

PROJECT PROCUREMENT MANAGEMENT:
PROCUREMENT STRATEGY – THE MISSING LINK
BETWEEN PROJECT AND BUSINESS STRATEGIES IN THE
OIL & GAS INDUSTRY

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ABSTRACT

This Dissertation provides insights into improving aspects of Project Management in UAE. A research is conducted in order to assess the impact of Procurement Strategy on Business and Project Strategies with respect to management of Oil & Gas projects.

UAE is rapidly developing and International as well as local companies are participation in hundreds of varied on-going projects. To elicit and maintain interest of majors, Procurement of projects should be towards achieving strategic objectives and improving relationships.

The Aim of the research is to detect the link between Project and Business Strategies. *Procurement Strategy is identified as the missing link and, as a Hypothesis to the Research, to solve project problems in meeting objectives.* Research objectives are to assess influence of Procurement Strategy on Projects/Business Strategies, show how current Procurement Strategies are impediments in achieving project and strategic objectives and identify elements of Procurement Strategy that aim at achieving strategic objectives.

The Literature reviewed on current knowledge of related issues suggested the inter-relation of Business to Project Strategies through Portfolio and Programs Strategies. The links to Procurement Strategy for outsourced projects in the Supply chain was explored extensively.

Research Methodologies of Quantitative and Qualitative methods were adopted to test the Hypothesis and assess Objectives of the research. Questionnaire for investigating the strategic role of Project Procurement in Oil & Gas was developed. As a qualitative method, a Case Study for surveying four major projects in Refining industry within Oil & Gas was also developed. The case study involved surveying different parties of the projects to assess problems in projects Procurement. These methods generated valuable ideas in supporting the position of project Procurement in Oil & Gas industry projects towards achieving objectives.

Data of the surveys responses were then presented in the both forms (Quantitative and Qualitative responses). The data was then analyzed with the findings from Literature to propose the recommended actions.

Recommendations cover Linking Procurement to Business Strategy in Oil & Gas and proposing Procurement Strategies to overcome problems in Oil & Gas Projects.

Conclusions have been finally derived and a subject of investigating Procurement Strategies on Project Performance was suggested for further research.

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1. INTRODUCTION

This chapter describes the intent of the Dissertation. It reveals background information and provides a problem statement to enable a full understanding of the issues involved. Thereafter, it explains the aims, objectives and the hypothesis of the Dissertation.

1.1 Purpose of the Dissertation

The purpose of this Dissertation is to gain knowledge and insights that would contribute to further developing and improving various aspects of Project Management in the UAE. The Dissertation is designed to obtain more information and conduct further research in order to assess the impact of Procurement Strategy on Business and Project Strategies with respect to management of Oil & Gas projects.

1.2 Background Information

UAE is rapidly developing and hundreds of varied projects are on-going. These projects involve all sectors, whether public or private (i.e. Construction, Telecommunications, Real Estate, Transportation, Environment, Oil & Gas, etc.). In fact, these projects have been launched to incrementally achieve the objectives they are intended for and are to a great extent in conformity with the strategic direction of organisations or UAE Government directives to develop the country. Local as well as International companies are participating in the development of this country. Consultants and Contractors from all over the world are being invited to share their expertise in these Projects.

The main reason for inviting International expertise is lack of resources and specialization in the region to undertake a huge number of projects of varying complexity. Attracting these specialists has of course contributed to raising the knowledge and resource base of local companies in addition to improving proficiency in handling projects. Therefore, Project Management in this region needs to focus more on developing/implementing Strategies which promote good relationships with International Contractors/Consultants. This is in order to retain the interest of these firms locally with a view to improving quality and achieving project objectives. Formulating procurement and contracting strategies and suitably awarding a project on the basis of techno/commercial considerations is a strategic Management decision to obtain optimum, cost-effective, world-wide professional services and expertise.

In order to gain maximum benefits, “It is important that a proper business control by owner / company is in place, to ensure that effective control of the contract process and its associated risk can be managed smoothly” (Rashid, 2006). This is the reason, he explained, why Project Procurement is considered as a major element in the management of any project.

