

Implementation of the Procurement Function and its Influence on Project Performance

تطبيق مهام المشتريات و أثرها على أداء المشاريع

By

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ABSTRACT

Project management has been heavily affected by procurement functions and the performance of projects is fundamentally associated with them. The research for this dissertation analyses the implications of inadequate implementation of the procurement functions and particularly their role in ineffective project performance. Three problem cases related to various projects in NPCC, an oil and gas construction company are considered. This organisation has suffered from different and improper implementation of procurement functions which have affected project outcomes.

These cases were analyzed based on five main project concepts: Project Scope, Project Schedule, Project Stakeholder, Project Progress and Procurement Issues. Interviews were conducted with relevant stakeholders, project managers and users participated in the problem cases to investigate the procurement issues that were contributing to the problems. The results showed that issues like clear interpretation of scope of work to the invited bidders, qualification based contractor selection, maintaining proper communication channels, implementation of non-traditional procurement methods and contractor's previous performance prior to the award can all contribute to better project performance. This study concludes that the role of stakeholder has to be more effective in enhancing the procurement functions and recommends further future research for academics and practitioners. Moreover, recommendations are presented for different stakeholders in NPCC, Client Organizations and the UAE Government.

ملخص

يعتمد أداء ادارة المشاريع بشكل رئيسي على مهام المشتريات. و قد اسهمت هذه الدراسة في ايجاد الأمور المترتبة على أداء المشاريع و المتعلقة في التطبيق السلبي لمهام المشتريات. تمت مناقشة ثلاث مشاريع لشركة الانشاءات البترولية الوطنية والتي عانت من مشاكل في التطبيق السلبي لمهام المشتريات إلى ضعف مخرجات مشاريعها. بحيث تمت مناقشة تلك المشاريع من خلال خمسة أقسام متمثلة كالتالي: نطاق المشروع, الجدول الزمني للمشروع, أصحاب العلاقة المعنيين بالمشروع, حالة المشروع و قضايا المشتريات. أجريت مقابلات مع أصحاب المصلحة المعنيين, و مديري المشاريع, و المستخدمين الذين تربطهم علاقة بالمشكلات المعنية بتلك المشاريع و ذلك للوقوف على الآثار المترتبة من التنفيذ السلبي لمهام المشتريات على أداء تلك المشاريع. و أشارت النتائج التي توصلت اليه الدراسة الى أن التفسير الواضح لنطاق العمل المرسل الى المشاركين في العطاءات, و اختيار المقاول المؤهل, و الحفاظ على قنوات الاتصال المناسبة بين الأصحاب المعنيين بالمشروع, و تنفيذ طرق الشراء الغير تقليدية, و متابعة الأداء المسبق للمقاولين يؤدي الى الأداء الأفضل في تلك المشاريع. و أظهرت الدراسة في النهاية الى اهمية دور أصحاب المشاريع في الرقي من مهام المشتريات و قدمت مقترحات لدراسة مستقبلية لكل من الأكاديميين و المستخدمين. كما أشارت الدراسة الى عدة مقترحات تم توجيهها الى مختلف الأصحاب المعنيين للمشاريع في شركة الانشاءات البترولية الوطنية, و شركات العملاء, و الدوائر الحكومية لدولة الامارات العربية المتحدة.

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Chapter 1: Introduction

Purpose of the research

The reasons behind embarking on this research investigation are generated from the interface between project management and procurement functions. One of these reasons is to find out the associations between project performance and procurement function and processes. It is quite important to find out how procurement functions shall impact on project deliverables and hence interact with the basic outcomes from the same project. Another reason is to identify different project's stakeholders' role towards project efficiency through efficient implementation of procurement functions and processes. Every stakeholder in the project would have an input towards different project pillars, such examples of these pillars are Project Scope of Work, Project Schedule, Project Progress and Performance and Procurement Team. The stakeholder shall have different affects and impacts on these pillars during different project's life cycle.

The most important impact that this research would aim to achieve is greater understanding of the influence of the procurement functions and how that would add to the project's progress. This research also has been conducted in order to highlight the impacts of appropriate implementation of procurement functions towards project's efficiency in terms of cost, time and quality. Appropriate implementation of procurement functions such as sufficient project substantiations of project scope of work prior to tendering would definitely have an impact on the project cost, time and quality.

One more important reason to conduct this research is to specify and determine best practices in procurement functions used in project delivery methods. This could obviously be shown from the type of contracts that are used in current practices and their implications for better project delivery. It is important to know how relevant terms and conditions would secure stakeholders' liability at the same time work for the contractor's beneficiary. The last reason is to show the role of technical and commercial evaluations of bids on project cost and performance. Technical evaluation of bids would concentrate on the specification and technical aspects related to the project that to be awarded, while commercial evaluation would basically investigate the prices of those specifications and scope of work. Thus, how the cost and project performance get affected from the methods of evaluation.

Research aim, objectives and questions

Aim

To investigate the role and implications of professional implementation of procurement functions and processes for projects' performance and efficacy.

Objectives

1. Defining procurement functions and processes that are contributing to project performance.
2. Illustrating the role of project stakeholders in setting up the procurement strategies
3. Setting up the key indicators for best scope of work documents substantiation in order to get the better clarity of scope of work.
4. Exploring the relationship between the project schedule and the procurement process and functions.
5. Elaborating on the issues contributed to project progress and performance, which are connected to procurement processes and functions.
6. Outlining best practices used in procurement functions and processes towards best project delivery methods.
7. Examining the affects of technical and commercial evaluation of bids on the final project cost and performance.

Research Questions

1. What are the relation between project scope of work and procurement functions and processes?
2. How would procurement functions contribute to better project performance?
3. How would a project manager contribute to a better implementation of procurement functions through the procurement team?
4. What is the role of project stakeholders in setting up project scope?
5. How would project stakeholders contribute to better implementation of procurement functions?

Outline of the Methodology

In order to achieve the mentioned aim and objective, the research shall undertake the qualitative approach of interviewing the related personnel who were interacting in the three cases of different projects that were executed by different parties in an organization called National Petroleum Construction Company (NPCC).

These cases have been formalized by the procurement team and accordingly, the interviews shall take into consideration all parties who contributed in every case such as Project Manager, Contractor, relevant department and Procurement team. Every case discussed the procurement issues that were contributing to project performance and elaborated on the consequences of implementing insufficient procurement function or processes.

Overview of Dissertation Chapter Contents

This dissertation shall include the following chapters:

- Chapter 1 – Introduction
 - This chapter shall provide an introduction about the problems of procurement functions and their affect towards project performances. It shall include of the following sections: 1) Previous studies, 2) Reasons for conducting the research, 3) Research's aim, objectives and questions, 4) Outline of the methodology, 5) Overview of Dissertation Chapter.
- Chapter 2 – Literature Review
 - This chapter shall provide an overview about different literatures that were concerned about issues contributing to the problem cases and as well related to the procurement functions and processes. This chapter consists of the following sections: 1) Project scope, 2) Project schedule, 3) Project stakeholders, 4) Project progress and 5) Procurement Issues.
- Chapter 3 – Methodology
 - This Chapter shall provide an idea on the methodology used to collect the data and conduct the research. It shall consist of 1) Scope and Objectives, 2) Statement of Research Aim, 3) Rationale of the Research Questions, 4) Interview questions and the five sections, 5) The Research Sample and 6) Method of Analysis
- Chapter 4 – Analysis and Interpretation of Results

- This chapter provides an overview of the problem cases and describes the five sections mentioned in Chapter 2 above among three main cases as follows: 1) Case 1: Construction of Gas pipeline to Al-Ain Cement Plant, 2) Case 2: Construction of new pipe coating plant and 3) Case 3 "Cathodic Protection Works for Pipeline and Facilities"
- Chapter 5 – Discussion
 - This Chapter discusses the similarities between the literatures in chapter 2 and the problem cases sections that were found in the analysis chapter. This chapter consists of the following sections: 1) Scope of the chapter, 2) Linking literature with each Problem Case and 3) Cross analysis between all cases
- Chapter 6 – Conclusion and Recommendations
 - This chapter provides the conclusion of the research findings and discussion and provides list of recommendations for certain stakeholders as per the following sections: 1) Conclusion, 2) Recommendation for Further Research, 3) Recommendation for NPCC, 4) Recommendation for Client Organizations, 5) Recommendation for UAE Government/regularity affairs and 6) Recommendation for Project Managers.
- References

Chapter 2: Literature Review

Procurement and Project Management

Different constraints and activities affect and impact directly on a project's progress, such as project's resources of material, project's personnel, project's planning methods and project's procurement team. Such reasons are to be considered valid and relevant when discussing the direct influences on a project's progress, however, these reasons are not the only constraints. It is important to highlight the important role of the project's procurement team in enhancing project's progress and hence affecting the project's completion. Procurement functions and procedures are key and important issues in ensuring the best outcomes in projects involving all parties. Procurement determines the relationship between the project team and the contractors or suppliers, and identifies those to provide material or services needed for the project.

Every project whether in the construction or IT field would basically require material to be delivered to the project's site and would also require provision of the specialist personnel such as design – build team and Health and Safety quality controllers in order to provide their services on the project. The procurement methods affect the progress and performance of the project such as in the study conducted by El Wardani et al. (2006) comparing procurement methods in design and build projects. The study thoroughly analyzed the procurement methods that could be used when procuring the best design –build team, which requires the input of many parties in the project such the project's owner, designer and contractor's organization. The study helped with better understanding of procurement processes and accordingly illustrated the best procurement methods to be used in procuring design-build team.

Further research studies have been developed to assess the role of procurement processes and functions in enhancing project performance. A framework has been established by (Erickson and Westerberg, 2011), which examined the specific type of procurement method called 'cooperative procurement procedure', which is demonstrated by factors such as selected tendering and soft parameters in bid evaluation that would affect project performance criteria, in terms of cost, time and quality. Studies related to the procurement functions and their affect towards better project outcome are limited (Erickson and Westerberg, 2011) such as how bid evaluation affects project cost (Assaf and Al-Hejji, 2006; Wardani et al., 2006 cited in Erickson and Westerberg, 2011) and how availability of adequate IT technologies such as integrated communication system

between the procurement team and the market shall affect cost and time performance (Yang, 2007 cited in Erickson & Westerberg, 2011).

Some studies analyzed thoroughly the effects of procurement processes and functions on the project from the risk management perspective. It has been found that many projects would suffer from risk issues pertaining to project execution as whether procurement processes and functions were or were not analyzed or used properly before the project execution stage. However, the amount or level of risks with a project that have analyzed the procurement variables during the tendering stage would be less than the one which did not perform such analysis (Osipova and Erickson, 2011). The procurement variables that were used in Osipova & Erickson's (2011) study were basically the ones that have great impact on project risk management such as project delivery method, form of payment and using of collaboration and partnering methods. Project delivery method could be interpreted as type of contracts that this project has to use in order to achieve the required deliverables (Akintoye et al., 1998 cited in Osipova & Erickson, 2011) for example, a design contract would jeopardize all the liability in the Client's hands, who would control the project or the scope delivery, but a design-build contract allows the project and the scope and delivery to be under the Contractor's control. It is quite interesting to know how procurement functions and different variables would play an important role in determining the future of executing the project and hence would impact on the project delivery and completion.

The studies never cease in providing further theories and new ideas about the role of procurement and supply chain management on a project's performance. Some projects had different parties involved; whom the roles and responsibilities would vary in accordance to the scope they handle, thus every party in that project would generate massive and huge documentation and information that might assist the procurement team in procuring the most suitable contractor for the required job. Therefore, more studies have come up with factors that would affect the role of supply chain in a procurement process; one of those factors is managing information and knowledge transfer during project procurement or tendering stage (Titus and Bröchner, 2005). Titus and Bröchner (2005) have introduced a model that represents the flow of information across the project partners and coordinators. This model has certainly contributed towards project efficiency through producing highest quality, low cost and less service duration or work completion (Titus and Bröchner, 2005). Project information such as, drawings, scope of work, bill of quantities, etc, have to be integrated and comprehensive between all parties involved, in order to allow for the bidder to quote for the required services as per the requirement.

