



**Influence of Project Managers Perception on The Success
of Projects in Relation To Early Engagement of
contractors And Suppliers**

**تأثير قدرات مدراء المشاريع على نجاح المشاريع في ظل التكلفة المبكر
للمقاولين والموردين**

by

Wael Saleem Alyan

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of the requirements for the degree of
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Dr. Khalid Almarri

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Abstract

The innovation in project management is highly required due to the massive expansion in project's sizes, values, functionalities and complexity. The projects are now a days being faced by plenty of challenges in terms of the high competition, confined budgets, multiple functions and high expectations by investors.

Moreover, the adoption of the innovation in construction field is relatively weak in comparison with the other industries. Hence, this research aims to add value to the existing literature about the influence of project manager perceptions factors on project success in relation of early engagement of contractors and suppliers procurement strategy. 13 factors of project managers perception and 9 factors of early engagement influence to the projects success were illustrated in this research.

This quantitative method was used in this research via online survey the targeted respondents were from the constructional projects field. The collected data were tested and found valid and reliable. SPSS software was used to display the analysis. The participants in this survey are relevant to the research topic.

The findings demonstrate an influence of project manager perceptions to project success in relation to the implementation of early engagement of contractors and suppliers as an innovative procurement.

Accordingly, the constructional projects concerned entities such as the clients, developers, authorities, consultants and contractors are advised to adopt such innovative procurement strategy and improve the project managers perception to secure best implementation of this innovative approach to reap the best outcome.

Keywords: *Project Manager perception, early engagement of contractors and suppliers, project success,*

ملخص البحث:

ان إدارة المشاريع بحاجة لتبني نهج الابتكار نظرا للتضخم الكبير في حجم و تعقيد المشاريع الانشائية، خصوصا و أن المشاريع المعاصرة باتت توجه العديد من التحديات من حيث المنافسة العالية و محدودية التمويل و تعدد الاستخدامات و توقع المردود العالي من قبل المستثمرين.

و قد لوحظ أن تبني نهج الابتكار في المشاريع مازال متواضعا بالمقارنة مع المجالات الأخرى، وعليه فإنني أهدف من خلال هذا البحث لا ضافة الجديد الى الأبحاث السابقة التي تناولت موضوع تأثير عوامل خبرات ومعارف مدراء المشاريع على نجاح المشاريع في ظل تبني نهج التعيين المبكر للمقاولين والموردين في المشاريع، ويتناول هذا البحث دراسة 13 عاملا لخبرات مدراء المشاريع و 9 عوامل إيجابية لتأثير تبني نهج التعيين المبكر و إيجاد العلاقة بينهما.

لقد تم اعتماد منهج الأبحاث الكمية في جمع البيانات من خلال طرح استبيان على شبكة الانترنت واستدراج تصويت عدد من الكوادر المتخصصة في إدارة المشاريع و قد تم تحليل ودراسة النتائج وكانت النتيجة فعالة حيث تشير مخرجات البحث الى صحة فرضية البحث المذكورة.

وعليه فإنني أوصي المؤسسات المعنية بمجال المشاريع بتبني هذا النهج المبتكر في التعاقد مع المقاولين والموردين في مرحلة مبكرة و تطوير خبرات وكفاءات مدراء المشاريع.

كلمات البحث: خبرة مدير المشروع، التعيين المبكر للمقاولين و الموردين، نجاح المشروع

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Chapter 1: Introduction

1.1 Background

There is an immense increment in innovation adoption in construction sector over time. An innovation in the construction industry is more related to new processes, material, approaches, methods, services, and some form of the construction at organization level, yet at project level. There is the existence of an agreement among researches that the project managers responsible for construction projects possess the significant role and participation in an innovation management, which is based on project level (Edum-Fotwe & McCaffer, 2000).

In addition to this, innovation and advance technology rate in the construction industry is relatively less as compare to other industries, due to industry's nature. It could be possible that few researches from R&D could be used for reasoning the restriction of growth in innovation. Hence, this study adds the evidences for the existence of knowledge that influence the perception of project managers and factors for delivering the innovation in construction at project level. There are numerous researches reflected on the changes in the project management and perceiving of leadership. The approach of Return on investment on the basis of 'iron triangle' of the cost, quality and time is replaced by the philosophy, which looks having wide range of benefits like increase administrative competencies and adding the value of organization involving in execution of the construction projects (Hwang & Ng, 2013; Lloyd-Walker & Walker, 2011; Svejvig & Andersen, 2015). Bringing changes in environment of construction industry were basically imposed on organizations, under some

critical circumstances like recession that change other traditional methods of procurement for alternative methods that influence project manager's role for keeping the abreast development in knowledge and skills (Edum-Fotwe & McCaffer, 2000; Shi, 2011).

The development of project management had some important growth because of increment in projects and skills in different level of organizations and firms (Winter, Smith, Morris & Cicmil, 2006). The abilities of project manager integrate and enhance some unique advancing activities needed for understanding the mind set and personality (Sauer & Reich, 2009).

Although this method is considered as appropriate for delivering the greater benefits, which are mostly linked with challenges and problems, which can be important enough to discourage the consumer or client and also their consultant, retraining them from implementation (Olawale, and Sun, 2010).

1.2 Major problems and challenges in the Construction market in UAE

In recent time, Construction industry is getting specialized more than any other firm and try to provide all the specialties required by the client, therefore, various specialist small size firms and businesses (contractors and subcontractors) with the narrow expertise also continues to work in order to meet complex and varied demand of the industry. This is the main reason for the increase in the demands of the interdependent specials and operating companies. As stated by Kale and Arditi, (2001) that the quality of the subcontractor and contractor relationship have impact on the ability of the main contractor's performance on the project that inevitably has the direct consequence of the project outcomes. This greatly implies about the relationship which become harmonious then before, there is also the possibility of bringing improvement in the performance and effectiveness of supply chain as

the participants, workers and employees of the project are able and responsible for planning and sharing the resources in the atmosphere of cooperation and collaboration. However, Dainty, Briscoe, and Millett, (2001), has claimed after realization that all the subcontractors have misgivings on the sincerity of the collaboration of supply chain. In this case existing relationships, specifically between the main contractors and subcontractors are riddled along the skepticism and mistrusts. For example, they believe that main contractors merely used by them for improving the cash flow and able to survive the construction business's volatility (Saad, Jones, and James, 2002).

There have been issues with the client perspective. Clients want exact estimated timeline for the completion of the project with proper outlined budget. This is what consultants are unable to provide, without the engagement of the contractors, and suppliers, because there have been various cases where suppliers terminate their agreement with the contractor or contractor terminate their agreement with suppliers. In such case, consultant is unable to retain the client, as he is unable to satisfy him. Clients are facing lack of trust and honest suggestions for the project. Consultants and contractors are disagreeing with their statement provided initially. They are also postponing the completion of the data. However, in many cases, there are clients who get satisfied with the work and approached the consultant many times after that (Morledge, 2008).

This issue got worse by the traditional procurement network and route's contractual structure, which exclude the subcontractors out from main contracts. Morledge, (2008) has argued that inability of the specialist contractors and subcontractors for contributing meaningfully in the process of construction under the hampers of traditional procurement bring the possibilities

of improving values on the projects. Subcontractors or suppliers or specialist contractors, plays the vital role in successfully delivering all the needed supplies and resources and the end projects as per the desire. It executes about 80% to 90% of volume of multiple works in housing and building projects. For having the important group excluded from the collaborative arrangements in process of construction leaves great volume to be required.

Owing to the large numbers and small size, they mostly require main contractors for coordinating their operations and function to provide the integration and focus of different parts. However, early engagement of the suppliers and contractors are important element in the construction sector, as with coordinating with the main contractors, it helps in focusing on the self-interest that remain unchanged in traditional procurement construction arrangement, as delivery processes of project are largely disconnected (Hampson, and Kwok, 1997). It leaves the place for rivalry between participants of project and fittest survives. In these situations, the traditional approach of construction procurement, contractual teams are mostly litigious and strictly applied no consideration or little to sustain the relationship for the future dealings of the business. Desire of this is to seek long-term benefits that could be arrived with the collaboration which is lacking between the participants of the project under the mentioned approach of project delivery (Morledge, 2008)

In the effort of addressing these challenges, government commissioned and industry- led enquiries were mostly undertaken for looking into practices of UAE construction industry. The result of all these enquiries were Carrillo, Anumba, and Kamara, (2000) reports. In other's reports, they identified the activities within construction industry of UAE were fragmented, ineffective, and inefficient. They have also revealed that the expectation of the

customers was not met and the practitioners in industry were all making low revenues. There are reports which called for the change in the attitude and for integration of the delivery of the project process in hope of successes of project are improved and all clients are served better. According to the Briscoe, Dainty, and Millett, (2001), fragmentation has made all the development of the unified approach for delivery of the project and continuity of team between key suppliers, members of supply chain and main contractors difficult over years. On the traditional type of procured projects, it is usually blamed about the dissatisfaction of the client with the completion of the projects. For improving the performance of the traditionally form of procured projects, therefore, the relationship of work between subcontractors, and main contractors need to be changed. However, regrettably, the usage of collaborative tools is nonexistent in the traditional procurement system, and the key participants are able to continue to endure and not able to enjoy the work relationship (Wolstenholme, Austin, Bairstow, Blumenthal, Lorimer, McGuckin, Rhys Jones, Ward, Whysall, Le Grand, and Guthrie, 2009).