It is accepted that Oil & Gas is one of the major UAE industries contributing to the development of this country. Oil & Gas projects are mostly of high specialisations that demand the expertise and professional services mentioned. Oil & Gas projects are generally similar to most Construction projects where Conceptual Study, Feasibility Study, Design, Procurement and Construction phases are involved for a big sized (Major) project; however, these phases might be slightly differently placed or named (Annexure 1 details the various phases of a Major Oil & Gas Project).

Similar to Construction projects, Oil & Gas Major Projects have specific objectives to meet overall business and strategic objectives. Specific project objectives of meeting its schedule, quality and cost effectiveness may be associated more with Corporate / Business objectives such as; increasing Oil & Gas production to meet international market demand, enhancing Oil & Gas processing and operations, ensuring reliability of process units/equipments and ensuring safety and protection of the environment. Other broader Strategic objectives to be met may be furthering the growth of the company and more publicly, development of UAE economy.

1.3 Problem Statement

It is sometimes alleged that the Oil & Gas industry fails to achieve many aspects of its overall strategic business objectives because of problems occurring in the projects it undertakes. These problems can be categorised as either not completing projects within a set schedule, at the quality level required or around the budget allocated. Another problem associated with Oil & Gas projects could be finding capable Contractors/Consultants, improper tendering competition (i.e. different levels of contractors/consultants’ proficiencies, capabilities and sizes in one tender).

Furthermore, a very persistent problem that figures in almost all projects is the reluctance of Contractors/Consultants to accept Contracting Strategies specific to the Oil & Gas industry projects which can include, but not be limited to, the following:

- Procurement Methods selected and Procedures for the Project.
- Terms, Conditions and Legal obligations in the contract for the Project.

- Payment Terms and methodology proposed.
- Risks Allocated for the Project.
- Mechanisms in dealing with Claims, Delays, Disputes and Penalties in the Project.
- Client's lengthy procedures and uncooperative interference in the project.

In the opinion of Turner (1995), the "Concept of establishing the terms of a contract by 'reciprocal concession and compromise' is an effective generality. However, it is difficult to achieve in reality because one party is more powerful than the other." It was further explained that this might be the case in circumstances that involve Contracts between "Big Oil" commercial muscle and small specialized contractors. Formulation of Procurement Strategies in Oil & Gas requires high-level strategic management involvement to maximise gains and optimise project deliverables. Hence, Management of Projects in the Oil & Gas industry needs to effectively utilise many advanced Project Procurement strategies and practices.

Rashid (2006) explains that the impact of Procurement and Contracting Strategies on the scope, execution and completion of projects drastically affects relationship between Owner and Contractor in terms of coordination, cooperation, communication, scope management and cost/risk associated. Thus, Procurement Strategies and processes in Oil & Gas sector need to be more attuned to completing the project to its and strategic objectives.

1.4 Aim, Objectives and Hypothesis of the Research

This section is intended to explain the aim, objectives and hypothesis of the research.

1.4.1 Aim of the Research

The general aim of the research is detecting the link between Project and Business Strategies in Oil & Gas industry. It is intended to propose Procurement Strategy as the missing link that solves perceived problems in Oil & Gas projects, as hypothesis to the research to be tested.

1.4.2 Objectives of the Research

The Objectives of the research hence derived from the above Aim are:

1. To investigate the influence of Procurement Strategy on Projects and Business Strategies and the relationships between these Strategies.

