

Managing construction projects in the United Arab Emirates to gain competitive advantage

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MANAGING CONSTRUCTION PROJECTS IN THE UNITED ARAB EMIRATES TO GAIN COMPETITIVE ADVANTAGE

SULTAN ALSHAMSI

MANAGING CONSTRUCTION PROJECTS IN THE UNITED ARAB EMIRATES TO GAIN COMPETITIVE ADVANTAGE

SULTAN ALSHAMSI

**A thesis submitted in partial fulfilment of the requirements of the University of
Wolverhampton for the degree of Doctor of Philosophy (PhD)**

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DEDICATION

This thesis is dedicated to the memory of my late father Mr Khamis Rashed Alshamsi, my mother Afra Rashed, my wife Wedad, my son Salem, my sister Mariam and brothers Ali, Salem, Mohammed and Humaid.

ABSTRACT

A tremendous growth has been experienced in United Arab Emirates (UAE) in the construction industry. It is also mirrored by the expansion and development of project management tools and techniques. The term project management prevails as a trending topic in the business world due to its vitality in the transformation process and execution of new business opportunities. However, regardless of the increasing importance of project management, still UAE construction industry is facing massive challenges in controlling their assignments since projects continue to fail in very high rate. Therefore aim of this research is to explore how the UAE construction organisations are managing construction projects to enhance competitive advantage. Given the relatively new and unexplored nature of the research problem, qualitative research method was adopted to collect and analyse data. Semi-structured interviews with 65 professionals were used to collect data which was then analysed using content analysis for inference and conclusion.

The study concluded that a complex mix of political, economic, social, technological, legal, and environmental forces drives construction project management in the UAE. Therefore, understanding the macro-environmental factors that impact on the UAE construction project management is important. Furthermore, it is noted that understanding drivers is imperative for smooth project implementation. As revealed in the current study, the single most important driver for managing projects in UAE is to improve greater efficiency. In addition, the UAE project management education struggles with challenges such as there are too many knowledge areas in project management, and struggle to provide education to professionals from different background and learning styles. Therefore, the UAE project management training and education should lead to a more active/practical approach. The study concludes that adoption of digital technologies in the UAE construction industry is still at their infancy. Despite of the incremental significance of project management, yet, businesses are confronting encounters in controlling their assignments since projects keep failing in very high rate. A project management competency framework for managing construction projects was developed and validated. It is recommended to explore the level of embeddedness of construction project management between developed and developing countries. This should lead to a generation of benchmark data and best practices in addressing global construction project management issues.

CHAPTER 1 : AN INTRODUCTION TO THE STUDY

This chapter of the thesis is an introduction chapter and identifies important element of the thesis including: background statement, research problems, research aim and objectives, research questions, research methodology, scope and limitation of the study, beneficiaries of the study and structure of the thesis. This chapter helps in understanding how the research is performed and what the factors were, which motivated research on this subject. This chapter helps the entire thesis to abide by various objectives and focuses on the extent to which research is conducted. It gives a glimpse and idea of the entire thesis.

The thesis discusses the role of project management in various industries and analysed how it helps in delivering project outcomes on time and within the specified budget. It observes that the role of project management is increasing with the increase complexities in the working culture. The construction industry requires hi-tech technologies and innovative systems to ensure high performance and productivity. Further, the construction industry currently facing problems of over investment due to undue delay in completion of project; these factors are affecting the overall quality of the construction project. However, it is important to understand that complexity associated with the approach of project management is high because it offers a wide variety of tools and techniques along with different kinds of risk associated with it. Further, it is not specified or no guideline is issued for the project managers to direct them as to which tool and technique is to be used in what kind of situations or which tools help in resolving what kind of problems (Zimmer, 2016). The project managers in this field have to meet project requirements by applying the most suitable project

management techniques as per their competence and experience. The probability of success associated with any project increases if the best technique of project management is selected by project managers. In order to do this, they have to use their skills and knowledge. A project has a particular lifecycle and in each phase of project lifecycle, different tools and techniques are used.

The discipline of project management is vast in understanding as well as implementation in literature and in practice. It stands on the iron triangle which is composed of cost, quality and time and forms the most essential elements of project management. Besides this there are number of stakeholders who are involved in a complete process of managing a project. All these stakeholders have to work together for successful completion of the project. This research analyse the United Arab Emirates (UAE) environment and in particular the work culture and construction industry in Abu Dhabi.

1.1 BACKGROUND TO THE RESEARCH STUDY

The construction industry of UAE has experience remarkable growth and one of the important elements assisting such growth is the integration of project management approach. The field of project management focuses mainly on application of tools, techniques, skills and knowledge so that specifications and requirements of the projects can be fulfilled (Ballal et al., 2007). Project management approach has been implemented in a various industries ranging from construction to information technology. It has come up as a new professional field however it was implemented even during ancient constructions in an informal manner (Al-Hajj & Sayers, 2014). UAE has been one of the first countries in implementing project management approach in the construction industry. The construction industry of UAE is looked upon even by

the developed nations for its efficacy and growth even in a very short period of time. Much of this growth is based on the implementation of project management approach. However, it has been seen that the project managers lack expertise in project management but are still assisting construction companies by giving professional guidance, thus it is pertinent for the individuals to acquire distinct qualifications in project management to boost the construction industry and ensure that it contributes significantly to the economy of UAE. Since the 20th century, UAE has been highly dependent on its oil resources for sustenance of its economy (Construction Week Online, 2013). Towards the end of 20th century, the authorities realized the importance of diversifying the economy and the resources were getting depleted at high rates. The construction sector was one of those potential sectors wherein authorities assisted for further growth and development. Thus, this research study analysis the current trends in construction industry and analyses the project management approach in UAE.

1.2 RESEARCH PROBLEM

The research problem for this thesis includes the following:

1. Identification of various styles and types of project management- this was one of biggest problems, as no mandatory styles and types of project management have been mentioned in the literature. Project managers have to choose the style and type according to their knowledge, experience and demand of the situations.
2. The current practices in the construction industry of UAE- the UAE construction industry is huge and includes variety of projects under it ranging from low investment to high investment. Thus, there are no practices that are prevalent in the entire industry and it is difficult to evaluate the exact benefits and challenges of implementing project management in the industry.

3. The work culture in the UAE construction industry- similar to the above problem, the work culture also varies depending upon the basis of capital formation of the organization or other factors. This shows a problem in understanding the behaviours of the people towards performance management approach.
4. Understanding the economy of UAE- the country has a huge efflux of population from the nearby countries and thus has mixture of population but the Islam predominantly guides the work culture ethics and practices. Thus, it is difficult to set standards that are suitable to the entire workforce.
5. Integrating the benefits of project management in the construction industry- due to the above problems it is very typical to identify the channel through which project management can be directly industry in all construction projects.

1.3 RESEARCH AIM AND OBJECTIVES

The aim of this study is to explore how the UAE construction organisations are managing construction projects to gain competitive advantage. The specific objectives are:

1. To explore the outlook of the UAE construction sector.
2. To analyse the UAE macro-environmental factors that have an impact on the construction project management.
3. To explore and document the key drivers for managing construction projects in the UAE.
4. To investigate the key digital technologies that have been adopted for managing construction projects in the UAE.
5. To investigate the key challenges the UAE construction organisations face in managing construction projects.

6. To develop and validate a project management competency framework for the benefit of UAE construction organisations.

1.4 RESEARCH QUESTIONS

A set of research questions were developed through a review of the existing literature to guide the research. Hence, the research study sought to collect data to answer and examine the following research questions (see Table 1.1):

Overall research questions

1. What is the status of the UAE construction sector?
2. What are the macro-environmental factors that impact on the UAE construction project management?
3. What are the key drivers that have fuelled the need for managing construction projects in the UAE?
4. What are the key digital technologies that have been adopted for managing construction projects?
5. What are the key challenges the UAE construction organisations face in managing construction projects?
6. Is there a need for developing a project management competency framework for the benefit of UAE construction organisations?

Table 1.1: Traceability matrix of research objectives, research questions and chapter addressed

Sl. No.	Research Objectives		Research Questions	Chapter addressed
RO1	To explore the outlook of the UAE construction sector.	RQ1	What is the status of the UAE construction sector?	Chapter 4
RO2	To analyse the UAE macro-environmental factors that have an impact on the construction project management.	RQ2	What are the macro-environmental factors that impact on the UAE construction project management?	Chapter 6
RO3	To explore and document the key drivers for managing construction projects in the UAE.	RQ3	What are the key drivers that have fuelled the need for managing construction projects in the UAE?	Chapter 7
RO4	To investigate the key digital technologies that has been adopted for managing construction projects in the UAE.	RQ4	What are the key digital technologies that have been adopted for managing construction projects?	Chapter 8
RO5	To investigate the key challenges the UAE construction organisations face in managing construction projects.	RQ5	What are the key challenges the UAE construction organisations face in managing construction projects?	Chapter 9
RO6	To develop and validate a project management competency framework for the benefit of UAE construction organisations.	RQ6	Is there a need for developing a project management competency framework for the benefit of UAE construction organisations?	Chapter 10

Legend: RO = Research Objective; RQ = Research Question

1.5 BENEFICIARIES OF THE STUDY

This study shall benefit the following organisations:

1. Project Management Companies- in identifying the current trends and requirements of the construction industry and selecting personnel as per these factors.
2. Authorities of Abu Dhabi - in helping them towards making better plans that can be integrated in the Abu Dhabi 2030 plan.
3. Project Manager & Employees- in understanding the scope, significance and relevance of project management approach in the construction industry and how can this be implemented for UAE construction projects.

1.6 CONTRIBUTION TO KNOWLEDGE

1. The thesis can be seen as a case study in developing project management competency framework in the construction sector and one which adds variety to the existing stock of such case studies. Given that construction related project management competency framework have not previously been studied from UAE perspective and its intrinsic interest, this thesis fill this gap.
2. Increase understanding on the macro-environmental factors, key drivers, key digital technologies, and key challenges the UAE construction organisations face in managing construction projects in the UAE.
3. The developed competency framework provides broad guidance to identify and classify the different competence elements needed by project managers, at all levels, for effective management of construction projects in the UAE.

1.7 STRUCTURE OF THE THESIS

The thesis has been organised in a logical manner in order to enable the reader to gain insight and understanding of how the key research objectives and research questions have been achieved. The layout of the thesis is in a logical sequence, commencing with the introduction to the study in chapter 1 to the conclusions and recommendations in chapter 11.

Chapter 1 – explains the background and justification for the study. Then it discusses the research aim, objectives and research questions. Also it highlights the contribution to knowledge, and gives a brief overview of the other chapters.

Chapter 2 – presents a critical review of current literature concerning project management in general. It analyses various definitions and scope of project management as given by scholars and academicians.

Chapter 3 – presents a critical review of current literature concerning project management and leadership. This chapter details about the types and styles of project management.

Chapter 4 – This chapter discusses the construction industry of UAE in detail.

Chapter 5 – discusses the research methodology that is used to empirically investigate the research aim and objectives. The chapter also discusses why a qualitative methodology was adopted. Furthermore, the sample size chosen for the study has been explained. Research process adopted for the study has also been described.

Chapter 6 – this chapter focuses on the UAE macro-environmental factors that have an impact on the construction project management. The results are based on the perceptions of the 65 interviewees who participated in this study. The findings are also substantiated with the relevant literature. Finally, chapter 6 concludes with a summary.

Chapter 7– this chapter focuses on the drivers for managing construction projects in the UAE. The results are based on the perceptions of the 65 interviewees who participated in this study. The findings are also substantiated with the relevant literature. Finally, chapter 7 concludes with a summary.

Chapter 8 – this chapter focuses on the adoption of technologies for managing construction projects in the UAE. The results are based on the perceptions of the 65 interviewees who participated in this study. The findings are also substantiated with the relevant literature. Finally, chapter 8 concludes with a summary.

Chapter 9 – present on the challenges for managing construction projects in the UAE. The results are based on the perceptions of the 65 interviewees who participated in this study. The findings are also substantiated with the relevant literature. Finally, chapter 9 concludes with a summary.

Chapter 10 – discusses a competency framework for managing construction projects in the UAE. The findings from the previous stages of this research study were taken into consideration in the development of the competency framework.

Chapter 11 – focuses on the conclusions and recommendations drawn from this study. It summarises the key findings of this research and also provides recommendations for the future research in the area of construction project management in the UAE.

CHAPTER 2 : A REVIEW OF LITERATURE ON PROJECT MANAGEMENT

2.1 INTRODUCTION

This chapter presents a literature review of the discipline of project management. It analyses various definitions and scope of project management as given by scholars and academicians. There are other benefits and challenges to the implementation of project management that have been deeply discussed in the later sections of the chapter.

As project management revolves around the work done by people, it is highly important to include the aspects of harmony within it. This chapter highlights the significance of advocating a harmonized culture within the organization for proper implementation of the approach of project management. Further, this chapter analyses the role of stakeholders in the project management approach and how they are affected by its implementation. Project management helps in delivering productive results within desired time and ensures growth of the organization by retaining customers and ensuring their satisfaction (Elearn, 2007).

Another section of the chapter discusses various tools and techniques that are used for efficient implementation of project management. However, it was found that no single tool is capable of fulfilling all responsibilities and further no technique is prescribed for a particular problem. It is upon the discretion of the project manager to implement a technique that he thinks fits into the particular situation.

2.2 CONCEPT AND ELEMENT OF PROJECT DEFINITION

The Project definition helps in establishing realistic and derivable goals related to the project management. The phase of project definition does not exist throughout the

project management but during the inception period when performance specifications are received and until the permissions of final and full planning are granted (Cio, 1997).

The concept phase is the initial and starting point of defining project management and understands the credentials related to the respective project (Fewings, 2005). There are various factors that contribute significantly towards development of the concept phase including: external stakeholders, internal stakeholders, project team and end users of customers. Majorly, the concept phase is formed on the basis of factors like motivation and team work to ensure that correct concepts are established for the purpose of project definitions (Munk-Madsen, 2010). The figure below mentions various concepts related to project definitions:

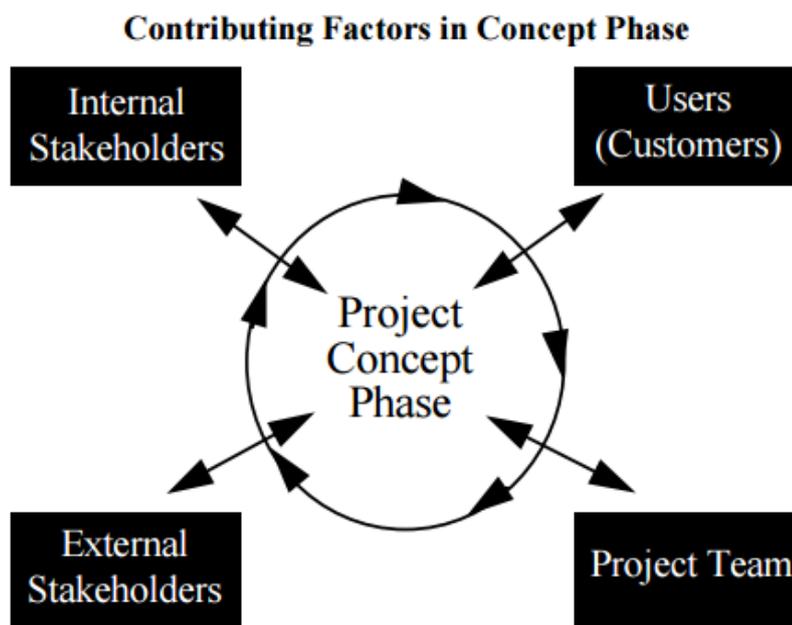


Figure 2.1: Stakeholders contributing in Concept Phase

Source: (Cio, 1997)

The stages of project definition are understood in the graph below:

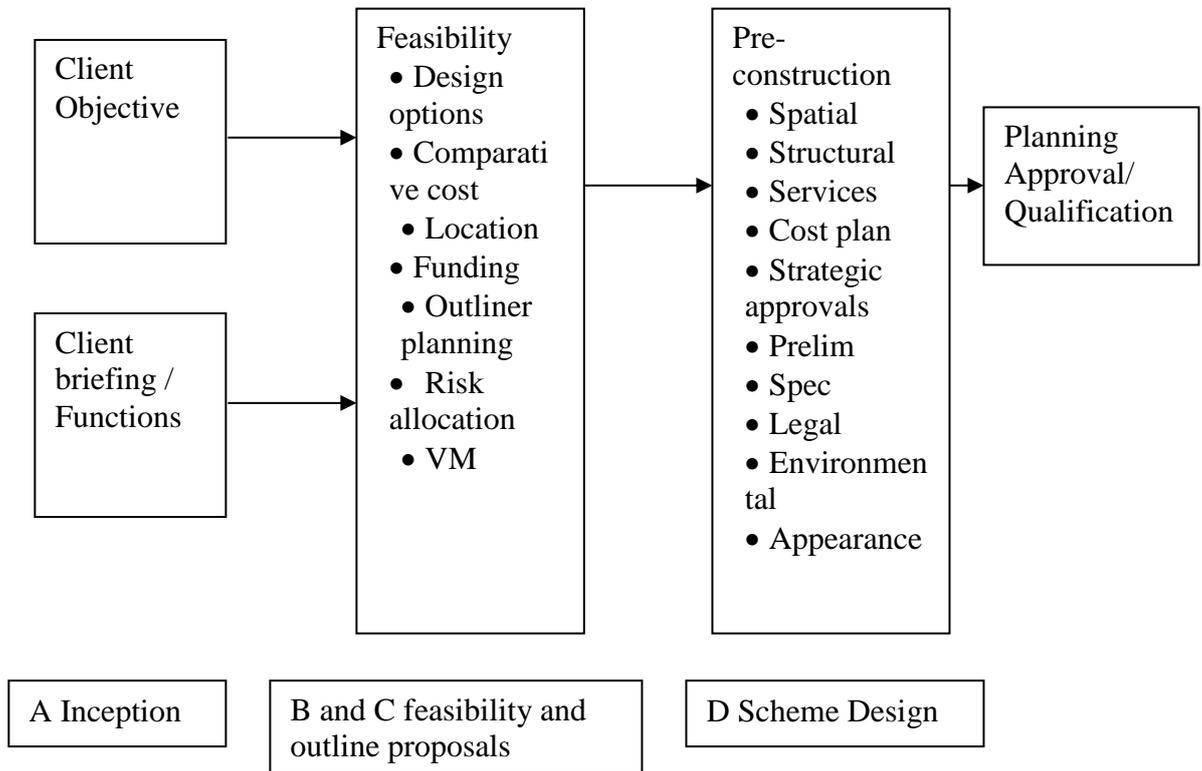


Figure 2.2: Stages of project definitions

Source: (Fewings, 2005)

The above three stages are as follows:

1. Stage A: Inception- it includes the identification of appraisal on the part of client on the basis of its requirements and in consideration of possible constraints. It helps in laying out a proper route for procurement.
2. Stage B: Feasibility- it includes preparing strategic briefs either on the part of the client or on behalf of the client. It helps in clearly identifying the organizational culture along with appointments of apt consultants (Artto et al., 2008).

3. Stage C: Outline Proposals-in includes analysing and examining the feasibility studies in regard to estimation of cost, reviewing the procurement route, etc.
4. Stage D: Scheme Design- it includes proposal in detail along with completion of the brief. Further, it includes applications relating to development control approvals (Fewings, 2005).

Stages	Activities
Stage A	Inception
Stage B	Feasibility
Stage C	Outline proposals
Stage D	Scheme design

Table 2.1: Stages of project

Source: (Fewings, 2005)

The process of project definition has been detailed and explained as below (Cio, 1997):

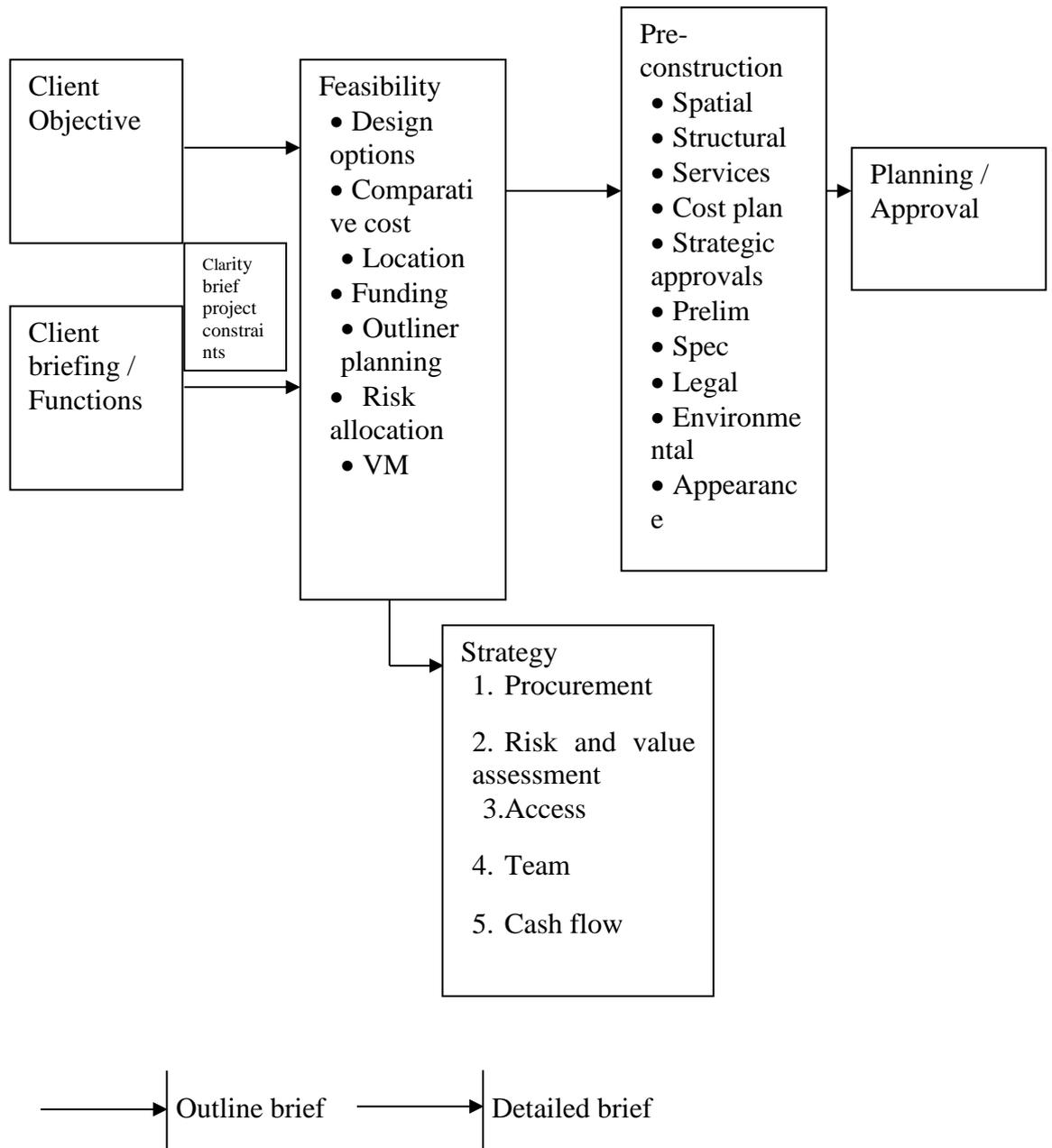


Figure 2.3: Process of project definition

Source: (Cio, 1997)

2.3 DEFINITION OF PROJECT MANAGEMENT

For understanding the concept of project management it is important to understand the meaning of the term project. The term 'project' is defined as an endeavour which is temporary in nature and that endeavour aims at creating a new product and service. A project can be termed as a process which has a definite beginning and an end; also it has a definite need of resources. The examples of a project can be of a construction of a building or it involves development of a new software or application in order to improve the business operations. To manage these projects the concept of project management has been developed (Mind Tools, 2015; Hobbs, 2009). Therefore project management is defined as the application of the skills and knowledge, tools and techniques by the experts in order to meet the requirements of the projects (Mind Tools, 2015). By applying the concept of project management it can be ensured that the project so undertaken by the experts is completed on time and also the outcome of the project is positive and the best that can be expected. (PMI, 2015). There are five functions in the process of the project management. These functions are initiating the project, proper planning, executing the planned process, monitor and control the process and closing the project when it is completed (Project Insight, 2015; Project Management Institute, 2013).

Project Management is considered as an application of skills, knowledge, techniques and tools to various activities of the project that are aimed to meet the requirements of the project (Choudhury, 1988). Accomplishment of Project Management is done by applying and integrating within it the processes of planning, initiating, executing, controlling, monitoring and finalizing. The person who is responsible for accomplishing all the objectives related to project is known as the project manager (Project

Management Institute, 2000). Also, project management is defined as a process of defining, planning, monitoring, controlling and delivering projects with the aim of realising common and agreed benefits (Project Smart, 2015). Projects are transient and unique endeavours that are commenced with a desire to achieve certain outcome. The change that is brought about by the project is realized most effectively by the approach of project management (Kerzner, 2013).

Project management has various definitions but broadly it can be defined as an academic field which is dedicated to some planning oriented techniques. These techniques can be applied in optimizing theory or engineering science (Lock, 2007). There are many generic factors which are responsible for the success of a project. The academic field of project management has also received interest from other disciplines in last decade (Project Insight, 2015). There are many emerging perspectives in the field of project management and project organization. These perspective ranges from stakeholder management to manage cost, quality, and time of the project. (Söderlund, 2004; Subramanyan et al., 2012).

The field of project management has evolved to coordinate, plan and control activities of industrial, commercial and information technology projects. These projects include complex set of activities which need to be managed effectively (Lock, 2007). The projects of different fields have a common characteristic i.e. their ideas as well as activities are entering in new endeavours. The elements of risk which are always present in a project become an obstacle in successful completion of a project. The activities need accuracy and risk mitigation strategies (Bureau of Reclamation, 2015). The process of project management is highly dynamic and utilizes proper and adequate resources available with the organization in a manner which ensures structured and controlled achievement

of objectives as per the needs of the organization. Project management is conducted within a distinct set of variables and constraints (Young, 2013). The success of the project is based on how well a project is managed in terms of cost and time (APM, 2015). Following figure depicts the components required for the success of the project:

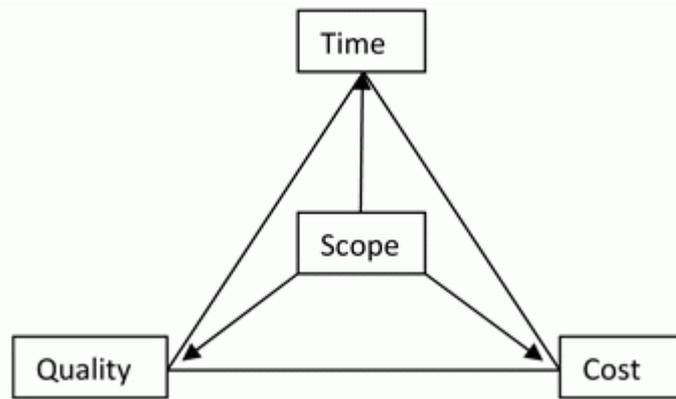


Figure 2.4: Components of Project Success

Source :(APM, 2015)

The success of a project is also determined on the basis of how well the team was managed. Team management is a very important aspect for a project to be successful. The concern of the concept of project management is to attain and achieve the objectives that the distinct packages of the work should be managed properly (APM, 2015; Reid, 1999).

The above definitions help in identifying various perspectives, scope and significance of project management in the present context. It helps in identifying characteristics of project management that have evolved during the period of advancement and thus the changes brought in this discipline. Primarily, a discipline of management, the project management approach is now applicable to all the fields whereby it delivers objectives as per its definitions.

2.4 HISTORICAL OVERVIEW OF PROJECT MANAGEMENT

In order to understand various aspects of project management it is necessary to examine its evolution and historical roots. The practice of project management dates back to the Egyptian era; although, at that time there was lack of adequate project management (Chiu, 2010).

Even the complex projects were then managed with unorganized project management. In the year 1950, first time modern project management methodologies were applied by Navy in their Polaris projects (Bradon, 2006). Then in the 1960s and 1970s the principles of project management were utilized by NASA and Department of Defence along with large construction and engineering companies. It can be analysed that informal project management exists since pre historic times but they have now been converted to formally organized project management (Visually, 2015). In the 1980s sophisticated project management techniques were implemented in the manufacturing and software development sectors. In the 1990s different industries and organizations started to adopt the tools and techniques of project management (Kwak, 2003).

However, after the World War II, a different perspective of project management emerged with related to a social practice. The tools and techniques of project management existed from centuries (Morris, 1994; Engwall, 2003). The development of practice of number of projects like Manhattan project started in 1940s. The chemical industry and Oil industry of Middle East has also led to the development of project management as a field. The role of project management in development of the United Arab Emirates is reasonably high and different project management techniques have been applied in several historical construction projects of Abu Dhabi (Shpak, 2015). The nature of project management has now changed as it has become more formal and

organized project management from an informal and unorganized project management. The development and growth in the field of project management is still continuing. The new tools and techniques of project management are evolving. These project management techniques have been implemented to plan and control cost, time and quality of construction projects (Cicmil, 2006).

There are number of directions and aspects of project management which are extending the scope of conceptual foundation of project management. The critiques of project management theories and practice are increasing (Chand, 2015). Various aspects and dimensions of project management in Abu Dhabi can be categorized in following areas: project complexity and creation of value, conceptualization of projects, social processes and development of practitioners. These aspects and dimensions are forming the foundations of project management in Abu Dhabi. These areas have been identified after comprehensive research in the field of project management in Abu Dhabi (Winter, 2006).

The table below lists the events in the history of Project Management that significantly contributed towards its evolution (Azzopardi, 2015):

Table 2.2: History of Performance Management

Date/Year	Particulars
Prior to 1958	The schedule of projects was shortened due to evolution of technology like telecommunications, automobiles, etc. The approach to project management with integration to new technologies was identified and its significance was understood (Kwak, 2003).
1958-1979	This phase saw the implementation of management science. As there was rapid development in the computer technology, thus the project management saw huge integration in the real time projects. Several softwares for project emerged due to computer technologies namely: Oracle, Artemis and Scitor Corporation (Huprich, 2015).
1980- 1994	This phase saw the introduction of personal computers and thus elevated the concept of project management to a further level. The

	project management techniques were made easily accessible during this period due to low cost multitasking PCs available in abundance (Whatishumanresource, 2015).
1995- Present	This phase is known with the creation of new surrounding or environment of working. The internet has developed during this phase, which has complimented the growth and development of project management. Internet helped in integrating stakeholders and processes of project management together (Azzopardi, 2015).

2.4.1 Project Management in Developing Countries- Historical Overview

Low levels of human and economic development are the key features of developing economies all over the world. The underdevelopment of these countries is compared with other developed or under-developed countries on the basis of per capital income. The aspects of project management are highly relied by developing countries to ensure growth and success in implementation of projects that are integral to the growth and development perspectives of the economy. Historical overview of project management in such developing countries is detailed below (Analysis, 2012):

1. During the 1930s, the Soviet Union made a project model aimed at managing development in the modern ways while considering the approach of centralized planning. The model of centralized planning was thereafter adopted by various developing countries post Second World War (Stuckenbruck & Zomorrodian, 1987).
2. During 1960s, the Manhattan Project in the US was based on centralized planning (Rondinelli, 2015)
3. Further support to centralized planning was offered during the period between 1950s and 1960s, when there was cold war. During this period, the developing countries got high support, assistance and expertise from developed countries to build the centralized planning and implement it successfully within the planning system. This aid by developed foreign countries was based on projects. Thus,

projects become a medium through which development plans of developing countries were translated into real actions (Frimpong, 2003)

4. During 1970s, the developing countries started to shift towards the project management models after analysing the weakness of centralized planning model, which were replaced after using the project management model. This model could be highly relied when developing high complex structures. This model also supported matrix project and pure project organizational structures. Under this model, a project manager was appointed who was entirely entrusted with the responsibility of the project from initiation till the end (Hussein, 2014)
5. Project management came to be highly relied for implementation of programs and plans while developing structures and projects in the developing countries. Both private as well as public organizations started to depend heavily on aspects and implementation of project management and thereby made it a dominant concern. Foreign assistance was considered significant in this regard (Microsoft, 2015)
6. In the developing countries, managing change has not been facilitated with the implementation of bureaucratic model of managing development. Thus, the project management model has been relied widely by developing countries so that projects can be implemented and objectives be achieved timely at national as well as local levels (Burke, 2010)

Project management helps companies in developing in the following manner:

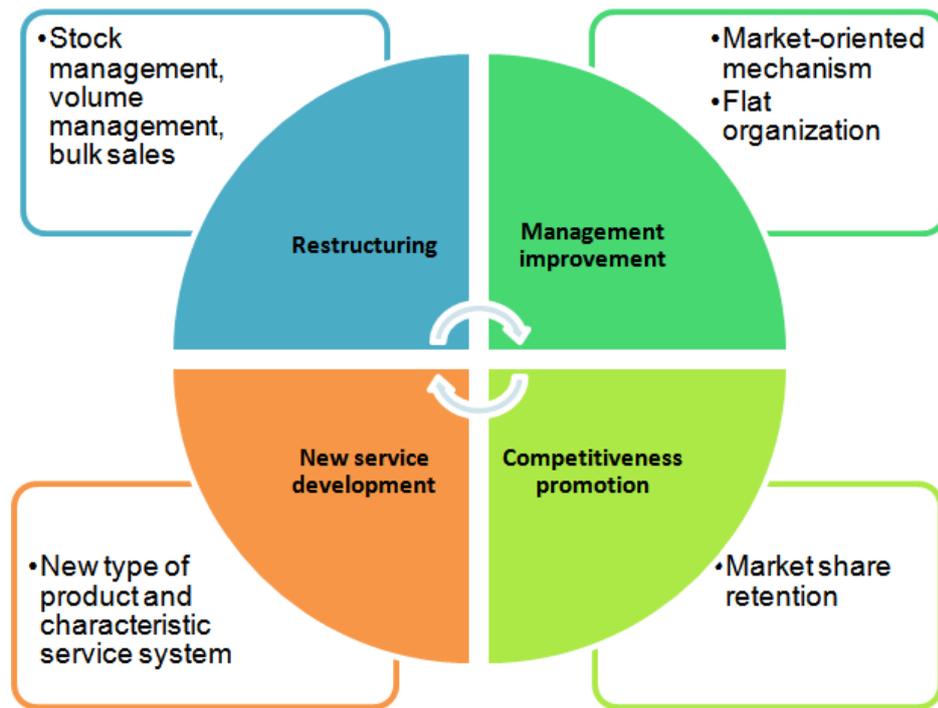


Figure 2.5: Development through Project Management

Source: (Burke, 2010)

2.4.2 Development of Project Management Theories

The roots of project management can be found in Egyptian Pyramids however this type of project management was informal and not properly coordinated. The Egyptian Pyramids are considered as early historical projects. The modern projects had their genesis in the 1950s. It was a period when projects were managed with help of different tools and techniques (Jugdev, 2008). After this period, proliferation of modern tools and technologies started in distinctive projects. These project management techniques were used so as to ensure that both budget of project along with high quality is maintained to ensure achievement of project deliverables within the cost. The strict schedules also were one of the major reasons of adopting modern techniques of project management. Since then number of new theories and practices have been evolved in academic field of project management (Stretton, 2007).

Even when there were no institutes for project management; the main source of implementing project management techniques was through books or guides that helped in effectively managing the projects without any Gantt Charts (Parker, 2015). The colossal projects were completed successfully and there are many evidences of them in history. Some of the effectively managed projects of history are The Great Wall of China, Coliseum and the Pyramids of Giza. Project management acts as a core of creating an environment where mutual objectives can be achieved with help of coordination and high quality projects can be delivered in a specific time (Mahadevan, 2009). The humanity throughout history has worked together in order to improve and refine the theories and practices of project management. The future of project management includes developments of more sophisticated tools and techniques which will allow project managers to reach to a next level of project management (Management Help, 2015). However, till date the techniques to be used for each field of project management are not specified and thus depends upon the project manager to choose from the various available techniques. Thus, this area is still not entirely developed and requires research from scholars, academicians, etc. to ensure best practices be adopted for every field of project management (Seymour, 2014).

It has been clearly analysed that no explicit theory relating to project management has even existed. The foundations for theories of project management have been best laid down by (Project Management Institute, 2000) and is implemented during majority of projects. The foundation of project management and its theories are understood through bifurcation of the concepts of project as well as management and analysing individual theories relating to these concepts (Drouin et al., 2013). The table under analyses various theories that are related to the individual aspects of “project” and “management” (Koskela & Howell, 2002):

Table 2.3: Subject of Theory and Applicable Theories

Subject of Theory	Sub-Subject of Theory	Applicable Theories
Project	-	Transformation
Project	-	Flow
Project	-	Value Generation
Management	Control	Scientific Experimentation Model
Management	Control	Thermostat Model
Management	Planning	Management as organizing
Management	Planning	Management as Planning
Management	Execution	Language/Action based
Management	Execution	Classical Communication Theory

Source: (Koskela & Howell, 2002)

2.5 BENEFITS OF PROJECT MANAGEMENT

The benefits of implementing project management help serving needs of every individual involved in the process of project management. Project management is a roadmap with a set of tools that helps the managers guiding them from one point to the other while doing a project (Soriano, 2016). Improved efficiency while delivering services - it helps in guiding in the right direction towards the project deliverables and thus enforces smart working and integrates efficiency (Bright Hub, 2015).

1. Enhanced levels of satisfaction of the customers- when the projects are done on time and without exceeding the proposed budgets, the customers of the project are happy and can be retained easily in the long run (NIBusinessInfo, 2015).
2. Improved effectiveness while delivering services- a planned and systematic approach with clear project deliverables helps in becoming effective.
3. Better competitive edge and standing in the market- project management helps to ensure superior performance and keeps the customers happy and satisfied, this has an overreaching effect on the overall standing of the company and helps in gaining competitive edge over other competitive companies (Ten Step PM, 2015).

4. Improved levels of growth and development for the entire team- positive work efforts help in ensuring better coordination amongst the team members thereby making them efficient and developing their personality as a whole (Project Accelerator, 2015; Soriano, 2011).
5. Enhanced flexibility in working- project management helps in integrating flexibility within the project framework. It helps in discovering a smarter action or direction that is required to be taken for better outcome (Baars, 2006).
6. Better opportunities to expand the business and project- it is a by-product of enhanced market standing as great performance ensures exposure of new and better opportunities (20|20 Business Insight, 2015).
7. Better evaluated risk- the elements of potential risk can be easily identified when the strategy works as planned. Project management helps in identifying elements of risk before they actually hit the project outcomes (Guo, 2012).
8. Enhanced quality- quality is improved with increase in effectiveness of working and operations (Chaouni, 2015).
9. Enhanced quantity- this aspect is a direct result of improved efficiency and other benefits discussed above (Bateman, 2012).

The benefits have been listed as below:

Table 2.4: Benefits Project Management

Hard benefits of project management	Soft benefits of project management
Informed and believable plans along with budgets and schedules	Improve general communication and corporate experience
Meaning assessment of the contingencies	Clear differentiation between good and bad projects
Discouraged acceptance of unsound projects	Development of high ability of team
Strong statistical information is available for future projects.	A responsible approach for key stakeholders

Source: (Xown-Akande, 2012)

2.6 CHALLENGES OF PROJECT MANAGEMENT

Project management is not an activity that is shouldered on a single person and thus demands efforts of many people at the same time. Thus, while implementing the approach and discipline of project management, various challenges are faced by the entire team including project managers, chief financial officers, directors of professional services as well as other members involved in the team. These challenges are as mentioned below (West, 2015):

1. Project teams that are geographically dispersed- when the teams being part of the same project are dispersed geographically, the centralized approach to project management becomes difficult to be adopted (Doraiswamy & Shiv, 2012). This challenge is new to project management and has come as new outsourcing and offshore development work is growing. It becomes difficult for a team which is living in distant continents to conduct meetings at regular intervals (Kousholt, 2007).
2. Over-utilization of mismanagement of resources- often it has been seen that the project management team does not get accurate information as to availability of resources with them. Teams demand more projects even when there is limited number of project team members to work with and this leads to mismanagement or over utilization of resources. This results in delay of work (West, 2015).



Figure 2.6: Project Management Challenges

Source: (West, 2015)

3. Implementing the wrong tool for completing a task- many organizations use local software to manage the work done under project management. This leads to poor management. Thus, it is highly important that the project manager is well aware of sophisticated and advanced technologies and tools and also as to when these should be integrated to ensure desired outcome. If wrong or obsolete tools are implemented, the entire purpose of implementing project management goes waste. (West, 2015; Muvunzi, 2013)
4. Wasting time while looking for assets or documents- project scope documents like issues lists, risk lists, emails, files and deliverables are included under project assets. In reality, it becomes difficult for the project manager to store all of these documents safely and much of the time goes waste for finding and searching of the documents even when they are saved in highly advanced software systems. Further, the files for the purpose of project management might also be available for members other the project team to access, this might lead to leakage of important information (West, 2015).

5. Spending excess time in conducting status meetings- to update the status of projects, meetings are conducted. However, it is complained that these meetings waste a lot of time and resources and act as a challenge in implementing and fulfilling the objectives of project management. Thus, the model for updating status of the project should be changed and be made virtual for overcoming this challenge (Bittner & Gregorc, 2010).

Another way of overcoming challenges is by developing project culture, so that the organization is capable of responding quickly to challenging situations and tasks. The diagram below tells the fields wherein project culture helps and contributes towards effective project management. The concept of project culture consists to three main elements: organizational structure of the project to support the aspects of success in the project, the processes, methodology, tools, etc. related to project management implemented in the organization and the project management competence. All of these areas should be balanced well while developing (Project Institute, 2015).

Other problems are faced in scheduling and resource allocation, time overruns, escalating of resources, uncertainty and risk management, adapting to the project differences, project leadership and project strategy. These problems are to be solved by applying the theories. Various theories can be applied for solving the problems and challenges of project management (Muvunzi, 2013).

Table 2.5: Project management problems and theories applied

Problems in project management	Theoretical basis for solving problems
Scheduling and resource allocation	Network theory showing operations research
Time overruns and escalating resources	Theory of constraints – showing critical chain
Risk management and uncertainty	Simultaneous time, and knowledge management perspective
Adapting the project differences of project management	Theory of contingency –a typological theory of project management showing differences between soft and hard aspects of the project
Project leadership	Theory of transformational leadership
Project strategy	Theory of strategic management

Source: (Shenhar & Dvir, 2007)

Some of the factors are there which could create problem in the project management. Factors are different from the perspective of different personnel of the study (Shenhar & Dvir, 2007) is shown in Table 2.5.

