of the project in order to meet project requirements, and managing project team within adequate project structure is considered the most important topic.

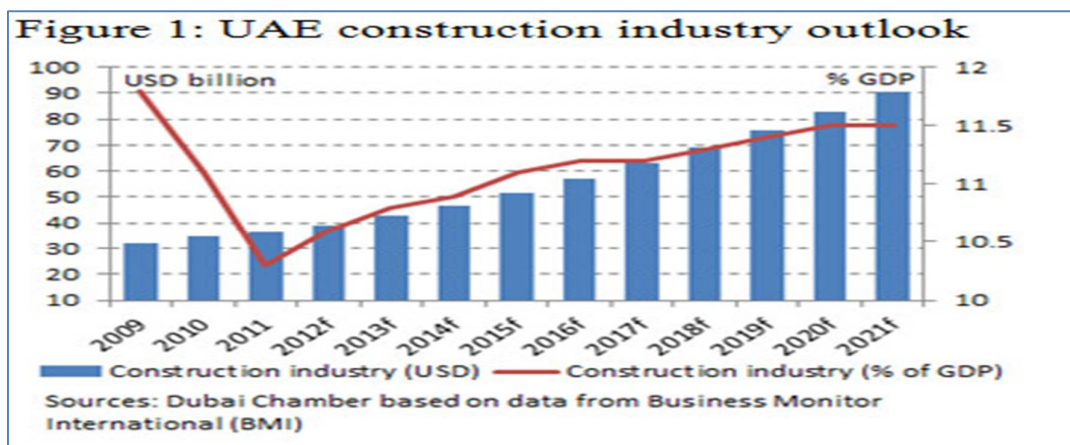


Figure (1.1): Trends for U.A.E Construction Industry (DUBAI CHAMBER, 2012)

1.1. Background and Statement of the Research Problem

Construction sector of many countries have recently undergone fundamental transformation, and this occur obviously in projects as construction firms use different projects to achieve their goals and objectives. Shirazi, Langford and Rowlinson, (1996) explained that one of the important roles of the top management in construction projects is to develop a project organization structure that suits the project environment and includes different project parties. Furthermore, top management involvement in establishment and management the project organization structure is generally perceived as one of the key factors in determining its success, since the organizations use different projects to achieve their objectives and goals, and the top management's influence on the organizational performance is attained from their responsibilities in developing and managing organizational strategies (Carmeli and Schaubroeck, 2006). Furthermore, a call for change by the top managers in the process that the construction industry uses to deliver its products and services has introduced new management initiatives within the sector in recent years.

On the other hand, establishment of adequate and suitable organization structure for any construction project according to the project requirements and environment is playing vital role for the project success and necessary to enhance completion of the project on time and also within the targeted budget. Furthermore, an effective project organization structure ensures the adequate and clear roles and responsibilities of the project team. Therefore, managerial decisions to change this structure during the project progress due to internal or external influences is very critical and would be impact negatively or positively on the project performance depending on many factors such as the time of change, level of change, number of members changed, the policy followed for change, firm organization structure and its support for the construction project as well as the type of the project structure. Meantime, the possible negative impact of changes in the project organization by firm management would lead to a lot of consequences such as role conflict and role ambiguity among project team; lack of communication between different site team; increasing of the site rework due to absence of full knowledge and project experience for the changed roles and positions and inadequate control on different project resources and increase of material wastage.

Since the above explained problem would have a negative impact on cost, time and project performance, hence it is helpful to study this problem in details to explore the different sides

of the problem and also to find out better solutions and recommendations to avoid unsuccessful decisions for change in the project structure of the construction projects.

1.2 Aims and Objectives

The main aim of this study is to study in details the impacts and consequences of the change in the contractor's project organization structure after the project start. Also study the factors driving these changes whether on the firm organization level or project organization level. On other hand, this research will study the different impacts of the changes on the different parts of the project and related consequences on the project performance and team innovation. Therefore, the following objectives will be investigated in details:

1. The role of top managers and project management team during establishment and change of project organization structure.
2. The reasons driving change in the project organization structure.
3. Impact of project organization structure changing on the project management roles, team dynamics, team innovation and the project performance.

1.3 Scope of the Research

This study aims to provide framework for the different sides of impact of contractor's project organization structure change on the project performance and the role of top managers during this change specifically their slow response and unsuccessful management of change in the project structure and its influence on project performance and team effectiveness. The qualitative research will be used in this research by studying five case studies of construction projects in U.A.E which had impact from changes in its project organization structure further to interview with members of project and top management of the case studies organizations to investigate the most factors drive their decisions for change in construction projects structures and its impact on the project performance. Conceptual frame works then will be developed as a result of extensive literature review.

1.4 Research Questions

The main focus of this research is to study impact of contractor's project structure changes on the project performance and the managerial decisions to response to that change. Therefore,

the following questions will be studied and developed to find out the different sides of the problem through the literature review, interview's results and the case studies of the research:

1. What is the significance of project organization structure on the project performance?
2. What is the top management role during establishment and change the project structure?
3. What are the factors driving change in project structure?
4. What are the impacts changing of roles and responsibilities for project management and subordinates on team innovation and project performance?
5. What is the recommendation to avoid negative consequences of change in project structure?

1.5 Research Structure

The research will be entails of six chapters as per the following structure:

Chapter One: represent background and problem statement which the dissertation based; aims and objective of the paper; scope of the research; the most research questions that will be studied and also the methodology used in this research.

Chapter Two: this chapter entails extensive literature review about the research topic such as top management role towards the project structure and impacts of the changes on the project performance.

Chapter Three: conceptual frame work will be developed in this chapter as a result of the literature review for the factors drive the change in organization structure and different impacts on the project performance.

Chapter Four: this chapter explains the study methodology and interviewees information.

Chapter Five: data collected from different case studies and interview results. Furthermore, these data will be analyzed and will discuss in details.

Chapter Six: represents the conclusion of the research and also recommendation to avoid or reduce the impacts of changes of project structure on the project performance. Also this chapter will contains limitation of the research with recommendation for future research.

1.6 Methodology

In this study, qualitative approach will be used which is convenient to the research problem and the data were collected through extensive literature review using published papers and articles to investigate the problem in details such as the role of top managers in setting out the basis of project structure and the impact of their roles on the project performance with study of the impact of changes in project structure on the project performance and project management roles. In addition to the literature review, five case studies for construction projects in U.A.E that exposed to changes in project structure to investigate the most common impacts of the change on the project performance. Meantime, interview will be conducted with project management members to investigate the problem in details further to interview with top management members to discuss their drivers for change in the organization structure.

CHAPTER TWO

Literature Review

In this chapter, extensive literature review pertain the research topic will be conducted to explain previous studies about the contractor's project organization structure and related changes during the construction.

2.1 Project Organization Structure: Definition and Types

The project is a temporary effort to construct a unique service or product and the project remain in align with the main strategic and procedures of the organization in order to achieve the business outcomes and objectives (PMBOK Guide, 2013). The project organization structure is considered as an important and critical part of any construction project. Therefore, many authors and scholars are defined and explained the project organization structure but all focused mainly on the relationships among members of the project as well as their clear roles and responsibilities.

2.1.1 Project Organization Structure Definition

Tetrick and Camburn (2004) defined the organization structure where individuals interact with each other in effective design chart that characterized for team structure, employment relationship, specialization and centralization which reflects the effectiveness of the organization structure parties. Furthermore, Tran and Tian (2013, p.230) illustrated the organization structure as arrangement of duties that required to complete a job. They added that organizations are constituted by group of people and teams in order to achieve certain objectives which one person cannot be achieve individually. The purpose of organization structure is to organize and create relation and mechanism between those groups to achieve the purpose it is established for.

On the other side, PMBOK Guide (2013) explained the project organization structure as a graphical display of the project members and the reporting relationship among them with the roles and responsibilities of each member. Furthermore, such structure can be highly or weakly details and may be formal or informal. Additionally, Ubani (2012, p.1284) defined the organization structure as a management framework in order to oversee the different construction activities of a project or any other organization's activities.

Similarly, ELKASSAS, HOSNY and MATTR (2013, p.411) defined the organization structural as a group of personnel who coordinate and communicate among them to meet their organizational or project objectives and such coordination and communication require clear understanding for each member's role and responsibility. They added that no good or bad organization structure but there is appropriate and inappropriate ones when they studied the optimum project organization structure during construction in Egypt. Meantime, Fassoula (2004, p.390) perceived the organization structure as the way followed for an organization to define the work groups, reporting and authority different relationships that communicate the groups and individuals together. Similarly, Mena (2012, p.182) reported that the organization structure is the process of project team design in hierarchical units based on the related work breakdown structure (WBS) as per figure (2.1). Furthermore, the main assumption made during this process is : (1) Job capacity and process time are well defined , (2) Full information about each workstation with skills of each job are available, (3) Splitting the work job is not acceptable, (4) Workstation is generally available, (5) it is obvious and understandable that supervisors or workstations would be added in any time.

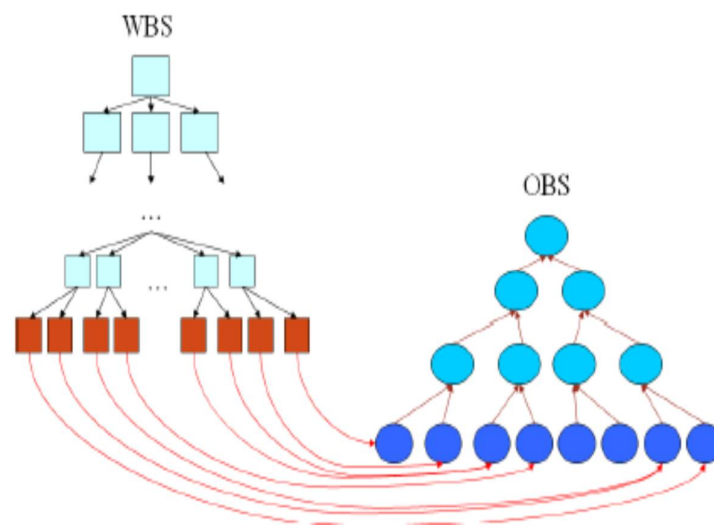


Figure (2.1): Mapping Work Breakdown Structure to Organizational Structure

(Fassoula, 2004)

2.1.2 Why Project Organization Structure is Important?

Project team in all levels play significant role for the project's success. Furthermore employees are the most significant assets in organization as they provide and support productivity and enhance the organization performance (Mehmood, Qadeer and Ahmed 2014, p.665). Tatum (1986, p.259) confirmed that design of project organization structure adds means of positions requirements, coordination and location of decision-making. On the other hand, Nahod and Radujković, (2007) stated that organization structure is playing vital role in the daily organization functioning. Furthermore, organization structure is considered as a dynamic element of the organization and contains all parts and integrates the use of all resources. additionally, Elsaid and Abdelghaly (2013, p.1) highlighted that organization structure process organizes people and their positions to accomplish the works to meet the goals set out and the relationship between the positions and people are illustrated graphically in an organizational structure that defines the roles, responsibilities, reporting relationship, task allocation and coordination. Simultaneously, Nahod and Radujković, (2007) affirmed that there are three main attributes of the organization structure that impact positively on the organization performance:

- **Flexibility:** Flexible enough to change in order to meet the different environmental factors needs.
- **Efficiency:** to optimize time, cost and effort.
- **Coordination:** Coordinate the various tasks, outputs and easy flow of information.

Jensen, Johansson and Löfström (2013, p.122) considered the project organization design as a policy tool of temporary organization to achieve the organization policies and objectives and its interaction with the permanent organization. Meantime, it is critical for project organization structure to fit with overall organization governance structure when it used as policy tool. Furthermore, when this fit achieved, there will be kind of congruent rules and procedures for coordination, communication and integration between the project organization structure and organization structure and if such congruent is missing and isolated. Then the project organization will be become like foreign body and policy will not be implemented (Jensen, Johansson and Löfström 2013, p.135).

2.1.3 Types of Project Organization Structure

Projects can be organized in different ways and each project is established and organized in the way that achieves effective and efficient accomplishment for the constructed project as each project has its unique characterises. Furthermore, having appropriate project organization structure is considered an important factor which affect the resource's selection and availability and therefore, organization structure influence how the projects are conducted. PMBOK Guide (2013) explained different organization structure types and its influence on the projects as per the following:

2.1.3.1 Functional Organizational Structure

In this structure, each staff has one direct clear superior and project components are managed by functional managers as shown in figure (2.2). ELKASSAS, HOSNY and MATTR (2013, p.411) defined the functional organizations as traditional organization to perform ongoing works and focuses on the functional disciplines. They added that, functional organization structure best used in routine works and to maintain the organizational standards. On the other hand, Anand and Daft (2006, p.330) explained that activities in functional structure are grouped by joint function from the bottom to the top of organization. Furthermore, project manager role in this structure is focusing on coordination. Moreover, Payne (1993, p.239) stated that functional organization is suitable for single line operations but not easy to support for coordination which is essential to enhance the project performance. The following are the main advantage and disadvantage of using functional organization structure:

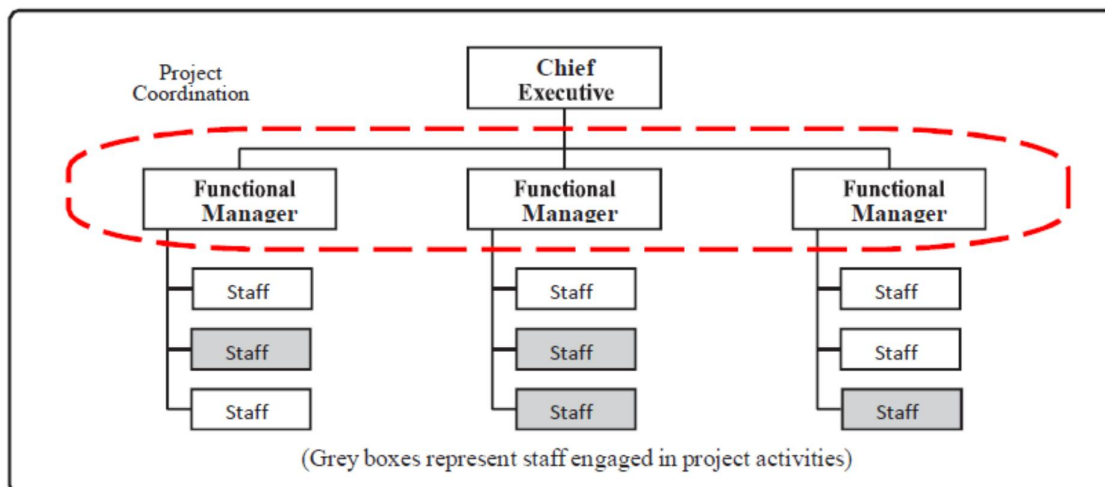


Figure (2.2) Functional Organization (PMBOK, 2013)

1. Functional organizational structure advantage

The following table (2.1) is showing the primary advantage of functional organization structure:

S/N	Advantage	Reference
1	The team members are familiar with each other	Dumitru (2011 p.196) & Youker (1977, p.46)
2	Compatibility with organization objectives and procedures	Dumitru (2011 p.196) & Youker (1977, p.46)
3	Team members tend to bring applicable knowledge and experience to the project.	Dumitru (2011 p.196) & Youker (1977, p.46)
4	Individuals in function structure can be support various projects of same type.	Taylor (2006, p.182)
5	Members have advanced path of career due to their extensive expertise.	Taylor (2006, p.182)
6	Suitable for small organizations	Nahod and Radujković, (2007)

Table (2.1) Advantage of Functional Organizational Structure

2. Functional organizational structure disadvantage

Table (2.2) listing the dis-advantage of functional organization structure:

S/N	Dis-Advantage	Reference
1	Limited authority for the project manager	Dumitru (2011 p.196) & Youker (1977, p.46)
2	The project team members less loyalty to the project	Dumitru (2011 p.196) & Youker (1977, p.46)
3	The daily needs of the organization is dominate the resource allocation	Dumitru (2011 p.196) & Youker (1977, p.46)

4	It is not clear who is in charge in the project.	Taylor (2006, p.182)
5	For large and complex projects. It is difficult to have the enough coordination.	Taylor (2006, p.182)
6	Functional organizations tend to pose the competition between team which create lack of team work and non-cooperative atmosphere between different teams.	Taylor (2006, p.182)
5	Response to the different environmental changes is slowly.	Nahod and Radujković, (2007)
6	Low tendency of innovation	Nahod and Radujković, (2007)

Table (2.2) Disadvantage of Functional Organizational Structure

2.1.3.2 Matrix Organizational Structure

According to PMBOK (2013), matrix organizational structure is mix of projectized and functional characteristics and is classified into three forms (weak, balanced and strong). Weak matrix is maintain most of the functional organization characteristics and the role of the project manager is more about coordination with less power and authority to enforce decisions in the projects, while the balanced matrix does not give the project manager with full power inside the projects. On the other hand, strong matrix is giving the project manager with full power to manage staff in projects with characteristics almost similar with projectized organization. Hobday (2000, p.871) argued that matrix organizations are strongly suited to perform the routine tasks and enhancing the organization technical learning developments across all projects. Please refer to figures (2.3) & (2.4) & (2.5) for the forms of matrix organizational structure. The followings are the advantage and disadvantage of matrix organization structure.

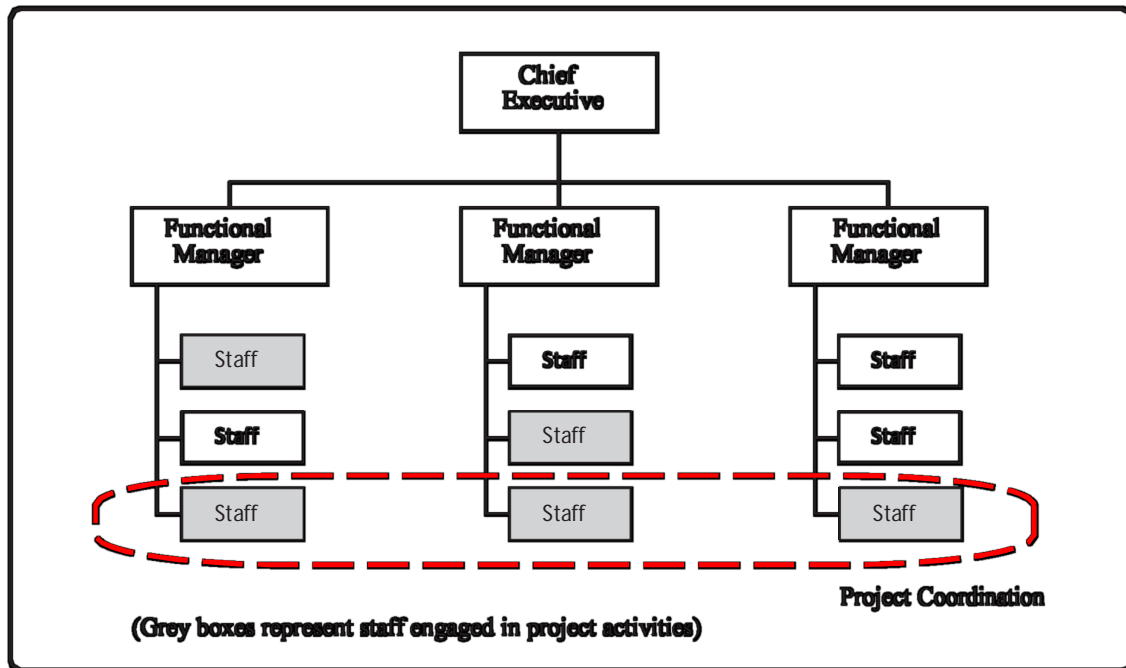


Figure (2.3) Weak Matrix Organization (PMBOK, 2013)

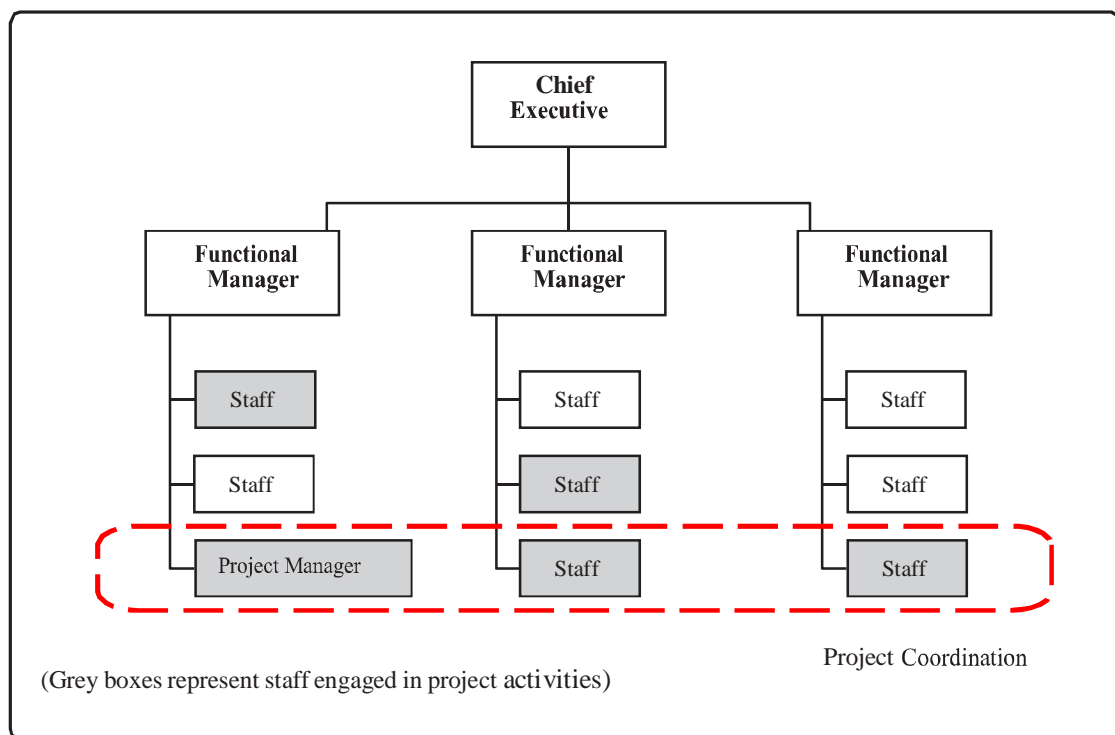


Figure (2.4) Balanced Matrix Organization (PMBOK, 2013)

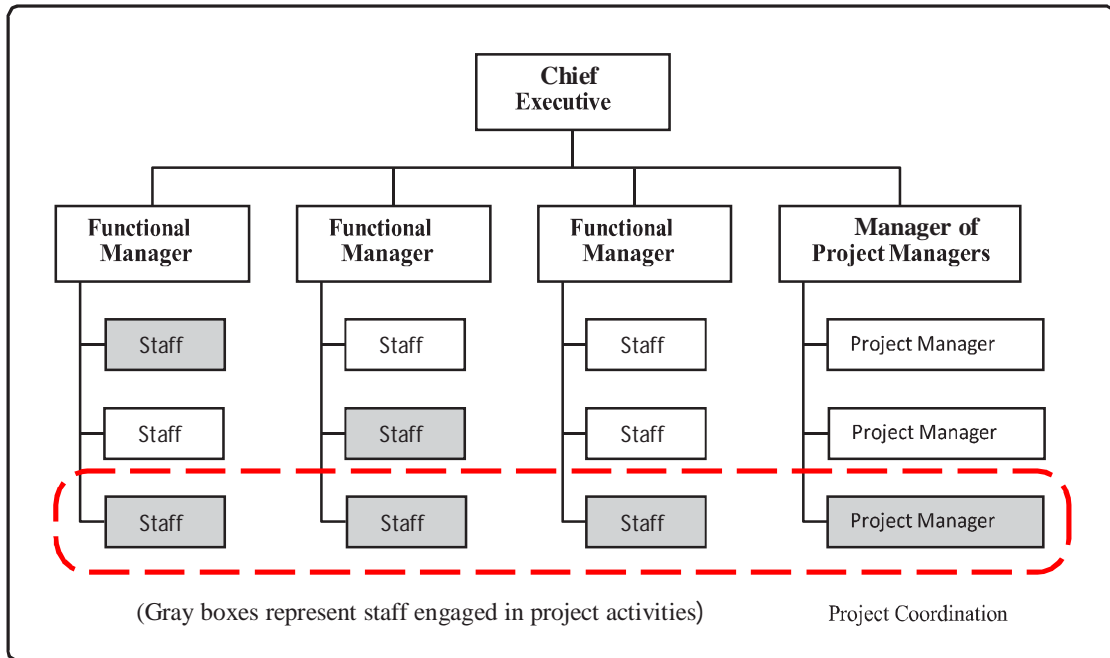


Figure (2.5) Strong Matrix Organization (PMBOK, 2013)

1. Matrix organizational structure advantage

Please refer to the following table (2.3) for the advantage of matrix organization structure:

S/N	Advantage	Reference
1	Efficient resources allocation that cannot utilized by one project	Dumitru (2011, p.196) & Youker (1977, p.46)
2	Compatibility between the project and organization objectives and procedures.	Dumitru (2011, p.196) & Youker (1977, p.46)
3	Customer focused and the project is emphasized.	Taylor (2006, p.182)
4	The project can draw from support staff as needed.	Taylor (2006, p.182)
5	High level of communication and integration	Nahod and Radujković, (2007)
6	Suitable for projects with complex decisions and unstable environment.	Nahod and Radujković, (2007)

Table (2.3) Advantage of Matrix Organizational Structure

2. Matrix organizational structure disadvantage

Matrix organizational structure also has some disadvantage which stated in table (2.4):

S/N	Dis-Advantage	Reference
1	The staff may have more than one reporting manager	Dumitru (2011, p.196) & Youker (1977, p.46)
2	The power and decision-making are shared by the project manager and organization function managers	Dumitru (2011, p.196) & Youker (1977, p.46)
3	It is not always clear who is in charge in the project in matrix organizations.	Taylor (2006, p.182)
4	The weakness or strength of the project is based on the strength of the project manager.	Taylor (2006, p.182)
5	Staff involved need high levels of skills and also extensive training.	Nahod and Radujković, (2007)

Table (2.4) Disadvantage of Matrix Organizational Structure

2.1.3.3 Projectized Organizational Structure

This structure commonly used in construction projects in U.A.E which is opposite to the functional structures as shown in figure (2.6). Projectized organization structure is a project focused structure where the project managers have enough independence and authority to manage the project resources and different teams inside the project. Furthermore, project team is specifically assigned to the project and report directly to the project manager and the same also affirmed by Hobday (2000, p.875) when stated that project manager in project based organizations is typically has direct control over resources and personnel. Hobday (2000, p.871) added that project based organizations is ideal and suited for project complexity, coping with project risks and changing in the client needs. Additionally, project based organization is potentially foster the team innovation and promoting efficient leadership during the project cycle. On the other side, ELKASSAS, HOSNY and MATTR (2013, p.412) articulated that projectized organization structure focuses strongly on the project and designed

for isolated kind of works as per the following advantages and disadvantages for using the projectized structures.