1.3 Performance Improvement

The advantages of an integrating supply chain for bringing improvement in many projects' performances have been developed in many construction companies. It is not surprising as the participants of the projects are realizing the information and knowledge sharing is the key for the success of project, because it is the demand of the client and to run the business successfully, it is the rule to satisfy the clients. As observed by Bresnen and Marshall, (2000) and the Construction Excellence, there are number of benefits, some of which are related to projects like, it delivers the lower building or construction cost and expenses for clients and

the higher profits or revenues for the contractors. It help in improving the options of capturing the requirements of clients and the eventful satisfaction. It helps in protecting and recognizing the profit margin of main contractors and prepare them to be able to deliver better quality related to requirements of all projects. It also increases the predictability and value of the work. It helps in reducing the severity and number of different contractual disputes. It develop an environment which enable technical and innovative development and also encourage the processes of continuous improvement. It reduces the time of the completion of project and make the project complete in relatively shorter span. This all is done according to the requirement of the client and the charges and expense were told before so that at the work in progress time, they will not do any augments on expense. Consultants need to take follow ups continuously from the contractors.

The chances for the achievement of performance importance in construction projects needs to employ many collaborative approaches with the suppliers, because without their engagement it will be impossible for the contractors to complete the project and also to satisfy the client. Unfortunately, it is not much happen in procurement approaches yet, as to embrace the collaborative principles, principles of poor or bad performances are still not abating. According to Bresnen and Marshall, (2000) it is stated that however, contend all that evidences supporting claimed successes and achievement of collaborative construction projects which are doubtful. In its support, Briscoe, Dainty, and Millett, (2001), claimed that it is difficult for proving the activities of improving management and good integration on the construction projects. There are no consensus among professionals on all these claimed advantages, in the practical sense of the events. There are some general perception by participants of the projects, which collaborate in an appropriate manner for overcoming

issues and improving all overall performance of construction industry. This is the specific essential for subcontractors and main contractors' relationship, and consultant and contractors relationship, which effect the end consumer that are often plagued by problems and conflicts under the traditional construction system of procurement arrangements (Wolstenholme, Austin, Bairstow, Blumenthal, Lorimer, McGuckin, Rhys Jones, Ward, Whysall, Le Grand, and Guthrie, 2009).

1.4 Aims and Objectives

This research's aim is assessing in detail the influence of project managers perception on the success of the projects in relation to the early engagement of contractors and suppliers procurement approach. This in-depth assessment could be done by formulated questionnaire which will be according to the literature to identify the following objectives;

- To identify the project managers perception factors impact to the overall Early engagement procurement implementation.
- To identify the advantages of the approach of early engagement and their effect to the project success.
- This will formulate the influence of project manager's perception to the project success in relation with early engagement of contractors and supplier's procurement strategy.

The study hypotheses will be developed using quantitative method.

1.5 Research Questions

This study will generate number of questions gained from the literature. The answers will be the outcome of the performed survey and consequent analysis:

1. What is the project manager's perception?
2. What are the main factors measure the project manager's perception?
3. What do the early engagement of contractors and suppliers mean?
4. What are early engagement benefits to overall project success?
5. Does the project manager's perception have an impact on the early engagement?
6. Does the project manager's perception have an influence of the project success in light of early engagement?

1. 6 Significance of Research

The sector of construction in the UAE particularly in Dubai was suffering an important fall in 2009, due to the financial worldwide crisis or debt crisis of the World. A big number of pre-planned projects were put on hold or cancelled. The viewpoint of the construction sector of UAE it will be helpful for the coming year. For a country, the low prices of the cost of material are one of the major challenges a UAE also face this challenge in the construction industry. The construction industry is the major contributor to the growth of economy and government also make an investment in this sector heavily.

This study addresses the project manager's perception influence on the project success in light of early engagement of contractor and supplier innovative procurement technique. The researcher believes that good perception of project managers improved the implementation of early engagement as a procurement strategy meantime, this innovative procurement strategy has a good positive impact to the project success which is the main goal of project management.

Early-engagement of suppliers and contractors still un-popular which is the main reason discouraging the project stakeholders to adopt it.

1.8 Research Methodology

This research study focused on the challenges and advantages from the views and perspectives of the consultants, clients, suppliers and contractors. This research will be based on the survey and questionnaires will be formulated relevant to the literature review about early engagement of the suppliers and contractors in the UAE's construction market. Participants along with relevant studies and experiences in UAE market, for helping in amassing the views and perception of the system which are reflective of multiple facts on ground.

Exploratory data will help in exploring and examining about early engagement of the suppliers and contractors in the UAE's construction market. Both secondary and primary research method will be selected. Past and published journal, internet, articles, and websites will be used, however questionnaire will be designed for the primary data collection. Around 151 participants will be selected for completing questionnaire. SPSS will be selected for measuring the credibility and reliability of data. Correlation and Chron Bach Alpha will be measured. The objective of questionnaire attached will identify the correlations:

1. Questionnaire part 2: influence of project managers perception factor wise on the early engagement implementation
2. Questionnaire part 3: influence of EE to the project success.

1.9 Chapter Organization

This research paper contains five chapters in total and its outlines are stated below.

First is chapter 1, introduction of this research paper which contains background of the subject, problem statement, aims and objectives, research questions, scope of the research and limitation, significance of this research, methodology of the research and lastly conclusion with outline of the study.

Second is chapter 2, literature review, which discusses the overview of the project and construction sector, main trends in the UAE's construction market, major problems, and the challenge faced in the construction market, performance improvement, and conflicts or issues of subcontractors and contractors.

Third is chapter 3, research methodology, which describes the best suitable and selected research designs, strategies, and philosophies, methods of collecting data, sample size and also the ethical limitations and considerations.

Fourth is chapter 4, data analysis in which findings and discussions will be included and discussed in detail about the subject, evaluation will be done according to the topic relevancy.

Fifth is chapter 5, conclusion, recommendations will be provided along with the brief summary of the whole research paper.

1.10 Study Hypothesis

This study aims to verify number of hypothesis which be summarized as follow:

H1: The project manager perceptions factors have an impact on the implementation of early engagement of contractors and suppliers

H2: The early engagement of contractors and suppliers has influence on the success of the project.

H3: The project managers perception has an influence on the project success in relation with early engagement of contractors and suppliers.

1.11 Summary

This research has the ability to provide the good understanding of the issues related to the construction of the UAE in order to make it successful in the state. There are some factors that are like the hurdles in the success of this industry in which the most important are the perception of the project managers and the early engagement. The research is based on these factors that how these factors affect the satisfaction of the clients and how these can be used to make them satisfy.

Chapter 2: Literature Review

2.1 OVERVIEW OF THE CONSTRUCTION AND PROJECTS SECTOR

In UAE, especially Dubai and Abu Dhabi, the construction industry had suffered the major blow in the year 2009, following with the financial crisis across the globe and debt crisis of Dubai world. Greater number of projects that were planned put on hold or got cancelled.

High gas and oil revenues in 2008-2014, expanded sector of tourism, re-export aided and flourishing industry aided the economic recovery of UAE. By the end of 2012, confidence of consumer had regained and the activities of real estate and prices picked up once again, in turn bringing benefits for the construction sector. The pace of growth is now lower than prior to 2009 downturn. Level of investments are undertaken cautiously and laid more focus towards infrastructure, hospitality, commercial projects and retail (Saad, Jones, and James, 2002; United Arab Emirates, 2017).

UAE construction sector has the positive outlook for the past many years and for future years also. Although, the decline in the oil prices had brought challenges for the economy, where hydrocarbons sector contributes almost 34.3% to Nominal GDP (2014) of the country, the construction industry is set for gaining benefits from the further development and growth of tourism industry, different international events like Expo 2020, greater investments of government in infrastructure and transportation and also from the political unrest and disputes in regions, UAE still able to continue to maintain the status of “safe haven” (United Arab Emirates, 2017).

By today’s innovative technology, as well as management understanding the technique of project management, project’s construction continues to delays of suffering as well as completion of projects dates still grow pushed back. The occurrence of delays has any reason. They can be due to poor organization, rework, strikes, change order, equipment failure, shortage of material and so on. Delays are mostly interconnected and make the situation more complex. In the mostly project’s construction delays happen, whether complex or simple.

Delays in construction can be defined as the overrun of time moreover beyond the date of the contract or also beyond the date in which parties are satisfied for the project's delivery.

Delays are characterized as difficult and complex due to numbers of activity which have to deal by any projects of construction. Causes of delay project construction researchers have studied them. A number of changing in orders with the owner having the deal by many changes ranked of orders as the second very important delay reason from the outlook of the constructor as well as third important as per consultant. In fact, several experts agree on that the change of excessive orders has a great effect on the construction project of financial performance. Change in orders has the ability to break or make a job.

2.2 Main Trends

It was inconvenient to use the conventional procurement strategy because of high risk and uncertainty involved in big projects. Such traditional procurement strategy also has an inaccurate cost and time estimation. Whereas the innovative procurement strategy overcomes all the drawbacks of traditional procurement strategy. It gives more realistic and accurate estimation of the time period and the cost. The cost of order change in the construction industry is approximately 5% to 10 % and this change in order is consider one of the fundamental factors of order delay. The interference of the operation of construction is also the reason of delay project. This is the reason that the contractor blames the consultant about the rapid change in orders. Poor scheduling and planning of the project through the contractor in cooperation both the consultant and owner ranked this delay reason is most important. The serious importance of this reason can be seen visibly by noticing the comparatively high ranks given with both the owner and consultant for the

bellowing delay reason relating both indirectly and directly to scheduling and poor planning of the project with the contractor.