Factors will be discussed from the perspective of the following personnel:

- Client factors
- Contractor factors
- Financial factors
- Project manager factors
- Financial factors
- Unforeseen factors (Motaleb & Kishk, 2010)

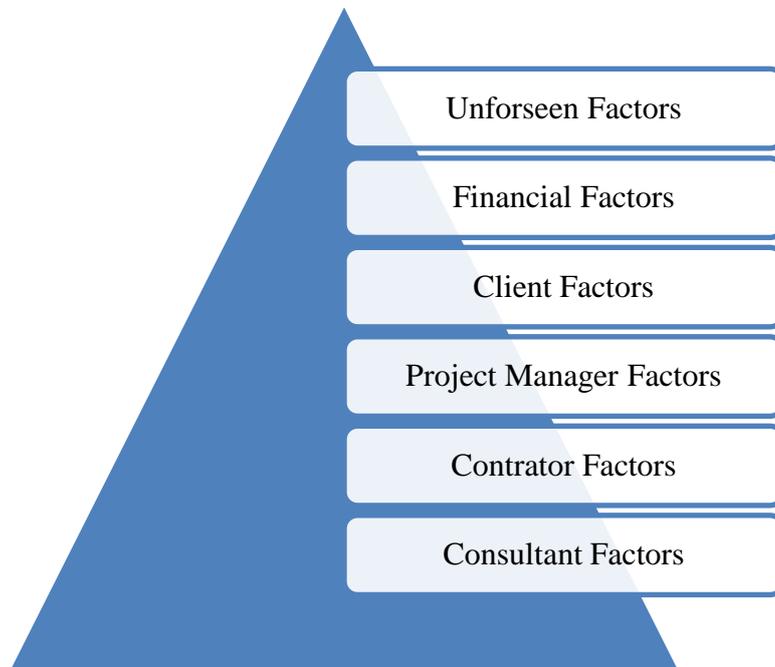


Figure 2.7: Factors affecting project management

Source: (Motaleb & Kishk, 2010)

Contractor factors

Contractor factors are shown below in the table:

Table 2.6: Contractor factors affecting management of project

Factor number	Factor description
1	Late delivery of materials
2	Shortage of skilled labour
3	Absenteeism
4	Low motivation /morale
5	Inadequate contractor experience
6	Inaccurate site investigation
7	Labour productivity
8	Strike
9	Contractor's financial difficulties
10	Labour supply

Source: (Motaleb & Kishk, 2010)

Consultant factors

Consultant factors are shown below in the table:

Table 2.7: Consultant factors affecting project management

Factor number	Factor description
1	Inadequate consultant experience
2	Detail of design and incomplete drawings
3	Poor inspection and slow response
4	Inapt project feasibility study
5	Poor design and delays in design

Source: (Motaleb & Kishk, 2010)

Project manager factors

Project manager factors are shown below:

Table 2.8: Project manager factors affecting project management

Factor number	Factor description
1	Lack of coordination and communication
2	Poor management of site and poor supervision
3	Inapt planning of project and improper scheduling
4	Inadequate assistance in project management
5	Inaccurate estimation of budget
6	Inapt estimating of time
7	Incompetent project team

Source: (Motaleb & Kishk, 2010)

Client factors

Client factors are shown below in the table:

Table 2.9: Client factors affecting project management

Factor number	Factor description
1	Change in orders
2	Slow process of decision making by the client
3	Lack of capability of the representative of client
4	Lack of experience of client in the construction industry
5	Financial crunch
6	Unreasonable constraint to client

Source: (Motaleb & Kishk, 2010)

Financial factors

Financial factors are shown below in the table:

Table 2.10: Financial factors affecting project management

Factor number	Factor description
1	Inadequate allocation of fund
2	High interest rates
3	Difficulty in making monthly payments
4	Fluctuation in prices or inflation
5	Delayed payment to sub-contractors and suppliers

Source: (Motaleb & Kishk, 2010)

Unforeseen factors

Unforeseen factors are shown below in the table:

Table 2.11: Unforeseen factors affecting project management

Factor number	Factor description
1	Uncontrollable weather conditions
2	Obsolete technology
3	Problem with neighbours

Source: (Motaleb & Kishk, 2010)

These are the factors which affect the project management in construction industry.

2.7 STAKEHOLDERS OF PROJECT MANAGEMENT

The coordination among stakeholders in managing a construction project is one of the most essential aspects of project management. Stakeholders are an important part of project management and they should not be neglected at any phase of project life cycle. (Cicmil, 2006) state that there are many stakeholder theories which are developed on the basis of instrumental power and descriptive accuracy along with normative validity. The normative theory combines the modern aspects of project management (Corped Group, 2015). The regional or local planning process of a construction project includes different stakeholders and coordination among them is an integral part of successful project management (Yang et al., 2009). In order to increase this coordination, first and

foremost stakeholder analysis must be done so that different categories of stakeholders can be identified. This will also help in identifying the processes which will in turn help in involving different categories of stakeholders (Munsaka, 2013). The approach partnership can be used to carry out planning process effectively along with identifying the obstacles. For this purpose stake holder analysis can be done with help of a matrix (Donaldson, 1995).

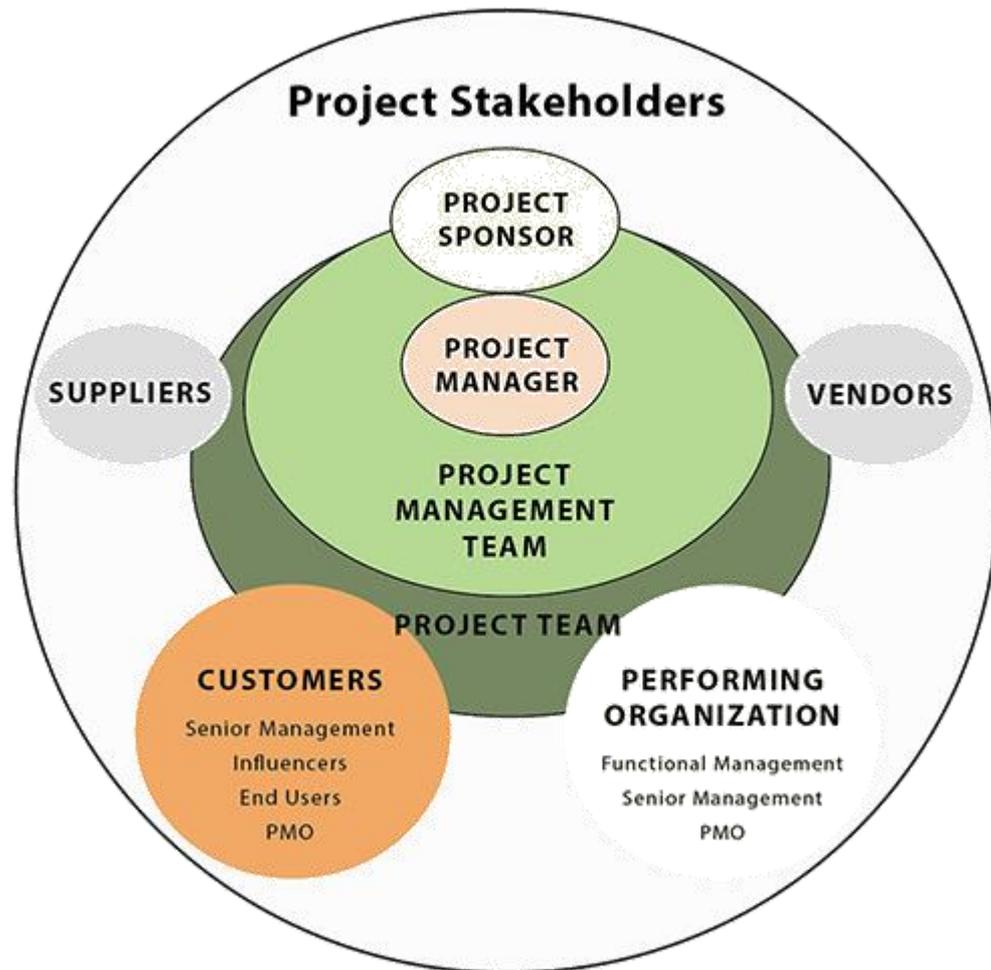


Figure 2.8: Stakeholders of Project Management

Source: (Primavera, 2013)

Further, the stakeholders have a special significance in project management. There are some contemporary theories which describe importance of stakeholder analysis. Different stakeholder groups of employees, suppliers, financial institutions, contractors and subcontractors must involve in a participative decision making so that expectations

of clients and customers can be fulfilled (1000ventures, 2015). The coordination and involvement of stakeholder in construction project management often depends on investments of these stakeholders. The technique which can help in increasing coordination among stakeholders is stakeholder mapping. This helps in mapping the categories of stakeholders by which interest of various stakeholders can be identified (Newcombe, 2003).

The stakeholders to the project management may be understood well from the following chart below: (Raheem, 2014)

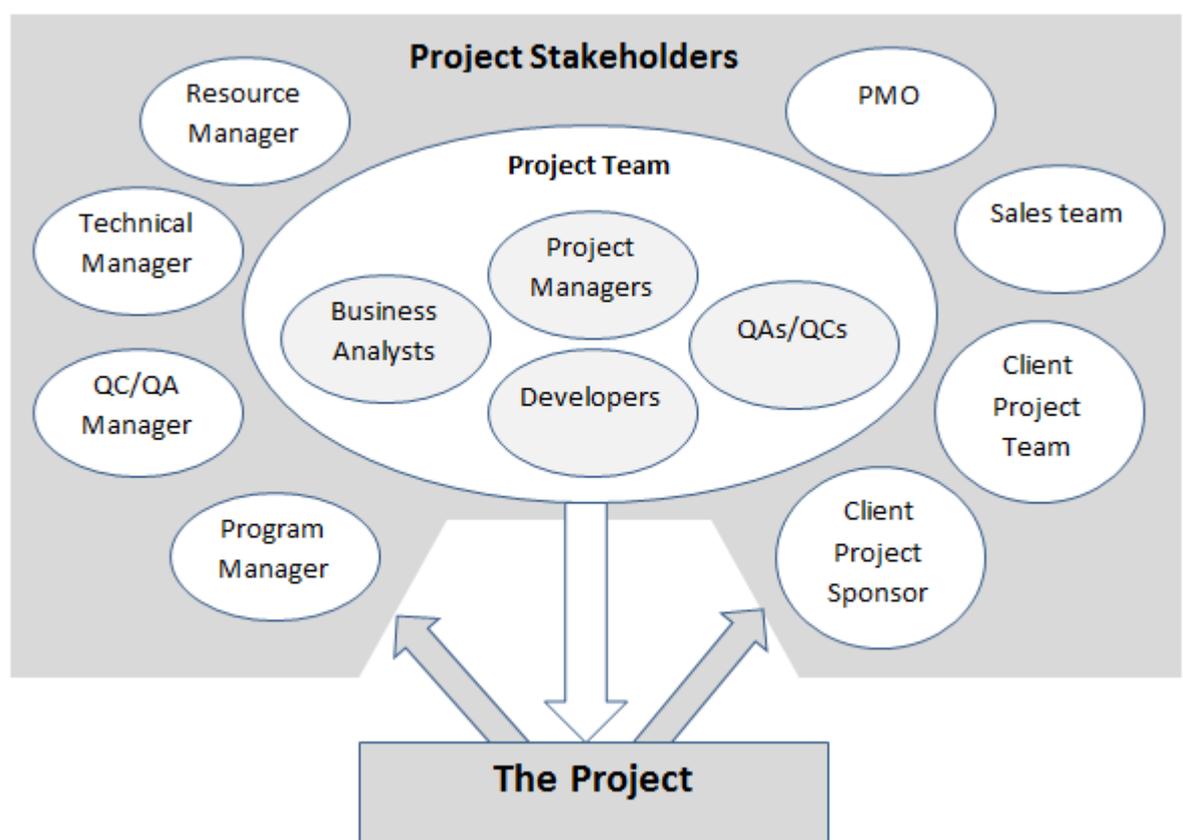


Figure 2.9: Project Management Stakeholders

Source: (Jepsen & Eskerod, 2013)

2.8 TECHNIQUES OF PROJECT MANAGEMENT

The task of project management is challenging and has various complex responsibilities over it. Fortunately, project management offers a variety of techniques that can assist

the project managers as well as team members in accomplishing tasks and fulfilling the responsibilities effectively (Baars, 2006).

Project managers must choose a technique that compliments the style of management adopted in the organization. A single technique cannot resolve all the issues and cater to all requirements of project management (GetApp, 2015). The most commonly used techniques under project management include Gantt Charts and Program Evaluation Review Technique (PERT). Both these techniques can either be manually or purchased as software systems that are easily available in the market (Termini, 1999). PERT is a technique that ensures effective planning and controlling and helps in clearly defining the tasks that are necessary to be completed for a project. PERT charts can be used interchangeably with the Critical Path Method or the CPM charts (Civil Engineers Forum, 2015; Kliem et al., 1997). The only difference between two techniques is the calculation of time for each task. Both of these charts display a sequential list of scheduled tasks for the entire project. The interrelationship of project elements can be graphically displayed using “CPM Diagram” or “Project Network”; it helps in clearly showing the activities that are required to be performed in a sequential order (Maserang, 2002).

Simulations techniques are helpful in estimating completion time of projects in order to complete stochastic networks. There are number of studies done to analyse an effective project management technique, however, the best technique out of variety of techniques is simulation techniques which can be done with Monte Carlo or GERT network technique (Burt & Garman, 1971).

2.9 CULTURE OF ORGANIZATION FOR PROJECT MANAGEMENT

The aspect of humanity and human resource management is critical for success of project management. These are complex issues of project management industry of Abu Dhabi. The humanity and human resource management are however not the central issues but these aspects affect other aspects of project management negatively (Raikhanghar, 2010).

The final outcome of projects is not achieved besides the time and cost of projects also maximizes which finally affects complete process of project management (Kerr et al., 2013).

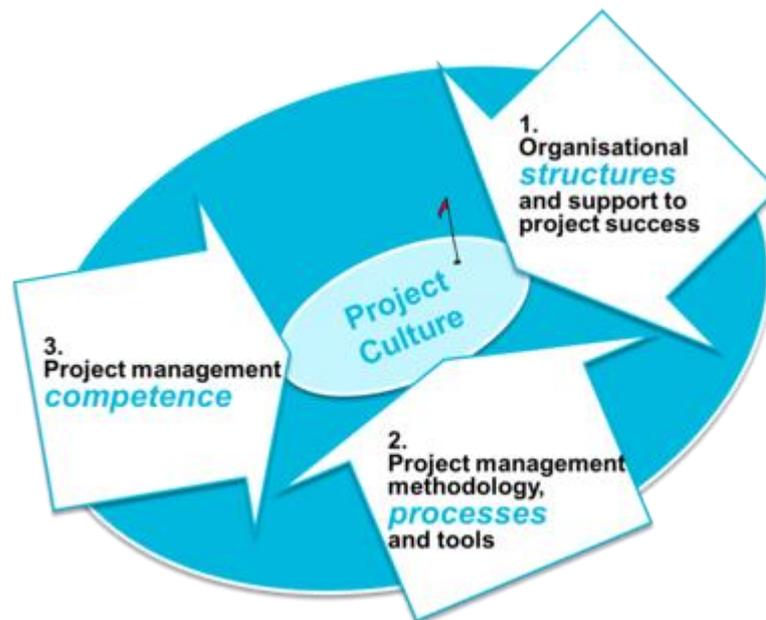


Figure 2.10: Areas of Project Culture

Source: (Project Institute, 2015)

From the Figure 2.12 it can be seen that there are three areas of project culture of organization namely project management competence, project management methodology, process and tools and organizational structures and support to project success. The most important factor for project managers is to manage the cultural aspects of project.

The project management industry of Abu Dhabi has become a multinational industry therefore this factor is extremely important. The multinational project management companies of Abu Dhabi must be flexible in managing the diversity of employees with help of training programs and compensation practices. The concern for humanity will help project managers to work with coordination towards ultimate objectives of the project. Humanity is concerned with the human aspects and is highly associated with project management. There are many researches which have focused on importance of human factor in project management but there is a lack of a realistic approach which can encourage a culture of humanity in project management industry.

The organizations must focus giving an equal importance to both internal and external customers as internal customers will lead to fulfil the expectations and requirements of external customers, which include the end users as well. The field of project management needs to shift from unrealistic assumptions to realistic assumptions which will ultimately lead to successful completion of high quality projects in scheduled time and cost (Lv, 2012).

2.10 SUMMARY

This chapter presents a literature review of the discipline of project management. It analyses various definitions and scope of project management as given by scholars and academicians. It considers the development and historical evolution of project management approach. The approach used during ancient times even being project management was implemented in an informal manner and it is clear that this discipline has been followed since centuries. Project management helps in achieving the desired

outcomes within the expected time frame and without compensating on quality or increasing the budget of the project.

CHAPTER 3 : A REVIEW OF LITERATURE ON PROJECT MANAGEMENT AND LEADERSHIP

3.1 INTRODUCTION

The main aim of this chapter is to understand the significance of project management and construction industry separately. Project management is an integral part of organizational management in almost all companies today irrespective of the industry to which company belongs. On the other hand, the construction sector is growing incessantly in all the countries of the world and is catering to basic and luxury needs of the people. Thus this thesis helps to implement the most required project management initiative in the most developing construction industry of the world. This chapter details about the types and styles of project management. The types of project management have been detailed on the basis of industry and on the basis of Complexity (Gentile, 2012). The traditional and modern approach as to project management and its growing scope has been discussed in detail whereby the project cycle is also identified. Waterfall, agile and cyclical styles of project management are discussed in detail in respect to the concept and basis of these styles, advantages and disadvantages of implementing the style and for which category of business the respective is suited the most. Further, considering that leadership is an integral component of project management, various leadership styles are discussed in reference to their application for efficient project management (Yousif et al., 2015). Also, this chapter analyses historical view of the construction industry in Abu Dhabi whereby the importance of oil is identified and the changes in the society are observed.

3.2 TYPE AND STYLE OF PROJECT MANAGEMENT

In this section various types and styles of project management are discussed.

3.2.1 Project Management on the Basis of Industry

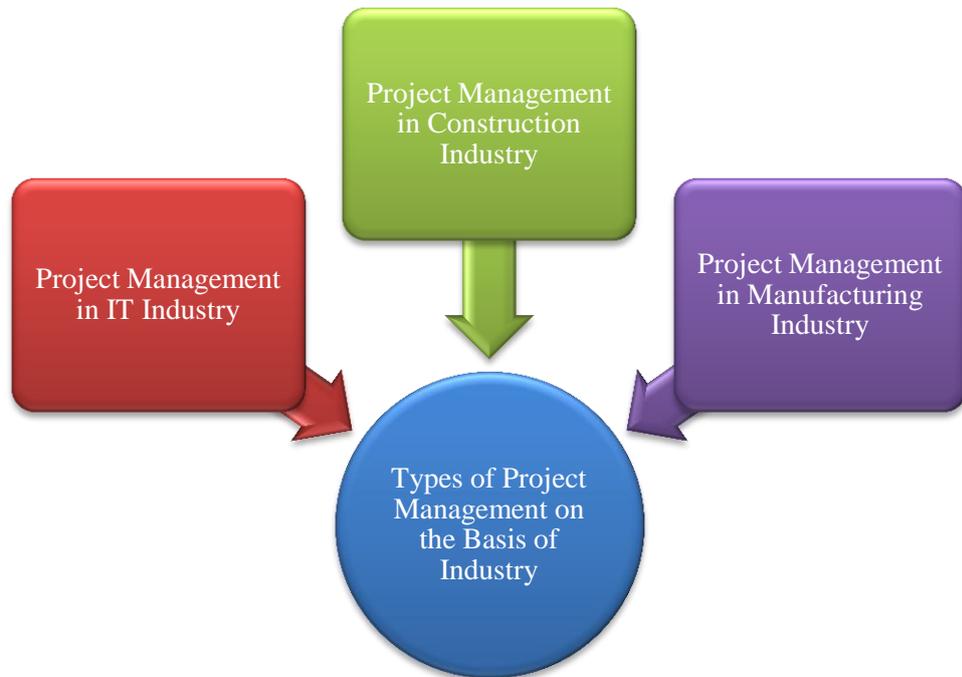


Figure 3.1: Types of Project Management on the Basis of Industry

Source: (Bairi, 2012)

3.2.1.1 Project Management in Construction Industry

In the recent years, development in the construction industry has grabbed the attention of the world. Construction industry is the largest industry in the world in today's scenario. It is growing rapidly in all the economies. It is mixture of service and manufacturing industry and interacts with the final consumers on daily basis. It being a part of manufacturing industry has components like that of service delivery timelines, high-quality product range, reduced rates of failure and reasonable cost of service (Bairi, 2012). However, in reality most project exhibit cost overruns, conflict between parties and undue extension of time. Project management is an integral requirement for the construction industry that can help in rectifying the current mismanagement.

Projects in the construction industry are mostly late, over the budget and saddled with creep due to poor protocols of communication and inadequate controlling system. It is pertinent for every project manager to implement a proactive approach for completion of the project (Loosemore, 2003). Project management in the industry helps in planning even for projects that are relatively modest and helps in exhibiting better level of methods that can ensure timely completion of the project as per the expected budget. Project management helps in dealing with practical on-site problems like miscommunication or poor communication, wrong pricing strategies during the state of schematic design, construction document development and risks related to unresolved issues. For implementation of project management in any construction project, the goal of the project must be set out straight (Sears et al., 2010). This should be followed by clearly writing a goal statement for the project. Then, the project scope should be identified and the scope must be different from the goal. Further, before examining the project life cycle, project management helps in breaking the project into various phases to ensure that each stage is individually looked upon for requirements. These stages can also be considered as various significant parameters for the construction project and might include the following:

1. Project Deliverables - these shall define the tangible products or services or results that are desired to be produced for the project. The project must identify these deliverables with specific dates on which these are accomplished (Toor & Ogunlana, 2008).
2. Important Dates - these would not merely include the end date of the project but also other dates relating to completion of small projects.
3. Criteria for Project Completion - it would help in identifying that the project is approaching towards its end. Also, it is test for the project manager to analyse the current stage of project and measure it with delays, if any. Setting the

project criteria helps the entire team to aim for specific project goals and clearly identify various project phases.

4. Project Expectations - it helps in setting up expectations for employees so that they can identify tasks and other requirements of the project (Schwalbe, 2013).
5. Potential elements of risk - it helps in identifying areas related to potential problems and can help in building some factors for checks and balances so that the problems can be minimized (Lester, 2007).

There are eight factors which actively participate in the development of the construction industry. These are physical resources, financial resources, competition, government intervention, coordination, cooperation, policy and long term vision. In the development of the construction industry the role of project manager is very important. Project manager is responsible for the communication between the government and the industry. Project manager profile is a unique position. The project manager should have management skills to significantly influence and effectively promote the development in the construction industry. Project manager is responsible for managing the construction projects in order to optimize the capital investment. The interpretation of the role of project manager can be explained by these eight factors. These factors have been explained according to their strengths (Hills et al., 2008). Project management in construction industry helps in dealing with many challenges. These challenges may be related to construction cost, construction time and construction control. Project management is a proactive approach to deal with challenges like over budgeting, late and saddled with scope creep, poor communication and inadequate control (Guérin, 2012; Kendrick, 2011).

3.2.1.2 Project Management in IT Industry

IT industry is the information technology industry which is emerging as an important industry considering its growing contribution to the growth and development of respective nations. IT industry is referred to the use or utilization of computer programs and software to ensure efficient management of information. This function of IT industry is also referred as Information Services or Management Information Services by many companies. IT departments of big companies are responsible for various computer related activities that are integral to the management processes including storing of data and information, processing of the information, ensuring levels of safety and security and protecting the information, transmitting information and retrieving information for future usage (Kumar, 2015).

The main aim of project management is to ensure efficient organization and management of resources in a manner that these cumulatively deliver the work as required for effective and timely completion of a project. As a project is identified to be a temporary endeavour undertaken to develop or fulfil certain objective, it contrasts with operations or processes that might be permanent or semi-permanent as per the ongoing functional work. Project management in the IT industry is required to ensure breaking of existing functional boundaries and finding new ways for accomplishment of the work. Construction industry has been the first amongst other industries to identify the importance of project management by forming and interpreting work breakdown structures, network diagrams, Gantt Charts, etc. With the expanding scope and horizons of project management, many IT organizations have also experimented with the structures of the organization to implement project management in some sense or the other (Schwalbe, 2015). It is pertinent to note that coordination and extensive planning are the two main pillars on which effective project management stands and thus without

these two managerial aspects it cannot be worked upon. Project management under IT department means management of huge Software Development projects, IT conversions or installations, networking projects or other related projects wherein technology and business are required to be infused with advancement and latest up-gradations so that co-ordination with the available limited resources can be maintained (Gentile, 2012).

3.2.1.3 Project Management in Manufacturing Industry

The discipline of project management is applicable to most of the industries irrespective of the product or service they deliver. Across various industries, project management is applied and it has been analysed that it has tremendous value and outreaching effect when it is implemented with the objective to increase the success factor associated with the product or service (Hughes et al., 2004). Further, it ensures that the delivery of project is done on timely basis without any extension of time or additional cost. The main components of manufacturing industry are tools, machine and labours; all of these collectively work towards producing goods for sale of specified end use. There are large scale activities that are aimed to process raw materials into finished goods that can be sold to wholesalers. Further, the wholesalers sell these products either to the retailers or directly to consumers (Engwall, 2003). This change is applicable to all the manufacturing industries irrespective of the product or service associated with that industry. Engineering and industrial design are integral to manufacturing. It is pertinent to note that the main nature of manufacturing is closely embedded with process. One process is closely associated and relies upon the next and thus each layer of the product gets build cumulatively in an order that is sequential and ensures control of quality within the working organization. Project management is highly relevant in the manufacturing industry as by the very nature it is based on process. The product lifecycle as considered in the manufacturing industry is directly supported by various

phases of the project management lifecycle that are sequential. Thus, project management acts as an invaluable tool in ensuring delivery of a product or service that corresponds to the original requirements of the specific industry (Cicmil, 2006). Integration of project management in the manufacturing industry shall help in ensuring timely delivery of products and service and maintaining the initial budget and time estimates. Strong methodologies adopted under project management can help to offer more flexibility and thereby increase the probability of success of the project and alongside guarantee better returns. Risk management being an integral part of project management can also be analysed, if an organization adopts a mature approach towards project management (Bateman, 2012). There are five lessons of project management that need to be remembered in the manufacturing industry.

1. **Project management should be dynamic just like processes:** To achieve the efficiency in the production and output, to change the resources availability, to innovate in the industry and to adapt the processes to the product demand, there is only one way which is project management in manufacturing. Project management allow us to be flexible and dynamic by eliminating waste. Waste is defined by 'Triple M' which means Muda, Mura and Muri. Muda has been further described in seven types of waste, which includes defects, over production and over processing. Waste of unevenness comes under Mura. Waste of over burden comes under Muri. Project management helps in preventing Muda, Mura and Muri wastes. Project management identifies the process which has maximum waste and start with a work breakdown structure to plan work packages and deliverables. Project management in manufacturing helps in giving a clear structure and distributing responsibilities among the team (Badiru, 1996).

2. **Keep the project on track:** Project management helps in keeping the project on track. Project manager is the key for the successful project management. Project manager motivate the team, display a strong leadership and make decisions for the success of the project.
3. **Project management should be simple:** To streamline and standardize the processes in the manufacturing some project management methods should be used such as creation of a project schedule, aforementioned creation of a work breakdown structure and Boscard for strategic planning and approval. There should be a standard inventory. These all standardizations keep the project management simple. Communication among the team members and availability of the information to all the individuals are the keys to simple project management (Angolia & Lesko, 2014).
4. **Knowledge transfer should be transparent:** knowledge management is the part of project management. There are lot of tools to share and manage knowledge. The aim of the knowledge management tool is to make the knowledge available all the time to those who need it. There are also many different ways to access the knowledge in knowledge management. With the help of knowledge management tool one can acquire the knowledge of one project to utilize it in the other project for great value (Shevtshenko et al., 2009).
5. **Always improving the product and processes:** all the skills and tools of the project management used to improve the products and processes in the manufacturing industry. Project management in manufacturing industry is important to manage the time, cost and scope of the project (Tremel, 2015).

3.2.2 Project Management on the Basis of Complexity of Project

Projects undertaken by the organizations can be classified on the basis of complexity as the projects being simple, complicated and complex projects of various levels. A project that can be developed in reductionist style or manner is a complicated project. A complex project means that can be further broken up into three different types being Type A, which includes independent and autonomous systems that are addressed by integrating independent systems into one; Type B that requires a subtle system approach so as to establish boundaries, define stakeholders and develop solutions; lastly Type C that is integration of independent assets and autonomous systems into large systems so that wastage can be reduced and benefits can be increased. To identify project management approach based on complexity following classification is understood in detail (IPMA, 2013):

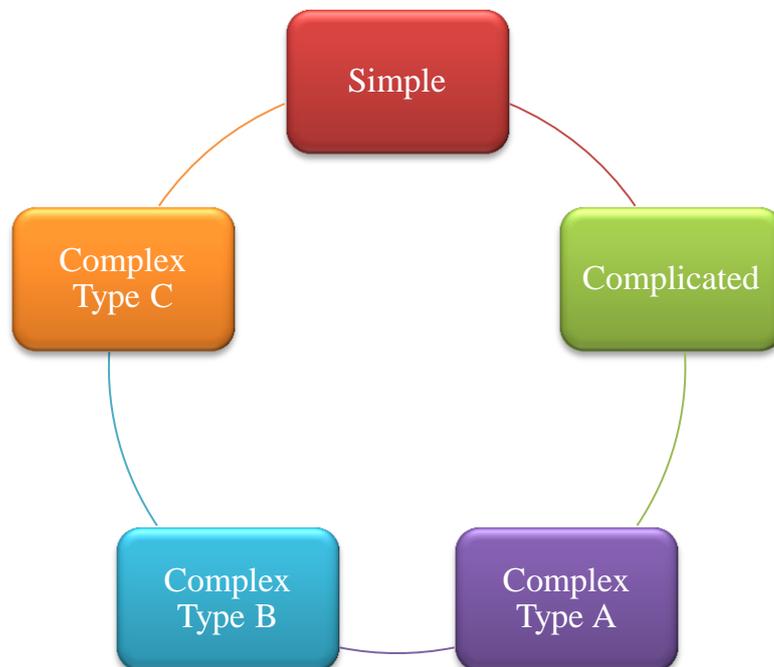


Figure 3.2: Classification of Projects Based on Complexity

Source: (IPMA, 2013)

1. Simple- it is a small and local project wherein top down leadership style for project management is most suitable. Tools for project management required for this type of project include scope development, scheduling, WBS, etc. At this level of complexity, clear instructions are most required. For Example: building of a house, repairs in a ship or managing a marketing campaign (IPMA, 2013).
2. Complicated- in this type of project, the cause and effect relationship is easily discoverable however it is not apparent on the face of the project and thus for the same expert diagnosis is required. There is possibility than more than one answer for the same problem is sought and thus is required management on the basis of fact. Top down leadership style of project management is most suitable under it (Davis, 2008). Clear instructions of the project manager are required at this level. The tools for project management that can be implemented in this stage include PMBOK or IPMA ICB or PLUS systems or other tools used in engineering technology. Examples include designing and producing a jet engine (Harris, 2009).
3. Complex Type A - at this stage projects are unpredictable and create a flux. The project managers have to adapt to emergent patterns of instructions as no right answers to any problem are available beforehand. At this stage, there might be various competing ideas as creative and innovative ideas are required for leadership based on patterns. However, it is important to choose the best of these ideas and implement them in an urgent manner. The leadership style required is top down and which is capable of sensing, analysing and responding to various difficult conditions in the working environment. Further, the leaders chosen must be capable of sitting as under the panel of experts so that the conflicting ideas can be heard and analysed for better productivity of the organizational project management. The staff at such level should be such that is competent for

abstract reasoning, has good level of emotional intelligence, comfortable with ambiguity or certain vague factors, has strong business insight or acumen and understands perspectives of Helmsman. The project examples at this stage include: airport traffic management, integration of the healthcare systems, space exploration, infrastructural integration, commercial airline development, defence system integration and electrical power systems integration (IPMA, 2013).

4. Complex Type B - at this stage there exist wicked problems. The leadership style required to handle this level of complexity must be responding, sensible and probe. The leaders must ensure that an environment is created wherein experiments are allowed to create new patterns of working. They must focus on increasing the levels of communication and interaction. Further, leaders should use methods that help in generation of innovative ideas; this can be done by motivating open discussions in large group of team members and encouraging diversity and dissent as well as managing initial conditions and monitoring conduct that might be required at the time of emergence. The employee that is required in Complex Type A is the same which is required at this type of level. Further, it must be considered that the employees are flexible, adaptive and dynamic in working. Staff should be such that motivates its co-workers to work more and work productively irrespective of the conditions or hurdles they get. Thus, there must be a collaborative effort of staff as well as the leader to ensure that even at this wicked stage, the project plans are implemented for accomplishment and there is no negativity, over burdening or pressurizing of the employees. Examples of project at this stage include: managing activities of terrorism in crucial states, managing disputes of international level, managing integration of climate change at multinational level and solving the rampant problem of drugs. (Harris, 2009)

5. Complex Type C - this level can be considered in the context that the project is considering reduction of wastage to the minimum levels. The leadership style at this level cannot be clearly identified or established as it depends upon the situation and circumstances of the project. Project management at this stage is crucial as there is no methodology, tool or technique that can be applied directly to resolve the problem. It must be ensured that the staff to deal with this stage of project management must have decent business acumen and should be focused on gaining and working on opportunity irrespective of territorial claims. For these projects, it must be made sure that new techniques be evolved as per the demands of the situations that can help to reduce wastage of resources. This complexity occurs mostly on national levels, where the government works hard to ensure minimum wastage of resources and relies on the concepts of sustainable development. Example of this type of complexity include: distribution of food from rich countries to the poor, integrating transport system by connecting countries through rail, road and air and integration of the river between the states. No particular staff can be appointment for such level of projects but the government must ensure that its citizens are well aware of these problems and contribute towards fighting and culminating them (Milosevic, 2003).

3.2.3 Traditional Project Management

Project management is a combination of two words i.e. Project and Management. Project involves a unique and exclusive set of activities that have a prescribed beginning as well as end, which are undertaken to meet established objectives, goals and specified deliverables within the constraints of quality, scope, cost, time, customer satisfaction and other stakeholders (Wysocki, 2010). It must be ensured that project and process, two important components under the management area are never confused. Product is

the outcome of the project that helps in measuring the success of the project on the basis of customer satisfaction, in most cases. Project management helps in resolving the issues relating with success of the project like organizational approach or management style to be adopted (Mathur et al., 2014). Project management in all the fields is a mixture of project and product and as both these concepts are contradicting to each other in terms of planning and producing, project management helps in bringing together and accomplishing the aspects of both. Thus, the style of project management is paradoxical in nature (Azzopardi, 2015). It revolves around contradictory characteristics but still holds them tight together for effective and timely accomplishment of the project. Apart from this, there are seven other paradoxes that might be encountered by the project leaders while mastering project management, these include the following: exposing egoist versus non egoist culture; leadership style in terms of delegator or autocrat; perfectionist versus ambiguous approach; written versus oral consent or planning; simplicity versus complexity; patience versus impatience and lastly trees versus forest. These paradoxes are a mixture of internal as well external forces acting upon the project. Further, the main objective of project management is to identify and settle chaos between these paradoxical elements in a manner that is suitable and profitable for timely accomplishment of the project. However, these elements are not highly relevant in the current times as project management has taken over other characteristics as well. Thus, this is considered as a vague approach for effectively understanding the type, style and characteristic of project management (Shenhar & Wideman, 2001).

3.2.4 Modern Project Management

Unlike ancient times, project management in the modern context is not merely doing and planning. Now project management includes the environment of the project both internal and external; the life cycle of project; configuration, integration and interfacing

of the project on the basis of reliable sources of information; processes of control and measures of success through the way of effective communication. Project management has a generic four phase project like cycle, which is followed in today's technical environment and business (Saynisch, 2010). As per this cycle, the approach of project management is mechanistic in application but linear in logic. (Baars, 2006). This is a theoretical approach, which is not similar to the practical implications of project management. There exist differences in the real world as project management revolves around the work done by people, who respond effectively to communication. One of the most important elements under project leadership is communication, as the workforce is becoming more and more educated, they must be treated with utmost care and leaders of the project must ensure that there is no miscommunication or gap in the communication. Leadership is the basis of project management to ensure proper planning and producing alongside each other. The people are more concerned about the health effect of the dangerous waste from the sites. It is also essential to make sure that the environment is harmed by the activities of the project as well as the health of the people are not affected by the activities of the project (Havranek, 2017). As per the modern approach, the main components of the ancient approach are considered and focused upon so that a direct and more structure approach can be adopted. Modern project management views a compartmentalized scope of the projects and considers the following five important elements under it:

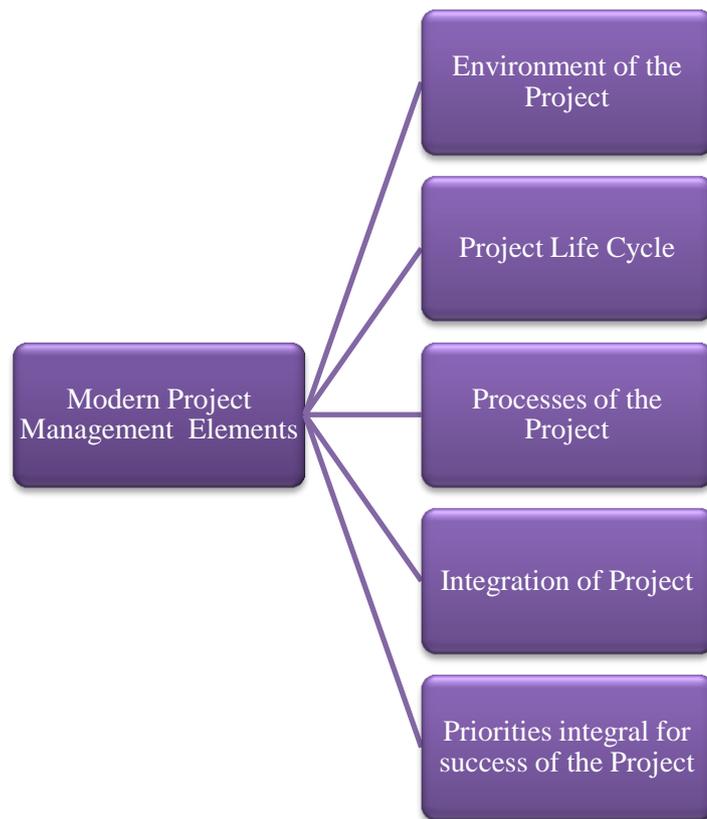


Figure 3.3: Elements of Modern Project Management

Source: (Shenhar & Wideman, 2001)

1. Environment of the Project- this helps in setting out the main context on the basis of which project is prepared. It accommodates to the needs of external environment in which the project is planned and shall be launched and evaluates the kind of management culture implemented as well as support services extended or relates issues of the environment. It finds out the kind of efforts required for accomplishment of the project objectives relating to cost, time, quality and scope (Shenhar & Wideman, 2001).
2. Project Life Cycle- a project is based on a sequential cycle that is inherent in the very definition of project only. The life cycle is divided into four phases namely: concept, development related to the planning aspect and implementation and termination related to the producing aspect. Apart from that there is pre and post project requirements included within the project life cycle. The pre project

requirements looks for the needs and opportunities and elevates the level of efforts required for the reaching the first phase of the project life cycle. On the other hand, the post project phase is concentrated majorly with services and disposal of the product and project plans. It along with other intricacies of project application as per specific requirements helps in providing progressive and logical basis for understanding various aspects of project management (Shenhar & Wideman, 2001).

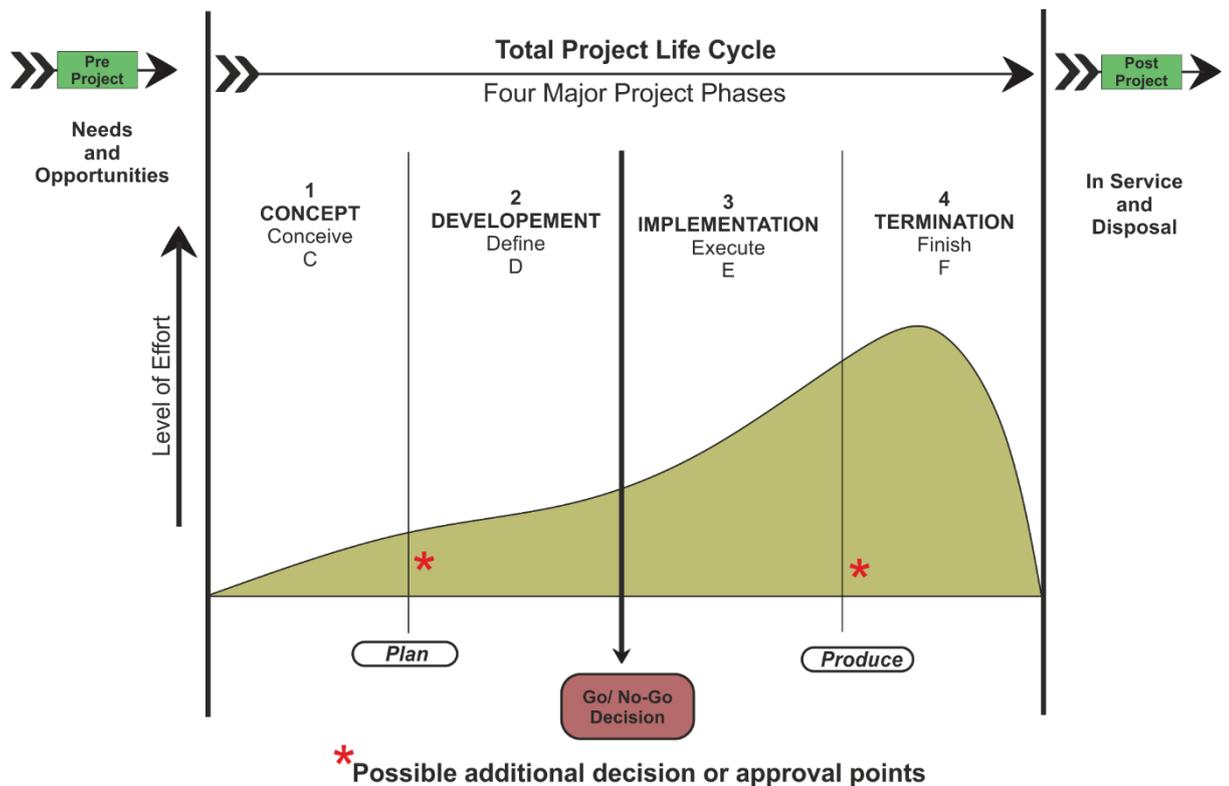


Figure 3.4: Project Life Cycle

Source: (Shenhar & Wideman, 2001)

- Processes of the Project- process is an important element of both project and management. It focuses towards justifications, establishing direct management controls and setting the right directions. Further, it provides the leader with an opportunity to explain and portray appropriate applications related with project management by clearly establishing pitfalls and benefits after taking all relevant and remote factors in consideration (Shenhar & Wideman, 2001).

4. Integration of Project- this includes setting up roles and responsibilities of internal and external stakeholders of the project for their respective component parts. It also helps in establishing correct levels of interfacing between these stakeholders so that the processes of project are carried out smoothly and efficiently (Shenhar & Wideman, 2001).
5. Priorities integral for success of the Project- this is evaluated on the basis of satisfaction levels of the stakeholders and on the basis of satisfaction motivates towards effective project management. Further, it considers the past experiences to ensure effective learning from them and thereby helps in identifying indicators on the basis of which project can succeed. This aspect of project management is closely related with communication and identifies the long term value of the final product of the project. It is this part, which is becomes the basis of future projects and is remembered even after the project is completed and also helps in setting up plans and objectives for the future projects in consideration of cost and time (Shenhar & Wideman, 2001).

3.3 PROJECT MANAGEMENT STYLE

A project management style must be picked as per the needs of the project and in alliance with the internal and external project conditions as well as environment. There are various styles that can be adopted for project management; however, no single style is applicable universally. Even these styles might not be applicable in strict sense to every organization and might require certain modifications as per the situations and circumstances. These styles of project management were invented so that all the different types of project management can be satisfied as per their needs. With inventions and alterations in user preferences, these styles have changed in the modern scenario. These styles have been understood as below:

1. Waterfall- this style is prevalent since 1970s and is a very traditional approach. As per this style, project management should start with identifying and clearly establishing the project specifications. Then, project should be done according to the various phases one after the other so as to reach to the final project deliverable. Thus, as per this style, details prior planning of the project is integral. It must be ensured that all the steps are followed and then dependents of the project should be mapped to move on to the next stage before completing the previous one (GetApp, 2015).

This style is best for the projects that deal with physical object and thus is highly relevant for project management in construction industry. For the projects wherein tasks and phases can be well defined in advanced by chalking out the entire sequence, this style is most suitable. Further, as per this style, the basics of project plans can be repeated for similar or identical plans in future (Cobb, 2015).

However, even this age-old and experienced approach has many disadvantages. It requires extensive schedule planning and working on the scope of the project before the project actually begins. Any changes in the scope at later changes may be implemented slowly and subject to the control processes. Further, this style is not suitable for projects based on services, designing, software or other non-physical things.