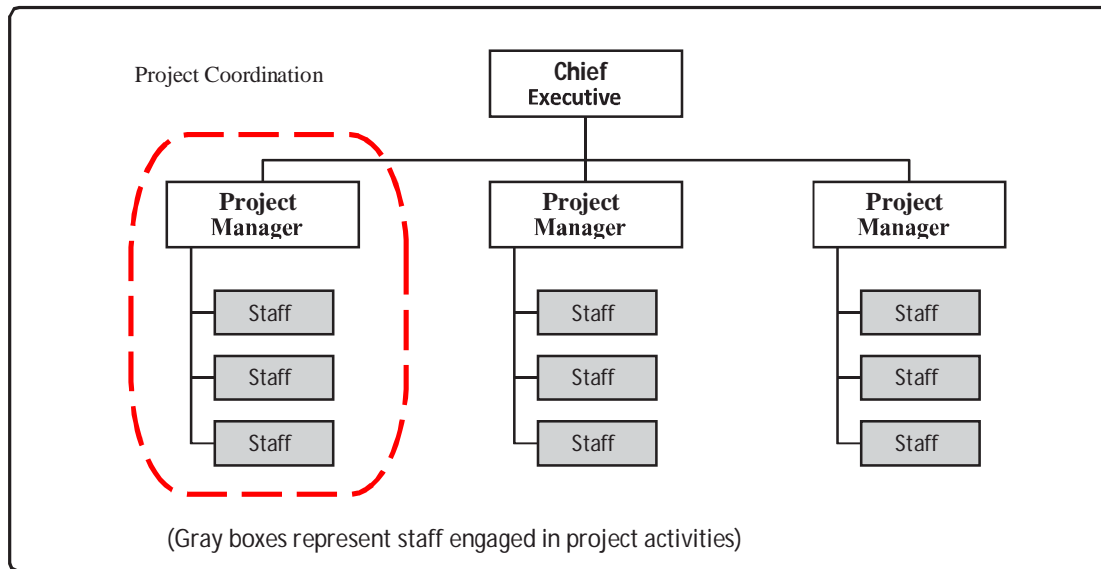


Figure (2.6) Projectized Organization (PMBOK, 2013)

1. Projectized organizational structure advantage

The following table (2.5) is showing the primary advantage of projectized organization structure:

S/N	Advantage	Reference
1	Team strong involvement in the project	Dumitru (2011, p.196) & Youker (1977, p.46)
2	The team is fully controlled and directly managed by the project manager	Dumitru (2011, p.196) & Youker (1977, p.46)
3	Communication between the project manager and team is direct.	Dumitru (2011, p.196) & Youker (1977, p.46)
4	Problems solving and decision making is faster	Dumitru (2011, p.196) & Youker (1977, p.46)
5	The project is customer focused in this type.	Taylor (2006, p.182)

6	The organization structure supports the holistic approach of the project management.	Taylor (2006, p.182)
7	Suitable for large organizations with various projects	Nahod and Radujković, (2007)
8	Suited for projects with unstable environment and exposed to rapid change.	Nahod and Radujković, (2007)

Table (2.5) Advantage of Projectized Organizational Structure

2. Projectized organizational structure disadvantage

Further to the above mentioned advantage for using projectized organization structure. Table (2.6) listing disadvantage for the projectized organization structure as per the following:

S/N	Dis-Advantage	Reference
1	The incompatibilities between the organization's and project's procedures and objectives.	Dumitru (2011, p.196) & Youker (1977, p.46)
2	Differentiation in staff skills and experience from project to another	Dumitru (2011, p.196) & Youker (1977, p.46)
3	Duplicating the support functions increase the cost of projects.	Taylor (2006, p.182)
4	Team tends does not want the project to end and that may effect on the project completion.	Taylor (2006, p.182)
5	Project would be isolated from other projects in the organization.	Nahod and Radujković, (2007)

Table (2.6) Disadvantage of Projectized Organizational Structure

On the other side, some organizations sometimes use composite structure which mixes of any of above explained structure. However, the following table (2.7) summarizes the differences between the various organization structures in terms of:

- Project manager authority
- Resources availability
- Who manage the project budget
- Project manager's role
- Project management administration staff

<div> <div>Organization Structure</div> <div>Project Characteristics</div> </div>	Functional	Matrix			Projectized
		Weak Matrix	Balanced Matrix	Strong Matrix	
Project Manager's Authority	Little or None	Low	Low to Moderate	Moderate to High	High to Almost Total
Resource Availability	Little or None	Low	Low to Moderate	Moderate to High	High to Almost Total
Who manages the project budget	Functional Manager	Functional Manager	Mixed	Project Manager	Project Manager
Project Manager's Role	Part-time	Part-time	Full-time	Full-time	Full-time
Project Management Administrative Staff	Part-time	Part-time	Part-time	Full-time	Full-time

Table (2.7) Various Organization Structures (PMBOK, 2013)

2.2 Influencing Factors in Selecting a Project Organization Structure

Selecting the best and suitable organization structure for the project is considered critical issue not for establishment of project organization structure only but also for the project success at all. Furthermore, construction projects are projects with special nature and therefore it deserves effective organization structure (Ubani 2012, p.1285). Additionally, selecting the suitable organization helps the organization to achieve its objectives and goals (Nahod and Radujković, 2007).

Payne (1993, p.240) clearly stated that “Incorrect project structures lead to frustration, low morale and poor motivation. It is essential to get the choice of structure as near correct as possible”. Furthermore, Dumitru (2011, p.186) addressed that “Choosing an appropriate structure for the project to be implemented is not only necessary, but, moreover, may prove fatal to the extent that is not obtained”. He added that constructing project structure process should be related to its future structure and both components are influencing each other in both directions. The followings are the primary factors influence selection of the project organization structure:

2.2.1 Uncertain Project Environment

Nogueira and Raz (2006, p.5) stipulated that managers responsible for organizational projects face double challenge as the environment where they operating is becoming more changeable, uncertain and also continuous technology’s development which require more flexible team structure to face the change in the project’s environment. Furthermore, Nogueira and Raz (2006, p.8) concluded that in uncertain project environments and when the project goals and tasks are not fully defined, the flexible organization structure (loose organization structure) is suitable to maintain dynamic response to the changes in tasks and goals. Meantime, Tatum and Fawcett (1986, p.51) highlighted that the project situation such as project goals, external influences, design and work technology and project phase outline which suitable organization structure is to follow

2.2.2 Project Nature

Tatum (1984, p.346) revealed that some projects have degree of complexity and an expanded scope comparing to its predecessors which need for effective structuring of project organizations. He added that project performance requirements such as quality; cost; schedule and safety goals are generally define the most optimal project organization to be used and managers systemically evaluate the project situation and based on this, they tailor the project organization to achieve the project goals. On the other side, Cheng et al. (2003, p.70) articulated that the complexity and size with long duration of constructed projects are essential factors when select the relevant suitable project organization structure which need to improve the communication between different project team efficiently due to the various working interfaces and diversified project members.

Middleton (1967, p. 73) added that projects with long time duration, definable and specific goals, unique to the organization, complex in task accomplishment and projects that critical to the organization because of certain threats and losses are all strong reason that make the management pay special attention for the project organization while projects with short durations with a few weeks or months are require less management attention and accomplished with minimum task force. Furthermore, Elsaid and Abdelghaly (2013, p.1) argued that selecting the best organization structure is depending on many factors such as the size of the work to be performed, organization size of employees and availability of the organization's resources.

2.2.3 Internal Organization Procedures and Considerations

Each construction organization has its own procedures and considerations and firms should asses the nature of the project and its requirements before establishment of the project organization (Middleton 1967, p.82). Furthermore, Middleton (1967, p.79) highlighted the cost consideration during the selecting process of project organization which depending on its size and the extent of introducing new facilities and resources needed. On the other hand, Youker (1977, p.50) listed some factors to help in the selection of the appropriate structure according to certain organization, project condition, with particular environment as shown in figure (2.7). He also highlighted some additional factors to be considered during the selection process such as:

- ❖ Define the relationship between the project manager skills, organizational design and project planning and reporting procedures inside the organization.
- ❖ The ways available to improve coordination and team commitment especially in functional structure.
- ❖ Define the variation between the different structure and advantage of each one and previous experience with each one.

<p style="text-align: center;">Figure 5 Criteria for Organization Design Decisions</p>			
	Functional	Favors Matrix	Project
Uncertainty	Low	High	High
Technology	Standard	Complicated	New
Complexity	Low	Medium	High
Duration	Short	Medium	Long
Size	Small	Medium	Large
Importance	Low	Medium	High
Customer	Diverse	Medium	One
Interdependency (Within)	Low	Medium	High
Interdependency (Between)	High	Medium	Low
Time Criticality	Low	Medium	High
Resource Criticality	Depends	Depends	Depends
Differentiation	Low	High	Medium

Figure (2.7) Criteria for Organizational Design Decisions (Youker, 1977)

2.3 Factors Impact on the Design of Project Organization Structure

Tatum (1986, p.271) concluded that specific large and complex projects create challenges to organize such projects. He added that factors such as external influences and differences in work operations are commonly require applying kind of expanded views of organization while designing the project structure. Meantime, Brooks (1999 cited in Fassoula 2004, p.390) explained six essential elements to be considered during the designing the organization structure as following:

- ❖ **Centralization:** It is about the authority for decision- making and normally rests with the top management of the organization.
- ❖ **Differentiation:** It consists of vertical and horizontal differentiation, vertical differentiation represent the different levels of authorities. On the other hand, horizontal differentiation represents the different organization divisions.
- ❖ **Integration:** It is refer to the coordination and coordination between vertical and horizontal organization hierarchy.

- ❖ **Specialization:** It refers to the roles and responsibilities of project members and relation with other project groups engaged.
- ❖ **Formalization:** The rules and procedures of organization being followed inside the organization.
- ❖ **Span of Control:** It refer to the number of members that a manager can be manage

Meantime, Tran and Tian (2013, p.232) studied six influential factors that impact on design the organization structure such as

- ❖ **Decentralization of Decision-Making:** This focus on the center of power and authority at the top of organization.
- ❖ **Customer Interaction:** It refers to concentrating on the implementation of customer interaction.
- ❖ **Value of Innovation:** This more about how the organization structure fit with the quality and time of the project.
- ❖ **Marketing Consideration:** It addresses the technology and new application used to fit with the market consideration.
- ❖ **Intensifying Competition:** This about how the characteristics of Organization structure design are related with the competitive environmental of a firm.
- ❖ **Liberalization of the Economy:** It about how the organization structure response to the technology transfer and technological change.

On the other hand, Slinger and Morrison (2014, p.20) focused on the “people” data when design the organization structure. They argued that data such as personnel salaries, experience, skills, project preference, daily productivity, working time and location are all important data when design organization structure as it influences the quality of outcomes and help to solve out the change in design problems.

2.4 Establishment of Project Organization Structure

Establishment of suitable project organization structure has been gaining importance in recent years from organization's and project's management. Therefore, there are many considerations should be taken by managers in the time of establishment of project organization structure.

2.4.1 Considerations before Establishment of Organization Project Structure

Levitt (2012, p.14) explained in details the benefits from establishing virtual design team as a tool to help the managers to design the organization structure and project team involved in large scaled projects to execute their projects smoothly and rapidly. Meantime, Youker (1977, p.50) focused on the communication between different project team including managers during establishment of project organization as effective tool to be considered. Additionally, Nahod and Radujković, (2007) highlighted some facts should be considered before establishment of the organization structure such as:

- No perfect organization structure.
- The probability of failure of organization structure is very high without selecting the right structure with the right people.
- Complex organization structure is taking long time for establishment.
- Role clarity is very significant in the organization structure which helps also to shorten the time of transition from current organization to future one.
- Preferred organization structure is recommended to be implemented once it is established.
- Iterative organization structure will be ideal if the right people or processes are not available which need for suitable course of action by the organization's management.

Simultaneously, Ubani (2012, p.1295) concluded that in order to build effective organization structure, it is recommended to have the followings:

1. Define the level of authority and sufficient flow of information in the organization structure.
2. Identify the different project's groups and skills required to do the work properly.

3. Assign enough training and team development to get the right qualified team that required for project success.
4. Grantee enough flow of communication and flexibility between the project team.
5. Focus on the consciousness and team orientation for the quality outcomes.

Moreover, Middleton (1967, p.75) added that the project organization must take into consideration the following responsibilities to be able to fulfill total control over the project:

- Define standards for quality and performance
- Allocate tasks and assign funds to all groups performing the project tasks.
- Coordinates for analysis of the firm capabilities and capacities and hence help in selection of sources and services.
- Coordinate the schedule requirements to develop project schedule.
- Establish reporting system through over the project.
- Identify risks impair project success and set actions for solutions.
- Identify project change control system over the project duration.
- Maintain understanding for customer requirements and satisfaction.

2.4.2 Establishment of Project Organization Structure

Lunenburg (2012, p.2) explained Mintzberg's framework which focused on the key parts of any organization structure which mainly focused on the following parts as per figure (2.8)

- ❖ The strategic apex is the top management of the organization.
- ❖ The operative core is the organization employees who carry out the tasks.
- ❖ The middle line is including for the medium and lower management levels such as project management and supervisors.
- ❖ The techno structure is analysts such as engineers and planners.
- ❖ The support staff which including the staff who give indirect support and services.

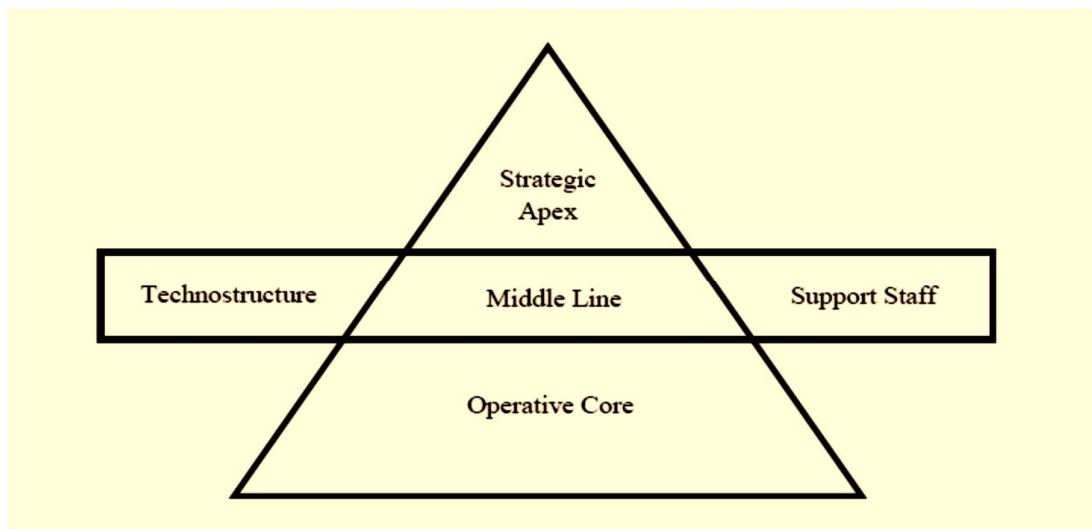


Figure (2.8) Key Parts of Organizational Structure (Lunenburg, 2012)

Cheng et al. (2003, p.72) demonstrated that importance step to develop project organization structure is to study the project details, characteristics, scale, construction methodology and project conditions to determine reference to select the suitable team members and consequently the optimal organization structure to complete the project successfully. They added that the next step to develop project organization structure to create the work break down structure (WBS) which designed to describe the work elements in details in logical hierarchy and levels. According to the prescribed WBS, the project organization structure then identified and project team is assigned. They also emphasized on the effective role communication between different levels of the structure which should be properly identified.

Meantime, Tatum (1986, p.271) explained eight steps to maximize the project performance during establishment of project organization structure:

- Defining the project objectives
- Defining the line management organizations
- Providing means of coordination
- Selecting the size of the project within the organization
- Designing the project groups
- Defining the planning and monitoring procedures
- Locating the decision-making
- Defining the requirements for each project position

On the other side, Tatum and Fawcett (1986, p.51) focused on some basics steps that should be considered when establishing effective project organization like:

- ❖ Set up clear responsibilities between the external interfaces and different project stockholders.
- ❖ Establish definite responsibility at the lowest practical levels of the organization.
- ❖ Integrate different project disciplines such as planning, engineering and construction with the available material resources in the lowest level of the organization.
- ❖ Implement and enforce the different discipline's priorities with the different construction phases of the project.
- ❖ Maintain clear and effective communication and reporting tools and relationships.
- ❖ Maintain effective use of available resources and management support for the project.

2.5 Influence of Project Structure on the Project Performance

Ling, Dulaimi and Ho (2012, p.235) concluded in their study about construction projects in U.A.E that a lot of projects in UAE are typically face cost and time overrun which mainly the human resources, project management and environmental factors are the main causes of such failure in the satisfactory levels. They emphasized that selection the right personnel from the start of the project is critical step for the project success to a large extent as it builds strong work relationship between the different project team and in all project levels. While, Dumitru (2011, p.186) pointed out that “Choosing an appropriate structure for the project to be implemented is not only necessary, but, moreover, may prove fatal to the extent that is not obtained”.

For the above critical reasons, establishment of suitable project structure is considered critical process as it has great impact on the project performance as well as project success as per following impacts:

2.5.1 Project Team Effectiveness

Murray et al. (2000, p.11) concluded when they investigated the project organization design for twelve construction projects in Scotland that effective communication and group interaction are generally related with team effectiveness and interaction between project members which impact positively on the job satisfaction and project performance. On the other hand, Rizzo, House and Lirtzman (1970, p.150) claimed that the organization structure shows the authority hierarchical from top to bottom and should be clear in order to meet members satisfaction and organization target goals.

Cheng et al. (2003, p.70) focused on the coordination and communication between different project members during the long duration of the project as important factors in selecting the suitable project structure which are vital for smooth project execution. On the other side, Nahod and Radujković, (2007) pointed out that the organization structure help to:

- ❖ Set out the relationship and reporting relation between the supervisors and subordinates.
- ❖ Determines the mental and physical vicinity between different teams and groups.
- ❖ The speed and frequency of the communication between different parties.
- ❖ Identification of decision – making parties.
- ❖ Guarantee the flow of information between all stockholders.

2.5.2 Internal Organization Effectiveness

Jensen, Johansson and Löfström (2013, p.122) emphasized that project organization is critical to fit into the overall governance organization structure and highlighted that projects are temporary organization and described it as policy tool for the permanent organization by having rules for coordination and interaction between both organizations to avoid isolating the projects. Furthermore, Middleton (1967, p.75) added that project organization can provide the necessary control on the functional weakness in company departments which could obstruct successful completion for the project.

Similarly, organization structures have critical impacts on the projects as it is concerned with the design of the authority relationship inside the organization. They emphasized also that organization structure and correlated design have proven for its critical effect on the project's effectiveness and success (Petro and Gardiner 2015, p.4).

2.5.3 Achieving Project Consistency and Goals

Tatum (1984, p.346) pointed out that effective structuring of project organizations assists in decision-making activities and to meet the unique project predefined goals under different project situations which increase the project performance. Meantime, Stare (2011, p .9) stated that project organization structure is means to avoid or to reduce the potential conflicts during the project life time. Moreover, Middleton (1967, p.73) illustrated that the main objective of

project organization structure is to complete the project within the targeted cost, time and established standards goals.

Simultaneously, Shirazi, Langford and Rowlinson, (1996, p.199) articulated that the organization structure can shape the relationship between different parties of the project such as subcontractors and specialized contractors through organizing the people involved in the project. In order to have effective structure, the project organization structure should link the tasks, technology and the human in formal or semi-formal means to complete the project according to its predefined objectives. Furthermore, Pérez and Fernández (2010, p.83) demonstrated that the organization structure is determine the way of communication between different parties that enhance the project performance and reduce the conflict which may be raised.

2.5.4 Build Clear Tasks

Linking the resources to the projects and clarify task are important in the initial stage of any project as it may affect the project performance. Moreover, tasks assigned to people in projects are very important in development of any temporary organization (e.g., projects) as creation of projects is motivated by a task that should be completed (Lundin and Söderholm 1995, p.440). Additionally, Ubani (2012, p.1284) highlighted that organization structure express about the management's framework to oversee the activities of the construction projects. He added that the suitable organization project assist for efficiency and effectiveness of the project management team to achieve the high performance of tasks as well as the objectives of the project.

2.6 Management roles and responsibilities towards project organization

Top management support towards the projects has been considered the most pivotal factor that necessary for the success of projects (Elbanna 2013, p. 278; Zwikael 2008, p.498). Furthermore, Hambrick and Mason (1984, p 193) stated that both strategies and effectiveness of organization are reflection of the powerful actor of its top managers. On the other hand, Dutton and Duncan (1987) confirmed that management in organizations playing important role to define the development plans which influence the organization's strategies to strongly link between the firm and its external environment.

2.6.1 Top management role during project organization establishment

Top managers in construction organizations use the project organization structure to control project's performance and work flow. Therefore, they playing significant role during the establishing and maintaining the project organization over the project span to meet their needs and organization's objectives. Furthermore, designing effective project organization by managers can increase the potential for optimum levels of project performance (Tatum 1984, p.346). Simultaneously, Shirazi, Langford and Rowlinson, (1996, p.199) explained that one of the important roles of the top management in construction projects is to develop a project organization structure that suites the project environment and includes different project parties. Furthermore, Stare (2011, p.18) concluded that top management's attitude and priorities of the projects among the most influential factors that enhance towards the project success.

García-Carbonell, Martín-Alcázar and Sánchez-Gardey (2015, p.69) explored the top management ability to identify the core employees and influence of the human capital on the organization performance. They emphasized that the strategic connections of the primary employees' identification procedures require effective role and support of the top management. On the other side, Tran and Tian (2013, p.234) pointed out that designing suitable organization structure helps the top management to find and identify the talents to be added to the organization which have positive impact to meet the company's objectives and goals. Tran and Tian (2013, p.230) also highlighted that organization structure plays important role to direct the competence of work and to coordinate between the top management and subordinates team.