Shortage of manpower like semi-skilled, unskilled labour, skilled and Manpower shortage ranker is third important delay reason from the point of view of the constructor. Skilled, Manpower shortage, unskilled, semi-skilled has been a major delay reason for residential project construction in Jordan. Currently, the region of Middle East has been suffering a boom in project construction because of war and increasing the price of oil resultant in access liquidity as well as a developed demand for the opportunities of investment. The residential construction boom of Jordanian has been accompanied by the shortage in manpower foreign leading to increasing the wages as well as adding to the burden of financing on the contractor. it describes the reliance of contractor on cheap, labour of unskilled. This fact is most revealing in that he ties by high ranks specified by the owner as well as the consultant to scheduling and poor planning of the project through the contractor as well as the technical staff of is assigned to the incompetent projects.

On the construction sites, the UAE is facing the achieving sustainability challenges. One of the major barriers lies increasing the amount of wastage of material generated from the dumped in landfills as well as construction activities. In pursuing, the sustainable development mission, numbers of countries are working to maintain a stability between developing the environment of built as well as securing the natural environment. This stability may only be achieved by shifting from the production of the traditional linear method to a cyclic method that is based on the prevention, recycling as well as reuse of material waste.

2.3 Project Success

According to Tuman (1988), projects, in general, involve serious and risky undertakings to be accomplished within a specific limitation in time and cost also fulfilling a predefined quality and performance. The Standish Group's Chaos Report published in 2009 stated that only 32% of all the projects under survey were considered successful. But what decides whether a project is successful or failed?

Muller & Turner (2007) defined the success criteria as the variables used to measure the project success. These variables are dependent to the stakeholder's perspective. Horne, there should be a pre-defined criterion to define their interest and outcomes expected from the project. The desired criteria is dependent to the project nature and complexity

The notion that revolves around what constitutes success for projects has been thoroughly debated in the field of project management. Earlier works seem to encompass the definition of project success by three factors including time, budget and performance. However, more recent works came to agree that it's an imperative that the client's satisfaction is added to that list. (Pinto and Slevin, 1988). In fact, in most cases the way clients perceive success is the basis for determining the outcome of the projects (Westhuizen and Fitzgerald, 2005).

2.3.1 Types of Project Success

The project success can be categorized to two main categories which are: the project objectives achievement and the project management success.

According to de Wit (1988), the project succeeds when the predefined objectives met. Also it is deemed imperative to consider the project management success, which is crucial to the successful delivery of the project in terms of allocated time, cost, quality, performance and specifications. De Wit (1988) also stated that while the two types of success are often conflated, plenty of projects were found successful on one front and failed on the other. The findings in Prabhakar's work (2008) were found similar to the aforementioned ones. Prabhakar asserted that the project success measured based on the project objectives is different from project delivery success measured upon the degree of the fulfilment of the budget, time and quality standards. He also highlighted the importance of the perception of the success criteria among the project stake holders.

A more elaborate categorization of project success was introduced by Sadeh and Pines (2006), which comprised four dimensions, each depending on a number of measures as shown in Exhibit A below.

Success Dimensions	Success Measures
Meeting design goals	Functional specifications Technical specifications Schedule goals Budget goals
Benefit to the end-user	Meeting acquisition goals Answering the operational need Product entered service Reached the end-user on time Product had a substantial time for use Meaningful improvement of user operational level User is satisfied with product
Benefit to the developing organization	Relatively high profit Opened a new market Created a new product line Developed a new technological capability Increased positive reputation
Benefit to the community, and national infrastructure	Contributed to critical subjects Maintaining a flow of updated generations Decreasing dependence on outside sources Contribution to other projects

Exhibit A: Project Success Dimensions and Measures (Sadeh and Pines, 2006)

2.4 What do Early Engagement means?

For the construction projects, contractors, and sub-contractors are selected mostly by the process of non-monetary selection, where great emphasis is laid on the proposed team's capability, as it depend on the selected model of early engagement, margins and rates. The process of tenders is usually interactive and allows the principal to have the feelings of behaviors of contracting for tenderers. When awarding the contract, it can be standalone with the pre-construction agreement, or a contract, with two different stages. Collaborative

behaviors are encouraged and motivated, stage one is about the effective communication and good collaboration benefits (Grierson, 2012).

Stage one of the early engagement of the contractor model involves the proceeding with the contractor for designing the development according to the design stage or preliminary design. Such form of development is mostly undertaken on the basis of cost reimbursement, which encourages the assessment and exploration of the innovative design substitutes. During this stage, issues and value engineering with the constructability could be addressed and identify the proper risks, apportioned and mitigated (Blayse, and Manley, 2004).

Stage 1 summarize the detailed design submission and the pricing strategies for stage two from contractors. However, Stage 2 tends to be fairly traditional design build agreement or contract. This is a major difference from the alliance. The second stage is mostly lump sum. In many cases, traditional designs establish the model that works well on the basis of documenting, because of the well-defined scope of work, as the outcome of first stage. The major issues of construction projects have been resolved, mitigated, after the identification. Further collaborations will be done and also the incentivizing of contractors (Grierson, 2012).

2.5 Advantages of the Early Engagement of Contractors and Suppliers factors'

impact to the project success:

This concerns the effect of early engagement of contractors and suppliers on the overall projects success:

2.5.1 Cost wise

The supplier's early engagement has been considered as one of the key innovative approach as it boost the productivity and saves cost. For completion of the contract at right time is greatly dependent on the control of cost and budgeting. Many times clients are not comfortable with extra spending other than budgeted estimates. Hence, early engagement of suppliers prevent from chaos (Eadie and Graham, 2014).

a. Best cost control:

Early engagement enhances the overall cost control of the project since it can reduce the opportunities of cost variations. The project design and specifications are more reliable and much precise than the specifications and design in conventional projects which eliminate the discrepancies, uncoordinated items and missing elements (Lahdenperä, 2010).

b. Management of cash flow:

The early engagement of the supplier and contractors in the construction industry leads to the overall improvement in time delivery of the project with relatively lower cost and lower chances of over running the cash flow and cost (Blayse, and Manley, 2004).

c. Best value Engineering opportunities:

Esteem building is characterized as: "a precise approach that looks to upgrade an incentive by wiping out pointless cost while look after capacity" An esteem building exercise is more thorough than the run of the mill venture audit: it should look to unite an unbiased group of experts with the regular motivation behind enhancing the undertaking outline. Esteem Engineering centers intensely around item investigation and item deterioration so as to break down esteem. Task Management utilizes item examination to disintegrate item and venture scope amid the start and arranging forms. It helps in getting success in the project by Staying inside the undertaking's financial plan while giving more degree to the building or venture. Decreasing the financial plan while giving a similar degree required to the building or venture (Wagner and LG ,2014)

2.5.2 Time wise

It saves time and prevent disputes from occurring. Prevention from unnecessary arguments may overrun the productivity levels. Early engagement of suppliers means time will be saved from overrunning in chaos and every process will be done systematically and in an organized manner (Lahdenperä, 2010).

a. Effective time frame management

The early engagement of the suppliers and contractors in the construction project could help in saving significant amount of time and complete the project before estimated time. It plays effective role to the construction process by determining the optimum construction methods and tools. On the other hand, the early engagement would introduce much more precise time

frame of site construction activities (Lahdenperä, 2013). It has been found by Saad, Jones, and James, (2002), the best possible way for completing the project early before the deadline, is to design and prepare the architecture before the time and is too based on designing viable equipment, fast construction, equipment, and techniques that are necessary with the early involvement of contractor.

b. Preventing disputes:

This is one of the major advantages of early engagement of the suppliers and contractors in the construction industry, because it has the ability for reducing the disputes opportunities. This is mainly reached by the proper execution of the contracts which demonstrate the responsibilities and relationships among the involved stakeholders in transparent way and eliminates the dispute reasons (Infrastructure Australia, 2008).

c. Risk mitigation:

Because of its collaborative nature, it helps in augmenting the project certainty and reduce the level of risks. It has been found by the Osipova and Eriksson (2011) that many projects are using traditional procurement which suffered variations in time and cost. It was also observed that projects in which suppliers are involved from early stages has shown relatively better capabilities for managing the risk completely and avoid such variations.