Thus, this approach should be adopted when there is no scope of changes in project specification and the same set of scope and elements of the project are carried on from initial till the last time. The team undertaking this style must be experienced with this approach and should feel positive and confident about achieving excellent results while following this style of project management. Further, this style is suitable for project management wherein the customer is

highly inclined towards formal approach and insists following upon the same.
(GetApp, 2015)

2. Agile- this style is more of an attitude that needs to be adopted by the leader rather than a method that is drawn upon for completion of the project. It is based on the approach wherein the inherent team of the project easily accepts and adapts to changes in the project plan or scope. Further, the team accommodates itself to changed specifications in the project or any other updates in the project. It is often described as a style in which unforeseen additions or specifications are well management by the project team and are considered as a natural part of the project. This style of project management is based on the principles of continuous improvement, adaptability and collaboration and thus is a flexible, dynamic and fast moving approach. This approach does not advocate following up of sequential stages as in the waterfall approach and thus is implemented for project are quick and iterative with easy release cycles (Wysocki, 2011).

This approach is best suited for projects that are service oriented and do not have physical deliverables like that related to copyrights, coding or designing. It gives scope for correction on basis of customer feedback. It gives the project team power to work creatively, innovatively and efficiently. It ensures that all the team members of the project contribute towards the project deliverable and work together in collaboration with each other (Carroll & Morris, 2015).

However, even this approach has certain limitations. It is not recommended for projects whose scope is strictly defined and cannot go beyond the pre-defined requirements. Initially, the stakeholders to the projects wherein this style adopted might be nervous due to uncertainty of events and scope. This makes the stakeholders reluctant in investing in the project and also considering the project deliverable worth and the project team as credible. It requires strong

document maintenance and a vigilant backlog. Thus, this style must be assisted with high levels of tech debt management and should be incorporated with advanced computer and technology systems to ensure timely success of the project (Layton, 2012).

Thus, this style of project management should be adopted for project in which the specifications are rapidly changing and are considered as normal part of the project. When the project team is new to project management, then this style should be adopted. Also, if no other style suits the project criteria, this style should be picked. However, most importantly the customers must approve implementation of this style or at least they should accept the idea of this style (GetApp, 2015).

3. Cyclical Project Management- under this style of project management, goals of the project are pursued in successive but short cycles that are consecutive in nature. Every cycle under this style is relatively shorts and lasts less than a month to complete. In each cycle, the various phases include analysis, design or laying out the plan, implementation and final check and balances as per the plan. This cycle is different from the cycle adopted under the waterfall method wherein each activity has its separate phase that is to be completed. In this method, each activity occurs various times in a sequential order. The evaluation for each step takes place after the completion of that particular cycle. A cycle in this style beings with the formation or making or altering of the schedule. This is followed by examination of results achieved in the cycle. For this style, a design is made by the project leader that is programmed and tested as well. After evaluation of the cycle for its competency, the cycle begins to work so that the components of the project can be fulfilled (Patzak & Rattay, 2012).

This method ensures high quality of the product, enhances the implementation of various functionalities, it works after considering realistic estimates in terms of cost and time, the team is not over burdened with work load of over pressured and thus works in a comparatively relaxed environment. The disadvantage of waterfall style wherein it is not possible to accurately identify the functionality of the project at early stages is overcome in this style. The desired functionalities in this style are implemented in various short or small cycles. In each of these short cycles, a small part of the desired functionality is well investigated, designed and then implemented and finally tested for actual productivity (Liquid Planner, 2015). This shortening of the cycle helps in focusing more on the quality of the product and thereby enhances the overall product quality and working efficacy. Further, when a design is not good or sufficient to meet the project deliverables, it becomes noticeable in the cycle and thus alterations in the design can be made and implemented then and there to avoid heavy losses. In this manner, even the requests made by the customers regarding any change in design or systems can be implemented by making alterations or adjustments. Another reason for this style to ensure high quality is that the cycle helps in collaborating designers, customers and programmers together so that there is no conflict of opinion and views. Further, in case of any conflicts, solutions can be sought jointly by a multi-disciplinary approach (Baars, 2006).

This method is suitable for such projects where the objective that is to be accomplished is not established clearly prior to the start of the project management. Thus, this method is well suited for research projects or creative projects, where goals are likely to change as per advancements in the research or creation. Further, in projects where the initial goals may be completely different than the final outcome and still the final outcome is better. Under this style, the project is advanced in number of cycles where at each stage

a joint multi-disciplinary team interacts with the programmers as well as end users to identify the lacunae in the cycle, if any. This also helps the entire team in discovering real goals and objectives of the project and what steps must be done in order to accomplish such goals. In each cycle, there exists an opportunity of adjustment or alteration on the basis of point of reflection identified (Baars, 2006).

However, for implementation of cyclic project management, certain conditions must be fulfilled. These conditions include the following: active involvement of the end customers or users; the project team must have the authority and competence to make decisions and implement them; the end results or final outcome of the project can be broken down into smaller fragments; the management does not interfere with the team by imposing mandatory, direct, specific or concrete requirements of any type; the customers must acknowledge the activities to be intelligible in nature; the policies must be framed in a manner that it is easier to take a backward step if situation demands so; programmers must be capable of communicating with the customers and vice versa; the organization must identify this style of working and support it by providing healthy working environment; team must be given sufficient time to accomplish the task within the deadline (Baars, 2006).

The style that is adopted for project management must be based on the type of project, its requirements, objectives of the project and team involved in the project. Once a style is selected for project management, its respective software must be implemented in the organization to ensure full utilization of the style and efficiency in operations. Further, this project management software helps in setting you sub-projects as per the wish and requirements of the team members that will contribute towards the project deliverables.

3.3.1 Leadership Styles in Project Management

Project management is done by leaders, who are either internal part of the organization or appointed specifically for the purposes of project management. An effective professional of project management must have the ability to invoke and practically use different styles of leadership. Daniel Goleman identified six various leadership styles that can be adopted by the same leader as per varying practical situations, these styles are explained as under (Harris, 2009):

1. Coercive style- in situations where leader issues orders in a manner wherein only a particular direction is mandated for the subordinates to follow, this style should be followed. As per this style. The discretion of subordinates is not taken into consideration rather only the order irrespective of what it is but as it is given by the leader, it has to be followed. Further, at times when the deadline is approaching soon and the project is not going as per schedule, this style can be implemented by the leader to ensure that no errors are done by the subordinates and only the orders of the leader are followed. Thus, in situations when the time is running out and subordinates fail to find a suitable solution; this style helps by empowering the leader and taking the situation under control. However, this approach cannot be implemented throughout project management as it kills scope of creativity and innovation. This style is controversial as it imposes the extreme superiority of the leader upon subordinates and thus is resented by many researchers. An example of this style can be when the leader specifies each and every detail of the project and system designs without giving much chance to the analysts so that they can explore and evaluate the efficiency of other related ideas (Cicmil, 2006).
2. Affiliative style-this style believes in keeping the team of the project in every action and gives them the power to speak while the project is planned and the

product is produced. Under this style, the leader ensures that each team member is encouraged to think individually and feel as a part of the gang. This style gives opportunity to the team to speak about their ideas and concepts openly. It offers wide range of flexibility on methods of working to be chosen for the project as far as the objectives are completed timely without any constraints of costs of other aspects integral to management. It promotes open and free communication and an environment of harmony, trust and cooperation in the organization (Elbeltagi, 2009). However, the leader implementing project management under this type must be sure that subordinates are not left alone to struggle with their problems and no guidance or support is extended towards them while they are working on various aspects of the project. The leader must implement this style effectively so that a balance can be created between giving freedom to think innovatively and letting loose to struggle with problems. The main objective of the leader should be that the project is accomplishing all the goals. A team leader, who is concerned about the balance between work and life, understands the significance of family along with individual goals sets the most perfect example under this style.

3. Authoritative style- in this style a mixture approach of the coercive and Affiliative style is adopted. The leader who follows this style shares his/her vision with the entire team but gives enough space and time for the individual team member to come up with their innovative and collaborative solutions to the problems. Under this style, both leader as well as subordinates has an equal role to play for ensuring efficient project management. Further, it is important in this style that the subordinates respect the leader and value him or her for skills, experience and expertise and thus feel privileged being part of the team with such a leader. The style of leader should not be authoritative but such authority

should be restricted to sharing goals and ensuring that the subordinates are working on the right paths. The authority must not intrude into the decision making and independent thinking of the subordinates and thus a free will should be awarded to them by the leader. In Apple, Steve Jobs adopted this style of leadership after he hired the most talented lot of people who were willing to work for their life goals and thus had innovative ideas that required the right directions and guidance of the Steven Jobs. The leader must motivate and appraise ideas and innovations of the subordinates (Jergeas, 2000).

4. Democratic style- under this style, everyone is given equal opportunity to be heard. Even otherwise, all the stakeholders are given equal rights in the project management and other aspects of the organization. This style is not suitable while considering the practical look outs, obligations and scope of business organizations. Everyone who is employed has a say under this democratic style of leadership implemented for project management. Due to this style, the planning and execution stages of management are delayed because everybody is considered for final decision making. At the same side, it keeps high morale of the employees and motivates them to work productively towards achievement of organizational goals. However, if this style is adopted in an organization which lacks true hierarchy then there shall be constant disagreement between various stakeholders and no true resolution can be sought for the company mission and vision. This style is followed in governance of democratic countries and can be seen in organizations where there is committee but lacks chair (Kerzner, 2013).
5. Coaching style- this style does exhibits the leader as more of a teacher for subordinates rather than a head or boss. The leader under this style is willing to teach the subordinates on various aspects of project management in theory as

well as in practice. Thus, the leader helps them in observing and analysing their own weaknesses and strengths and further motivates them to work upon such aspects to develop the overall personality. The leader here gives challenges to the subordinated so that they can aim higher and achieve better and strongly encourages on failures. This style is suitable for an organization where the employees are less in number and are not experienced. Further, the employees must be eager to learn from the leader and acceptable to the faults and weaknesses identified by the leader. This style helps in polishing the employees and preparing them towards tough tasks and project that they would be handling in future. It helps in creating a friendly environment and making the employees learn about work ethics and organizational culture (Harris, 2009).

6. Pace-setting style- under this style high standard of performance for the subordinates is set by the leader. It implements a weeding out process whereby employees with certain weaknesses are identified and kept separately from the other employees. The parameters and basis of identifying weaknesses and the factors related are evaluated in reference to the requirements of the project and internal and external working environment of the organization. This is sometimes considered a negative approach as it constantly burdens the employees to compete and achieve expected standards in the given time frame. Thus, great pressure is built upon the employees while following this style of project management. Further, employees are constantly reviewed on their performance for whether they are acting as assets of the organization by giving meaningful contributions to the processes. There might be a constant nagging on the employees from the leader to keep achieving higher by aiming better and fulfilling the tasks within the deadlines. A team leader whose main focus is to

get high productivity whereby ignoring the aspect of quality is an example of leadership under this style (Lock, 2007).

The style of leadership is a combination of the behaviour of the leader that is adopted by the leader at the time of the completion of tasks as well as the method in which the leader establishes the relationship with subordinates (Ahmmed, 2015). Thus, an effective project manager who also acts as a leader for project management must implement variety of leadership styles so that project deliverables can be accomplished in time and within the specified cost. Further, leader must understand that no one style is sufficient and capable enough to excel in all the situations and thus styles must be changed and adapted as per changing situations and behaviours of the subordinates (Loosemore, 2003).

3.4 SUMMARY

This chapter discusses about the types and styles of project management. The traditional and modern approach as to project management and its growing scope has been discussed in detail whereby the project cycle is also identified. Waterfall, agile and cyclical styles of project management are discussed in detail in respect to the concept and basis of these styles, advantages and disadvantages of implementing the style and for which category of business the respective is suited the most. Further, considering that leadership is an integral component of project management, various leadership styles are discussed.

CHAPTER 4 : THE STATUS OF THE UAE CONSTRUCTION SECTOR

4.1 INTRODUCTION

This chapter discusses the construction industry of UAE in detail. UAE's construction industry is growing at a fast pace and is getting huge amount of foreign investments. The industry has implemented the best approaches, policies, framework, methodologies and techniques to ensure desired outcome and high standing in the world. UAE is known with its ambitious construction projects, one of them being Burj Khalifa, the tallest building on Earth. This chapter describes the current scenario of the construction industry in UAE by firstly identifying the types of construction projects taken up in the industry. Secondly, it analyses the city of Abu Dhabi and its construction industry by observing the Abu Dhabi 2030 plan. Other sections of this chapter discuss work culture in the UAE, particularly in the construction industry; practices of lessons learned in the construction industry and performance management project in the construction industry (BBC, 2015). This chapter focuses on identifying the manner in which construction industry is working in the current times so that the lacunae can be identified and future needs be determined. Construction industry contributes significantly in the GDP of UAE and thus is considered by the government while formulating policies and laws. However, it is not easy to do construction business in the UAE until and unless the company has complete understanding of laws and the culture prevalent in UAE. Culture is an obstacle to work in UAE due to which many international companies have failed. A part of this chapter also helps in relating aspects of project management as a discipline and its importance in the construction sector. This chapter helps in broadening the knowledge about construction industry and its actual working in the

UAE. Further, it helps in observing the role of government for the development of construction industry (Caldas, 2009).

4.2 HISTORICAL REVIEW OF CONSTRUCTION IN THE ABU DHABI

4.2.1 Significance of oil

The United Arab Emirates is one of the most reliable, the biggest producer and the exporter of the oil in the raw form i.e. the crude oil (UAE-embassy, 2015). The major contributor in the Gross Domestic Product of the United Arab Emirates is the Oil and Gas Industry (OPEC, 2015). The cost of production of the oil and gas in the United Arab Emirates and the Middle East is very low. This makes the area very feasible for the oil and gas industry to flourish (IE Singapore, 2015). The availability of the ready market for the oil and gas so extracted is also a major reason for the industry to flourish in this particular market. The proximity of the United Arab Emirates to the Asian countries has increased its customer base. The world's seventh largest reserves of oil and gas are in the United Arab Emirates. The UAE is also the fourth largest exporter of the oil. The exploration of the oil fields is still under process in this part of the world. The government in the country feels that the more the production of oil in this area the more exporting of oil will be possible, which will ultimately increase the Gross domestic product of the country (UAE Interact, 2015).

Oil has been the main source of revenue for the economy of UAE until 1990s. Till date, the oil industry has attracted a large number of foreign workers who work together with the expatriates and comprise of more than three quarters of the total population of UAE. Oil industry has helped the country to transform from one of the poorest nations in the world to the richest and wealthiest. Abu Dhabi is highly cherished with oil wells and it

is expected that it is capable of supplying oil to the world even for the next hundred years (Al-Hajj & Sayers, 2014). However, considering the reality that oil is a non-renewal source of nature and it shall deplete till the level of non-availability, the authorities of UAE since 1990s started to diversify the economy and thereby focused on reducing dependence of oil by booming other business industries, focusing of tourism and developing the construction sector. Abu Dhabi's approach had been quite conservative in diversifying the revenues of economy as compared to Dubai, which had smaller oil reserves and had implemented the diversification policy as a bold step. Dubai started to attach huge amounts of foreign investments for ambitious and luxurious construction projects like Burj Khalifa, the skyscraper and the tallest building in the world and also the projects relating to land reclamation. The construction sector was hard hit by the global crisis in the year 2009, but regained slowly and contributed significantly towards the GDP (BBC, 2015).

The growth rate of oil sector in the UAE fluctuating during the years 1975-1998 but till that time, the country was highly reliant and dependent on oil as the source of revenue; particularly Abu Dhabi did not consider changing its dependence until late 2000s. However, the country witnessed an increase in the GDP contribution from the manufacturing sector during this period of time. industries that were growing in the UAE after 1998 were mainly agriculture, manufacturing, electricity and water, commerce, restaurants and hotels, real estate, construction, government services and financing and insurance. All of these sectors contributed between 3.6% and 22.4 % and thus shifted the burden of revenue from oil to other sources of revenue. (Al-Hajj & Sayers, 2014)

4.2.2 Developments till date

Table 4.1: Developments till date

S. No.	Year	Event Occurred
1.	1498	Portuguese arrived in the UAE followed by Britishers.
2.	1820	British imposed a treaty of peace and established a garrison in the nine Arab sheikhdoms region.
3.	1930	Until this time the pearl industry, which flourished in the previous decades was devastated by Japanese. (ZU, 2015)
4.	1931	Granting of first oil concession by Sheikh Shakhbut Bin-sultan Al Nahyan. However, no oil was found even for the next fourteen years.
5.	1962	Exports began in the country which supported the revenue regimes of the government and helped in lifting the economy.
6.	1971	UAE was created.
7.	1975	Contribution of crude oil in the GDP was 67.7%.
8.	1998	Contribution of crude oil in the GDP was reduced to 22.4%.
9.	2000	Credit boom was built up, after which Dubai turned itself into a cosmopolitan hub and financial gateway of the Middle East.
10.	2007	Contribution of construction industry to the GDP and the non-oil GDP respectively was 8% and 12% respectively.
11.	Currently	Construction sector is flourishing and contributes significantly to the GDP.

Oil was the main source of income for decades for the people of UAE and before discovery of oil; the country was amongst the poorest nations with no scope of development and growth. Discovery of oil wells in abundance in Abu Dhabi helped the country to rake its revenues at a very high rate. Further, this bought a transformation in the lives of people and increased the levels of employment, education and living and also reduced the levels of employment. UAE became the hub of employment for many labourers from the nearby poor nations. Once the government was able to secure basic needs of its citizens, it thought of expanding and started to invest the revenues earned from oil in other sectors. This helped in developing other sectors and growing them potentially to ensure maximum revenues. Further, government introduced liberal trade policies within the GCC countries and even with other countries so that foreign

investments can be made in the home countries and the resources could be exploited for better use (Halder, 2015).

There are various other sectors that have also flourished in the United Arab Emirates in the recent years (The Prospect Group, 2012). The most important sectors other than the Oil and Gas Industry for the economy of the United Arab Emirates is the Energy Sector, water distillation, construction industry, materials and fabricated metals used by the construction industry, textile industry and also the food and beverage industry. The major reason for the development of these industries in this area is that the United Arab Emirates has become technologically advanced in the recent years (Khaleej Times, 2015). There has been a tremendous increase in the construction industry which has led to the development of this sector as well as other sectors which are associated with this construction sector. Since the year 1960, the construction industry has been growing at a very fast pace in the United Arab Emirates (Dubai-Freezone, 2015). There has been a boom in the hotel and food industry as well due to the increase in tourism in the UAE in recent years (ECSSR, 2011).

4.3 CONSTRUCTION PROJECTS IN THE UAE

In the year 2011, the share of construction sector in the total GDP of UAE was 10.3%. During the years 2012-2016, the construction industry was expected to grow around 9.5% as a compound annual growth rate, as per the reports from analysis done by RNCOS. During the beginning of the year 2013, a total of USD 903.05 billion worth projects were ongoing in the sectors of infrastructure, real estate, power, oil & gas and water. The main leaders in the construction industry of UAE include Arabtec Construction, Giga Group, Danube Group, Emaar, Drake & Scull International, Dubai

Contracting Company, Al Habtoor Leighton Group, Dubai Holding, Nakheel Properties, etc. These leaders have been capable of bringing the best projects in the UAE and also significantly contribute towards the growth and development of construction industry. Many of these players now have become international companies after ensuring success in the UAE (ADUPC, 2015). The construction industry has still not been able to contribute more than an average 10% to the GDP due to certain shortfalls. There are many challenges that have become hurdles in the way of growth and development. One such challenge is that most of the projects are mega projects and the companies are not realizing the value and benefits of small projects. These mega projects hold up huge amount of capital investments, which turns up to huge losses in case of failure or even in case of delay. The main challenge that is faced by the construction sector of the UAE is that even when the demand for large scale projects is there but it is unbroken. The industry is trending more towards mega projects and thus the mid-scale projects are reducing. In mega projects that are also known as the EPC projects, the investors expect that only one main contractor should be appointed and he should take complete responsibility of the project whatsoever it may be (AHK, 2013).

Joint Ventures are the main element of the industry projects in UAE. These joint ventures are mainly between local organizations of the UAE and foreign companies or individuals. As per the rule of the government, foreign companies cannot retain more than 49% of the shareholding in the registered companies of UAE and thus the shareholders account for 51% of the share capital in construction projects. However, the percentage of ownership does not determine distribution of profits, which is flexible and can be determined with the consent of all the shareholders. The construction projects do not just evolve around construction but also include the following strategic groups under them: project management, real estate development, design and supervision

consultants, sub-contractor, design and built contractor and service suppliers and building materials. Players of each of these strategic groups are distinguished from each other but also share some basic characteristic features. The construction projects in the industry have a particular configuration comprising of four types of capital including: commercial, property, financial and industrial. The strategic groups discussed above along with these four forms of capital form the basic matrix structure for the construction projects in the UAE (AHK, 2013). To accomplish the construction projects successfully, the companies evolve upon both financial as well as commercial strategy. It is mandatory for all the players to formulate strong strategies related to property investment as well as industrial growth so that profits can be procured out of each transaction. Most construction projects revolve around the activities of contracting. Irrespective of the size of the project, it is given to contractors and further to sub-contractors, all the responsibilities are shouldered on these contracting companies to formulate strategies and ensure efficient project management (Oryx, 2007).

Focusing on the aspects of social development especially education, housing, healthcare and transport requirements, the Abu Dhabi Government committed to fund AED 330 billion in the year 2013 for major developments that would be made in the next five years. However, Dubai being the hub of construction projects in the UAE has seen continuous growth and expansion of the construction projects. Working construction projects in Dubai include Business Bay and Downtown Dubai projects. UAE has been on high rise and also is accredited in the global market due to its ambitious construction projects. The tallest building of the world stands in Dubai and further its major project showcase creativity and innovation. Construction projects of UAE have guided the world and brought drastic changes in the methods and techniques of construction used all

around the globe. This industry is still growing and is capable of serving extended needs of the UAE citizens (Kerr et al., 2013).

4.2.3 Type of Projects

It is pertinent to identify the type of construction project at first so that planning can be done accordingly. Methods of procuring professional services, financing the constructed facilities and awarding construction contracts depend upon the type of construction project selected and these differ in each style. The projects under construction are many and can be classified on the basis of various factors, however mentioned below are the four major categories in construction and all of these are identified with their integral characteristics (Elbeltagi, 2009):

1. Construction of Residential Housing- this type of construction includes projects of high-rise apartments or residential buildings. While such projects are developed and constructed, the developers are generally made to serve as surrogate owners to take charge and make necessary contractual arrangement for arranging finances, finalizing designs and construction facilities and undertaking the sale of the structure when completed. These designs are usually made by engineers and architects and then these designs are based for construction that is executed by the builders who further hire subcontractors for speciality work including mechanical, structural and electrical. The demand of the residential unit in Abu Dhabi has increased significantly in the recent years because of an increase in the population. Some of the major players and clients associated with construction sector of Abu Dhabi are as follows: Ministry of Public Works (Dubai), Department of Municipal Affairs - Abu Dhabi Municipality, Ministry of Public Works (Abu Dhabi), Department of Finance - Administration of Commercial Buildings (Abu Dhabi), Department of Municipal Affairs - Al Ain Municipality, Public Works Department (Abu Dhabi) and the Ministry of

Interior (Abu Dhabi) (Gulf News, 2017). One of the important residential projects of Abu Dhabi is Ain Al Faida Residential Development that is a project started in Al Ain. The value of this project is around Dh4.18bn. It is a government project that includes residential space for 2,000 people (The National, 2017).

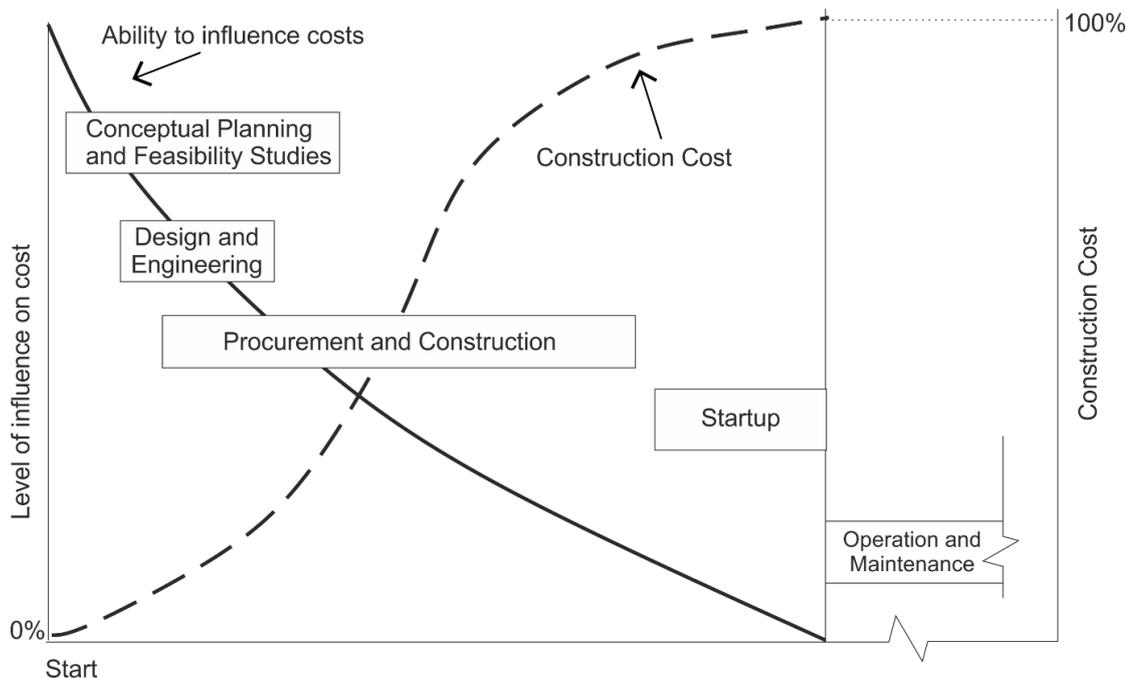


Figure 4.1: Level of influence on cost vs. the duration of project

Source: (Elbeltagi, 2009)

The market of residential house gets highly affected by the domestic market conditions. Even a slight increase in the overall demand increases the investment in the construction sector. The market for this type of construction project is highly competitive as it is relatively easier for builders and constructors to enter into the domains of residential construction.

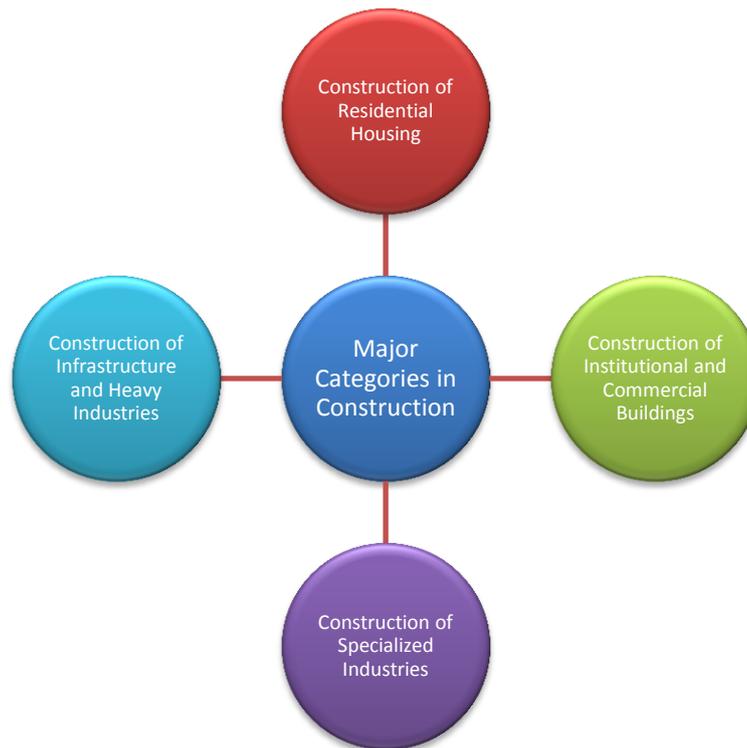


Figure 4.2: Major Categories in Construction

Source: (Engwall, 2003)

2. Construction of Institutional and Commercial Buildings -

This type includes a vast variety of sub types of projects in various sizes. Institutional and commercial buildings include construction of medical centres, hospitals, universities and schools, shopping centres, sports facilities, skyscrapers for hotels and offices, light manufacturing plants and warehouses. The owners of such buildings do not have knowledge of construction and the prevalent industry practices and thus they select competent consultants and professionals for construction by arranging for finances at their own level. To design a specific type of building, specialty architects and engineers are appointed. There are high restrictions of entry and exit in this project type as it involves greater sophistication and higher costs. There are only few competitors to the industry giants in this type of construction. Further, the demand for these constructions is less sensitive to the general domestic and economic conditions

as it takes a long process in building and these projects last a number of years before they can be actually acquired by the end users (Ferris-Lay, 2011). The institutional and commercial buildings are an important part of the Abu Dhabi's construction sector. Abu Dhabi will soon start tendering the projects for reducing the water and energy consumption for more than 3,000 non-residential buildings (Graves, 2017). The Abu Dhabi's commercial construction sector has witnessed a robust growth that further led to oversupply of commercial units especially the office. As a result of oversupply, there was a high vacancy rate that finally resulted in a decline in the commercial office property (Oryxme, 2016). The commercial construction industry of Abu Dhabi will gain benefits from the premiums of rental yield. One of the important commercial building construction projects of Abu Dhabi is the Abu Dhabi Airport Business City that is being developed at Abu Dhabi International Airport. This commercial building is operating three major facilities - the Business Centre, Business Park and the Logistics Park. This project is completed and it provides recreational, retail, residential and lifestyle districts (Abu Dhabi Airport Business City, 2016). The institutional construction will also have a major boom especially in Abu Dhabi (Infoline News Service, 2016). The current growth of institutional construction projects in Abu Dhabi is low in comparison of the commercial and residential constructions. Abu Dhabi has seen progress in two major healthcare projects – Al Mafraq New Hospital and the Cleveland Clinic that provide more than 1000 new beds (Ken Research , 2016).

3. Construction of Specialized Industries- this type of construction usually involves projects of large scale that have a high degree of complexity in technological matters. These projects include: oil refineries, chemical processing units, steel mills, nuclear power plants and coal fired. Here owners are deeply involved in

the day to day activities and development of the project and preferably work with builders and designers so that the time for completion of the project can be reduced and profits in the projects can be ensured. Further, in these projects, the owner generally prefers to work with such builders and designers with whom they have had good business relations during the near past. Such projects impact the overall economic conditions and are mostly aimed to ensure social development and safeguard the nation from economic crises. Thus, initiation of these projects is done after taking approval from the government or on the request of the government. These projects impact the economic conditions of the country and thereby it is mandatory that forecasting is done on the basis of correct and true analysis of the future that is capable to consider the affectivity of these projects. These projects require investment of huge capital amounts and proper planning and long time for construction activities to complete. Government has a huge impact in the decision making criteria for these projects, especially the owners must see to ensure that all environmental obligations are met before the project begins (Halder, 2015). One of the important specialized construction projects of Abu Dhabi is the expansion project of Abu Dhabi's Ruwais fuel refinery. The construction of this project is completed but this project needs to be expanded (Everington, 2015). Abu Dhabi is however focusing on expanding the petrochemical industry and the oil refinery industry for creating more job opportunities. This will significantly boost the specialized industry construction sector of Abu Dhabi (Everington, 2015).

4. Construction of Infrastructure and Heavy Industries- the projects relating to construction of highways, bridges, tunnels, pipelines, sewage treatment and drainage systems are included in this type of construction. These projects are owned by the public in most cases and thus their main source of finance is either

through the taxed earned by the government or bonds purchased by the investors. This construction category inculcates features of having high degree of mechanization, which has helped in gradually replacing the operations that are labour intensive. For these projects, highly specialized, mastered and experienced builders and engineers are appointed because construction of every segment under this project requires utmost excellence and thus the builders and engineers must have command over these. However, one of the biggest disadvantages in this type is that as the market for one sub type of construction project declines, the labour for that segment moves over to another segment, this causes loss of labour and experts for a particular segment to work with (Elbeltagi, 2009). Construction of Infrastructure and Heavy Industries is also experiencing an upward trend in the Abu Dhabi's construction industry. Abu Dhabi General Services Company (Musanada) has completed two of the six packages of one of the most important Mafraq-Ghuwaifat Highway project. This completion has led to removal of temporary detours (Arabian Industry, 2017).

4.4 OVERVIEW OF ABU DHABI

The capital city of United Arab Emirates is Abu Dhabi. Also, Abu Dhabi is the capital of the Emirate of Abu Dhabi. It is one of the sovereign countries amongst the seven emirates and is situated on Arabia Gulf's edge. Abu Dhabi has the government's federal seat and is the largest emirate among others. The Abu Dhabi city is considered to be on cross roads by many because of its historical scenario and other conditions. During the 18th century, Abu Dhabi was opted as a commercial centre for business in pearling and hunting. However, until then no significant business was done (BBC, 2015). During the 20th century, after discovery of large number of oil wells and formation of UAE, its importance increased in the world market. Since then, this city has witnessed steady

growth which was manageable for the authorities to ensure that growth and development is done for all. Abu Dhabi is a comfortable, gracious and well-functioning city for more than half million people that are living therein. Not whole of the population of Abu Dhabi belongs to the same religion as a major portion is of the migrated population from the nearby countries and continents.

The growth and development aspects in the Abu Dhabi have risen drastically with the introduction and implementation of policies promoting limited private ownership of land and demonstration UAE as a hospital, revenue and safe investment area. This new growth is important to support the objectives and mission of the government, but at the same time it must be ensured that the growth is managed in a sustainable and well-coordinated manner.

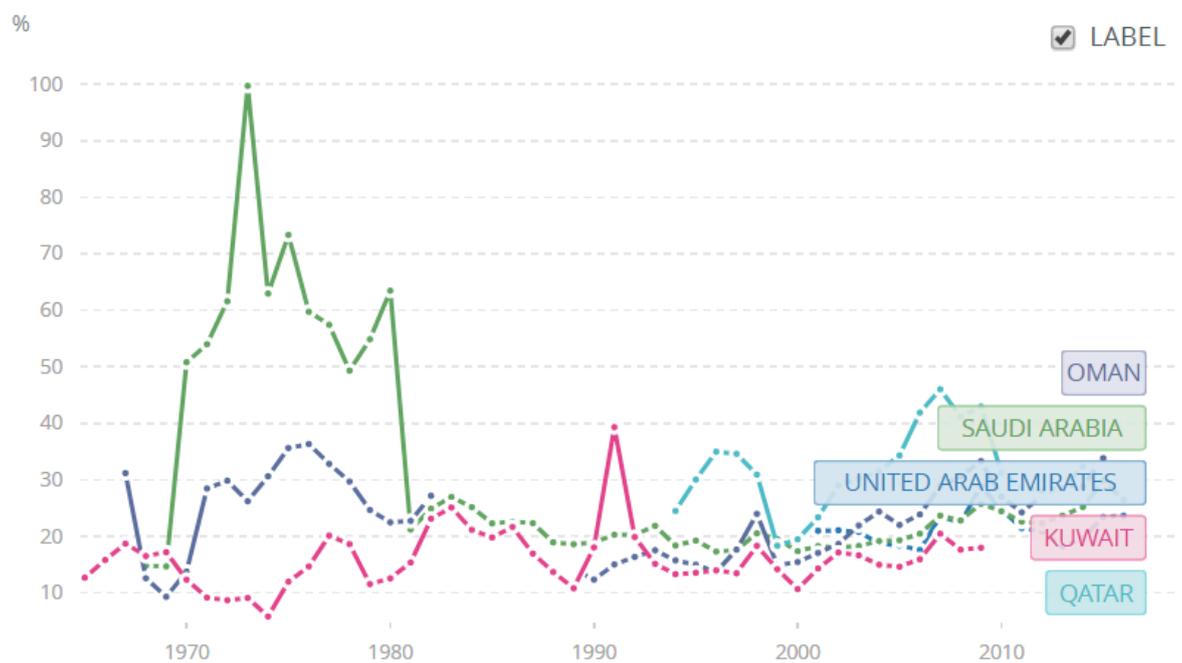


Figure 4.3: Gross Fixed Capital Formation

Source: (World Bank, 2017)

The above graph shows the percentage of Gross fixed capital formation (GFCF) to GDP (Gross Domestic Product) of GCC countries. GFCF is one of the important

macroeconomic concept that are used in the official accounts such as the account of the United Nations System of National Accounts (UNSNA), European System of Accounts (ESA) and the National Income and Product Accounts (NIPA). This factor helps in identifying that how much of the total income is further invested in the new fixed assets. Abu Dhabi is at a higher position with a high percentage of GFCF to GDP ratio (Zaneldin, 2016).

Abu Dhabi's overreaching principles that are considered for implementing planning process in the city are as follows (ADUPC, 2015):

- Abu Dhabi stands to be a contemporary expression in the Arab city. The population of this city includes people from various countries and religion who are engrossed in doing different things, living differently and helping each other in ensuring growth and development of the overall city as well as nation.
- The city well understands the aspects of measured growth that is planned and well controlled rather than aiming for uncontrolled growth. Thus, the vision of the authorities of the country is clear to save it from negative influences even if there comes any lucrative offer. (ADUPC, 2015)
- The city well respects the significance of natural resources and environment and thereby frames policies and rules that aim for sustainable development. Abu Dhabi respects the contrasting natural resources of being desert ecology on one side and sensitive coastal are on the other.
- Abu Dhabi understands its role in this growing and highly competitive market and structures itself as a capital city to foster the standing of UAE in the worldwide scenario.
- The city has developed an infrastructure that has a hint of both traditional and urban aspects, thus this helps in retaining social values of the people and

ensuring best arrangements for the people. Further, it ensures that the culture of people is safeguarded. (ADUPC, 2015)

The Abu Dhabi city is well planned and structured and provides for a healthy living to the people residing there and also protective policies for the foreign investors.

4.3.1 Abu Dhabi 2030

A multifaceted initiative was designed and implemented by the Abu Dhabi Urban Planning Council so as to produce a plan aimed at Urban Structure Framework aimed at evolution of the Abu Dhabi. For the purpose of the same, the council identified a time framework between the years 2007 and 2030 for execution of the plan. This plan is named as the “Plan Abu Dhabi 2030” aimed at Urban Structure Framework. This plan will help in filtering and responding towards the needs of present and future in consideration to growth and development and will help in establishing a culture of planning by introducing strong and effective guiding principles for new advancement.

Abu Dhabi's Economic Vision 2030 considers sustainability as the heart of all the projects regardless of the sectors. Continuously eye popping solutions that are sustainable are implemented that also garner the international acclaim and the awards. The conference of building sustainability in Middle East 2012 presented the leading figures and project that are rolled by the state bodies, urban planner, and construction companies in the pursuit of energy efficiency ratios and the LEED targets. LEED certification is one of the internationally accepted standards for measuring the sustainability of the building and is considered a true “green” streak. This certification is awarded if the strict criteria are met for reducing the environmental impact of buildings as well as the wellbeing of occupants. This certification also helps the developers to

gain certain incentives. Work done to produce the initiative “Plan Abu Dhabi 2030” includes the following actions (ADUPC, 2015):

- Inspirational and interactive sessions with the Crown Prince of Abu Dhabi, His Highness Mohamed bin Zayed Al Nahyan and other senior representations working with the Abu Dhabi Executive Council and the Department of Municipalities. These sessions helped in creating a better understanding of the vision for Abu Dhabi that would help in setting the right plan for guiding future development.
- An in-depth analysis of the economic, cultural and social aspects helped in understand various measures and factors that affect the life of people living in Abu Dhabi and evaluating the reasons because of which the demand of construction and real estate sector is increasing.
- An environmental analysis conducted by considering the laws, rules, regulations and policies imposed by the government and the current conditions of environment. This analysis helped in understanding and evaluating the ecological assets that the Abu Dhabi has.
- Conducting a comprehensive audit by the experts in city planning to evaluate what a ‘master plan’ could be and how it should be implemented for best results.
- Analysis of the needs and requirements of the city in terms of construction, infrastructure facilities, transport, housing and settlement. This helped in setting the requirements of the people and analysing how much of the resources would be used for fulfilling the requirements.
- Conducting two design workshops in 2007 in the city of Abu Dhabi that discussed extensively on the topics of community development and urban planning. These workshops were attended by industry experts and experienced faculty from eight countries and other representatives of the Abu Dhabi

departments and authorities, who worked together to plan the future ‘master plan’ required to be implemented for the development of the city (AHK, 2013).

The “Abu Dhabi 2030” which is made under the urban structure framework plan is basically a conceptual document, which includes all themes, ideas and directions that are explored through strict processes of planning and reviewing. The main objective of this document is to establish a clear vision of Abu Dhabi and set plans for the development of the city in accordance to achieve the vision. (ADUPC, 2015) For making this document certain set of policies, principles, geographic schemes and plans were considered as the basis for evaluating the levels of growth and development permitted and required and thereby the propositions of growth were made under the Abu Dhabi 2030 plan so that these be integrated with the culture and economy of the city. The key directions of the plan include various elements that helped it becoming flexible and showcasing a sustainable and practical view, these directions are as follows (ADUPC, 2015):

- Sustainability- it was required to interpret and accommodate the needs of the new growing population, majority of which has migrated from the nearby areas or countries. It is essential that proper accommodation planning be done to fit this population without wasting revenues on over development and unnecessarily building infrastructure. Thus, it is highly important to respect the cultural and natural resources of the city and at the same time fulfilling basic needs of the people living. The future of Abu Dhabi is bright only if the present authorities use existing wealth in a cautious manner, explore renewable resources of energy in an active manner, educate the generation for future good and reduce or limit the consumption and utilization of non-renewable resources.

- An Evolving Culture- the plans under “Abu Dhabi 2030” should be designed after considering that even after execution of the plans, three million populations is living in the city that is pleasant and there exist areas for exploration of natural resources and clean and green environment. On the basis of income level, a range for housing services should also be set. The traditional style of living should be integrated with creativity and flexibility so that choices of new lifestyle are also accommodated simultaneously.
- A Unique Environment- it is prudent to plan carefully and sensitively that the critical natural environment that makes the city of Abu Dhabi unique is well preserved. It is pertinent to identify and also conserve the diverse cultural and environmental amenities before deciding the places and areas of new development. It must be well understood that once the environment is damaged it cannot be undone, thus before exploiting any area complete study and research should be conducted and the decision should be taken after making extensive plans. The areas that are protected or that needs to be protected should be identified before so that these can be developed at a later stage (ADUPC, 2015).
- Liveability and Excellence- it is highly important for Abu Dhabi to correctly define the quantity and quality of development that is required and acceptable for the city. It is advised that under the “Abu Dhabi 2030” plan principles of development are used explicitly to evaluate the project proposals rather than succumbing towards extensive marketing or external influences. The factors of convenient and comfortable liveability must be present while taking all the decisions regarding development. Thus, the plan must take into consideration the important of well-being and peaceful living of the citizens. The aim of the plan should be to ensure better living to the people of the country rather than

filling up pockets of the external influences in the name of development (ADUPC, 2015).

- **Opportunity and Identity-** the opportunity with Abu Dhabi to offer various combinations of features in the city is rare. The developers must consider that the mind-sets of the people are well considered while planning to give an urban identity to the city. The city of Abu Dhabi is filled with people who have an authentic and safe approach but are also open and progressive in terms of development. The people live life in a traditional manner but utilize all the latest technological advances offered in the 21st century. The city is not just a place of business but also of culture and government. Thus, the city is a mixture of natural environment including dunes and natural islands along with infrastructure, homes and streets to be developed.
- **Connectivity-** inter-city transport is very poor and only means of public transport is auto and thus it cannot be relied completely for serving the needs of three million people. It is important to integrate a multi-layered transportation system in the “Abu Dhabi 2030” plan that is able to connect the downtown cores with newly developed islands and growth nodes.

All of the above factors were considered while developing the strategies under Abu Dhabi 2030 plan for giving a new shape and structure to the city that is capable to meeting traditional needs of the people and adding a hint of innovation and creativity in it (ADUPC, 2015).

4.3.2 Construction industry in Abu Dhabi

The 2008 crisis had a significant impact on the different sectors including the construction sector. After the global economic recession in the year 2008, the real estate sector in Abu Dhabi got a hit. In the year 2008, the path of oil prices witnessed a sharp

steepening that led to an increase in the oil prices as high as \$145/barrel in 2008 followed by spectacular price collapse. After the 2008-09 crises the government of Abu Dhabi decided to invest in the economy with the help of significant capital projects. A stellar example is the plan to create 14 industrial cities across Saudi Arabia. There was a sharp fall in the oil prices that further impacted the income and spending of government. The contracts were re-visited, payments were significantly delayed and banks also became cautious in terms of lending. The historical oil price shocks were caused primarily because of the physical disruptions in the supply. The 2007-08 were caused because of the strong demand that confronts the stagnating world production. The causes of oil shocks were different; the consequences were similar in the economy, affecting the overall consumption spending along with the purchases of domestic automobiles in particular.