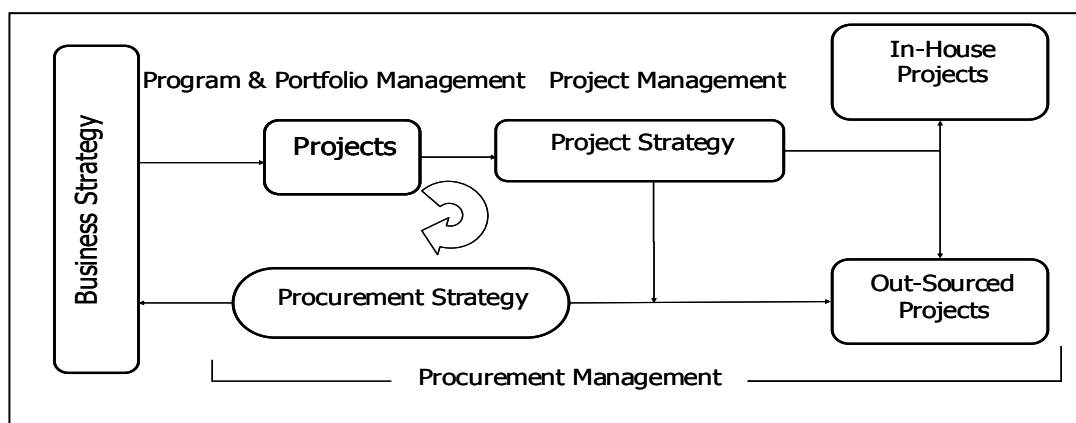
2. To show how current Procurement Strategy in Oil & Gas industry causes difficulties in achieving objectives of the Project that are inline to Business objectives and how an effective Procurement Strategy could solve these problems.
3. To investigate the ideal composition of an effective Procurement Strategy and prescribe advanced Procurement Strategies that Oil & Gas industry should implement.
4. To develop a model of linking Procurement Strategy to Business Strategy in Oil & Gas.

1.4.3 Hypothesis of the Research

The assumptions made in order to arrive at the Hypothesis of the research are as follows: Business Strategy decides on Projects to fulfil the strategic business needs through Portfolio and Program Management. Project Management handles initiation and execution of a Project. Project Strategy decides on Projects, whether out-sourced or in-house, which enables the Project to achieve its objectives through Portfolio/Program Management. For an outsourced Project, a Procurement Strategy is set to complete the Project in the manner desired. Procurement Strategy specifies how the two parties should proceed to successfully complete the Project, by achieving its objectives in consonance with the overall Business Strategies and goals of the company. Hence, the Hypothesis to the research is:

The ability of any Oil & Gas Project to successfully meet its objectives in accordance with the prescribed strategic objectives is dependent on linking that Project's Procurement Strategy to the Corporate / Business Strategy of the Company.

The Hypothesis model is illustrated in Figure 1 showing the link and the loop of the Strategies. It is intended to test this hypothesis for acceptance through Literature Review and specific Research Methodologies adopted for the purpose.



As the discussion progresses and gets influenced by Literature and research, modified and final models of Procurement Strategy will given.

1.5 Description of Research Contents

The scope of this Dissertation is:

- To give a General Introduction, as shown above, stating the background information to the Dissertation, problem statement, aims, objectives and hypothesis.
- To conduct a Literature review on how similar or related issues, challenges and problems have been tackled and documented in the field.
- To conduct and adopt proper research methodologies to display the detailed results of the responses elicited through this research and data obtained thereby. Both quantitative and qualitative methods are used.
- To analyze the data gathered from the research and discuss findings gleaned from Literature and collected through research.
- To provide recommendations and offer corrective solutions that could contribute to the development of a more effective Procurement Strategy in view of objectives and hypothesis.
- Finally, to give a conclusion of this Dissertation and suggest a subject for further research.

2. Corporate & Business Strategy and the Link to Project Strategy

This section is intended to review the Literature for issues related to Corporate Business and Project Strategies to see the links and relationships. Industries from Building, Construction and IT were consulted to provide the necessary information on the subject.

First, the concept of each Strategy is explored; then, the links to Business Strategy are seen.

2.1 Overall Corporate and Business Strategy

Overall Strategy of an Organisation is defined as “Matching the resources and activities of an organisation to the environment in which it operates”, (Johnson and Scholes, 1999).

It was added that Strategy is likely to be concerned with the long term direction of the organisation.

Hence, Strategy is the direction and scope of an organisation over the long term which achieves advantage for the organisation through its configuration of resources within a changing environment to fulfil stakeholder expectations. It was explained that Strategy differs with organisations' sizes. For a huge multinational organisation, Overall Strategy is the ability to achieve a position to becoming the ‘industry standard’ recognized by suppliers and buyers. Furthermore, Organisation Strategy is divided into two levels: Corporate level Strategy and Business level Strategy.

Corporate Strategy is the consistency in development in terms of: clarity of the rationale of the corporate parent in seeking to add value to business units; the logic of the corporate portfolio; the nature and the extent of the diversity of the portfolio and the nature of corporate control exercised by the corporate parent.