Tatum (1984, p.353) argued that managers apply their experience and adapt previous experience to decide the structure to use in meeting the project objectives and increase the potential for innovation in structuring. He added that the main objectives of use manager's past experience are:

- ❖ Divide the works into “manageable pieces” in order to overcome on prior problems of overloading so it easy to manage the subordinates.
- ❖ Fully define the authority and responsibilities in order to avoid confusion of responsibilities in previous experienced projects.

- ❖ Group the team in units based on specialization to avoid previous problems in work coordination.
- ❖ Establish checks and balances for different work activities to help in meeting the project goals and objectives.
- ❖ Use the experience in selecting designated positions.

Moreover, he added that managers play significant role during establishing the organization structure by define the objectives statement and develop of alternative structure in either initial structuring or project reorganization process. Furthermore, Tatum (1984, p.351) investigated five models used by managers for decision making for effective establishment of organization structure:

- ***Adaptation Model:*** Manager use this model based on previous learning process to avoid past problems and focused on trial and error in designing the organization structure.
- ***Behavioral Choice Model:*** Mangers decision making based on behavioral process and focus on accepting satisfactory solution rather than optimal salutations.
- ***“Garbage Can” Model:*** This model used in case of unclear roles and objectives. Decision making is not linked with problems requiring choices but managers adopt solutions which are not correlated with the current problems.
- ***Political Model:*** Managers concentrate in this model of decision making on the powerful actors in the organization to meet their goals.
- ***Rational-Contingency:*** Managers use this model to meet the project goals and decision making process involve complete analysis and adequate information with contingency variables.

2.6.2 Project Management as a Key Influential Factor in Project Organization

The role of project managers in construction industry development is very important in driving the whole construction industry for success and development. Moreover, project managers often become managers and conduct the decision making and setup policies in their organizations and related projects. On the other hand, project managers also can be extended to drive change to continue develop their organizations and projects (Hills et al. 2008, p.7).

Tatum (1984, p.355) stated that project manager also can play vital role to assist top managers in organization structuring by using their experience to transfer previous experiences in different project organization structures to develop and enhance tools in designing of project structure which could result for better structure. Additionally, Youker (1977, p.50) focused on the role of project manager during the organization design and mentioned that it is not possible to finalize the project organization structure without initially selecting the project manager. He added that project manager should combine both management as well as technical knowledge in order to be able to lead the project team.

On the other hand, Taylor (2006, p.191) indicated that project manager understanding for the project organization structure types and his or her awareness of its advantage and disadvantage help to maximize apply their project management tools and techniques. Furthermore, Vann (2004, p.58) stated that “Project management reflects a philosophy of efficiently accomplishing a finite goal and moving on to another project”.

Moreover, Zwikael (2008) concluded that selecting the qualified project manager for the project and his communication with the organization are among the critical success factors of the project success. Likewise, Tabish and Jha (2012, p.1131) pointed out that the aim of project manager in any construction project is to ensure the successful outcomes of the project and to achieve the project’s goals and objectives. They added that human factors and management action are main traits factors to achieve the project success. Meanwhile, Middleton (1967, p. 78) illustrated that project manager is selected by the top management and he is playing vital role during establishment of the project organization structure by defining the functions and responsibilities and getting the team needed to complete the project successfully. Therefore, project manager should have leadership capabilities and administrative experience to manage the project probably and to create applicable and effective organization structure.

On the other hand, Taylor (2006, p.180) asserted that project manager has no influence on the way the organization is structured but project manager has significant role on the project. Furthermore, project manager need to understand the project organization structure for the following reasons:

1. Project organization structure help the project manager to easy manage the project.
2. Easy interfacing with management and function managers.
3. Project organization structure defines the line of authority so it is easy to project manager to communicate with the authorized managers to negotiate for resources.
4. The project manager will be exposed to many organization structures which enhance the practical experience.

On the other side, Wilemon and Cicero (1970, p.271) summarize some roles of project manager during the establishment of the organization structure such as:

- Managing the personnel interrelationship during the setup the project organization structure.
- Surviving the different organizational restraints.
- Avoiding the risks associated with the project management.
- Balancing between the managerial and technical project functions.

2.6.3 Project Manager Position and Authority and Impact on Project Performance

Middleton (1967, p.75) concentrated on the role of top management in appointing only one head for the project to achieve the organization goals towards the project and to have control over the project team, furthermore he focused on the project manager's role in defining the project organization's functions and responsibilities in order to provide the necessary control to assist him in overcoming any weakness that may occur during structure implementation and to complete the project within the specified goals successfully. Moreover, Nogueira and Raz (2006, p.5) mentioned that the extent of the power and authority given to the project manager has a great impact on the capability of the project team to meet the project goals and stakeholders expectation.

Since the project manager is mainly concerned with delivering a successful project as defined, the project manager role then should be clear and well defined; otherwise it will affect other team members' roles and responsibilities and consequently on the project performance and team integration. Furthermore when the role ambiguity occurs, member will experience stress

and will perform less effectively which will lead to both decrease in individual and organizational effectiveness and this is known as role theory (Rizzo, House and Lirtzman 1970, p.150). Besides, Stare (2011, p.1) stated that increasing the project manager authority in the project and in different types of the organization is impact positively on the cultural dimension and consequently on the projects' performance. He stated also that many projects do not bring the benefits for which it was implemented and many projects exceed the planned cost and time which impact negatively on the project benefit.

On the other hand, Rizzo, House and Lirtzman (1970, p.150) mentioned that for any action, organization's members should obtain orders from only one superior through one leader and this should be considered in the organization structure to avoid any incompatible expectations from receiving the orders from more than one superior and this known as unity of command theory as success or failure depends on the manager to resolve any conflicts between project members which may effect on the project delivery (Gaddis 1959, p.91). Furthermore, McFarland (2002, p.127) reported that assignment of one manager responsible for the project management is considered a critical factor for the project success. In most project structures' cases, project members report to a single leader/manager. In some cases, the project manager may suggest dividing the tasks of the project into subtasks, each group can report to the subtask leader who report to the project manager directly. Gaddis (1959, p.91) pointed out that clear authority and responsibility are the basic concepts for project management and the subordinate managers should have same characteristics.

2.6.4 Top Management Support for the Project Manager in Construction Projects

Top management support for project managers in construction projects is considered clue for project success. Zwikael (2008) stated that top management support has high impact on the project performance and contribute to the project success. He added that since the project manager is responsible for delivering the project outputs and since the project is considered a complex endeavor. Then, the support of the top managers for the project managers is very critical to achieve the project success. Meanwhile, Middleton (1967, p.77) stated that top management can avoid many problems by empower the project manager authority and his/her dealing with other different firm departments and also by supporting the project managers to enable them to perform their authority to control the different activities in the project.

Iqbal et al. (2015, p.560) concluded that top management support is very important factor between the leadership behaviors of the project manager and the project success. They added that top managers have to change their strategies and policies towards the projects if the old strategy proved unsuccessful and they should give enough delegation for the project managers to assign resources in order to attain the project success. Furthermore, they asserted that there is unfolding relationship between the top management support and the project manager's transformational leadership which impact positively on the project success. Also the support of top management for the project is considered an elementary factor to achieve the project success.

Youker (1977, p.50) explained that successful project organization structure is correlated with organization's top management competency and support for the project manager. Additionally, Torfi and Rashidi (2011, p.69) argued that project manager selection is considered a major decision in any construction organization as they play critical role during the project construction. They added that project managers are selected by top management after considering the special requirements of the project. This process requires predefined processes and evaluation criteria to select the suitable project manager with enough support during the project life cycle.

2.6.5 Project Team Role Clarity and Impact on Project Performance

Project team plays vital position in the project structure, also, satisfying and identifying the customer needs and expectation are strongly related much down to the project team and staff (Dulaimi 2005, p.101). Thus, selecting the qualified and suitable team for the project is considered a clue to the project success (Pinto and Slevin 1988, p.68) and (Dumitru 2011, p.186). Furthermore, when selecting the project team, the project manager should take into consideration the term of "team" which must not include only for team involved to construct the direct activities but also indirect working team. His/her effective role is to bring all teams to work together in order to achieve the project objectives with related client satisfaction. Dumitru (2011, p.186) added that preparing list of all personnel will be involved in the project is the first point to build the team process. On the other hand, analysis of different roles with resources requires is significant step to constitute the initial group of individuals. For large projects, it is recommended to construct people diagram for each set of activities or work sequences which can be then combined in one chart represent the project organization

structure. Meantime, the author recommend preliminary meetings to measure and notice the different interests of the team will be involved in the project during the execution and then select the people who show more interest towards the project than other.

Additionally, Ubani (2012, p.1284) indicated that typical organization structure should define the limits of authority, power, communication, responsibility and roles of all teams within the project organization. Furthermore, organization structure is about people, therefore it should be people oriented and their roles should be clear. Incidentally, Rizzo, House and Lirtzman (1970, p.154) indicated that there is a relation between the role ambiguity and the negative impact on member performance and added that it is obvious that role ambiguity affects negatively on organizational outcomes. Lyons (1971, p.108) agreed with previous point of view and concluded that there is a positive relation between role clarity and work satisfaction. Also Sundstrom, De Meuse and Futrell (1990, p.123) reported that effectiveness of the team may rely on possessing a clear defined role within the organization

On the other side, McComb et al. (2008, p.301) studied the relationship between the team effectiveness and project success. They concluded that there is a strong relationship between the team effectiveness and project performance. Furthermore, they focused on four important factors that effect on the performance of the project team which is top management involvement, authority of team leader, resource allocation and predefined project objectives. Results indicated that adequate resources allocation with clear roles is correlated with the successful of the project team to complete their job. On the other side, top management involvement is found critical for the project success as they have the authority to allocate the adequate resources and also they playing significant role during the project team setup which help to directly to better performing teams. They added that failure to do that will negatively impact on the cost overrun and time schedule of the project.

2.7 Changes in Project Organization Structure

Van de Ven and Sun (2011, p.58) clearly stated that “Change is a going and never-ending process of organizational life”. Furthermore, BLAIN and KEOHANE (1969, p.23) argued that change and growth are significant and correlative part of our life. The change may be introduced to the organization as a part of business development, new activities started or expanded, new work techniques or change in work staff. Therefore, change is an important

issue in any organization and therefore, it is vital to study the concept of change, role of top management during the change process and also the impact of change on the performance.

2.7.1 Concept of Change in Organizations

Lundin and Söderholm (1995, p.437) described the projects as temporary organization which appeared as significant part of the world economy and social life. They considered also the project organization as steady method to make a business. They added that change in standing operations and projects is step to “make things happen” or to handle specific problem within or among the organization. Furthermore, management need to make radical change in organizations in order to develop strategies and processes that keep construction organizations to be more customers oriented (Dulaimi 2005, p.101).

Therefore, previous studies introduced several definitions for the concept of change, for instance, Gareis (2010, p.315) determined the term of “change” as it refers to considerable and significant development. Middleton (1967, p. 75) stated that “a project organization can change radically in form during its lifetime”. Van de Ven and Poole (2004) defined organization change as a difference in form or state over time. Furthermore, change can be identified by measuring an entity at certain time based on set of dimensions and comparing the difference at time scale. Furthermore, BLAIN and KEOHANE (1969, p.23) studied an organization before and after change and concluded that structure change is associated with the change in proportion of managers. Van de Ven and Sun (2011, p.58) articulated that knowing and understanding which strategy to follow in managing organizational change still remains an art. They added that change can be measured through observing the same structure over two or more times based on a set of characteristics with noticing the difference over time.

On the other side, Van de Ven and Poole (1995, p.510) argued that explaining how and why change in organization is occur has been a focused researches of scholars in field of management and many other disciplines. They added that it has been difficult to explain the processes and event’s sequences that reveal in these changes such as change in the individual’s jobs, group development, organizational growth and organizational innovation. Therefore, they gathered most of the change theories and summarized into four basic theories to explain the change process as per the followings and as shown in figure (2.9):

- **Life-Cycle Theory:** Describe the change processes in structure through tracking the sequences and progressed stages with logical program to depict the specific contents of these stages.
- **Teleological Theory:** Depicts the development as formulation and modification cycle of goals, implementation and evaluation of predefined goals based on what was learned by the structure. The process of social construction is required to be defined in this mode of change.
- **Dialectical Theory:** Conflict between the different entities in organization generates syntheses which becomes the thesis of next progress dialectical. The outcome of this conflict between the entities should result in new optimal structure.
- **Evolutionary Theory:** This focus on the repetitive serious of variation and selection events among the structure organizations. Competition of environmental resources among the structures creates this cycle.

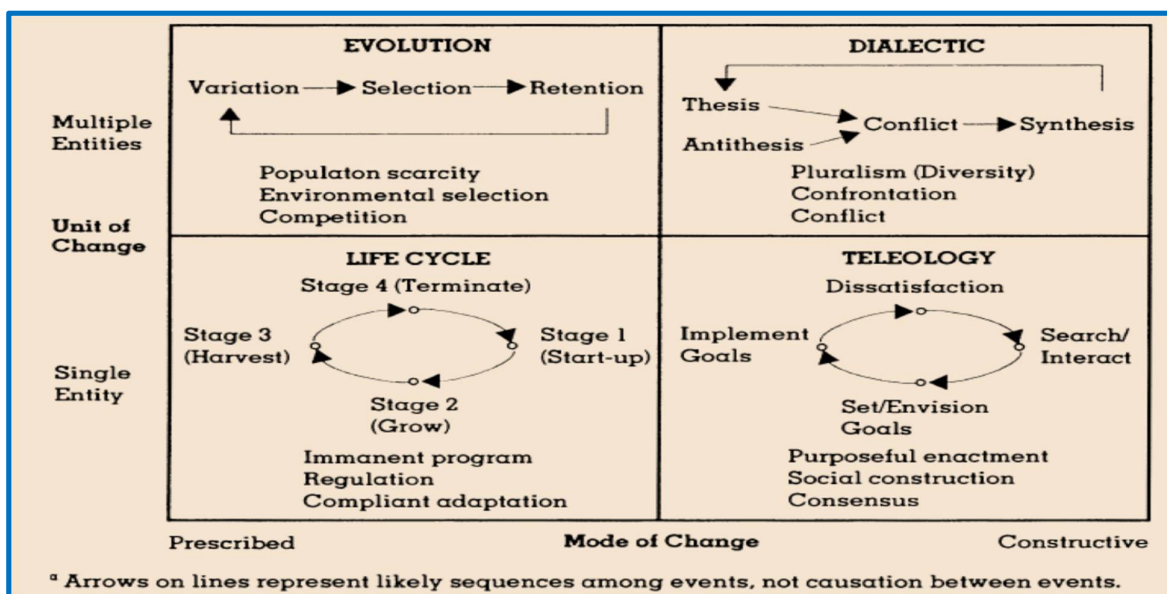


Figure (2.9) Process Theories of Organizational Development of Change (Van de Ven and Poole, 1995)

2.7.2 Factors Driving Change in Project Organization Structure

Nastase, Prediscan and Roiban (2013, p.512) indicated that change is unavoidable and in order to successfully manage the change process, the managers should have acknowledge and to understand the forces that drive it. Furthermore, organization structure is dynamic element

and always changing and updating due to the rapid changing market and increase of the clients' demand and increased competition (Nahod and Radujković, 2007). Therefore, it is significant to understand the factors driving change in the organization structure in order to articulate clear vision about change process.

March (1981, p.563) stated that most changes to the organizations reflect kind of response to economic, social, demographic and political forces. Furthermore, organizations continually changing and that change sometimes cannot be controlled as they rarely do exactly what they should do. Gilley, Dixon and Gilley (2008, p.155) stated that although many individuals in organizations are recognize the need for change, few are capable to foster successful change. Furthermore, resisting change is individual's nature but failure to change would be deadly. moreover, Sadri and Sadri (2014, p.79) clearly stated that the purpose from the organizational change is to add value and it can be nothing but to have change for only the sake of change without meaning is not recommended under any conditions. Furthermore, change has been seen a sign of progress and symbol of facing the uncertainty.

Tatum and Fawcett (1986, p.49) revealed that the project situation is sometimes pass with certain changes which require alternatives organizations structure. They outline some changes such as:

- **Goals:** Firm's managers are generally defining each project goals which differs from project to another. Such goals are normally interrelated with the cost, time, safety and quality requirements of projects. Examples of goals like developing allocated project team, controlling the project funds, complying with authorities' requirements and client's satisfaction for the project outcomes and also client's additional requirements. Therefore, change in project goals may force changes in organization structure.
- **External Influences:** Different parties' interest like owners, contractors, suppliers and regulatory agencies are considered external influences to the projects. Describing and defining these influences are important to select the suitable structure. Meantime, such influences may effect on the project organization structure.
- **Design and Work Technology:** The complexity and diversity of technology used whether in design or construction processes are have impact on the selection of the organization to be utilized. For instance, special project design requires specific work

activities, equipment and qualified team. On the other hand, different variable conditions might be introduced to the project design and technology by the clients that require new changes.

- **Project Phase:** The construction projects contain many phases such as design, planning, engineering, construction and handing over. Large construction projects require specific requirements in each phase which impose diverse organizational requirements which may require extensive changes in project structuring in order to meet the new demands for coordination of different phases.

On the other hand, Tatum (1984, p.347) highlighted some factors driving changes to the project organization structure such as dynamic changes in project phases, changes in project goals, difficulties in the project performance or dynamic certain project situation which require for reorganization of project structure. Meantime, Ibbs, Wong and Kwak (2001) stated that it is very common occurring changes in projects which may be beneficiary or ineffective and it affects the cost and duration of the project. Therefore, project management team should have effective ability to respond to changes in the project to reduce the impacts to the project. They added that lack of communication; integration and changing the project environment are common project change drivers.

On the other side, Engdahl (2005, p.59) demonstrated that organization structure would be changed as a result of the followings:

- The response to translated information from internal or external environments factors that affected on the works inside organization and require action for change to avoid its negative impacts.
- Subsequent internal allocation and organizing resources to response to constantly changing in strategies.
- Subsequent adaptation in the low team levels within organization.

Nastase, Prediscan and Roiban (2013, p.516) concluded in their study about the main sources of the change inside the Romanian organizations as per figure (2.10) which showing that employees are the least source of change. Furthermore, the study shows that about half of the change to organizations comes from managers and owners in order to improve the organization performance. Nahod and Radujković, (2007) stated that change in organization structure urgently required when the current used organization is unable to achieve the target

level of effectiveness. Also they emphasized that organization structure change should be considered as a last option. Meantime, Gareis (2010, p.322) demonstrated that the change is about establishing new positional due to existing threat to the organization that lead to a change for future development of the organization in order to achieve certain goals and suggests change being in suitable time of projects' life and it can be not all projects depending on project type and scope of work.

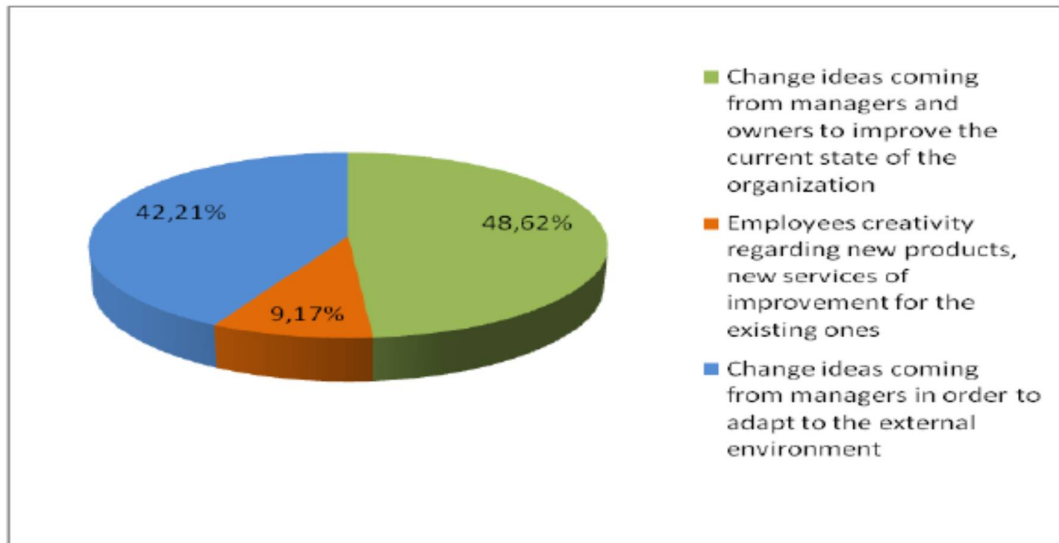


Figure (2.10) the Main Sources of Change within Organizations (Nastase, Prediscan and Roiban, 2013)

Moreover, Elsaid and Abdelghaly (2013, p. 3) explained signs of poor performance of the organization structure which considered as indicators for necessity of action for change:

- **Low Productivity:** People low productivity is strong indicator for problem in the organization structure which may be for many reasons such as lack of communication, constraints in staff empowerment, lack of proper work environment or insufficient resources allocation.
- **Unclear Line of Communication:** Communication between employees with their managers is critical for the success of the organization structure. Unclear line of command has negative impact on the performance of the employees and is indicator for problem in organizational structure.

- **Equal Workload:** Unfair work load between employees in the different departments is also from the weak signs of the structure.
- **Lack of Team Work:** Lack of cooperation and team effectiveness between different teams and departments is strong signal of weak organization structure which does not foster to the concept of team work.
- **Slow of Decision – Making:** Fast and effective decision making by manager's help to solve many problems and obstacles face by the employees which enhance the works to achieve the targeted objectives. Slow of decision making will not foster solving problems which will have negative impact on the work progress and in this case, there is a clear problem in the organization structure.
- **Lack of Innovation:** Organizations with weak and bad organization structure are often slow to innovate and to develop new ideas and implement development to the works which strong indicator for the necessary of change.

Therefore, above factors that drive the change in the project organization structure can be summarized as per figure (2.11).

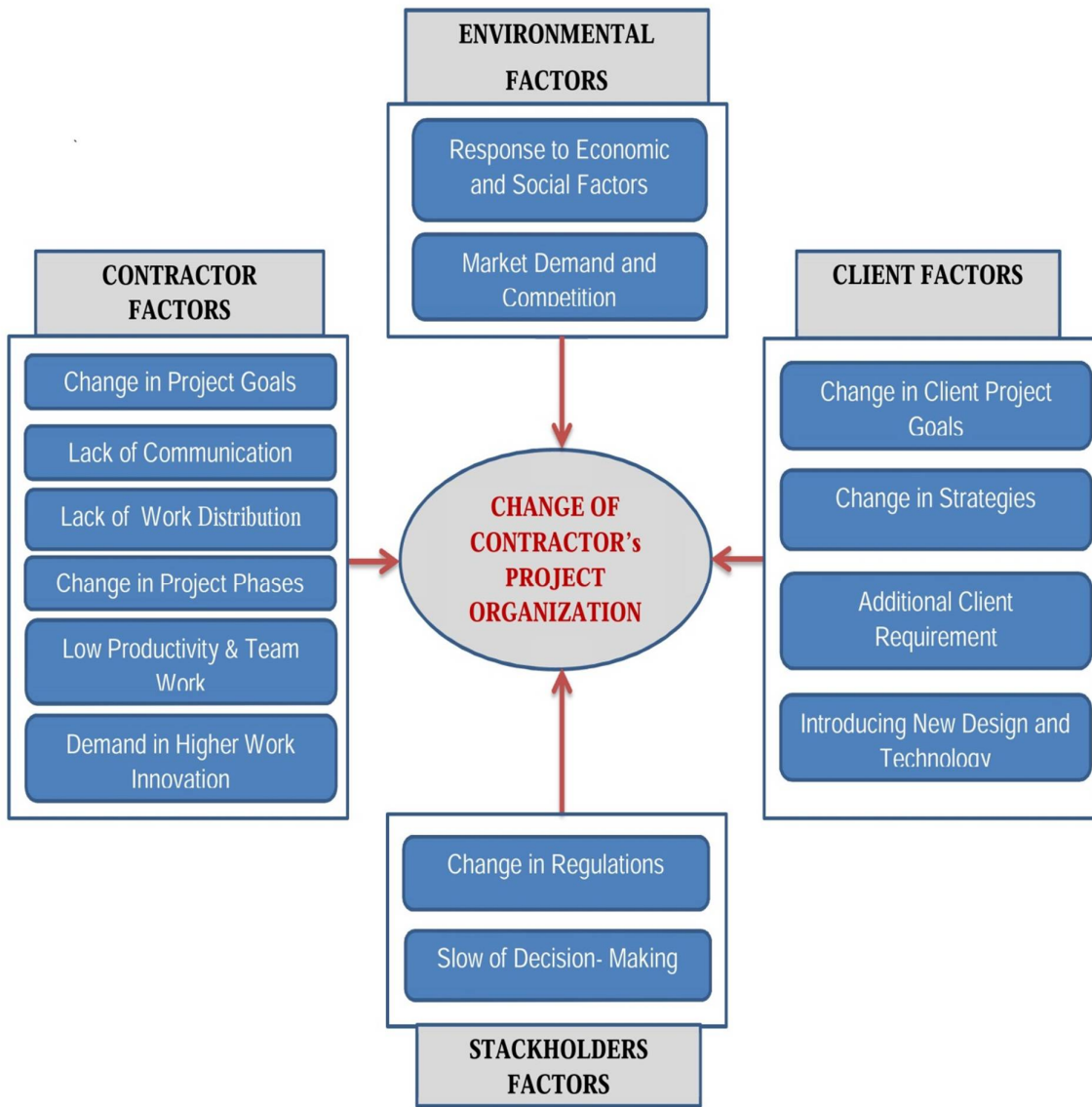


Figure (2.11): Factors Drive the Change in Organization Structure

2.7.3 Management Decision for Change

Fassoula (2004, p.392) explained that top management commitment towards the organizational strategy is great obvious. Therefore, their commitment to response to change is also great. Jovanovic (2015, p.144) demonstrated that it is fact that most of business different environments are exposed to ongoing changes and therefore, organizations must be aligned with changes in order to face the market competition. Furthermore, due to the continuous technological advance which lead to new customer requirements, organizational change become permanent feature of organizations landscape and the same keep organization in case

of “Strategic change management”. He added that practice showed that managers often fail to adequately response to the change for many reasons. Managers sometimes do not notice the surrounding changes in the business environment or they may be not able to interpret the change in proper way or maybe they wait long time to response and take the suitable course of action.