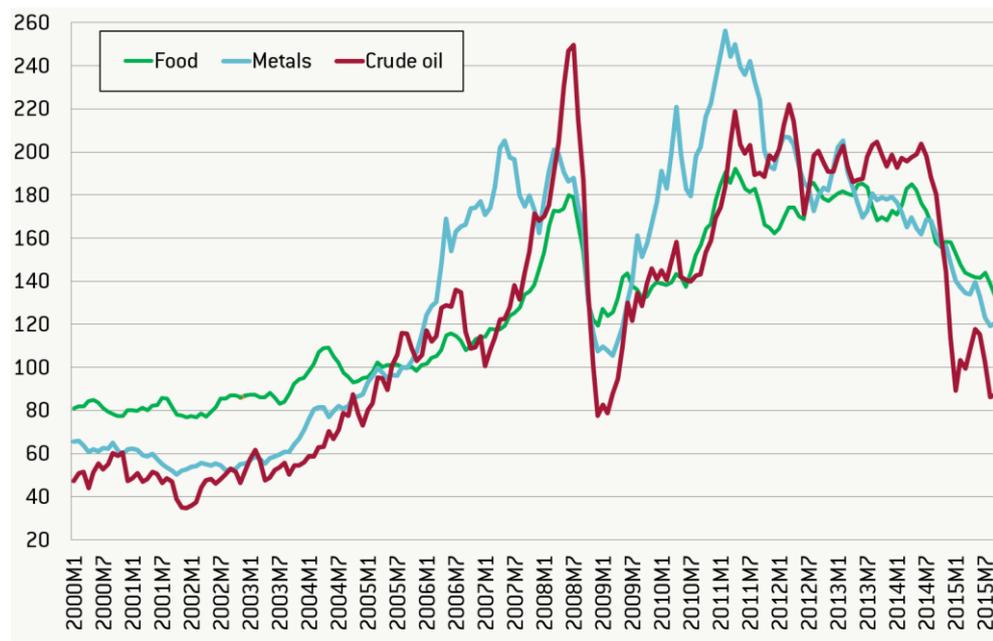


Figure 4.4 : Oil consumption in three sectors

Source: (Dabrowski, 2015)

The above graph shows the impact of oil crisis on the three different sectors of UAE - Food, metals, and crude oil. In order to cope up with the 2007-08 oil crisis economic diversifications was adopted by increasing the investments in different construction

projects so as to survive the economic crisis of the world. In addition, legislative, fiscal, and monetary measures were also adopted by the Abu Dhabi's government so as to reduce impact of crisis on the construction sector of Abu Dhabi. A strong transparency and corporate governance were other aspects that helped the Abu Dhabi's government to cope up with the oil crisis (Zaman, 2017).

For the first time after recovery from recession, all the segments dominated in the market were showing simultaneous growth in the third quarter of 2014. The government is now set to promote plans and policies aimed at achieving market stability and ensuring high levels of participation from the real estate investment section. The government has suggested that the prices should be kept as increasing during the year 2015 and there must be tightened supply in many sectors. The construction industry of Abu Dhabi entered a period that is experiencing renewed levels of growth and development. The total value grossed by construction projects was \$727 billion as on April 2014. This figure has helped UAE to have second largest market of the construction industry all across GCC countries (OBG, 2015).

In the next five years, the UAE is expected to grow at an exponential rate of 9.5% as reported in RNCOS, a market research firm. As per the UAE Construction Industry Outlook 2016, report prepared by the firm, it is investigated that retail, residential, hospitality market shall have stimulating demands as per gross domestic products rates, patterns for foreign direct investment and the demographic patterns of the nation. It is argued that the city of Abu Dhabi is to witness the most substantial growth and on the basis of current developments, it is predicated that with the growing support of government to construction centre, it will become the hub of construction boom. The current trends of the construction market observe under supply because the demands in

all the types of properties including retail, office and residential are very high than the total supply. Further, in the current phase of development, the city of Abu Dhabi is all set to launch new housing and large infrastructure projects and facilities. The growth in population of expatriate community is the main reason for continued demand of construction in the city in relation to more residential as well as industrial units. This will help to improve the economic conditions of the UAE with increased and improved levels of the GDP (Construction Week Online, 2013).

The industrial strategy of Abu Dhabi for the year 2015 focused on boosting the economic growth. The top agendas under the strategy were to ensure high growth in potential sectors of construction, semi-conductors, renewable energy, petrochemicals and gas. All of these industries were planned to be provided with extensive support from the government and required incentives for overall growth. These industries were proposed to be given infrastructure and land at competitive prices coupled with other important incentives that include easy funding and financial options (Al-Hajj & Sayers, 2014). The construction sector in the city has shown significant growth and has helped in generating business in abundance for industries with construction material. Further, it has helped in providing high value services that are looked by world countries. The industry offers huge opportunities from professionals of every field and integrates the knowledge of management and technology to ensure best results. The construction industry in Abu Dhabi started to grow after the Dubai development began and thus in the current phase it is growing rapidly. The Abu Dhabi 2030 plan aims towards creating sustainable infrastructure by satisfying the needs of people of UAE as well as environmental conditions. The techniques used by the construction industry are highly advanced and significantly contribute towards the success of the project (Halder, 2015).

However, the practical state of construction industry of Abu Dhabi showcases an entirely different reality. Many of the ambitious construction projects in the Abu Dhabi have been scaled down by the government. This scaling down of the projects that were directly or indirectly by the state is expected to have huge repercussions on the developers appointed for these projects. After Dubai, Abu Dhabi is speculated to become the worst construction market in the entire GCC. During 2015, the construction industry has witnessed cut-throat competition and approximately 30% of scaling down in construction projects that were backed up by the government. This has hugely affected the margins of the developers and increased backlog in the construction industry. Recently, the Guggenheim Abu Dhabi tender was withdrawn by the government and this is a salient example of the above condition. The contractors and developers of real estate sector in the region were hard hit by the recession in the year 2008 wherein the prices in the sector were dropped by at least 60%. Until recently, the sector was growing from the past losses and now such regimes and practices of the government are again deploying the developers towards losses. Further, there are many issues regarding the labour treatment in the construction industry. As most of the projects are mega projects, thus developers are mandated to take all the precautions for the benefit of labours, which they fail to take in most situations and thus cause huge loss to the labours and their families (Ferris-Lay, 2011).

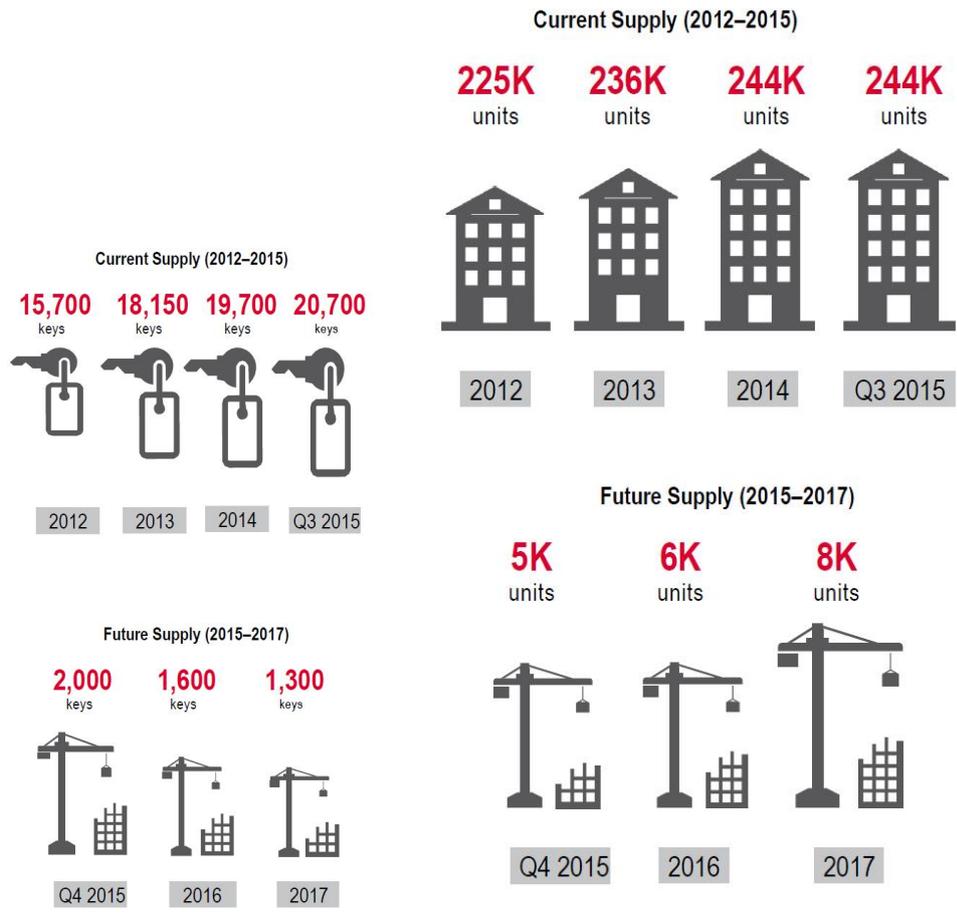


Figure 4.5: Supply of Housing and Hospitality Projects

Source: (Property Watch, 2015)

According to Abu Dhabi Statistics Centre (SCAD), the total number of extensions and new buildings that were completed in the 3Q2013 was 1,531 out of which 56% of the extensions and buildings were in the region of Abu Dhabi itself. In the same year, the building extensions were 280 that were 180 in the same quarter of the previous year. However, the number of completed buildings fell from 2,248 in comparison of same quarter of the previous year. During the 3Q2013 the estimated cost of constructing a building area for government was between AED 3,273 and AED 4, 255 according to the factors such as size and project sophistication. (The Business Year, 2014).

The capital city of UAE, Abu Dhabi is the best point for investors as the real estate market exhibits the strong performance in the region of MENA. A more conservative

approach is however, required for pacing the development of real estate combined with significant oil revenues so as to cushion the construction sector of Abu Dhabi. This will further result in a relative outperformance in the future years. It is important to highlight that the residential market of Abu Dhabi is still undersupplied. Over 3,000 residential units were completed in the year 2016 that further pushed the property stocks to around 250,000 units. The developers also became cautious by delaying the construction projects and reducing the number of competitions. In the year 2017, around 5,000 units are scheduled to be completed, but it is estimated that a significant portion of these 5000 units will be delayed only at the final stages so as to balance the market. The factors such as rising inflation, high cost of living and weak economic conditions are curbing the demand of commercial and residential units of construction sector in Abu Dhabi (Graves, 2017).

The Abu Dhabi construction sector will continue to be affected by the economic conditions and the government policies. However, the growth in the service sector, government and the institutions will increase the demand of the office space as soon as the market matures. The demand of retail space will grow because of the increased population and increased tourism. The graphs below show the projection in the demand of the construction sector till 2030. The projections show that the tourist market will grow at a fast pace in comparison of the residential market. However, there will be a significant increase in the both the markets. The graphs also show the projections in the supply of residential, office, retail and hotel supply. All the units show an upward trend but the office supply shows a downward trend in the year 2020 (John, 2017).The industrial sector of Abu Dhabi will also grow with the relocation and expansion of the port area combined with development of different industrial zones that are close to the

new port. In addition, there is a growth in the leisure and business guests leading to a growth in the construction sector of Abu Dhabi (Arab News , 2017).

Abu Dhabi's construction sector began to recover in the year 2017 after the global oil prices reached to their pain point in 2016, after the OPEC deal, the prices began to rise. After the oil prices stabilized, the government was able to reduce the spending cuts along with keeping the long-term outlook of the industry positive as the Abu Dhabi Urban Planning Council (UPC) and the Abu Dhabi Executive Council approved a number of real estate projects, public works as well as the neighbourhood master plans in the year 2016 along with the Al Maryah Island's infrastructure. The sluggish macroeconomic growth keeps the costs of construction flat and the pressure on the contractors remains high. The contribution of Abu Dhabi' construction sector in the employment rate, GDP expanded between 2011 and 2014. Statistics Centre - Abu Dhabi (SCAD) highlighted that contribution of the construction sector in GDP shrank in the year 2012 to Dh85.15bn (\$23.18bn) but it improved to Dh92.6bn (\$25.2bn) in the year 2014. The infrastructure of UAE has boosted in terms of impressive international ranking: worldwide for roads, ports and airports. The outlook for Abu Dhabi's construction sector is positive for the future years. The low oil process will however, pose a challenge for Abu Dhabi's construction sector. Yet, the Abu Dhabi's construction sector will benefit from the development of international events such as Expo 2020, tourism, government investments in transportation infrastructure.



Figure 4.6: Gross Domestic Product UAE

Source: (Clifton, 2016)

The impact of oil price collapse can also be seen in the GDP of the country. The GDP is expected to grow at the rate of 5.5% and there has been a contraction by 5% in the year 2015 because of the oil price collapse (Clifton, 2016).

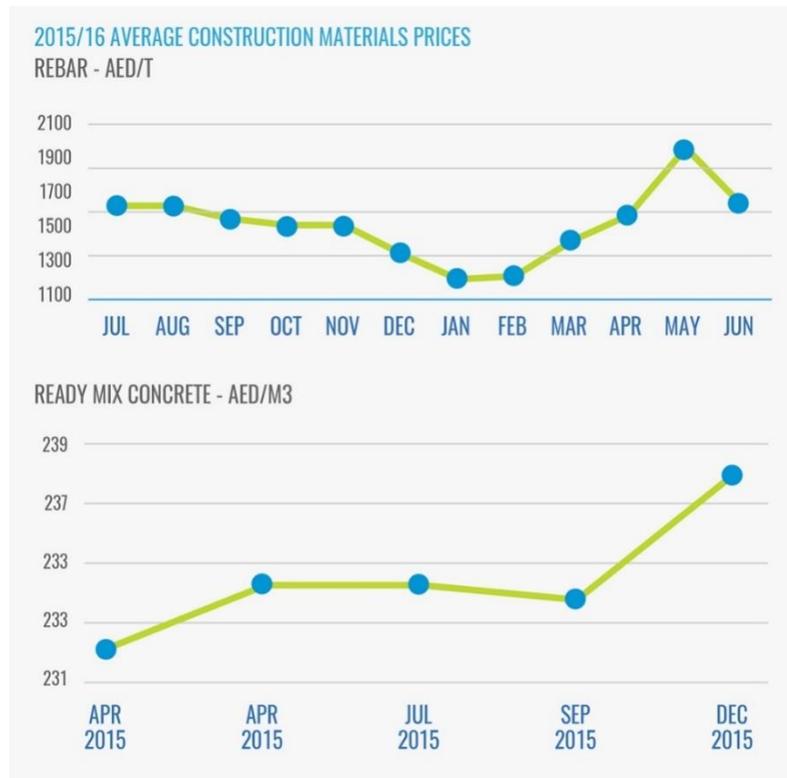


Figure 4.7: Average Construction Material Prices

Source: (Clifton, 2016)

The impact of oil price collapse can also be seen in the process of the material used for construction. The above graph shows the increase in the construction material process (Clifton, 2016).

The table below shows the value of different construction projects of Abu Dhabi along with their completion date.

Table 4.2: List of Projects in Abu Dhabi

Project	Value in US \$ Million	Expected Completion
Infrastructure		
Abu Dhabi Metro	7000	2020
Abu Dhabi Airport Expansion: Midfield Terminal	2960	2017
Residential		
Capital District- Abu Dhabi	40,000	2030
Ain Al Faida Residential Development	Dh 4.18 bn	2017
Jebel Hafeet Housing Development	Dh 5.5 bn	2017
Office	40,000	2030
Capital District- Abu Dhabi	30,000	2016
Renaissance City (mixed use) - Abu Dhabi	25,000	2020
Masdar City - Abu Dhabi	22,000	2025
Masdar City (mixed use) - Abu Dhabi	22,000	2016

Source: (Driessche, 2016)

Abu Dhabi requires less capital support and it can yield significant benefits from the development and implementation of its bespoke strategy. The Abu Dhabi's government invested Dh470m on the infrastructure construction projects. In addition, Dh200 million has been invested to construct the roads for transportation (Arabian Business, 2016). The investment will be done in the community and housing facilities. The renovation, construction and infrastructure projects will be implemented in Al-Shuaib, Liwa, Al Salamat Umm Alashtan, Um Ghafa, Nema, Al Salamat Umm Alashtan, Alybanh, Bida Al Mutawaa and Mazyed. Additional infrastructure projects will be further implemented in different residential districts of Mohamed bin Zayed, North of Al Wathba and

Emirati neighbourhoods. Further, the project to develop terminal facilities at Abu Dhabi has been approved by the Executive Council at Abu Dhabi International Airport. The new terminal will have an area of 700,000 m² and it will have the potential to handle over 27million passengers per year. (Gulf News, 2017). The Al Ain Faida Residential Development is a government residential project which aims to provide housing facility to nearly 2000 people. This is a huge step by the government of Abu Dhabi. Jebel Hafeet Housing Development is a residential project near the Al Ain area. This project aims to provide housing facility to more than 3000 people. The main attraction of this project is that this project with housing facility is also going to provide a school, a clinic as well as many other facilities at one place. This project is a township project which will benefit the citizen (The National, 2017).

According to the Abu Dhabi 2030 Urban Structure Framework Plan, the focus is on expansion as well as the restructuring. There are number of extensive construction projects are in progress in Abu Dhabi along with the project that will be started in future. One of the capital projects is the development of central business district (CBD) on Al Suwwah Island. This project extends from the Al Mina, Abu Dhabi Island and Al Reem (Abu Dhabi Urban Planning Council, 2013). This project is expected to be one of the skyline buildings and a complex of office blocks that is connected to Al Reem Island and the city with over ten bridges. The bridges facilitate the pedestrian access.

The capital city is also being developed that is expected to host the government buildings including a medical campus and biomedical research centre along with the Grand Mosque District that will be the home to the Grand Mosque, Sports City and the Officer's Club. The location of the Grand Mosque is strategic in the Abu Dhabi Island. The area is further expected to become populated densely.

4.5 ABU DHABI GENERAL SERVICES – MUSANADA

Abu Dhabi General Services “Musnada” was established in the year 2007, as a Public Joint Stock Company by the Law 27/2009. The company was established so as to provide support services to government entities in major areas of construction, contract management, facilities management, catering, stores logistics etc. The current offerings of the company focus on Design & Construction along with facility management. Musnada supports the delivery of Economic and Urban Planning visions of Abu Dhabi (Musnada, 2012). The mission of organization is to provide cost effective, integrated sustainable maintenance and delivery of Abu Dhabi government Assets. The objectives of the organizations first is to effectively deliver the Public Sector Assets within the Regional Plans, second, to manage the assets in a sustainable manner, third, to manage the supplier market in an open, fair and transparent manner, fourth, to be a trusted Technical Adviser to government. (Musnada, 2012). The services offered by Musnada can be segregated in seven categories:

Design and construction project management - The Company operates as the agent for taking responsibility of all the phases associated with construction project lifecycle. Some of the important phases are design consultant appointment, feasibility, design, contractor appointment and construction project management. (Musnada, 2012)

Abu Dhabi Government Contact Centre - The organization also manages Abu Dhabi Government Contact Centre along with servicing the entities of Abu Dhabi. The contact centre manages the contracts from residents, citizens, visitors, business organizations along with other government entities. (Musnada, 2012)

Travel Management Services - We offer a centralized travel, accommodation planning and booking service. The service leverages the collective purchasing power of Abu

Dhabi Government providing a best fare guarantee for air bookings and lowest available hotel rates. (Musnada, 2012)

Facilities Management (FM) - The organization also manages cleaning as well as maintenance of Abu Dhabi Government buildings and facilities. The financial management services cover strategic assets of mosques, schools and civil buildings (Musnada, 2012).

IT Project Delivery Management - The organization provides end-to-end project delivery capability along with delivering the critical information associated with different leveraging years of multinational and local experience, we provide end-to-end project delivery capability throughout the entire project lifecycle to deliver critical information technology projects to the government entities of Abu Dhabi. Musnada's dedicated IT Service Delivery Management and technology services provides the best solutions (Musnada, 2012).

Office consumables - The organization also manages procurement and provisions associated with a range of office stationery products (Musnada, 2012).

The clients of Abu Dhabi General Services comprise of different departments and authorities that are within the Abu Dhabi government across the Western, Central and Eastern regions.

Abu Dhabi General Services operates under the brand name of Musnada that was officially established in the year 2007 by Law (27) of 2007, in the Emirate of Abu Dhabi as a Public Joint Stock Company. According to the article (5) Law (27) the company aims at providing support services to all the governmental departments, bodies and authorities as per the decision of Abu Dhabi Executive Council. The organization focuses on promoting its performance at all the levels. In this context some of the major activities of the organization are as follows:

The company manages the facilities and the real estate in emirate according to the decision of Executive Council. The organization also looks after the engineering works, contracting as well as management of governmental building projects that are developed in Emirates. Next, the organization also develops, promotes as well as manages supportive services and operations associated with information technology. Musanada further supports and caters services as well as the logistics services. Musanada is governed by Board of Directors that is composed of a chairman along with a minimum of five appointed members. The members of the board are appointed by the Abu Dhabi Executive Council.

4.4.1 Organization Structure

An organizational structure clearly defines the scope associated with behaviour that is acceptable within an organization along with the lines of accountability, organizational relationships, external environment and authority. Specifically, the organization structure shows the different patterns or arrangements of groups or jobs that are within the organizations. The organization structure also shows the reporting structure and the operational relationships (Montana & Charnov, 2008). The organization structure affects the actions of organization in major ways; firstly, the organization structure provides the foundation of operating the standard procedures. Secondly, the organization structure also helps in determining which individuals can participate in the process of decision making. Abu Dhabi General Services “Musanada” also has an effective organization structure that helps in defining the accountability, organizational relationships, external environment and authority. In the year 2012, the organization transitioned to a new organization structure that promotes accountability of service delivery. The new structure of organization fosters an environment where authority and decision making are equally distributed. The figure below shows the organization

structure of “Musnada”. The organization structure shows that there are functional divisions as the organizational activities are divided on the basis of functions. (Montana & Charnov, 2008).

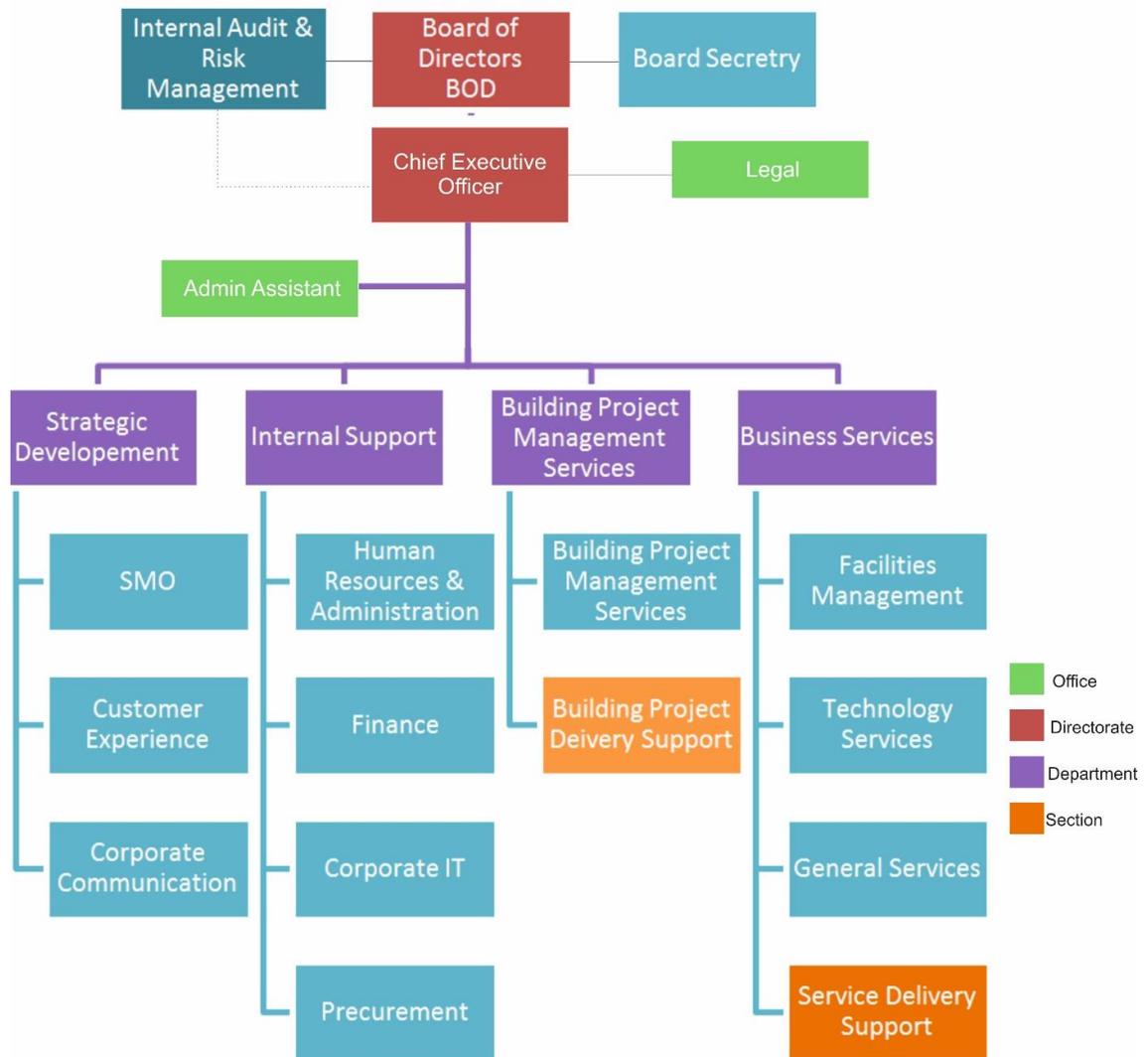


Figure 4.8: Abu Dhabi General Services - Musanada Organizational Structure

Source: (Musnada, 2012)

Organization has four major activities - strategic development, internal support, Building Project management services and Business services. Each of the functional area was further divided into other functions. The basic functions of the organization such as the human resource and administration, corporate IT, finance and procurement are the internal support functions. This organization based on the specialization helps the organization to achieve operational efficiency as the employee of each of the

functional areas becomes the specialist within their realm of expertise. The lateral communication is an important aspect in such an organization structure as the information needs to be disseminated both vertically and horizontally. (Montana & Charnov, 2008).

Balanced scorecard management system is one of the important parts of the organization and Musanada has implemented balance score system in all the functions listed in the above organization structure. This system has been implanted for measuring the corporate performance along with ensuring the daily alignment of the activities with the targets and goals. On the basis of principles of Balance scorecard Musanada has effectively established the standard procedures for the Annual Planning and Performance Management. The Annual Planning and performance management serves as governing tool and driving the strategy and performance of the organization (Musanada, 2012).

4.4.2 Projects of Musanada

Musanada has projects in different categories, some are completed and some are running. The project categories of the Musanada are presented in the form of a Table below:

- Housing
- Building
- Healthcare
- Education

A brief description of the project is given below:

Table 4.3: List of Musanada Projects

Housing		
Umm Al Ashtan Project	The project is associated with Designing and Construction of about 20 Residential Units in Umm Al Ashtan – Western Region	2014
Bidaa Al Matawa'a Project	The project is associated with Designing and Construction of about 60 Residential Units in Bidaa Al Matawa'a _ Western Region	2015
Neimah and Al Salamat Project	51 Residential Units in Al Ain along with infrastructure	2014
Mezyad and Umm Ghafa Project	Residential Compound Project of 110 Villas in Al Ain	2014
Ramah Project	46 Residential Units in Al-Ain along with infrastructure.	2015
Buildings		
Abu Dhabi Ladies Club Project	Ladies Club Project in Abu Dhabi	2015
Abu Dhabi Accountability Authority Headquarters	A building with 3 underground basement floors + ground floor + 7 floors	2015
Civil Defence Academy	Design, construction and maintenance of the Civil Defense Academy	2015
Al Shahamah Slaughter house	Construction, completion and maintenance of a modern slaughterhouse at Al Shahamah	2014
Healthcare		
Al Noor Centre for Special Needs	Centre for Special Needs	2015
Al Mushrif Center	Demolition and construction of Al Mushrif Center	2015
Sheikh Shakboot Medical City	151 Clinics + 732 beds	2016
Ghayathi Hospital	N.A.	2015
Al Ain Hospital	Hospital main building + mortuary building,+ logistic building+ administration building+ rehabilitation building+ main station	2017
Al Sila Hospital	Main building of hospital +infrastructure	2015
Education		
Al Misk Kindergarten	A Kindergarten that is located in Al Fou'a area- Al Ain with a Capacity of around 360 students.	2015
Bin Ham School – Al Wagan	Rehabilitation Program +air conditioning systems + power generator room	

Source: (Musanada, 2017; Musanada, 2012)

The Abu Dhabi General Services Company (Musnada) is investing 187 million dollar in the housing project Al Hayer which the organization has promised to complete by the year 2019. This project aims to boast nearly 300 residential plots which calculate to be 2025sq m each. This project is going to be completed on an area which is spread over a one million sq. m area, which is huge. This project is a very strategic project of Musnada organization, and will give a boost to the growth and development rate of the company. Musnada aims to providing a comfortable housing facility to the citizens of the country. The organization is taking every effort to become an integral part of the Abu Dhabi Plan related to the social development of the country. Musnada aims to provide people a decent living facility to give them a new experience and improve their standard of living. This project of the organization is considered to be one of the best housing projects of the country that have the capacity to transform many lives at a time. This housing project also provides with two mosques in the huge area of this residential project. Al Suwaidi the head of the Hosing section of the government stated that the, "Al Hayer residential project is the outcome of co-operation with Musnada" (Trade Arabia, 2017).

4.4.2.1 Completed projects

Neima Housing Project in Al Ain

This is an infrastructure project of housing in Al Ain. This project spans more than 150 hectares along with including 1080 sq. meter and 493 plots that are dedicated for the villas for nationals. This is one of the significant projects and it is a part of 2030 vision. (Albawaba, 2012).



Figure 4.9: Neima Housing Project in Al Ain

Source: (Musnada, 2017)

Al Noor Training Centre

This is another significant project of Musnada in Dubai. The project is focused on fulfilling the special needs of special people regardless of their background with help of professional training and care. This project is erring as a guiding light of the community (Alnoorsneeds, 2017).



Figure 4.10: Al Noor Training Centre

Source: (Alnoorspneeds, 2017)

4.4.2.2 Running Projects

Abu Dhabi General Services Company (Musanada) has number of projects in different areas some of the major projects are discussed below:

Two Projects at Al Rahba City with total cost of AED461M

Musanada is working on two important projects at Al Rahba City that is 30km from Abu Dhabi international airport. This project serves 519 residential plots. It comprises of internal roads construction along with the infrastructure of Al Rahba city. This project also involves the construction of road networks, electricity grids, installation of fire breaching inlets ad portable water lines. The project term is around 35 months that will cost approximately AED164 million. (Musanada, 2017).

Two Projects at Al Wathba North

Musanada is executing two major projects that stretch over 2,361 square meters at Wathba North. This project serves 18,413 residential plots that are split into 1,801 townhouses, 13,150 villas and 3,462 mid-rise buildings. Both these projects are located Al Wathba that is 15 Km from the International Airport. (Musanada, 2017)

4.6 CULTURE AND UAE CONSTRUCTION

The Middle East area of the globe is burgeoning in a variety of ways including demographically, economically and politically (Wilco Tjihuis, 2012). This region is bordered by Africa, Asia and Europe and thus is a region which has mixture of various religions and cultures. UAE has many ethnic groups like Pakistani, African, Emirati, Indian, European and Bangladeshi. The region of UAE is ancient and dates back to 3500 years, however its demographics comprise of people who are young. The overriding concern for the Middle East countries is to create job for the people below

the age of 25 years, which account for sixty-five percent of the total population. Most of the wealth in this region is directly attributable to the biggest deposits of oils and other natural resources including aluminium and petrochemicals. However, this region is also bright in terms of banking and tourism sectors. Many international companies have come up in the UAE with its implementation of liberal trade policies. Thus, it is indeed important to understand the work culture of the people. In terms of construction industry, the work culture is same as of any other industry and does not have many variations (Miller, 2011).

UAE is a stable country in terms of economic, social and other considerations. The country portrays strong Islamic values, high standard of living and Arab Traditions. There is a strong link between the religion followed in the country and culture adopted at organizational and workplace level. According to Naoum, Alyousif, & Atkinson (2015), culture of country impacts management practices adopted. Thus, for international and national construction companies, it is highly important to understand various aspects of the culture prevalent in the society. It is highly recommended for the project manager of the construction industry to be present at intercultural training activities and workshops that help in raising awareness of the local cultures of UAE. Language is an important element of culture. The official language of UAE is Arabic; however other commonly spoken languages are English, Hindi and Urdu (Gorgenlander, 2011).

Every aspect of life of the people of UAE is governed by Islam and thus it is important to understand the religion so that the culture can be understood. Most importantly, showing disrespect to Islam in any form or manner is considered as a serious as well as punishable offence. The Islam faith propagates and emphasizes on components like

modesty, respect and generosity. The honour of every individual is paramount and must be respected every time. The style of communication is indirect which is capable of saving face as per their cultural desires. In informal conversation, there is no concept of personal space and it is considered impolite to take a step behind; high value is placed on the element of civility by the Arabs. While meeting or departing, Arab men shake hand as a gesture of welcome or thank you but on the other hand the Arab women do not shake hand with men. The safest way for men to greet Muslim woman is by placing a hand over the heart, this way is used by Arab men to greet woman. It is preferred to take first name, last name or any specific title while greeting each other. However, if people are standing in a group then the most senior person is greeted first. The work culture is not free in terms of drinking alcohol as the same is prohibited under Islam (Engwall, 2003). UAE is one of the most westernized and cosmopolitan countries of the Middle East region. Abu Dhabi, Dubai, etc. are popular destinations for holidays amongst national and international tourists. These cities have variety of things to offer for shaping up career paths and lifestyle. Due to stability of politics and society, UAE has attracted large number of skilled multicultural workforce. On the other hands, the foreign investors are attracted due to bureaucratic approach adopted by the UAE. The country a wide range of financial incentives that are better than what is offered in parts of the world. UAE offers a sophisticated way of living and safe working conditions which is liked by both businesses as well as workers (Gorgenlander, 2011). With the economic expansion in 21st century, the country has transformed itself from being traditional in organizational and business approach to multicultural. It is a kind of experience to work and do business in UAE, which advocated a mix of modern and traditional culture of people from both Western and Eastern, countries (Miller, 2011). Thus, it is clear from the above analysis that the work culture of UAE is quite unique as the country has a population with varied religions. However, it is integral to understand

the basics of Islam that guide the work culture of the organizations working in the country. Overall the work culture may be construed as rigid as compared to western cultures and maintains a border line between the senior and subordinates. The people are not free in the way they work and are mostly guided by the seniors. There is huge significance of giving respect to the seniors at all times. The work culture between men and women also varies in terms of their lifestyle, dressing and communication style (ZU, 2015).

4.7 LESSONS LEARNED IN THE CONSTRUCTION INDUSTRY OF UAE

The players of the construction industry have failed to learn from their own previous mistakes or from the mistakes of others. This practice has generated huge losses and unnecessary waste of resources like cost and time because the construction industry is based on projects that are of unstable and fragmented nature. Project performance can be largely improved by the way of adopting practice of lessons learned. The professionals of UAE in the construction industry are familiar with the concept of lessons learned but only in an informal way. The essence of working for the organizations in the construction industry has solely been “value for money” (Winter, 2006). However, to achieve the same, it is highly important to ensure that errors of every kind are avoided to the maximum level and these also be controlled by employing various methods. Every organization must strive to ensure that no mistakes are made and even if mistakes are made once they should not be repeated at any cost. Also, good practices should be discussed largely in the organizations and these should be implemented to ensure success and timely achievement of objectives in all the projects. The lessons learned practiced should also be focused by the project management team as it helps in serving the organization with the functions of transferring knowledge,

capturing knowledge and eventually aims at retaining knowledge within the organization. The practice of Lessons Learned has attracted largely the fields of project management, knowledge management and learning and it covers all these three areas as shown in the figure below (Yuan & Skaik, 2014):

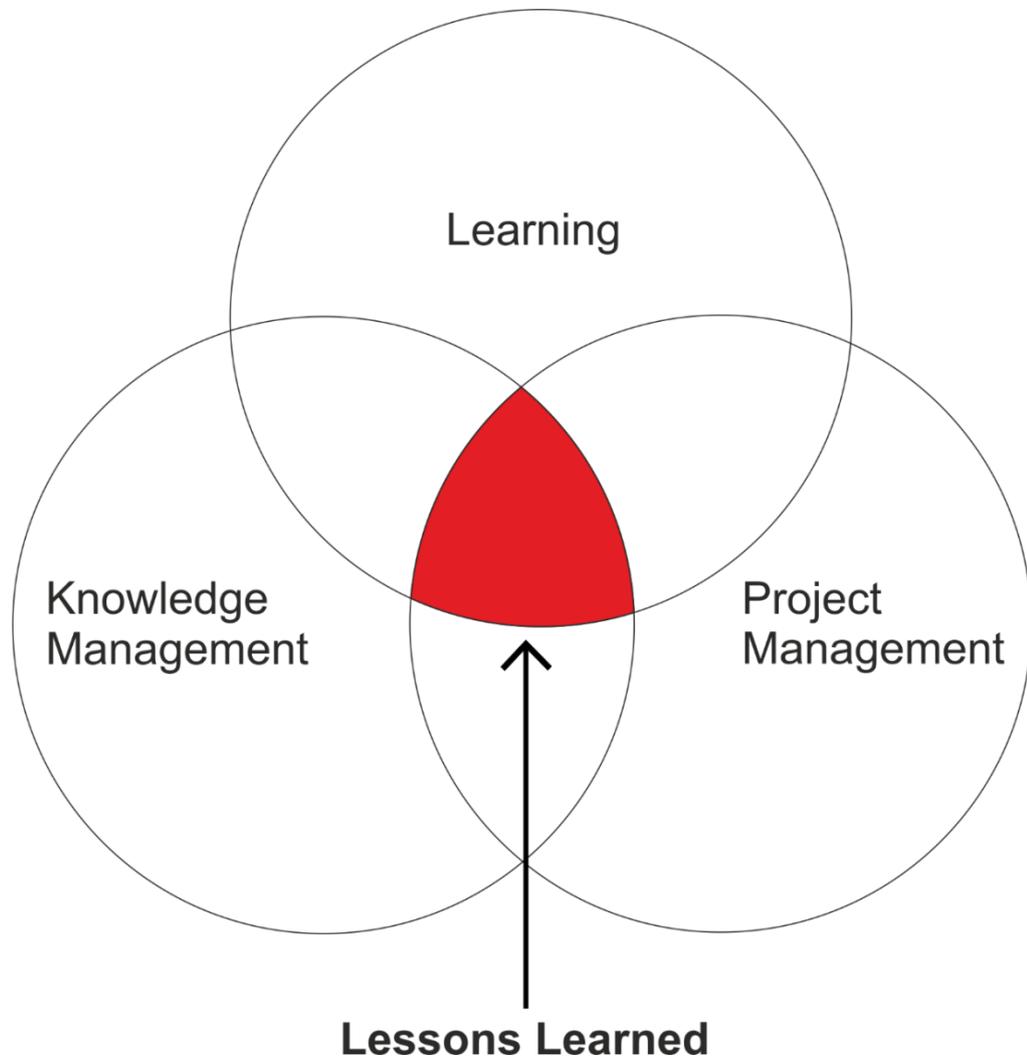


Figure 4.11: Definition of Lesson Learned

Source: (Yuan & Skaik, 2014)

Potential examples of lessons learned could be the following:

- A lesson which is learnt and can be easily integrated in the working process;
- A tip under the lesson learned that helps to enhance the performance and productivity of the employees;

- A potential solution or preventive action suggested while encountering a problem;
- A lesson that could be easily incorporated as a guideline for others or into the internal policy of the organization (Othman, 2005).

The main purpose of the program of Lessons Learned is to give value to those hard earned lessons that have not been captured or remembered by the employees. The practice of lessons learned evolved around people, technologies that are capable of supporting collection, processes, analysis and implementation of the lessons learned. There are seven key areas that get affected with the success of implementation of lessons learned program including: leadership, analysis, lesson collection, resource like monetary, human, technology and material, lesson implementation, culture and improvement and maintenance (Gündüz et al., 2013). These factors are summarized in the figure explained below:

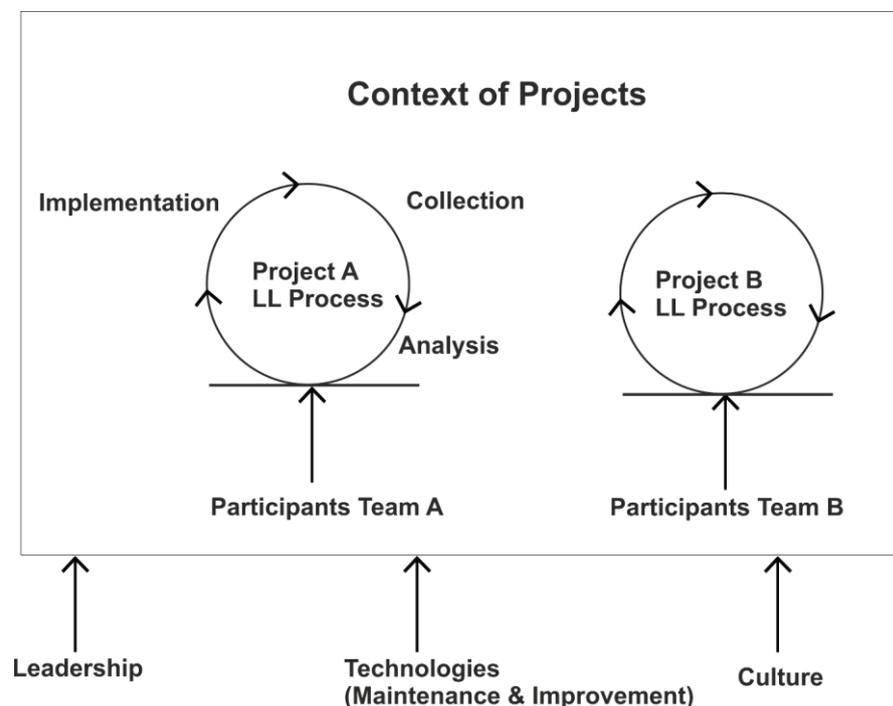


Figure 4.12: Context of Organization

Source: (Yuan & Skaik, 2014)

As per the above figure, two independent projects A and B are taken wherein lessons learned program (collection, implementation and analysis) is implemented. This lesson learned involves participation from the team members on every level of project. The influential and supporting factors from the viewpoints of the organization include “technology”, “leadership” and “culture”, these factors are strategically related and impact on all future and current projects that are undertaken by an organization (Yuan & Skaik, 2014).

It has been observed that the professionals of UAE construction industry are well aware of concepts of Lessons Learned but they lack in-depth understanding of the same as a process. The practice of lessons learned requires to be implemented in the project life cycle by efforts and initiatives taken up by the individual by means of implemented either a formal and mandatory practice in the organization or an informal approach towards project practice. After that, professionals are required to make a record of bad or good practices at the end of the project and these become the crucial areas on the basis of which notes for lessons learned should be prepared. Project manager is kept as in-charge of verifying the lessons. However, in practice of lessons learned is performed in an informal way in most organizations of the UAE. Thus, at no level the formal practice of lessons learned is implemented. The implementation of lessons learned program is advocated mostly by the consulting companies in the UAE construction industry; however the least practitioners are the contracting companies (Söderlund, 2004; Radosavljevic & Bennett, 2012). Further, it is evident that the lessons recorded by the professionals are used mostly for guiding individuals rather than teams and thus it is not considered and understood in true sense. Implementation of this practice will help the construction industries to advocate efficient practices at work and ensure enhanced productivity and profitability (El-Reedy, 2013). Further, it will help the employees in

getting satisfaction from the job in the form of feedback which will include their good habits as well bad habits. In the current context, the practices employed in the construction industry of UAE are immature in consideration to the lessons learned program. Even after understanding the scope and significance of implementation of lessons learned practice, these are not followed and even the professionals do not take any steps to implement them till the lower levels. It is not difficult to implement this practice as it can be easily combined in with the practices of project management and the project manager can undertake this task alongside others. There shall not be any kind of burden over the manager as well (Caldas, 2009).