2.5.3 Quality wise

It improves the quality more as compare to their late involvement, because early engagement provides it more time to keenly observe everything and in case of finding any mistake, they could be able to solve it on point, to avoid mistakes ahead. In case of need of any new material

or resource, enough time will be available to the supplier for arranging it (Saad, Jones, and James, 2002). Early work with good quality in less cost is the major aim and demand of every client.

a. Creative Teamwork and appropriate estimation of team:

Creativity is developed because of the efforts of multiple parties for achieving the desired outcomes and goals and helps in overcoming the various challenges and differences. As stated by Ozorhon, (2013), investigation was done with four different case studies, the early engagement of the suppliers and contractors was observed for bolstering the collaborative working and projects among the group members for completing the creative construction project and in construction industry. It is necessary for outlining the more precise and realistic estimates of time needed to be made, for the outcome of the casting suppliers and contractors in the designing stage of the construction projects stated by (Eadie and Graham, 2014). It is done mostly because contractors and suppliers are capable enough for estimating and predicting the situations of contractors on the site that are accommodated with the timeline. The early engagement of the supplier and contractors plays the vital role towards augmentation of the team and stakeholders' integration in different procedures. It has been observed by the Dainty, Briscoe, and Millett, (2001), that higher degree of integration can be able to achieve the constructor with the desired outcomes.

b. Enhancement of Design quality:

When the vision of the contractor is incorporated or unaligned with the design and

architecting phase, it can increase the projects' performance on several fronts which include cost, productivity and time. It is stated by Eadie and Graham, (2014) that early engagement of the suppliers and contractors at the designing phase plays a vital role in finding the solutions for the constructability problems and also improve the entire projects' performance.

c. Good quality assurance and control:

Fragmentation is one of the largest inhibitors of the quality. This increase the usage of modern procurement approaches which include the early engagement of the contractors, (Gorman, 2013). It has been concluded in the study of Gransberg, (2013), that consultants, clients and contractors concurred the modern procurement approach for efficiency route to have better time and quality control. Good quality control and assurance helps in enhancing the consumer loyalty. Furthermore when there will be strict control over quality it keeps all the workers motivated and alert that helps in achieving the goal of the project and eventually resulted in success

Just like any of the other procurement approaches, the success of projects using the early engagement approach is highly dependent on the project management traits (Bakar et al 2011). In this section, a review of the relevant literature regarding the influential project manager's perceptions is presented and discussed. The project manager's traits were broken down into three categories: leadership, capabilities and skills.

2.6 Effect of Project Manager's Perceptions and Traits on the Early Engagement of Contractors and Suppliers Process

Just like any of the other procurement approaches, the success of projects using the early engagement approach is highly dependent on the project management traits (Bakar et al 2011). In this section, a review of the relevant literature regarding the influential project manager's perceptions is presented and discussed. The project manager's traits were broken down into three categories: leadership, capabilities and skills.

2.6.1 Leadership

A project manager's leadership is regarded as one of the most important driving forces for the subordinates' performance (Kissi, Dainty & Liu 2012). It is also an essential tool for creating and sustaining innovation throughout the project activities (Bossink 2004) and among the project team members (Panuwatwanich, Stewart & Mohamed 2008) and (Kissi, Dainty & Liu 2012).

The success of projects is governed, to a far extent, by the leadership style of the project manager (Fisher 2011). This is due to the fact that it decides the way direction is provided to the project team and how the project goals and objectives are attained (Dulaimi, Nepal & Park 2005). An empowered project manager is capable of delivering innovation to the project and overcoming obstacles (Dulaimi, Nepal & Park 2005). The leadership of project manager manifests itself in a number of ways that reflect the abilities of the manager. This includes knowledge sharing, experience, financial knowledge and organizing.

a. Efforts to transfer of knowledge and experience:

The sharing of knowledge and experience is vital to the integration among the project teams and enhancing the innovation and quality of the deliverables (Blayse & Manley 2004; Lloyd-Walker, Mills & Walker 2014). Transferring knowledge, experience and skills creates a more productive environment, which is instrumental to the success of the project and its delivery (Baiden, Price & Dainty 2006). The project manager plays a major role in encouraging the team members to collaborate and share information (Fisher 2011).

b. Relevant experience and technical knowledge:

Relevant experience and technical knowledge enables the project manager to use his/her leadership skills to deliver the project success (Edum-Fotwe & McCaffer 2000). In addition, the relevant experience and knowledge can formulate the project manager's perception of the project success and its measures (Muller & Turner 2007). The importance of experience and knowledge is directly proportional to the project level (Keegan & Turner 2002).

c. Financial and procurement knowledge:

Besides technical knowledge, the delivery process of projects is significantly affected by the financial and procurement knowledge of the project manager (Baiden, Price & Dainty 2006). Financial and procurement knowledge help identify the appropriate procurement methods that create an integrated team and enhance innovation in projects (Blayse & Manley 2004; Dulaimi et al 2002; Lloyd-Walker, Mills & Walker 2014).

d. Ability to organise responsibilities between project members:

Large-scale projects feature a wide array of disciplines that require good organizing of responsibilities among the project members. The diversity of disciplines and the concomitant goals, requirements and cultures require good organization to create a cohesive fabric where the performance and attitudes of team members are enhanced (Baiden, Price & Dainty 2006).

There are many works of literature that identified to major styles of leadership. The first style is the transactional style which is basically the representation of communication between managers and other team members in order to get the desired result. This style is important for the surface of the project of construction because without clear communication desired result cannot be achieved. This type of leadership has the positive impact on the perception of manager of the project. The other style of leadership is the transformational style which is basically the style that has the objective to change the thinking style of the other members of the construction team. This style is opposite to the previous style because it is associated with the emotions and feelings of the other team members. However, this style is useful for bringing the innovations and increase the satisfaction of client in the industry of construction. Both styles of leadership are related to the perception of the manager of the project who has to make the decision about the project and also responsible to integrate the different ingredients of the projects into use. So, the style of project manager leadership is also crucial to the success of the project.

2.6.2 Capabilities

Capabilities are the characteristics possessed by an individual that enable him/her to perform certain tasks or take on certain challenges. Capabilities that define the effectiveness of project managers comprise knowledge, technical skills, and performance (Murphy, Perera & Heaney 2015). In addition, commitment and administrative abilities of managers are critical in the project execution phases (Babu & Sudhakar 2015). Murphy, Perera & Heaney (2015) asserted that the capabilities of project managers can decide the success and failure of projects.

a. Understanding of the required result and deliverables:

Understanding the required results and deliverables: the responsibility of the success of the construction projects, in general, within the identified constraints is attributable to the project manager (Edum-Fotwe & McCaffer 2000). Lack of clarity and other uncertainties result in difficulties for the project manager's attempts at innovation.

b. Understanding the project processes and technology:

Understanding project processes and technology assists the project manager in delivering success through wielding technical capability to overcome uncertainties associated with the project activities (Bossink 2004; Blayse & Manley 2004). The project manager must be able to analyze the project processes before and during implementation (Murphy, Perera & Heaney 2015). Another important capability is the project management knowledge, which

the information and background needed for the specific works to be implemented (Crawford 2005).

c. Project management knowledge:

The project management knowledge forms the basis for creating effective execution plans and utilizing project management techniques such as establishing KPIs, which help boost the project performance (Fisher 2011). The project manager is responsible for applying the appropriate management techniques to plan and implement the construction projects in a successful manner (Babu & Sudhakar 2015).

d. Ability to build trust among project stakeholders:

One major capability of the project manager that is crucial to the success of the project is the building trust. Trust among collaborating parties should be reciprocal to ensure the success of the collaborative work (Bosch-Sijtsema & Postma 2009). Also, building trust between leaders and subordinates bolsters their commitment to accomplishing the organization's goals and enhances their ability to create and implement innovative ideas (Kissi, Dainty & Liu 2012). In addition, building trust help create a collaborative and friendly environment to share and discuss knowledge (Lloyd-Walker, Mills & Walker 2014). This collaborative environment helps team members address problems and alleviate concerns. An environment of trust can be achieved through the personal contact between project manager and other members (Kissi, Dainty & Liu 2012).

e. Ability to adapt change:

In addition to the previously mentioned capabilities of project managers, the ability to adapt to change is very crucial to the success and innovation of projects. This capability defines the project manager's capacity to incorporate new ideas in the various construction projects activities. This ensures a continuous process of enhancement and innovation in construction projects, which is instrumental to the success of these projects (Creasy & Anantatmula 2013).

2.6.3 Skills

To fulfil their many professional responsibilities, construction project managers need both engineering and non-engineering knowledge and skills (Edum-Fotwe & McCaffer 2000). Fisher (2011) asserted that competence is achieved once the right skills are deployed, leading to the performance of construction project managers. Complex projects, in general, require a wider variety of managerial skills (Bakar et al 2011). In this section, a number of studies highlighting the importance of the project manager's skills in delivering the success of projects are reviewed. The skills influencing the success of projects fall into the following major items:

a. Ability to evaluate of the project and the financial outcome:

Evaluation of the project and its financial outcomes is one of the most critical skills to project success (Bakar et al 2011; Cserhati & Szabo 2014; Davis 2014; Edum-Fotwe & McCaffer 2000; Fisher 2011; Munns & Bjeirmi 1996; Jari & Bhangale 2013; Walton 1984). The bulk of the importance of evaluation lies in the fact that it can influence the crucial decisions taken

by the project manager and the project team along the course of the project (Davis 2014). Financial evaluation skills enable projects managers to understand the status of the project and monitor costs and timelines in conjunction with the financial managers (Gann & Salter 2000).

b. Planning and control skills:

Another type of skills that impacts the success of the project is the planning and control skills, which involve the management and control of materials, resources, labour and all relevant activities (Bosch-Sijtsema & Postma 2009).

c. Managerial skills:

The manager's ability to control resources and make decision creates a fertile environment for success and innovation (Dulaimi, Nepal & Park 2005). The role of the project manager involves coordinating among the project parties and making the right decisions with regards to the implementation (Slaughter 2000).

d. Ability to negotiate innovative ideas:

In addition to the previously mentioned skills, the project manager's ability to negotiate innovative ideas among the project participant is crucial to the success of construction projects (Blayse & Manley 2004; Bygballe & Ingemansson 2014; Slaughter 1998; Slaughter 2000; Winch 1998). The project manager should be able to not only create and adopt innovative ideas, but also convince the different project parties of these ideas (Dulaimi, Nepal

& Park 2005; Slaughter 2000) and eventually secure all the necessary approvals for implementation. Negotiating ideas successfully is possible only through possessing the required technical, managerial and social skills (Dulaimi, Nepal & Park 2005).