Mintzberg (1979) disclosed that top management responsibility is to identify problems and consider the organization capabilities and different constraints and therefore implement the necessary changes. In the meantime, top managers play an important role in the change process, Clement et al. (2012, p.15) confirmed that the change considered complex process in organizations but it sometimes is necessary for organization competitive in the market. Furthermore, top managers have vital role to define the need for the change and the most applicable ways in order to achieve the target of such change, besides middle management should be considered in the organization change as they have the technical knowledge and can understand the organization strategy, in the same time roles should be clear and defined through proper communication system and also through proper training.

According to Glick et al. (1990, p.293), the change is critical matter to senior managers and this change is a result of their ambition to increase improvement and effectiveness to their organization’s environments. Moreover, Chisholm and Martell (2013 p.23) mentioned that change is among the high priorities and concerns of top management and that change step is a challenge to implement due to lack of unclear communication and visible leadership to support that change.

Wiersema and Bantel (1992, p.93) explained the relationship between the demography of the top management team and strategic changes. They explained that top management team traits such as low age, short team and organization tenure, high technical levels and high degree of education levels are all have tendency to change and ready to take risk. Furthermore, they added that heterogeneity factors of top management team such as age, team and organization tenure and educational specialization are indicate of information diversity and innovation in decision – making which all are factors correlative with the decision for strategic change.

Similarly, Payne (1993, p.239) demonstrated that change in project management structure may be introduced by top management to facilitate efficient and effective performance of the projects. Further, Payne (1993, p.241) pointed out that senior management are committed to

change. Furthermore, he stated that no best way to introduce change but rather top management support for the change is critical and help to increase the success of innovation.

2.7.4 Effect of Project Organization Change on Project's Performance

Change in project organization structure would impact negatively or positively on the project performance depending on the way the organization managers follow to response to change and how they implement change in the organization structure. Wah (1999 Cited in Sakalas and Venskus 2007, p.25) stated that unfortunately, strategic policy decision makers are not paying heed to the potentially negative impact on employee morale and work satisfaction. Bresnen, Goussevskaia and Swan (2005, p.39) focused on the implication of change in projects which may interfere with the existing project management practices and as a result it can disrupt the power in the project and project goals. Furthermore, Middleton (1967, p.81) highlighted that shifting personnel from project to another may disrupt and affect the training and knowledge on new people which affect negatively on their development and employment growth.

Moreover, DeCanio, Dibble and Amir-Atefi (2000, p.1285) stated that organization structure effects on both firm's performance and individuals and subunits in organizations. Firm performance such as adopt productivity and enhancing the innovation process. Furthermore, changing in external circumstances produce changes in organization structure and communication between employees. Meantime, Martin, Lewis and Fifi (2014, p.1) affirmed that project organization structure has a great impact on the team communication. Furthermore, inappropriate structure management would be contribute to communication problem and therefore to inefficiency in project performance. On the other hand, removing any communication barriers in the organization structure is considered vital factor for the project success.

Meantime, Tichy (1983, p.55) asserted that accelerating the rate of change in any organization often produces inadequate consequences and change with small increment is proven to be more adequate. Furthermore, strategic decisions for change by managers are very important to avoid any irreversible consequences. Meantime, major change in organizations is requiring strategic reorientation. This orientation may involve changes in organization structure or human resources. Moreover, Tichy (1983, p.56) stated that managers often concentrate on

small portion of the overall change problem which leads to tactical concerns and incomplete change management which effect on the organization performance.

Additionally, Christensen and Overdorf (2000) articulated that some managers lack thinking about their personnel capabilities rather than their organization's capabilities. They added that, the manager should think firstly when facing change whether their organization have the enough resources to perform successful change or not and thereafter define whether the organization possess the procedures and processes to success in this change. Also they should pay enough attention to the consequences and impacts that may be introduced into the organization.

However, Hannan, Polos and Carroll (2003, p.399) argued that understanding the change in organizations especially change in internal structure is remains a core essence. They also raised important questions "Why would an organization conduct a change that may take long duration to accomplish and cause to miss opportunities inside the organizations?" they answered to this question those outcomes of the change sometime unanticipated.

Hannan, Polos and Carroll (2003, p.429) pointed out that opacity in manager's decision-making for change in their organizations is often leads to lack of calculation the length of duration for reorganization and associated cost of that change which lead to adverse consequences to company performance. Furthermore, Mariana and Nadina (2015, p.130) focused on the importance of the creating the culture and climate for change between all organization's members in order to feel comfortable for any change initiatives that help to improve the organization performance.

2.8 Innovation and Organization Structure Change

Innovation in construction is considered a significant process for successful long term performance in the construction projects through improves of quality, safety and cost in projects. Furthermore, top management support and project team communication and integration are important factors that affect innovation effectiveness (Gambatese and Hallowell 2011, p.553). For this reason, there is a strong relationship between the organization structure and innovation. Meantime, any change to the organization structure whether positive or negative will be definitely having impact on the innovation in projects.

2.8.1 Innovation: Definition and Impact on Construction Industry

Pierce and Delbecq (1977, p.27) defined the innovation as implementing and adoption for new ideas or activities in a firm setting. On the other hand, Şimşit, Vayvay and Öztürk (2014, p.690) stated that innovation is concerned with improving the way the jobs are being done in order to meet the organization's objectives and mission. Further, Şimşit, Vayvay and Öztürk (2014, p.691) defined the innovation as introduction for new ideas and transferring these ideas or concept to effective processes, object and practical use. Also innovation is concerned with implementing the strategic creativity.

Innovation is playing vital role in construction industry. Tatum (1989, p.602) indicated that firm's ability to innovate quickly is becoming necessity to compete in the construction market and considered from the driving forces in the construction industry. Besides, innovation and introducing new ideas in construction projects are critically needed to help to enhance the idea of being customer oriented. Meantime, senior managers in organization required to commit their self to radical change in order to enhance development of customer oriented processes and strategies that project team is critical part of it (Dulaimi 2005, p.11). Meantime, Pries and Janszen (1995, p.43) highlighted that the competitive market environment is considered a significant driver for innovation in organizations which creates competitive advantage is possible. Furthermore, Pries and Janszen (1995, p.43) & Rankin and Luther (2006, p.1545) considered the competition as the main driver for innovation.

On the other side, managers in organizations have great role to encourage and implement innovation in their organizations. Furthermore, top manager's consistent effort and performance to eliminate knowledge, information and competence deficiency have positive impact on the innovation in the construction projects (Bossink 2004, p.211). additionally, Yuan, Guo and Fang (2014, p.323) emphasized the role of top management team in the innovation process and how the top management team experience and background diversity are playing important role to enhance the innovation process effectiveness.

2.8.2 Relationship between Innovation and Organization Structure

Tatum (1989, p.602) studied the impact of organizing on the innovation and concluded that organization structure elements such as priorities, policies and flexibility in the team size and coordination between them are considered among the critical factors that foster the innovation

in the construction industry. Furthermore, complex project need for technological innovation to overcome complex processes and activities. Also, DeCanio, Dibble and Amir-Atefi (2000, p.1297) concluded in their study simulation that organization structure is critical element in adoption of innovation. Additionally, Şimşit, Vayvay and Öztürk (2014, p.692) explained that one of the types of the innovation is “structural innovation” which focus on implementing of new ideas and increase functionality such as enhancing the human resources processes. Thus, human resources are one of the innovation focus potential areas.

Lam (2010, p.163) confirmed that innovation is significant as a source of development and growth and key dominant of competitive advantages in a lot of organizations. Furthermore, in order to achieve the innovation in any organization, it needs for coordination and integration between all employees and activities. Therefore, organization structure is essential to the process of achieving innovation as it is aim to effectively communicate and integrate the team and employees. Meantime, Gilley, Dixon and Gilley (2008, p.158) argued that innovation need for array of communication which considered as important tool to motivate employees. Communication is significant part of the organization structure as well as tool for change management.

Simultaneously, Gilley, Dixon and Gilley (2008, p.160) stated clearly that project structure is impacting the innovation. Further, effective establishment of working group structure and team work collaboration by managers are critical to achieve the organization objectives and goals. On the other hand, promoting team work structure and collaboration between them are considered a great entrance to enhance innovation. Meanwhile, the climate of work place and communication between project team help to generate and support new ideas. On the other side, Pierce and Delbecq (1977, p.35) concluded that organization with more organic structure is more likely to initiate innovation. Likewise, organization structures which support formalization and centralization of authority in decision- making are likely tent to be more innovative. They also emphasized that discussion about innovation without recognizing organization structure is incomplete.

2.8.3 Innovation and Organization Structure Change

Pierce and Delbecq (1977, p.28) considered innovation and change as similar synonymous which concerned with invention something new. Furthermore, Van de Ven and Poole (2004) stated that innovation is significant partner for change. On the other hand, Gilley, Dixon and

Gilley (2008, p.153) considered the implanting change and conducting innovation in organizations as the drivers of the leadership effectiveness. However, they revealed that organization competitiveness is depending on the successful change effort that leads to organizational innovation. Therefore, there is a strong relationship between innovation and change in project organization and each one have impact on the other.

2.8.3.1 Impact of Organization Structure Change on Innovation

Fundamental changes in organizations are causing excessive demand for innovation in both construction firms and projects levels (Tatum 1989, p.603). On the other side, Mariana and Nadina (2015, p.130) stated that innovation and change are concepts which should be on agenda of any organization strategies due to the excessive competitive environment that require to incorporate such strategies. Furthermore, managers at all levels should understand the importance of the change in their organization to recognize new ideas and to support involvement of effective members to enhance the innovation process. Gilley, Dixon and Gilley (2008, p.166) concluded in their study that in order to promote a successful change, organizations are required to enhance their leader's abilities for improving change management skills and innovation talent at all levels. Furthermore, Gambatese and Hallowell (2011, p.564) considered the innovation as a positive change due to new ideas and contribute to decrease cost, time and improving the productivity and safety in the construction projects.

Meantime, traditional organization structures are being challenged by the continuous changes whether due to internal and external influences or as routine change by the organization. Selecting the best organization structure which the project team is part of it is considered from the great factors to enhance innovation. Also organization structure change should enable creativity and innovation. However, de Mello, Marx and Salerno (2012) disclosed that good organization structure enhances the communication and interaction between the employees that permit for knowledge development and interaction between groups which consequently increase the innovative environment for the organization.

2.8.3.2 Impact of Innovation on Organization Structure Change

Gilley, Dixon and Gilley (2008, p.156) argued that in order to enhance adaptability, organizations rely on innovation through implementing initiatives which support the continuous improvement by change for better performance. Furthermore, innovation is

considered the direct outcome of introducing new ideas. The extent for newness for the individual decides his or her reaction for the change.

Rankin and Luther (2006, p.1538) stated that construction industry is seeking for effective and positives changes through innovative process to implement advanced technology and adoption advanced communication technologies. Similarly, Blayse and Manley (2004, p.144) stated that “Innovation is the actual use of a nontrivial change and improvement in a process, product, or system that is novel to the institution developing the change”.

On the other side, Maliutin (2015, p.54) stated that organizations need innovational processes to manage changes in organizations and creating new ideas to move from rigid structure to flexible ones as the management change problem is common in many organizations. Furthermore, Meroño-Cerdan and López-Nicolas (2013, p.1312) stated that innovation in organizations is including performing considerable changes in practices, workplace and external relations of the organization.

Lam (2010, p.163) recognized that introducing new technologies as a part of innovation process is often create challenges in organization which require to change organization structures and management practices in order to be align with the innovation process. Furthermore, Lam (2010, p.175) concluded that technological innovation is tend to foster the organization change as it is enhance the competitive environment in order to adapt with market demand. Meantime, BRIX & PETERS (2015, p.29) stated that innovation process with high degree of uncertainty in construction projects produce change in the main elements of the organization structure.

2.9 Management of Change in Project Organization Structure

The ability of the organization to respond to internal and external pressure for change opportunities is considered one of the important paths to ensure its viability and competitiveness (Wiersema and Bantel 1992, p.91). Furthermore, effectiveness of the organizational response to change is mostly associated with the top management interpretation towards the strategic issues. Moreover, Mehmood, Qadeer and Ahmed (2014, p.665) pointed out that continuous improvement indicates how to avoid defects and do improvement in the procedures of transferring the inputs to outputs. Furthermore, top

management commitment playing vital role to enhance quality performance and organizational performance. Top management commitment refers to the setting out goals and directs the organization for better performance.

Meantime, Westover (2010, p.45) pointed out that “There is nothing permanent except change”. Furthermore, change is a great reality in our current life and is a great challenge for today’s managers is how effectively learn managing the change. Westover (2010, p.47) focused on how manager manage the change process. He added that managers should effectively plan and anticipate for the subordinate’s response who will be involved in change process implementation. Meantime, McClellan (2014, p.192) considered the organization structure change as communicative challenge which should be frame with form of information exchange between different parties in order to manage the uncertainty related with the change. Therefore, the following factors should be incorporated in any action plan to respond to change in organization structure.

2.9.1 Top Manager’s Role to Response to Change

Soulsby and Clark (2013, p.192) concentrated on the power context of top managers when restructuring the organizations. They argued that top manager use their power and authority context to enact new structures and development of practices in different ways in order to enhance the organization restructure. Furthermore, Nastase, Prediscan and Roiban (2013, p.513) indicated that it is significant to have a vision for change in order to deal with the business environment complexity. Managers are the ones who should play the pivot role to response to the change due to their power inside the organization to involve different parties and people in change process and reduce their resistance to change. On the other side, Tatum (1986, p.271) concluded that organizing large size projects represents a major challenge for the organization management. Managers use previous experience to adapt organization used to the current demand to overcome many problems such as negative impacts on external market influences and difference in work operation which change from project to another.

Tatum and Fawcett (1986, p.49) stated that managers are facing great challenges to organize the large construction projects such as change in goals and project phases and situation which make each project is unique. This situation pushes managers to play vital role during such projects in selecting alternatives organizations and outlining specific logical processes to

overcome on such variation. Fassoula (2004, p.389) summarized that organization structures often face fast continuous changing in business environment which often correlated with changes in organization structures. He added that top management should identify the needed action within strategic organizational framework and the change in organization structure can be managed and controlled as a project considering the human factor as well as the organization culture. Fassoula (2004, p.391) added that top management should continuously track and analyze the internal and external environment very carefully to ensure the stability of the organization structure in order to achieve high performance behind it.

In addition, Jovanovic (2015, p.150) argued that managers more than industry forces are more important for the organization success. Therefore, they have to increase their knowledge and managerial thinking and organization learning about change. They should pursue and refine existing knowledge to develop capabilities and competencies which will provide their organization the competitive advantage through clear conscious for surrounding business environment changes and how to explore new idea to initiate change or to response to change in their organizations. However, Duck (1993, p.109) emphasized that when change occur, each individual in the organization should feel, think or to do something different even in large organizations. He added that “Empowerment doesn’t mean abandonment. Setting the context for change means understanding what employees do and don’t know” which means that giving employees permission in order to do something without enough empowerment will be not helpful. On the other hand, he concluded eight primary responsibilities for top managers to do in response to change:

- Provide guidance and establish context for change by providing common and clear understanding for the organization vision for all team.
- Provide and allocate the required resources to projects in order to make things happen. This can be managed by allocating resources from dead to alive projects in order to manage change.
- Coordinate and align projects and implementing coherent plan especially for the project faces change program.
- Ensure the coherence of policies and behaviors related to change to all organization’s employees.

- Provide opportunities for organization's employees to have the information that required making the correct decisions.
- Identify and anticipate human role during the change process as communication and human resources are critical to success of change procedures.
- Prepare the critical mass and enforcing the necessary strategies and resources as the real role of top managers in the time of change focus on the managing dynamics not the pieces.

On the other hand, they explained the most common mistakes of managers in the time of change as per the following:

- ❖ Lack of involvement and support.
- ❖ Failure to listen to employees and key personnel concerns.
- ❖ Lack of communication with impacted employees from change.
- ❖ Showing resistance to change.
- ❖ Poorly managing and supporting employees during the change.

2.9.2 Dynamic Top Manager's Role to Implement Change

Top managers are playing vital role during the change process as they have the power to conduct and manage this process. The following table (2.8) listing the critical role of top managers during the change in the organization structure:

S/N	Top Manager Role	Reference
1	Ensure the need for change and provide plan	Fernandez and Rainey (2006, p.169) & Creasey et al. (2014, p.16)
2	Conduct meetings with all departments to explain course of actions going to do to implement change.	Sadri and Sadri (2014, p.100) & Creasey et al. (2014, p.16)
3	Control, guide and monitor the change process and control the cost impact.	Sadri and Sadri (2014, p.100) & Creasey et al. (2014, p.16)

4	Provide resources sufficient to implement the change.	Fernandez and Rainey (2006, p.169)
5	Improve the internal coordination and cooperation between different departments.	Sadri and Sadri (2014, p.100)
6	Establish internal support and commitment during the change.	Fernandez and Rainey (2006, p.169) & Creasey et al. (2014, p.16)
7	support team innovation by focusing on training and behavior of the organizational members	Fernandez and Rainey (2006, p.169)
8	Understanding the change management and the role of leading people side of change.	Creasey et al. (2014, p.16)

Table (2.8) Top Managers Role for Implementing Change Process

2.9.3 Involvement of Project Manager during Change Process

PMBOK Guide (2013) mentioned that project manager expect change in projects and implement and develop processes in order to keep the change managed and controlled. Besides, Payne (1993, p.242) demonstrated that high management in any organization should give the project manager the enough authority to manage, control and perform the tasks inside the projects and the project manager job must be seen to all as important and should be continuously encouraged in order to enhance their skills. Furthermore, top management during change should select qualified and skilled project managers in order to remove some of the resistance to change.

Wilemon and Cicero (1970, p.282) concluded that project manager facing great organizational and technological challenges to accomplish certain project objectives. In order to maintain and reach his objectives, he should cope with maintaining intensive interaction between the project personnel.

2.9.4 Support People during Change Process

Supporting people during change management process is considered a critical factor for success of all process. Kline (2007, p.35) argued that implementing change in organizations is critical and difficult process. Furthermore, people often show resist to change even if they agreed for the need of it which requires great attention for complete process to manage that change. Also, Nastase, Prediscan and Roiban (2013, p.517) stated that managers need to focus on employees and to have a vision for change and support it. Furthermore, they should create the climate to support the positive change to the organization through support and motivate the employees and reward any behavior help for positive change.

Simultaneously, Payne (1993, p.242) pointed out that during the change process. Managers should support the people involved during change by providing them comprehensible information; new skills of how to deal with new people or supervisors and support in order to help them to deal with problems.

On other hand, Nahod and Radujković, (2007) explained the processes of handling the change in the organization structure and emphasized that employees are strongly required to understand and realize the importance of the new structure. They explained the following main steps when major change is occurred such as transform from non-project oriented structure to more project oriented organization structure which focus primary on the staff and management support:

- ***Empower the role of the project management:*** Project management role is critical in change process and also incorporating the functional manager from different departments can be help to leads for more effective change as they have technical and management skills in their areas.
- ***Re-define the roles and responsibilities:*** updating the policy of roles and responsibilities for project manager and function managers are critical for successful changing process.
- ***Development of the communication plan:*** updating and development the communication plan is important for easy flow of information between all parties.

- ***Re-define the staffing plan:*** redefine the staffing plan is required when change occur which help to discover any resources shortage. Collaborative effort from all organization departments is critical for the suitable staffing plan.
- ***Updating the performance management plan:*** revise the performance management plan helps to be aligned with the new changes to the organization structure to meet the goals and objectives of the project.
- ***Maintaining management support:*** securing the top management support for any change is very critical for the successful of the change to maintain the organization and business objectives.

2.9.5 Strong Internal Organization Change Procedure and Consideration

Internal effective and dynamic procedures to response to change inside the organization play vital role to manage change. Tichy (1983, p.55) stated that organization recently face great change which make the strategic management of change more difficult and complex and need for comprehensive and effective reaction towards the change in the organizations. Furthermore, Tichy (1983, p.57) explained some “change levers” that should be available in organization in the time of change:

- ***Mission:*** Clear statement and vision are needed in order to guide the organization’s management in the different strategic decisions in different times.
- ***External Interface:*** To confront the different environmental pressures, it is necessary to continuously develop information and processes to use it during any external pressures and changes to the organizations
- ***Strategy:*** Strategic plan in all levels is required to be prepared by managers with clear strategic objectives.
- ***People:*** Managing people during management of change in organizations is critical for successful change management through motivating people to be involved in this process.

- ***Prescribed and Emergent networks:*** Adjust in the communication networks are required to deal with different change situations. Also management of informal communication is critical to understand the effort required during the change process.

In addition, DeCanio, Dibble and Amir-Atefi (2000, p.1285) demonstrated that organization response to change would be in two steps. Step one including for immediate response to external changes. Secondly step including, response to the change after full recognition from the firm. Van de Ven and Poole (1995, p.521) argued that change process hold on at different organization levels including individuals and groups of the organization structure. Such change in organization requires the organization to study and management the changes through two basic methods. Firstly, study the internal organization structure by examining its historical development and processes of change, replication and adaption. Secondly, examine the relationship between different structures in the organization to understand the ecological procedures of competition, conflict and cooperation and any other forms of interaction among all the organizational entities.

They also demonstrated that defining the type of change; the objective of change; the details of process; change procedures details and defining ant internal or external communication impacts is important when change is introduced. Moreover, they explained three main steps that the organization should do with every change process: (a) emphasizing the project's objectives; (b) defining the project organization structure accordingly and (c) taking the relevant social-environments into consideration.

2.9.6 Flexible Organization Structure

Moore and Moore (1997, p.296) suggested that project organization structure should have a degree of openness and flexibility to respond to the external environmental forces. They added that, project organization structure for specific project should be in line with the position of this project on the closed - open spectrum structures. Furthermore, Legerer et al. (2009, p.147) argued that divisional organizational structures are preferable and suited to unstable firm environments with fast changes. They added that organization structure type effect on the quality of management decisions for any firm.

On the other side, Tatum and Fawcett (1986, p.60) concluded five alternatives organization to be used in construction of large projects which are exposed in variance and changes in external influences, objectives and goals, technology and design new demand and also additional requirements during the different project phases. They summarized such alternatives as per the followings:

1. Strong functional organization structure which maintain clear division of work that focuses on specialization and clear definition of authority and responsibility.
2. Functional organization structure with focused area coordination based on the priorities and the coordination of functional activities.
3. Functional organization structure with sort of area coordination which split the project responsibility between the functional and area managers.
4. Autonomous area organization structure which breaks the construction project into different work areas with different distinct geographic separation.
5. Craft discipline with specific area management, and this type, area managers playing significant role to manage all different phases of the project.