Thus, it is important the project managers understand the importance of practice of lessons learned. These managers must take extensive training on these programs and policies can be implemented in the organization for better productivity and involvement of the employees. Lessons learned will help the construction industry in reducing the errors done and ensure that the project is able to achieve its deliverables in terms of time, cost and quality. At the current level, UAE needs to reform the practices followed in the construction industry because there is huge demand of different types of projects but relatively very less supply (OBG, 2013). Thus, it is important to meet the demands on time so that consumers can be protected from high pricing. It is not difficult to implement programs of lessons learned as they can be easily adjusted within the project life cycle at various stages and the project manager can identify the lessons without diverting much attention from other aspects of project management. However despite of efforts put in for implementation of Lesson Learned processes in project environment, there are various barriers that often arises (eLearningindustry, 2015). These are as follows:



Figure 4.13: Barriers to LL Implementation

Source: (Marlin, 2008)

- The projects that are undertaken mostly involve complex processes within it. When a project is very much complicated it might take a lot of time to complete it. There is always a time constraint particularly in the construction projects. Hence, the biggest barrier in the learning process in management of a project is completing the project within a stipulated time. 'There is not enough time' is the biggest barrier to the learning process (Skinnarland & Yndesdal, 2015).
- Since the nature of the project is very complicated, some mistakes are bound to happen. The barrier arises at the time when no member of the project team is taking the responsibility of the mistakes that have been made. The team members are either not willing to admit or they are afraid to admit the mistake they have conducted. This "I have not done any mistake" nature of the people

concerned with the project proves a barrier to the learning (Langford & Retik, 1996).

- The most important factor in order to make a project as big as a construction project successful is the completion of the project on time (Sørensen et al., 2015). The completion of the project on time is possible only when the entire work is properly divided into well organised teams. The efficient teamwork is very essential in making a project successful. The efficient division of the work helps in fixing the accountability of each and every member of the team. If the team is not working efficiently and the members within a team are not supporting each other, it becomes the biggest barrier to the success of the project. It also hampers the willingness to learn in the members of the team (Langford & Retik, 1996).
- Mistakes are bound to happen if a very complex project is undertaken. It is normal that while undertaking a big project, the work is divided between a number of persons and due to the difference in the working style mistakes occur (Hua & Bee, 2013). But if the same mistakes are being repeated again and again, it proves to be a barrier in making a construction project successful and also it proves that the learning process is not very efficient.
- The management of the organisation undertaking a project is also responsible to pay a close attention to all the activities related to learning. The management should take initiative in framing the policies for making the learning of the employees effective. If there is lack of management support to the training and learning process, it becomes the biggest barrier to the learning process. Also the policies framed with respect to the learning must be properly implemented by the management. If the plans are made and not implemented by the management, it will lead to a barrier in learning.

- The employees are not willing to learn new and improved ways of performing the work which will create a barrier in the learning process. The policies so framed in this regard by the management of the company have to face resistance from those employees who are afraid to make changes in their traditional way of working. This thinking hampers the learning process.

For making the learning process in the project management a success there are various ways that could be adopted by the management of the organisation which has undertaken the responsibility to complete the project (Albertus-Magnus-Platz, 2012).

These ways include the following:

- Efficient and effective Leadership is very important for making the learning process successful.
- Process of making somebody accountable and differentiating it with the process change. Accountability is something which is required to be dealt with by the organisation's management. The learning should determine the deficiency in the various processes which are carried on within the organisation.
- Pointing out Personal benefits of undertaking learning to the employees. Learning in one project will improve the performance of the employees in the other projects.
- Assessing the benefits of learning to the organisation. If the employees in an organisation are trained well it will save cost of wastage of the resources and also the time taken to complete the project, leading to increase in overall efficiency of the organisation. This also increases the goodwill of the organisation.
- Documenting the lessons learned in the process is a very effective way to remember all the lessons. This also helps the organisation to apply these leanings in the other projects that are undertaken in the future (Marlin, 2008).

4.8 PERFORMANCE OF PROJECT MANAGEMENT IN THE CONSTRUCTION INDUSTRY OF UAE

The table below depicts the practices that must be followed during various phases of project management in the construction industry so as to achieve objectives of the project. The three phases include: Pre-construction, Construction & Site Management and lastly Post-construction (Derrick, 2015).



Figure 4.14: Managing Construction Project

Source: (Derrick, 2015)

With the understanding, development and expansion of the scope of project management, the UAE construction industry has experienced tremendous growth. With the implementation of this principle, UAE had the unique opportunity to adopt international practices of management and thus elevate its standard of construction techniques. Project management directly contributes to the success or failure of a project (Al-Hajj & Sayers, 2014). However, with the growing recognition of these concepts, a distinction between project management success and project success is been drawn. According to Faridi & El-Sayegh (2006), around half of the construction project in UAE gets delayed (Ramanathan et al., 2012). Major reasons for delays are identified as delay in drawings' approval, lack of initial planning and slow decision-making process on account of owners (Motaleb & Kishk, 2015; Baghdadi & Kishk, 2015). It

has been analysed that overall project objectives during the life cycle of the project are based to evaluate the project success rather than a mere interpretation of quality, time and cost. On the other hand, project management success is a narrower term and is established on the basis of a shorter time frame and parameters of quality and cost. The following critical success factors have been identified for evaluating the level of project success (Toor & Ogunlana, 2008):

1. Involvement and sponsorship from the top management.
2. Alignment of interest of the stakeholders and project goals strategically.
3. Adoption of project management methodology that has been approved.
4. Effective control procedures and measures for project planning.
5. Effective measures to implement change management.
6. Competence, experience, qualifications and skills posed by the project manager.
7. Competence, experience, qualifications and skills posed by the team members of the team.
8. Level of clarity while defining objectives, goals and priorities of the stakeholders.
9. Sufficient amount of resources.
10. Adequate levels of communication amongst all concerned parties.
11. Regular consultation of clients.
12. Highly responsive clients.
13. Capabilities of including feedback within the system.
14. Technical tasks that is clearly designed and well-co-ordinated.
15. Acceptance of plans from customer's side.
16. Effective mechanisms to control adversities of project at the time of planning, controlling and implementing (Zadeh et al., 2015).
17. Fast capabilities of troubleshooting within the system.

18. Standard use of IT and software structures within the organization.
19. Clearly written and well explained responsibility at each stage.
20. Capability of quantity surveyors to estimate right amounts of cost.
21. Positive structure of the organization towards project management.
22. High levels of mutual trust between the stakeholders of the project.

Even as we have moved forward in this 21st century and developed the concepts of project management, there is still some ambiguity in the concept related to project success (Ajelabi & Tang, 2010; Westerveld, 2003). From the research, it has been analysed that at the strategic level it is often difficult to assess the goals, objectives and implementations process related to project management. Thus, it is clear that adoption of methodologies and techniques under project management forms only a certain part of the overall project success. It is pertinent to note that even if the project management initiatives fail to meet the long term objectives, the project can be successful. Considering the same view, it can be construed that project management is more of a functionalist activity that is based on some purpose imposed through reductionist techniques by way of order and centralized control (AlNasseri et al., 2015). There is little information as to how the project managers practically implement various methodologies, tool and techniques of project management and ensure effective maintenance of these techniques for accomplishment of project deliverable and overall project objectives (Goddard & Melville, 1996; Eybpoosh et al., 2011).

The main methodologies and tools of project management as regarded in the UAE construction industry comprise of organization breakdown structures, work breakdown structures and task responsibility matrices (Miller, 2011). Apart from these, other regarded tools include change register, document register, Gantt bar chart, project

directory, project master plan, and risk analysis. The current analysis of the UAE construction industry shows that more than half of the total projects are performing poor in terms of budget, time and quality. These failures have been directly attributed towards the principles of project management in terms of tools and methodologies used in the construction industry. Most of the project managers appointed by construction organizations are experienced in the field of construction but lack experience in field of project management. Thus, it can be clearly observed that as the principle of project management gained momentum, professionals from other disciplines of management started moving in this discipline, this is affecting the performance of construction industry of the UAE. The benchmark standards of even the ranked project managers in UAE are slightly lower than the international standards. This clearly shows the reason for poor performance of construction projects and their falling back on resources and time (Al-Hajj & Sayers, 2014).

Project management discipline has been able to achieve acclamation recently only. It was not considered necessary in the construction industry to employ practices of project management. Thus, with a sudden increase in scope and significance of project management, managers from other disciplines of management have diverted to this discipline but have failed to bring results in the projects (Alnuaimi & Mohsin, 2013). Project management is not implemented in the correct manner by using right kind of methodologies, techniques and tools in the construction industry and thus the discipline is not able to stop delay of time, increase in cost and reduced quality problems in the project (Bodea & Constanta-Nicoleta, 2016). The players of construction industry should start appointing separate project managers from ensuring proper implementation of the project management discipline and such a manager should not be overburdened

by other tasks and responsibilities that are not directly related with project management (Caldas, 2009; Crawford, 2000).

4.9 SUMMARY

Construction industry is achieving laurels in the world scenario but there are various elements that are still required to be considered so that effective performance in the construction projects is achieved. The United Arab Emirates is growing at a rapid rate and recently has emerged as a smart nation of the world. The construction industry of UAE is also flourishing and some of the landmark projects include Khalifa City, Masdar City, and Burj Khalifa which have been constructed by efficient project managers of Abu Dhabi. The significance of organized project management in construction industry of Abu Dhabi is comparatively very high. The contractors, sub-contractors, financial institutions, insurance companies and all the other stakeholders work together to achieve the common objectives. The coordination among stakeholders is one of the factors which have led to growth of construction industry in UAE. The residential, industrial, retail and hospitality construction projects are witnessing a stimulating demand. One of the reasons of this growth is due to the development of the United Arab Emirates as an important trading and financial hub. The project managers of Abu Dhabi have to face number of challenges in terms of selecting the best techniques of project management from the great variety of techniques and simultaneously maintain relationships with different categories of stakeholders. In this chapter we have tried to analyse various types of project prevalent in the construction industry of UAE including residential, commercial, specialized industries and infrastructural and heavy industries. The market for each of these projects varies and has different characteristics. It is clear that the Abu Dhabi has adopted a liberal and modern approach and seeking towards boosting the construction industry. UAE's

construction industry showcases a mix culture but is highly dependent and inclined towards the practices as mentioned in Islam. The people of UAE are workaholics and they complete their work in a timely manner. They are sincere about work allotted to them and demand respect irrespective of the level at which they work. Abu Dhabi 2030 plan is focused on developing the infrastructure of the Abu Dhabi city while considering the aspects of sustainability, liveability, environment, etc. The main aim of this plan was to ensure that development is made only to a level which does not cost the environment. Further, it is clearly cautioned that a place should not be selected on the basis of any external politics or influence but rather on the final considerations that must be made into a man-made building or developed as a required infrastructure. Abu Dhabi has placed great importance on environment while promoting construction industry. The authorities of Abu Dhabi have extended a supportive hand towards development of the industry whereby ensuring that the environment and basics of the people are not taken away while focusing on development.

CHAPTER 5 : THE RESEARCH METHODOLOGY

5.1 INTRODUCTION

The scientific method is an ordered series of procedures to make use of scientific research to observe the extension of our knowledge and to discover valid methods of research, finding reasons and explanations for controlling natural phenomena which can be replicated (Taylor, 2005). This chapter allows the researcher to explain how this investigation project was developed. Therefore, it discusses research methodology, strategies, type of data analysis, and data collection. According to Kothari (2004) research methodology is a tactic used to systematically resolve the research problem. This may be implicit as a science of studying how research is carried out scientifically. There, it is studied the numerous phases that are commonly implemented by the researcher in studying his or her investigation problem sideways with the reason behind them. It is essential for the scholar to design his/her methodology for the research problem as the same should be different from problem to problem.

5.2 RESEARCH FRAMEWORK

The research model chosen to undertake this study is called the research onion diagram made by Saunders et al. (2009) (See Figure 5.1). This research framework is considered to be by scholars as extremely helpful, interactive, well-organized, and relevant process to apply when developing any research (Saunders et al., 2009). The different layers of this onion serve as guide to select the most suitable research methodology and to explain a diversity of methods and techniques existing that are very important in order to deliver the appropriate results and conclusion of the investigation (Saunders, et al., 2012). The research 'onion' is used by Saunders *et al.* (2009) for explaining the selection process of a data collection and data analysis technique.

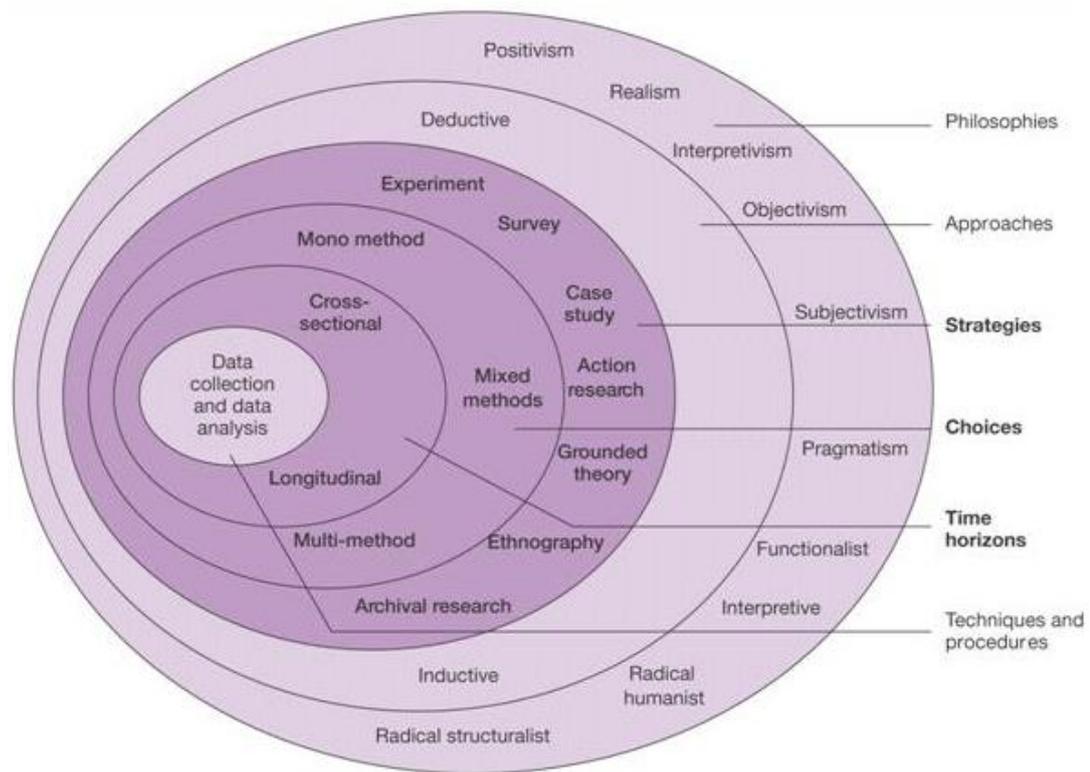


Figure 5.1: The research ‘onion’

Source: Saunders et al. (2009)

5.3 RESEARCH PHILOSOPHIES

Research philosophy is directly related to the source, nature, and development of knowledge. Despite of the idea of bringing new knowledge seems to be thoughtful; researchers are involved in knowledge creation (Bajpai, 2011). Therefore, research philosophy is considered to be the conviction about the methods in which the information should be collected, analysed and used.

Before referring to the research philosophies individually, we have to consider the three types of assumptions: Axiology, Epistemology and Ontology in order to differentiate research philosophies (Saunders, et al, 2015). Acknowledging and selecting a philosophy is a crucial stage in planning and executing the research study which is why

these elements have been included as the outside layer of the onion model (Saunders, et al., 2009).

Axiology discusses the involvement of elements: values and ethics as part of the research development (Saunders, et al, 2015). This assumption permits the investigator to comprehend and identify the role their values and judgement play in the collection and analysis of the inquiry in the contrary to exclude or to control the influence of It (Biesta, 2015).

Epistemology is the assumption dealing with evaluating claims related with “the way in which the world can be known to us and, as such, involves issues as to what it is to know anything” (Hughes and Sharrock, 2016). Basically, it is concerned about knowledge, what is seems to be acceptable or not, valid and reasonable knowledge, and how to communicate the understanding with other individuals (Saunders, *et al.*, 2015).

According to Eriksson and Kovalainen (2015) ontology is the assumption used to express reality. It shows the truth helping to reduce the gap among reality, our perception of it; and how this influence in the different aspects of society and people’s behaviour (Saunders *et al.*, 2009).

Every stage of the research process is grounded on suppositions about the foundation and the nature of the knowledge (Dudovskiy, 2016). Once described the assumptions outside of the research onion model lets continue with the first layer. This contains an exhaustive analysis of the subcategories of axiology, epistemology and ontology which reflect the philosophical beliefs of the research (Saunders, *et al.*, 2015).

5.4 POSITIVISM

This approach there is only a unique and tangible reality, which can be fragmented into portions and each of them could be manipulated separately. In addition, it is extremely objective, independent of how individuals live; hence, do not pay attention to subjective states (Boyd, et al., 1991). Objectivity is real only if factual knowledge and the process of obtaining information prescribing opinions and feelings, etc. have been achieved. And it's free of values. Furthermore, Zikmund, et al., (2013) discuss that the thinking of the positivist school comes to conceive social research as a neutral activity, since from this point of view research can have: eliminate all bias and preconception, not be involved in emotional or attitudinal situations, transcend beyond appearance and common sense. Besides, the researcher is in charge for quantifying the gap between the factual knowledge and the believed knowledge.

5.5 REALISM

There is almost no difference between positive and realism research philosophy (Jacobsen, 2005). This philosophy relies on the idea of separating what we perceive as reality from the human mind. Both philosophies have the same approach and their principles are attached a single ideology, believing on the assumption of a scientific method to the creation of knowledge (Van Fraassen, 1985). However, they are somehow different when realism states that scientific methods are not infallible. Therefore, understands that all theories can be questioned and that our capacity to distinguish for sure what the truth is may not exist if we lack of continues research and do not open our minds to use the new methods of investigation (Dudovskiy, 2016).

5.6 INTERPRETIVISM

The main approach of this philosophy is to incorporate the subjective aspects of the researcher as genuine and legitimate artefacts of knowledge; the importance of techniques related to participation; and recovery for cultural and social knowledge from the perception of the participants (Goldkuhl, 2012). Within qualitative research, interpretivism seeks to give meaning to a certain investigated reality. Widely used in social investigations, this qualitative theoretical perspective does not seek the mere description of the facts, but their understanding, therefore seeks to provide attention to the social actor trying to understand their point of view (Schreier, 2012). This means, the principle of analysis for this paradigm is the study of theory in contrast with the reality, it also requires impartiality and evaluative capacity to any action that promotes change (Venkatesh, et al., 2013).

5.7 CONSTRUCTIVISM

This philosophy drives all the way around objectivism (Greener, 2008). It has a subjectivist epistemological interpretation of reality, that is, the researcher investigated merge into a simple monastic entity, thus the results are literally the creation of the process of interaction between two researchers (Guba, 1990). From a methodological point of view, the individual constructions are chosen and refined in a hermeneutic way, and then compared and contrasted dialectically. From there a consensus emerges substantial. On the other hand, Glasersfeld (1988) argues that constructivism is radical because it disrupt with the conventional and ordinary by emerging a theory of knowledge in which the knowledge does not reproduce an objective ontological reality but the collation of a world created by our experience.

5.8 OBJECTIVISM

This philosophy sustains an epistemological posture that gives priority to the object in its relations with the subject, whether these are cognitive or evaluative (Elander and Cronje, 2016). Objectivism is to focus on the external world, observable reality, meaning that every object is what it seems to be, and every fact is as it is observed, things are by their physical reality. Moreover, objectivism states that the reason of man is destined to seek knowledge of the facts of reality, is the intellectual faculty that recognises and integrates the material provided by the senses. The reason is the faculty of the human being that allows him to acquire knowledge, in this way, from this epistemological perspective, mysticism, faith and feelings are not accepted as means of knowledge; this does not mean that objectivism denies the subjective, expressive or symbolic components of human reality, they simply are not

5.9 PRAGMATISM

This philosophy suggests that reality is multiple, it has been constructed by the particular subject, and it is universal and interrelated (Biesta and Burbules, 2003). The investigator is broad with the observed and capable to interpret and determine the perceptions of reality from the point of view of the subjects, being able to articulate an individual's experience in relation to the phenomenon that studies. Also, it addresses aspects of the investigated phenomenon that can be abstract and subjective.

The philosophy describe and interpret sensibly and in detail the situations, events, people, interactions between them, attitudes and behaviours that are observable or inferred through the methods and techniques used (Morgan, 2014). It incorporates what

was said by the participants, their experiences, attitudes, beliefs, thoughts and reflections as they are expressed by themselves and not as one describes them. Specifically, the meaning is emphasised as the author's interpretation of his reality, the context that includes those aspects that are part of the social, cultural, historical, physical, actor's life, the holistic perspective seen as the conception of the stage, the participants and the activities as a whole, the culture directed to know what the actor does, what the actor knows and what he builds and uses accepted as representative components to find true knowledge (Goldkuhl, 2012; Bryman, 2015).

Pragmatism has been the philosophy that best fit this endeavour. Meaning, this investigation is an exploratory study to explore how project management strategies are implemented in the UAE construction industry. In order elaborate this idea, first a literature review was undertaken adopting different concepts and points of view. The research went from general to specific since not much is written about the topic. This philosophy provided the researcher the freedom to develop in the way that best considers (Goldkuhl, 2012).

5.10 RESEARCH APPROACH

The subsequent layer of research onion framework is the one associated to the research approach. According to Saunders (2009), the research method consists on the deductive and the inductive research approach. In order to decide the adequate and desired approach researcher is required to pay special attention to the research aims and objectives as well as the subject topic that is being investigated.

Deductive vs Inductive

The inductive approach and the deductive approach, both have divergent methodologies to undertake the investigation (Nešić and Hamidović, 2015). Each method has its advantages and its implementation will depend on the phenomena to be studied, the field of the desired research or the perspective the researcher wishes to follow (Hammersley, 2017).

According to Dudovskiy (2016) the deductive view works from the most general to the more specific. The researcher creates a theory about a topic of interest. Then, elaborate a specific hypothesis that he or she is willing to test is reduced. On the other hand, the inductive method works in an opposite way: it starts from the most specific to the broadest generalizations and theories. In the inductive reasoning, the investigator begins with some observations and specific measures to reach some general conclusions (Liu, 2016). These two techniques are poles apart and suggest different foundations when carrying out a research. By its nature, the inductive method allows more flexibility and the deductive method is more closed by nature and is more oriented to test or confirm hypotheses (Greener, 2008).

In other terms, Graneheim, et al., (2017) argue that inductive approach quest for patterns. While analysing the data the researcher try to find the variances and similarities in the data gathered, which are separated into categories or themes in the different levels of abstraction and interpretation. As a result, the investigator evolves from the data to a theoretical understanding; from the tangible and specific to the intangible and general. Nevertheless, inductive research is suitable for qualitative inquiry (Trumbull, 2005). This method supports the effort of the researcher to describe and analyse multiple realities by constructing a deep understanding and capturing day to

day human life and their perceptions. Therefore, the inductive approach is appropriate to use in this research.

However, deductive considered as a concept-driven as Schreier (2012) explain that academics investigate the implications of current theories or explanatory models about the phenomenon under study against the collected data. In contrast, this approach evolves from theoretical understanding to data; from intangible and universal level to existing and specific one. In addition, this approach is usually identified with the quantitative method.

5.11 RESEARCH STRATEGY

The selection of the methodological choice represents the third layer of the research onion model, which is the strategy or strategies to help the researcher to identify the preferred data to collect, what will be analysing sources, and how is the data gathered going to be reported (Saunders and Tosey, 2013). There are several styles on existence that the academic can utilise, however all of them have pros and cons.

For instance, experimental research consists of a manipulation of an unproven experimental variable, under strictly controlled conditions, in order to describe what the cause of a particular situation or event is (Lancaste , 2005). In the experiment is precisely the researcher that causes a situation to introduce determined variables of study manipulated by the scholar. Moreover, Besen-Cassino (2017) suggests that this way researcher can control the increase or decrease of that variable, and its effect on the observed behaviours. The scientist deliberately manages the experimental variable and then observes what happens in controlled situations.

In addition, it differs from the non-experimental methods in which the experiment is carried out in the formation of special conditions that produce the desired events under circumstances favourable for scientific observations. The experimenter takes an active part in the production of the event (Bryman, 2015).

Whereas the case study consists of a research method or technique, usually used in the health and social sciences, which is characterised by the need for a search and inquiry process, as well as the systematic analysis of one or several cases (Silverman, 2016). To be more exact, by case we understand all those circumstances, situations or unique phenomena from which more information is required or deserve some type of interest within the world of research (VanderStoep, 2009).

Depending on the field of research in which it is carried out, the case study may be focused on a wide variety of subjects or issues. Unlike other types of empirical research, this methodology is considered as a qualitative research technique, since the development of this focuses on the exhaustive study of a phenomenon rather than a statistical analysis of existing data (Silverman, 2013).

The term action research comes from author Kurt Lewin and it was first used in 1944. The strategy described a form of research that could combined an experimental approach to social science with programs of social action that responded to the major social problems of the time (Bryman, 2015). Through action research, Lewin argued that theoretical advances and social changes could be achieved in simultaneous forms.

In addition, action research offers other advantages derived from practice itself: it allows the generation of new knowledge to the researcher and the groups involved; it

allows the mobilization and reinforcement of organisations and, finally, the best use of available resources based on a critical analysis of needs and options for change (Greener, 2008).

The results are proven in reality; experiences that result in the social field provide information about historical processes (Costello, 2003). In other words, a new cycle of action research begins when the results of the common action are analysed, through a new phase of information gathering. Then, the discourse about the information begins with the stage of elaborating guidelines for the processes of action or the modifications of the preceding processes.

Grounded theory is above all a methodology adapted to the study of social reality Lampard (2013). As a strategy its ultimate objective is to understand how the world works, and access human understanding. Therefore, research based on Grounded Theory is more interpretive than descriptive. People are not present in the speeches, but the concepts that the researcher does.

According to Dudovski (2016) this strategy tend to utilize the inductive approach to discover theories, concepts, hypotheses and propositions starting directly from the data, and not from a priori assumptions, from other investigations or from existing theoretical frameworks. In this sense, Grounded Theory forces the researcher to avoid everything that has been learned and to focus exclusively on the data. As result, it provides a new perspective in the inductive method (Robson, 2011). Meaning, there is no part of the theory or the existing bibliography, but the data of the scenario. The analysis of the data in a constant comparison process leads to the generation of explanatory concepts and theory.

Furthermore, this method does not pursue to produce formal theories, but rather to theorise about the subject (Wagner, 1968). In this regard, the researcher does intend to prove his/her ideas to generate grounded theory, but only to demonstrate that they are plausible.

The ethnographic investigation constitutes the description and analysis of a specific social field, a specific cultural scene. For example, a locality, a neighbourhood, a factory, a social practice, an institution or another type of field, without prejudice to the application of other methods and techniques of collection, synthesis and analysis (Townsend, et al., 2016). The main goal of the ethnographic method is to capture the point of view, the sense, the motivations, intentions and expectations that the actors give to their own social actions, personal or collective projects, and the cultural surroundings that surround them.

Ethnographic research gathers the data that, together with those built on quantitative approaches, are the basis for the reflection of ethnology and anthropology (Journal of Management Studies, 2011). Thus, the strategy by comparing contrasts and elaborates theories of intermediate or more general vigorous, which in turn feeds the considerations that on nature and society are made at the anthropological level.

The application of the strategy in the fieldwork consists in the displacement of the researcher to the study site, the examination and registration of the social and cultural phenomena of his/her interest through observation and direct participation in the social life of the place; and the use of a theoretical framework that gives meaning and relevance to social data (Bryman, 2015). In that context, ethnography is not only a

description of data, but it implements a particular type of analysis, related to the prejudices, ideology and theoretical conceptions of the researcher (Watson, 2011). The researcher not only observes, classifies and analyses the facts, but interprets, according to his social condition, time, ideology, interests and academic formation.

The archival research method involves a wide range of applied activities in order to ensure that the research of textual materials and documents produced by the organisations and about the organisations, run as smooth as possible (Ventresca and Mohr, 2017).

In this manner, Flick (2011) states that not only the archival strategy consist on gathering data form existing materials such as historical documents opening an entrée to search on events, organisations, and individuals from the past but also is applied by scholars involved in investigations that are not specifically historical. Since, it is used as an instrument to support other studies such as field method and survey method. Consequently, archival method could be utilised in order to analyse digital papers such as emails, database, and websites.

5.12 RESEARCH CHOICE

At this stage of the research onion model the researcher is emerging into the area connected to the nature of the investigation deeply related to the research types (Saunders et al., 2009). On the other hand, the nature of the study is separated in three key aspects, which are: quantitative method, qualitative method and the mixed of latest two elements.

However, the nature of the report is what establishes the type of the study as well as the approach of the research. Still, the techniques in both types of investigation are very different from one to another; researcher is entitled to use them both, depending on the subject. Though, there will be a predominant characteristic (Barrett, et al., 2011). Therefore, in order to understand in depth the research choice there is the need to compare quantitative data in regards to qualitative data.

Mono Method (Selected)

This is the sort of method is where the researcher comprehends the requirements of the nature of the investigation and decides to apply only one kind of research type. Either quantitative or qualitative can be used in the investigation but as a main characteristic for the mono method to prevail is that scholar must not combined both research types (Silverman, 2013). Therefore, this exploration is undertake under mono method as its nature due to it only focuses on one kind of study, this facilitates the process and helps reduce the complexity of the research as a whole. However other methods will be explained the reader understand differences, hence the reason for selecting mono-method.

Mixed Method

Bryman (2012) defines the mixed approach as a set of systematic, empirical and critical research processes that involve the collection and analysis of quantitative and qualitative data, as well as their integration and dual discussion, to make interpretations of all the information obtained and to achieve a greater understanding of the phenomenon under study. In other words, the mixed method is a process that collects analyses and associate quantitative and qualitative data in the same study. Therefore,

methods of quantitative and qualitative approaches are used and quantitative and qualitative data intervene and vice versa (Venkatesh, et al., 2013).

When analysing the research choice from the bigger picture, there is to visualise mixed research as a continuum in which quantitative and qualitative approaches are mixed, focusing more on one of these or giving them equal importance, allowing researcher to use the strengths of both types of inquiry, combining them and trying to reduce the potential weaknesses. This type of approach can also answer different research questions of an approach to the problem. However, a mixed investigation requires time, handles large volumes of data and performs various analyses. To carry it out, the collection of quantitative and qualitative data is required (VanderStoep, 2009).

Multi Method

Among the three form of research, the multimethod approach is the most complex. Since, this type of inquiry carries as main research strategy that two or more procedures are used to inquire about the same phenomenon or object of study. The researcher is empowered to use both quantitative and qualitative in that sort of investigation. However, the study will only be analysed from perspective either quantitative or qualitative despite both type of data are collected (Saunders, et al., 2012). The use of this method in research is alleged to have greater flexibility, understanding and explanation a reality.

The multi method and the mixed method are very similar. Nevertheless, there exists dissimilarity between them. The multi-method form is how the researcher separates the investigation into isolated fragments, and every single piece provides a particular result; each fragment was analysed via instruments prevenient from quantitative or qualitative

methodologies (Feilzer, 2010). In contrast, the mixed method indicates a shared methodology, which allows the researcher to generate a particular outcome (Flick, 2011).

5.13 DATA COLLECTION AND DATA ANALYSIS

The last layer of the research onion is composed of data collection and data analysis instruments. Besides, both, the collection and the analysis method rely on the methodological approaches that have been taken in previous layers. The nominated process at this phase of the project will considerably impact reliability and validity of the project (Hammersley, 2017).

Primary data

The primary data are those that researchers obtain directly from reality, collecting them or producing them with the instruments available, which means they are first-hand data. The use of primary sources in social research plays an essential role as a contrast between our theory and empirical reality (Silverman, 2016).

According to Lampard (2013) primary data or direct sources are the data obtained by the researcher himself or in the case of bibliographic search, by scientific articles, monographs, theses, books or articles of original specialized magazines, not interpreted. Therefore, this kind of data provides direct testimony or evidence about the research topic. The primary sources are written during the time being studied or by the person directly involved in the event. The nature and value of the source cannot be determined without reference to the subject or question that is being addressed (Besen-Cassino,

2017). The primary sources offer a point of view from within the particular event or period of time that is being studied.

Secondary data

Alternatively, secondary data is information that has already been produced by other people or institutions. The use of documentation in social research is therefore a secondary source (Eriksson and Kovalainen, 2015).

This sort of data consists on the recompilation of summaries, compilations or lists of references, prepared based on primary sources, which mean secondary source interprets and analyses primary sources; this data information is already processed (VanderStoep, 2016).

Research Design

Exploratory research is described by Stebbins (2001) as the undertaken study to obtain an overview of the context on a subject that is the object of study. The author also maintains its objective is to find all the evidence related to the phenomenon of which there is no knowledge and increase the possibility of conducting a full investigation. However for a successful exploratory research a lot of concepts have to emerge. Although exploratory research is a very flexible technique, compared to other types of studies, it implies that the researcher is willing to take risks, be patient and receptive (Hughes and Sharrock, 2016; Besen-Cassino, 2017).

This research is exploratory due to the lack of information in the implementation of project management aspects in UAE construction sector.

Qualitative vs Quantitative

Research can be both, quantitative and qualitative as well as mixed (Payne, 1999). According to Namey and Trotter (2015) qualitative research is tool kit based on theoretical and methodological factors and each of these has specific functions, usages, and restrictions. In order to differentiate qualitative from other approaches there exist three different characteristics which are: a) capability to collect very detailed by selecting people with high intellect, personal and public data by open surveys about their life experiences and attitudes, and inducting probing of their response; b) vulnerable to the natural environment where conducts and perspective take place and arise; and c) the ability to make participants understand questioning by using the adequate language and providing the opportunity to clearly express their response.

This means that qualitative method provides descriptive data of those impalpable aspects of the behaviour of the human being and of life, such as beliefs and attitudes; In addition, this method is extremely useful for understanding and interpreting social problems, because it allows researchers to study the relationship between people, social entities and culture (Liu, 2016).

When it comes to the investigation of social factors the quantitative type barely respond and limit to the nature of the subject. Also, the approach is weak in regards to the internal validity since the findings are interpreted from a general perspective (Del Canto and Silva, 2013). Furthermore, Abalde and Muñoz (1992) argues that the measurement in the quantitative methodology is penetrating and controlled as well as constrained to the extent of the data. This means, quantitative methods produce numbers which results from its application (Bowling, 2014).

Qualitative research are hard to examined since to its orientation to deliver results from a point of view such as feelings cannot represented in numbers Green (2000). According to Portney and Watkins (2014) quantitative research provide advance to the researcher in order to summarise the data into numerical analysis instead of qualitative method that relies on the experience of the person.

Data Collection

Semi-structured interviews were chosen as the data collection method because they have the potential to generate rich data to explore a range of perspectives and develop a holistic viewpoint (Cassell and Symon, 1994). Interviews were recorded and transcribed. Interviews covered topics such as details of the business; macro-environmental factors that impact on the UAE construction project management; key drivers for managing construction projects in the UAE; adoption of digital technologies for managing construction projects in the UAE; key challenges for managing construction projects in the UAE; and development of project management competence framework.

Population and sampling

According to Oakshott (2014) purposive sampling is the process where certain members of the population are purposefully chosen. Meaning, the purposive sampling is use to get information from specific and selected individuals. The sampling is limited to particular classes of folks who can provide the preferred information, and who fit in to some criteria established by the investigator (Black, 2010).

The method of purposive sampling is useful to develop the sample of the research under discussion. According to this method, which belongs to the category of non-probability sampling techniques, sample members are selected on the basis of their knowledge, relationships and expertise regarding a research subject. Copper and Schindler (2008) proposed that in designing the sample; the following should be taken on account: the target population, parameters of interest, sampling frame, the appropriate sampling method and the required sample size.

Within the different categories that purposive sampling holds the one that fits the more to objectives is the homogeneous sampling which is described as the kind that centre in one specific subgroup where groups member are very similar, having particular characteristics in common such as profession and pyramid work status (Saunders, et al., 2012).

A total of 100 top construction organisations in UAE were contacted of which 40 organisations agreed to participate in this study. Firstly, the organisations were sent the invitation letter which stated about the research, ethical aspects of conducting interviews and the benefits of participating (i.e. sharing the summary of the results). Within the 40 organisations, the sample included directors, advisers and managers responsible for project management implementation in their respective organisations, as presented in Table 5.1. The participants were grouped by their job title: directors, advisers and managers. All the interviewees have considerable experience in the UAE construction sector; in particular they had relevant experience on project management issues, with some of them having 'project management' in their job titles.

Table 5.1: A break-down of professionals who were interviewed for the study

Responsibility of interviewee in the organisation	No. of Interviews
• Senior directors	9
• Project manager	20
• Human resource managers	9
• Supply chain manager	3
• Quality management and control manager	3
• Client relationship manager	1
• Project team leader	2
• Feasibility and validation manager	2
• Knowledge management manager	1
• Project management advisors	9
• Procurement manager	4
• Construction site manager	2
Total	65

Table 5.2: A break-down of size of the organisation

Total employee size	No. of Interviews	Percentage
<250	22	34%
250-500	14	21.5%
500-1000	15	23%
>1000	14	21.5%

Of the 65 interviewees, 34% of interviewees are from small and medium sized enterprises (SMEs) (fewer than 250 employees); 21.5% of interviewees are of the size 250-500 employees; 23% of interviewees are of the size 500-1000, and of interviewees are of the size 21.5% >1000 employees.

Data Analysis

As part of the analysis of the interviews, content analysis was employed. The past two decades have seen an increasing scholarly interest in qualitative methodologies to study complex business phenomena, borrowing and adapting from more established disciplines (Miles and Huberman, 1994). The content analysis began as a tool for quantitative researchers, now it is increasingly being used in qualitative studies (Silverman, 2004).

Content analysis, a class of methods at the intersection of the qualitative and quantitative traditions, is promising for rigorous exploration of many important but difficult-to-study issues of interest to management researchers (Morris, 1994). Weber (1990) defined content analysis as “a research method that uses a set of procedures to make valid inferences from text”. The key assumption is that the analysis of texts lets the researcher understand other people’s cognitive schemas (Huff, 1990). At its most basic, word frequency has been considered to be an indicator of cognitive centrality or importance (Huff, 1990). Scholars have assumed that groups of words reveal underlying themes, and that, for instance, co-occurrences of keywords can be interpreted as reflecting association between the underlying concepts (Weber, 1990).

Fraenkel and Wallen (2003) noted that content analysis is a study of textual messages of human behaviour in an indirect way. This helps researchers generalise findings, predict the future, understand attitudes, values and cultural patterns of an organisation or an industry or a country. In the study, coding of the transcribed documents involved open coding of meaning units, that is, words, phrases, sentences, paragraphs, which essentially involved labelling concepts. The emerging concepts were mapped into themes. The themes have been cross-checked on group discussions between the authors and two fellow researchers.

Unit of analysis

One of the most basic decisions when using content analysis is selecting the unit of analysis. The unit of analysis is the element on which data is analysed and for which findings are reported (Neuendorf, 2002). It is the major entity that is studied and to which the result will be applied. The unit of analysis adopted for this study was the UAE construction industry, and the embedded unit of assessment was the ‘individual employee’.

5.14 ETHICAL CONSIDERATIONS

In an ongoing investigation researcher has to acknowledge the required ethical fundamentals in order to increase reliability and validity to the endeavour. From a general perspective, ethical considerations are directly related the researcher and its ability to do not perform illegal activities that exist in the academic field. In order to have the trustworthy results validated by academics, the investigator must be strict when it comes to ethical considerations. Therefore, researcher has signed an ethical form provided for the faculty and there have not been aspects manipulation in the data collected.

While conducting the research, the researcher is required to focus on various ethical aspects that increase the reliability of the viewers and other social participants over the research process and its results. These ethical considerations must be followed at colossal scale as it helps in giving absolute validity to the report. It will not be wrong to say that the quality of the report and ethical considerations have great connections with each another. However, in broader terms, the ethical aspects are related to the practice

of researcher that is authentic and genuine and avoids the illegal activities. The academic field also has certain illegal activities that must be avoided by the researcher. Without following the ethical considerations within the research, the researcher can never get the desirable results and can never win the confidence of academic fraternities (Langdrige and Hagger-Johnson, 2009). Therefore, the methods and data have been collected honestly; the researcher has avoided the element of manipulation.

5.15 VALIDITY AND RELIABILITY

The investigator has to put a lot effort and emphasis in the validity and the reliability of the research. According to Miller et. al. (2012) these are the most fundamental factors of whole enquiry. Essentially, researcher must guarantee the validity and reliability of the study. Therefore, for a research question to be both valid and reliable will be determined by if the subject causes the intended data or not (Taylor, 2005).

In the quantitative approach, an investigation will have a high level of validity as far as its outcomes reproduce an image as complete as possible, clear and representative of the reality or situation under study (Morse & Richards, 2002). On the other hand, According to Hammersley and Traianou (2012) a research with good reliability is one that is stable, trustworthy, congruent, equal or similar results at different times and predictable for the future.

Miles and Huberman (1994) referred to validity with terms such as internal validity and external validity. Internal validity refers to the accuracy and trustworthiness of the information. That is, whether it represents the participants' reality. In other words, internal validity addresses whether the findings are credible (Creswell, 2003). In this

study, threats to validity were minimised through triangulation of data collection methods (interviews, internal and external documents) and verification of the initial thematic codes by participants, where they judged the accuracy of data collected, though not its conclusions (Tajeddini and Mueller, 2012).

External validity explains how generic the research findings are beyond the cases used in the study (Yin, 2003). External validity has been an important issue and the number one subject of discussion when discussing the quality of qualitative research. Yin (2003) notices that critics typically claim that no generalising can be undertaken on the basis of a few cases, let alone a single case. As to the external validity, the results of this study remain limited in their generality, irrespective of the triangulation.

5.16 SUMMARY

This chapter provided an overview of the research methodology and procedures used in the acquisition and analysis of empirical evidence used to determine how UAE construction organisations are managing projects. The chapter also explains why and how qualitative methodology was adopted for this research study. Content analysis was used to analyse qualitative data. Results from the analysis of qualitative data are discussed in further chapters.

CHAPTER 6 : THE MACRO-ENVIRONMENTAL FACTORS THAT IMPACT ON THE UAE CONSTRUCTION PROJECT MANAGEMENT

6.1 INTRODUCTION

A tremendous growth has been experienced in United Arab Emirates in the construction industry. It is also mirrored by the expansion and development of project management tools and techniques. UAE has an opportunity to employ the best and international practices so as to improve the cost and quality of the projects. However, before implementing the efforts associated with improving the project management in the construction industry, it is essential to conduct an in depth analysis of UAE macro environmental in the context of construction project management. Therefore, this chapter focuses on the UAE macro-environmental factors that have an impact on the construction project management. The results are based on the perceptions of the 65 interviewees who participated in this study. The findings are also substantiated with the relevant literature.

In this study, during face-to-face interviews, in order to capture the macro-environmental factors that impact on the UAE construction project management, a question was raised, i.e. what are the macro-environmental factors that impact on the UAE construction project management? This study revealed six key factors that have a positive impact on the UAE construction project management. They are: political factors, economic factors, social factors, technological factors, environmental factors, and legal factors. Each of these key factors is discussed in detail. In doing so, this chapter addresses the second research question of the current study, “what are the macro-environmental factors that impact on the UAE construction project

management”. Overall, this chapter addresses the research objective “to analyse the UAE macro-environmental factors that have an impact on the construction project management”.