Chapter 3: Conceptual Framework

3.1 Introduction

This chapter is basically the association between the practical feedback and the literature review. The feedback is collected by the experts and other participants and also based on the purpose or the aim of the research. There are also some factors as well as the method of the analysis that has the influence over the method of the selection of the particular analysis that is being identified. So, there is a need to develop the conceptual framework, as it has the attributes to develop the way to understand the manager perception and the early engagement role in the construction industry of the UAE. The conceptual framework also provides the view that how these approaches can be used to generate the better results in this industry.

3.2 Conceptual model:

Research Factors		Reference
Early Engagemen	Best cost control	Lahdenperä, 2010
	Management of cashflow	Blayse, and Manley, 2004

Research Factors		Reference
	Best value engineering opportunity	Wagner and LG ,2014
	Effective time frame management	(Lahdenperä, 2013), (Saad, Jones, and James, 2002)
	Preventing disputes	Infrastructure Australia, 2008
	Risk mitigation	Osipova and Eriksson, 2011
	Creative team work and appropriate estimation of team	(Osipova and Eriksson, 201), (Eadie and Graham, 2014)
	Enhancement of design quality	Eadie and Graham, 2014
	Good quality assurance and control	(Gorman, 2013), (Gransberg,2013), (Bakar et al 2011)
Project managers perception factors influence to early engagement	Project manager's efforts to transfer of knowledge and experience among the project teams	(Kissi, Dainty & Liu 2012), (Bossink 2004), (Panuwatwanich, Stewart & Mohamed 2008) and (Kissi, Dainty & Liu 2012).
	Project manager's Relevant experience and technical knowledge	(Edum-Fotwe & McCaffer, 2000), (Keegan & Turner 2002)

Research Factors	Reference
Project manager's Financial and procurement knowledge	(Baiden, Price & Dainty 2006), (Blayse & Manley 2004), (Dulaimi et al 2002; Lloyd-Walker, Mills & Walker 2014).
Project manager's ability to organise responsibilities between project members	Baiden, Price & Dainty 2006
Project manager's understanding of the required result and deliverables	Edum-Fotwe & McCaffer 2000
Project manager's understanding the project processes and technology	(Bossink 2004; Blayse & Manley 2004), (Murphy, Perera & Heaney 2015), (Crawford 2005)
Project manager's project management knowledge	(Fisher 2011), (Babu & Sudhakar 2015)
Project manager's ability to build trust among project stakeholders	work (Bosch-Sijtsema & Postma 2009), (Kissi, Dainty & Liu 2012)

Research Factors	Reference
Project manager’s ability to adapt change	Creasy & Anantatmula 2013
Project manager’s ability to evaluate of the project and the financial outcome	(Bakar et al 2011), (Cserhati & Szabo 2014), (Davis, 2014) (Edum-Fotwe & McCaffer 2000) (Fisher 2011), (Munns & Bjeirmi, 1996(, (Jari & Bhangale 2013)
Project manager’s planning and control skills	Bosch-Sijtsema & Postma 2009
Project manager’s managerial skills	(Dulaimi, Nepal & Park 2005), (Slaughter 2000)
Project manager’s ability to negotiate innovative idea	(Blayse & Manley 2004; Bygballe & Ingemansson 2014), (Slaughter 1998), (Slaughter, 2000), (Winch 1998). (Dulaimi, Nepal & Park 2005)

The major aim of this research is to make the analysis of the perceptions of the manager of project as well as the early engagement in the construction industry and the success of the project in the United Arab Emirates. The conceptual framework of the research is developed with the help of literature review that represent the construction industry in the United Arab Emirates and also explain the relationship between the manager’s perception and early engagement on the project success. The above table represent the researches that are being used in order to explain the issue and is also relevant to the topic of discussion.

3.3 Summary

This chapter represents the conceptual framework that explains the project manager perception and the early engagement effects on the success of the projects related to the construction industry. The table of this chapter explain different important factors that are extracted from the literature review that is based on the previous studies like the construction market, challenges to this market in UAE, performance improvement, early engagement, sills, capabilities, leadership, cost wise and quality wise, sampling, data collection etc. the literature review also provides the view that these factors have the influence on the two major variables that have the direct association with the success of the construction project. So, the following chapter explains the methodology of research.

Chapter 4: Research Methodology

4.1 Overview of chapter

Research methodology identifies and determine different methods, tools, approaches and techniques for anticipating the detailed outline of the research. The methodology of the research clearly describe instruments, suited for gatherings, methods, analysis and collection

of gathered data (Kothari, 2004). The research methodology chapter will discuss and examined the specific selected techniques, approaches, and tools for identifying engagement of suppliers and contractors in UAE market. Strategies and methodologies along with discussion of the selected approaches and there advantages or disadvantages will be explain in detail. Sample size, strategies, analysis, design, methods of collecting data will be explained according to the topic for the research. All the proposed research methods, designs, philosophies and sample size which best fit for the subject will be reflected in this chapter. The ethical limitations are also discussed so that all the research must be done in an ethical manner.

4.2: Research Philosophy

Best fit research philosophy is a necessary component of this chapter or for conducting research, because it helps in providing the suitable manner or way for nicely gathering the accurate data for the research, examine and its usage. It helps in reflecting perceptions and thoughts of researchers who are involved in this subject (Kumar, 2014). It provides the comparison findings, opinions and thoughts with an events' reality and true happenings. Basically, there are four forms of philosophies; inter-pretivism, positivism, pragmatism and realism. In this research, some philosophies are used which represent the acceptance of the subject towards finding approaches and methods of early engagement of suppliers and contractors in UAE market (Lindgreen, 2012).

According to the Kumar, (2014), an importance of different research philosophies. It stated two major way for researching about any subject; ontological and epistemological manner of an assumption. Positivism is selected for this subject because it was best for this subject. The

whole research is fully based on concepts findings and factors of the early engagement of the suppliers and contractors in UAE market. The research turns towards specific investigation. Hence, ontological manner is supporting this investigation of analysis and examination. Moreover, concepts found in investigation and data collection are done on the basis of recent phenomena and it supports ontological manner, and positivism fit with this manner.

Selection of positivism philosophy was done only on the basis of its attribute of supporting and helping the gathered data, information and findings by researching on multiple phenomena and taking references of many other studies made by quantitative methods. It assist, helps and support objectivity of knowledge or information for an interpretation of different events happening in reality. It further it help, allows and assist the subject in the investigation of the research which is on the bases of hypotheses testing. It helps in investigating early engagement of the suppliers and contractors in the UAE market (Killam, 2013).

Lindgreen, (2012) mentioned the advantages of positivism in his research in terms of its determination of objective components of information, hence, it participates in gathering information on the basis of facts and accurate data, which could be examined through quantitative for of data collection about the early engagement of suppliers and contractors in UAE market. Moreover, it give explanations about investigated factors. However, with this approach it is difficult for supporting and carrying out subjectivity of data or information as components on the basis of not analyzed subjectivity level.

4.3 Research Approach

For the objective or purpose of the research, there are particularly two strategies; deductive and inductive strategy. By Gray, (2013), selection of any strategy out of these two will be done on the basis of a paradigm of the research study and also the problem statement identified for conducting the research study. These influences the flow of data in study, thus, reflecting on its importance during its selection after identifying problem statements. Deductive strategy was best suited for this research study.

Deductive strategy is best for this study because it helps in assisting the movement of the information in study in more systematic way i.e. from the top to bottom. This indicate the information or data flow which was collected initially through opinions theoretically, so that problems could be identified and hypotheses statements could be developed and designed, and outcome could be investigated. It finds the outcomes on the basis of perceiving behaviors and attitudes of suppliers and contractors in the market in construction industry (Bryman, 2015). It helps the collection of fata through quantitative method in the regards of early engagement of the suppliers and contractors in the UAE market in construction industry. Hence, the literature review is completely based on determination of early engagement of the suppliers and contractors and the factors that affect their engagement level and also the challenges or problems faced by the construction companies in the industry. It is a proof in theoretical framework which move forward to the significance and importance of hypotheses testing. Advantages for choosing deductive strategy is the systematic order of information flow which explores the research questions of the study. The cons is that it does not provide assistance in explaining the secondary information.

4.4 Research Design

According to Creswell and Clark, (2007), there are three researchers design suggested; explanatory, descriptive and exploratory design. Particularly for this study, explanatory design is chosen due to its attribute of assisting and supporting findings of the study and also its occurrence on the basis of elaboration of impacts, causes and effect relationships. This research is particularly for the findings of the data for early engagement of the suppliers and contractors in the construction market of UAE. Thus, the study was done on the basis of interpretation and explanation of chosen events and examine the topic and relationship of the two major variables. This selected research design helps in providing the assistance in determining the relationship of two main variables of topic or subject along with its impact and factors. However, the problem with this is that its elements are linked with research subject which do not investigated up to the fullest degree.