A Strategic choice in Business level Strategy needs to take into account the environment in which the organisation operates like competitive advantage maybe eroded as technology changes or as new competitors emerge.

Hence, Business level Strategy is about how to compete successfully in a particular market.

The long term direction of an Organisation is stated through expressing the Mission, Vision and Objectives of the Business for an organisation.

Merwe (2001) stated that the strategy making and strategy implementing process in business development is thought to consist of five interrelated managerial tasks:

1. Deciding what business the company will be in, and forming a strategic vision of where the organisation needs to be going, infusing the organisation with a sense of purpose, while providing a long-term direction and establishing a clear mission.
2. Converting the strategic vision and mission into measurable objectives and performance targets.
3. Crafting a strategy to achieve the desired end results.
4. Implementing and executing the chosen strategy.
5. Evaluating performance, while reviewing new developments that could lead to initiating corrective adjustments in the long-term direction, in light of actual experience, incorporating changing conditions, new ideas, and new opportunities.

It was further discussed in details that strategic management process is about moving the organisation from its present position, to a future strategic position, in order to exploit new products and markets. In general, Modern Business Strategy deals with the matching of activities of an organisation to the environment in which it operates. Strategic Management is that set of managerial decisions that determines the long-term performance of a company. It includes strategy analysis, strategy implementation, evaluation and control.

Strategic analysis process investigates current and future positions. Strategic implementation is the way of getting the organisation to move swiftly and surely. Study of strategic management therefore emphasises monitoring and evaluating the environmental opportunities and threats in light of corporate strengths and weaknesses. The strategic objective setting process is designed to make the program more fruitful.

Further, it was discussed that strategic decisions may also have to manage and perhaps change relationships and networks outside the organisation, for example with suppliers, distributors, customers and services providers.

The concerns are what new opportunities can be identified or created, which products or services should be developed and the extent to which these meet stakeholders' requirements or the objectives of the organisation. The aim is meeting these strategic objectives regardless as objectives vary from one organisation to another.

Organisations therefore select various projects to properly achieve these strategic objectives.

2.2 Project Strategy:

As explained earlier, organisations choose on projects to achieve strategic objectives. “The project is part of the strategy by which the parent organisation achieves its development objectives”, (Turner, 1999). Further, Projects themselves carry their own objectives. Since projects are chosen to achieve overall objectives, their objectives shall be inline with the overall objectives. The project’s objectives are set by the Project Strategy. Hence, Project Strategy aims at placing the project to meet overall Business objectives. Morris (1994) defined Project Strategy as achieving project specific objectives to obtain the overall business objectives responding to internal and external environment in which the project exists. Project Strategy includes:

- Clear identification of stakeholders requirements;
- Statements on how these are to be achieved;
- Environmental issues, quality and safety issues;
- Owner's roles with the parties;
- Financial strategy;
- Milestones and schedule;
- Technical policy and strategy;
- Risk management strategy;
- Procurement and contracting strategy;
- Logistics policy;
- Employment strategy;
- Information technology strategy; and
- Communication policy.

The above parts formulate the projects objectives along with requirements in existing environment which should also be inline with strategic objectives. Hence, Project’s Strategy should be aligned to overall Business strategy. Investigating the relationship and drawing the link of these strategies are shown from Literature in the next section.

2.3 The Link to Overall Business Strategy through Program / Portfolio Management

Project Strategy is linked to Business Strategy through Program / Portfolio Management. It is to be seen how Program Management and Portfolio Management separately and jointly link Project Strategy to Business Strategy. Program Management is defined as “the coordinated management of interdependent projects over a finite period of time in order to achieve a set of company’s strategic objectives and desired business results”, (Matinelli and Waddel,

2004). In high-technology industries such as aerospace or automotive, program management is a critical business function that provides means by which new products are conceived, developed and brought to market in order to achieve a major share in the profit.

In addition, outside these core industries, program management is not well understood and there is much confusion between the disciplines of program and project management.

Program and Project Management are related but distinct disciplines. It is important for everyone within the organization to fully understand the distinctions between the two, as well as the various roles and responsibilities of program and project managers.