6.2 MACRO-ENVIRONMENTAL FACTORS THAT IMPACT ON THE UAE CONSTRUCTION PROJECT MANAGEMENT

Table 6.1 presents the macro-environmental factors that impact on the UAE construction project management as revealed by those interviewed in this study. From the data in Table 6.1, it is apparent that the single most macro-environmental factor is technological factors. This is followed by economic factors, political factors, social factors, political factors, and environmental factors.

Table 6.1: The macro-environmental factors that impact on the UAE construction project management

Sl. No	Macro-environmental factors	Total number of interviewees cited (N=65)
1.	Technological factors	95% (62)
2.	Economic factors	92% (60)
3.	Political factors	84% (54)
4.	Social factors	77% (50)
5.	Legal factors	71% (46)
6.	Environmental factors	66% (43)

6.3 TECHNOLOGICAL FACTORS

In this study, 95% (62 of the 65) of the interviewees noted that technological factors have had a positive impact on the UAE construction project management. The

technological factors are the factors that determine that how the changes or up gradation in the technology can have an impact on the projects or an organisation. For example, in a case of the project management, the technological developments can help the managers in employing the tools and machinery that can reduce the cost as well as time in finishing a particular process (Kavis, 2016). Further, there are a number of other advantages of technological advancements in the construction industry such as the proliferation of the Electronically Stored Information (ESI) has significantly increased in the area of project management. This proliferation has however increased because of the increased communication in the construction project management (Deng et al., 2014).

Today, technology in the fields of construction and project management has considerably changed. The technological advancements and developments are an important part of the construction industry because construction is a process that is associated with movement and assemblage of the operational equipment's and material into an operational facility. The technological factors have significantly positively affected the construction project management of UAE (Al-Ansari et al., 2013).

The implementation of technology in the construction process is essential as there are some repetitive actions that have to be performed. The technological advancements in the construction equipment's focus on improving flexibility, accuracy and reliability of the construction operations. There have been dramatic improvements in the machines and equipment's used on the construction site. The laser based equipment's have also been widely used in the construction industry (Deng et al., 2014). This indicates that technological improvements and advancements are one of the most important positive aspects for the construction project managers of UAE.

The technology has helped the contractors in saving the cost of the overall construction activity along with meeting the deadlines and expectations of the customers. Moreover, the construction sites now also feature the most prominent use of the material such as honeycomb structures, polyester fibres along with an improved durability associated with the fittings. Technology has positively affected all the aspects associated with construction. Technology has however increased the cost of the industry as the contractors have to buy the new equipment's and technology that can help in competing with other players of the industry, for example, implementation of automation and expert system in the construction industry. Such implementation requires resources and potential in terms of managing the change in the industry. The use associated with computerized expert systems in the industry is increasing widely (Drake, 2013).

The technological factors in the construction industry also pose a challenge before the industry that the focus of the industry players has to be on the research and development so that new ways and technologies can be evolved for making the construction work efficient and effective. The allocation of financial resources for the research and development needs to be optimum so that best tool, technologies and equipment's can be evolved. Internet is another significant aspect of the technological factors that have an impact on the operations and functioning of the construction industry. Internet is being widely used by the contractors, project managers, clients and the people of UAE to build a network and know important details and facts about the industry.

The integration of technology and information technology has paved the path for the industries to maximise the productivity along with delivering the quality projects on the time. The construction sector is one of the sectors that have seen the benefits of this

integration. One of the major challenges that are posed by the rapid technological developments and advancements is that companies have to become highly flexible in context of adopting the new technologies so as to stay ahead in the competition. Moreover, one of the major benefits that are being leveraged by the companies in the construction field through technological development and advancement is improved communication among the parties involved in the projects. In this way, the overall efficiency has been improved (Al-Ansari et al., 2013).

The technological growth and development has both positively and negatively affected the construction project management. For example, the project management software like Primavera and Microsoft Project has changed the way people used to manage project (Al-Khouri, 2013). These software helps in project planning, project updating, and tracking. The software is a boon to the project management industry of UAE as it helps the project managers to keep track of project progress and ensure optimum utilisation of resources. However, in a case if there was no technological growth and development in UAE, then the project management sector would have lagged behind and would have not attracted foreign investors.

In a global context also, the technological growth and development of UAE has contributed in its overall growth and development. One of the negative aspects of technological development for project managers in UAE is that they cannot be dependent on any technology and have to be adaptive in the context of adopting new technology. The workers of the industry also have to be trained frequently so that they can use the technology effectively (Nour, 2013).

6.4 ECONOMIC FACTORS

In this study, 95% (62 of the 65) of the interviewees noted that economic factors have had a positive impact on the UAE construction project management. The economic factors are the major determinants of the performance of the economy that can have both positive and negative long- term impact on the industries such as the construction industry. The major economic factors include the interest rates, inflation rate, foreign exchange rates and the economic growth patterns. The economic factors also include the FDI (foreign direct investment). The economic factors have a great relevance in the construction industry of UAE. The UAE's economy is the second biggest economy of the Arab world (UAE Government, 2017). It has gross domestic product (GDP) of over \$570 billion (AED 2.1 trillion) in the year 2014 (Revolvy, 2017).

There has been a successful diversification in the UAE's economy. The country has been dependent on the petroleum (oil) revenue. Apart from the oil and the petroleum industry, there are other industries such as construction industry and hospitality industry that are the major source of revenue (UAE Government, 2017).

An increase in the inflation rates of an economy will have a direct impact on the way in which the constructors purchase the raw materials or the finished products for the construction process. The graph given below shows the inflation rate of UAE from the year 2010 to 2014. The inflation rate in the year 2017 is predicted to be 3.13 % that is lower than the inflation rate of the year 2016 (Statista, 2017). The lower inflation rate indicates that the construction contractors will be able to purchase the raw and finished materials easily. This is one of the positive aspects for the construction industry of UAE. High inflation may have negative impact of project as due to inflation cost of project can go up which in turn can lead to delay of project. Thus, there is need for

project manager to take inflation in account while forecasting project cost. Also, steps need to be taken for countering effect of inflation.

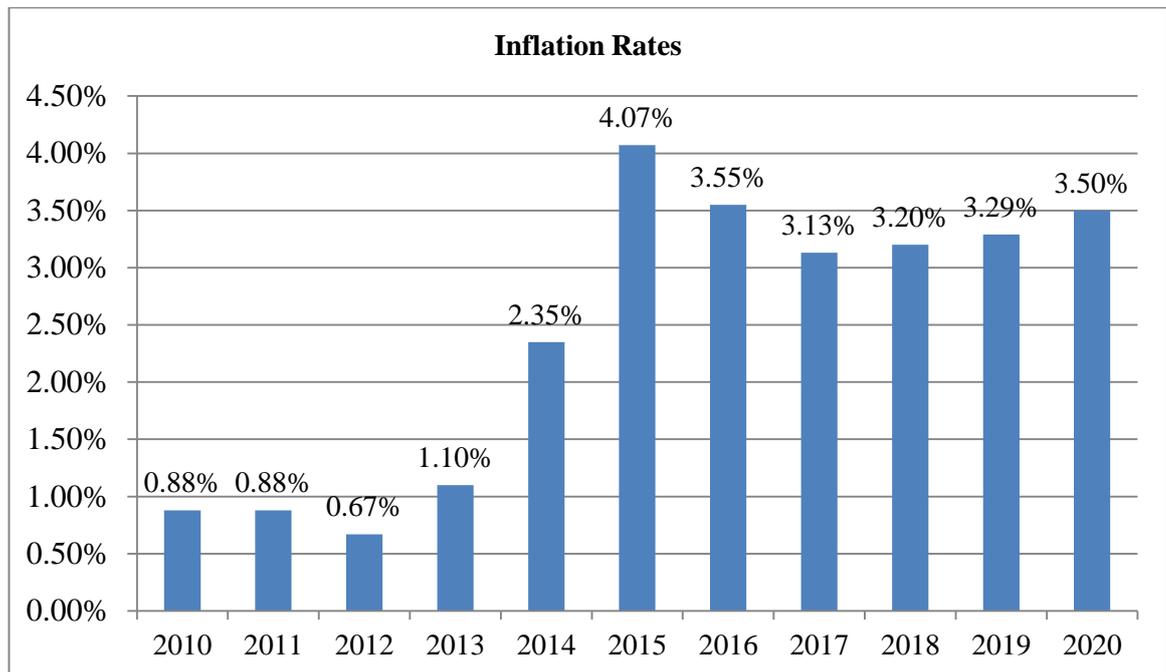


Figure 6.1: Inflation rates

Source: (Statista, 2017)

Other economic factors that can have an impact on the construction projects are interest rates, inflation rates along with the economic growth patterns. If the inflation rate is high, it costs high to start a construction project due to high prices of resources and material (Oghenekevwe et al., 2014). This is the reason why, during the economic slowdowns the construction activities are severely affected.

The construction project managers should therefore focus on the times of the strong economy. During the strong economy, the incomes of the individuals are raised and people are more interested in spending on the construction projects. This will certainly increase the income of the contractors. Similarly, during the times of economic downturns, people may prefer to delay the capital investments in the construction projects until there is an upward trend in the macroeconomic factors (Rastogi & Trivedi, 2016).

The job trends are another significant aspect of the economic factors that may have positive or negative impact on the construction industry as well as the project managers. The non- oil private sector of UAE is predicted to pick up momentum in the job growth that will certainly help the new construction projects and the managers. The construction sector and the construction project managers need some potential people who can help the managers in delivering the quality projects on the deadlines (Khaleej , 2016). The disposable income trends decide the expenditure of the consumers in the construction sector that will further decide the revenue and profit of the industry. The facts and figures indicate that the disposable income of UAE is high. Among all the Middle Eastern countries, Riyadh (11,700), Dubai (12,543), and Abu Dhabi (13,496) are among the countries having highest disposable income states. The Table given below provides an in depth detail of the disposable income in the Middle Eastern countries. High disposable income indicates that people in UAE may invest in the property or the homes (Zawya, 2017).

Table 6.2: Middle East’s Richest Cities

MENA City	Top Disposable Income USD mn	Disposable income Per Capita USD
Riyadh	67,772	11,700
Jeddah	38,925	10,234
Tehran	34,391	4,062
Dubai	29,695	12,543
Cairo	26,786	3,002
Bagdad	20,409	3,313
Makkah	18,052	10,739
Abu Dhabi	17,780	13,496
Beirut	16,028	7,473
Alexandria	12,453	2,694

Madinah	11,133	9,200
Doha	10,911	11,046
Dammam	10,137	10,141
Casablanca	9,693	3,067
Mashhad	7,892	2,733
Tripoli	7,512	6,510
Muscat	7,500	6,520
Algiers	7,452	2,217
Amman	7,184	3,005
Basra	4,687	2,325
Kuwait City	3,978	11,429

Source: (Zawya, 2017)

The above Table shows that UAE is one of the countries with highest income levels. A highly developed welfare system of the country attracts companies and employees from outside the country. This is one of the most positive aspects for the construction sector as it will reduce the shortage of labour and investments. The construction sector is positively affected by the economic growth (Wakefield & Mostyn, 2012). However, a dependence of UAE' economy on the oil sector is a major concern for the construction industry as well. The position of the oil reserves will affect the income and revenues of the country. If the economic position of the country changes, then it will severely affect both the oil and non-oil sectors. The construction sector may not find the investors as well as the labours who can contribute in the goal and objectives achievement of the construction industry. The global perspective for the UAE will also be affected and that can be clearly reflected in the trade relations of the country (Devaux, 2013).

6.5 POLITICAL FACTORS

In this study, 84% (54 of the 65) of the interviewees noted that political factors have had a positive impact on the UAE construction project management. Political factors are the

factors that help in determining the extent to which government can have influence on an industry. The political factors can be significantly altered by the influence of government on the infrastructure of the country. Many of these interviewees noted that the factors that can influence the project management range from tax policies, environment regulations to tariff reforms and political stability. The construction project management may also be affected by the political factors such as government may increase or impose taxes on certain raw materials.

Of the interviewees, 80% (52 of the 65) noted that government stability is a key political factor. UAE enjoys an excellent level of political stability. According to the World Bank's report, UAE is strong in terms of political stability and in the terms of absence of violence it ranked high, even slightly higher than the United States of America (Ramady, 2013). This indicates that the political situation of the country is very strong and it is hardly influenced by any forces, as there is no other political party and the legislative power is in the hands of one chamber. The people think UAE, as more stable in terms of political regime than any other gulf country (Held & Ulrichsen, 2013).

Of the interviewees, 75% (49 of the 65) noted that regulation trend is a key political factor. The concentrated efforts of UAE government to improve the regulatory environment of the country have made Dubai as a favourable environment for investment for capital growth. The new rules of the Real Estate Regulatory Agency (RERA) have made it compulsory for all the owners to provide proof of ownership for their properties. This has helped to gain the confidence of the customers in the market and will create the realistic environment for comparing properties in the country (OECD, 2017).

Of the interviewees, 68% (44 of the 65) noted that freedom of speech is a key political factor. In UAE, the government of the country restrict the freedom of speech and freedom of the press. People in UAE cannot speak and take action against government and royal family. Similarly, 60% of the interviewees noted that corruption is another key political factor. The UAE is the least corrupted country in the Arab World. The UAE has a comprehensive legal framework against corruption, but it is scattered across various laws and codes of conduct. On the other hand, the national law of UAE lacks a lot of legislation such as no protection to whistle blowers, limited access to information laws, weak civil society and lack of transparency in public sector procurement processes (Bouyamourn, 2014).

Corruption is an important aspect of the political factors that can significantly affect the construction industry as well as the project managers. United Arab Emirates is the least corrupt country in the Arab world. In this context it is important to highlight that UAE offers business-friendly environment along with efficient and effective public administration. In United Arab Emirates Anti-corruption and anti-fraud legislation is also enforced so as to ensure that contractors and sub-contractors do not involve in the corruption activities. The practices associated with bribery are uncommon (Business-anti-corruption, 2017).

Of the interviewees, 55% (36 of the 65) noted that terrorism and war is a key political factor. In terms of terrorism, UAE is considered as a less prone area and the country has condemned terrorist attacks. UAE is a major transit hub for regional travel and commerce and large population of expatriates resides here. UAE could be a most preferred choice of terror due to its proximity to unstable and hostile countries. The

country does not have any personal threat from any country. The relation of UAE with its neighbourhood countries are good, but the unethical activities in the neighbour countries like Iran, Syria and other gulf countries always create the threat of war between the countries that may indirectly affect UAE (OSAC, 2017).

Of the interviewees, 5% (33 of the 65) noted that a government policy is a key political factor. The industrial construction policy of the country is supportive and attractive to the investors. The lucrative policy is attractive enough to grab positive growth rates in the coming years. The industrial construction policy of the country reduces the influences of the oil and gas adverse market shocks on the economy of the nation (Ken Research, 2016). The political environment of the country is quite stable. The rapidly changing political environment of the country is confronted with a number of risks. In the context of UAE, the political environment is quite stable. In fact, the country is one of the leading political forces in the Middle East.

In UAE, one of the most important political factors that have a positive impact on the construction project management is the stability of the political factors. There is no ethnic tension and tribalism that disturbs the project managers in completing their projects on time. The countries that are facing long- term conflicts like Afghanistan and Somalia face a number of complexities in completing the construction projects because of wars and tensions. Other nations are facing the ethnic divides such as Sri Lanka and therefore, there is constant distraction, destabilization, and discouraging investment (Rastogi & Trivedi, 2016).

Further, the fiscal policy of the government can also have an impact on the construction project management. This is because the fiscal policy greatly influences the business

environment which includes all the partners such as suppliers, and labours (Rastogi & Trivedi, 2016). The fiscal policy is an important aspect of the political factors as it aims to improve the output and demand in the economy of UAE.

The political factors in the construction projects are generally out of the control of the project managers or the construction managers and therefore, the focus of the construction project managers should be on being prepared to face the political changes or the aspects. Such as the construction project managers should always consider the aspects that can control the cost of the projects so that, new government's taxation policy or the new taxes imposed do not have an impact on the cost of the projects (Rodrigo, 2016). Another example from the construction industry of UAE that demonstrates the impact of political factors on the construction project management is the budget allocation of the government for the construction projects. In the year 2016, the cabinet of UAE approved the federal government budget that is estimated to be \$13.2bn (AED48.5bn). This indicates that the spending in the construction projects in UAE will be around 1.2% lower in comparison to the year 2015 (Construction Week Online, 2015).

The dynamic political environment has spawned an entirely new scenario for the construction companies in UAE. Therefore the construction project managers in UAE are likely to face a broad array of political risks that can significantly affect the construction projects (Deng et al., 2014).

6.6 SOCIAL FACTORS

In this study, 77% (50 of the 65) of the interviewees noted that social factors have had a positive impact on the UAE construction project management. Social factors are the

factors that consider all the events that can have an impact on the community and market socially. The construction project managers have to consider the advantages and disadvantages of the people particularly of the area in which the construction activity will take place. For example: the construction project managers have to consider the social and cultural factors and expectations of the people while building their houses. Similarly, if the construction project managers are working with some international company then the social and cultural factors may differ. Two other social factors that have a huge impact on the construction projects are –housing and living cost and the crime rates (Musa et al., 2015). The housing and living cost in United Arab Emirates is high.

The monthly rent of a house in an expensive area is about 9,569 Dirham whereas the monthly rent of a house in a normal area is around 8,167 Dirham. This indicates that the construction contractors and the project managers should focus on building the properties on the basis of the rent or the rate of return (Expatistan, 2017).

Table 6.3: Living Cost

Housing	Dirham
Monthly rent for 85m ² (900 Sqft) furnished accommodation in EXPENSIVE area	9,569
Monthly rent for 85m ² (900 Sqft) furnished accommodation in NORMAL area	8,167
Utilities 1 month (heating, electricity, gas ...) for 2 people in 85m ² flat	661
Monthly rent for a 45m ² (480 Sqft) furnished studio in EXPENSIVE area	7,490
Monthly rent for a 45m ² (480 Sqft) furnished studio in NORMAL area	5,527
Utilities 1 month (heating, electricity, gas ...) for 1 person in 45m ² (480 Sqft) studio	314
Internet 8 Mbps (1 month)	325
40" flat screen TV	1,740
Microwave 800/900 Watt (Bosch, Panasonic, LG, Sharp, or equivalent brands)	484
Laundry detergent (31 ~ 100 oz.)	37
Hourly rate for cleaning help	35

Source: (Expatistan, 2017)

The construction project managers must consider the cost of living in a region where the construction activity is taking place. Further, the crime rates in a region also determine the process and techniques that have to be used in the construction projects (Sun & Meng, 2009). UAE has the lowest level crime rates with just 110 crimes in comparison to other countries such as England which has over 1,053 crimes. The nation aims at having the lowest crime rates in the world. The construction industry has to consider this social factor while completing their projects (Salma, 2017).

There are some other important social factors that have a significant impact on the functioning of the construction project managers. First, the inhabitants of UAE live a comfortable lifestyle because of their well-paying jobs. This is a positive aspect for the construction industry of United Arab Emirates as the people invest in good properties and homes so as to enhance their living styles. Moreover, the social changes have also led to an increase in the entertainment and retail activities across UAE. There is an increasing demand of the shopping malls and the places where people can enjoy shop and eat. This is one of the biggest opportunities for the construction contractors and the project managers of the industry. This particular social factor makes UAE as one of the best destinations for construction and property (Barnard, 2014). Moreover, it is important to highlight that in UAE, there is a mix of different cultures because of the globalization.

In UAE, people from different nationalities are living and therefore, the construction contractors and the project managers have to consider their ideas and views also. Religion is another most significant social factor in UAE. Religion affects the society in a number of aspects such as way of living, clothing and eating habits. There are a number of religion associated social factors that have to be considered by construction

contractors and the project managers before starting a project. Moreover, in UAE, there has been a social change as last 37 years have shown the spectacular years of economic development. In 2015 per capita GDP of UAE was US\$39,313 (Trading Economics, 2017). The economy has been improving sharply in a number of aspects. The Human Development Index of major Middle Eastern countries is shown below. As a result of the social change, the goal of UAE has been the modernization of the country. Modernization also includes the modernization of the infrastructure. The construction industry has an important role to play in the modernization of the country's infrastructure. This is one of the most positive aspects for the construction industry of United Arab Emirates (Prnewswire, 2017).

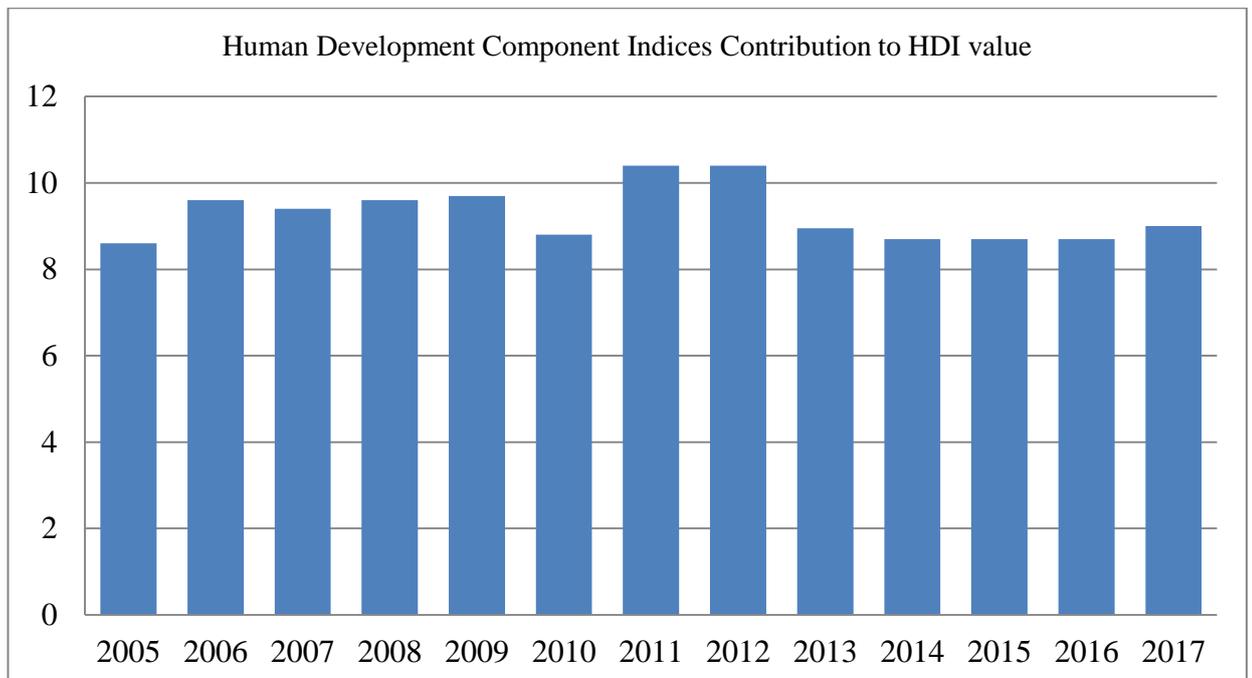


Figure 6.2: Human development Index UAE

Source: (Ossman, 2017)

The changes in social factors will require the construction companies as well as other companies to review the changes so that customers can be offered value according to the social factors. The changes in social factors will however not affect the political or economic position of the country. In terms of religious ethics and its influence on the economic development, the region has an advantage as the dominant religion is Islam.

This is also favourable to the construction businesses. In a global context, all the Middle Eastern countries are attracted to UAE because of compatibility in the social factors (BTI, 2017).

Expatriates forms the large part of UAE's workforce in construction industry. As a result, significant cultural difference exists between workers in construction industry. For example, the study by Khan (2014) pointed out that Indian construction labourers showed high Uncertainty Avoidance Index (UAI), on the other hand Pakistani labourers showed high Masculinity (MAS). The study by Khan (2014) also reveals that the national culture of the migrant construction labourers in the UAE can have significant impact of performance of construction project. For example, cross-cultural differences among expatriates working on some construction project can negatively impact delivery of project. The study recommends that there is need for project manager to ensure effective management of cultural differences for successful completion of construction projects (Khan, 2014).

6.7 LEGAL FACTORS

In this study, 71% (46 of the 65) of the interviewees noted that legal factors have had a positive impact on the UAE construction project management. Legal factors consider all the legal aspects such as quotas, taxation, imports, exports and employment. In a case of the construction projects, the project managers have to typically focus on getting the approval of the relevant authorities for starting the construction work along with considering the labour laws so that the labours involved in the construction projects are not exploited in any manner. Further, the legal aspects associated with safety standards must have to be considered by the project managers. The legal factors can be managed best when the contractors and the construction project managers focus on fulfilling all

the legal requirements of the project without neglecting any of the issue (Afridi & Angel, 2012).

The legal environment faced by the organisations is becoming complex with a number of days. The legal aspects affect the business directly and indirectly. In addition, it is also becoming difficult for the organisations to take the actions without encountering the laws and the regulations. Moreover, the construction operates within certain limits of environment, safety practices, codes of practices, licensing, taxation laws, insurances, and planning regulations (Afridi & Angel, 2012).

In UAE, for example, there are some core principles of law that are drawn from Sharia. The legislation in UAE involves both the concepts of European law and the Islamic law. Both of these laws have common roots in the Egyptian legal code that was established in the late 19th to 20th centuries. In UAE there are different legal legislations that cover a wide range such as labour law, company law, intellectual property and the civil and commercial codes. In essence it can be said that the country has a structured and comprehensive legal systems that are highly inflexible or rigid in terms of adopting the rapid environmental changes. The bureaucracy of regulation is associated with all the countries of the Middle East (Khedr, 2014). The contractors and the construction companies in UAE have to give an extra importance of fulfilling all the legal processes and the requirements so as to prevent themselves from the complex dual courts. The court is known as the complex dual court because the civil court and Sharia court operates in parallel along with covering the major areas of law. In UAE each of the Emirates has its own federal court but, Dubai and Ras Al Khaimah have their separate judicial frameworks. One of the major negative points associated with the legal system of UAE that may affect the construction industry is its complexity for the ones who are

not familiar with the law, rules and regulations of the country. In fact, it is to be highlighted that the legal system of UAE is completely different in comparison to the west (Preston, 2012).

Free zones are the important aspect associated with the legal factors of the country. The UAE is the host of many free zones and there are number of foreign investors who get the benefits from the free zones such as 100 per cent foreign ownership. The free zones guarantee a tax free environment, a one-stop-shop of support services, high technology, services, facilities and real estate infrastructure. In UAE, there are a number of free zones and each of the zones has its regulations and the geographic boundaries that can accommodate a specific type of activity (Bouyamourn, 2015).

Table 6.4: Free Zones in UAE

Jebel Ali Free Zone	Dubai Gold & Diamond Park
Dubai Airport Free Zone	Dubai Flower Centre
Dubai Internet City	Dubai Healthcare City
Dubai Media Centre	Dubai International Financial Centre
Hamriyah Free Zone	Dubai Knowledge Village
Sharjah Airport International	Dubai Logistics City
Ras Ali Khaimah FTZ	Dubai Maritime City
RAK Investment Authority	Dubai Multi Commodity Centre
Masdar City	Dubai Outsource Zone
Abu Dhabi Ports Company	Dubai Silicon Oasis
Abu Dhabi Airport Free Zone	Dubai Studio City
Ahmed Bin Rashid FZ	ENPARK
Ajman Free Zone	Fujairah Free Zone
Dubai Auto Zone	Zones Corp
Dubai Academic City	International Media Production Zone
Dubai Biotechnology & Research Park	Intl. Humanitarian City

Source: (Expatistan, 2017)

The stakeholders on the construction industry in UAE face the major challenges in ensuring the compliance with the legal regulations of the country. Among all the regulations, the health and safety regulations are the most important for the industry.

There are already a numbers of obligations that have been placed on the ones who are working in the construction industry of UAE. The major difficulty lies in compiling the orders, regulations, legislations and the guidelines (BTI, 2017). One of the major and well known examples of the legal factors in the construction industry is associated with the labor of UAE that includes the health and safety regulations as well as the generic guidelines that have to be theoretically and practically applied to the industry. Unlike the other countries like the United States of America and the United Kingdom, UAE is a tax free country that further offers a number of opportunities to the industries. This legal aspect of UAE is positive for the construction companies of UAE (DegTev, 2017).

The legal structure of the country is one of the most important aspects that is considered by the foreign investors and the people coming to the country for investment and employment. If the legal structure of UAE will be made highly complex, then the country will face shortage of people and investors. One of the negative aspects of the legal system of UAE is that there are several core principles of Sharia that are applied in the business transactions and this can negatively affect the interest of the foreign investors. This is because the foreign investors may find it difficult to interpret the laws. For example: the Sharia law states that risk must be shared and income cannot be derived from the payment of interests. The global view towards UAE is that the legal structure of UAE is a bit complicated. However, the sound and clear principles of UAE's legal structure may attract the companies and employees from across the globe (Pwc, 2015).

6.8 ENVIRONMENTAL FACTORS

In this study, 66% (43 of the 65) of the interviewees noted that environmental factors have had a positive impact on the UAE construction project management. The

environmental factors include the factors that are determined by the environment. For example: in the construction projects, the constructors and managers have to ensure that the construction work does not harm the environment. The environmental factors such as changes in the weather and climate can lead to a halt in the construction projects. In the area of construction, depending on the type of the project there can be a large amount of waste that can have harmful effects on the environment, such as the soil is contaminated and also water can get contaminated. Therefore, the companies should focus on an effective waste management. There are other safety mechanisms that can help in dealing with the environmental factors (Abraham, 2014).

The construction industry is one of the largest and active industries of the world. The construction industry even in times of recession is highly active and is a source of employment for a number of people directly and indirectly. From an environmental point of view there are a number of activities that have a downside. The construction activities in UAE are a source of pollution of different types such as air pollution, noise pollution and water pollution. In essence it can be said that the construction industry of UAE is contributing to increasing the pollution of the country. The environment of a project is composed of a number of factors such as legal factors, political factors, institutional factors, cultural factors, sociological factors, physical (infrastructure) etc. The environmental factors pose a greater challenge to the UAE (Khan, 2014). In this context it is important to highlight that construction environment can be referred to as the aggregate of the conditions, surrounding things and the influences. Virtually, the environment includes all the important factors such as nature of the products, technology, competitors along with its geographical setting, political, economic and the metrological climate in which the organisation operates. It is often said that the less predictable is the environment greater are its potential impacts (Deng et al., 2014). The

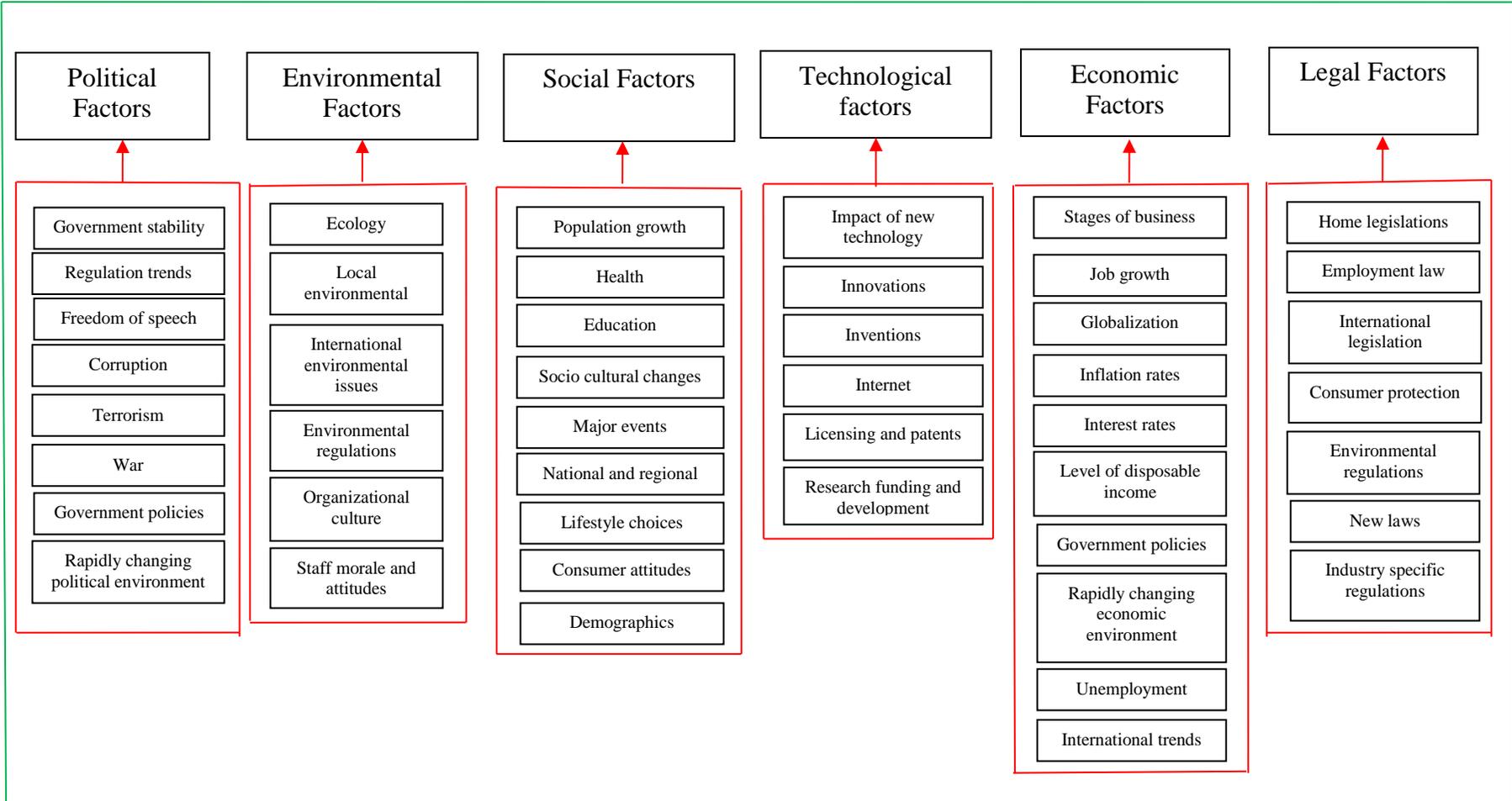
success and failure of the projects is often based on the number of the environmental factors that are under the control of the project managers. It has been suggested in a number of studies that a good understanding of different factors and features associated with an environment is crucial. In UAE, the construction project managers should set up a particular process in addition to the traditional functions so as to scan the environment and identify the potential problems that is essential for the successful implementation of the project. Among all the environmental factors the most important environmental factor is associated with the pollution that is caused by the construction activities in UAE (Abraham, 2014).

The physical environment of a project is vast and a project can always be impacted by the number of physical influences. These influences are unpredictable in nature and their occurrence cannot be prevented. Making the optimum use of the resources is another important aspect of the environmental factors. Taking the advantage of the available resources will help in providing a long -term growth to the construction companies and the project managers (Goerpcloud, 2017).

The environment of UAE is one of the factors that reflect country's growth and development. The government focuses on the optimum use of resources and minimising the pollution. If the environmental conditions of the country change then, the pollution in the country will increase along with the wastage of non- renewable resources such as oil. The environment of the country also shows that there is a shortage of water as in the year 2012 only 18% of the ground water was usable in Abu Dhabi (Environment Agency - Abu Dhabi, 2012). The government of UAE has to take some major steps to improve the water availability in the region. However, the Emirates Nuclear Energy Corporation is working constantly to deliver the efficient, clean and safe energy to the

people so as to support the social and economic growth of UAE (Wakefield & Mostyn, 2012).

Figure 6.3: Summary of the UAE macro-environmental factors that have an impact on the construction project management.



6.9 SUMMARY

The project management nowadays has become highly dynamic in nature because of the increasing uncertainties in the budget, development process and uncertainties in technology (Oberlender, 2014). There are many factors that have an impact on the project management. Some factors are under the control of an organisation whereas some are outside the organisation's control (Richards, 2017).

Every organisation has to deal with its business environment. The way in which an organisation interacts with its environment determines success or failure of an organisation. The term "business environment" is often referred to as environment. It includes factors outside the organisation that can lead to opportunities for or threat to the organisation. The factors are also referred to as uncontrollable factors as they are mostly not under the control of a business (Saleem, 2015). There are number of factors that can negatively or positively affect the business capabilities and the investment capabilities of an organisation. It is apparent from this study that the single most macro-environmental factor is technological factors. This is followed by economic factors, political factors, social factors, legal factors, and environmental factors.

Political factors are the factors that determine the interference of the government in the economy. Some of the important political factors include: government stability, regulation trends, corruption, terrorism and war, government policies, and rapidly changing political environment (See Figure 6.3). Government stability is one of the most important factors that have an impact on project performance and outcome of the projects of all the industries including the construction sector. Only a stable government can provide an environment of growth and development. Corruption can worsen overall time and cost performance of the construction projects as well as other projects.

Corruption is extremely relevant in case of planning as well as delivery of the projects. The features of mega project such as large size of the project, uniqueness of the project as well as complexity favours corruption in a project.

Terrorism is another important political factor that has an impact on the project performance and outcome. In terms of project initiation, the construction projects are heavily impacted by the terrorist events. The projects are delayed because of the slow procurement process along with an increased cost. The regulation trends associated with particular sector or industry can also have a direct impact on the performance and outcome of the project. Regulations help in shaping the major decisions associated with project such as the cost decisions and the duration decisions. This further affects the performance of the project and project outcome.

The government policies and reforms have both positive and negative impact on the project. The government policies have the potential to decrease or increase the overall demand of the construction services with the help of monetary and budgetary measures. If the government policies are not clear to the developer, then it develops number of issues in the project that further increase the cost and delays the project. The rapidly changing environment is another important political factor that can have severe impact on the performance of the project. The changing political environment changes the policies and reform of the industries that hinders the functioning of the project hence affecting the performance and cost of the project.

The environment factors are the factors that focus on the environment in which the industry is operating. The environment factors include: environmental regulations, organisational culture and staff morale and attitudes. The local environment is the

environment that has a profound impact on the wellbeing and quality of life of the people. The local environment includes the factors that have an impact on the choices of the people. The local environment trends have to be considered for the projects so that the performance can be improved. The international environment includes all the global factors that can have impact on the project. The international factors can be the legal, technological or the economic factors that can affect the performance and outcome of the project. For example: recession and inflation affect the demand and supply of different industries. In order to keep the environment safe and pollution free, the government generally introduces number of environment regulations that imposes certain restrictions on the project. This further affects the project functioning eventually affecting the project performance.

The organization culture includes the factors such as the commitment of contractor towards the agreement that has a significant impact on the performance of the project. Further, the goal alignment, worker orientation and the commitment are also important factors of organization culture that can contribute in improving the performance and outcomes of project. Among all the environmental factors one of the most important factor that affects the performance and outcome of the project is the morale and attitude of the people who are completing the project. If the morale will be high and attitude is positive, then the projects can be completed in the most positive manner.

The social factors are also known as the socio-cultural factors and these are the areas that involve shared attitudes and beliefs of the population. The social factors include: population growth, health, education, socio cultural changes, major events, lifestyle choices, consumer attitudes and demographics. The growth in population affects the project in terms of supply and demand. The demand of the projects increases, if the

projects are managed well then the demand is fulfilled effectively. If the management is poor then the project has decreased performance and has negative outcome. Health is one of the most important factors that can have an impact on the performance and outcome of the project. Health of the people involved in the project will have a direct impact on the quality of the project. The project developers should focus on maintaining the health of people so that they can continue to perform effectively. Another social factor that has an impact on project performance and outcome is education. Education of the people involved in the project and the customer base. If people are educated then the project specifications can be understood effectively, hence affecting the project performance and outcome. In addition, education also affects the choices and preferences of the people. Socio cultural change can be referred to as the desirable variation in the social organization, process and the interaction. One of the factors of socio cultural change is the process of modernization. The project developers have to adopt modernization in the processes and techniques so as to positively affect the project outcome and performance.

The technological landscape changes rapidly therefore there are some technological factors that have an impact on the industries. The technological factors include: innovations, inventions, internet, licensing and patents and research funding and development. For instance, innovation can be defined as the application of better solution that can meet the unarticulated needs, requirements and the needs of the exiting market. Innovation has a positive impact on the project performance and outcomes. Innovation in the projects refers to the implementation of new technologies and processes. Innovation is essential for the projects so as to meet the dynamic needs of the customers. An invention can be defined as the novel, unique method, process or composition. It is a process within the overall product development, engineering or the

construction projects. Invention will have a positive impact on the project performance and outcomes. Invention can be in terms of technology and process that can improve overall efficiency and effectiveness of the project.

The Internet is a decisive technology associated with the information age as well as the explosion of wireless communication. Internet helps in improving the communication process and the information sharing so that the overall effectiveness of the projects can be improved. Internet can also be used for taking the feedback of customers so that project specifications can be made clear and the project performance and outcome can be improved.

Economic factors present the economic condition of an economy. Some of the economic factors include: stages of business, job growth, globalization, inflation rates, interest rates, level of disposable income, government policies, rapidly changing economic environment, and unemployment and international trends.

Legal factors are the factors associated with laws and right. The legal factors include: home legislations, employment law, new laws, consumer protection, environmental, new laws and industry specific regulations. For instance, there are some home legislation that has an impact on the project. If the project managers do not follow the legislation, then the performance and quality of the project will be negatively affected. Similarly, there are certain employment laws that have to be followed by the project managers and developers for employing the people in the projects. If the employment laws are not followed effectively then the performance and outcome will be negatively affected.

A complex mix of political, economic, social, technological, legal, and environmental forces drives construction project management in the UAE. Therefore, understanding the macro-environmental factors that impact on the UAE construction project management is important. This understanding could assist decision makers to develop construction project management strategies based on the factors.

This chapter has addressed the second research objective of the current study, which is, “to analyse the UAE macro-environmental factors that have an impact on the construction project management” and second research question “what are the macro-environmental factors that impact on the UAE construction project management”. Overall, this chapter addresses the research objective”. The next chapter (i.e. chapter 7) will discuss the key drivers that have fuelled the need for managing construction projects in the UAE.

CHAPTER 7 : DRIVER FOR MANAGING CONSTRUCTION PROJECT IN THE UAE

7.1 INTRODUCTION

Today, Middle Eastern countries try to diversify their economic resources seeking for alternatives rather than oil, which are the main resource for their economies (Al-shabbani, 2015). Banihashemi et al., (2017) noted that the prevailing trend towards economic growth in developing countries has resulted in a huge demand for delivering construction projects. Recent reports indicate that the Middle East ranked at the top of the list in terms of disputes cost and length reaching double the global average (EC Harris, 2013).

This chapter focuses on the drivers for managing construction projects in the UAE. The results are based on the perceptions of the 65 interviewees who participated in this study. The findings are also substantiated with the relevant literature. In this study, during face-to-face interviews, in order to capture the drivers for managing construction projects in the UAE, a question was raised, i.e. “what are the key drivers that have fuelled the need for managing construction projects in the UAE?”. This study revealed six key drivers that have fuelled the need for managing construction projects in the UAE. They are: to improve greater efficiency, to manage complex projects, to reduce cost overruns, to reduce delays, to reduce disputes and to improve project success. Each of these key drivers is discussed in detail. In doing so, this chapter addresses the third research objective of the current study, “to explore and document the key drivers for managing construction projects in the UAE”. Therefore, this chapter has answered the third research question which is “what are the key drivers that have fuelled the need for managing construction projects in the UAE?”.

7.2 DRIVERS FOR MANAGING CONSTRUCTION PROJECTS

Table 7.1 presents the drivers for managing construction projects in the UAE as revealed by those interviewed in this study. From the data in Table 7.1, it is apparent that to improve greater efficiency is an important driver for managing construction projects in the UAE. This is followed by to manage complex projects, to reduce cost overruns, to reduce delays, to reduce disputes and to improve project success. Each of these key drivers is discussed in detail below.

Table 7.1: Drivers for managing construction projects in the UAE

Sl. No	Drivers for managing construction projects	Total number of interviewees cited (N=65)
1.	To improve greater efficiency	90% (59)
2.	To manage complex projects	85% (55)
3.	To reduce cost overruns	80% (52)
4.	To reduce delays	77% (50)
5.	To reduce disputes	75% (49)
6.	To improve project success	69% (45)

In this study, 90% (59 of the 65) interviewees noted that to improve greater efficiency, the application of project management techniques has become an integral part of their business. Project management has become a skill-set for successful project delivery, irrespective of the specific industrial sector. The definition of a project is always similar although the management of projects shows significant differences depending on the approach practitioners follow (Baumann, 2013).