4.5 Methods of Data-Collection

Data collection could be done by three ways; mixed, multiple and mono method (Katsirikou and Skidas, 2010). The mono method refers to the use of only one method for investigation, it could be quantitative or qualitative method. Multiple method refers to the use of methodologies which focus towards different philosophical approaches and research. For this study, data collection was mono and the method used is quantitative method (Robson and Neuman, 2012).

Quantitative method was used for data collection as it helps in assisting the data findings and also its interpretation in the quantitative approach. Furthermore, research philosophy was the positivism and the research approach is deductive, so quantitative method best fit for this. It

also helps in collecting and gathering the scientific evidence for result and phenomena. This further helps in the elimination of the additional factors which were external such as biased perceptions and statements about the topic and Give the analysis along with an explanation. This is completely based in early engagement of suppliers and contractors in the construction industry in the UAE market, and analysis was conducted for the selected method with quantitative design because of its assistance in the factors determining the early engagement of contractors and suppliers.

A quantitative design has some advantages and disadvantages. It is beneficial as it helps in analyzing the research framework and also dependent on quantitative way of collecting information, interpretation and find scientific evidences. Whereas, the disadvantage is that it is failed in providing justification based on subjectivity on early engagement of suppliers and contractors in the construction industry in UAE market.

4.6: Sources of Information

As stated by Billing and Waterman, (2014), about the sources of collecting information are two mainly primary or a secondary source. The primary source has another name i.e. direct source. It has direct impact on the study. However, secondary source refers to the collection of data from past researches in the relevant field. For this study, both sources are used for gathering accurate information.

Both the information sources are selected with the main objective of the research, because primary source provides assistance in aspects of the quantitative examination, however secondary sources are used for aligning subjective tools and instruments for statistical records and proofs for achieving the outcome on the basis of elaboration. The primary source are

contractors and suppliers and also employees of construction companies while, secondary source are journals, research, books and other online materials.

Advantages of the both sources are there helps which provide the elaborated discussion from different aspects or providing explanation for mentioned hypothetical statements. Both sources provide the relevant information about the early engagement of the suppliers and contractors in the construction industry in UAE market, with in the time constraints and other limitations were also taken into consideration.

4.7 Instruments for gathering data

Primary source used for gathering data in this study, and the researches has used the questionnaires. Close ended questionnaires were developed and designed very carefully and relevant to the subject, where each and every variable was defined clearly (Manion and Morrison, 2013). Different statements were designed and created in consideration of reactions of the candidates on every variable. The Questionnaire was selected due to the fact of its helps in gathering accurate data on the basis of parametric framework of theory.

The statements were developed in accordance to the participant's reaction for every variable. Questions were developed on the basis of Likert scale, rating was from strongly agree to the strongly disagree and also different options were provided in some questions. It basically useful for collecting different and mostly accurate responses of candidates in short span of time stated by (Denscombe, 2014). However, secondary source of gathering data through books, journals and articles were used for providing the explanations and reasoning for subject.

4.8 Sampling Technique

The sampling techniques used for this study in non-probability, as it is necessary the researcher to reach candidates without any favoritism or biasness. The data for this study was gathered in the non-probabilistic manner to eliminate the small chances of biasness (Levy and Lemeshow, 2013).

The convenience sampling was selected due to its targeting nature of suppliers and contractors in the construction industry in UAE market and employees who are willing to participate in the research (Farrokhi, and Mahmoudi-Hamidabad, 2012). This specific sampling was used because of the fact that it is able to reach to candidates according to their convenience, time frame and interest. It also allows candidates the right to withdraw at any time they want (Farrokhi, and Mahmoudi-Hamidabad, 2012).

4.9 Sample size

For this stud, selected sample size is decided for filling the questionnaire with 50 suppliers and contractors related to construction industry but engage in different projects in UAE market. They were selected because the research was mainly based on them and their familiarity with the subject and industry. Some candidates responded through emails and others were been visited in their offices or construction site according to their convenience or feasibility.

4.10 Analysis Methods

Analysis methods or approach was the Linear Regression Analysis, and also Pearson's Correlation Matrix. The regression analysis will help in interpreting and understanding the differences and influence of the relationship identified in hypothesis. Significance of research

was proven by the evaluation of the model. While, correlation matrix is helpful in the identification of the variable and its relationship (Sen, and Srivastava, 2012). According to Field, (2013), SPSS tool is used for the statistical representation of the outcome and the Cronbach Alpha will identify the data's reliability. Pie charts will represent the results.

4.11 Ethical Limitations

For conducting the research, limitations were taken into consideration. No unethical or illegal activity was done which deteriorate the research gathered. Candidates were made sure that the information provided by them will be secured and will not be leaked without their consent. They were also given the right of leaving the questionnaire any time they want. Reliable sources were used for the secondary source for gathering accurate information (Bryman and Bell, 2015).

4.12 Chapter Summary

This is the chapter of research methodology, which clearly describe every approach, strategy, designs, sources, sample size, ethical limitations and methodology of the research used in this study. This chapter facilitate in developing better understanding to get the proper ideas about the research questions and also provides the ways to make the better analysis to the collected data with the help of appropriate strategies as well as the tools of analysis. So, there is the need to planned, identified, managed as well as monitor these factors in order to resolve the issues of the construction industry that leads the projects of construction toward success.

CHAPTER 5: RESULTS AND ANALYSIS

5.1 INTRODUCTION

The major aim of this chapter is to present as well as discuss the descriptive statistics as well as the study measure. This descriptive statistic consists of everything that is based on the demographics of the respondents in term of percentage, numbers as well as comparison. This chapter also discusses the formation in detail. So, in this regard, a questionnaire was designed and also implemented. After it, this questionnaire was distributed among the selected sample of different demographic in UAE. The researcher efficiently managed to approach the different type of people that have different background and level of experience regarding the projects of the constructions. In order to make the analysis as well as the discussion on the gathered results, the collected data arranged as well as assembled in efficient manners that are structured. Some elements of the general information and the demographic will also be presented as well as described in the findings of the survey and such type of findings will be followed by a different and additional investigation.

This chapter of research is based on results which have gained by using questionnaire as a tool of data collection and SPSS as a tool of data analysis. All results of this research have presented in tabular form, which are later interpreted for reaching the final conclusion in the form of accepting or rejecting hypothesis, answers of research question, and achievement of research objectives.

5.2 Demographics

		Affiliation			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Client	11	22.0	22.0	22.0
	Contractor	7	14.0	14.0	36.0
	Supplier	14	28.0	28.0	64.0
	Consultant	18	36.0	36.0	100.0
	Total	50	100.0	100.0	

The above table present frequency as well as the percentage of the participant who responds to the particular questions. The different types of respondent may become the reason of increase the reliability of the data. The total 36% of respondents are consultants, 28% of

respondents are suppliers, 14% are contractors, and remaining 22% are clients. It indicates that researcher has collected data from different respondents who can provide answers of questions in a best manner, and it remained good for research.

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 5 years	15	30.0	30.0	30.0
	5 to 10 years	16	32.0	32.0	62.0
	More than 10 years	19	38.0	38.0	100.0
	Total	50	100.0	100.0	

The above table present frequency as well as the percentage of the participants in term of level of experience. Total 38% of respondents have claimed that they have an experience of more than 10 years. 32% of respondents have an experience of 5-10 years and remaining 30% respondents have an experience of less than 5 years. It also indicates that more people are well experienced that take part in this survey. All it indicates about the research reliability because data has collected from respondents of different experience, and experience matters a lot while providing answers of questions.

Job Discipline

		Frequency	Percent	Valid Percent	Cumulative Percent
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Valid	Design intent	17	34.0	34.0	34.0
	Contracts and procurement intent	16	32.0	32.0	66.0
	Project management and construction intent	17	34.0	34.0	100.0
	Total	50	100.0	100.0	

The above table present frequency as well as the percentage of the participant in term of job discipline. In the total fifty respondent total 34% of respondents belongs to project management department and construction jobs. 32% of respondents are of contracts of procurement related jobs. Remaining 34% of respondents are of designer related jobs. It also indicates that mostly of the respondents belongs to the design intent and as well as the project management and construction intent department. When data has collected from different respondents with different job discipline, then definitely it will bring reliability in research.

Project Sector

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Private	28	56.0	56.0	56.0
	Public	22	44.0	44.0	100.0
	Total	50	100.0	100.0	

The above table present frequency as well as the percentage of the participant. The table indicates that among the total participants of fifty, 28 belongs to the private sector and 22 belongs with the public sector. Total 56% of respondents are of private project sector, and remaining respondents are of public project sector; the collection of data from both means that research has provided actual results about perception of project managers of both sectors because both work in a different manner.

5.3 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Kurtosis	Std. Error
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Early Engagement	50	1.22	4.88	3.7596	.95473	.744	.662
Perception of Manager	50	1.22	4.88	3.6758	.91496	1.005	.662
Valid N (list wise)	50						

This table has shown the descriptive statistics of early engagement questions. The mean value has explained the arithmetic mean across the observation. Mean and standard deviation values are mentioned in the table. The table has shown the mean statistics value which is 3.7596 for early engagement variable and its questions. This value indicates the respondents that they agree with the questions related to early engagement variable. It means respondents agree about the early engagement of each and every stakeholder of project lead towards a successful project.

This table has shown the descriptive statistics of perception of project manager questions. The mean value has explained the arithmetic mean across the observation. Mean and standard deviation values are mentioned in the table. The table has shown the mean statistics value which is 3.7596 for early engagement variable and its questions. This value indicates the respondents that they agree with the questions related to the perception of project manager variable. It means respondents agree about the perception of project manager towards something and its role in the early engagement process.