The greatest difference between Program and Project Management is that Program Management focuses on achieving business results to create a competitive advantage while Project Management focuses on planning and executing the work required to deliver the end product.

In the Program Management model, the program manager manages across the multiple functional projects, while the project manager manages within a single functional project. Other distinctions between program and project management are shown in Table 1.

Program Management	Project Management
Strategically focused	Tactically focused
Business and technical in nature	Technical in nature
Aligned to strategic objectives of business	Aligned to goals of the program
Assures the work effort remains feasible from a business standpoint	Assures the work effort generates desired deliverables on time, within budget and at required performance levels
Change managed from both a business and technical perspective	Change managed from a technical perspective
Risk spread across the projects and concerned with probability of business and technical success	Risk contained within a single project and concerned with probability of technical success
Cross-functional at all times	May be partially cross-functional
Broad range of management and business skills and experience required	Project management and technical skills required

Table 1 Comparison between Program and Project management, (Martinelli and Waddell, 2004)

It has been discussed that Program Management effectively and successfully fills the skill gap between Project Strategy and Business Strategy in many organizations and industries. This is because the discipline brings the requisite skills, abilities and business acumen to perform this critical strategic role.

Figure 2 (a) and (b), graphically illustrates the identified gap between strategic elements and project execution which exists in many organizations today.

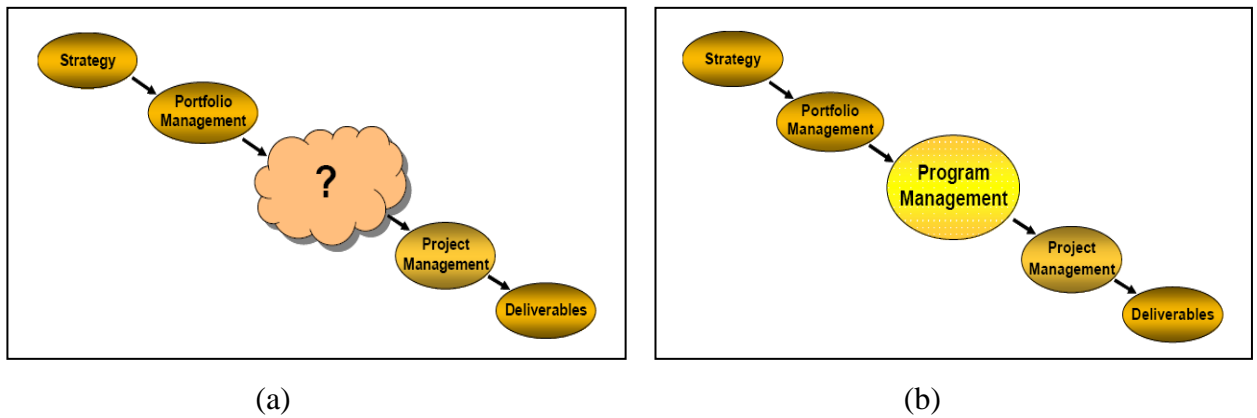


Figure 2 Link between Portfolio, Program and Project Management to Business Strategy, (Martinelli and Waddell, 2004)

As illustrated in the figure, when the Program Management function is employed, the gap between strategic elements and project execution is effectively eliminated. Missing parts have been identified and provided the complete link to Strategy. Figure 3 (a) and (b) illustrates the closed-loop relationship between Business Strategy, Program, and Project Management in delivering a product.