British Standard Institution defines a project as “unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources.” The situation becomes more ‘interesting’ when an organisation is operating multiple projects (programmes or portfolio’s) to ensure that its limited resources are aligned appropriately to meet the time, cost and performance requirements. However, failure to achieve this can lead to poor quality of outcomes along with serious delays in project deliveries, budget constraints and higher failure rates (Levine, 2005; Ziadat, 2017).

“A project is a temporary endeavour to create a unique product, service or result” (PMI, 2008). This definition shows that compared with repetitive work, which is typically part of company processes, contents of a project are unique to the organisation where the project is carried out. Furthermore a project always has a definite beginning and end (PMI, 2008); (Baumann, 2013). Thus a project can be defined as a goal-oriented temporary activity, where limited resources like time and labour are used in a temporary setting. Another definition is: “A project is a complex, non-routine, one-time effort limited by time, budget and resources, and performance specifications designed to meet customer needs” (Gray and Larson, 2002).

In this study, 85% (55 of the 65) interviewees noted that to manage complex projects is a key driver for adopting musanda project management strategies in the UAE construction sector. Project work is an integral part of each organisation. New strategies or changes inside the company are often implemented by working on projects, so project work is a vital part of an organisation which has to adapt to new market needs and changing

requirements. During the last decades new methods and tools for the project management practice were developed. “Management by projects has become a powerful way to integrate organisational functions and motivate groups to achieve higher levels of performance and productivity” (Morris, 1997).

According to Ziadat (2017), organisation whether it is profit seeking or societal, operate in complex environment. The recent events that characterise the global economic recession illustrate this vividly. This dynamic complexity presents numerous challenges to organisations seeking to accomplish their corporate strategy. Most organisations strive to deliver their strategy through Project, Programme and Portfolio’s (P3M) Therefore; it is important to understand the processes, tools and techniques that are used to achieve this.

Nowadays, not only the industrial sector but even service organisations cannot survive without being capable of managing complex projects. It becomes more and more important to establish project management skills within one’s own organisation to react to customer requirements in a way that leads to successful delivery of large international projects (Baumann, 2013).

Success on a project means that certain expectations for a given participant were met, whether owner, planner, engineer, contractor or operator. However, these expectations may be different for each participant and the study of project success and critical success factors (CSFs) is often considered as one of the vital ways to improve the effectiveness of project delivery (Chan et al., 2004; Alias et al., 2014).

In this study, 80% (52 of the 65) interviewees noted that to reduce cost overruns, 77% (50 of the 65) to reduce delays, and 75% (49 of the 65) to reduce disputes are key drivers for implementing project management strategies in the UAE construction organisations. As mentioned earlier, various Middle Eastern industries are still suffering from problems associated with. According to Al-shabbani (2015), different studies have been conducted to identify such problems and the associated reasons with them. Frequently reported reasons include: lack of management, inefficient management practices, slow decision-making, bureaucracy of clients, etc. Even for those international firms who practice their best management strategies, problems associated with time delays and disputes are still significant in their projects in the Middle East.

In fact, international firms are more prone to disputes than local Middle Eastern firms are. According to recent report about global construction disputes, 46% of joint ventures in the Middle East ended up in disputes during the year. It appears that even with what is labeled today as “best practices”, international firms face significant problems when they apply their management strategies in the Middle East construction environment. It also appears that the problem is beyond what is reported as inefficient management practices in the Middle Eastern management style (Al-shabbani, 2015).

Baumann (2013) noted that, as a result, the oil and gas industry has a huge demand for external labour driven by the drilling and exploration activities, but also for administrative improvements of company processes as part of IT-projects. Furthermore, there is a huge demand for qualified workers and managers in the construction industry in the Middle East aiming to develop the local infrastructure. Moreover, many of the Middle Eastern

construction workers were immigrants from neighbouring African countries (Birks and Sinclair, 1979). In recent years, the project types changed from purely construction related activities to technical and highly skilled IT jobs. Dubai for example is seeking to invest into projects like 'internet city' or 'media city' for which a highly skilled workforce and many expatriate workers are required. As a matter of fact no later than during the strong growth during the 1970s and 1980s, the region was forced to import labour and specialist (Baumann, 2013).

As mentioned above, the project teams in various sectors were typically staffed with resources from countries with low labour costs and regions which are geographically close to the Middle East. According to Baumann (2013), many construction sites rely on personnel from Asian countries like India, Pakistan or Bangladesh or other North African countries like Sudan, Egypt or Jordan. Another trend were European or North American companies bringing the resources into the region to achieve low labour costs on the construction site, but to keep control over the management processes by delivering turnkey projects (Baumann, 2013).

Lampel (2001) looked into the overall project setup and discussed the frequent involvement of EPC companies (Engineering Procurement Construction) in Middle Eastern and African (MEA) construction industry. These companies have a business model to move into a region with a team of project managers and project resources. Their goal is to deliver quick results in large scale international construction projects. Based on a case study at Stone and Webster (US-based EPC Company), during 1999 the company had a huge contract backlog, but operative loss of \$59.3 million. The projects in the Middle East and Africa

(MEA) region contributed largely to the loss with \$170 million. One of the identified reasons for this finding was the lack of cultural competences among their staff. Another reason mentioned by Lampel was the weak ability to manage diverse project teams. It seems obvious that in less developed regions the project risks are higher compared with projects in the companies' home markets.

Baumann (2013) noted different approaches to mitigate the risk of high project losses in diverse and international projects. One of the suggestions is a clear focus strategy, which means that the EPC Company has to decide if they have the required core competencies to manage projects in certain international markets.

Furthermore, project delays represent a key driver for project management in the Middle East. According to Abdelsalam and Gad (2009) project failure costs due to weak project quality management are estimated being around 7% of the overall project costs. Also, Assaf and Al-Hejji (2006), who analysed 76 projects in the Middle East, found evidence that project delays were often caused by change orders projects in the Middle Eastern construction industry.

In this study, 69% (45 of the 65) interviewees noted that to improve project success the UAE construction organisations are implementing Musanda project management strategies. Although, there have been innovations in the project management processes, tools, and systems (Mir and Pinnington, 2014) project success is still a challenge (Carvalho, et al., 2015). The success rate of the projects is questionable since almost 70% of them tend to nosedive (Januska, 2017). Generally, project success is understood as when the project is

able to meet and deliver within the different criteria in the “iron triangle” scope, time, cost, and quality (Balakian, 2017; Scott-Young and Samson, 2008). However, there are many other elements of success factor (Caccamese and Bragantini, 2012). This means, what was understood as project success has changed from the simple triple constrain point of view and now incorporates a bigger variety of success criteria. Yet, Muller and Jugdev (2012) establish that it does not exist a flawless description of project success and there is the need to develop one.

Despite of there are researchers such as Mir and Pinnington (2014) questioning the relationship between project management and project success, there are authors, establishing project success as the core value of project management. Indeed, organisations that invest more resources and put more effort into their project management development and to expand their project management capabilities have proved to go through a better implementation in their schemes (Carvalho, *et al.*, 2015). Therefore, project success is one of the most important objectives that the project manager and stakeholders have.

Also, one the main difficulty project management is facing, consist on, that there is not a single and general theory (Crawford, 2006). According to Ahlemann et al. (2013) it appears to be “as if no simple remedy is available” since not much is acknowledged about when, why and how the project management methods will, in fact, work. This issue not only affects project management ability to deliver a successful project but also the educational efforts to teach the best practice (Ojiako, et al, 2013). It must be observed that this lack of a singular theory is directly related to, that there are different types of projects such as construction projects, defence project, petrochemical projects, IT projects, event management and so on (Burke, 2010). Besides, even if the schemes are the same type,

probably, they will not have the same time, scope, cost, requirements, risks, human capitals, etc. and each one of them awaits for arising issues, changes, situations and challenges that entails different methodologies to deal with these (Cooke, 2016). Ultimately, it shall depend on the context (Besner and Hobbs, 2013).

However, Saenz (2012) concludes that “project” as a concept as well as project management belong to the same organization. Hence, it does not have to be tagged as a science itself. Instead, it should be studied under administrative science paradigms and the organizational theory. Regardless of its chaotic, complex and multidisciplinary nature, several of the factors involved in its conceptual basis are grounded on social and group aspects. Therefore, the studies that have been done previously in the traditional organization are quite relevant to Project Management, but it has to be considered that the context of this project organization is temporary.

Moreover, most of the projects, often struggle to complete their goals by reason of multiple inconvenient related to managerial and organizational factors such as poor project design, lack of stakeholder management, cost overruns, postponements concerning project identification and start-up, deferrals in the project execution, coordination failure, etc. (Ika, Diallo and Thuillier, 2012). Nevertheless, it has been noticed that the cause of as project failure could depend in variety of elements Carvalho, Patah and de Souza Bido (2015) recognized and categorized these factors of project success as environmentally related, people related, process and tools related; and context related (Joslin and Müller, 2015; Beleiu, Crisan and Nistor, 2015).

7.3 SUMMARY

Ling et al., (2012) noted that the UAE has become an attractive market for foreign architecture, engineering and construction firms. It is therefore timely to assess the challenges faced in managing construction projects in the UAE and recommend ways to reduce or overcome them. In their comprehensive study to investigate the outcomes of projects in UAE, Ling et al., (2012) followed the basic and traditional criteria for measuring and benchmarking project outcomes, counting; cost, schedule, quality and client satisfaction (Konchar and Sanvido, 1998). Moreover, the project management practices adopted in the projects were also investigated, based on the project management knowledge areas (scope, time, cost, risk, quality, human resources, communications, procurement management and their integration and management of externalities) defined by the Project Management Institute (PMBOK Guide, 2004).

This study concludes that understanding drivers is imperative for smooth project implementation. As revealed in the current study, the single most important driver for managing projects in UAE is to improve greater efficiency. This is followed by to manage complex projects, to reduce cost overruns, to reduce delays, to reduce disputes and to improve project success.

Moreover, recognising and sensibly handling cultural diversity allows efficiency improvements and increases profitability of international projects. Furthermore, the variances are of the most common problem in the UAE construction industry, caused largely by changed orders and owner-related delays. Therefore, it is important to identify

significant causes of construction delay to avoid recurring problems or mitigate their impact.

A great number of decisions need to be taken during the project management process and as usual, the decisions at the earlier phases of the design have a bigger impact on the project management practice as compared at later stages or during building operation or construction. If project managers are not aware of the criteria that would influence their goals set from the inception phase then the project will not be successful (Alias et al., 2014). Alias et al., (2014) noted that project management has evolved over the past couple decades as researchers and practitioners have attempted to identify the causes of project failure and the various factors that lead to project success. Traditional project management skills were developed from the requirements of construction and defence industries to plan, control and manage large and complex ‘tangible’ projects.

From these arose the so-called “hard” concepts of project success criteria in the form of controlling and managing schedule, cost and scope. Project management can also be seen as being about managing change (Bourne and Walker, 2004) and project managers should consider themselves as change agents adding to the project management role an additional focus on so-called ‘soft’ aspects of relationship management (Bourne and Walker, 2004).

Moreover, in most UAE organisations, project managers are accountable for the successful delivery of complete projects. Increasingly, this success depends on project managers’ processing and utilising skills and competencies that may initially appear contradictory. A successful project manager must demonstrate flexibility and competency in many area,

hard and soft skills, introverted and reflective, extroverted and social behaviour. Many of the initiatives for improving the practice and profession of project management have been focused on enhancing techniques and method associated with skills that included effective management of time, cost and scope. However, the management of construction project requires knowledge of modern management as well as an understanding of the design and construction process. Specifically, project management in construction encompasses a set of objectives which may be accomplished by implementing a series of operations subject to resources constraints.

Teaching and learning in project management have become themes of great interest to researchers of the field in recent years (Córdoba and Piki, 2012; Ojiako et al., 2011; Egginton, 2012; Salas-Morera et al., 2013). A large number of researchers, educators and teachers have taken up the task of investigating project management due to understand what influence the most in the education of project managers (Thomas and Mengel, 2008). As a result, there is a great amount of information about this, information that includes teaching strategies, greater understanding of the most appropriate way to teach to achieve optimal learning in students, new theories formulated from the research carried out in these areas, and many other aspects. Still, projects fail in high percentage due to the lack of proper management capacity (Ssegawa and Kasule, 2015; Thomas and Mengel, 2008).

Contemporary project management education faces difficulties to prepare project managers to deal with complex project environments (Rumeser and Emsley, 2017; Thomas and Mengel, 2008). According to Tcha-Tokey et al. (2016) teaching in project management was programmed under an expository paradigm followed by exercises to implement an

exclusive technique or a tool in specific. Nonetheless, these exercises do not meet the required level stimulus that students need, falling to deliver effective learning due to lack of engagement. In addition, the UAE project management education struggles with challenges such as there are too many knowledge areas in project management, and struggle to provide education to professionals from different background and learning styles. Therefore, the UAE project management training and education should lead to a more active/practical approach.

This chapter has addressed the third research objective of the current study, “to explore and document the key drivers for managing construction projects in the UAE”. Therefore, this chapter has answered the third research question which is “what are the key drivers that have fuelled the need for managing construction projects in the UAE?”. The next chapter will discuss the adoption of digital technologies for managing construction projects in the UAE.

CHAPTER 8 : ADOPTION OF DIGITAL TECHNOLOGIES FOR MANAGING CONSTRUCTION PROJECTS IN THE UAE

8.1 INTRODUCTION

The construction industry is at an evolutionary period, the new generation of the construction industry - Industry 4.0 is expected to boost quality, improve productivity and efficiency. This chapter focuses on the adoption of technologies for managing construction projects in the UAE. The results are based on the perceptions of the 65 interviewees who participated in this study. The findings are also substantiated with the relevant literature. In this study, during face-to-face interviews, in order to capture the adoption of technologies for managing construction projects in the UAE, a question was raised, i.e. what are the key digital technologies that have been adopted for managing construction projects? This study revealed four key digital technologies adopted in the UAE construction organisations for managing construction projects. They are: Building Information Modelling, Automation of processes, Virtual Reality, and Drones. Each of these key digital technologies is discussed in detail. In doing so, this chapter addresses the fourth research question of the current study, “what are the key digital technologies that have been adopted for managing construction projects”. Overall, this chapter addresses the fourth research objective which is “to investigate the key digital technologies that have been adopted for managing construction projects in the UAE”.

8.2 ADOPTION OF TECHNOLOGIES FOR MANAGING CONSTRUCTION PROJECTS

Table 8.1 presents the adoption of technologies for managing construction projects in the UAE as revealed by those interviewed in this study. From the data in Table 8.1, it is apparent that the BIM is most important adopted technology for managing construction projects in the UAE. This is followed by Automation of processes, Virtual Reality, and Drones. Each of these key technologies is discussed in detail below.

Table 8.1: Adoption of digital technologies for managing construction projects in the UAE

Sl. No	Adoption of digital technologies	Total number of interviewees cited (N=65)
1.	Building information model	72% (47)
2.	Automation of processes	71% (46)
3.	Virtual Reality	63% (41)
4.	Drones	54% (35)

8.3 BUILDING INFORMATION MODEL

In this study, 72% (47 of the 65) interviewees noted that their organisations have implemented Building Information Model (BIM) for construction management and planning.

In the construction industry performance is key as it determines deadlines being met and allows construction firms to win work for the future. Achieving a good performance record depends on a variety of measures however planning works is an important factor in attaining top performance. The construction industry in the UAE is looking to improve the

market activity over the next few years and achieving top performance would prove valuable for the industry. Improving planning procedures within the industry would boost the industry's performance and by using BIM it would be possible.

The BIM is mostly thought of as a 3D model, however it is much more than that. BIM is a process which aims to improve productivity and reduce costs and can be utilized at any stage of the constructions process from planning to asset management. Most planners would ask how is BIM going to assist with the planning procedure as it is just a 3D model, this is where 4D planning comes in. the BIM process does not just produce a 3D model but it is capable of much more.

With 3D BIM, all the components contain spatial relationships,, the have all the geometry and geographical information for example height of the building components. With the use of a 3D model, errors can be identified and eliminated before the works commence (Dang, 2012). With 4D BIM involves the construction plan being linked to the 3D model which allows the both the construction team and planners to visualise how the site would look at any specific time and also allows visual communication (Dang, 2012). This allows for alternatives for work processes to be tested out highlighting the best way to carry out an activity. 5D BIM involves cost along with time and the 3D model. This allows the tracking of the projects costs throughout the phases of works. 5D BIM is mostly helpful during the early stages of the construction, the cost data outputted from the 5D model can also be used to measure the financial performance of the project through all stages of construction (Dang, 2012).

For instance, 4D modelling can be used as a visualisation tool which also enables better communication between the different disciplines within an organisation, it gives all parties a better understanding of the planning process and project milestones. It can also assist in finding potential problems before the commencement of construction activities which can be resolved saving future extra costs (Autodesk University, 2014). 4D models can be used a number of ways to assist with the planning process.

In the construction industry, temporary works and structures are a vast part of the whole construction process, using the normal planning outputs such as Gantt charts usually do not account for the temporary works to be undertaken and structures to be worked on (Sardari, 2016). With the utilization of 3D models, linking the planning program to the construction activity appropriate would enable the sequencing to be visualized, this would allow sequencing requirements to be determined. In addition to visualization, additional information required can be linked into the project model such as the description of equipment locations and material staging areas which can assist the site management team in making decisions for all phases of the construction activity.

With the use of a 4D model, time-based clashes can be detected which would allow planners to gain insight on potential clashes for activities while the coordinate the trades materials and equipment needed for the works activity. With the use of clash detection, temporary items within the works which have been linked to the construction planning models can be combined with the overall project model to check for potential clashes that are time based.

With the model being linked to the program, materials, building elements within the model can be monitored. This will allow planners to be able to understand how much material would be needed for a specific task and what elements are needed on site for the installation. There are numerous advantages of 4D simulation when it comes to planning, from figuring out potential issues prior to the commencement of works which is a which essential as it would save time and cost of having to do reworks to fix the issues. Scheduling methods which are traditionally used do not outline the construction activities as they are usually words on a Gantt chart, with the use of a 4D model, the onsite team can visualize how the works is to be carried out giving them a better understanding and also allowing them to markup potential issues or concerns (University, 2014).

8.4 AUTOMATION OF PROCESSES

In this study, 71% (46 of the 65) interviewees noted that their organisations have embedded automation technology to manage construction projects. An example of technology that has been successfully integrated was in the 1980's when Caterpillar integrated vibration with the rolling action of their compactors, resulting in an increase of productivity by 260% (Sepasgozar and Davis, 2018). A study conducted by Sepasgozar and Davis (2018), found that technology adoption in construction is subject to a process involving two parties, the customer and vendor and the subsequent interactions that took place.

An example of positive collaboration was described by one of the interviewees that their organisations had used an automated saw to cut into concrete barriers, not only reducing health and safety hazards to the operatives, but also a reduction in exposure of dust and noise and increase in the quality of the job as a result. Automation and robots can be a way in which construction processes can be enhanced, when compared to the manufacturing

industry that has a total of 71 robots per 10,000 workers (Statista, 2019), which is below the European average of 74, whereas construction is still trialling such technology. For instance in the UK, a promotion ran by Balfour Beatty titled “25% by 2025”, which is the aim to reduce on site activity by 25% by 2025 will only promote the use of automation, due to the systematic nature of the manufacturing process that can be adopted as a result of removing the process from a construction site to a specialised environment.

Holt (2018) has discussed whether robots are the future of the construction industry and stated that a labour shortage that affects the industry can be alleviated by the use of such machines. The attraction of outdoor, manual labour is waning with younger generations and the use of drones for example, can be used to survey land and program driverless bulldozers, although this does not eliminate jobs in their entirety as there is then a requirement for the programming of the drone/bulldozer and also a requirement for the inspection and maintenance of such devices as quoted by Shestakofsky (2015) who said those that focus on the elimination of jobs by automation, in turn, miss out on the emerging roles created by such in the background.

8.5 VIRTUAL REALITY

In this study, 63% (41 of the 65) interviewees noted that their organisations are using Virtual Reality (VR) technology for managing their construction projects. VR is a technology that has emerged from the gaming sector as a tool used for entertainment and leisure, however, the benefits that it can provide to businesses are being now being realised and the potential to save money for companies and clients are a realistic thought. It can be defined as “technology that provides an interactive, spatial and real time medium” and thus

enables interaction and real time viewing of spatial information (Whyte, 2003), such information as included within the design of a construction project. Some of the uses highlighted by the interviewees include: prototyping the product and simulating the processes of its construction and operation. Re-using the model at different stages of the process; offering the customer a greater understanding of the design and a limited design choice from a palate of options. Re-using models across many different projects; using VR to diversify rather than to obtain business benefit in the building design process. Marketing expertise in spatial design and competing with web-designers, human-computer interaction experts and programmers in the design of new media ‘places’.

One way that VR has changed the construction industry is by streamlining collaboration between departments and across projects as the modern industry can have various personnel working remotely, or working on a site whilst doing work for another, meaning that site visits can often be awkward to organise and costly to the business, although charity Build Change has employed VR to its full capacity as it’s work often includes remote or disaster-hit areas (Autodesk BIM 360, 2018). This results in staff working considerable distances away from the site itself and by using VR; its staff can see progress and therefore provide involvement far more regularly than would’ve been possible with its use.

Another way in which VR can benefit the industry is with the inclusion of the client at an early stage of design to establish their thoughts on the design and how the building will appear upon completion. For clients, it may be hard to visualise and the use of VR can mean that whilst foundations are being laid, design changes can be made with no implications on cost or programme that would’ve had bigger consequences had it been

included as a variation once the project had arrived at the construction stage of that aspect, meaning the product development costs are reduced and the ability to involve the client is improved.

According to Tůma et al. (2014) Virtual reality is an imitation of the normal human space, images and scenarios produce by an informatics system. It resides in a computer-simulated model of a 3D environment stimulating physical presence in places that really exist or in imaginary worlds (Fernandez and Alonso, 2015). Currently, an immersive virtual environment or reality is the one perceptually involves the users on its fictitious world creating a sense of real experience in a virtual atmosphere. Think of it like a video game; but the television set is the virtual environment and the control is the virtual reality headset allowing people to feel and observe from the actual point of view of the main character of the video game (Bailenson, et al., 2008).

An ultimate environment for interactive pedagogy and training using virtual reality involves a well elaborated and defined world that encompasses a large number of activities available to the student, simulating the real world assignments (Goulding et al., 2012). If a training or educational program for project managers is put into place, it may perhaps help to close the knowledge gap between theoretical and practical due to a learning by doing approach (Farrell, 2018).

One of the biggest benefits of applying virtual reality into educational and training settings is that learning becomes doing as a result an improvement in performance (Farrell, 2018). Another relevant benefit identified is the automation. According to Vaughan, et al., (2016)

data driven characteristics of this learning technology allows adapted training content for every trainee in specific. Once the trainee completes the assessment the autonomous system receives the input, which permits the system to generate a customised training stabilising level of difficulty to fulfil individual requirements. Another factor from the data driven characteristic is that knowledge management systems are supported by virtual worlds Mueller, et al. (2011). The authors suggest that virtual reality permits alternatives methods to support knowledge, knowing process, and knowledge transfer highlighting points such as interactive collaboration and socialisation. Also, it decreases the number of equipment dedicated only to training, along with space requirements (Goulding et al., 2012).

Furthermore, Immersive virtual reality permits students to learn from a role play in simulated lifelike scenarios without facing the consequences that could happen due to the absence of experience (Gutiérrez, et al, 2007). Besides, the authors highlight that simulation allows apprentices to train and learn how in a kind of environment that would have been impossible to access due to the high risk situation. Project management as a high risk profession illustrated in the large number of project fails can definitely take advantage of this opportunity to improve human capacity, especially the project managers.

This type of training is applicable to different types of workers, in many different subjects (Farrell, 2018), which could eventually facilitate to train not only project managers but also the whole project team. According to Goulding et al., (2012) another approach of immerse virtual reality is its interactive characteristic that transforms learning into a vivid and an engaging experience. Above and beyond, every time the apprentices access to the virtual environments, altered interplays would take them to different experiences and outcomes, by

this means improving the learning experience (Alexandru, Alin and Florica, 2018). However, in the realisation of this instrument there are some recognised challenges to overcome such as platform stability, user interface or security issues.

According to McCaffrey (2017) the design is one of the key challenges to elaborate the suggested platform. Usually, when developing virtual reality environments to fulfil specific need, both the expert on the field and game designer, professional skills are required (Bjrk, Rydmark and Bjrk, 2007). The researchers state that designers tend to be solo practitioners which have a negative effect on the communication process during the development. Therefore, Sofronia et al., (2013) discuss that there is high risk of failing in the design stage of virtual reality- based training simulator.

In addition to the design challenge, Callaghan et al., (2015) considers essential not to overwhelm the player (student or trainee) since intensity will be overblown by a large amount of information and graphics producing a motion sickness. Another challenge that immerse virtual environments are facing in regards to motion is its depth perception, generating some sort of discomfort to the user (Armbrüster et al., 2008). However, latter research illustrate that there has been some progress to improve this issue (Micheletto and Nagahama, 2018).

In regard of the teacher perception there are two major challenges both, professor's loss of control over the content and its delivery, and the resistant to change from the old method to the new technology (Rice, 2007; Taylor and Disinger, 1997). However, these were simply surpassed by engaging the teacher in the development of the learning environment

(Falloon, 2010). But, in the case of the realisation of virtual world for project management, resistance from academics has to be identified if any.

8.6 DRONES

In this study, 54% (35 of the 65) interviewees noted that their organisations are using drones and unmanned aerial vehicles (UAV) to not only monitor project progress but also by using the images captured from several locations and point clouds to scan the site and then build a 3D model by using a technique known as photogrammetry. This can then be contrasted to the BIM model to ensure that progress is on track, reducing the resource required when compared to existing methods of reporting and significantly improves the safety aspect of a construction project as, for example, instead of a site manager having to access the workforce during a busy period such as a concrete pour, an item of critical importance, the use of a drone can check progress and also quality and accuracy (Krassanakis, et al., 2018). Also, when completing high level works, surveying, initial checks and even snagging can be completed by such devices which disregards the requirement for a long term hire of access equipment such as scaffolding or a mobile elevated working platform (MEWP), reducing cost for the contractor and ensuring that the client and clerk of works receive a building that conforms to industry standards and their requirements.

8.7 SUMMARY

The industrial production is being transformed by technologies, and these digital technologies are being currently used in manufacturing and if fully adopted by the

construction sector can lead to better efficiency and enhance relationships between all disciplines in an organisation (Boston Consulting Group, 2018). As revealed in the current study, the single most important digital technology adopted for managing projects in the UAE is BIM. This is followed by automation of process, virtual reality and drones.

The study concludes that adoption of digital technologies in the UAE construction industry are still at their infancy's, technologies such as BIM and Mobile Applications are mostly common now and are being used widely in the western countries especially BIM as it has been mandated in the UK as of 2016 for all public-sector projects. Other technologies such as VR, Drones and Robotics are still at their prime stages, drones and VR are trailed on some projects in the UAE however they are not very much used yet.

The UAE construction industry is very aware of all these technologies and how innovation can better the industry, it is no secret that the construction industry can be slow when it comes to change, however the need for change has increased as productivity within the industry needs to be improved especially with massive investments made by the government through many different sectors of the construction industry. Organisations in the UAE are under pressure to become innovative and complete projects with efficient delivery as this enables them to save costs and time during construction and enables clients to become confident in their abilities.

This chapter has addressed the fourth research objective of the current study, “to investigate the key digital technologies that have been adopted for managing construction projects in the UAE”. Therefore, this chapter has answered the fourth research question which is “what

are the key digital technologies that have been adopted for managing construction projects”. The next chapter will discuss the challenges for managing construction projects in the UAE.

CHAPTER 9 : CHALLENGES FOR MANAGING CONSTRUCTION PROJECTS IN THE UAE

9.1 INTRODUCTION

This chapter focuses on the challenges for managing construction projects in the UAE. The results are based on the perceptions of the 65 interviewees who participated in this study. The findings are also substantiated with the relevant literature. In this study, during face-to-face interviews, in order to capture the challenges UAE construction organisations face in managing projects, a question was raised, i.e. what are the key challenges the UAE construction organisations face in managing construction projects? This study revealed eight key challenges the UAE construction organisations face in managing construction. They are: nature of the industry, cultural issues, communication issues, information and communication technology, project management methodologies, inventory management, project management framework, and quality management. Each of these key factors is discussed in detail. In doing so, this chapter addresses the fifth research question of the current study, “what are the key challenges the UAE construction organisations face in managing construction projects”. Overall, this chapter addresses the fifth research objective which is “to investigate the key challenges the UAE construction organisations face in managing construction projects”.

9.2 CHALLENGES FOR MANAGING CONSTRUCTION PROJECTS

Table 9.1 presents the challenges for managing construction projects in the UAE as revealed by those interviewed in this study. From the data in Table 9.1, it is apparent that the nature of the industry is an important challenge for managing construction projects in

the UAE. This is followed by cultural issues, communication issues, information and communication technology, project management methodologies, inventory management, project management framework, and quality management. Each of these key challenges is discussed in detail below.

Table 9.1: Challenges for managing construction projects in the UAE

Sl. No	Challenges for managing construction projects	Total number of interviewees cited (N=65)
1.	Nature of the industry	94% (61)
2.	Cultural issues	92% (60)
3.	Communication issues	91% (59)
4.	Information and communication technology	89% (58)
5.	Project management methodologies	85% (55)
6.	Inventory management	80% (52)
7.	Project management framework	77% (50)
8.	Quality management	72% (47)

9.3 NATURE OF THE INDUSTRY

In this study, 94% (61 of the 65) interviewees noted that fragmented nature of the construction industry is challenging for managing construction projects in the UAE. Zaneldin, (2006) noted that the construction industry in the UAE is considered the largest single industry, yet, it is also very complex and the most fragmented industry as it involves multidisciplinary participants. In this multidisciplinary environment, claims appear to hinder the completion of construction and cause delays in delivering projects. The UAE

government is investing billions of dollars every year in new facilities to improve the infrastructure of the country. Considering the giant size of these projects, it is not surprising that the number of claims continues to increase. Construction claims are considered by many project participants to be one of the most disruptive and unpleasant events of a project (Ho and Liu, 2004). In UAE, construction claims, normally seen in almost every construction project, are direct results of the ongoing growth in the construction industry in the country. In general, claims are common in construction projects and can happen as a result of several reasons that can contribute to delaying a project and/or increasing its costs. Finishing a project on schedule is a difficult task to accomplish in the uncertain, complex, multiparty, and dynamic environment of construction projects (Kartam, 1999).

Motaleb and Kishk (2010) noted that in the UAE, local and foreigner investors attract people to own and invest in properties. This trend has resulted into the growth of population in a very short time and affected the GDP. Clients and investors are complaining of non-receipt of their projects on time since delays take many years and gets on one of the most critical problem in the UAE. A study by Faridi and El-Sayegh (2006) revealed that half of construction projects in the country encounter delays. According to Motaleb (2009), the number of construction projects encountering delay increased by about one fifth in 2009.

9.4 CULTURAL ISSUES

In this study, 92% (60 of the 65) interviewees noted that cultural issue is important challenge for managing construction projects in the UAE. The differences in management styles across the world are highly associated with culture since culture and management are

interconnected (Hofstede et al., 2010). It becomes critical today to make a distinction between management styles and the associated cultural differences to avoid such problems. For international companies who work in the Middle East, it is essential to have a comprehensive understanding about the Middle Eastern cultural characteristics and their effect on the management style adopted. It is also important for them to understand the Middle Eastern management framework and cope with its nature to avoid the aforementioned problems arising from applying management practices that could be inconsistent with the Middle Eastern business characteristics (Al-shabbani, 2015).

However, some important studies and books use a common definition of culture, which defined it as “a set of mores, values, attitudes, beliefs, and meanings that are shared by a group or organization” (Akiner and Tjihuis, 2008; Duarte and Snyder, 2006; Hofstede, 2001). In fact, it is what makes a distinction between different groups and organizations (Al-shabbani, 2015). Culture can be considered as the concept of the group environment where common certain things are shared, such as traditions, norms, values, attitudes and behavior (Alnasseri et al., 2013). On organizational level, most managers define culture as a set of shared values, goals, attitudes, and practices within the organization’s context when it carries out a project (Putty, 2009). Numerous definitions of culture can make it complex and difficult to understand (Al-shabbani, 2015).

Culture is complex, yet important to understand because it is a hidden and powerful set of forces that determines people’s individual and collective behaviours, values, ways of thinking and understanding, and thoughts patterns (Akiner and Tjihuis, 2008). It is important because cultural forces determine and shape people’s decisions that could lead to

desirable or undesirable results. Culture can help to anticipate consequences and make a choice from their potential desirability. It is important because of its role in creating a business framework and establishing the basis for organizational strategy, and its effects on the management behavior at all levels (Alnasseri et al., 2013). Therefore, it is essential to fully understand culture and its effects on management, and seriously take it into account.

Researchers have argued that management values, attitudes, and behaviour vary across different cultures. Therefore, effective management styles are culturally bounded (Boussif, 2010). Culture affects management practices in different aspects. For example, it affects the project team performance. Different studies reported that project team performance can be directly influenced by national culture values. In their study to analyze the cultural effect on team performance, Horii et al. (2005) conclude that team performance can give better results when management practices are congruent with national culture values (Al-shabbani, 2015).

Hofstede *et al.*, (2010) proposed that workers can deliver better performance if they work under their preferred management practices. Thus, in order to achieve better outcomes, it is essential to find harmony between the internal characteristics of an organisation and the cultural context. Many studies have reported that there is a direct impact for culture on project management. Management practices and effectiveness vary from country to country, and this variation is partly attributed to cultural differences (Al-Kazemi and Ali, 2002). Culture affects construction management in a variety of ways (Al-shabbani, 2015).

For example, in the western countries, where the power distance is relatively low, more participation is allowed in the decision making and managers are more democratic in their leadership style. However, in high power distance countries, such as Middle Eastern countries, a more authoritarian leadership style is adopted, and there is less participation from workers in the decision making process (Al-shabbani, 2015).

Al-shabbani (2015) noted that this issue can cause problems especially where multicultural workforce characterizes the industry, as is in the Middle East. When workers are from different cultures and have different expectation from their managers, it becomes difficult for project managers to adopt one leadership style. Consequently, their effectiveness will be declined in such work environment. This issue is very significant in the Middle East because of the multicultural workforce and multinational projects that are prevalent in this region. The literature reveals that these cultural effects are not limited to leadership, but extent to affect the communication process at the project level. According to a study by Jaeger and Adair (2013), the most common multicultural problem when it comes to construction management is the communication challenge. Having multicultural workforce with variety of languages and cultural backgrounds can lead to misunderstanding and misinterpretation, which in turn results in communication problems and may decrease the productivity and increase the chance of conflict (Enshassi and Burgess, 1990).

9.5 COMMUNICATION ISSUES

In this study, 91% (59 of the 65) interviewees noted that communication is an important challenge for managing construction projects in the UAE. According to Bakhtari (1995), consultants and safety officers in the UAE report that communication is the main issue that

affects safety in the construction sector. Regulations, rules, and policies can also be influenced by culture. In fact, culture influences government policies and the way regulations are enacted and enforced (Alyousif et al., 2010). A practical example of that is the Middle East region, where high power distance and uncertainty avoidance scores refer to authoritarian leadership that produces rigorous rules, regulations, and laws to strengthen its authority and reinforce its control (Hammoud, 2011). Al-shabbani (2015) noted that the high obedience for rules and high resistance to change coupled with a short-term oriented culture make it difficult for Middle Easterners to adapt to new changes.

Ling et al., (2012) noted that multinational PM is also subject to the legal framework of the host country. For example, studies have suggested that the UAE has an underdeveloped law enforcement system (Daoud and Azzam, 1999). This gives rise to out-of-court dispute resolutions that are sometimes enforced unfairly, creating injustices that may damage future relationships between parties. Contractors hesitate to sue clients and consultants who deal with them in an unfair manner, but this caused schedule delays and disputes to arise during project execution (Daoud and Azzam, 1999). Daoud and Hamdani (1988) also observed the misuse of family and political connections in contract award and administration.

9.6 INFORMATION AND COMMUNICATION TECHNOLOGY

In this study, 89% (58 of the 65) interviewees noted that use of Information and communication technology systems is a challenge for managing construction projects in the UAE. The impact of Information Technology (IT) on business processes has interested many interviewees to implement in their organisations. For instance many organisations consider ERP (Enterprise Resource Planning) systems which are the typical example of IT /

IS having an impact on both the supply chain and project management methodologies. An ERP system can be defined as a set of assistant systems for business processes. It supports and automates business processes, providing information necessary for decision-making throughout the company. This type of system assists companies in different areas: supply chain management, project management methodologies, inventory control, human resources management, etc. Also some organisations used other IT systems such as EDI project management methodologies, Intranet, Extranet, etc. Some organisations do not observe gains due to the misconfiguration or misuse of IT. Also, in some organisations, there may be some time before IT is considered beneficial for the business process. In general, IT / IS does not necessarily deliver the expected results from the moment they are established. In order to obtain good results, it is important to associate IT / IS with the right project and business processes.

In this study, some large organisations are using the SAP system. They found that by using SAP systems, the users had achieved better performance in respect of productivity per employee, profit margins, return on assets, renewal of inventory, and use of assets. One of the interviewees noted that their ERP system make it possible to reduce the time required for the circulation of information by grouping within the same project system, thus allowing improving the efficiency of the supply chain management. ERP systems support the extensive customisation of products the goal of which is to respond quickly, efficiently and at low costs to the needs of the customer (Zhu et.al, 2005). They also support the standardisation of processes and data, thus offering the opportunity to study the performance of these processes. Previous studies show that the association of the business principle virtual processes and IT allows an agile manufacturing environment, which is

focused on small quantities, on modular construction equipment and operations that is able to manage the changing environments. Interviewees also highlight that IT has a positive impact on business process performance in an environment of construction projects, which also helps in better distribution of resources, a reduction in construction time, an improvement of quality and improvement of the sharing of market.

Implementing an ERP system leads to changes in the processes of an organisation. These are better integrated within the organisation, as well as within the different divisions of the organisation. Besides, we also observe a reduction in operating costs due to implementation of ERP system. However, the benefits that are obtained vary according to the type of ERP system implemented (SAP, Peoplesoft, Oracle, or a combination of different project management methodologies). There is a significant difference in performance between users and non-users of ERP systems, at the business process level as well as at the level of companies.

Moreover, over the long term, more the organisations increase their experience with ERP, the higher will be the overall performance (Kamalahmadi & Parast, 2016). Only those who adopt ERP with supply chain management systems have a significantly better performance of business processes. The studies present them as systems coordinating and integrating the flow of materials, information and finance from the supplier to the manufacturer, then to the seller, the wholesaler, the dealer and finally to the end customer (Markus, 2004). The study shows that these systems allow the organization to gain financial benefits through an increase in the gross margin, a better turnover of stocks, an increase in the share of the market, a higher return on sales and a drop in general and administrative selling costs.

The benefits of using ERP are evident in the long term. However, the results vary depending on the size of the company. For large organisations, this process may take up to 4 to 5 years for its service improvements, while for the Medium-sized enterprise; revenue improvement is evident within five years. For Small business, there is no improvement. Moreover, these results vary according to the type of ERP implanted. ERPs of international repute present better results than ERP systems that are developed locally. IT implementation in construction sites is described according to 3 factors: process, integration and collaboration. The study highlighted that the use of IT at the level of the construction process has an impact on the size of operations and productivity (Khan & Burnes, 2007). There is also evidence that the level of IT integration in a system needs to be unique and the level of collaboration with suppliers and the client has an impact on organisational changes, the flexibility of volumes, the specialisation of products, and customer satisfaction.

The project management methodology and its information are essential for the success of companies as it directly affects each of the chain links. The ERP system allows for the global tracking and visibility of any part of the company and its chain, making it possible to make faster and more accurate decisions for the company (Laari et.al, 2017). The ERP system started to be used by companies of all sizes due to its effect on the reduction of costs and the high competitiveness of the market. The costs and risks of ERP systems decreased due to the increasing maturity of the ERP solutions, the greater qualification of users and technological advances. Thereby allowing more significant benefits and making

these systems, indispensable for the management, and important for the survival of small and medium-sized enterprises companies.

Therefore, this system is essential for the medium sized competitive position in the market because it allows the companies to increase the speed of transmission of data and control over the company's operations, making the operations more efficient. The multi-national companies intend to invest in this technology in the coming years in order to increase their competitiveness and meet the requirements of some retailers using this system. Another important factor in the supply chain is inventory. To reduce the volume of inventory and its cost, companies could implement a demand forecasting system through qualitative and quantitative methods and invest in greater sharing of information with suppliers and customers. The inventory control management of the companies must meet these two standards by combining methods. The MRP system can be used in the management of components where the demands are dependent, allowing greater control in manufacturing, reduction of operating costs, time and dimensioning of the number of materials required for the manufacture of goods and services.

PRINCE 2 is a British method, widely used in more than 150 countries (Ballou, 2007). Its primary focus is the product and the deliverables that must be performed during the execution of the project. To do this, the company must comply with some basic principles: justification for the development of the project; learning with mistakes and past successes; well-defined distribution of roles; division of the project into stages; tolerance with adversity; focus on results; the degree of flexibility, adapting the method to the project. PRINCE 2 follows all the steps of the project. Initially, the first idealisation and the quest

for viability are carried out. The development of activities corresponds to the phases of control, review and monitoring until the project is completed. As highlighted, this is one of the most used project management methodologies in the world but has a challenge that a few techniques and the reference bibliography, in general, should be in English.

9.7 PROJECT MANAGEMENT METHODOLOGIES

In this study, 85% (55 of the 65) interviewees noted that project management methodologies are critical for managing construction projects in the UAE. The scope developed in the project planning stage demands some standard planning. As all the projects follow a pattern of scope management with a feasibility analysis and collection of data from the clients, the scope needs to be raised by projects team as per the project demands. By analysing the process of scoping control, the organisation does not have a formalised project change management process with the project manager's responsibility developed. Some practices are used, such as the review of projects, but without the formalisation of the change. This work demonstrates the need for an effective logistic system, developed by organisations providing such service in the market (Melo et.al, 2009). The organisation participated in this study is one of the leading construction organisations, and has been pursuing the development of these project management practices in order to achieve greater success in the projects it develops.

Several practices have already been followed, giving greater formalisation to all these processes. In relation to the scope management, the theory shows the importance of knowledge development in this area in relation to these types of projects, understanding the

needs of customers and to ensure excellence in project development. Managing the scope is to manage customer expectations and ensure that they are the final project. The work also shows improvement points necessary for the organisation, in order to be more effective in relation to project management such as: development of a standardized design framework; development of a scope management plan; and formal management of scope changes. The work makes it clear that project management practices are rather developed in companies in this area, but are still needs some more development.

Project management already presents significant advances, mainly in relation to the documentation of requirement and the project scope statement in itself (Kleindorfer & Saad, 2005). However, there are still some steps to be taken by the UAE construction organisations. With the development of objectives, the work fulfils its aim of demonstrating the scope management by the type of organisation. Project management also fulfils the objective of presenting a case in an organisation with an essential aspect of this scenario, which represents well the maturity of project management organisations.

Since 1990, the UAE construction market environment has become more competitive due to the international companies that allowed greater diversification of products and the emergence of new project management technologies (Abro et.al, 2015). Currently, as there are similar large products in the market, customers have become more demanding, the price of the services are no longer the only concern of those who seek products and services of better quality and greater availability. The high competitiveness of the market, technological advances, the search for companies that provide the same products at reduced costs and improvements processes has made supply chain one of the main areas to be

exploited to gain permanence by a company in the current market. This scenario forces companies to restructure their processes, seek new strategies and technologies to excel in this competitive environment (Petersen et.al, 2005). A good management chain may represent a competitive advantage for the company regarding service, cost reduction and speed of response to the market needs. In this way, supply chain management serves as high importance area contributing to the national economy.