The studies about procurement functions from a variety of researchers have been used to discuss further procedures that are related to procurement functions and their influence on the performance of the contractor awarded the project (Kashiwagi, 1995). An example of those procurement functions is Technical Evaluation of bids, which has been found that the implementation of such function is done in a misleading way. It has been stated by (Kashiwagi, 1995) that technical evaluation of bids are completed in accordance to the specifications and technical aspects that are related to the service required, this would be enhanced and effectively implemented if the technical evaluation of bids are done in accordance with the full performance of the required service. The evaluation of bids shall consist of noting the technical aspects of the bids as well as noting their compliance with the required scope of work. By implementation of such procurement function in the former specified way, long term performance of a supplied item or an awarded contractor would satisfactorily be achieved and hence the performance of the project would accordingly be enhanced and developed.

The effect of procurement functions have also interpreted and impacted on projects' strategies. A research study conducted by Migliaccio et al (2008) explained how procurement strategies in selecting type of contracts for public organizations construction projects would require a change in the organization's work processes and also project or organization structure. These modifications and changes to the organization will affect the project owner perspectives and responsibilities in contractor selection criteria, required contractual documentation, and contract administration practices, etc (Migliaccio et al, 2008). A framework has been established by Migliaccio et al (2008) that accommodated an innovative procurement approach of combining the traditional Design–Bid–Build contracts with the Design–Build contracts in order to change the project delivery strategy. Procurement or tendering strategies would have a great impact on the required outcomes of tendering the requirements. It would give an indication to the procurement team on the potential contractors that would be able to perform the required job and also would give direction on the way that bids have to be submitted. Moreover, a comprehensive tender strategy should contribute to better project performance and might lead to long-term partnership with the awarded contractor.

Project Scope

The definition of scope of work in a project environment has a specific meaning which Gannon (1994) has stated that in order to manage the project successfully; it would be recommended that the scope of work shall be detailed from the project initial stages till the handing over stage. Furthermore, Gannon (1994) examined that a written set of project objectives could illustrate initiation document for a detailed scope of work. He elaborated that the project success could be assessed by using the project scope statement, due to the reason that the scope statement includes project tasks and deliverables which help Project Managers to evaluate the project success. It is important to mention that the project scope shall have a direct effect on project plan as Gannon (1994) linked the project scope with the project plan and schedule. It has been found that any revisions that apply to the project scope shall be reflected on the project plan due to the reason that the changes in project scope would results in additions or deletion of related project tasks and deliverables, in which it should be reflected on the project plan and schedule. The format that was recommended by Gannon (1994), to represent the project scope should be on the format of Work Breakdown Structure (WBS). This format represents all works, tasks or deliverables, that to be implemented during the project life cycle. WBS is represented in the scope definition document, which organizes, defines and displays the deliverables and tasks that are related to the project.

As far as the preparation of proposals by the estimation team shall have similarities to preparation of quotations by the contractor, it has been found important issues that contractors shall take care into consideration in order to understand thoroughly the scope of work related to the proposal and accordingly provide a competitive proposal. These issues shall illustrate better clarity of scope of work. The first issue that was illustrated by Pickett (2005) is that the proposal Engineer or the scope of work estimator shall display the knowledge that he has about the scope of work. Pickett (2005) elaborated on this issue that the better understanding of scope of work shall result in better preparation of bill of quantities that reflect the requirements of the work that needed to be subcontracted. Moreover, record communication that is illustrated by conducting meetings with the project team and the relevant contractors, who are quoting for the job, shall also add a great value to assess the level of understanding of the scope of work (Pickett, 2005). It is better for the project team and the procurement team to write down all issues that were discussed during the meeting in order to settle all ambiguities that would rise during the tendering stage and accordingly stand on the level of understanding of the contractors for the scope of work. Furthermore, Pickett (2005) stated that the record documentation shall also play a vital role in better understanding and clarity of the scope of work. The level of scope that is provided in order to procure a service provider shall

not be an obstacle to the procurement engineer in order to allocate the required service provider. It has been analyzed by Dysert (1997) in Kodak's estimation team, that level of scope could be classified into 4 classes; in which every class vary according to the information provided at the time of estimate preparation. These classes would assist the procurement team and the project team to build up the basis for project costs.

One of the critical aspects about the scope, as mentioned above, is the scope definition. Scope definition has a vital role in assessing the overall costs of the project as it involves all tasks and deliverables that to be persuaded during the execution of the project. Several definitions of "scope definition" has been formulated by different researchers, as advised by Edward and Gebken (Cited in Sharma and Lutchman, 2006, p. 161), that the scope definition is "the stage of a project where risks associated with the project are analyzed, early designs are formulated, critical decisions are made and the specific project execution approach is defined". When the project scope id defined, modified and refined, a project's cost estimation could be established prior the execution and progress of the project (Pietlock, Leo and Hollmann cited in Sharma and Lutchman, 2006). The definition of the same has been elaborated further in accordance to project management perspective. Sharma and Lutchman (2006, p.161) advised that scope definition "includes equipment and material to be provided and work to be done and is documented by the contract parameters for a project to be completed by the by a service provider, EPC or contractor". Moreover and to simply define scope definition as defining the scope boundaries accurately, defining the resources and tasks to complete the project, stakeholder involvement and agreement on the tasks to be completed for the project and well definition or analysis of risks pertaining to the project have been implemented. Scope definition is usually demonstrated by issuance of scope statement, which shows the basis for making project decision. The components of scope statement as advised by Sharma and Lutchman (2006) are as follows: (1) Project Justification, which explain the reasons to undertake the project into execution, (2) Project Product, which provides a summary of the product description, (3) Project Deliverables, which refers to list of items that required to be finished by executing the project and (4) Project Objectives, which illustrates the criteria that the project to be assessed in order to present project success.

When the agreement of a project is being settled and there was a need for procuring subcontractor for a specific type of work, the scope work has to be re-examined as suggested by Fleming and Koppelman (1996, p. 11). The process of re-examining the scope of work includes "further refinement of scope of work, consistent of what of being authorized by management, flow

down of requirements to specific functions and or to specific individuals for performance and addressing the scope portion that to be subcontracted to different company for performance".

Project Schedule

It is essential to understand the difference between project plans and project schedules (Douglas, 2004). The definition of project plan as advised by Douglas (2004, p. 71) is "The documentation of project planning efforts". They exist under a variety of titles due to the size and project capacity, such as "Project Management Plan, Task Order Plan or Task Work Package". The project plan is handled by the functional sections and it is developed in accordance with the project prime objectives and organization's policies and strategic objectives. While project planning or scheduling is defined by AACE (sited in Douglas, 2004, p. 72) as "determination of project objectives with identification of project activities to be performed, methods and resources to be used for accomplishing the tasks, ... stated in the project plan to achieve completion as required".

When contractors submit their schedule during participation in a tender, it has been noticed that the submitted schedules are not realistic and do not represent all activities that are mentioned in the Work Breakdown Structure (WBS) (Glenwright, 2004). Glenwright (2004) argues that the reason behind those unrealistic schedules is that the contractor or subcontractor has not appointed the project management team during the tendering of the project due to non-assurance of being the successful bidder. He has elaborated that many schedules are incomplete and do not include activity resources loading and scheduling. Thus, Glenwright (2004) stated that the scheduling process consists of three main processes and have also weighted every process in accordance with the amount of effort that need to be provided during the establishment of project schedule. These processes are (1) Planning, which shall require 60% of the total effort, (2) Development, which requires 25% of the total effort and (3) Management, which require 15% of the total effort. It is crucial, as explained by Glenwright (2004), that the schedule planning should take the biggest portion of scheduling process due to the list of tasks that would add a great value to the project schedule. Some of these tasks, listed by Glenwright (2004), related to project schedule planning are (1) Organization of the work by deliverables in a WBS, (2) Identification of activities within each work package, (3) Determination of scope of work of every activity, (4) Estimation of resource needed for every activity, (5) Estimation of duration for every activity, and (6) Developing of logical arrangement of every activity.

Further research has been conducted on planning project schedules as implemented by Douglas (2004) in his journal article "Project Planning – Then Scheduling". Douglas (2004) focused on the necessary elements of a project plan and the responsive actions from the project team on translating these project plans into effective and sufficient project schedule. The reason to plan as stated by Douglas (2004) is that the project performance is improved when proper and sufficient plan do exist.

The information that is to be incorporated in the project schedule is important and requires special attention as contractors tends to neglect providing the right information about schedule during tendering stage (Douglas, 2005). Douglas (2005) has developed a research document that illustrated the importance of preparing a schedule document and showed what information shall be incorporated in that document. As stated above, most contractors spend less time and effort in documenting the schedule basis, which leads the project participants to have difficulties in understanding carefully the basis of project scheduling and accordingly this can contribute to difficulties in chasing project schedules deficits when a project becomes delayed (Douglas, 2005).

Douglas (2005, p. 31) defined the basis for schedule documentation as "A documentation that describes how an estimate, schedule or other plan competent was developed and defines the information used in support of development". This document includes several elements that should be mentioned such as description of scope of work, description of deliverables, methodology of work to be implemented, exclusions, level of uncertainty, etc (Douglas, 2005). The format of schedule documentation as suggested by Douglas (2005, p. 32 citing Pinnel's 1998 book "How to Get Paid for Construction Changes") is that this documentation should consist of ten sections. The only sections that will be highlighted in this literature review and are related to the research topic are Scope of Work, Contract Period, Activities Duration, Procurement and Schedule Progress Reporting and Updating. To elaborate further on the Procurement Section, it has been mentioned by Douglas (2005), that this section shall include bidding duration and time frame for award, logistics and storage information, assembly and installation duration, suggestion to shorten long lead procurement duration.

One of the most important challenges of project scheduling is project delays, as they would affect negatively on the project environment (Casinelly, 2005). The implications of schedule delays as stated by Casinelly (2005) are illustrated by the difficulties of implementing the project on the required and desired rate of progress. This may accordingly drive the contractor to suffer financial problems and can lead to the contractor becoming bankrupt. It has been found that most project

delays occur during the initial phase of the project, specifically prior to procuring the contractor, which shall lead to catastrophic financial loss from the owner of the project, due to the re-procurement or a re-tendering process and delayed delivery of the required project (Casinelly, 2005). Moreover, schedule delays would allow the project stakeholder to lose control over the project and in very serious situations can lead to chaos.

The causes of project delays during the initial phase of project life cycle as advised by Casinelly (2005) are mainly related to the contractor's ability to allocate the responsible project management team to tackle the requirement of project scope and accordingly implement the right processes of project management. Critical factors have been addressed by Casinelly (2005) that explain the reasons for such schedule delays like: 1) lack of proper knowledge of project scope and technical specifications, 2) In-sufficient understanding of the contract's requirements, 3) Lack of experience in similar projects, 4) Lack of managerial skills and project management culture, and 5) inadequate contractor's financial capacity.

Douglas (2008) conducted a research study of establishing schedule constructability review, which is used to assess the project schedule in terms of adequacy and completeness. It also evaluates project schedule's activities sequence and various engineering discipline. This process could be implemented alongside with the project plan phase.