5.4 Correlation Value

Correlation is basically the method that can be used in order to explain the relationship among the variables that are selected in the study. The Pearson correlation is one of the commonly used correlation that ranges between -1 and +1. This correlation can be used in efficient way where the study's distribution is normal. That is why, the Pearson correlation is appropriate to use. The positive correlation is an indicator of the positive relationship that if there is an increase in one variable then other variable will also increase. On the other hand, the negative correlation represents the reverse case that in case of increase in one variable another variable

will decrease. When the value of the correlation is between the range of between -1 and +1, then this is the indicator that the particular variables are much related to each other. Additionally, the Sig (2-tailed) value of p is the gauge of check the level of significance between variables in statistical correlation. In case, when significance value is above .05 then it indicates the absence of statistical correlation that is significant. On the other hand, if Sig (2-tailed) value of p is less than .5 then it indicates the presence of significant relationship between variables.

Descriptive Statistics

	Mean	Std. Deviation	N
Early Engagement	3.7596	.95473	50
Perception of Manager	3.6758	.91496	50
Affiliation	2.78	1.166	50
Experience	2.08	.829	50
Job Discipline	2.00	.833	50
Project Sector	1.44	.501	50

Correlations

		Early Engagement	Perception of Manager
Early Engagement	Pearson Correlation	1	.982**

	Sig. (2-tailed)		.000
	N	50	50
Perception of Manager	Pearson Correlation	.982**	1
	Sig. (2-tailed)	.000	
	N	50	50

** . Correlation is significant at the 0.01 level (2-tailed).

The correlation value should exist between +1 and -1. Early engagement is a dependent variable of study, which has a correlation value to 0.982 with perception of manager; it exists between +1 and -1. This correlation value means that positive relationship exists between dependent and independent variable of study. It has helped in accepting hypothesis 1 in which it is claimed that early engagement depends on perception of managers.

5.5 Correlation between all variables

The coefficient of correlation in the study is the indicator of the level of significant of the relationship between the selected variables. In addition, the Sig (2- tailed) value is the indicator of the significant correlation between the dependent as well as the independent variables of the research.

Correlations

Early Engagemen t	Perceptio n of Manager	Affiliatio n	Experienc e	Job Disciplin e	Projec t Sector
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Early Engagement	Pearson	1	.982**	-.029	.078	-.305*	-.143
	Correlation						
	Sig. (2-tailed)		.000	.839	.588	.031	.321
	N	50	50	50	50	50	50
Perception of Manager	Pearson	.982**	1	.007	.046	-.279*	-.107
	Correlation						
	Sig. (2-tailed)	.000		.960	.753	.050	.461
	N	50	50	50	50	50	50
Affiliation	Pearson	-.029	.007	1	-.129	-.168	.064
	Correlation						
	Sig. (2-tailed)	.839	.960		.371	.243	.658
	N	50	50	50	50	50	50
Experience	Pearson	.078	.046	-.129	1	-.207	-.037
	Correlation						
	Sig. (2-tailed)						
	N	50	50	50	50	50	50

	Sig. (2-tailed)	.588	.753	.371		.149	.797
	N	50	50	50	50	50	50
Job Discipline	Pearson Correlation	-.305*	-.279*	-.168	-.207	1	.049
	Sig. (2-tailed)	.031	.050	.243	.149		.736
	N	50	50	50	50	50	50
Project Sector	Pearson Correlation	-.143	-.107	.064	-.037	.049	1
	Sig. (2-tailed)	.321	.461	.658	.797	.736	
	N	50	50	50	50	50	50

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The above table is the representation of the correlation between all the variables that represent the effect of the early management on the perception of the project manager who is responsible for the outcome of the project. The values of the Sig (2-tailed) is different for different variables and in most of the cases the relationship is not significant. However, the

relationship of the early management with the perception of the manager is significant as that statistically correlation value is .000. This concludes that the early engagement has the strong relationship with the perception of the manager and the best relationship of both leads the project toward success. Additionally, the table also represent the correlation between the other variable of the research with each other.

5.6 Regression Test

The use of the regression analysis is made in order to identify the dependence of the variables between the perceptions of the managers and the early engagement towards success of the project. The perception of the manager is important for the success of the project so it is used as the dependent variable of the research and the manager's perception is the independent variable. So, the simple regression test is the good indicator to identify the level of significant and the factors that are involves in the success of the project of construction.

Variables Entered/Removed^a

Model	Variables		Method
	Variables Entered	Removed	
1	Perception of Manager ^b		. Enter

a. Dependent Variable: Early Engagement

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.982 ^a	.964	.963	.18348	1.786

a. Predictors: (Constant), Perception of Manager

b. Dependent Variable: Early Engagement

Adjusted R square is 0.963 which means that perception of managers affect early engagement by 96.3%. This percentage is quite high due to which it is important that if any manager want to gain success in project, then it should focus on perception that it either allow early engagement in project or not.

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.2438	4.9932	3.7596	.93730	50
Residual	-.43515	.36390	.00000	.18160	50
Std. Predicted Value	-2.684	1.316	.000	1.000	50
Std. Residual	-2.372	1.983	.000	.990	50

a. Dependent Variable: Early Engagement

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.048	1	43.048	1278.726	.000 ^b
	Residual	1.616	48	.034		
	Total	44.664	49			

a. Dependent Variable: Early Engagement

b. Predictors: (Constant), Perception of Manager

The value of F is less than 4 and significance value is less than 0.50 which means that significant relationship exists between a perception of managers and early engagement. The test of regression for the factors of manager's perception has the significant association for the success of the project and the early engagement. The major aim of this test is to make the analysis of the fact that how the factors of perception of the manager have an influence on the success of the projects altogether. The simple analysis of the regression between the dependent and independent variables indicates that there is the significant relationship between both due to which the model is significant. In this model, the value of the R, as well as the adjusted R square, is also significant which is the indicator that the perception of the manager is important for the success of the project. The value of the F is 1278.726 that is also significant at .000 that is the indicator of the fact that the model of regression has the ability to predict the model inefficient way. On the other hand, the beta value is .982 that indicates that the perception of the manager has the influence on the early engagement, and

the good perception can make the project valuable. Furthermore, the value of correlation becomes the reason for the acceptance of the H1 hypothesis.

The simple analysis of the regression between the perception of the manager's factors and early engagement variable of this project reveals the significant relationship. The F ratio is also significant that is the representation of good prediction of the regression model. On the other hand, the simple analysis between the other factors and the perception of the manager also provide the information about the significance relation as well as the acceptance of the other hypothesis. So, all the other factors play important role in the formation of the perception of the manager that is crucial for the success of the construction project.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.006	.108		-.055	.956
Perception of Manager	1.024	.029	.982	35.759	.000

a. Dependent Variable: Early Engagement

The value of beta is 0.982 which means that early engagement affected by 98.2% by perception of managers; all it means that successful project managers adopt their perception in a way that it promote early engagement, otherwise project do not gain success in achieving goals.

5.7 Reliability Test

Variables	Cronbach's alpha value
Early engagement	0.937
Perception of managers	0.990

Cronbach's alpha value should be more than 0.70 which means that research variables and their used scales for developing a questionnaire are reliable. In this research, both variables including early engagement and perception of managers have Cronbach's alpha value of more than 0.70 which indicate about research reliability.

Chapter 6: Results and Discussion

6.1 Introduction

The major aim of the study is to identify the relationship between the early engagement and the perception factors of the project manager and their impact on the success of the project. The study utilized a questionnaire survey to gather the relevant data needed for the analysis. The respondents were asked the questions that solicit their opinions of the early engagement as a procurement approach, its impact on the several fronts of project success, and its tendency to be affected by the project manager's traits and perceptions. The results were then analyzed to determine the general trends reflected by the results, the statistical significance of these trends and correlations, and how they compare to the worldwide view of this topic as suggested by previous studies.

The analysis took into consideration the attributes of the respondents that have been found influential to their views on this topic. These attributes included affiliation, experience, discipline and sector. The analysis also took into consideration the opinions of the respondents on how the early engagement impacted the project success on the time, cost and quality levels and how the project manager's perceptions and traits impacted the process.

6.2 Implications of the research

The results of this research are of great importance to the construction industry. This is due to the fact that it signified the role of one of the innovative procurement approaches in

enhancing the project success. In addition, it shed some light on how the project manager's capabilities, traits and skills can impact the early engagement process and ultimately, the project success. The relevant organizations in the construction field can look at the findings of this study as an incentive for modernizing the traditionally followed procurement techniques. It can also offer a groundwork for the development of project managers' abilities such that they achieve maximum contribution to the success of projects that engage contractors and suppliers at such an early stage. While the findings of this research study were interpreted on statistical and academic grounds, the nature of the data used in this research enable this study to lend itself to field use.

6.3 Discussion

As presented in the previous chapter, the collected data included *at least 7* respondents per affiliation, 15 respondents per experience level, 16 respondents per job discipline and 22 respondents per project sector. This suggests that the results and findings brought forward by this study have a good representativeness of the demographic composition of the construction industry in the UAE. Each group underpinned by each attribute was found to be generally in favor of the early engagement of contractors and suppliers. They were also found to be unanimous about the significance of the project manager's perceptions and traits in the early engagement process.