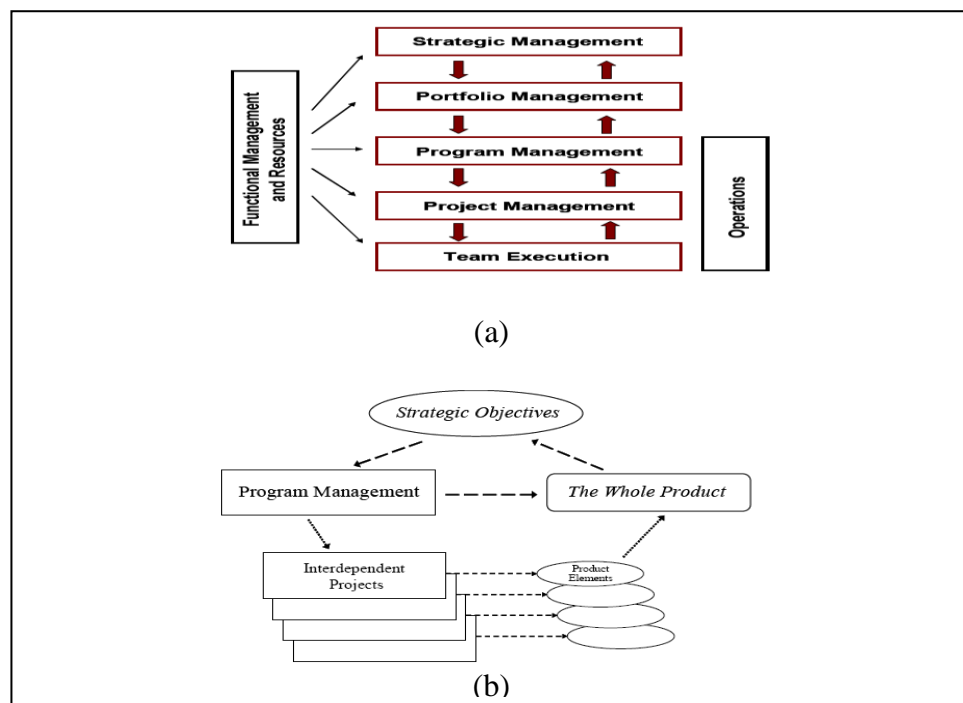


Figure 3 The strategic relationships in developing product delivery, (Martinelli and Waddell, 2004)

Therefore, Program management is a proven business model used by many organizations to achieve their business objectives, and is designed to be used strategically by Business Management. Although all projects and programs deliver tactical and operational deliverables, the real power of program management is the ability to link similarly aligned projects into programs that are tied to business strategy of the organization. Figure 4 illustrates their link to business strategy.

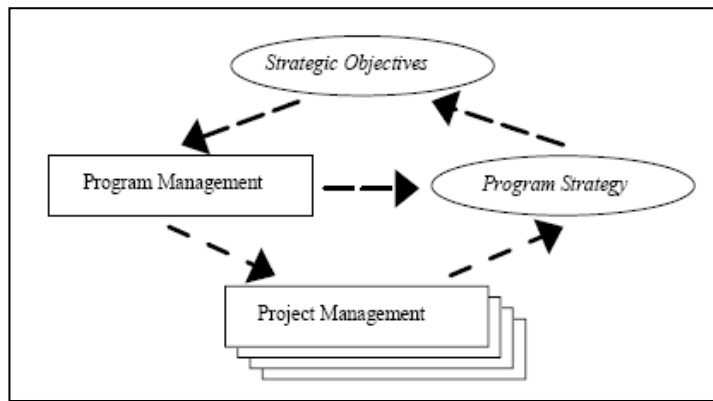


Figure 4 The Link to Business Strategy through Program Management, (Martinelli and Waddell, 2004)

On the other hand, originating and correctly prioritizing programs of projects are Portfolio Management activities. Michael & Manon (2007) in their discussion of project based organisations (PBOs), linked Project Management to Business Strategy through Portfolio Management which manages the programs. It is discussed that PBOs need to adopt integrative approaches that will enable consistent structures and delivery of strategy. A research was conducted to investigate and understand the double loop effect of strategy, governance and structure on project management and vice versa. Then, through the research, it is suggested that it is generally recognized that PBOs are struggling to integrate knowledge and structures and that projects are often viewed as “singular ventures”.

Studies done in strategy implementation have demonstrated that strategies are seldom implemented as planned. Strategy analysis, formulation and implementation are not a linear process, but the three activities are going on concurrently all the time and strategies are therefore formed incrementally. If programs and projects are used to implement strategies in relatively unstable environments, PBOs are expected to be designed to cope with emergence and enactment. A recommendation was laid out allowing great autonomy to program managers, who would have responsibility for the business level strategy and displaying value chain principles of cooperation and collaboration between the stakeholders of a program.