2.9.7 Effective Change Management Process

Creasey et al. (2014, p.12) emphasized that when change has impact on the employees' job performance and their level of speed and adoption. In this case, the need for proper change management process will be absolutely needed. They explained seven necessary actions for change management as per the followings:

- ✚ Active and effective role of the top managers through building correlation and communication directly with the subordinates.
- ✚ Establish efficient change management structure approach based on easy framework across multiple changes in different project phases with logical and detailed stages and identification of gaps and common mistakes. This framework is better to be identified in early stages of the project to support a clear vision for the project.
- ✚ Availability of the resources and funding to execute the change management. Building qualified and dedicated resources to manage the change is very important to drive this change process.

- ✚ Open and frequent communication among project team about change is significant also through delivering change management in timely manner, using effective communication channels and clear reasons for the change and implication of not changing and its impact on the work and organization performance.
- ✚ Employees' engagement and involvement during the change management process in order to make the employees aware for the need of change and its impact on the work performance through making surveys to assess the change , monitoring the team feedback and tracking the variation in performance.
- ✚ Integration among the project team, project management and top managers during change management are significant through integrating the different parties' approaches and support the integration and cooperation between the project different parties with the change management team to enhance and develop the overall project plan.
- ✚ Involvement of middle management early in change process is important to own the enough support to implement effective change procedures to enhance their subordinates' learn and skills.

Moreover, Kline (2007, p.36) explained seven steps in order to address change in organization as per the following:

❖ **Address Human Concerns and Notes**

People are considered great asset in any organization. Therefore, it is important to take their concerns about change by taking some time and effort to understand human concerns and their ideas which may help to take the suitable decision.

❖ **Address the Vision to All**

Top managers are required to articulate clear vision for change and reasons behind implementing to change to organization and outline the steps for change to all departments.

❖ **Demonstrate Strong Leadership**

In order to implement effective change in organization, strong leadership is needed through removing barriers and makes the change process going smooth and keep everyone in organization involved in change process.

❖ **Build Trust in the Leadership Competency**

Mutual trust between the organization top management and employees in different position is essential to implement changes effectively.

❖ **Create Enabling Environment**

Managers should identify the barriers and break any structural silos that may obstacle smooth change implementation. Furthermore, Training people in organization is important to increase their experience and skills to understand the change purposes and objectives. Also, it is significant during implanting change to listen to employees and their concerns. This will help top managers to clearly collect information that help for effective change process.

❖ **Build the Culture for Change**

Culture of change should be shared to improve the organizational performance after change. Spreading the Change culture is not easy but need for great effort from top managers to share between all organization members.

❖ **Celebrate Change Success**

Keeping all parties acknowledge for the results of change by tracking milestones in short term duration which help to enhance the performance improvement and keep people in line with new changes.

2.9.8 Sustainable Solutions to the Negative Impacts of Organization Structure Change

Management of change in organization structure is considered important issue but also sustain any negative impacts as a result of implementing or response to change is essential to complete comprehensive change management process. Elsaid and Abdelghaly (2013, p7) explained main steps to solve problems due to change in the organization structure:

- ❖ Define the problem and its impact on the different work's progress.
- ❖ Analyze the cause of the problem in order to find out the solution for it
- ❖ Creating many solutions or alternatives for the problem solving out
- ❖ Selecting the best solution path with the optimized cost impact
- ❖ Implementing the necessary solution

- ❖ Evaluating the result of implementing the solution with continuous follow up

Simultaneously, March (1981, p.564) discussed in details six perspectives of action in response to organizational changes and to solve problems of changes in organization structure as per the followings:

- **Problem Solving:** action in response to change can be seen as a problem solving. Selecting among available alternatives is considered from effective processes to response to change by comparing different available alternatives in terms of expected consequences of goals by using some decision rules.
- **Rule Following:** action to change can be seen by applying certain rules, standards and procedures for certain situation appropriate to the change situation.
- **Learning:** successful past experience to similar change situation can be used as appropriate action for new similar situation.
- **Contagion:** action to change can be seen as per comparing to the imitated spreading from organization to another according to the behavior and variation in the rate of spread.
- **Conflict:** Conflict between individuals or groups can be confronted by underlying process depending on the preference of individuals and their power.
- **Regeneration:** action to change can be seen by generating and allocation new members with skills and attitude suitable to the organization goals and procedures through focusing on the main organizational actors.

Above course of actions would be utilized in particular situation or one action only would be fitted to the situation. He added that, organization should understand the change, contain it and effectively adapt to it.

CHAPTER THREE

Conceptual Framework

Figure (3.1) shows the conceptual model that derived from the above extensive literature review. As can be seen from the research model, it focuses on the change that may be occur during the life cycle of the construction project whether in project start; construction or in the handing over stage as a result of change in organization structure by the organization management to response to external or internal influences. Here below the main components of the model:

3.1 Establishment of Project Organization Structure

After selecting suitable organization structure for the project, the next step is to design and establish the organization structure. Proper design for the organization structure play important role to effectively establish the structure. Design of project structure should consider three significant attributes according to Radujković, (2007): 1) Flexibility; 2) Efficiency; 3) Coordination. On the other hand, establishment of project organization structure is to consider the following main steps as studied by Tatum (1986, p.271); Tatum and Fawcett (1986, p.51):

1. Define and set out the project objectives.
2. Define and set out the line management organizations and authority outlines.
3. Define available resources and the requirements of each position for all staff levels.
4. Establish roles and responsibilities for all project staff.
5. Provide and maintain means of coordination and communication between different team and groups.
6. Maintain planning, reporting and monitoring procedures.

During the interview with top managers in this study, the above primary procedures will be investigated if being followed or not during the establishment of the project organization structure and impact on the project structure efficiency as well as project performance.

Hypothesis 1: the appropriate design and establishment of the project organization have positive impact on the project performance.

3.2 Change in Project Organization Structure

The project organization structure is exposed to change in any stage of the project's life cycle. There are many factors that drive the change in project organization structure as shown in the conceptual model such as change in project objectives; change in project phases; lack of innovation; external influences like market competition; difficulties in technology and design; low in productivity and team work or lack of communication. These factors impose the top managers to respond to change and/or to implement changes in the project organization structure. The relationship between the change in project organization structure and impact on project performance will be investigated during this study through investigating projects in U.A.E construction market and how changes occurred and what were the actual impacts on project performance.

Hypothesis 2: inconvenient response to change in project organization structure by managers has negative impact on the project performance.

Furthermore, the nature of the change in organization structure is strongly impact on the innovation and introducing new ideas. It is significant to study this relationship from the point of view of construction experts in U.A.E.

Hypothesis 3: There is a strong relationship between the nature of change in organization structure and innovation and team effectiveness in construction projects

3.3 Management of Change in Project Organization

Construction projects often exposed to change as studied in the literature review but when change has impact on the employees' job performance and their level of speed and adoption. In this case, the need for proper change management process will be absolutely needed (Creasey et al. 2014, p.12). The method followed to manage change is considered critical issue for the process success as well the performance of the project. Research model in figure (3.1) explains the main steps concluded to manage the change from different perspectives as derived from the literature review. The essential steps in this process are focus on the role of top managers and project managers to effectively response to change and implement effective

change in organization structure; also factors such as people support and using strong organization procedure with proper change management process are also significant for the success of change management. On the other hand, implementing solutions to confront any possible negative impact due to the change is critical for the performance of the project structure. This study will explore the role of following proper change management procedures when implementing change in the organization structure and its impact the project performance.

Hypothesis 4: There is a strong relationship between following dynamic change management procedures and successful of implementing change to organization structure.

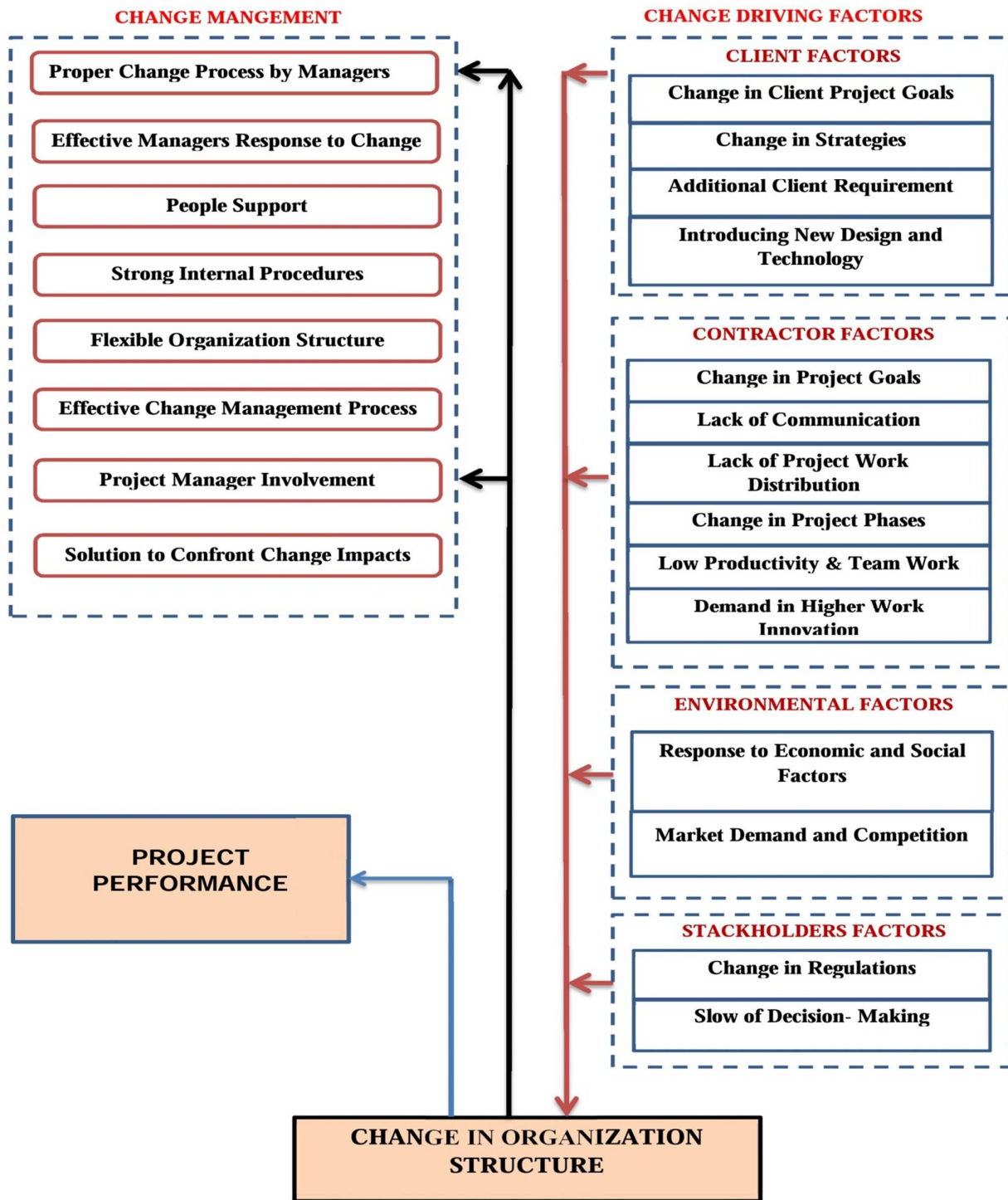


Figure (3.1) Conceptual Frame Work

CHAPTER FOUR

Research Methodology

4.1 Introduction

The purpose of this chapter is to explore and analyze data collected from the construction field about the impact of contractors' project organization structure on the project performance and effect of project organization change during the life cycle of the project on the performance and also the relationship between the change and innovation atmosphere in the project after change.

In order to investigate the hypothesis that concluded from the research literature review. Qualitative approach will be convenience in this research to check the hypotheses through investigate and analyze the data collected. Collecting information will be through focus group approach by conducting extensive interviews with managers on project and top management levels in U.A.E construction industry in order to practically investigate how managers in construction field think about the organization structure and their driving forces for changes in this structure, and what is the impact of change on the performance and innovation of U.A.E construction projects.

Results of the interview will be extensively analyzed and discussed to investigate the hypotheses. Results of this research will help to improve the performance of construction industry through understanding the negative consequences of unnecessary changes in organization structure during the project life cycle. Furthermore, proposing and recommendation will help managers to understand that taking the right decision is considered a critical issue in any construction project and may have critical impact on the project as well as the organization they are responsible for.

4.2 Research Approach

Given the topic of this research and its nature which seek to understand specific problem from the perspective of contracting managers in U.A.E construction industry and since identifying factors driving change in organization structure and its impact on the performance in general is need to use method that can be effective in obtaining specific information about opinions, objectives and behavior of managers towards the project organization structure. Therefore, the

qualitative approach is found convenience in this research topic by using focus group method which is appropriate for collecting data from perspective of certain groups such as interview with different contracting managers in U.A.E construction organizations further to five case studies for projects faced changes in its organization structure to investigate the drivers for change and its impact on project performance.

4.3 Validity and Reliability

This research results is considered having high validity as collecting data is based on qualitative approach through actual cases studies and interview with experience managers with contractor's background whether on project or management levels to effectively answer on the research questions which focused on the change in contractor's project organization structure and its impact on the project performance. On other hand, the experience of selected managers on the project and management level and their various extensive experience in construction field are giving reliability to this research topic without any intervene or giving own point of views of the researcher.

4.4 Design of the Sample and Case Studies

Five case studies for construction projects are selected for the purpose of this research. The selected projects were selected based on prior information about the project from employees that were involved in these projects to collect data about the project and its nature that suit the research topic. List of the projects case studies is indicated in table (4.1). Furthermore, the selected projects were chosen carefully founded on the following factors:

- ✚ Diversity in project's location (Abu-Dhabi, Dubai and Sharjah).
- ✚ All projects have been completed.
- ✚ All projects are projectized type.
- ✚ Different client entities (Government, Semi-Government and Private).
- ✚ Varies in project value ranging from Dhs. (90M to 650M).
- ✚ Diversity in reasons and impact of change in organization structure.
- ✚ Different interviewee's management positions.

Project	Type	Location	Interviewees Information (Table 4.3)	Project Value
A	Semi-Government	Dubai	M1 & M2	650M
B	Government	Abu Dhabi	M3 & M4	90M
C	Private	Dubai	M5 & M6	180M
D	Private	Dubai	M7 & M8	250M
E	Private	Sharjah	M9 & M10	125M

Table (4.1): Case Studies for Projects in U.A.E

On the other side, above selected case studies are constructed by different scale of contracting organizations as per table (4.2). Selection of organizations was based on the following factors:

- ✚ All organizations are working in U.A.E construction industry.
- ✚ Diversity in organization culture and category.
- ✚ Diversity in organization scale (medium and big).

Additionally, the selected sample for the research interviewees consists of different managers' levels as shown in figure (4.3). Interview's questions focus on employees (M1&M3&M5&M7&M9) that involved and worked in the selected case studies projects to understand the nature of occurred change in the project organization they involved and how it impacted on the project performance. Meantime, the interview's questions focus also on top managers (M2&M4&M6&M8&M10) for the selected projects. The purpose of interview with contracting senior managers in U.A.E construction organization is to understand their role during the establishment of project structure, also the driving forces beyond change in it and the different impacts on the project performance.

Project	Organization	Organization Scale/ Employees	Category
A	DGD	5000-10000	International
B	CRA	1000-5000	International
C	DW	500-1000	International
D	SC	1000-5000	Local
E	NC	100-500	Local

Table (4.2): Organizations' Information

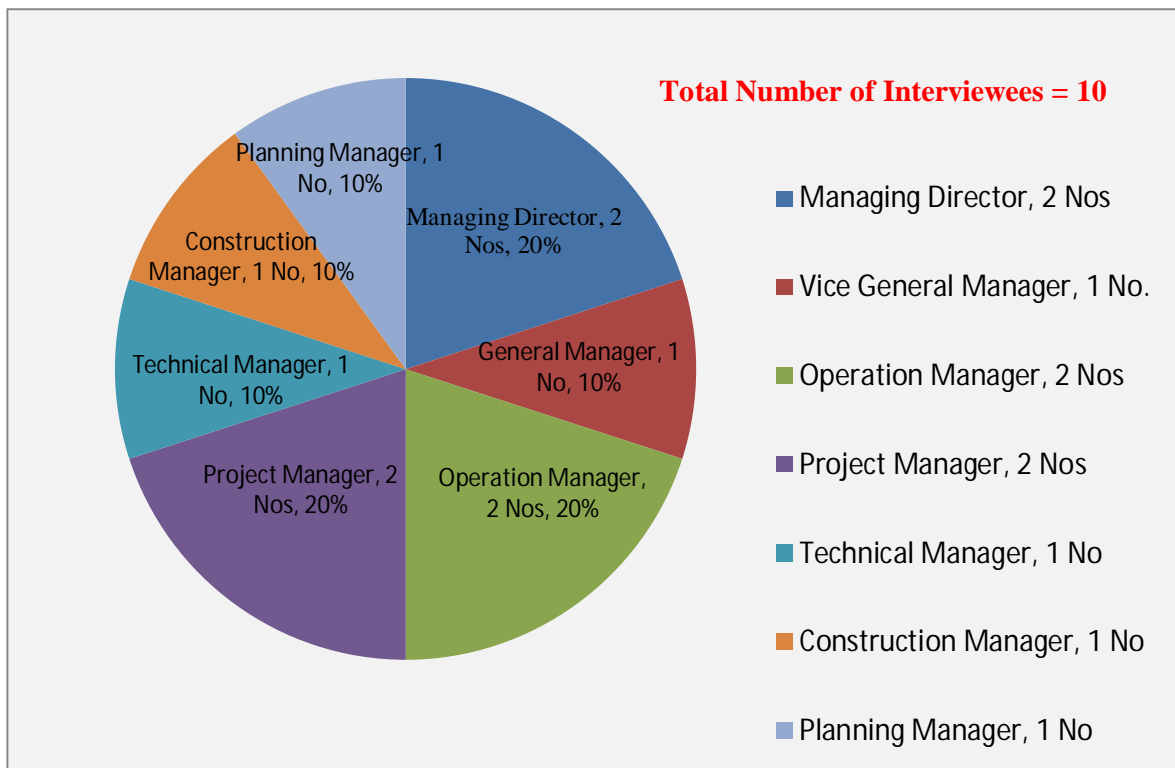


Figure (4.3): Demography of Interview Sample

Interviewee	Position	Project	Experience in Construction	Experience in Same Position	Experience in Current Organization
M1	Project Planning Manager	A	15 Years	8 Years	13 Years
M2	Managing Director	A	44 Years	22 Years	35 Years
M3	Senior Technical Engineer	B	13 Years	5 Years	8 Years
M4	Managing Director	B	29 Years	8 Years	22 Years
M5	Project Manager	C	16 Years	5 Years	3 Years
M6	Operation Manager	C	24 Years	5 Years	12 Years
M7	Construction Manager	D	19 Years	9 Years	14 Years
M8	Vice General Manager	D	30 Years	7 Years	18 Years
M9	Project Manager	E	14 Years	5 Years	4 Years
M10	Operation Manager	E	18 Years	8 Years	6 Years

Table (4.3): Interviewees' Information

CHAPTER FIVE

Data Analysis, Findings and discussion

5. Introduction

The interview with ten members represents the selected five case studies for construction projects in U.A.E are conducted. The interview was done with two members for each construction project. One of them represents project management level and other one represents the senior management level. The purpose of that is to investigate the critical changes that occurred in the project organization from project members inside the project with the opinion of senior management about such changes for wider clear picture about their driving forces of change and impact of such changes on the project performance and team effectiveness. The results of this analysis will help also to explain how both project management and senior management think about the project organization and its relationship with the company objectives and policies. Prior discussion was done with members worked in the study's projects in order to collect information about the project and the critical changes occurred in the project in order for the researcher to focus on the problem during the interview that related to the research topic.

5.1 Project (A) Case Study Analysis

Project (A) was constructed by a large construction company in U.A.E which named here as (DGD), one of largest private group's subsidiaries with offices in several gulf regions and over 8000 employees and operating in various range business sectors such as real estate investment , construction, industrial and tourism.

Project (A) is selected for this study which consists of commercial and residential buildings and owned by prestigious semi-government real estate Company. Project (A) commencement date was in 2009 and planned completion date in 2012, the project progress was clearly operating as planned and there was obvious homogeneity between project management team

and the project team. However, the project was suspended for some time due to the global financial that affected on the global market as well as U.A.E market. Meantime, the work in project (A) was resumed in 2014 with new completion date in 2015 according to new memorandum of understanding between the client and the contractor.

Figure (5.1) showing the contractor's project organization structure when awarded the project in 2011. The project manager was selected by the top management of DGD Company who possess more than 28 years of experience in construction field in order to manage the project. The selected project manager was given the power to select other project management team after coordination and assent of the company management and all other project team were selected based on mutual discussion and assent of both the project manager and top management of DGD organization. The project organizational structure had defined roles and responsibilities for each member in the project; for example, the main role of the project manager was focus on managing the other project management team and set out target goals and objectives according to the company internal procedures and resources to complete the project as planned and according to the client satisfaction. While the construction manager main role was to supervise the site team to complete the different site activities and coordinate with other site departments such as the engineering team. On the other side, the engineering manager key role was to manage the engineering team and communicate with other project parties for the project requirements.

When the project resumed as per the client request, the top manager of DGD company had decided to change in the project organization structure by promoting the project manager to operation manager and also promoted the construction manager to project manager without mentioning any specific reason, and without following the company internal formal procedures to assign the new roles and responsibilities of each manager. Furthermore, the position of construction manager was vacant and nobody had assigned to handle this important position in replacement of the old construction manager (refer to figure 5.2 for the revised organization structure).

Above change led to a lot of sequences and negative impact on the project performance such as lack of communication between the project team and project management; role ambiguity of the new project management team and lack of control on the different site activities and increase of material wastage.