As discussed earlier, the dimensions of the success measured in this research correspond to how success is rated by the clients in the construction industry in the UAE and worldwide. The results showed that the respondents have a positive opinion of the early engagement of contractors and suppliers as an effective tool to enhance success. This is demonstrated by the

average rating of the early engagement measure which was approximately 3.76. This general favorability was found to be in consistent agreement with the three defined categories of success. The average ratings of the early engagement effect on the project success on the cost, time and quality levels were found equal to 3.87, 3.80 and 3.62, respectively. The analysis results were in agreement with the reviewed literature, particularly, the studies conducted by Eadie and Graham (2014), Lahdenperä (2010), Saad, Jones, and James, (2002), and Gransberg, (2013).

The research indicates that the early engagement of contractors and suppliers is a convenient solution that caters for the complexities and the challenges of the modern construction industry in the UAE. Respondents overwhelmingly agreed that it has the ability to reduce the cost and enhance the productivity, enable the completion of the contract within the specified timeframe, boost teamwork, eliminate disputes and ensure the quality of the final product.

In addition to the advantages of the early engagement of contractors and suppliers in delivering and enhancing success to construction projects, this study focused on how the different project manager's perceptions and traits impacted the process of early engagement. As discussed earlier, the project manager's perception factors were subcategorized into three categories: leadership, capabilities and skills. The respondents generally viewed the project manager's traits as influential to the early engagement process. This was demonstrated through an average rating among all respondents of approximately 3.68. The general opinion of the role of the project manager's perception factors in the early engagement approach was not found to disagree with that pertaining to each of the subcategories of the perception factors. The average rates given to the leadership, capabilities and skills factors were found

to be equal to 3.68, 3.76 and 3.84, respectively. It was clear that the respondents viewed the project manager skills including evaluation of the project and the financial outcomes, planning and control skills, managerial skills and negotiating innovative ideas as the most influential to the early engagement process. On the other hand, leadership, in general, and the ability to transfer knowledge, in particular, were viewed as relatively less influential perception factors. The results were found to further-corroborate the previous studies, including those conducted by Kissi et al. (2012), Murphy et al. (2015) and Edum-Fotwe & McCaffer (2000).

The findings of this research validate the focus that is placed on the competence level of the project manager in the construction industry. With the growth in the size of projects and the associated growth in the responsibilities and challenges, it has become incumbent upon developers to choose individuals that possess a wide range of abilities and skills. The unanimity of the respondents on the significance of the influence of every project manager trait on the early engagement process is indicative of the veracity of this trend.

The mean rates along with the values of correlation presented in the previous chapter indicate that there is a positive relationship between independent variables (perception factors) and the dependent variable (Early engagement of contractors and suppliers). The value of the adjusted R square was 0.963.

6.4 Conclusion

Based on the reviewed literature, the collected data and the performed analysis, the following summarize the results and findings of this research:

1. The collected research data included 50 valid observations. Only completed questionnaire were used in the statistical analyses.
2. The collected data included respondents from every attributed group.
3. The respondents comprised individuals associated with 11 clients, 14 suppliers, 14 contractors and 18 consultants.
4. 38% of the respondents have more than ten years of experience.
5. The results showed that the respondents have a favourable opinion of the early engagement of contractors and suppliers in enhancing the project success. The average rating of the early engagement measure which was approximately 3.76. The average ratings of the early engagement effect on the project success on the cost, time and quality levels were found equal to 3.87, 3.80 and 3.62, respectively.
6. The respondents generally viewed the influence of the project manager's traits as significant to the early engagement process. The average rating among all respondents was 3.68. The average rates given to the leadership, capabilities and skills factors were found to be equal to 3.68, 3.76 and 3.84, respectively.
7. The respondents viewed the project manager skills including evaluation of the project and the financial outcomes, planning and control skills, managerial skills and negotiating innovative ideas as the most influential to the early engagement process.
8. Leadership, in general, and the ability to transfer knowledge, in particular, were viewed as relatively less influential perception factors than the other categories and subcategories.

6.5 Recommendations

The following summarizes the recommendations that were interpreted from the research topic, the research methodology, the performed analyses and the results of the study.

1. The results and the analyses presented in this research study have demonstrated the unequivocal favourability of the early engagement of contractors and suppliers in construction projects among the individuals with relevant experiences. This can play a major role in promoting such innovative procurement techniques in the construction industry that provide the capacity and the efficiency required to ensure the successful delivery of the projects.
2. While the study focused on the advantages of the early engagement of contractors and suppliers in construction projects, it did not tap into the disadvantages and challenges associated with this form of procurement as perceived by the same respondents. This calls for researchers to address the downside of this procurement method and determine its significance in inhibiting the success of the project. While the results showed a concrete agreement among the respondents of the favourability of this approach, the inclusion of the challenges and disadvantages is believed to play a sizeable role in offering a more realistic and holistic view of the early engagement as compared to the traditional measures.
3. The perception factors of the project manager investigated in this study have been shown as effective in influencing the early engagement process. This suggests that this research, supported by more corroborative efforts, can help develop a guide for selecting and training the project managers and team members such that they are more suited for

handling the wide array of responsibilities and challenges faced during the course of large projects.

4. In addition to the perception factors studied in this research, a number of categories including personal characteristics of the manager could be added to the list of variables.

6.6 Summary

The construction industry in the UAE is very crucial to the development of the country. Like in the case of every other industry, the growth in the projects and the concomitant increase in the challenges and complexities have created a need for modern and innovative procurement techniques that help increase efficiency, reduce risk and enhance success. The early engagement of contractors and suppliers is one of the most prominent innovative techniques for project procurement. The purpose of this paper was to study the role of the early engagement in enhancing the project success on the cost, time and quality levels. A questionnaire survey was distributed among individuals of several affiliations, experience levels, disciplines and sectors. Non-probability sampling was used in selecting the respondents involved in the data collection and the analysis procedure. As part of the study, the impact of the different project manager's perception factors on the early engagement process was also investigated. This included three categories of perceptions: leadership, capabilities and skills. The results showed that the respondents had a favorable opinion of the early engagement of contractors and suppliers in enhancing the project success regardless of their attributes. The relationship between the early engagement and the project success was found to be statistically significant. The respondents also generally viewed the influence

of the project manager's traits as significant to the early engagement process. This relationship was found to be statistically significant as well.

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Appendix

Questionnaire

This survey is aimed at collecting the necessary information that help understand the significance of the early engagement of contractors and suppliers in delivering project success. It also investigates into how the project manager's traits and perceptions work hand in hand with the early engagement approach to enhance the project performance and success. The survey is consisted of 3 parts:

Part 1: The first part of this survey addresses the relevant attributes of the respondent and the project that are expected to have an impact on his/her views on the early engagement of contractors and suppliers approach and how it compares to the traditional methods.

1. Affiliation
 - Client
 - Contractor
 - Supplier
 - Consultant

2. Experience
 - Less than 10 years

- 10 to 20 years
- More than 20 years

3. Job discipline

- Design intent.
- Contracts and procurement intent.
- Project management and construction intent.

4. Project Sector

- Private
- Public

Part 2: The Second part of this survey addresses the influence of the project manager's perceptions on the early engagement approach as suggested by the reviewed researches and articles. Please indicate the level of your agreement on the following statements from 1- strongly disagree to 5- strongly agree.

1. Project manager's efforts to transfer of knowledge and experience among the project teams have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

2. Project manager's Relevant experience and technical knowledge have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

3. Project manager's Financial and procurement knowledge have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)

- 2
- 3
- 4
- 5 (Strongly agree)

4. Project manager's ability to organise responsibilities between project members have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

5. Project manager's understanding of the required result and deliverables have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3

- 4
- 5 (Strongly agree)

6. Project manager's understanding the project processes and technology have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

7. Project manager's project management knowledge have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

8. Project manager's ability to build trust among project stakeholders have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

9. Project manager's ability to adapt change have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

10. Project manager's ability to evaluate of the project and the financial outcome have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

11. Project manager's planning and control skills have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

12. Project manager's managerial skills have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

13. Project manager's ability to negotiate innovative idea have a significant impact on the early engagement of contractors/suppliers approach.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

Part 3: The Third part of this survey addresses the advantages of using the early engagement of contractors and suppliers approach towards the project success in terms of cost, time and quality as suggested by the reviewed researches and articles. The respondent is expected to answer the questions based on a five-point rating system, where 1 denotes “Strongly disagree” and 5 denotes “Strongly agree”.

1. The early engagement of contractors/suppliers help reduce the cost of the project, in general, without compromising quality.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

2. The early engagement of contractors/suppliers achieve better cost control and help avoiding budget overruns.

- 1 (Strongly disagree)
- 2
- 3
- 4

- 5 (Strongly agree)

3. The early engagement of contractors/suppliers offer a better value engineering opportunities.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

4. The early engagement of contractors/suppliers offers better time saving in generl.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

5. The early engagement of contractors/suppliers help prevent disputes among the involved parties.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

6. The early engagement of contractors/suppliers increase certainty, offer a better risk management and reduce chances of time and cost variations.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

7. The early engagement of contractors/suppliers enhance teamwork and provide a more cooperative and productive environment.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

8. The design quality enhanced in a noticeable manner as a result of using the early engagement of contractors/suppliers.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)

9. The early engagement of contractors/suppliers offer better quality control and assurance.

- 1 (Strongly disagree)
- 2
- 3
- 4
- 5 (Strongly agree)