Portfolio Management is an approach that aims to align projects efforts through programs with the corporate strategy and optimise the efficient use of resources throughout the organisation. Portfolio management is a management approach for PBOs; its objective is to guarantee efficient use of resources in support of the corporate strategy by managing Programs of multi projects. Figure 5 (a) and (b) illustrates the above discussion.

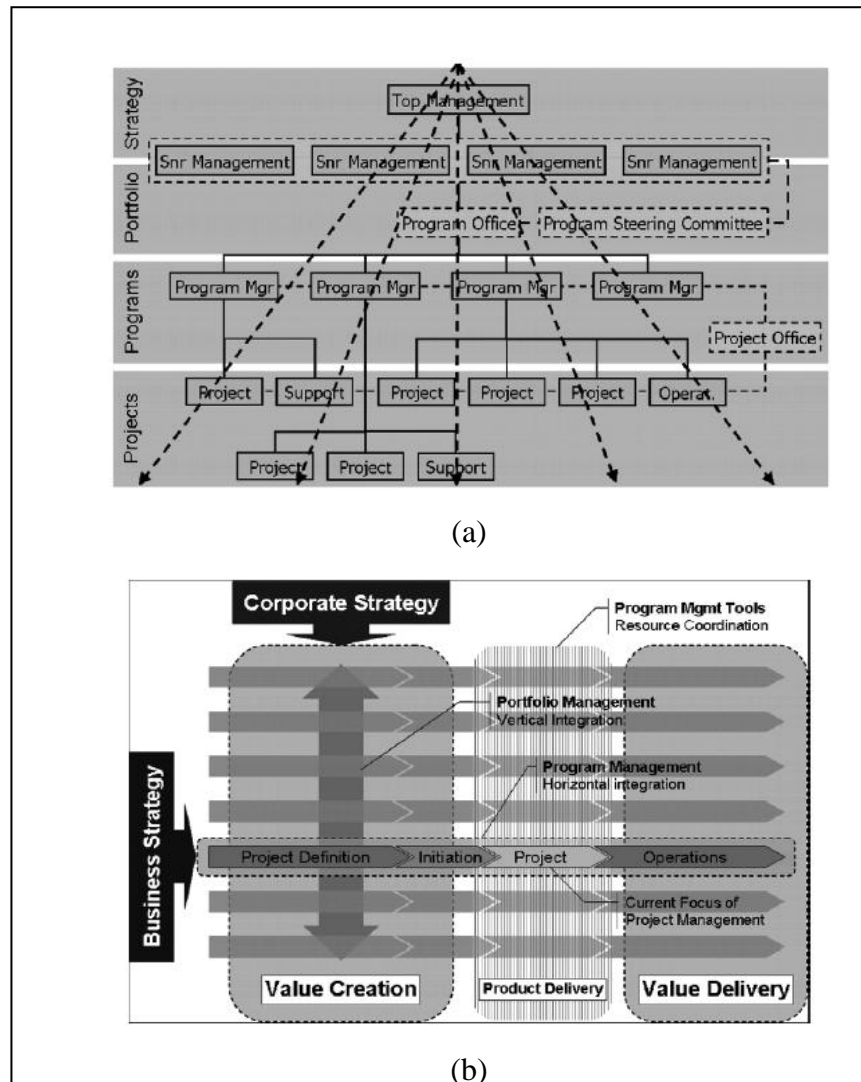


Figure 5 The Business Strategy through Portfolio and Program Management, (Michel and Manon , 2007)

Figure 5 (a) shows the top down structure they developed from Top Management to Projects showing levels of Portfolio, Programs and Projects to the Strategy.

Figure 5 (b) shows the value creation and value delivery out of projects to the Business and Corporate Strategies through vertical integration of Portfolio Management and the Horizontal integration of Program Management.

Gareis (2000) referred to PBO's as Project-Oriented Organisations (POO's), and discussed the essence of Program and Portfolio management in achieving Strategic goals.

It is discussed that a POO is characterised as a company which:

- defines "Management by Projects" as an organizational strategy,
- applies temporary organizations for the performance of complex processes,
- manages a project portfolio of different project types,
- has specific permanent organizations to provide integrative functions,

- applies a “New Management Paradigm”,
- has an explicit project management culture, and
- perceives itself as project-oriented.