Project Stakeholders

Further studies have been implemented to figure out the answer of the main question about the identity of project stakeholders and it has been found during the last century that the only entity that was found as the stakeholder of the project is known as "Client", however, this idea was vanished due to the existence of complex projects (Newcombe, 2003). This concept of the single entity is being obsolete as it does not reflect reality of stakeholder configuration for most projects (Newcombe, 2003). Newcombe (2003, p. 842) has identified project stakeholders as "groups or individuals, who has a stake in, or expectation of, the project performance and include clients, project managers, designers, subcontractors, suppliers, funding bodies, users and the community at large". Okorafor (2010, p. 147) identified the stakeholders in a project as stated in PMBOK (2004) as "a person and or organization that is actively involved in a project execution or whose interests maybe positively or negatively affected by the execution or the completion of the project". It has been stated by Morris (1994 cited in Newcombe, 2003) that the project's objectives shall be in

accordance and matching with the stakeholder's objectives and they shall be suitable for accomplishing the stakeholders' interest during the project life cycle and also they should be formable to change according to project changes and stakeholder objectives change. The stakeholder ultimate key is power in the project, which is usually used whether to maintain the strategy of the project and its status or to implement the required successful change in the project (Newcombe, 2003). The types of stakeholder in a project could be categorized as inside stakeholder such as, designer, contractors, procurement teams and outside stakeholders such as, users, the community,.. etc (Newcombe, 2003). Newcombe (2003), pointed to the importance of how different groups of stakeholders influence the project outcome. He used a technique called stakeholder mapping or stakeholder analysis, which shall assess the level of interest and expectation of different project stakeholders in accordance to the level of their power and influence to the project. Okarafor (2010) has gathered different views of different researchers on the steps that to be used in project stakeholder analysis, and three common steps have been found in agreement with most of the researchers. The first step is to identify and categorize the stakeholders of the project, while the second step is to assess the interest of identified stakeholders and finally the third step is to determine the influence of the stakeholders' interest and to provide the best way to deal with them in order to mitigate the unexpected side effects resulted from them.

The information that important stakeholders own during the initiation of the project shall play an important role towards the success of the project. It been described by Boddy and Paton (2004 cited in Okarafor, 2010) that the knowledge that critical stakeholder as the asset to organization in will have a great influence on the input of the project scope during the project initiation stage. They have elaborated on the influence as the support that to be provided in shaping the project brief and assisting in project execution.

The stakeholder role in organizations differs as the interaction and size of control on project matters. It has been found by Dada (2012) that stakeholders in a project could influence the performance of the traditional type of procurement (Design, bid, build) by expressing their perceptions and needs. These perceptions as stated by Dada (2012) could be used as a guiding tool for the procurement and the project management team in the direction towards best project procurement method and accordingly towards project success. Dada (2012) has elaborated that stakeholders have to incorporate and transfer the right and required knowledge in order to deliver the prime objectives of the project as well as the organization strategically objectives. The types of information that the stakeholders have to transfer during the procurement process have to be in a way that contribute to the further improvement in tendering procedure, direct the strategy and

policy of the procurement method and provide intervention effort to the industry that the tender is to be floated.

The idea of satisfying project stakeholders have been thoroughly discussed by Mallak et al (1991). It has been found that the well known three triangle of project success as Time, Cost and Quality, are not the only factors that contribute to stakeholders' satisfaction. However, in addition the former constraint, stakeholder satisfaction is achieved by providing the required project data and information accurately and also assuring that learning curves of previous projects have been analyzed carefully in order to mitigate reoccurrence of past project problems (Mallak et al 1991). Mallak et al (1991) have analyzed and categorized different stakeholders that might be involved in a project and also have provided their perception interest in the project, their power assessment and power channel and provided the means to satisfy them. The literature shall shed light on two categories of stakeholders that were analyzed by Mallak et al (1991) and are related to the case problems. The first category is Subcontractors and the second one is Project Users. Subcontractors are normally project stakeholders that are responsible of a small portion of the project. The main interest of this type of category is that they would care about implementing their scope of work perfectly in order to assure further projects to be procured by them. They exert their power by providing their technical advice or proposal on the part of their scope and they exercise their power delaying the project and not delivering it on the justified time constraint. Mallak et al (1991) stated that to satisfying this category of stakeholder shall be in a lower priority and it is implemented by providing the required scope of work of the project, specifications, drawings, deadlines and all necessary project information. The second stakeholder category is the project user, which is known as the client or the customer who should use the project after completion. Project users' interest is that the project meets their objectives and they exert their power through public relation, financial or legal means. Mallak et al (1991) advised that to satisfy this category of stakeholder, their input and ideas on the project shall be noted and taken into consideration, make sure their concerns are attended and assure that this group of stakeholder is well understood as they are considered to be as "Powerful Force".

As mentioned in the literature, stakeholders have different affects and roles on the tendering process (Doloi, 2011). The role of a project sponsor or owner during project tendering stage is basically is to take over the project from the conceptual frame to the reality, therefore, the project stakeholder has to provide logical cost estimation to the tendering team in order to procure best contractor to the required project.

Project Progress

Progress has been defined in economics as "a term that involves abundance of material possessions and resources possessing monetary or exchange value", while as in project management project progress is defined as the physical advancement of project status at specific project time and duration, based on consumed cost value. (Natoli and Zuhair, 2010, p. 202).

Measuring project progress in order to assess the relevance performance has played an important role in project management practitioners in dealing with their project evaluation techniques. It has been found that one of these major techniques that is used to measure project performance is Earned Value Analysis (EVA) techniques (Bower and Finegan, 2009). Bower and Finegan (2009) have found that the usage of this technique in projects as a practice is limited and scarce. They have cited the reasons that were analyzed by Fleming and Koppelman (2004) on not utilizing EVA techniques in projects. Three main reasons have been summarized in which I shall address one of them, which that project managers does not prefer to know the real cost of the project. However, in fact, project management practitioners are depending on the EVA techniques in order to assess the performance and progress of their projects (Bower and Finegan, 2009). The functions of this technique have been illustrated by Bower and Finegan (2009) in their research as it provides a specific information about the project status by evaluating project performance and progress using metric approach. EVA technique would be sufficient approach to evaluate project progress as long as the quality of the information provided by the project team is accurate and consisted. Bower and Finegan (2009), have provided further insight on the functions of this technique as the narrow perspective shall in somewhat be a strength as it will provide an easy way to understand the outcome of this technique as well as can convert these outcomes into quantifiable components.

In addition to the above mentioned definition of EVA, further research have been conducted to introduce Earned Value Management (EVM) methodologies, which is concerned to investigate the real progress of the projects and integrating the three main performance elements or indicators for project management (Scope, Time and Cost Management) (Vanhoucke and Vandevoorde, 2007). This methodology is implemented by analyzing the completed work at certain duration of time of the project in accordance to consumed costs. This practice is implemented between the plan and actual status of the project (Anbari, 2003 or Fleming or Koppelman 2005 cited in Vanhoucke and Vandevoorde, 2007). Moreover, it has been advised by Chen (1994) that project progress

should be evaluated based on earned value systems for project deliverables and physical accomplishment. He stated that this system depends on the comparison between completed activities against planned activities to figure out the actual earned value.

Further studies have been thoroughly implemented to analyze reasons that are contributed to projects' schedule slips or delays and budget over runs. Hormozi (1999) set up the reasons that are related to poor project performance and progress and ranked them in accordance to views of general and senior management and project managers. Fifteen reasons were ranked by the former project stakeholders, and it has been found that general managers have relayed their first reason for poor project progress to insufficient project planning. However, project managers have stated that the first reason that causes insufficient project performance is Client or Management changes. Both categories have agreed that the last reason that has least negative implication to project progress is unqualified project personnel (Hormozi, 1999). Hormozi (1999), have also explained how the Project Control Cycle works in a project. The tool that senior management is using to determine the project progress is Project Status Reports. These reports show the important and critical project aspects and status that would indicate the conditions of project schedule, status and budget overruns. Senior management are heavily depending on these reports and often implies critical project decisions, as they report whether the project is profitable or it should be terminated (Hormozi, 1999). Hormozi (1999) mentioned the way that the project team has to use in order to monitor and control project progress. He cited (Knutson and Bitz, 1991) five stages of project control process, which are as listed below:

1. Update past status
2. Analyze the impact of new changes
3. Act on the variance between actual and planned performance
4. Published schedule changes
5. Inform Senior Management

As the above showed the importance of progress reports in projects, it is also important to describe how progress reports should be prepared. As Chen (1994) stated that the target of these reports is to deliver important project information to the senior management and vice presidents, those reports are not being specific and illustrate the required information that to be presented. Therefore, Chen (1994) has come up with relevant thoughts about preparing status reports. He suggested that a sufficient progress report format shall consist of "must read" items and "recommended read" items. By this way of categorization, the management shall skim and scan the

required as quickly as possible and hence shall save time to find the required piece of information. The "must read" items consists of project overall safety, executive summary and project problems and the required action plans. While as The "recommended read" items in a report consists of highlights of important achievements in project functions, such as engineering, installation, procurement,... etc during the last period, plans of major activities of the project for the coming period and project's related graphs, charts and pictures.

It is important to monitor and control the performance of the Supply Chain in projects due to the "uncertainty of large cost and delivery of outsourced service or supplied material", which shall accordingly be related with other important activities in the project (Wickramatillake et al, 2007, p. 53). The research that was conducted by (Wickramatillake et al, 2007), have indicated that this process would difficult to monitor, as the quantities of the supplied items in a project would vary and also due to lack of "pre-determined" contractors and well reputed service providers. They have suggested overcoming these difficulties by integrating and collaborating between modern management methods and traditional practices between suppliers and customers in supply chain.

Procurement Issues

Many researchers have investigated several definitions for procurement and it has been agreed by Lee (2010, p. 405) that the definition of procurement is the "acquisition and purchase of goods and services in both the private and public sectors". Lee (2010) has identified two type of procurement as public procurement and private procurement. The public procurement refers to the procurement methods that are applicable in the public sectors and the private ones are the methods applicable to the private sector. Both types of procurement are considered to be generally identical due to the reason that both are serving the purpose of finding best sources of supplies when required, at the best or cheapest price and within the acceptable limit of quality; however, discrepancies between the both procurement methods exist (Lee, 2010). Moreover, Erridge (2000, p. 15) have cited the definition of procurement as "whole process of acquisition from third parties, and covers goods, services and turnkey projects.... etc."

As procurement stimulates the supply process, which is dominantly used to satisfy the demands of projects, it has been found procurement is part of a larger process called "Supply Chain Management" (SCM) (Zuo et al 2009). Chen and Pualraj (2004 cited in Zuo et al 2009, p. 388) have identified SCM as "the management of relationships of other members of supply chain". It has been

found that the key performance indicator for SCM is the two ways communication between the buyer and the supplier (Zou et al 2009). Zou (2009) advised that poor communication between the actors in SCM, shall contribute to weak measures in SCM performance and accordingly shall contribute effectively in suppliers or contractor performance.

One the major parts or a tool in supply chain is e-procurement, which is basically integrate Information technologies with the different process of supply chain management (Puschmann and Alt, 2005). Studies have incorporated that e-procurement has positive direct influences on process and procurement costs (Gebauer and Segev, 1998 cited in Puschmann and Alt, 2005). As stated by Puschammn and Alt (2005, p. 123), the prime objective of e-procurement is to get the end user involved in the procurement process electronically and to "close to process gaps of re-entering the data in the supply chain for indirect goods". One of the benefits that e-procurement endorse that it gives strategic procurement processes greater space than operational procurement processes, which accordingly enhance supply chain transparency.

Moreover, further studies have been conducted to elaborate on tendering and procurement methods. It has been found by Love (2002) that procurement methods were categorized into two types, the first called "Traditional Procurement Method", which consists of traditional lump sum, traditional cost plus and traditional with provisional quantities. This type of procurement method has been criticized as it endorses problems of procurement process gaps, which it affects the delivery of project that its design is separated from the construction stage. The second type called "Nontraditional Procurement Method" such as design and build and construction management, which overcome the procurement gaps mentioned above and partnering, which encourages team collaboration between the client/owner and the contractors' different teams (Erickson et al, 2007). The core issue about appropriate implementation of partnership in project management is coordination between the contractor and the client in order to assure performance in project execution (Xue et al., 2007 cited in Cheng and Carillo, 2011). Love (2002) has also conducted a quantitative search on the tendering methods that are commonly used in the procurement of construction projects and he examined that single stage tendering is the most popular tendering method of (52%), then negotiation (32%) and finally two stage tendering (16%). This shall agree with the views of Love (2002) that the most popular procurement method used is the traditional ones which are correlated with the usage of single tendering method. On the other hand, negotiation and two stage tendering methods are considered to be related with the nontraditional procurement methods, which are rarely used in market place.