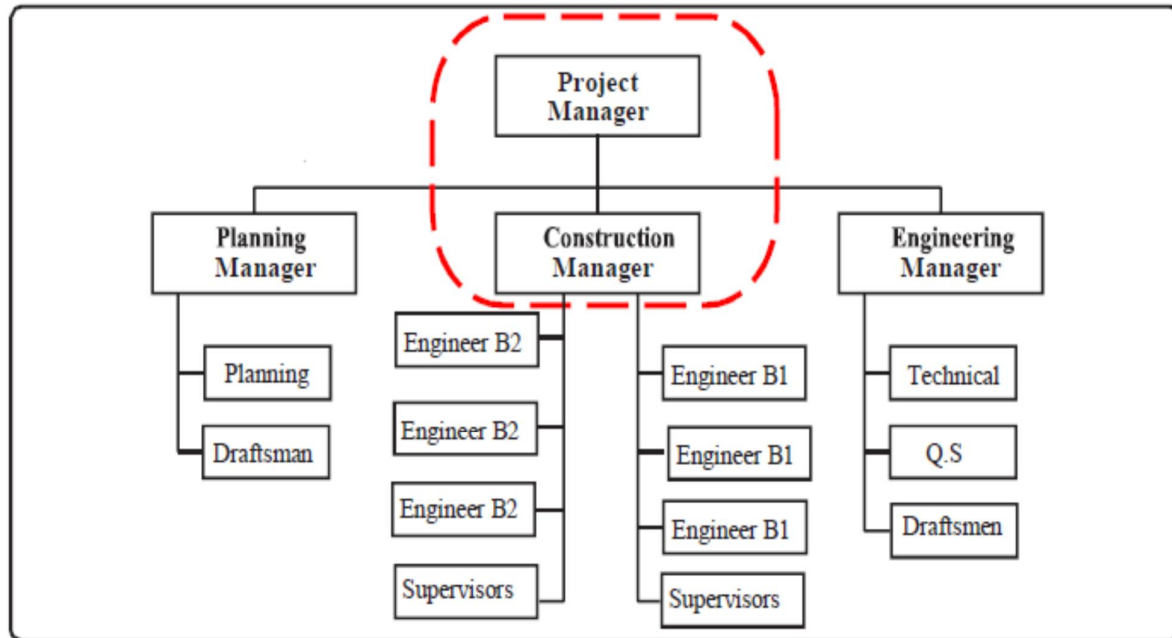


Figure (5.1) Project A Organization structure before Change

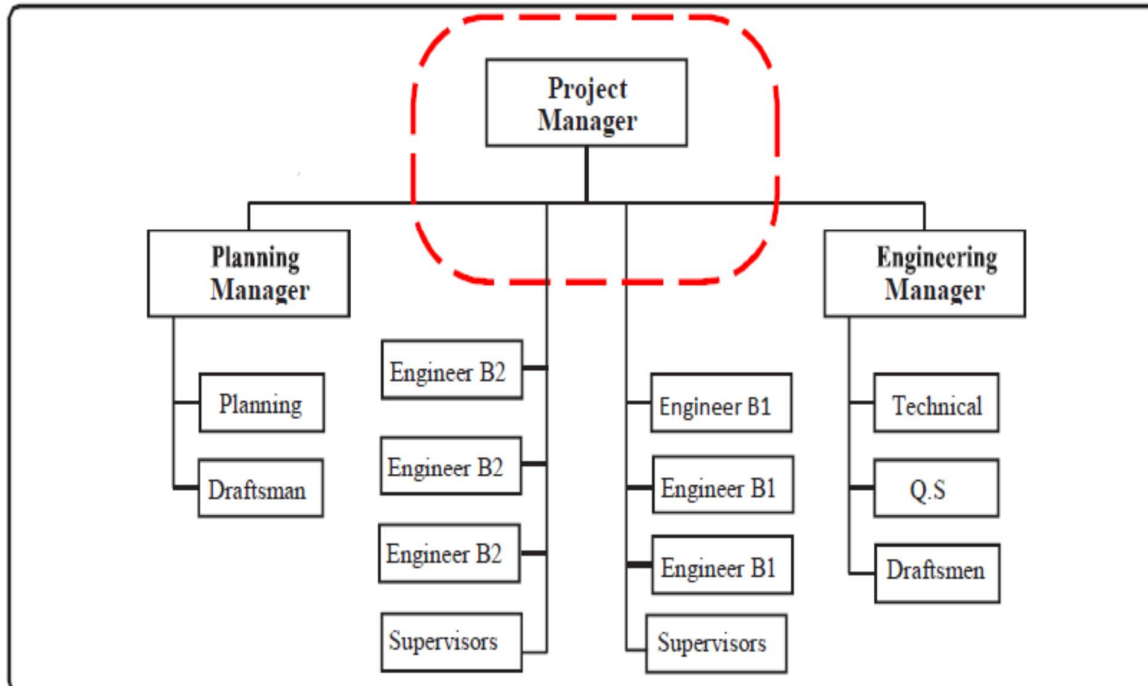


Figure (5.2) Project A Organization structure after Change

5.1.1 Interview Analysis With Project Planning Manager - M1

M1 is key member that was working in Project (A) as Planning Manager. Furthermore, he involved from the start to completion of the selected project (A). M1 confirmed during the interview that there was joint cooperation between the top management for (DGD) Company with the project manager that selected to manage the project. Top manager of the company selected highly qualified and experienced project manager. Meantime, the selected project manager had given the chance to select the subordinate's team for the project after joint consultation with the top management of company (DGD).

On the other hand, M1 pointed out that no one from the project's team realized the reasons behind the change in the project organization and the reasons behind the sudden promotions of two key members of the project. He added that there were no certain procedures for the change in organization structure or the description of the new roles and even no internal memo or new organization form were submitted by the company management.

Additionally, M1 stipulated that the change in organization structure led to the following consequences:

1. Lack of communication between engineering staff and site team staff.
2. Role ambiguity and conflict among site team and top management team.
3. Materials wastage had been increased as a result of the inappropriate control on site different parties that was performed by the old construction manager.
4. Absent the role of the construction manager led to increase rework of activities due to the loss of control on the different site parties and activities.

M1 asserted that building effective organization structure helps to build homogenous environment between the different project team and contribute to establish effective communication which impact on the project performance positively. He indicated that project (A) organization structure was built effectively and that assisted for smooth management of the project and that was clear during the project construction before the sudden change in the project organization structure.

On the other hand, M1 stated some general reasons behind change in the project organization from his previous experience such as relocation of the project staff between the different company's projects, also sometimes due to request of the Client/Consultant to change in

Contractor's organization structure as response to low performance of the Contractor's staff which impact negatively on the project performance and lead for further delay in the project completion.

5.1.2 Interview Analysis With Managing Director – M2

M2 is the managing director of (DGD) Company and has extensive experience in construction industry with more than 44 years of experience and 35 years of experience in (DGD) company. The interview was short with specific questions due to his busy schedule. He confirmed on the importance of the project (A) for the company as the project was with valued client with high requirements of quality and time. Therefore, he selected highly qualified and experience project manager with more than 28 years of field experience and more than 25 years of experience in (DGD) company. Meantime, he gave the project manager enough power to select the team for the project and the organization structure was mutually agreed by him and the project manager.

M2 revealed that as a result of the global financial crises and suspension of many projects of the company in many countries. He had to restructure the company organization to be aligned with the new situation and conditions. He added that the new organization structure was not published to all employees to avoid any conflict as the company did not have new projects in that time.

On the other hand, he pointed out that there was not significant impact on the project progress as there was only change in the positions name rather than job description. He emphasized also that building strong project organization structure is not achieve the project objective but also the company objectives as completing the construction projects within the targeted time and quality have great impact on position of the organization in the market. He added that the company spent enough time during the early stages of establishment of project organization structure for project (A) which was convenient with the project conditions.

He also asserted that the most reason behind change in the project organization structure from his previous experience in construction industry is the priorities of the projects within the organization which lead to relocation of key project's members to response to the new challenges.

5.2 Project (B) Case Study Analysis

Project (B) selected for the study is government building with value of 90 Million dirham and constructed by CRA company which is international construction company with operations in many countries such as U.A.E, Saudia Arabia and Kuwait and number of employees are more than 3000. Project (B) that selected for the study was the first project for CRA Company with the project client. Project (B) duration was 12 month and started in 2012 and expected to be completed in 2013 but the project actually delivered after the contract completion date for 4 months and liquidated damage was applied on the contractor CMA. Once CMA Company awarded the project, the client requested for kick off meeting and both parties agreed to start the project in the next day of the meeting. The contractor submitted two subsequence project managers to the client for approval and both were working in the same company for long time but both were rejected by the client as they did not have the enough experience for such government projects. After three months of the project start and after mutual discussions between the client and contractor, the client sent notice to CMA Company to assign another qualified project manager to comply with the contract's requirements which stated that the project manager experience is not less than twenty years' experience with five years' experience in same government projects.

New project manager was hired by CRA Company and was assigned and approved by the client after five months of the project start date which in mid duration of the project. Meantime, the project in the beginning until approval of the new project manager was managed by operation manager on part time bases. The several changes in the project organization structure due to unsuccessful establishment of structure in line with the project requirements and contract condition led to a lot of negative impacts on the project performance and delay of the project for more than four months and consequently on the project completion date which mainly due to improper establishment of project organization

structure from the start of the project, please refer to figure (5.3) for the project organization structure.

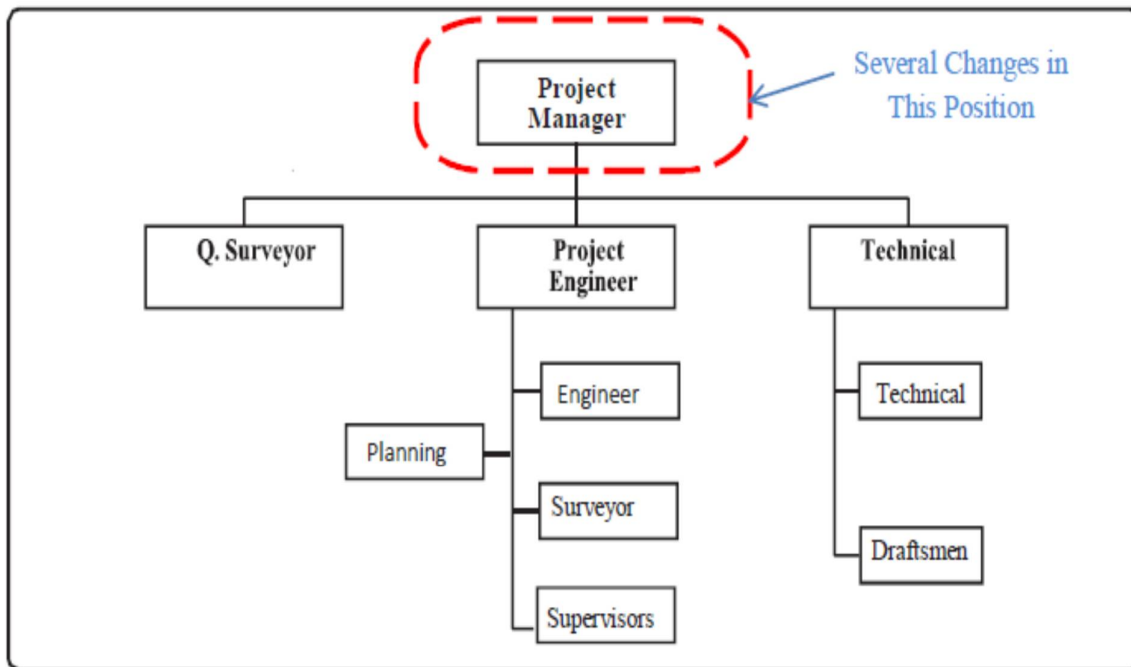


Figure (5.3) Project B Organization structure

5.2.1 Interview Analysis With Project Senior Technical Engineer – M3

The selected project member M3 for the interview was involved from start to the completion of the selected project (B) which gives clear picture about the problem. According to (M3), CMA Company started the project (B) very fast after the meeting held with the client which did not give enough opportunity to establish proper project organization structure. The project manager had not clear role in selection of the members of the project as there was no approved project manager for about five months and all project's staff were assigned except the project manager. Therefore, the final approved project manager did not select any of his staff and most of the staff was selected by the operation manager.

M3 considered the delay of assign approved project manager as critical issue for the project. Furthermore, changing the head of the project organization structure for three times had impact on the documentation process and site performance. He added that it was obvious that

there was no clear procedures had been followed by the company's management in selection of the project manager from the beginning of the project

However, M3 revealed that there was obvious difference in the project performance before and after the change in the project organization structure. He articulated that delay of assign approved project manager for five months led to the following consequences:

1. Delay approval of the project engineering works that required before the start the different activities at site.
2. Weak communication between both the client/consultant and Contractor.
3. Weak communication between the project contractor team.
4. Delay the site activities due to absent of coordination between the project and the contractor's main office.
5. Delay of the contractor to get the required permits from concerned authorities.

On the other side, the project performance was improved after approved project manager had been assigned such as engineering approvals were improved within suitable time; communication between project team was enhanced and the performance of project team was also improved. Furthermore, the coordination between the project management and top management had improved which all impacted positively on the project and team performance.

In addition to above, M3 confirmed that building effective and efficient project organization structure from the beginning is very important to avoid negative impacts of what happened in project (B). Improper assessment by the management for the project led to a lot of negative impacts on the project completion date and liquidated damage was applied and deducted from the contract.

M3 also illustrated that the client/consultant request to change certain key contractor's staff is considered the most reason behind change in the contractor's project organization structure due to their qualifications and competencies.

5.2.2 Interview Analysis With Managing Director – M4

The interview with (M4) the managing director of company (CRA) was open and in details about the selected project for the study. M4 explained that project (B) had different conditions than other company's projects although the project (B) is considered medium size project for the company. The financing and payments by the client for most of other company's projects in that time was affected by the global financial crisis which impacted negatively on the financing in U.A.E construction sector. Project (B) was special project for the company as the project was directly financed by the government. For this reason the company started the project in the next day of the meeting with client after the contract had been awarded. He also illustrated that there was joint discussion with the company's operation manager for the organization structure and the project manager and staff were selected based on the availability from the other company's projects.

For this reason, the company did not have the enough time to select project manager as per the client and contract requirements. The company proposed two project managers to the client and all rejected by the client. Therefore, the company hired one project manager who have extensive experience with such projects for more than twenty years and approved immediately by the client. He added that there was impact for such delay which affected on the project and site activities. Also, the impact was not only on the site and staff performance but also was on the project cost as the project had delayed for four months and the company had to pay liquidated damages to the client.

On the other hand, M4 agreed that building effective and efficient project organization structure is critical for the project success. He stated that there was clear difference for the project and staff performance after final approved project manager had been assigned in project (B) and that assisted to complete the project as per the client satisfaction which also was very important for the company's position in the market even if there was a delay in the project.

M4 illustrated other reasons that he faced to change in the project organization structure such as the budget cost of the project when exceed the allowable limits for staff. In this case also it may be suitable to relocate the staff based on the different project's requirements.

5.3 Project (C) Case Study Analysis

Project (C) is high rise residential building with value of 180 Million U.A.E Dirham and constructed by (DW) Company which is international construction organization with branch in U.A.E since 2005 with manpower scale of 800 employees. Project (C) was started in 2013 and completed on time as per the contract duration in 2015. Due to delay of DW Company to obtain the approval of the authorities for shoring design for more than two months which was part of DW contract scope, the project delayed for two months as the shoring design was on the critical path of the project. DW tried to compensate such delay after the shoring works started through changing the construction methodology and other alternative sequences and methodologies to expedite the works and complete the project as scheduled and according to the contract duration. Therefore, Company DW top management changed the construction methodology of the core walls by using new slip form system which expedited the works of the concrete and reduced the duration of the slab and vertical elements from eight days to five days only. Such system led to additional cost impact as it needed for additional staff and manpower and materials. Therefore, Company DW top management had to change in the project organization structure by adding new staff which is different than the original staff assigned for the project and changing the construction manager for the project with another one that familiar with the new slip form system with better communication with other project and company divisions (please refer to figure 5.4). This change in the project organization structure had both negative and positive impacts. It led to improve in the construction process and led to successfully completing the project on time. Meantime, such change by the company top management had additional cost impact and the project was over budget.

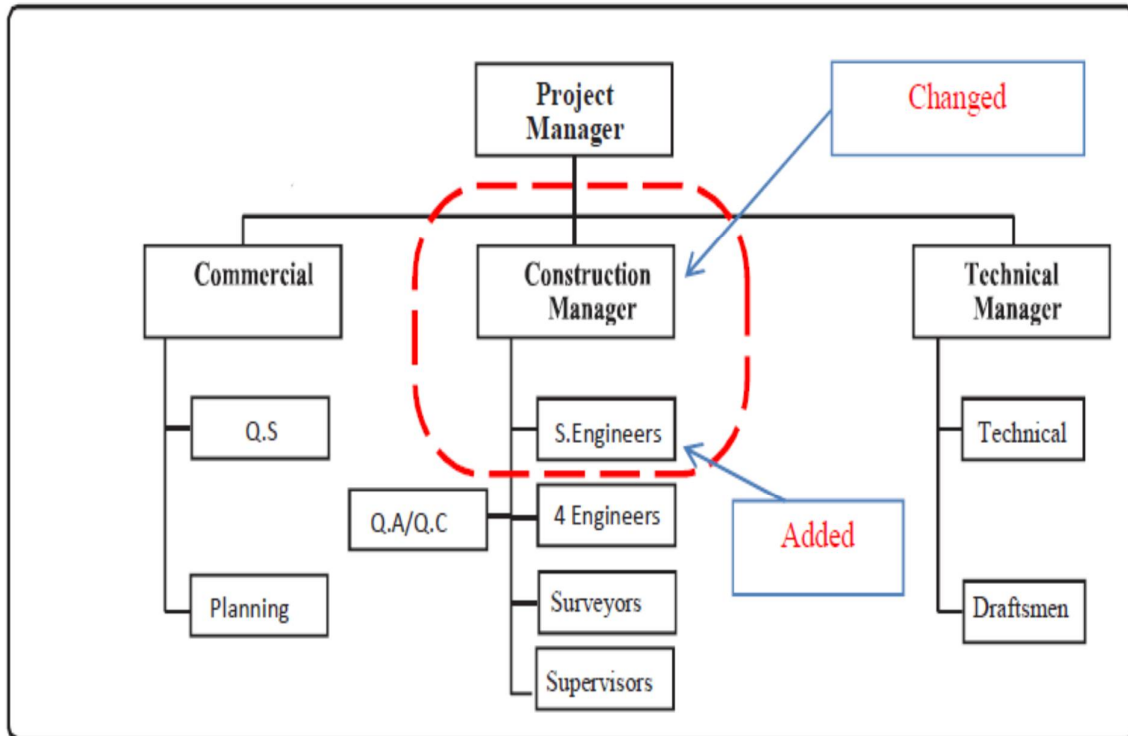


Figure (5.4) Project C Organization structure

5.3.1 Interview Analysis With Project Manager – M5

Interview was done with (M5) the project manager for the selected project (C). He worked in the project from start till end of the project. Firstly, he confirmed that the project organization structure is selected and established based on joint discussions with the top management of the company and there was coordination and involvement of top management for the selection of the project staff. The project organization structure was established effectively and all parties were agreed for the staff qualifications and it was approved also by the consultant.

He added that due to the delay in obtaining the shoring permit which was part of the contractor scope. Issuing of the permit was delayed for two months and therefore, the project was delayed for two months on the project's schedule. He added that several meetings with the company's top management was arranged to discuss how to compensate such delays. It was agreed to expedite the works by changing work methodologies for some activities and construction manager for the project was also changed with another one in same company that had previous experience in the system and have more experience in the company. Also new engineer was hired for this system only. All such changes were followed after joint discussion

with the top management of the company and official memo's and recorded emails as per the company procedures and policies.

M5 explained that there was positive impact for the change on the project performance and also the team coordination. The delays that occurred during the early stage of the project were sustained almost in the end of concrete works which impacted positively on the project's schedule. This also assisted on the staff's spirit which impacted positively on their performance and also their ideas to expedite the works and complete the project according to the schedule. He added that, building effective and coherent staff and suitable project organization structure help for better performance of the construction project. This was clear in project (C) and coherence and communication between the staff team were effective and increased after the change in the project organization structure.

He illustrated also that the priority of the project among other organization projects is still most important reason behind the change in the project organization structure. He added that when the project being important and critical for the company. The top management of the company trying to keep all the company resources are available for such critical project. M5 confirmed also that introducing new technologies as happened in project (C) also sometimes special reason behind change in the project organization structure.

5.3.2 Interview Analysis With Operation Manager – M6

M6 is working in company (DW) for last eight years with twenty four years of experience in construction industry. He also was involved in the project (C) since the start of the project. He confirmed the answer of M5 for the joint discussion between the project manager and top management in the selection of the staff and the project organization structure. He added that project (C) was critical for the company as the client was from the Company's valued clients and the cash flow and payments of the project were on time. Therefore, it was important to pay attention for the project and solve out any issue that may effect on the project completion and as per the client satisfaction. Due to delays of the approval for the project's shoring from the authorities. There was necessity to search how to save the relation with the client and to keep it in strong position. Some modification and relocation of staff were done and also program crashing was done by increase the project resources and changing the sequence of the activities.

On other side, although the new changes to the project organization structure helped to complete the project as per the baseline and as per the client's satisfaction. It is significant to mention that the project cost was behind the budget for about eight millions due to the increase in the project's staff and additional resources that were added to the project to complete it as scheduled. M6 added that it was clear for the insistence of all parties whether on company's top management or project level to solve out the problem through joint discussion meetings or through the company policies and procedures.

M6 affirmed on the importance of tailoring suitable project organization structure based on the conditions and situation of each project in order to reach the required project objectives. He added that the new project organization structure in project (C) was adequate in completing the project as per the client's satisfaction. Furthermore, the new structure demonstrated clear effectiveness and coordination between the project team with each other which assisted in fostering the cooperation spirits between the staff and the project manager that encouraged in generating innovative ideas from all parties to solve out the problem.

He also interpreted that the low productivity and coherence between the project team are considered the most sources of the change in the project organization structure that noted during his experience in the construction industry. Furthermore, some hired staff showing low productivity which is difficult to discover during the interview and therefore, it is a good reason to change in the project organization structure to match with the project requirements.

5.4 Project (D) Case Study Analysis

(SC) is local construction company with experience in the construction U.A.E market since 1995 with about 3000 employees and specialized in different construction sectors such as infrastructure, government and residential projects. Company SC has extensive experience in horizontal projects such as villas and government projects. Project (D) consists of construction of 400 villas with its related infrastructure for reputed semi-government client. The project start date was in 2007 and completion date was in 2009 with duration of 18 months but the project actually had been completed six months late after the original completion date. The project was managing by highly experience project manager with 35 years of experience in construction industry and also he was working for long time in company SC. Therefore, he had great support from the company management as well as from

all company's sectors and divisions. In the third portion of the project duration, the project manager's control on the project staff and management started to be reduced due to his sickness. Furthermore, his ability to manage the project and liaising with the consultant and client also affected. The senior construction manager for the project was in charge for the position of the project manager and the project manager was managing the project with part time bases. The senior construction manager tried to minimize the gap occurred particularly in the daily management relationship between the contractor and consultant/client. Due to this situation, the activities in the site started to be affected and loss of control on the staff and daily activities in the project had increased. The management spent four months before decision to assign the senior construction manager to the position of project manager and assigned another construction manager in the position of the senior construction manager (please refer to figure 5.5).

The change in the project organization structure led to a lot of negative consequences such as delay of the project activities; insufficient coordination between the project management and other project team; weak coordination between the contractor and the consultant/client which all impacted negatively on the project performance and also the team effectiveness.

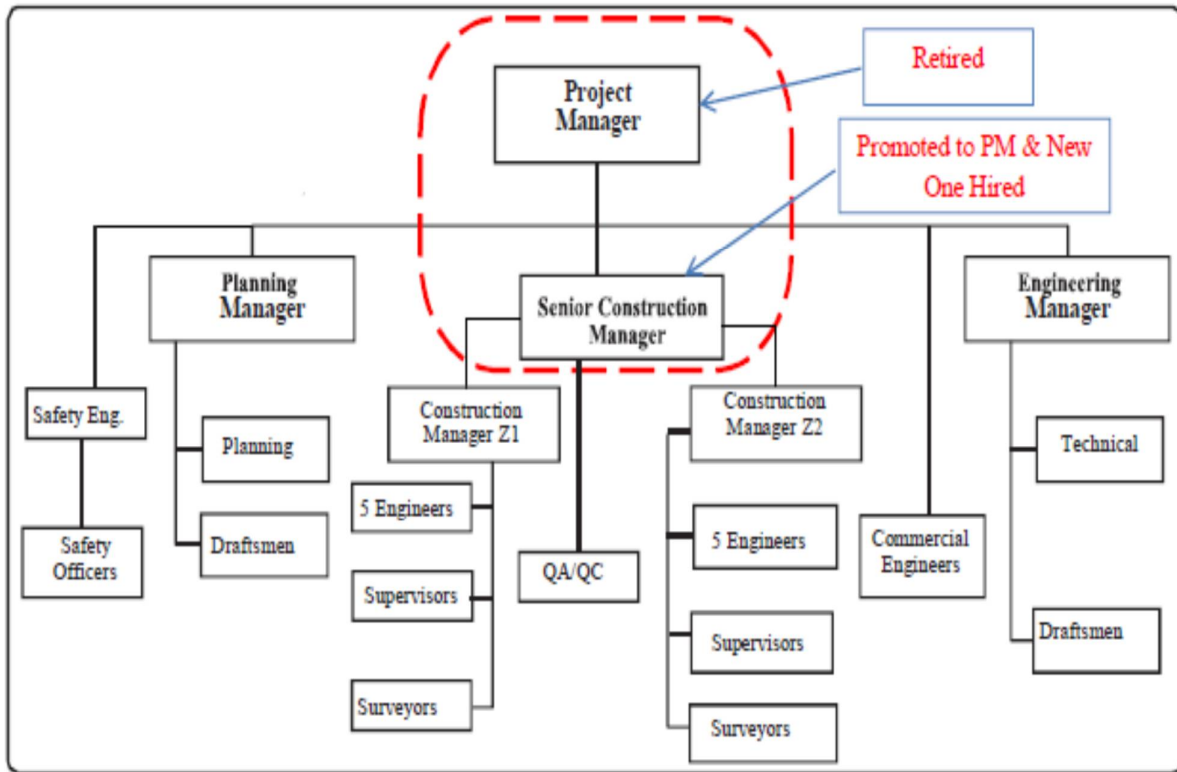


Figure (5.5) Project D Organization structure

5.4.1 Interview Analysis With Construction Manager – M7

M7 was working in the project (D) as a zone construction manager and he involved in the project after the finishing works had been started until handing over of the project to the client. He illustrated that the project organization structure was convenient to the project conditions and the top management of the company selected qualified project manager to manage the project. He added that there was clear homogeneity between the project team and project management. Furthermore, the communication between the project management and the company management was also efficient.