9.8 INVENTORY MANAGEMENT

In this study, 80% (52 of the 65) interviewees noted that inventory management is another critical challenge for managing construction projects in the UAE. The impossibility of availability of demand and supply at any time leads to accumulation of inventories in order to guarantee the availability of goods thereby increasing total production and distribution costs. Construction companies should define inventory policies, use effective techniques of project management, forecast demand and plan inventory correctly. Not doing this leads to an excess of products, high costs of storage and risks of obsolescence. Thus, the inventory management tools are of great importance for profitability and agility of the company. The most commonly used stock management models in the UAE are MRP, Economic Purchase Lot (LEC), and, protection stock and order point. Distribution is one of the processes of the construction supply chain considered to attract high costs and has the responsibility of the administration of the materials from the production stage to the products to final customers. This process has great importance in the management of the supply chain because any problem can generate delays, sales losses, production losses and customer dissatisfaction (Sarkis et.al, 2011).

The purchasing segment is an integral part of the supply chain that can reduce the cost of inventory, obtain better prices and services through negotiations and efficient choice of suppliers, i.e. it is a key factor for increasing competitiveness and ensuring the success of the company. The management of purchases is not limited to the act of buying and monitoring. It is a strategic process, which involves cost, quality and speed of response.

Another important element of the supply chain is the information system (IS) as many technologies have emerged that enables a high level of supply chain performance. The information technology is of vital importance within supply chains and can deliver the following benefits: the ability to capture and accumulate information about the production process, better monitoring of the productive process, facilitates the decision-making, allows to modify activities during the production process, and the integration of tasks and processes.

9.9 PROJECT MANAGEMENT FRAMEWORK

In this study, 77% (50 of the 65) interviewees noted that choosing project management framework is another challenge for managing construction in the UAE. The critical path method was developed in the 1950s and takes into account that in any project there are tasks that are linked together by dependency bonds. In other words, some tasks can only be started after others are completed, forming the critical path of the project. Thus, the project manager must be able to define these activities and prioritise them, since if they are not executed, they can block the path and cause significant losses, such as the delay of the activities schedule (Wisner et.al, 2014). A project can have more than one critical path. The

best way to define it is through a network diagram, which shows a graphical view of the activities and how they relate to one another.

Project model canvas is also one of the most well-known and used project management framework. This framework proposes the replacement of all documentation, projects and other papers with an A4 sheet and some post-its. At first sight, it seems to be very simple and not very useful. However, applying this method can yield surprising results. To do so, the project manager should meet with each of the teams and create a simple and objective project plan. From the answers to these questions, it is possible to have more definite ideas and, using the post-its, it becomes easier to define the project plan (Lenny Koh et.al, 2007). This type of methodology has the ease of understanding as its main advantage, even by collaborators who are not familiar with the subject or who are inexperienced.

9.10 QUALITY MANAGEMENT

In this study, 72% (47 of the 65) interviewees noted that managing quality is another challenge for managing construction projects in the UAE. Quality management system and the guidelines for quality in project management are responsible for ensuring quality of any project. Standards seek guidelines to preserve standardisation in project management, certifying their quality, regardless of their scope. In other words, quality management addresses processes that will take the project to its ultimate goal. Six Sigma is also not considered one of the methodologies of project management, although it is an excellent resource to apply to projects and obtain better results. We can say that Six Sigma is based on statistics to measure the nonconformities of a product, during the execution of the project, seeking its elimination. According to Six Sigma standards, the final result must be

defect-free at a percentage of 99.9996%. It is important to note that many companies are combining the concept of Six Sigma with the Lean concept (lean, without waste). The result is Lean Six Sigma, which is a set of practices aimed at achieving high levels of quality through efficient and cost-effective processes.

The waterfall is another of the project management methodologies known all over the world. Its primary objective is the sequential execution of steps, from a logical order, seeking to achieve a particular result. This methodology is simple to understand, mainly because a task can only be started when its predecessor is finished. However, not everything is flowers: any change in the scope of the project, however small, can interrupt the flow and cause significant disruption. Despite being considered a traditional methodology widely used in manufacturing or construction, it cannot be considered flexible. Some experts consider that Waterfall was the first model adopted in engineering project (Russell and Taylor-Iii, 2008). A significant innovation in project management methodologies is the inclusion of project and other systems capable of monitoring activities in real time. The contemporary world is more agile and requires professionals to be more punctual in their interference. Each methodology presents its differential and its qualities, and the choice of the best alternative depends on the needs of the project.

Table 9.2: Summary of challenges cited by interviewees for managing construction projects in the UAE

Criteria	Current challenges
Scope management	<ul style="list-style-type: none"> • Owners' inexperience and lack of expertise contribute to scope variation. For example repeated changes in requirements conform to local regulations, and changes in owners' demands. • Disputes due to discrepancies in architectural drawings/ bills of quantities. <p>This results in delays in execution and avoidable rework leading to budget overruns.</p>
Schedule management	<ul style="list-style-type: none"> • Providing daily, weekly and monthly progress reports supplemented by Gantt charts and frequent meetings to track project progress. Extreme weather conditions in summer present a challenge to workers as do sandstorms.

	<ul style="list-style-type: none"> • Variation in working times by season (e.g. work in the sun is prohibited between 12pm and 3pm by law) • Working hours reduced during Ramadan. <p>Frequent progress reports, printed in hardcopy for wide distribution is environmentally unfriendly and waste personnel time in preparing them.</p>
Quality management	<ul style="list-style-type: none"> • Quality management is performed by having stringent criteria for contractor selection. • Criteria for selection include financial capacity, experience, existing contract capacity, manpower and resource commitment and bid price. • Soft skills are also an occasional consideration. <p>In some instances, selection was not purely based on merit which brings significant impact on the overall project quality management.</p>
Risk management	<ul style="list-style-type: none"> • The impact of the global economic crisis of 2008 affected cash flow and in turn many projects were halted or slowed down. • Technical risks include variation in the practice of material use. • The political risks as the Middle East is politically volatile and the threat of war is ever-present • Some clients were unable to raise funds to complete their projects. <p>Many foreign investments rely on Multilateral Investment Guarantee Agency (MIGA) which offers political risk insurance for investments in developing countries.</p>
Human resource management	<ul style="list-style-type: none"> • The low paid labour force struggles both financially and psychologically to survive in the UAE where in some nations e.g. Abu Dhabi is one of the highest costs of living in the world. • Recourse to legal or contract solutions is not usually preferred. • Cash incentives for good work and timely payments are used to keep employees motivated. <p>Conflict of opinion frequently arise due to the multicultural workforce and are usually dealt with through closed-door meetings until a mutually agreeable directive is reached for future use.</p>
Communication management	<ul style="list-style-type: none"> • In many instances communication barriers are significant due to language constraints. • Sign language, actions, illustrations, technical drawings and translation by workers who are more fluent in English language are all methods adopted to communicate. • Westerners prefer problems to be verbalised and addressed rigorously, while locals tend to adopt a more quiet approach. <p>Cultural differences in communication style have led to occasional difficulties. Many foreigners mistake locals' quietness to passiveness when in many instances, this is not the case, but that locals do not like the fast and noisy approach. This has hampered the smooth working relationship in international teams. Experience in cross-cultural environments is definitely an advantage for international projects.</p>
Procurement management	<ul style="list-style-type: none"> • Materials delivery is subject to arbitrary schedule changes to accommodate demands of more important projects, although extensions are granted when this happens. • Late orders by contractors and delayed customs clearance also pose barriers to timely procurement. • Establishing good interpersonal relationships and trust with local project partners is very helpful since such ties are highly valued in the region. <p>Many legal and social factors impact the overall project scheduling and cost. For instance, in the UAE importing materials already supplied from Abu Dhabi is prohibited. Foreigners need to establish close relationships with local decision makers to gain their trust first before they are awarded projects.</p>
Cross cultural management	<ul style="list-style-type: none"> • Dispute resolution is typically based on good faith practices rather than legal recourse.

	<ul style="list-style-type: none"> • Being late for appointments is a common phenomenon among locals. • Respect for local culture and practices, including prayer timings and abstaining from non halal food and alcoholic drinks, are appreciated and help gain trust. • Long-term relationships with business partners are valued regardless of ongoing economic constraints. • Interpersonal relationships help to get jobs done faster or better and contribute significantly to project success. • Often, specific companies are selected to carry out tasks because of personal connections which indicate that trust had already been built up successfully. <p>Because of these constraints, training and mentorship are challenging to come by, though experienced professionals may find promising career opportunities.</p>
The legal system and approval process	<ul style="list-style-type: none"> • Regulations often change after contracts are awarded. • Rapid modification and introduction of regulations without adequate notice. • A personal approach is often more efficient. • Prompt and persistent follow-up actions are important to obtaining permits and licences in a timely manner. <p>Regulation change affects travel times for heavy vehicles, fire safety and workers' welfare. The application processes to obtain authorities' approval is lengthy.</p>

9.11 SUMMARY

Project management has been transformed into a subject discipline similar to other management core of the business comparatively to operations, information technology, or finance (Mir and Pinnington, 2014). As reported by Rockwood (2018) project management is progressively understood as a high demand profession. Indeed, around 22 million jobs will be created in the area of project management between 2017 and 2027 (PMI, 2017). Correspondingly, project managers have been identified as fundamental people in project management and their competencies are understood to be critical for the project to succeed (Ojiako, et al, 2013; Ekrot, Kock and Gemünden, 2016). Organisations have realised the advantages of adopting a disciplined approach to the delivery of successful projects (Balakian, 2017). Since the projects are considered as one of the ultimate fragments for transformation process, execution of new business opportunities and the accomplishment of the strategic objectives of the organisation and not just a limited application of something worthless (PMI, 2014; Ojiako et al., 2014). Therefore, the role that project

management plays in process of change has developed constant concern for the topic learning and development of project managers.

It is apparent from this study that the nature of the industry is an important challenge for managing construction projects in the UAE. This is followed by cultural issues, communication issues, information and communication technology, project management methodologies, inventory management, project management framework, and quality management. Despite of the incremental significance of project management, yet, businesses are confronting encounters in controlling their assignments since projects keep failing in very high rate. For that reason, it generates uncertainties on the value of project management as a consequence of the large number of project miscarriages and despite all the efforts to improve the process. According to Januska (2017) there is about a 70% rate of projects that do not succeed, and 60% -70% of these projects that failed, fall into that status due to the lack of human capacity to accomplish effectively. Identifying elements such as culture, leadership and inappropriate risk management, which are directly engage within the project manager activities and its competences.

The chapter concludes that managing construction projects is an integrated and complex process. This involves social, cultural, financial, and technological considerations. Furthermore, the UAE construction industry needs to work more collaboratively with its stakeholders. There is a need for developing a new co-value creation project management models and use of collaborative knowledge sharing partnerships, but also by a need to overcome shared risks and realise long-term outcomes.

More effective knowledge-sharing within and across construction organisations is also required. Business memory is lost as project teams break up toward the end of a project, or when people move on from short term contracts. Opportunities to reflect on lessons learned which could benefit future projects. Therefore, the UAE professional institutions and construction industry should support and participate in the work of knowledge-sharing groups to address perceived risks from new technologies (e.g. BIM,) and processes (e.g. sustainability issues).

This chapter has addressed the fifth research objective of the current study, “to investigate the key challenges the UAE construction organisations face in managing construction projects” and fifth research question “what are the key challenges the UAE construction organisations face in managing construction projects” of the current study. The next chapter will presents a competency framework for managing construction projects in the UAE.

CHAPTER 10 : DEVELOPMENT OF PROJECT MANAGEMENT COMPETENCY FRAMEWORK

10.1 INTRODUCTION

This chapter presents a competency framework for managing construction projects in the UAE. The findings from the previous stages of this research study were taken into consideration in the development of the competency framework. The developed framework consists of technical, behavioral and contextual competence domains. The developed competency framework provides broad guidance to identify and classify the different competence elements needed by project managers, at all levels, for effective management of construction projects in the UAE. In doing so, chapter 10 addresses the sixth research objective of this current study, which is “to develop and validate a project management competency framework for the benefit of UAE construction organisations.”

10.2 RATIONALE FOR DEVELOPING A COMPETENCY FRAMEWORK

Many businesses recognise project management as a core business capability and seek to reap the benefits of proactive and effective management of projects. As a result, the problems of defining and measuring competency for project managers are exercising the profession’s leading researchers and practitioners alike. Project management is increasingly recognised as being an eclectic discipline, requiring mastery of a vast range of behaviours honed to suit the particular project and organisational context. Dziekoński (2017) noted that the growth in the number of business activities that are deployed through projects results in

increase in interest of all the issues related to project management. Management of a project team is significantly different from managing team of employees. That is mainly due to the nature of project and resulting range of project manager duties. Projects are strictly defined by result requirements, the cost and time constraints, and are bounded by the environment in which are implemented.

As a result a set of project manager's activities typically include motivation, time, cost, scope, quality management and various administrative duties (Dziekoński, 2017). Project management competency describes those behaviours that facilitate effective project management (Murray-Webster and Hillson, 2011). Gaddis (1959) described project manager competencies as: "ability to have different approach towards classic management functions, ability to finish tasks within the time with no specific information at the early stages of the project and that is related to the ability of taking risks, shall have power in the organization to delegate responsibility to subordinates, "trouble shooting" skills, planning skills, avoid crises "selling and reselling the project" abilities, to be able to act as a front man and a man in between with communication skills, "ability to generate necessary drive and momentum to spark the project to success". According to Murray-Webster and Hillson, (2011), competency can be defined as "any aspect of behaviour and/or performance that results in effective and/or superior performance on the job" (Klemp, 1980).

Dziekoński (2017) noted that duties of project manager include a range of activities from administrator of the project to team leader. Therefore, to successfully execute project its manager needs a unique set of capabilities and competencies (Huemann et al., 2007). Since there is a strong relationship between the project's success and the project manager's work

effectiveness, conditions ensuring that effectiveness are concern of many researchers. That initiates attempts to define competencies that have the significant impact on project manager's effectiveness. Due to the nature of project manager work, which is largely based on cooperation and project team directing, manager's characteristics can have a crucial impact on project's results. Therefore a choice of a "right" person to perform a project manager role is one of the most important decisions taken by project's sponsor/investor. The differences between the processes of employees' selection in traditional organizations and those with project structures are indicated by Lichtarski (2007). Kerzner and Kerzner (2017) mentions following features of project managers: initiative, leadership abilities, ambition, creativity, flexibility and adaptability, personal commitment, vision, creating trust, ability to persuade, effectiveness, ability to make decisions, ability to identify problems, and ability to organize work to subordinates.

The project manager is the individual accountable for achieving the objectives of the project. For that reason, the latter has the duty to manage the project through the identification of requirements and the establishment of clear and achievable aims (Clarke, 2010). Also, it is essential for a project manager to have the capacity to meet the demand on quality, scope, time and cost (Müller and Turner, 2010); it must be able to adapt the plans and the approach to the concerns and expectations of the stakeholders in the project and must also be able to manage it in environment of uncertainty (Müller and Jugdev, 2012). The role of the project manager is one of the most challenging jobs in any organisation because it requires a broad understanding of several areas that must be coordinated and that require strong interpersonal skills (Ahsan, et al., 2013).

According to Meredith and Mantel (2010) it is widely recognised that the final outcome and success of the project depends mainly on the project manager. Actually, authors state that the project manager is probably the most crucial input to the project when contrasted to the team, the funds, the materials, and any further resources. Therefore, the selection and training of this professional is one of the most important decisions that affect the project. That is why, a key aspect that organisations must know to develop successful projects, is to know the competencies that the person who will play the role of project manager must present (Ekrot, et al., 2016), as well as, in which way, these skills can be developed and enhanced. However, according to Cartwright and Yinger (2007) it is important to highlight that project success is not guarantee by a just competent project manager, achieving the required objectives in regards of time, cost, scope, quality, resources and risk is not enough. The authors also recognise organisation's project management maturity and capability as critical success factors. Indeed, according to Shenhar and Dvir (2007) evidence illustrate that even well managed projects fail when project is completed but has not met expected benefits.

Processes, tools, methodologies or techniques are not what delivery projects. Indeed, projects are delivered by individuals working together to make a vision become reality (Zhu and Lee, 2017). Each member of the team is inimitable in relationship with their existing and future levels of competence. As more and more projects are tending to fail, both the request for project management and the attention in developing project managers' competencies are arising (Bredillet et al., 2015). As one of the main results of project manager competences being pointed as success factors, project management education and training have been acknowledged as essential elements to avoid project miscarriage in

numerous researches (Phillips, 2017). Therefore, it requires a competency framework that allows assessment and development guarantees that all members of the team including the project manager have the right skill, experience, aptitude and attitude to appropriately and effectively contribute to the success of the project. In this study, during face-to-face interviews, interviewees were asked the need for a development of competency framework for managing construction projects in the UAE.

Of the interviewees, 95% (62 of the 65) of the interviewees cited the need for a holistic, comprehensive project management competency framework. Many interviewees noted that their executives are familiar with managing business as usual, whether in terms of economic value added or other measures. However, their executives are less knowledgeable about developing, deploying, managing and measuring emerging social and environmental issues and values. Considering the above discussions, it is clear that there exists a need for developing a holistic, comprehensive project management competency framework. Such framework should be clear and easily understood by a variety of stakeholders with diverse backgrounds, who are involved in the different phases of the implementation of construction projects. The framework should also have a means of aligning and integrating the organisation level objectives and actions.

10.3 DEVELOPMENT OF PROJECT MANAGEMENT COMPETENCE FRAMEWORK

According to Cheng, et al., (2005) what it needs to be a successful project manager in today's work environment are competency models that supports the project manager to focus on the task to perform and best behaviour. Based on the definitions above, it could be

said that a competent project manager owns some attributes to fulfil her/his role; and will demonstrate a certain level of performance (Takey and Carvalho, 2015). These attributes and performances models are described and issued by the diverse bodies of knowledge such as the Project Management Institute (PMI, 2013), the International Project Management Association Competence Baseline (IPMA, 2006), the Global Alliance for Project Management Standards (GAPPS, 2015), and Association for Project Management competence framework (APM, 2015). PMI'S, IPMA's ICB, and APM's have been principally made for the attribute-based approach, whereas GAPPS' Project and Program Manager Standards have generated for the performance-based approach (Bredillet, et al., 2015).

The Project Manager Competency Development (PMCD) Framework (PMI, 2013) explains that the project manager must be able to understand and apply knowledge, tools and techniques that are known as best practices to manage projects effectively, as well as having specific set of skills in an area and general competencies in management matters, which are explained with the upcoming concepts: Knowledge: refers to what the project manager knows about project management; Performance: refers to what the project manager is able to do or achieve when he applies his knowledge; and Personnel: refers to the manner in which the project manager behaves when executing it, or carries out activities related to it. Personal effectiveness encompasses attitudes, personality and leadership, which provides the ability to guide the team.

In addition, the International Project Management Association's Competence Baseline describes the people, practice and perspective as the three areas of competence of project

management. This Individual competence baseline identifies 29 competence elements as model criteria (IPMA, 2015). The IPMA IBC 4.0 also discusses that project managers should be able to apply knowledge, skills, which is very similar to “performance” in PMCD, and ability. Different from the PMCD framework the personnel is not identified but ability is (IPMA, 2015).

On the other hand, GAPPS frameworks, first stand by outlining units of competency, related to particular areas of professional performance in the place of work. Second, defining elements of competency associated with main rudiments of work execution in a unit. Third, describing performance criteria linked to the necessary type and/or level of performance in order to demonstrate competence in each element based on observable results and actions (GAPPS, 2015; Bredillet, et al., 2015).

In addition, there is APM competence framework created to support professionals, organisations, and trainers within the project, programme, portfolio management, and PMO profession. This framework is suitable for all sectors, projects, and organisations independently of their magnitude, complexity and geographical position. It involves 27 competences, each with different standards in regards of knowledge and application that are required for a project professional to accomplish in its career (APM, 2016).

However, it is important to mention that in a critical review of the three most accepted competence guidelines made by institutions such as Association for Project Management (APM), Project Management Institute (PMI), and the International Project Management

Association (IPMA) particularises that these frameworks lack of social competence development in contrast to functional and cognitive competences (Chipulu, et al, 2013).

To sum up, an adequate competency assessment and development guarantees that all members of the team including the project manager have the right skill, experience, aptitude and attitude to properly and effectively contribute to the success of the project (Crystal Consulting, 2016). Nonetheless, all of these established competency assessment and frameworks, and still project managers do not manage to handle and overall of the 30% rate of project success (Januska (2017). These means, there is a gap to identify and develop new learning and development approaches in the project management field.

The construction project management competence framework has been developed after a thorough research of a variety of competence frameworks worldwide in the area of project management. The IPMA competence Base line (Version 3.0) provided a useful framework in the development of this competence framework. The framework presented in this document has greatly benefited from the feedback and contributions provided by practising project managers at all levels. The key objectives of this competency framework include: to define the work of construction project management personnel; to develop a robust, holistic and clear competence framework for use by project managers; to define and document project competences and process steps for achieving related construction project management competence; and to identify and classify the different competence elements needed by project managers, at all levels, for effective construction project management implementation.

A competence is a collection of knowledge personal attitudes, skills and relevant experience needed to be successful in a certain function. It can be understood to represent the language of performance in an organisation, articulating both the expected outcomes of an individual's efforts and the manner in which these activities are carried out. The developed framework consists of technical, behavioral and contextual competence domains.

The Technical competence domain – to describe the fundamental project management competence elements on which the professionals are working. This domain covers the project management contents, sometimes referred to as the solid elements. The construction competence framework contains 27 technical competence elements. The Behavioural competence domain – describes the personal project management competence elements. This domain covers the project manager's attitudes and skills. The construction competence framework contains 9 behavioural competence elements. The Contextual competence domain – to describe the project management competence elements related to the context of the project. This domain covers the project manager's competence in managing relations with the line management organisation and the ability to function in a project focused organisation. The construction competence framework contains 8 contextual competence elements.

Technical Competence Elements	Behavioural Competence Elements	Contextual Competence Elements	
Project success and benefits management	Teamwork	Business case	8 contextual competence elements dealing with the interaction of the project management with the context of the project and within the permanent organisations
Stakeholders management	Conflict management	Health, safety and environmental management	
Requirements management	Leadership	Project financing and funding	
Project risk management	Professionalism and ethics	Legal awareness	
Project quality management	Negotiation	Organisation structure	
Scope management	Behavioural characteristics	Organisational roles	
Resources management	Human resource management	Governance of project management	
Budgeting and cost management	Learning and development	Project sponsorship	
Change control	Communication		9 behavioural competence elements dealing with the personal relationships between the individuals and groups managed in the projects, programs and portfolios.
Information management and reporting			
Value management			27 technical competence elements dealing with the project management matter on which the professionals are working.
Technology management			
Earned value management			
Development			
Estimating			
Value engineering			
Modelling and testing			
Configuration management			
Handover and closeout			
Procurement			
Project reviews			
Methods and procedures			
Marketing and sales			
Project management plan			
Project life cycles			
Scheduling			
Issue management			

Figure 10.1: Overview of the construction project management competence framework
TC: Technical Competence; **BC:** Behavioural Competence; **CC:** Contextual Competence

Table 10.1: Sample description of technical competence domain

Technical Competence Domain		
Competence	Project success and benefits management	
Definition	Project success is the satisfaction of stakeholder needs and is measured by the success criteria as identified and agreed at the start of the project. Benefits management is the identification of the benefits at an organisational level and the monitoring and realisation of those benefits.	
Process Steps	<ol style="list-style-type: none"> 1. Analyse and understand the project and its context within the proposed business change and its relationship with the expected benefits (indirect, direct, financial and non-financial). 2. Develop critical success factors for the project – project KPI's, ensuring these are quantitative by using traditional Time, Cost and Quality techniques. 3. Understand the relationship between achieving deliverables to time and benefits realisation. 4. Discuss and agree the project success criteria and benefits realisation responsibilities with all relevant stakeholders as part of the project management contract with the customer. 5. Plan the management of the project and establish the PM team, methods, techniques and tools, ensuring that the responsibilities for the implementation and embedding of project deliverables into the business, and the start of benefits realisation, are clearly defined and understood by the responsible stakeholders. 6. Execute and control PM plans and changes, and report on project performance. 7. Ensure that the impacts of any deviations from plan are considered against the business case and the benefits realisation plan and are escalated to the responsible stakeholders. 8. Collect results and prepare project performance against the agreed KPI's, communicate to relevant stakeholders. 9. Evaluate PM successes and failures, transfer and apply lessons learnt to future projects. 	
Level of Competence achieved	Level A	Has successfully directed the management of PM success for important projects, programmes and/or portfolios of an organisation or an organisational unit
	Level B	Has successfully managed the PM success criteria of a complex project
	Level C	Has successfully managed the PM success criteria of a project with limited complexity
	Level D	Has the knowledge required concerning the management of PM success and can apply it

Table 10.2: Sample description of behavioural competence domain

Behavioural Competence Domain		
Competence	Communication	
Definition	Communication is the giving, receiving, processing and interpretation of information. Information can be conveyed verbally, non-verbally, actively, passively, formally, informally, consciously or unconsciously.	
Process Steps	<ol style="list-style-type: none"> 1. Set out the communication plan at the start of the project or programme, or as one of the portfolio process 2. Identify the target population for communication and their location 3. Determine what needs to be communicated and the content 4. Choose the place, time, duration and means of communication 5. Plan the communication process and prepare material 6. Check the infrastructure and send/transit communication 7. Seek feedback on the effectiveness of the communication 8. Evaluate and take appropriate actions on issues to do with ineffective communication 9. Document the lessons learnt and apply to future projects 	
Level of Competence achieved	Level A	Has successfully directed the management of communication for important projects, programmes and/or portfolios of an organisation or an organisational unit
	Level B	Has successfully managed the communication in a complex project
	Level C	Has successfully managed communication in a project with limited complexity
	Level D	Has the knowledge required concerning the management of project communication and can apply it

Table 10.3: Sample description of contextual competence domain Business case

Contextual competence Domain									
Competence	Business case								
Definition	The business case provides justification for undertaking a project, in terms of evaluating the benefit, cost and risk of alternative options and rationale for the preferred solution. Its purpose is to obtain management commitment and approval for investment in the project. The business case is owned by the sponsor.								
Process Steps	<ol style="list-style-type: none"> 1. Understand the content and be prepared to write a business case according to the customer’s standards and accounting norms. 2. Be aware of the internal (i.e. project / programme changes) and external (legislative, market forces) factors that could impact the business case. 3. Ensure the project / programme team are made aware of the business case and the potential impact to the business case arising from any changes to the programme and/or associated project plans. . 4. Throughout the project / programme and at closure evaluate against the business case to ensure the continued viability of the project / programme, report and escalate to appropriate management levels for decisions. 5. Provide feedback on lessons learnt and apply in permanent organisation and/or portfolio/programme/project organisation as appropriate. 								
Level of Competence achieved	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #e0e0e0; width: 15%; text-align: center;">Level A</td> <td>Has successfully directed the management of the business case for important projects, programmes and/or portfolios of an organisation or an organisation unit.</td> </tr> <tr> <td style="background-color: #e0e0e0; text-align: center;">Level B</td> <td>Has successfully managed the business case of a complex project.</td> </tr> <tr> <td style="background-color: #e0e0e0; text-align: center;">Level C</td> <td>Has successfully managed the business case of a project with limited complexity.</td> </tr> <tr> <td style="background-color: #e0e0e0; text-align: center;">Level D</td> <td>Has the knowledge required concerning the management of business case and can apply it.</td> </tr> </table>	Level A	Has successfully directed the management of the business case for important projects, programmes and/or portfolios of an organisation or an organisation unit.	Level B	Has successfully managed the business case of a complex project.	Level C	Has successfully managed the business case of a project with limited complexity.	Level D	Has the knowledge required concerning the management of business case and can apply it.
Level A	Has successfully directed the management of the business case for important projects, programmes and/or portfolios of an organisation or an organisation unit.								
Level B	Has successfully managed the business case of a complex project.								
Level C	Has successfully managed the business case of a project with limited complexity.								
Level D	Has the knowledge required concerning the management of business case and can apply it.								

10.4 VALIDATION OF THE PROJECT MANAGEMENT COMPETENCY FRAMEWORK

Validation is defined as an assessment of whether a framework is in congruence with reality (Brink, 2003). The process tries to ensure that the framework represents the characteristics of the general population and not limited to the samples used in the estimation (Good and Hardin, 2003). That is, if the framework is applied to a different sample and there is a severe drop in its predictive power, then the framework clearly does not generalise (Field, 2000).

Corbin and Strauss (2008) to evaluate the ‘quality’ of research findings derived using the principles of grounded theory. These criteria are;

- ‘Fit’ (i.e. ensuring that the findings ‘resonate’ with the experience of the professionals for whom they are intended).
- ‘Applicability’ (i.e. establishing the usefulness of findings).
- ‘Logic’ (i.e. ensuring that there is a logical flow of ideas, making sure that there are no significant gaps in logic).
- ‘Depth’ (i.e. ensuring that there is sufficient substance within the findings)

In this study, the developed project management competency framework was validated with 10 senior professionals, who had over 20 years of work experience in their organisations. In this study, during face-to-face interview, the interviewees were asked about the comprehensiveness of the developed project management competency framework. Most of the interviewees asserted that the competency framework has a very

high degree of comprehensiveness and in terms of areas covered; the developed framework has a very high level of project management issues. Furthermore, the interviewees were asked if they think the framework would help their organisations to implement and manage construction projects; and response from all interviewees was very positive. Overall, most of the interviewees recommended that the developed project management competency framework can be used for managing construction projects in the UAE. Overall, competency framework and its validation attempted to address objective fifth of this research study.

10.5 SUMMARY

This chapter has discussed the development of project management competency framework. A competence is a collection of knowledge personal attitudes, skills and relevant experience needed to be successful in a certain function. The developed project management competence framework has benefited from a thorough research of a variety of competence framework worldwide in project management and allied areas. The framework has also greatly benefited from the feedback and contributions provided by practising project managers at all levels. The findings from the previous stages of the research study and aspects from critical review of literature were taken into consideration in the development of this competency framework. The developed and validated project management competency framework provides broader idea for management of construction projects. In doing so, this chapter addressed objective sixth of the current study, which is “to develop and validate a project management competency framework for the benefit of UAE construction organisations”.

CHAPTER 11 : CONCLUSIONS AND RECOMMENDATIONS

11.1 INTRODUCTION

This chapter presents the research aim and objectives. To do so the research process is described, and the conclusions and recommendations are provided.

11.2 RESEARCH PROCESS

Aim	The aim of this study is to explore how the UAE construction organisations are managing construction projects to enhance competitive advantage.
Research Objectives	<ul style="list-style-type: none"> • To explore the outlook of the UAE construction sector. • To analyse the UAE macro-environmental factors that have an impact on the construction project management. • To explore and document the key drivers for managing construction projects in the UAE. • To investigate the key digital technologies that have been adopted for managing construction projects in the UAE. • To investigate the key challenges the UAE construction organisations face in managing construction projects. • To develop and validate a project management competency framework for the benefit of UAE construction organisations.
Research questions	<ol style="list-style-type: none"> 1. What is the status of the UAE construction sector? 2. What are the macro-environmental factors that impact on the UAE construction project management? 3. What are the key drivers that have fuelled the need for managing construction projects in the UAE? 4. What are the key digital technologies that have been adopted for managing construction projects? 5. What are the key challenges the UAE construction organisations face in managing construction projects? 6. Is there a need for developing a project management competency framework for the benefit of UAE construction organisations?
Research	Qualitative research
Sample technique	Purposive sample
Sample size	65
Sample diversity	Directors and managers
Data collection method	Semi-structure interviews
Unit of analysis	Construction organisations
Embedded unit of	Individual employee

analysis	
Method of analysis	Content analysis
Outcome of analysis	Framework

11.3 KEY FINDINGS

Research Objective 2: To analyse the UAE macro-environmental factors that have an impact on the construction project management.

Research Question 2: What are the macro-environmental factors that impact on the UAE construction project management?

The project management nowadays has become highly dynamic in nature because of the increasing uncertainties in the budget, development process and uncertainties in technology. There are many factors that have an impact on the project management. Some factors are under the control of an organisation whereas some are outside the organisation's control. There are number of factors that can negatively or positively affect the business capabilities and the investment capabilities of an organisation. This study revealed that the single most macro-environmental factor is technological factors. This is followed by economic factors, political factors, social factors, legal factors, and environmental factors.

Research Objective 3: To explore and document the key drivers for managing construction projects in the UAE.

Research Question 3: What are the key drivers that have fuelled the need for managing construction projects in the UAE?

The UAE has become an attractive market for foreign architecture, engineering and construction firms. It is therefore timely to assess the challenges faced in managing

construction projects in the UAE and recommend ways to reduce or overcome them. This study revealed that the single most important driver for managing projects in UAE is to improve greater efficiency. This is followed by to manage complex projects, to reduce cost overruns, to reduce delays, to reduce disputes and to improve project success.

Research Objective 4: To investigate the key digital technologies that have been adopted for managing construction projects in the UAE.

Research Question 4: *What are the key digital technologies that have been adopted for managing construction projects?*

The current study revealed that the single most important digital technology adopted for managing projects in the UAE is BIM. This is followed by automation of process, virtual reality and drones. The UAE construction industry is very aware of all these technologies and how innovation can better the industry, it is no secret that the construction industry can be slow when it comes to change, however the need for change has increased as productivity within the industry needs to be improved especially with massive investments made by the government through many different sectors of the construction industry. Organisations in the UAE are under pressure to become innovative and complete projects with efficient delivery as this enables them to save costs and time during construction and enables clients to become confident in their abilities.

Research Objective 5: To investigate the key challenges the UAE construction organisations face in managing construction projects.

Research Question 5: *What are the key challenges the UAE construction organisations face in managing construction projects?*

Since the projects are considered as one of the ultimate fragments for transformation process, execution of new business opportunities and the accomplishment of the strategic objectives of the organisation and not just a limited application of something worthless. Therefore, the role that project management plays in process of change has developed constant concern for the topic learning and development of project managers. This study revealed that the nature of the industry is an important challenge for managing construction projects in the UAE. This is followed by cultural issues, communication issues, information and communication technology, project management methodologies, inventory management, project management framework, and quality management. Despite of the incremental significance of project management, yet, businesses are confronting encounters in controlling their assignments since projects keep failing in very high rate. For that reason, it generates uncertainties on the value of project management as a consequence of the large number of project miscarriages and despite all the efforts to improve the process.

Research Objective 6: To develop and validate a project management competency framework for the benefit of UAE construction organisations.

Research Question 6: *Is there a need for developing a project management competency framework for the benefit of UAE construction organisations?*

A competency framework for managing construction projects in the UAE was developed and validated. The findings from the previous stages of this research study were taken into consideration in the development of the competency framework. The developed framework consists of technical, behavioral and contextual competence domains. The developed competency framework provides broad guidance to identify and classify the different

competence elements needed by project managers, at all levels, for effective management of construction projects in the UAE.

11.4 RECOMMENDATIONS

Recommendations for decision makers

- The government policies and reforms have both positive and negative impact on the project. The government policies have the potential to decrease or increase the overall demand of the construction services with the help of monetary and budgetary measures. If the government policies are not clear to the developer, then it develops number of issues in the project that further increase the cost and delays the project. Therefore, to solve some of the construction project management problems, it is important that key leaders and decision makers connect with other stakeholders to have a positive impact.
- Smart technology has enormous potential to enable construction organisations systems and processes to be automated; to provide managers with better data/information; and to support them in performing more tasks and activities while remaining visible to their communities. Therefore, there is a need for implementing more smart technology initiatives in the UAE construction sector. It is recommend that implementing regulations to push large organisations to implement smart devices in their projects, and to subsidise this implementation in small and micro companies.
- In order to keep the environment safe and pollution free, the government generally introduces number of environment regulations that imposes certain restrictions on the project. This further affects the project functioning eventually affecting the project performance. The lack of leadership skills for successful deployment of environment sustainability initiatives is one of the most important challenges for the UAE construction sector. Therefore, there is an urgent need to develop and deliver a bespoke

leadership training programs to address, improve and measure the effectiveness of leadership skills for driving change towards sustainability.

Recommendations for the UAE construction sector

- A complex mix of political, economic, social, technological, legal, and environmental forces drives construction project management in the UAE. Therefore, understanding the macro-environmental factors that impact on the UAE construction project management is important. This understanding could assist decision makers to develop construction project management strategies based on the factors.
- Recognising and sensibly handling cultural diversity allows efficiency improvements and increases profitability of international projects. Furthermore, the variances are of the most common problem in the UAE construction industry, caused largely by changed orders and owner-related delays. Therefore, it is important to identify significant causes of construction delay to avoid recurring problems or mitigate their impact.
- The construction industry is at an evolutionary period, the new generation of the construction industry - Industry 4.0 is expected to boost quality, improve productivity and efficiency. The industrial production is being transformed by technologies, and these digital technologies are being currently used in manufacturing and if fully adopted by the UAE construction sector can lead to better efficiency and enhance relationships between all disciplines in an organisation.

Recommendations for academics and researchers

- The study concludes that adoption of digital technologies in the UAE construction industry are still at their infancy's, technologies such as BIM and Mobile Applications are mostly common now and are being used widely in the western countries especially BIM as it has been mandated in the UK as of 2016 for all public-sector projects. Other technologies such as VR, Drones and Robotics are still at their prime stages, drones and VR are trailed on some projects in the UAE however they are not very much used yet. Therefore, the UAE business and construction education curricula must integrate the digital technology aspects into its courses.
- More effective knowledge-sharing within and across construction organisations is also required. Business memory is lost as project teams break up toward the end of a project, or when people move on from short term contracts. Opportunities to reflect on lessons learned which could benefit future projects. Therefore, the UAE professional institutions and construction industry should support and participate in the work of knowledge-sharing groups to address perceived risks from new technologies (e.g. BIM,) and processes (e.g. sustainability issues).
- Teaching in project management was programmed under an expository paradigm followed by exercises to implement an exclusive technique or a tool in specific. Nonetheless, these exercises do not meet the required level stimulus that students need, falling to deliver effective learning due to lack of engagement. In addition, the UAE project management education struggles with challenges such as there are too many knowledge areas in project management, and struggle to provide education to

professionals from different background and learning styles. Therefore, the UAE project management training and education should lead to a more active/practical approach.

- This research concludes that managing construction projects is an integrated and complex process. This involves social, cultural, financial, and technological considerations. Furthermore, the UAE construction industry needs to work more collaboratively with its stakeholders. There is a need for developing a new co-value creation project management models and use of collaborative knowledge sharing partnerships, but also by a need to overcome shared risks and realise long-term outcomes.

11.5 FUTURE WORK

This research study has revealed a number of areas for further research and development including the following areas:

- It would be worthwhile to explore the differences between micro enterprises (organisation employee size less than 10), small and medium-sized enterprises' (organisation employee size less than 250) and large organisations (organisation employee size more than 250) approach to managing construction projects in the UAE.
- Given that the research reported in this thesis is largely exploratory in nature, the results presented here are only tentative and of limited value for the purpose of generalisation. Therefore, additional research with more elaborate and better articulated designs is therefore called for, to further explore the complex issue of managing construction projects.

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APPENDIX A: PROTOCOL FOR SEMI-STRUCTURED INTERVIEWS

MANAGING CONSTRUCTION PROJECTS IN THE UNITED ARAB EMIRATES TO GAIN COMPETITIVE ADVANTAGE

Dear Potential Participant,

My name is Sultan Alshamsi and I am a research student at the University of Wolverhampton. As a part of my programme I am carrying out a study into explore how the UAE construction organisations are managing construction projects to enhance competitive advantage. I would like to invite you to participate in the above research project, as you are possibly influential for the implementation of construction project management strategies in your organisation.

If you agree to participate you will be asked to:

- Participate in an interview (of maximum 30 minute's duration) with me to answer questions regarding how your organisation embeds construction project management strategies for improved competitiveness and what influences your organisation to do so. Questions will be topic specific and not of a personal nature, and you will not be asked to reveal any information which your organisation would regard as sensitive and not for public disclosure. You can choose not to answer questions.
- Complete the attached consent form and return it to me.

With your agreement, interviews will be tape recorded then transcribed onto a computer system. You may review, edit or erase the transcripts and tape recordings of your interview if you wish to do so. Recordings will then be destroyed. Your responses will be treated as confidential and computer transcripts will not contain references to any persons (including yourself) or organisations. Such references will be replaced by codes known only to me, and all data will be stored securely.

Once completed a summary of results will be available at the conclusion of this research study. If you wish to obtain a copy of these results, please provide your contact details. Please note that all data gathered for this research will be stored securely and destroyed after the report has been submitted. Supervision team and I will be the only people who will have access to this data.

Thank you for taking time to consider this invitation and if you choose to participate in this research. I would like to extend my personal gratitude; your contribution is greatly appreciated.

Sultan Alshamsi
University of Wolverhampton
Wulfruna Street, City Campus
WV1 1LY

Consent form

**MANAGING CONSTRUCTION PROJECTS IN THE UNITED ARAB EMIRATES
TO GAIN COMPETITIVE ADVANTAGE**

Consent Statement

- I agree to participate in the above research project and give my consent freely.
- I understand that the project will be conducted as described in the “Information Sheet”, a copy of which I have retained.
- I understand that I can withdraw from the project at any time and do not have to give a reason for withdrawing.
- I consent to participate in an interview with the researcher.
- I understand that my personal information will remain confidential to the researcher.
- I understand that my organisation will not be identified either directly or indirectly.
- I have had the opportunity to have questions answered to my satisfaction.

Print Name: _____

Signature: _____ Date: _____

Contact Address:

Phone Number: _____

Fax Number: _____

Email Address: _____

**MANAGING CONSTRUCTION PROJECTS IN THE UNITED ARAB EMIRATES
TO GAIN COMPETITIVE ADVANTAGE**

SEMI-STRUCTURED INTERVIEW QUESTIONS

Date	
Time of interview	
Organisation	

Name of Interviewee
Position of Interviewee
Organisation total employee size
Please kindly tell me a little about what your current job role is in the organisation?	
•	Given your role in this organisation, please explain what are the macro-environmental factors that impact on the UAE construction project management?
•	Can you describe the key drivers that have fuelled the need for managing construction projects in the UAE?
•	From the job role and responsibilities that you perform in this organisation, please, describe the key digital technologies that have been adopted for managing construction projects.
•	From the job role and responsibilities that you perform in this organisation, please, enlighten me on the key challenges the UAE construction organisations face in managing construction projects.
•	In your view is there a need for developing a project management competency framework for the benefit of UAE construction organisations?

Thank you for your views on the above questions. I would also like to thank you for the time you have dedicated to this research. If you are interested to know the outcome of this research, it would be my pleasure to share it with you.



Dear Sir/Madam

Re: Validating a project management competence framework

I am a PhD student at the University of Wolverhampton, U.K. and currently conducting an interview to validate a research framework titled as above. The overall aim of this research is to investigate how the UAE construction organisations are managing construction projects to enhance competitive advantage. This research will explore the key macro-environmental factors that impact on the UAE construction project management and the role which digital technologies will play in dealing with project management issues across a value chain.

This discussion aims to gather your responses which will help the researcher to validate the a project management competence framework that will subsequently be applied for the managing construction projects in the UAE. This cannot be effectively developed without your participation; therefore, you are requested to participate in this research discussion. This discussion is estimated to take about 30 minutes.

In order to protect your confidentiality, privacy, dignity and anonymity, your answers will be attached with a unique code that will only be understood and accessed by the researcher. This will be stored in a password-protected computer that only the researcher has access to. Finally, any data provided by you will be destroyed once the degree is achieved. The project has ethical approval for the study protocol from the University of Wolverhampton, which provides further assurance.

If you have further questions about your participation, please contact me or my supervisor using the details below.

Thank you in advance for your help in conducting this research and I am looking forward to seeing you at the validation interview.

With best regards

Sultan Alshamsi
University of Wolverhampton
Wulfruna Street, Wolverhampton.
England, WV1 1LY

Validating a project management competence framework

Purpose of this interview:

This focus of this interview is to validate a project management competence framework.

Respondent details:

- Name:
- Background:.....
- Position / Area of expertise:
- Organisation:
- Date:

Evaluation of the proposed competency framework:

1. What is your opinion on the level of completeness in terms of the overall contents of the proposed competence framework?
2. What is your opinion on the level of completeness in terms of the logic (i.e. flow/ sequence within the framework and how it mirrors what should be done) used within the proposed competence framework?
3. What is your opinion on the issues covered within the developed competence framework?
4. What is your opinion on the level of understanding of the proposed competence framework?
5. Do you have further comments/suggestions regarding any areas that need to be improved/included/deleted within the proposed competence framework?
6. Would you recommend the competence framework for use by your organisations in the UAE?