It has been found by Forgues and Koskela (2009) that the reason for project poor performance is mainly related to the implementation of adversarial procurement practices. Therefore, the importances of nontraditional procurement methods have shown their influences on project performances in terms of cost, time and require quality (Elwardani et al, 2006). One of those methods called Design-Build in which the owner gets the service for design and construction from a single entity. Several studies that were cited in Elwardani et al (2006) indicated that design–build procurement method should contribute to have less cost and average schedule growth. Elwardani et al (2006) have elaborated on four tendering methods that design – build contractors are procured, and they are as per the following: 1) Sole Source Selection, 2) Qualification Based Selection, 3) Best Value Selection and 4) Low Bid Selection.

It has been recommended by Laedre et al (2006), that one of the internationally recognized best practice for selection of procurement route in construction and building projects is Design and Build, in which is it is popular with industrial project owner. This procurement method would allow to transfer the risk to the contractor from the initial stages of the project starting from the design till the execution stage formed as construction. It gives the owner the credential of using contractors design competencies and optimizes project schedules. However, this approach would lead to exaggerated project costs due to risk transfer (Laedre et al 2006).

Moreover, it has been indicated that the implication of Owner/Contractor Work Structures is considered to be a critical activity (Anderson et al, 2004 cited in Laedre et al, 2006). This activity consists of establishing a framework that differentiates the responsibilities between the owner and the contractor. This activity shall contribute to better selection of procurement method or route.

According to Office of Government Commerce Report (OGC, 2008 cited in Oyegoke et al 2009) it was found that the Private Finance Initiative (PFI), Design and Build and Prime Contracting are the highly adopted procurement routes by the government sectors. In addition to the former procurement routes, it has been found that management contracting of construction management is also considered one the major procurement route used in the UK, which is basically concerned with "designer-led construction works managed for fee/fee construction management method" (Oyegoke et al 2009, p. 344).

Having stated different procurement methods above, it is important to clarify the criteria that are to be used in order to select best appropriate procurement method, which suits the project (Chan, 2007). Chan (2007) has reviewed different literatures about procurement selection methods and has been found that a project procurement system selection model (PPSSM) has been developed

depending on 4 criteria: 1) Feasibility ranking, 2) Evaluation by comparison, 3) Weighted evaluation and 4) Analytic hierarchy process (Alhazmi and McCaffer, 2000: cited in Chan, 2007). However, this system has not proven its efficiency as its criteria lacks explanation on why those to be used to choose the procurement method. In addition to the formers criteria, another 8 selection criteria were identified by Cheung et al (2001: cited in Chan, 2007) as follows: Speed of project completion, 2) Certainty, (3) Flexibility, 4) Quality, 5) Complexity, 6) Risk avoidance, 7) Price competition and 8) Point of responsibility.

The criteria while evaluating bids depend on how the client shall control the level of trust between himself and the contractor (Eriksson and Laan, 2007). Eriksson and Laan (2007) have provided two types of Client standpoint when evaluating bids. The first one called the output control, where the client tendency is not to affect the contractor's or the supplier's characteristics. While in process control in which the Client bears all the risk, the client tends to change the characteristics of the contractor such as competence and capacity.

Rajagopal and Bernard (1993) have shown the importance of setting up a procurement strategy in the beginning of the procurement process. They have indicated three main phases in order to start establishing the required strategy. The first phase is Analyze inputs, which is concerned about gathering up the required information. The second phase is Initiate activities, which is about identification and integration of the strategic planning process. In addition, the third phase is known as Abolish or avoids inertia, which is about communication and implementation of the content of the purchasing strategy (Rajagopal and Bernard, 1993)

Chapter 3: Research Methodology

Scope and Objectives

The purpose of this chapter is to provide a clear overview of how the research problem was investigated. The research problems were identified through selecting, researching and evaluating three different project cases called "Problem Cases". These cases have been selected from on-going projects in the Supply Section in Commercial Department of NPCC and other related projects that the supply section has procured required services.

Every case has been classified using a set of headings that are related to the formulation of the research problems; notably the core concepts of Project Scope of Work, Project Schedule, Project Status or Progress, and Procurement Issues. All of the problems studied are related to the role of the procurement function and the overall efficiency of the projects. Since the stakeholders for each case were available for observation interview study, the research problem was tackled using a qualitative approach implementing one-to-one interviews with relevant stakeholders for each of the projects. These interviews have been designed to concentrate on the problems related to the procurement functions and its processes while procuring required services requested by the project manager of the case project.

Interviews were selected as the method for collecting data because as was mentioned above, these projects were all related to NPCC, making it easier to approach relevant stakeholder and get informed viewpoints and data on all of the interview topic headings. The implementation of the main study was preceded by conducting two pilot interviews in order to assess informant validity and the adequacy and reliability of the questions in the draft interview schedule. Moreover, it was envisaged that this qualitative approach to the data collection was highly appropriate for identifying problem solutions and making recommendations that would be relevant and of benefit to NPCC. Also, it was planned that the research would simultaneously uncover many points of weakness that are related to procurement functions and accordingly could generate recommendations for improvement in terms of practical and contextually relevant courses of action and best practices to be implemented in NPCC.

This chapter will explain the details of the research tool that was used to undertake this investigation. It will state the precise question format used to collect the data from a sample of relevant individuals and also shall justify the reasons for asking these questions. The questions that are used to collect the data were subdivided into separate headings; therefore this chapter will also

provide a brief explanation on how the questions were interrelated within and between sections and what was the purpose of asking these questions.

The research methodology applied in this dissertation is essentially a case study approach based on work-based participant and non-participant observation by the author of the study, and the data collected are through interviews of knowledgeable informants who are major stakeholders in the project. The precise characteristics of the research sample are described and justified according to who are key informants on the projects and the related problems to be investigated. Then, the methodology chapter explains how the interviewees' talk and responses to questions were analyzed. The chief method of data analysis is case based and relies on deriving case themes and narratives, both within and across cases.

Statement of Research Aim

The aim of the research as was stated in Chapter 1 is:

To investigate the role and implications of professional implementation of procurement functions and processes for projects' performance and efficiency.

It is to be noted that the aim of the research offers a broad indication of the methodological approach that could best be used in investigating the research problem and also would help in understanding why these questions were presented to the interviewees and hence should assist in identifying some of the more appropriate methods to analyze the answers.

Rationale for the Research Questions

The structure of the interview questions has been generated to suit the case studies that were selected to investigate the research problem. Every case has an identified set of factors that were thought to be contributing to the problem. These factors were addressed in each case study and it has been found that common factors are contributing towards the main research problem.

The structure of the interview questions has been established in accordance with the viewpoint that the common factors relate to procurement functions and processes and impact directly on projects and their project management. The structure of the interview questions was based on five main headings: Project Scope, Project Schedule, Project Stakeholders, Project Progress and

Procurement Issues. The structure facilitates in-depth research into the dynamics of the procurement function and the impact of specific procurement issues on projects, it also enables iterative and repeated conceptualization of the practices and procedures of procurement and their impact on projects through asking the same questions in multiple circumstances for the three case study projects. The method of research interview was deliberately open-ended and designed to elicit responses from different perspectives and viewpoints of the informants. The following section shall state the questions that were asked according to every heading and also shall identify reasons, which contributed to posing these questions:

- **Scope**

1. How would the PM prepare the scope of work? And who would he get information assistance from?

This question is raised in order to come up with the sources required to write the scope of works for a specific project. It depends on the parties who would help the project manager to prepare or initiate the scope of work.

2. In your opinion, what determines better clarity of scope of work?

The reason for asking this question is to find out the best documents that shall substantiate the submission of project scope of work to the procurement team in order for the bidders to be able to understand thoroughly the scope of work. This question is designed to identify the approaches that most Project Managers would follow to ensure better clarity of scope of work.

3. In what situation would PM provide information about two types of scope of work "Firm & Optional"? When is it important to specify optional scope of work?

The reason for raising this question is to investigate occasions that require specifying a type of scope called "Optional scope of work". Also, it should give an indication of the importance of specifying optional scope in accordance to the firm scope.

4. In your opinion, what documents should be provided along side with the scope of work? Why?

This question could be a continuation of the above question No. 2, which determines the documents; however, this question will indicate the reason behind listing specific documents to be part of the scope of work.

5. From Project Management point of view, what is the best approach for vendors' better understanding the scope of work?

This question is also a continuation of question No. 2, which is intended to indicate different approaches in transmitting the scope of work to bidders during the tendering stage.

6. What is scope split matrix? And how is it important for understanding scope of work?

The reason for raising this question is to identify the scope split matrix and emphasise on the importance of this tool to contribute to better clarity of scope of work.

7. What is the role of project stakeholders in the preparation of the scope of work?

This question is raised to check the level of contribution of relevant stakeholders in the preparation of the scope of work and also to understand the relation between project scope of work and project stakeholder.

- **Schedule**

1. How would the PM determine project schedule?

This question is raised to identify the issues that the PM would consider to establish project schedule, which accordingly is then communicated to bidders.

2. What are the key components that to be used for setting up a project schedule?

This question is raised to identify the components that are necessary to prepare the project schedule. This is an important issue in order to help the bidder to provide sufficient quotations for the required job and accordingly this area of information will affect the prices.

3. In your opinion, what is the relationship between Project scope and schedule?

This question is raised in order to study the relationship between the project scope and the project schedule and how this relation works towards better submission of commercial and technical offers by the bidders.

4. What is the role of project stakeholder in setting up a project schedule?

This question assesses the contribution of the project stakeholder to the project schedule.

5. How would the PM evaluate the project schedule efficiency in accordance with project scope?

As stated above, the relation between the scope and the schedule of the project would affect the commercial offers; hence this question is raised to understand how the PM shall enhance the project schedule in accordance with the project scope.

6. Why would is project schedule important prior to floating a tender?

This question is raised to explore the importance of the project schedule in tendering

7. How would PM use the project schedule in determining the project progress?

This question is deployed to clarify the usages of project schedule specifically in determining the progress of the project. This helps to clarify how the PM assesses the contractor's progress during the execution phase of the project.

- **Stakeholders**

1. What would be the stakeholders' role in setting up project scope?

This question would be a repetitive question; however, the difference in perspectives relates to the interviewee who responds to it. This question seeks to clarify the role of the stakeholder in setting up the project scope. This contribution of the stakeholder would assess the extent of implication that would be reflected in the scope, which accordingly affects the technical and commercial offers.

2. What would be the stakeholders' role in assessing project schedule?

This question intends to clarify the role of the stakeholder in assessing the schedule, which accordingly affects the commercial offers.

3. In your viewpoint, what are the key important issues while procuring a contractor?

This question shall illustrate the issues that matter to the stakeholder while procuring a contractor, which shall accordingly enhance the procurement functions and process and also shall result in procuring the most suitable contractor for the required service or project.

4. What are the key important issues while procuring a subcontractor?

This question shall represent the same reasons above, but in relation to procuring a subcontractor. The reason to ask this question is to analyze the purpose of subcontracting.

5. According to your project objectives, how would you improve and enhance procurement processes/procedures?

The main objective of this question is to find out the positive implications of project stakeholder interference towards the procurement functions and processes to analyze the efficiency of the scope awarded to contractors. This would allow the research to list out the issues that need to be incorporated from project stakeholders during the tendering stage.