The project manager in the end of the project and after months of his sickness had decided to retire. The senior construction manager promoted to the project manager and new construction manager was hired to be in the place of the senior construction manager as per the company procedures.

Meantime, M7 revealed that the company delayed to take this action for months and during this unstable time of the project, there were considerable negative impacts on the project performance. The main effects had occurred in the management of the project with the consultant and client which took months to settle the new situation. Furthermore, the new construction manager spent reasonable time to understand the company's procedures and policies which negatively impacted on the productivity of the different teams of the project and their performance to do the different site activities.

He assured that building stable and efficient project organization structure is considered critical to reach the targeted objectives. In project (D), the initial selection of the project team and the project heads was convenient to complete the project as planned but the unforeseen retiring of the project manager led to this situation.

M7 illustrated that objection of the consultant and client on the staff performance in later stages of the project is still among the familiar reasons behind the change in the organization structure in construction industry. He added that relocation of staff also repeated in the new nature of the construction projects which need to change in the project organization structure. Moreover, termination by the company management for the projects' staff due to their qualifications or their productivity to do the works also become important reasons behind the change in the contractor's project organization structure.

5.4.2 Interview Analysis With Vice General Manager – M8

Company (SW) is considered from the reputed local companies in the field of construction particularly in construction of horizontal projects such as villas as (M8) confirmed. He added that the company has extensive experience staff in such projects. Furthermore, the project (D) was running with busy schedule for the company in that time as matching with the situation in U.A.E construction market during 2005 till 2010. Qualified project manager and subordinates were selected to be assigned to the project. Both the company management and project manager were selected the staff in the project and the project structure was also approved by the consultant and the client of the project.

Unexpected retiring of the project manager led to change in the project organization structure. The company tried to replace the project manager with another qualified project manager

from any of the other company projects but it was difficult to relocate another project manager as the company awarded number of similar projects. Therefore, it was difficult to promote the senior construction manager to project manager quickly but agreed with the project manager to attend part time until the new changes been settled to avoid any unstable conditions in this critical duration of the project. M8 added that the company conducted market search and hired qualified new senior construction manager instead of the old construction manager who promoted to manage the project as project manager. He added that many meetings between the project management and company management were arranged and conducted to reduce the impacts of the change in the organization structure of the project and also to keep the project on the track as scheduled and according to the company procedures.

M8 clarified that there was a slight responsibility of delay to the contractor and the change had impact on the project performance and team effectiveness but likely there was delay from the client due to new modification that introduced to the project. Most of the delay due the change in the project organization structure was absorbed in the client delay due to the new modifications to the contract. He added that there was no liquidated damages applied to the contractor as agreed with the client and project was delivered as per the client satisfaction.

M8 also agreed that effective project organization will provide the sufficient skills and information to project team and it would enhance the performance and the productivity of project teams. Therefore, the suitable project organization structure will enhance the creativity and innovation between the project team and management. In project (D), the performance of project team was efficient most of the project duration and their productivity was convenient to the project schedule. He added that the economic situation sometimes is important reason behind the change in the project organization structure as happened during the global crises and its impact on the U.A.E construction market. Many clients asked to reduce the contract value as discount due to the market situation and therefore it was good reason also to optimize the project staff to be in line with the contract value and that occurred in many construction projects.

5.5 Project (E) Case Study Analysis

Project (E) is offices multistory building with value of 125 Million Dirham that constructed by medium size local construction company (NC) which started in the U.A.E construction market since 2003 with about 400 of employees. Company NC awarded the project (E) in 2009 and started the project in 2010 and completion date was proposed in the end of 2012 according to the contract with the client but the project actually completed in 2013 with two months of delay than the original completion date. The project was going smoothly with slight delay but was manageable when the project manager and construction manager of the project (E) decided to leave the company NC to another construction company in the mid of the project's duration. Company NC had to hire a new project manager and construction manager for the project as no other staff was available inside the company and all staff was busy in the company's other projects. The new construction manager was assigned in the end notice of the old staff without enough time lags to deliver the project's documents and transferring the project's history from the old staff to the new staff. Furthermore, the new project manager was assigned after the old project manager left the company for two months. The project faced some difficulties on the project management level and also lack of communication between the project manager and the company management which impacted on the project schedule and led to two months of delay to the project's original completion. Figure (5.6) shows the organization structure for project (E).

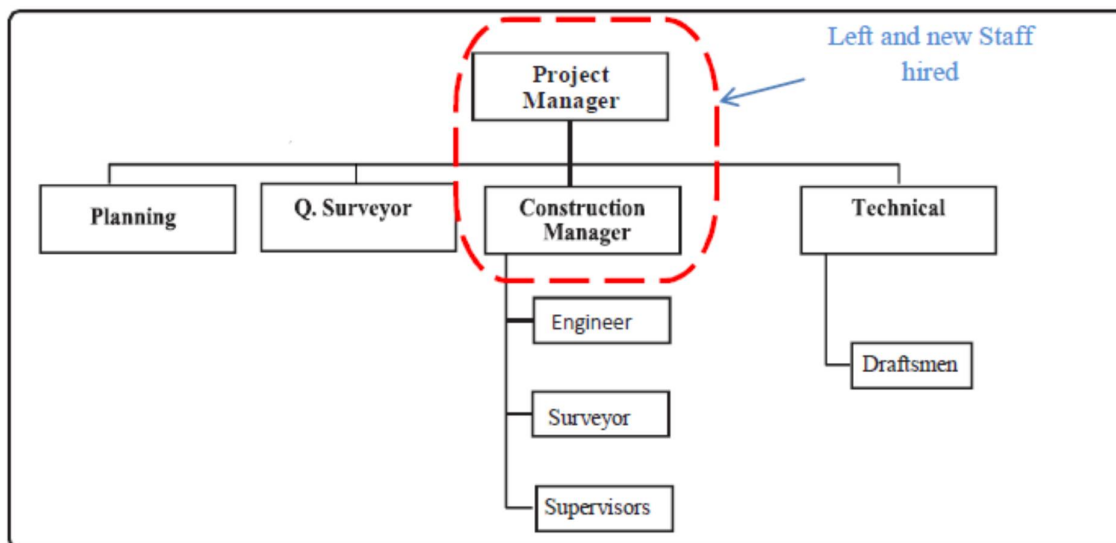


Figure (5.6) Project E Organization structure

5.5.1 Interview Analysis With Project Manager – M9

Interview was done with the new project manager that assigned to the project (E). He confirmed that he was assigned to the project (E) after the old project manager had been left the company and therefore he did not select any member of the project organization structure as all project staff was assigned to the project by the company management and the old project manager. M9 added that, the old project manager left the company in the mid duration of the project and also the construction manager of the project and there was no alternative staff from the existed staff that was working in the company NC.

M9 illustrated that he was assigned two months after the old project manager left the company which was difficult for him to understand and collect the history of the project quickly and he spent long time to well understand and to be aware with the project requirements and related problems. He added that there were no certain recorded evaluation procedures of the company for the staff that already assigned to the project before the new change in the project organization structure such as the project engineer and the supervisors.

M9 explained the impact of the change in the project organization structure that the project faced negative impact for such change in this critical time of the project. He illustrated that the project performance had serious impact like time and cost escalation, lack of information transferred between the previous and the new staff. Moreover, the new staff faced several technical problems to understand the approvals and pending approvals from both consultant and client. Furthermore, the new staff spent two to three months to understand the project team abilities and skills and also the new staff spent valuable time to manage the daily activities and required authority's approvals. On the other hand, the new staff needed to understand the company's rules, procedures and policies which had impact on the delay of material delivery and shop drawings submission. He added that there was clear lack of communication procedures inside the company between the new staff and company management.

On the other side, he demonstrated that establishment of effective project organization structure based on recoded company procedures and policies are significant for the project success. It was necessary for the company to manage the change in project (E) in proper way and to guarantee enough time for the old and new staff to transfer all project data and history

in order to complete the project in efficient manner. He added that the most familiar reason behind the change in project organization structure that he faced from his experience in the construction industry were resignation of the employees, termination by contractor top management and termination by consultant and client.

5.5.2 Interview Analysis With Operation Manager – M10

Company (NC) operation manager confirmed that there was cooperation between the old project manager and company management during the early stages of the project (E) and the staff in the project was selected based on joint discussion with the old project manager. He added that the old construction manager, project engineer and project's supervisors were selected by the old project manager and the organization structure for the project was approved also by the consultant and client.

M10 clarified that the resignation of the old project manager and construction manager for the project was not expected and the staff of other projects were busy. Furthermore, the resigned project manager and construction manager were involved from the early stages of the project and therefore the company management had several meetings with them to discuss and solve out the reason behind their resignation but all trials had been failed. Therefore, it was important to search for other staff for the project but due to the market situation which started to be surviving after the global financial crises, it was difficult to hire another qualified project manager quickly as a lot of projects resumed after long time of suspension. The company hired construction manager firstly in the end of the notice period of the old construction and project manager. Also new project manager was hired and assigned to the project after two months of the old project manager was left after extensive market research and several interviews with many project managers.

M10 revealed that there was kind of information lack between the old and new staff as there was no enough time for both staff to meet and transfer the project history. Also the new staff faced difficulties to be familiar with the company procedures and communication and the same took some time but the company tried to reduce the impact of such change as possible by conducting meetings with the new staff to understand and to be aware with the company key communication plan. He confirmed that there was negative impact on the performance of

the project schedule and team effectiveness as the project was in critical stage and the coherence between the old and new staff took some time to be settled.

Meantime, M10 agreed that building efficient project organization structure is highly important on the project and staff performance but project (E) faced exceptional conditions that the heads of the project organization had left the company in same time which had impact on the performance and the old organization structure. He clarified also that the most reasons behind the change in the project organization structure when the contractor hire disqualified staff for the project which have impact on the work productivity and also on the project schedule as well the quality of the different work activities.

5.6 Findings and Discussions

The analysis of the interviews and the case studies that for construction projects in U.A.E, reported obvious effect of the global financial crises on U.A.E construction market which had impact on the change of the project organization structure. In case study (A) the global financial crises led to restructure the organization (DGD) and had impact on the project (A) structure. Furthermore, company (CRA) had to start the project (B) without any prior arrangement and contractual establishment of the project organization structure due to also the global financial crises on U.A.E construction industry. Simultaneously, the hypothesis validity will be discussed according to the analysis of the five case studies.

5.6.1 Design of Project Organization Structure and impact on Performance

One of the most important factors that helps to design appropriate project organization structure is the cooperation between the project manager and the company top management to establish efficient and effective structure that match the project conditions and requirements. In case study project (A), it was clear the cooperation between the project manager and top management in the early stages of the project which assisted in establish agreed project structure that impacted positively on the performance of the project before the change to the structure had been occurred. On the other side, the case study project (B) showed that the assigned project manager in later staged was enough qualified to manage the project and the

project got improved. Furthermore, case study (B) showed that the communication between the contractor and the consultant had improved which led to expedite finalizing all approvals and orders that was delayed due to unsuitable organization structure in the early stages of the project.

Meantime, updating and enhancing the project organization structure in case study project (C) to match with the new project delay conditions and new technology introduced to the project by adding new staff to the project organization structure and changing the construction manager which all factors led to positive impact. Also this enhanced the project productivity and schedule and therefore, the project directed successfully to complete on time and as per the client's satisfaction. Simultaneously, case study project (D) showed the homogenous established project organization structure and showed that the project performance was going smoothly until the project organization structure had been changed and new construction manager was hired.

On the other hand, the project performance impacted negatively when both the project manager and construction manager of the case study project (E) decided to leave the company (NC). The new project manager and construction manager introduced to the project without enough lag time to transfer the project history which led to lack of communication between the new staff and the other project parties such as the consultant and client. Also the new change had negative impact on the performance and team productivity of the project as the communication between the new and old project staff spent long time to effective and clear. That impact led to delay the project for months.

Above findings and discussions showing the establishing effective contractor project organization structure is correlated with the project performance and also the performance of the team inside the construction project which is very critical in order to complete the project according to the schedule, cost and the quality and also according to the organization objectives.

5.6.2 Implementing change in Project Structure and impact on Performance

Changes to the contractor's project organization structure are common in the construction industry and the time and nature of this change is significant on the project performance.

Inappropriate implementing change or slow response towards the change by top managers in the construction project organization structure would impact on the performance of the project. In case study project (A), there was no proper process implementation for change in the project structure by the top management of the company (DGD) as the construction manager role was vacant in the new structure which impacted negatively on the project progress, communication between the project team with each other and consequently on the project's performance due to the absent of coordination role. Moreover, the delay of (CMA) company to assign qualified project manager in case study project (B) had a lot of negative consequences on the project accomplishment as scheduled. Furthermore, changing the project manager who represents the head of the project organization structure for three times was disruptive which not only had impact on the project but also on the relationship between the contractor and consultant as well as the client.

On the contrary, the action of top management of (DW) company and time of change in project (C) were appropriate and effective to compensate the delay that occurred in the start of the project. DW quickly searched for solutions to compensate the delay such as assigning qualified construction manager and also utilized the new technology to construction industry to expedite the works in the project to complete the project as per the contract which achieved in the end of the project although the action had impact on the cost of the project.

On the other side, there was a slow action by top management of company (SC) to response to the unexpected change to the project organization structure of project (D) when the performance of the project manager started to be affected by his sickness and such delay impacted on the performance and schedule of the project. The project was managed part time in both head positions of the project. The senior construction manager was difficult to manage his position and the project manager position for months which impacted on the project management. Meantime, change in the project (E) influenced on the performance of the project as the top management of company (NC) delayed to assign new project manager for two months which had negative influence in transferring the information and project previous history between the old and the new assigned project manager. This delay in assigning new project manager led also to lack of communication between the new project manager and project team for long time which all had impact on the performance of the project such as the project progress and delay of the approvals that required for the project to complete on time.

It was clear from the analysis and interview discussions that there was unsuitable managing for the change in the project structure by the senior management and also slow action by the senior management towards the change in the project organization structure in most of the research case studies which had impact on the project performance and particularly the time of project handing over as well as cost impact on all studied projects with considerable negative impact on the team performance which confirm the hypothesis that inappropriate response to the change in project organization structure by managers have negative impact on the project performance.

5.6.3 Implementing change in Project Structure and impact on Team Effectiveness

The inappropriate performance of the project team also one of the great impacts of inconvenient change in the project organization structure that effect on the team effectiveness and their innovation to response to different project conditions and external influences. Inadequate change in project (A) led to negative impact on the project team performance. The role of construction manager was indeed important for team building and communication. Absence of such role had impact on the team performance in the project and their communication. Furthermore, the change created incoherence between the project members and that influenced on the delay of work activities. The same was clear also in project (B) due to several changes in the project organization structure in fast track project which created confusion between the project members and effected on their ability and their effectiveness to perform their duties.

The situation in case study project (C) was slightly different for the project team. The quick response of the top management of the company led to effective change implementation and the changes in the project organization structure had positive impact on the team performance. Assigning additional staff and new construction manager from company staff had positive impact on the staff fulfillment for their duties. Furthermore, the changes in the project management led to increase coherence between the project team and project management and

their ability to contribute for new ideas to complete the project as schedule and as per the company objectives.

Case study project (D) showed stable project conditions for most of the project duration until the project manager retired. The interview discussion revealed that the project manager control on the project and team was effective and all project teams were convenient and cooperation between them and project management was also clear and efficient. The relocation of construction manager to project manager and hiring new construction manager led to some retreat in the performance of project team as the new construction manager spent great time to be in line with the project and company policies and conditions. Same situation also occurred in the project (E) due to the change in the most important members of the project organization. The project manager and construction manager left the company without enough lag time to exchange the history and data of the project. The same also had impact on the team performance and coherence as the new staff spent some time to understand the company internal procedure and spent portion of time to be communicated effectively with the old staff in the project which had negative influence on their performance.

Therefore, the interview discussion and analysis emphasize that unsuitable change implementation in construction project and the negative nature of the change in the project organization structure have a great impact on the team effectiveness and performance and on their response to internal and external influences on the project. Furthermore, inappropriate change implementation creates weak team building as well as innovation of staff.

5.6.4 Effective Management of Change and Impact on Successful of Change

Implementation

Process of change management is critical for successful of change implementation to the project organization structure as any failure in process will lead to difficulties to empower the change in the construction project. Procedures of change in project organization structure of project (A) were insufficient as no change management procedures were followed by the company management. The purpose and impact of change were not published to the project team and also no meetings were held for project team to understand the purpose of change. Furthermore, the company did not assign new construction manager in the replacement of the old one who promoted to project manager and the company management response to the impacts of the change was also inadequate. On the other hand, it was clear that there were not appropriate procedures followed in project (B) to implement change in the project organization. The project started quickly without giving the enough time to prepare proper organization structure. Meantime, the management response to take action to hire qualified project manager was slow and led to delay of assigning experienced project manager and therefore the project delayed for months as no procedures had been followed.

Due to the delay in the early stages of project (C) and on the contrary of other case studies projects. There was a clear procedure to implement change to the organization structure of project (C) and company managerial response to the change was fast. Moreover, the cooperation between the project management and company management was obvious to implement effective change that led to accomplish the project on time but in the same time, the change led to cost impact on the contractor's budget for the project.

The management of change in project (D) was also late and company internal procedure and change action were obvious delayed for months. Moreover, the company response to

unexpected change in the organization was late but implementation of change in later stage was effective through promoting the construction manager to project manager which was effective step although it was slightly slow. The company held meetings also with new construction manager and team staff to expedite the effectiveness of the communication process and to avoid the consequences of the change impact on the project performance.

Therefore, the effective change management by top management enhances the process of implementing change to the organization structure of the project and consequently has positive impact on the project performance and team effectiveness.

5.6.5 Reasons behind the change in the organization structure

The research case studies showed gap between how the members of the project and members of the top management think about the reason behind change in the organization structure. For example, in case study (A), the reason behind change in the organization structure for the project member (M1) was different than top management member (M2). M1 illustrated that he did not realized the reasons behind the change while M2 confirmed that the change was for restructuring purposes due to the financial crises. The following schedule (5.1) illustrates summary for the reasons behind the change in the project organization structure as concluded from the interviews conducted.

Project	Reasons for Project Structure Change
A	Re-structure of the company organization
B	Nomination of unqualified project manager
C	Utilizing new construction technology
D	Project Manager retiring
E	Resignation of the project staff

Table (5.1): Case Studies Change Drivers

On the other hand, interviewees indicated other reasons behind the change in the contractor's project organization structure from their previous experience such as:

- ❖ Client/Consultant request due to the low performance of staff.
- ❖ Internal relocation of staff according to the priorities of the different projects.
- ❖ Cost overrun that related to the staff.
- ❖ Termination for staff due to their qualifications and productivity.
- ❖ Economic and financial market conditions.

CHAPTER SIX

Conclusions and Recommendations

This chapter will explore and summarize the confirmation and validity of the hypothesis that proposed during this research. Conclusions will be then reviewed and research contribution will be outlined. Also this chapter will explore the research limitation and future recommendation for the topic for further investigation.

6.1 Conclusions

This study focused on implementation of changes in the contractor's project organization structure by the top managers and its likely negative impact on increasing the conflict in project management tasks, role clarity, team effectiveness as well as project performance which all impact negatively on the cost, quality and time of the project. Also this study has been able to show as concluded from study of five case studies for construction projects in U.A.E that efficient design and implementation of project organization structure based on hierarchical relationships that showing clear relationship between the subordinates and work heads with clear and defined roles and responsibilities has positive impact on project performance and team effectiveness. Furthermore, the project manager role is critical in any construction project and clarity of this role is considered the ground for the success of the project and ambiguity of it will negatively impact on the team and project performance.

This study also revealed also that there are many reasons behind change in the project organization structure such as improper establishment of initial project organization structure and assigning unqualified key staff. Also, utilizing new technology would lead to change in the project structure to conform and to be aligned with the new technology which need for additional resources than the old technology. Moreover, the study indicated that staff retiring and resignation are common reasons behind change in the project organization structure. Moreover, contractor's internal priorities for different company projects from the spread reasons of changing in the project organization structure as the organization redistribute its resources according to the project priority among the other company projects. Furthermore, the organization often focuses on the projects with better and stable cash flow or with client that has strong business relationship.

Meantime, it was obvious from all case studies in this research that the top manager's response towards the project organization change could be negative or positive depending on their followed strategies, time and the way they manage the change in the project organization structure. Moreover, the way the senior managers manage the change in the project structure has also impact on the performance of the project's team and also the coherence between the project team with each other which consequently has negative influence on their innovation to impose new ideas and sharing information to enhance the project outcomes. For instance, the change management by managers is considered effective when the senior managers take fast and timely action towards the change in the project structure and following well defined organization procedure to response and manage the project structure change. However, this study explained the most impacts of the negative change in the contractor's organization structure such as increase of activities rework, lack of communication between the project team, increase wastage of materials as a result of loss of control by project management and also role ambiguity of the project team.

On the other hand, the research focus on the necessity of regular examination and follow up by top managers for the effectiveness and workability of the project organization structure changes on achieving the project goals and objectives and also to detect any incompetent decisions and correct it as soon as possible. However, efficiency of introducing changes in the project organization structure by top managers is considered critical in the successful of change implementation to the project structure. Furthermore, factors such as people support, strong internal procedures, project manager involvement in the change management process among the most critical factors that assist in the successful of change implementation in the project structure.

6.2 Recommendations

In order to get the desired benefits from this research, the following recommendations would be enhance the direction towards more efficient and effective project organization structure as derived from discussed five case studies in this paper.

- ❖ If the new project structure is proved to be unsuccessful, the company top manager should take quick corrective action in order to empower the old structure once he/she discovers

that the new structure has negative consequences on the coherence between project team as well as the project performance.

- ❖ Top managers are necessary to consider the contract conditions and requirements when assign and establish the project organization structure to avoid the negative impacts on the project performance. Any delay for response to the project contract conditions would lead for more complications and further delays to the project duration.
- ❖ It is important to properly consider the authorities approvals as a risk when finalize the contract between the client and contractor. Inadequate contract conditions between the client and the contractor sometimes lead for more risk consideration which has negative impact on the project cost due to the negative impact on the project duration that need for additional resources to complete the project as targeted.
- ❖ Clear roles and responsibilities for the company's different key department's heads should be defined and be obvious to all project members; this will enhance and foster the integration between top management team and project team.
- ❖ Suitable establishment of the project organization structure by the top management and project management that matching with the project conditions is assist to enhance the performance of the project as well as the team performance. It is recommended also to involve project management team to select the subordinates which will help for more coherence that assist to impose innovation between the project team.
- ❖ Involvement of both the organization top management and the project manager and coordination between them are necessary during the change process in the project organization structure to avoid any improper change in the project structure.
- ❖ Senior managers of any construction organization should regularly ensure implementation and effectiveness of project and company internal procedures and processes to fulfil the project objectives and goals during the project period.
- ❖ Regular meetings should be conducted between organization top management and project team members to settle any communication misunderstanding with involvement of all members in order to keep the original project objectives on the track.
- ❖ Top managers of construction organizations are recommended to be aware that the project should have only one leader, and it is advised to regularly emphasis and focus on this important side during the various company meetings.

- ❖ Strong data base for all construction projects' staff requirements and their qualifications are indeed necessary to avoid any delay to assign new staff when urgent change to the project organization structure is occurred.
- ❖ Selection of experienced project and construction managers in the organizations for long time is proved as critical for the high priority projects which need for fast action and strong knowledge for the company's procedures and objectives.

6.3 Research Limitation and Future Recommendation

This paper has a number of limitations; firstly, the geographic areas of the case studies which focused on Dubai area (three case studies in Dubai, one case study in Abu Dhabi city and one case study in Sharjah city) with no case studies from other U.A.E emirates which would be more precise to involve other emirates to test the relationship between the geographic location of the project and its relationship with management action towards the project organization structure change. The second limitation for this study is number of questions in the interview particularly to the top managers for the selected organizations of the case studies due to their busy schedule which would be better to conduct more interviews with other top managers members of the organizations for more clear picture about their opinions for the change in their different projects structure particularly it was indeed difficult to unveil about their mistakes and improper action towards the project structure change. On the other hand, lack of previous studies in this research topic is another limitation particularly in U.A.E construction industry in order to compare the research results with previous studies. Moreover, this research focused on one type of project organization structure (Projectized Type) which is the familiar and most spread type of the project structure types in U.A.E construction industry.