6. How would the stakeholder evaluate the progress of the project?

This question is raised to illuminate the means that the project stakeholder uses to evaluate the progress of the project so that it can be compared with the PM's means of evaluating the project's progress. This comparison shall endeavor to communicate the means of evaluation with the bidders or contractor who would get the award of the scope project.

7. Why should the stakeholder recommend/nominate subcontractors for the procurement team to invite?

This question shall give a clear view on the reasons behind nominating contractors for the procurement processes. These reasons might be used as part of question No. 5 above in order to identify the ways that the stakeholder could enhance the processes of procurement.

- **Progress**

1. How would the PM assess project progress?

The reason to raise this question is identify the way the PM would assess the progress of the project after as well as during the execution in order to evaluate the performance of the awarded contractor.

2. In your opinion, what is the relation between a contractor's performance on past projects and a current project's progress?

The aim of this question is to identify the performance of the awarded contractor based on the experience of the PM with the same contractor. This information will give an indication for the procurement team on when to invite or exclude bidders for bidding according to their previous experience. Further, it will provide the basis for the procurement team to prepare specific forms for evaluating contractor's performance by the PM after completing the project.

3. How would payment terms and other procurement issues contribute to better contractor progress?

This question will indicate the procurement or commercial issues that are necessary to be addressed during the tendering stage in order to allow the PM to control the project's progress.

4. Would you explain how bidder prequalification prior tendering is important for better project's progress?

This question is raised to indicate the importance of pre-qualifying bidders before inviting them to make sure that the invited bidders are providing the requested service and accordingly will enhance the procurement processes.

5. What are the tools that are used in evaluating the project progress?

This question shall indicate the tools to be used by the PM to evaluate the progress of the project.

6. During project execution, how would PM enhance the project progress?

This question will show the means that the PM would use to enhance the project's progress and assess these means in accordance with all invited bidders' capabilities and resources.

7. In your opinion, what are the factors that contribute to the project progress?

This question is designed to identify and indicate the main factors that affect the project's progress, which could then be used for assessing the bidders' capabilities in pre-qualification.

- **Procurement Issues**

1. How important is project schedule for tendering procedures?

This question is raised to indicate the importance of scope schedule for a project for the procurement team in order to use for tendering procedures and assess how this information would affect the commercial submissions from different bidders.

2. In your opinion, what shall determine sufficient/proper tender documents?

This question is used to determine the best documents that shall substantiate the tender documents from the procurement team's point of view. This will be helpful for finding out the similarities in viewpoints across the different respondents.

3. How does technical evaluation of bids affect the commercial evaluation?

This question explores the effects of the technical evaluation of bids by the PM on the commercial submission, which then leads on to the submission of price impacts.

4. What are the selection criteria for choosing a contractor?

This question shows the ways that Procurement team chose the bidders to be invited for the job, which shall be compared in accordance with activities and services that are a result of the prequalification process. It will help to show the similarities and differences between the other stakeholders' views on choosing bidders.

5. What is the role of a project stakeholder in determining the tender strategy?

This question is designed to indicate the ways that stakeholders, which affect the tendering procedures and consider how this would lead to better contractor selection.

6. How should the PM contribute to better a commercial evaluation?

This question will identify the contribution of the PM in gaining better commercial evaluation of bids received from bidders. Thus, these contributions could be suggested and incorporated during the tendering stage in order to assure the best competitive prices from bidders during their commercial submission.

7. What are the differences between contract and subcontract?

This question shall identify the main differences between Contract and Subcontracts in order to clarify the confusion that the PM and other stakeholder could face during the tendering stage. This clarification can help the procurement team to convey the message to bidders during the tendering stage and accordingly shall enhance the organization's tendering procedures.

Interview questions and the five sections

The interview questions were grouped as mentioned above into five sections. Every section was generated from the case problems of projects that had issues related to the project progress delays resulting from improper implementation of procurement functions and processes. This part of the methodology chapter shall indicate the headings that were used in the interview questions and shall provide an explanation of the issues that the answer to every question achieved in relation to the required objective mentioned in Chapter 1 earlier. This section indicates what was intended to be obtained from the respondents and what objectives it was hoped would be achieved by asking the group of questions under each section.

The first heading in the list of interview questions is Project Scope. It was intended to obtain relevant information related to the scope of works and its implications for better implementation of procurement functions. As the scope of work is one of the important issues that is related to procurement functions and as it contributes directly to the cost of the required project, it is important to identify issues that contributes better clarity of scope of work and communicate these issues to bidders during the procurement or tendering stage. The question under this heading shall ensure investigation and achievement of objective number three that is mentioned in Chapter 1.

The second heading in the interview questions is Project Schedule. These questions aim to look into the issues that contribute to setting up the project schedule and also have a role in enhancing the outcomes of procurement processes. The reason behind asking these questions is to show the importance of the project schedule in according to tendering procedure and also to understand how that the project schedule can affect the price of the tendered project or scope. Project Schedule questions shall contribute to achievement of objective four mentioned in Chapter 1.

The third heading in the interview questions is Project Stakeholder. The aim of the question under this heading is to assess the involvement of the project stakeholder on the procurement processes. It is intended to identify how the project stakeholder would contribute to the tender strategies and how procurement teams shall implement these strategies in accordance with the project's aim and objectives. The reason behind asking these questions is to specify the level of contribution of the project stakeholder on the tendering procedures and identify what implications these contributions would have effecting the award of the project. These questions shall contribute to study and achievement of objective two in Chapter 1.

The fourth heading in the interview questions is Project Progress. It was intended from the respondents of questions that are related to project progress to identify how project progress is evaluated during the execution of the scope of the project. These means of evaluation could be identified to the bidders during the tendering stage and accordingly shall contribute to better understanding of relevant progress evaluation methods that can be used during the execution of the project. The reason to ask such questions is to identify the reasons that contribute to project delays and evaluate these reasons with the procurement issues and find relationships between the two. This shall contribute to eliminating project delays and improve opportunities for project progress, if early engagement existed. These questions shall assist with the achievement of objective five in Chapter 1.

The last heading in the list of interview questions is Procurement Issues. The respondents to these questions were approached to reflect on the procurement functions, processes and procedures that are related to the project. These questions aim to indicate the main procurement issues and illustrate the relationships between these issues and the outcome of the project in terms of cost, quality and time. The reasons for asking these questions is to clarify the most critical procurement functions that contribute to better project performance and outcomes and to identify on the missing gaps between relevant project users and the procurement team during the tendering procedure and processes. These questions, it is envisaged, shall assist with achievement of objectives one, six and seven in Chapter 1.

The Research Sample

The research sample or the informants have been selected from cases that were represented with issues related to the research problem. Every case has been analyzed thoroughly and every informant has been allocated in accordance to the focus of the research questions. For example, in the first case, the identification of the most suitable individual who could provide information and data about the Project Scope, Project Schedule and Project Progress was considered to be the Project Manager in that specific project, while the one who it was felt could provide sufficient information about Project Stakeholder is the Contractor, and about the Procurement issues is the Supply Section Team. For easy reference, below should show, according to every case, who the informants would be:

The Research Study's Informants

Case 1: Construction of Gas pipeline to Al-Ain Cement Plant

Scope: PM
Schedule: PM
Stakeholder: Contractor
Progress: PM
Procurement Issues: Supply Section

Case 2: Construction of new pipe coating plant

Scope: Engineering Department
Schedule: Yard Department / PCY
Stakeholders: Yard Department / PCY
Progress: Yard Department / Engineering
Procurement Issues: Supply Section

Case 3: Cathodic Protection Works for Pipeline and Facilities

Scope: PM
Schedule: PM
Stakeholder: Contractor / Engineering Department
Progress: PM
Procurement Issues: Supply Section

The research sample has been drawn according to the methods and criteria that is formed on a case to case basis. In the first case and the third case, the method or the criteria to select the informants was basically from the nature of the project. As the project in cases one and two are related to the project management team, which is managing main projects and working as the contractor representatives, then the scope of the cases are mainly called the scope of the subcontractor. This shall determine who would be the person, who shall manage the subcontractor works and will accordingly provide all necessary information about the sub-contracted works. In summary, those two cases have terms and conditions that are back to back to other major projects.

While in section three, the criteria to select the informants was also related to the nature of project, as the project aimed to construct a facility for NPCC, it will shown that this project has a sole discretion as NPCC is the client of the project, thus the informants of the project should be internal departments that contributed to the establishment of the project scope schedule and contributed to monitoring the project's progress. The common factor about all of the informants is that all of them are working in the same organization. The reason that this method of selecting the research sample has been chosen is to focus on the procurement issues that the supply team and the end user of the project would face during tendering and awarding process and also during project execution phase. Hence, in order to do so, it was necessary to choose informants who have direct contact and involvement with the project. Another selection criterion that was used was to choose informants that were available to approach. This approach is used, because some informants like clients of major projects were not able to be approached for interview, which meant that it was anticipated it would be difficult to collect relevant information in relation to the project stakeholder and project progress section.

The basis of the research sample is that all of them are employed and working within NPCC. The employment experience that each informant has ranges from 5 – 10 years of experience in NPCC and 10 – 15 years of work experience overall. Most of them have direct contact with the project activities and details. The informants were basically classified as middle managers or held other senior positions in the organization. The respondents were based in different departments within NPCC, for example, the Project Managers worked in Projects Department, and the Supply Section were from the Commercial Department and other relevant departments that are concerned with the project cases.

Method of Analysis

The data collected was analyzed based on the interviewees' input and answers to the interview questions. Transcripts of the collected data were initially prepared in order to analyse on the main findings from the interview questions. These transcripts have been analyzed and comments and concepts for every answer have been noted in order to research the issues that tackle the problems raised.

The approach that has been used to analyze the data was twofold. The first approach taken was to analyze the data and main findings for every case taken as individual cases. This approach assists with understanding the different viewpoints of respondents within the same case study. Then, the second approach adopted was to analyze the data and main findings in accordance with the other data and main findings of the other cases. This approach provides an indication of the similarities and differences in perspectives of interview informants in one case in relation to the other cases. The analysis in the second approach was based on a comparison between interview informants within similar interview headings, for example, answers to questions related to Project Scope in case 1 were compared with answers in case 2 and case 3. Moreover, the answers of the interview questions assist with identifying and establishing the key case narratives, which provides a clearer view of respondents' individual and collective perspectives on the research problems in the context of the case studies.

Chapter 4: Analysis and Interpretation of Results

Problem Cases:

Case 1: Construction of Gas pipeline to Al-Ain Cement Plant

Project's Scope:

The project is to lay 50 Km of pipes from Suwaihan Area to Al Ain. The contractor's scope is to provide residual engineering, procurement of bulk items for the completion of the project, obtaining approval/ permits to commence work on site, finalization of necessary construction procedure, receiving / transportation or storage of project materials, construction, testing, pre-commissioning and commissioning of the new pipeline and related facilities. The contractor would struggle with certain difficulties in terms of acquiring necessary approvals to work on site, as the work location is situated among UAE's Army camp and residence farms. On the other hand, the contractor's scope is also to perform pipe tie in with the main gas pipeline supply, which is owned by a company called "Dolphin". This should be another reason for the contractor to struggle, which shall forecast a problem of allowing the contractor to enter Dolphin's territory. Supply of bare pipes and associated valves is excluded from Contractor's scope of work.

Project's Schedule:

The project is scheduled for duration of seven months, commencing at June 30th, 2011. The Contractor has to accommodate project's plan with the supply of materials plan, in order to achieve appropriate project efficiency.

Project's stakeholders:

The stakeholders for the project could be divided into two main divisions; Direct and indirect stakeholders. Direct stakeholders consist of ARKAAN the Client, who owns the cement plant and the project, National Petroleum Construction Company (NPCC) the Project Management Company, JP Kenny the Engineering consultant and Construction and Trading Company (CAT) the

Contractor. The second division of stakeholders had a lower interference with the project such as, Al Ain Municipality the regulatory department, GASCO the provider of gas pipeline standards and codes and Dolphin the gas supplier.

Project's status / Progress:

The project is still in 60% progress, which tends to be delayed. As mentioned above the completion date has to be on January 30th 2012. The project has been delayed due to several technical reasons, but these reasons were not the only contribution. There are other reasons that are related to procurement or tendering procedures that also contributed to the same problem.

Procurement Issues:

Arkaan and NPCC are sister companies that are governed under a holding company called "General Holding Company" GHC. Arkaan is a company that deals with construction of cement factories and operating other construction building materials. Its management has poor exposure to the construction of pipelines. Therefore, the board of directors of GHC has decided that NPCC has to provide its services and expertise to construct the required gas pipeline. Arkaan was in a very critical situation, in which they have to operate their cement plant by gas since the company was losing about USD 1 million every month as operation cost resulted from fuel consumption. Accordingly, NPCC took the role of being a project management consultant for laying the required pipeline.

The project manager has requested to tender the construction of gas pipeline to concerned local companies in UAE. It was indicated that the award shall be done on a very urgent basis as a super fast track project. The procurement section started to analyze the scope of work; however the time taken for scope analysis was very short and limited. Contractor selection criteria were based on choosing prequalified contractors listed in company's data base. The prequalification process involved the project management team to assess contractors' ability to execute such projects. Once Invitations to Tender (ITT) floated to bidders, it has been noticed that three bidders out five had no interest to quote for the job. Among of those bidders was "CAT". The reasons for not participating were varied from contractor to another. For example, the scope of work being very limited to contractor's capability and capacity and other work load commitments. Accordingly, additional

bidders were invited to participate in the same bid, which allowed for bid closing date to be delayed further.

The total number of contractor's that showed an interest to quote after floating the second ITT were three and CAT was not among them. The three bids were accordingly received and the technical copies were sent to Project manager for technical evaluation. The PM has technically accepted two bids and rejected one. upon receipt of the technical evaluation, the tendering team has realized that the bid would lose tremendous value of bidders' competition by rejecting a bid, therefore, the supply section in association with the project team have decided to invite two more bidders to quote for the job. One of those two bidders was CAT, which was approached by NPCC senior management headed by CEO to convince CAT to reconsider their decision on participating in the tender. CAT and another company located in Fujairah agreed to participate in the tender and hence submitted their bids. According to the subcontracting procedure, technical bids were opened initially for Project Manager's evaluation. In order to expedite technical evaluation process, bidders were called for meeting in order to clarify all technical points raised by Project manager. The project manager has technically accepted three bids among the four submitted bids. Hence, upon completion of technical evaluation, commercial evaluation took place for the three acceptable bids. It was noticed that the prices were on the higher side; therefore, bidders were asked to provide commercial discounts on the submitted offers, which the response was not up to NPCC's expectation.

After finalizing the commercial negotiations, the subcontract documents were prepared and sent to Legal Advisor for review, who stated that the terms and conditions used in this tender are not relevant to subcontractor's case. Because, terms and conditions for subcontracts would require a contract to be available in order to be the basis for terms references, in which was not available this case. Accordingly, it has been recommended by Legal Advisor to remove all terms and conditions that are related to clauses in the subcontract and replace them with clauses related to Contracts. This has resulted into having new terms and conditions different than what have been tendered and also resulted in delays in awarding the job.

Case 2: Construction of new pipe coating plant

Project's scope:

The project is to construct a pipe coating plant facility in NPCC yard premises. The scope of the contractor specifically calls to carry out the civil works for the construction of the new plant. Other scope, which is about purchasing necessary coating equipments and related power substation, is excluded from the civil contractor's scope. In order for the contractor to achieve scope objective, certain works shall be done, such as: site grading with associate cut and fills alongside with the required leveling and compaction, Construction of reinforced concrete foundations for the sheds, construction of reinforced concrete on grade slabs, Construction of water basin and pump pits and construction of reinforced concrete trenches for cables and water pipes. The contractor's scope was also to provide all necessary licenses and No Objection Certificates from concerned authorities to enable him to execute the required work.

Project Schedule:

The project is scheduled to commence on February 27, 2011 and shall completed within two months' time. This schedule is only to execute the above mentioned scope of work and not related to the plant operation schedule.

Project's stakeholders:

As the project has to be done for NPCC, the stakeholders were mainly NPCC's department. The main project's stakeholder was the User, which was represented by the Yard Department. The Engineering Department has a role in providing the technical specification and participating in the provision of the technical evaluation. Another important shareholder was the Contractor, who is represented by G.E Construction Company (GE). The Accounts Department could be considered as the stakeholder, which interfered during contractor's payment process.

Project's Status / Progress:

The project is completed; however, the actual completion date was not matching the User requirement. The project was delayed for two months, as the contractor has other commitments with NPCC as well as with other clients.

Procurement Issues:

The procurement team started to analyze the scope of work and accordingly prepared the ITT. The terms and conditions that were used are general services terms and conditions. The Contractor's selection criterion was based on the list of prequalified contractors, which are listed under the civil construction activity. Most of the invited contractors are used to work with NPCC since long time; therefore, they were familiar with NPCC's terms and conditions and have not disagreed with them. When the procurement team started to select and invite contractors for the above job, an important issue was not taken under consideration, which is contractor's performance for a placed order. This means that the evaluation on contractor's performance for a previous job with NPCC has not been taken into consideration prior invitation. The User had information about invited bidders and did not provide any comment about contractor's previous performance. Moreover, Once ITT was floated; pre-bid queries were raised about dewatering scope of work. The bidders were confused about adding the dewatering work in their quotations. The ITT showed that dewatering is part of the scope of work; however, when the question has been raised by bidders, the User has excluded dewatering works from bidders' scope. It has been realized that the User or the Engineering department have used a standard format of scope of work which did not accommodate the required changes to the scope of work. In addition, an important issue was found to be very critical in terms of bids' technical evaluation.

It was noticed that the User was not the party who was supposed to issue technical clarification directly to procurement team. The User was incorporating all technical clarification and issues to the Engineering Department, which provided work's specification and scope. The procurement team faced difficulties to receive technical clarifications from the User as they were issued from the Engineering department. The procurement team has also struggled in terms of communication between the User and the Engineering team, which allowed for miscommunication with the bidders. After receiving technical evaluation from the User and accordingly opening the commercial bids, it has been found that the estimated budget provided by the user during initial

tender stage was very low in accordance with the prices and exact expenditures that the procurement team received or worked out. This has also forced the procurement team to negotiate the submitted prices. This has contributed to elongating the procurement process and hence delays in the awarding process. After preparation of award recommendation document and getting all approvals from concerned level of authorities, the award was done to a company called G.E. Construction Company.

As mentioned above, the terms and conditions used for this type of award were general services terms and conditions, which has a clause pertaining to the Performance Bank Guarantee. The provision of bank guarantee certificate by the successful bidder was not clearly mentioned in the Service Order. On the other hand, there was no clear policy on when such certificate is to be solicited from bidders. The Accounts Department has raised the flag that a bank guarantee shall be existed for this contract for two main reasons. The first one is related to the award value, which was considered to be high, and the second reason was related to the poor performance of the awarded contractor for previous jobs. These reasons have caused uncertainty and ambiguity on contractor's performance during project life cycle; therefore the need of performance bank guarantee was a must.

Case 3: Cathodic Protection Works for Pipeline and Facilities

Project's Scope:

Cathodic protection is a system, which is used to protect steel pipeline for gas or crude oil from corrosion and rust. It uses sacrificial anodes like Zinc or Magnesium to be rusted and eliminated instead of the pipeline by providing electrical current to the pipeline. This work is part of main scope of work related to the engineering, procurement and construction for Bab Thamama G and Habshan 2 1.8 MMBOPD Phase – 1 Development Project. The project scope of work is to provide cathodic protection system for underground pipelines, tank internal, tank bottom plates and small section of water injection piping. The project has an optional scope of providing temporary cathodic protection system. The duties of the successful contractor are to provide all necessary security passes and training for his personnel in order to be allowed to enter the site. Moreover, the contractor has to submit weekly progress reports as well as shall follow and meet Health, Safety and Environment (HSE) regulations according to ADCO – ADNOC group of companies.

Project's Schedule:

The project is scheduled to commence on October 10th 2010 and be completed by April 29th 2012.

Project's Stakeholder:

Many stakeholders are interacting with the project. The User or the main stakeholder of the project is the Project Manager, who manages the project and controls the operation and construction part of it. The second stakeholder in the project is the contractor, which is called as CT Services, who executes the project. Another assistance party to the Project Manager is the Engineering department, which reviews the contractor's designs and approves the shop drawings. Abu Dhabi Company for Oil and Gas Onshore Operation (ADCO) is the Client and the owner of the project.

Project's Status/Progress:

The project is still going as per the schedule and it is about 70% progress. As the scope of the cathodic protection works is just a small part of the entire project's scope, the contractor is

moving according to the main project plan. The Project Manager presumes that the CP contractor would finish his scope on time.

Procurement Issues:

The Project Manager raised a service requisition requesting the procurement team to procure the services of cathodic protection contractor to execute the scope of work mentioned above. The Procurement team started to analyze the scope of work, which seemed to be very wide and not specific. The issue of scope of work clarity was raised to the project manager and he stated that "what is been available in the service requisition is enough for floating the ITT", therefore, the project manager requested to float the ITT with the available information in order to minimize the time to receive required bids and accordingly award the contractor. The procurement team recommended a tender strategy that to procure CP contractors from local market and to use terms and conditions for general services. It was also recommended in the tender strategy that the bidders have to submit separate technical and commercial bids. Based on the tender strategy, contractors were selected from the local market; however, the number of contractors invited was only three, which limited the competition between contractors. Nevertheless, the procurement team prepared and floated the ITT to the market. Once closing date for receiving bids was due, three bids were received and forwarded to the Project Manager for technical evaluation.

The Project Manager requested a meeting with the two bidders only as the third bidder was technically rejected due to the reason that the third bidder was not listed under Client list of approved bidders. The meeting addressed additional scope of work as the information was not available during ITT floating stage. This has resulted in price impact and accordingly new submission of commercial and technical offers from both bidders. After completion of all technical clarifications, bidders were requested to submit their price impacts.

Upon commercial bids opening, it was realized that the two bidders have followed their own pricing schedules, which has made the case for commercial evaluation is very difficult and the task of comparing rates is not applicable. Therefore, the project manager was requested to participate in the commercial evaluation by choosing the items that have to be compared against each other. This was a very risky task as it might allow for unfair comparison between bidders as comparing items quoted as "apples to apples" was not applicable with bidders who did not similar items. Upon completion of commercial evaluation, it has been noticed that the Project Manager did not provide

the estimated budget that to be used for the provision of the services. Estimated budget is essential for evaluating the rates provided, assessing the market value and estimating difference between budget and exact expenditure. It is worth mentioning that the Project Manager has raised two revisions to the scope of work since the date of award.

Case Narratives:

Case 1:

The project manager in this case has requested to float tenders to the market as the required project is sound to be urgent. The procurement team has floated the tender; however, the time that was used to analyze the scope of work was limited. Most of the invited bidders regretted to quote for the job and accordingly, several invitation to other tenders were floated. Quite surprisingly, once re-initiation letters were prepared, one of the forfeited bidders has been invited called again to participate in the tender and to revise the withdrawal decision. Upon the awarding stage, it has been found that the bidder, who has no interest to quote, has quoted the lowest price and got the award of the job.

Once the project manager had the information that this bidder, known as CAT got the award, he was surprised and shocked as he did not want a company such CAT to work in this project as it faces resources problems in other projects with one client, as he got this information from his connections in the market. Besides, the project manager stated that CAT doesn't presume to have enough experience to work in laying gas pipeline. On the other hand, the project manager had a preference that a contractor who had a working experience with him in a similar previous job to get the award of the job, noting that this contractor was invited and his price was exaggerated.