Simultaneously, the followings are recommended for further future directions pertaining the research topic for more benefits to the construction market.

1. More case studies in other locations such as other U.A.E emirates and gulf areas which have similar nature of construction industry to investigate the relationship between the project location and its effect on the project organization structure and related changes in the project structure. According to this study results, the authority's procedures and market conditions and requirements playing important portion in the change of the

project organization structures. It will be more practical when conducting comparison about the results in different locations particularly between the gulf countries.

2. Future studies are required considering other project organization structure types such as matrix and functional organization structures. The results of this research may be vary with the different project organization structure types as the role of project manager will be different in each type.
3. More investigation for the role of the project manager during the establishment and change of the project organization structure is necessary through investigating other case studies that involved for strong role of the project manager.
4. Innovation relationship with the project organization structure change is still needs for further realization particularly when considering the diversity in top management culture and their action towards the project organization structure change.
5. Evaluating the difference in the results between different construction projects delivery methods such as P.P.P projects and traditional delivery method are indeed required to investigate the relationship between the project delivery method and the action of top managers and project managers towards the change in the project organization structure.
6. Explore unified and effective model to response to change in project organization structure is needed to avoid as possible the negative impacts of the unnecessary changes and improper response to change in the project structure of the construction projects.

References

- Anand, N., & Daft, R. L. (2006). What is the right organization design?. *Organizational Dynamics*, 36(1), p. 329-344.
- Bossink, B. A. (2004). Effectiveness of innovation leadership styles: a manager's influence on ecological innovation in construction projects. *Construction Innovation*, 4(4), p. 211-228.
- Bresnen, M, Goussevskaja, A, & Swan, J 2005, 'Implementing change in construction project organizations: exploring the interplay between structure and agency', *Building Research & Information*, 33, 6, p. 547-560.
- BRIX, J., & PETERS, L. S. (2015). EXPLORING AN INNOVATION PROJECT AS A SOURCE OF CHANGE IN ORGANIZATION DESIGN. *Journal Of Organization Design*, 4(1), p.29-43.
- BLAIN, I., & KEOHANE, J. (1969). One Company's Management Structure Before and After a Change. *Occupational Psychology*, 43(1), p. 23-38.
- Blayse, A. M., & Manley, K. (2004). Key influences on construction innovation. *Construction innovation*, 4(3), p. 143-154.
- Cheng, M. Y., Su, C. W., & You, H. Y. (2003). Optimal project organizational structure for construction management. *Journal of construction engineering and management*, 129(1), p.70-79.
- Christensen, C. M., & Overdorf, M. (2000). Meeting the challenge of disruptive change. *harvard business review*, 78(2), p. 66-77.
- Carmeli, A., & Schaubroeck, J. (2006). Top management team behavioral integration, decision quality, and organizational decline. *The Leadership Quarterly*, 17(5), p. 441-453.
- Clement, P., Minel, S., Roussel, B., & Renaud, J. (2012). The Human side of organizational change: improving appropriation of project evolutions. *International Journal of Projectics*, p. 41-63.
- Creasey, T., Taylor, T., Demailly, C., & Brighton, D. (2014). Seven greatest contributors to change management success. *People and Strategy*, 37(1), 12.

Chisholm, T, & Martell, A 2013, 'Change for the better', *Communication World*, 30(9), p. 22-25.

Dumitru, T. R. O. A. N. C. A. (2011). *Building The Project Team And Project Organization– Challenges And Obstacles*. Studies in Business and Economics, Lucian Blaga University of Sibiu, Romania, p.186-195

Duck, J. D. (1993). *Managing Change: The Art of Balancing*. Harvard Business Review, 71(6), p. 109-118.

DeCanio, S. J., Dibble, C., & Amir-Atefi, K. (2000). The importance of organizational structure for the adoption of innovations. *Management science*, 46(10), p. 1285-1299.

DUBAI CHAMBER (2012, December 30). *Construction Sector to contribute 11.1% to UAE's GDP in 2015*..Retrievedfrom <http://www.dubaichamber.com/en/news/construction-sector-to-contribute>.

de Mello, A. M., Marx, R., & Salerno, M. (2012). ORGANIZATIONAL STRUCTURES TO SUPPORT INNOVATION: HOW DO COMPANIES DECIDE? DOI: 10.5773/rai. v9i4. 623. RAI: revista de administração e inovação, 9(4), p. 05-20.

Dutton, J. E., & Duncan, R. B. (1987). The creation of momentum for change through the process of strategic issue diagnosis. *Strategic Management Journal*, 8(3), p. 279-295.

ELKASSAS,E.&HOSNY,H.&MATTR, W. (2013). Optimum Organizational Structure for Construction Projects (Management Tool of Selecting Organization in Egyptian Construction Market). *International Journal of Engineering Science and Innovative Technology*, 2(3), p. 411-433.

Elbanna, A. (2013). Top management support in multiple-project environments: an in-practice view. *European Journal of Information Systems*, 22(3), p. 278-294.

Engdahl, R. A. (2005). Organization evolution: the natural change model for organizational structure in changing times. *Organization Development Journal*, 23(2), 50.

Elsaid, N. M., Okasha, A. E., & Abdelghaly, A. A. (2013). Defining and Solving the Organizational Structure Problems to Improve the Performance of Ministry of State for

Environmental Affairs-Egypt. *International Journal of Scientific and Research Publications*, 10(3), p. 273-283.

Fadhil Dulaimi, M. (2005). The challenge of customer orientation in the construction industry. *Construction Innovation*, 5(1), p. 3-12.

Fernandez, S., & Rainey, H. G. (2006). Managing successful organizational change in the public sector. *Public administration review*, 66(2), p. 168-176.

Fassoula, E. D. (2004). Managing the project of organization structure change by using a flexible tool. *Operational Research*, 4(3), p. 389-398.

Gilley, A., Dixon, P., & Gilley, J. W. (2008). Characteristics of leadership effectiveness: Implementing change and driving innovation in organizations. *Human Resource Development Quarterly*, 19(2), p. 153-169.

Gambatese, J. A., & Hallowell, M. (2011). Enabling and measuring innovation in the construction industry. *Construction Management and Economics*, 29(6), p. 553-567.

García-Carbonell, N., Martín-Alcázar, F., & Sánchez-Gardey, G. (2015). Determinants of top management's capability to identify core employees. *BRQ Business Research Quarterly*, 18(2), p. 69-80.

Glick, W, Huber, G, Miller, C, Doty, D, & Sutcliffe, K 1990, 'STUDYING CHANGES IN ORGANIZATIONAL DESIGN AND EFFECTIVENESS: RETROSPECTIVE EVENT HISTORIES AND PERIODIC ASSESSMENTS', *Organization Science*, 1(3), p. 293-312.

Gaddis, P. O. (1959). The project manager. Harvard University, p. 89-97.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of management review*, 9(2), p. 193-206.

Hobday, M. (2000). The project-based organisation: an ideal form for managing complex products and systems?. *Research policy*, 29(7), p. 871-893.

Hannan, M. T., Polos, L., & Carroll, G. R. (2003). The fog of change: Opacity and asperity in organizations. *Administrative Science Quarterly*, 48(3), p. 399-432.

Hills, M. J., Fox, P. W., Skitmore, M., Hon, C. K., & Fong, P. S. W. (2008). The role of project managers in construction industry development. *AACE International Transactions, Proceedings AACE International's 52nd Annual Meeting & ICEC's 6th World Congress on Cost Engineering, Project Management and Quantity Surveying DE141*, p. 14.1-14.9.

Ibbs, C. W., Wong, C. K., & Kwak, Y. H. (2001). Project change management system. *Journal of Management in Engineering*, 17(3), p. 159-165.

Iqbal, S. M. J., Long, C. S., Fei, G. C., Ba'ith, S. M. L. A., & Bukhari, S. (2015). Moderating Effect of Top Management Support on Relationship between Transformational Leadership and Project Success. *Pakistan Journal of Commerce and Social Sciences*, 9(2), p. 540-567.

Jovanovic, Z. (2015). Management and changes in business environment. *Ekonomika*, 61(2), 143.

Jensen, C., Johansson, S., & Löfström, M. (2013). The project organization as a policy tool in implementing welfare reforms in the public sector. *The International journal of health planning and management*, 28(1), p. 122-137.

Kline, J. A. (2007). How to implement change in your organization. *Armed Forces Comptroller*, 52(1), p. 35-38.

Lundin, R. A., & Söderholm, A. (1995). A theory of the temporary organization. *Scandinavian Journal of management*, 11(4), p. 437-455.

Ling, F. Y., Dulaimi, M. F., & Ho, P. J. (2012). Strategies to overcome challenges faced in managing construction projects in the United Arab Emirates. In *World Construction Conference, Global Challenges in Construction Industry*, Colombo, Sri Lanka, p. 229-236.

Lunenburg, F. C. (2012). Organizational structure: Mintzberg's framework. *International journal of scholarly, academic, intellectual diversity*, 14(1), p.1-8.

Lam, A. (2010) 'Innovative organizations: structure, learning and adaptation', *Innovation Perspectives for the 21st Century*, Madrid:BBVA, Spain, p.163-175.

Legerer, P., Pfeiffer, T., Schneider, G., & Wagner, J. (2009). Organizational structure and managerial decisions. *International Journal of the Economics of Business*, 16(2), p. 147-159.

Lyons, T. F. (1971). Role clarity, need for clarity, satisfaction, tension, and withdrawal. *Organizational Behavior and Human Performance*, 6(1), p. 99-110.

Levitt, R. E. (2012). The Virtual Design Team: Designing project organizations as engineers design bridges. *Journal of Organization Design*, 1(2), p. 14-41.

Mehmood, S., Qadeer, F., & Ahmed, A. (2014). Relationship between TQM Dimensions and Organizational Performance. *Pakistan Journal of Commerce and Social Sciences*, 8(3), p. 662-679.

Maliutin, A. (2015). Managing Changes in the Innovational Activity of Regional Organizations. *Problems of Economic Transition*, 57(9), p. 54-61.

Middleton, C. J. (1967). How to set up a project organization. *Harvard Business Review*, 45(2), p. 73-82.

March, J. G. (1981). Footnotes to organizational change. *Administrative science quarterly*, p. 563-577.

Moore, T A and Moore, D R (1997) Project management for the construction industry: an examination of a systems approach. In: 1997, P S-S (Ed.), 13th Annual ARCOM Conference, 15-17 September 1997, King's College, Cambridge. Association of researchers in Construction Management, Vol. 1, p. 295-303.

Martin, H., Lewis, T. M., & Fifi, J. (2014). Centralized versus decentralized construction project structure—Easing communication difficulties. *International Journal of Construction Management*, 14(3), p. 156-170.

Mintzberg, H. (1979). The structuring of organizations: A synthesis of the research. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.

Mena, J. A. (2012). THE OPTIMAL ORGANIZATION STRUCTURE DESIGN PROBLEM IN MAKE-TO-ORDER ENTERPRISES. *International Journal of Industrial Engineering*, 19(4).

McClellan, J. G. (2014). Announcing Change: Discourse, Uncertainty, and Organizational Control. *Journal of Change Management*, 14(2), p. 192-209.

Meroño-Cerdan, A. L., & López-Nicolas, C. (2013). Understanding the drivers of organizational innovations. *The Service Industries Journal*, 33(13-14), p. 1312-1325.

Mariana, P., & Nadina, R. R. (2015). Employee Involvement In A Change Process-A Case Study For Romanian Organizations. *Annals of Faculty of Economics*, 1(1), p. 1158-1164.

Murray, M. I. C. H. A. E. L., Langford, D., Tookey, J. O. H. N., & Hardcastle, C. L. I. F. F. (2000). Communication and Decision-Making as a Means to Determine Project Organization Structure. *CIB REPORT*, p. 29-48.

McComb, S. A., Kennedy, D. M., Green, S. G., & Compton, W. D. (2008). Project team effectiveness: the case for sufficient setup and top management involvement. *Production Planning & Control*, 19(4), p. 301-311.

Nogueira, J. C., & Raz, T. (2006). Structure and flexibility of project teams under turbulent environments: an application of agent-based simulation. *Project Management Journal*, 37(2), p.5-10.

Nastase, M., Prediscan, M., & Roiban, R. N. (2013). The Role of Employees in a Process of Change-A Case Study for the Romanian Organizations. *Revista de Management Comparat International*, 14(4), p. 512-518.

Nahod, M. M., & Radujković, M. (2007, January). Project in different organization structures and transition from non-project to the more project-oriented organization structure. In 5th International Conference TECHSTA 2007, p. 1-11.

Payne, J. H. (1993). Introducing formal project management into a traditional, functionally structured organization. *International Journal of Project Management*, 11(4), p. 239-243.

Pries, F., & Janszen, F. (1995). Innovation in the construction industry: the dominant role of the environment. *Construction management and economics*, 13(1), p. 43-51.

Pérez, C. G., & Fernández, S. P. (2010). New ways of organization. An organizational change process. *Revue Sciences de Gestion*, (75).

Pinto, J. K., & Slevin, D. P. (1988, June). Critical success factors across the project life cycle. *Project Management Institute*.

Petro, Y., & Gardiner, P. (2015). An investigation of the influence of organizational design on project portfolio success, effectiveness and business efficiency for project-based organizations. *International Journal of Project Management*, 33(8), p. 1717-1729.

Pierce, J. L., & Delbecq, A. L. (1977). Organization structure, individual attitudes and innovation. *Academy of management review*, 2(1), p. 27-37.

Project Management Institute. (2013). *A Guide to the project management body of knowledge (PMBOK Guide) (5th ed.)*. Newtown Square, PA: Project Management Institute.

Rankin, J. H., & Luther, R. (2006). The innovation process: adoption of information and communication technology for the construction industry. *Canadian Journal of Civil Engineering*, 33(12), p. 1538-1546.

Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Role conflict and ambiguity in complex organizations. *Administrative science quarterly*, p. 150-163.

Soulsby, A., & Clark, E. (2013). Organizational Restructuring and Change in Transition Societies: Dominant Coalitions and the Dynamics of Managerial Power and Politics. *Competition & Change*, 17(2), p. 176-196.

Sadri, S., & Sadri, J. (2014). Management of Change in Organizations that Use the Top Downward Structure. *International Journal of Multidisciplinary Approach & Studies*, 1(5).

Shirazi, B, Langford, D, & Rowlinson, S (1996), 'Organizational structures in the construction industry', *Construction Management & Economics*, 14, 3, p. 199-212.

Slinger, G., & Morrison, R. (2014). Will Organization Design Be Affected By Big Data?. *Journal of Organization Design*, 3(3), p. 17-26.

Sakalas, A, & Venskus, R 2007, 'Interaction of Learning Organization and Organizational Structure', *Engineering*

Şimşit, Z. T., Vayvay, Ö., & Öztürk, Ö. (2014). An outline of innovation management process: building a framework for managers to implement innovation. *Procedia-Social and Behavioral Sciences*, 150, p. 690-699.

Sundstrom, E., De Meuse, K. P., & Futrell, D. (1990). Work teams: Applications and effectiveness. *American psychologist*, 45(2),p.120.

Stare, A. (2011). The impact of the organisational structure and project organisational culture on project performance in Slovenian enterprises. *Management: Journal of Contemporary Management Issues*, 16(2), p. 1-22.

Torfi, F., & Rashidi, A. (2011). Selection of project managers in construction Firms using analytic hierarchy process (AHP) and fuzzy Topsis: a case study. *Journal of Construction in Developing Countries*, 16(1), p. 69-89.

Tetrick, L. E., & Camburn, M. K. (2004). Organizational structure. *Encyclopedia of applied psychology*, 2, p. 747-753.

Tatum, C. B. (1989). Organizing to increase innovation in construction firms. *Journal of Construction Engineering and Management*, 115(4), p. 602-617.

Tatum, C. B. (1984). Organizing large projects: How managers decide. *Journal of construction engineering and management*, 110(3), p. 346-358.

Tatum, C. B., & Fawcett, R. P. (1986). Organizational alternatives for large projects. *Journal of construction engineering and management*.

Taylor, J. (2006). CHAPTER 10: Project Management in Different Organizational Environments. In , *Survival Guide for Project Managers* (pp. 179-192). American Management Association International.

Tatum, C. B. (1986). Designing project organizations: An expanded process. *Journal of construction engineering and management*, 112(2), p. 259-272.

259-272. Tran, Q., & Tian, Y. (2013). Organizational Structure: Influencing Factors and Impact on a Firm, *American Journal of Industries and Business Management*, 2013(3), p. 229-236.

Tabish, S. Z. S., & Jha, K. N. (2012). Success traits for a construction project. *Journal of construction engineering and management*, 138(10), p. 1131-1138.

Tichy, N. (1983). The essentials of strategic change management. *Journal of Business Strategy*, 3(4), p. 55-67.

Taylor, J. (2006). CHAPTER 10: Project Management in Different Organizational Environments. In , *Survival Guide for Project Managers* (pp. 179-192). American Management Association International.

- Ubani, E. C. (2012). Evaluating the effects of organizational structure on the effective delivery of civil engineering projects. *Interdisciplinary Journal of Contemporary Research in Business*, 4(6), 1284.
- Van de Ven, A. H., & Sun, K. (2011). Breakdowns in implementing models of organization change. *The Academy of Management Perspectives*, 25(3), p. 58-74.
- Van de Ven, A. H., & Poole, M. S. (1995). Explaining development and change in organizations. *Academy of management review*, 20(3), p. 510-540.
- Van de Ven, A. H., & Poole, M. S. (2004). *Handbook of Organizational Change and Innovation*. Oxford, UK: Oxford University Press.
- Vann, JL (2004), 'Resistance to Change and the Language of Public Organizations: A Look at "Clashing Grammars" in Large-Scale Information Technology Projects', *Public Organization Review*, 4, 1, p. 47-73.
- Westover, J. H. (2010). Managing organizational change: Change agent strategies and techniques to successfully managing the dynamics of stability and change in organizations. *International Journal of Management and Innovation*, 2(1), 45.
- Wilemon, D. L., & Cicero, J. P. (1970). The project manager—anomalies and ambiguities. *Academy of Management Journal*, 13(3), p. 269-282.
- Wiersema, M. F., & Bantel, K. A. (1992). Top management team demography and corporate strategic change. *Academy of Management journal*, 35(1), p. 91-121.
- Youker, R. (1977). Organization alternatives for project managers. *Management Review*, 66(11), p. 46-53.
- Youngjin, Y., Boland Jr., R. J., & Lyytinen, K. (2006). From Organization Design to Organization Designing. *Organization Science*, 17(2), p. 215-229.
- Yuan, X. N., Guo, Z., & Fang, E. (2014). An examination of how and when the top management team matters for firm innovativeness: The effects of TMT functional backgrounds. *Innovation*, 16(3), p. 323-342.

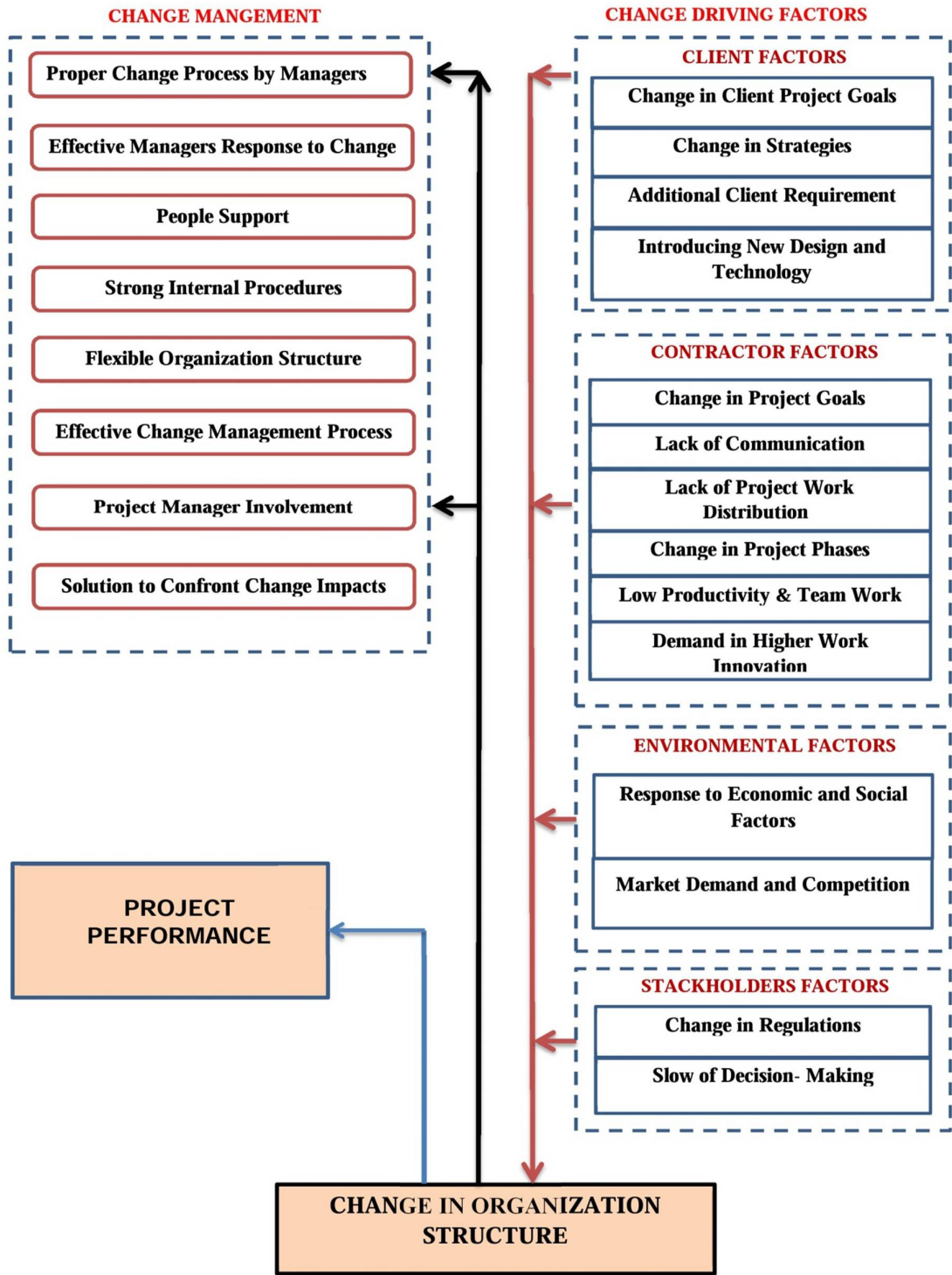
Zwikael, O. (2008). Top management involvement in project management: A cross country study of the software industry. *International Journal of Managing Projects in Business*, 1(4), p. 498-511.

Appendix A – Interviewees Information

Interviewee	Position	Project	Experience in Construction	Experience in Same Position	Experience in Current Organization
M1	Project Planning Manager	A	15 Years	8 Years	13 Years
M2	Managing Director	A	44 Years	22 Years	35 Years
M3	Senior Technical Engineer	B	13 Years	5 Years	8 Years
M4	Managing Director	B	29 Years	8 Years	22 Years
M5	Project Manager	C	16 Years	5 Years	3 Years
M6	Operation Manager	C	24 Years	5 Years	12 Years
M7	Construction Manager	D	19 Years	9 Years	14 Years
M8	Vice General Manager	D	30 Years	7 Years	18 Years
M9	Project Manager	E	14 Years	5 Years	4 Years
M10	Operation Manager	E	18 Years	8 Years	6 Years

Interviewees Information

Appendix B – Conceptual Model



Conceptual Model

Interview's Questions on Senior Corporate and Project Management Level

1. How do you explain the role of senior management at corporate level and project management during the establishment of the project organization structure?
.....
.....
2. How would you describe the reasons behind the change in the project organization structure?..
.....
.....
3. Were there any certain procedures that have been followed to implement and empower that change to the project organization? Please explain.
.....
.....
4. From your point of view, how do you evaluate the impact and time of the change in project organization structure to the project performance and team effectiveness?
.....
.....
5. How far do you agree that building effective project organization structure play significant role on project performance during the project life cycle? Please explain considering the project case study as an example?
.....
.....
6. From your previous extensive experience in construction industry. What are the most widespread causes of changes facing the contractor's organization structure in different projects?
.....
.....