Once the work started, the contractor has started the work with slow progress and less number of the resources. Two months later, the project manager have confirmed that the project is officially delayed and behind schedule and the reasons of this initial delays are related to the poor performance of CAT, however, after few weeks from this announcement, it has been found that the Client is no longer interested to complete the project and has suspended the progress due to organizational change occurred in Clients Organization.

Case 2:

Once the User requested to float invitation to different vendors, it has been noticed that the scope of work has no relation with the User specialty. All the required scope of work documentation was prepared by a different entity that supports the User, which called the Engineering Department. Upon floating the tenders and receiving bids, the technical evaluation was not prepared by the User, but it was done by the Engineering Department. Here, the procurement team started to communicate with the Engineering department solely and started to ignore the User. This negligence has contributed to lower the User interference in the procurement process. It was shocking that even the Engineering department does not provide its full concentration in the preparation of the scope of work due to the reason that this project was not related to their priority or their objectives.

Upon the award, and as GE Company got to start the work, it has been noticed that this contractor has three other projects with NPCC, which allowed for this contractor to start the work in a good manner. However, the progress endorsement was poor and not sufficient. The user have stated that the Engineering department have revised that drawings and the design several time, which forced the contractor to work on other works till the design been revised. It is important to state that neither the user nor the Engineering department requested to have bank guarantee for the contractor's performance, which was resulted from the miscommunication caused between the procurement team, the User and the Engineering department during the tendering stage.

Case 3:

Once a request to float a tender to procure a cathodic protection contractor was raised by the User, it has been noticed that the scope of work was not clear and upon floating the tenders, most of the bidders requested to meet with the User to clarify the requirements. Unfortunately, the User capability in performing this work was very limited and he has no experience in performing the same. After receiving the bids, the procurement team has also noticed discrepancies in the pricing structure of every bid. This has also contributed to more difficulties in evaluating the bids by the non-expert User. The User has also requested all bidders to attend another meeting to clarify the input of their bids. Once, technical evaluation is completed, the procurement team struggled to compare the rates between the accepted bidders and accordingly asked the user to provide his input, which also caused delays in placing the order.

Upon placing the order, it was anticipated that the project would be delayed due to the delays occurred during the tendering and procurement process; however surprisingly, the project was completed on the required time. It was noticed that the User have overcome the occurred delays by implementing an progress optimization techniques known as Earned Value Analysis (EVA), which allowed the user to clear the contractor's civil works ahead of time by using an existing contractor on the same site who completed the civil works and allowed the cathodic protection contractor to start his work directly. It is worth mentioning that the civil works was listed as one of the activities listed under the critical path of the project.

Chapter 5: Discussion

Scope of the chapter

This chapter shall discuss the different themes and results that were found in the three different cases and shall compare these themes and results between the problem cases. The discussion shall be implemented on the case studies by linking the results findings back to the literature review and verifying the similarities and discrepancies between themes in all cases.

Interpretation of each Problem Case

Case 1: Construction of Gas pipeline to Al-Ain Cement Plant

Project's Scope

As advised in the literature, Sharma and Lutchman (2006) have defined scope definition and provided a broad definition for the scope as it should show the scope boundaries clearly and also should provide an analysis on the risks pertaining to the execution of the project. The scope in Case 1 agrees with what have been stated in the literature as contractor in Case 1 was clearly informed about certain difficulties in terms of acquiring necessary approvals to work on site, as the work location is situated among UAE's Army camp and residence farms. On the other hand, the contractor in Case 1 has been informed to perform pipe tie in with the main gas pipeline supply, which is owned by a company called "Dolphin". This should be another reason for the contractor to struggle, which shall forecast a problem of allowing the contractor to enter Dolphin's territory. Moreover, it is obvious that the tendering team, who was responsible of delivering the scope of work to the invited contractors in Case 1, have implemented a proper transfer of available knowledge about the scope of work, which agrees with the views of Pickett (2005) on the issues that would contribute to better understanding of the scope of work. It has been found that the scope documentation in Case 1 was found to be acceptable as all documentation required about the scope of work or the scope of the main project was provided, as Dysert (1997) has classified the level of scope clarity according to the level of information or scope documentation that is provided at the time of tendering.

Project's Schedule

The project schedule in Case 1 has indicated an important aspect about project scheduling, which is about schedule documentation. This process, as advised by Douglas (2005), has shown the important issues that to be incorporated in the tendering documents in order to allow the contractor to prepare a sufficient project schedules that consists of all important activities related to the project. The tendering team in Case 1 has provided the information about the long lead procured items that to be supplied by different entity other than the Contractor. It has been stated by Douglas (2005) that issues that to be highlighted in the schedule documentation are the bidding duration, logistics and suggestion to shorten long lead procured items. This observation was clearly shown when the tendering team have advised the invited Contractors to accommodate project's plan with the supply of materials plan, in order to achieve appropriate project efficiency.

Another point that to be highlighted that the information provided by the user in Case 1 on the tentative project schedule was not appropriate and show improper project planning. This agrees with views of Glenwright (2004) and Douglas (2005), which clarify the importance of schedule planning in the preparation process of project scheduling.

Project's stakeholders

The stakeholders in Case 1 as mentioned are categorized into two main divisions; Direct and indirect stakeholders. This shall compliment the views that were illustrated by Newcombe (2003) that the idea of having a single entity being as the stakeholder is vanished. Case 1 showed that the stakeholders are groups or individuals who have a stake in the project and their interpretations are essential to project scope, execution and delivery. Moreover, Case 1 showed that stakeholders could be categorized as "organizations", which also complements Okorafor's (2010) opinion.

Project's status / Progress

The statement that was mentioned in Case 1 about the project progress, which says "There are other reasons that are related to procurement or tendering procedures that also contributed to the same problem", complements and agrees with the previously mentioned views on poor planning. One of the reasons that were stated by Hormozi (1999) on project delays according to general managers' point of view is poor and insufficient project planning.

Procurement Issues

Once The board of directors of GHC has decided that NPCC has to provide its services and expertise to construct the required gas pipeline, as stated in Case 1, this shall constitute the relationship between the client and the reputed contractors or supplier as stated by Erickson and Laan (2007). They have stated that the evaluation of contractors heavily depends on the level of trust between the Client and the contractor.

As mentioned above, the scope of work has been communicated to the invited contractors properly; however it was obvious that the scope of work has not been analyzed properly according to the following statement "The procurement section started to analyze the scope of work; however the time taken for scope analysis was very short and limited". This is consistent with the views of Dysert (1997), which show the importance of the level of scope of work in order to procure the required service provider.

Case 1 has also specified the criteria that the procurement selection method to be adopted as stated by Cheung (et al 2001 cited in Chan, 2007). It has been found that the price competition is used to be the major selection criteria as the tender was floated three times upon rejection of one technical bid. It is important to mention that the contractor selection criterion in this case shall comply with the views raised by Elwardani et al (2006) of selecting contractors based on qualification basis.

The process of bid evaluation that was conducted in this Case, showed an important implementation of a process called "Record Documentation", in which it expedites the process of bid evaluation. This shall compliment with the ideas raised by Pickett (2005), which encourage to meet with contractors in order to raise their level of understanding of the scope and bids' compliance.

Case 1 has implemented a tendering method that is categorized by Love (2002) as nontraditional procurement method. This was obvious, when the procurement team noticed that the prices were on the higher side and approached the bidders to negotiate their prices.

It was noticed in Case 1 that the stakeholders have not provided all the required information about the terms and conditions that to be used in this contract or tender. This appreciate the views that were raised by Boddy and Paton (2004 cited in Okarafor, 2010), as they mentioned that the

information that stakeholders own about the project or the scope would be important to other teams involved in the project. It was obvious that the PM had information about the contract's terms and conditions that to be used but he failed to transfer it to the procurement team, which in terms took further time to issue the required contract.

Case 2: Construction of new pipe coating plant

Project's scope

The scope definition in Case 2 agrees with the views stated by Ganon (1994), that the scope of work shall be detailed from the initial project stages, which the tendering team has successfully provide the contractor with all necessary information, not only about the scope but also, acquiring necessary licenses and No Objection Certificates from concerned authorities to enable him to execute the required work.

Project Schedule

The project schedule in Case 2 is lacking the appropriate information that to be incorporated about the amount of the scope of work, which shall determine the most suitable and appropriate project schedule. This contradicts with Douglas's (2005) approach of preparing schedule documentation that includes information about the scope of work, description of deliverable, methodology and level of uncertainty and risk.

Project's stakeholders

Case 2 has shown a type of stakeholder that was described by Newcombe (2003) as inside organization stakeholder, as the project has to be done for NPCC, the stakeholders were mainly NPCC's department.

Project's Status / Progress

The literature has not specifically provided an insight view on the project delays reasons attributed to contractors' improper planning, as it was stated in Case 2 that the contractor has other commitments with NPCC as well as with other clients. However, this could be categorized as improper project planning as advised by Hormozi (1999).

Procurement Issues

In Case 2, the Contractor's selection criterion was based on the list of prequalified contractors. This selection criterion shall compliments with the views that were raised by Elwardani et al (2006), which stated four main issues used to select the contractors and one of them is qualification based selection.

It is noted that the procurement team has failed to assess the contractors' capabilities and competencies in to order to select the most suitable contractor. It has been found that the procurement team has selected a contractor full of workload and with bad performance in previous jobs, which contributed negatively to the project performance. this might be due to the reasons that were stated by Wickramatillake et al, (2007), whom stated the difficulties to monitor the performances of the suppliers and contractors due to the high level of uncertainty. However, in my opinion, that should not be a must, which the procurement team could require all necessary information about contractors performance by getting both feedback from the User.

It was noticed as well from Case 2, that the procurement team did not get a proper scope definition from the user as stated that the User or the Engineering department have used a standard format of scope of work which did not match with the required scope. The procurement team has to look into the scope definition as described by Edward and Gebken (Cited in Sharma and Lutchman, 2006).

Moreover, it was noticed that the communication between the procurement team, the User and the Contractor has faced some difficulties, as stated in Case 2 that the procurement team has also struggled in terms of communication between the User and the Engineering team, which allowed for miscommunication with the bidders. This shall comply with the views of Zou (et al 2009) on the importance of communication in SCM on the contractor's performance.

One of the non-traditional procurement methods advised by Love (2002), known as negotiation, has been implemented in Case 2 as the estimated budget provided by the user during initial tender stage was very low, which has forced the procurement team to negotiate the submitted prices.

In Case 2, the User has failed to provide the required information about the contract requirement as the requirement of the provision of bank guarantee certificate by the successful bidder was not clearly mentioned by the User. This shall also contribute to bad performance of the project as the information that the stakeholder own was not transferred to the procurement team successfully (Boddy and Paton 2004: cited in Okarafor, 2010).

Case 3 "Cathodic Protection Works for Pipeline and Facilities"

Project's Scope

In Case 3, the definition of the scope was not interpreted properly which allow for ambiguity in scope to be shown. This contradicts with the views of Pickett (2005) which guides the proposal team to use issues that contribute to better clarity of the scope of work. One of these issues is that the scope of work shall elaborate in better preparation of bill of quantities, which is deemed to be the role of the tendering team. The reason that this defect in preparation of bill quantity is related to the inadequate preparation of the scope of work by the User as he supervised the cathodic protection works for first time and had less experience in this field.

Project's Schedule

In Case 3, the lack of experience of the project team or the user have greatly implicated on the project schedule. The project scheduling in this case would expect several delays and project changes as it agrees with the points raised by Casinely (2005), who stated that one of the reasons that causes project delays is lack of proper knowledge of project scope and technical specification. It is obvious that the User have failed to provide the required information about the scope of work

which supposes to support the project schedule as suggested by Douglas (2005) in the preparation of the schedule documentation.

Project's Stakeholder

In Case 3, the stakeholder represented by the PM, who lacks experience in implementation of the scope work, has a great implications on the effectiveness of tendering the scope of work and accordingly placing the order to most suitable contractor. This complements the ideas of Boddy and Paton (2004 cited in Okarafor, 2010), which stated that the knowledge that the stakeholder owns is considered to be as an asset to the organization. In this case, experience in managing cathodic protection works is considered to be as important knowledge that the PM has to own. This knowledge as elaborated by Boddy and Paton would be as a great support to appropriate establishing of scope brief and project execution. On the other hand, there is a possibility that the tendering team is considered to be as stakeholder in this case, therefore, it is worth mentioning that the tendering team have failed to implement an important task of evaluating and analyzing the stakeholders involved in this case as advised by Okarafor (2010), which in this case the Engineering department has a strong hands-on approach and control on project-related technical issues. Moreover, it has been found that one of the stakeholder's role have not been fulfilled during the tendering process as stated by Doli (2011), which suggests that the stakeholder shall provide logical cost estimation to the tendering team in order to procure the most suitable contractor.

Project's Status/Progress

From the following statement as stated in Case 3 Project progress that "The project is still going as per the schedule and it is about 70% progress", it is analyzed that the project team has implemented one of the proper project performance and progress monitoring techniques, which is called an Earned Value Analysis (EVA), as mentioned in the literature by Bower and Finegan (2009). This technique would help the project team to predict whether the project team would complete the project on time or not, which complements the following statement in Case 3 that "Project Manager presumes that the CP contractor would finish his scope on time".

Procurement Issues

In Case 3, the scope clarity was a critical issue, which in have affected the procurement process negatively. This shall agree with the view raised by Pickett (2005) that the procurement team has to display all knowledge available about the scope of work. The procurement team has found this issue as to be "very wide and not specific". As advised by Pickett (2005), the procurement team in Case 3 shall conduct meeting with the User in order to clarify all points that are related to scope creep.

As the procurement team recommended a tender strategy that to procure CP contractors from local market and to use terms and conditions for general services, this shall comply with the advice that Rajagopal and Bernanrd (1993) have stated about establishing a tender or procurement strategy in the beginning stage of procurement process, which shall contribute to better implementation of procurement process and output.

In case 3, the Project Manager requested a meeting with the bidders, in order to clarify the technical issues related to the submitted offers, this complies with the idea of meeting with the contractors in order to vanish all ambiguities related to the scope of work as advised by Pickett (2005).

It has been noticed by the procurement team that the implementation of evaluation by comparison as stated by Alhazmi and McCaffer (2000 cited in Chan, 2007) could not be implemented as commercial bids were not following similar pricing format. This shall make the project procurement process difficult and consumes more time and effort.

Cross analysis between all cases:

This section analyses similarities and differences and common themes between two or all three of the cases.

Project Scope

The available project scopes in Case 1 and Case 2 have been transferred to the invited bidders successfully as stated by Sharma and Lutchman. It has been found that the bidders had an idea at the time that invitations to tenders were floated. This shall contribute to better understanding of the scope by all participants. In contracts to Case 3, which the available scope was not interpreted properly by the tendering team and allowed for a poorly specified scope to be floated to the vendors, which had contributed to discrepancies in pricing schemes and hence affected to commercial evaluation of bids. It is worth mentioning that the scopes of work for all Case 2 and Case 3 were not prepared appropriately and did not match the minimum requirement of floating enquiries to the market. On the other hand, Case 1 scope of work was a little bit better but did not achieve the optimum requirement.

Project Schedule

All of the three cases have faced a problem of transferring the required information that substantiates proper implementation of project scheduling. It was obvious that the reason behind the lack of the required information is related to the amount of scope of work documentation that is prepared prior to issuing the required invitation to tender. However, Case 1 had a better implementation of schedule documentation, in which it has specified the schedules for long lead items, which all contractors had to incorporate the required dates within their work schedules.

Project Stakeholders

The main issue for stakeholders in every case is the failure to provide the correct and relevant information that the project would require during tendering. It was stated in Case 1 and Case 2 the different types of stakeholders that were involved in the project, however, in Case 3, the elaboration

has not only cover the type of stakeholders involved, but also covered the role that the stakeholders have to implement towards achieving project efficiency and effective performance.

Project Progress

It has been found that Case 1 and Case 2 have both agreed that the reason behind project delays is poor planning. In contrast to Case 3, that surprisingly found to be on time and the PM predicted to complete the project on the required time. In this Case, it is found that PM overcame the delays that resulted from the tendering procedure directly after awarding the contract and implemented a technique called EVA during the execution of the project, which allowed PM to better control the project's progress.

Procurement Issues

It was obvious from Case 2 and Case 3 that the scope was not provided properly by the User as difficulties raised during the tendering stage. However in Case 1, the scope was provided by the User in an acceptable manner but it was not analyzed adequately by the procurement team. However, it is important to mention that the role of the User in Case 1 in the tendering process was not appropriate, which means that the User has to implement effective efforts for providing the scope of and necessary information required for the procurement team.

It has been found that the invited contractors' selection criterion in Cases 1 and 2 have been implemented on the qualification basis. However, in Case 2, the procurement team has failed to implement the required check up on the contractor's performance during previous projects. That process, if implemented, would change the procurement strategy and awarding process dramatically.

It has been found that the basis for technical evaluation of submitted bids by the invited contractors in Cases 1 and 3 was by conducting meetings. This process shall have a great impact on evaluation input of the user as it shall give an indication on the level of understanding of scope of work and also would help the User to evaluate the contractors' technical competencies.

Moreover, it has been noticed that Cases 1 and 2 have implemented a non-traditional procurement method of negotiating the rates provided by the participated contractors. This process

is usually implemented when the estimated amount that was provided by the user during the initial tendering phase is higher than the submitted rates by the participated contractors.

Two issues were unique about Case 2 and Case 3. In Case 2, it has been found that the communication channel between the procurement team, the user and the contractors was not sufficiently implemented, which accordingly led to inadequate procurement process implementation. On other hand, Case 3 implemented a tendering strategy during the initial tendering phase, which contributed to better implementation of procurement process and output.

Chapter 6: Conclusion and Recommendations

Conclusion

The literature in the research has identified the contribution of different procurement functions and processes on project performance and has also examined the role of different stakeholders on the output of better implementation on tendering processes and functions. It showed the side effects of issuing inadequate scope of works to the invited bidders and explained the best way to prepare the scope of work by identifying scope definition documentation. The literature showed the problems that improper planning can create and its impact on project scheduling. It demonstrates that improper planning of project scheduling will negatively affect the procurement process outcome. Moreover, an elaboration on has been implemented on project progress and how improper implementation of procurement function hinders the project progress. However, the literature has not explained how project progress would be optimized in cases where procurement functions influence it negatively. It has been found that the implementation of e-procurement systems in the procurement functions shall positively contribute to better project delivery. Having said the issues that were covered by the literature, it has been found that less research has been implemented on the two types of evaluation of bids; ie technical or commercial, on project cost and performance.

It has been found that the better the scope of work is substantiated, the better the procurement process is implemented and hence, it can contribute to better project progress and performance. The problems that were analyzed during this research have shown that scope of work has not reached the allowed requirement that would guide the participated bidders to understand and digest the scope of work. The improper implementation of scope of work has also contributed to inappropriate substantiation of the project schedule. It has been found that the relation between scope analysis and project schedule is positively correlated. This relation was clear in Case 1, as stated above, as the scope and schedule were illustrating the best example among the represented cases.

In addition to the above, it was found that the role of stakeholders in the three cases have not been used efficiently in optimizing the procurement process. The role of stakeholders was limited to provide requisitions to the procurement team, which did not show their effectiveness role in enhancing the scope of work and effective participation in establishing appropriate tender strategies.

It was obvious from the cases that stakeholders' roles were not understood properly, in which its effectiveness was limited.

Project delays were found to exist in some of the cases due to the reason of poor planning for procurement functions. Surprisingly, one of the cases showed and proved that delays could be optimized even if the reason was behind improper implementation of procurement functions.

The procurement processes in the three cases have not shown a system that to be followed. It was a mixture between traditional and nontraditional procurement functions. Literatures about the procurement functions, which was used in this research have provided the effectiveness of implementing these methods separately, however, there were no indication of implementing both methods at the same time. The cases have shown that the implementation of non-traditional and tradition procurement methods is applicable to be used.

Recommendations

Recommendation for Further Research

Recommendation for further research is to be advised for academics and for practitioners. As the literature has broadly specified the different aspects of procurement functions, it was noticed that less research have been implemented on the different ways to select contractors in the procurement functions. Therefore, it is recommended for the academics to establish a model for contractors' / Suppliers selection methods. This shall assist the procurement team to implement the best way to select contractors that would be most suitable for the required service. In addition, academics are also recommended to implement further research on the adequacy of the following hypothesis; "Procurement functions are positively related with project portfolio management performance".

On the other hand, it is recommended for the practitioners to implement further research on establishing a knowledge management center to check which of the procurement functions are heavily affecting the project performance and accordingly workout the most suitable solution to reduce their implications.

Recommendation for NPCC

It is recommended for NPCC Board of Directors to provide a strategy to the project team and the procurement team to set up a prime objective of reducing the implication of improper implementation of procurement functions. This could be implemented by establishing a key performance indicator for project managers to evaluate their projects' performance by fulfilling all procurement team's requirement and needs and vice versa.

Moreover, the board of directors has to encourage integration between project teams and procurement teams by introducing a technology system that governs flexibility in processing the project's requirements with the services that the procurement teams provide. This shall assist the project team to understand the requirement of the procurement team and also contribute to save time and efforts in processing the required procurement functions.

It is recommended, indeed, to the board of directors in NPCC to implement an overall risk analysis on the improper implementation of procurement functions in different projects and

circulate the results between the project teams. Moreover, to provide the required proposals to reduce the risks generated from the above.

Recommendation for Client Organizations

It is recommended for the client organizations to provide all the required and necessary information about the scope of work of the concerned project by list out all documents that to be delivered to project managers in NPCC, which shall assist in managing the scope properly and specially allowing better implementation of procurement processes and functions. Moreover, it is recommended for the client organization to provide the list of approved bidders that to be invited for certain project by the procurement team. This shall assist the procurement team to shortlist the selection of the required bidders and accordingly save more time and effort in the procurement process.

Recommendation for UAE Government/regularity affairs

It is recommended for the UAE Government to establish an information technology system to keep all contractors updated about all necessary requirements about approvals or certificates that to be provided once the contractor got the award of a new project and allow them to apply all of the above electronically. This shall assist the contractors in examining the required time for the provision of the required approvals and hence provide an accurate project schedule during bid submission.

It has been necessitated from the UAE Government to establish a database for all list of contractors that are authorized to work in the UAE and to specify their specialty, activity, current status and region for operation. Moreover, this database shall be circulated electronically to assist all procurement teams to check on the best available contractor for the required scope of work to assist in contractors' selection criteria.

Recommendation for Project Managers

It is recommended for project managers to meet with the procurement team regularly to establish a common understanding on the level of comprehensiveness of the scope of work prior floating the Invitation to Tenders. This shall contribute to achieve most optimized level of scope of work clarity.

Moreover, project managers have to allow sufficient time for planning for procuring of services that are supposed to assist the project in certain issues and advise the procurement team about the plan ahead of time to allow the procurement team to integrate the project manager plan with their plan.

In addition to the above, when the project got delayed due to the procurement functions, it is recommended for the project team to optimize the performance of the project by implementing all techniques that would help to overcome project delays, such as Earned Value Analysis (EVA).

Last but not least, it is recommended for project managers to allow for a focal point for communication between the procurement team and the project team or User, which shall minimize the risk of misunderstanding between project stakeholders.

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