It is explained that POO's hold a portfolio of projects. The more projects a company performs, the more complex it becomes. In order to cope with this increasing complexity, new management competences are required.

POO's are highly complex organizations because of their dynamic boundaries and contexts. On one side the number and the sizes of the projects and programs are constantly changing, permanent and temporary resources are employed, and cooperations are organized in virtual teams. On the other side varying strategic alliances are established and relationships to the different social environments of the different projects and programs are managed.

In order to manage the dynamics of POO's besides intensive corporate identity activities, such as strategic planning activities, reflections of the corporate culture, and continuous organizational development, specific integrative functions, such as program management and managing the project portfolio, have to be performed.

Program management and the management of project portfolios, as new management competences of Project-oriented Companies, require specific management processes and management methods.

For Program Management, it is explained that:

A program is a temporary organization for the performance of processes of medium and high complexity, which are closely coupled by common overall objectives.

For the realization of several processes of medium and high complexity a program applies on the one hand side projects, as differentiation instruments, and on the other hand side a program office, a program steering group, process owners, etc., as integration structures.

Usually some of the projects in a program are performed sequentially and some are performed in parallel. Programs have program-specific strategies, organizational rules and structures.

It was added that typical programs are the development of a product family (and not of a single product), the implementation of a comprehensive IT-solution (such as SAP), the

reorganization of a group of companies in a holding structure, and large investments, such as an oil platform.

Program management has to be performed in addition to the management of the single projects of a program. It includes the processes of starting, coordinating, controlling and closing-down a program. The program-management methods are similar to the project management methods, i.e. there is a program work breakdown structure, a program bar chart, a program environment analysis, etc.

In order to allow for autonomous projects on one side but to assure the benefits of organizational learning, economies of scale, and networking synergies in a program on another side, a specific program organization is required. Typical program roles are program owner, program manager, and a program coordination team, typical program communication structures are program owner meetings and meetings of the program coordination team.

The advantages of designing specific program organizations with several subprojects are:

- a less hierarchical organization
- a clear terminology: a program- manager and several project managers instead of one project manager and „project managers“ of the sub-projects
- empowerment of the projects of the program by allowing for specific project cultures, specific relationships to environments and specific project organizations
- differentiation between program ownership and different ownerships for the different projects.

For Portfolio Management, it is discussed that:

For integration purposes a set of projects might be clustered in different ways. Considering the sequence, in which projects are performed the chain of projects results, by relating a set of projects to each other according to a specific criterion such as the technology applied or the region performed for, a network of projects results, and by considering all projects performed by a company at a given point in time, the project portfolio results.

The basis for the management of the project portfolio is a database with aggregated project data, such as the project type, relations of a project to other projects, information about the project organization, information about relevant project environments, and project ratios. These data can be used for relating projects to each other, for deciding about new projects to be started, for setting project priorities, and for stopping projects.

For the management of a project portfolio a specific process and specific methods, such as the preparation of a project proposal, and project portfolio reporting methods, are required. Typical project portfolio reporting methods are the bar chart of projects, the projects profit versus risk graph and the progress chart of projects

The objectives of the project portfolio management process are:

- Optimizing the results of the project portfolio (and not of the single projects)
- Selection of projects to be started
- Interrupting or stopping projects
- Definition of project priorities
- Coordination of internal and external resources
- Organization of learning of and among projects .

For Project-oriented Companies it is not sufficient to have the competence to manage single projects efficiently, but additional competences, such as the competences for the assignment of projects and programs, for project and program coaching and auditing, for networking between projects, and for program management and project portfolio management are required. For all of these processes an explicit assessment and continuous further development is necessary.

Program management used to be a side job for executives, but in today's environment of change, it is clear that a new approach is needed. In the near future, organizations will rely on individuals to focus all of their energy on implementing an overarching strategy that pulls together multiple disciplines within the organization. This new responsibility of program management is a likely path for both functional managers and project managers.

A program manager's focus never wavers from the organization's strategic objective. The strategic objective is a long-term objective that is essential for the business to achieve in order to maintain a competitive advantage, for instance, reducing cost, increasing customer satisfaction by, or increasing revenue. Once the strategic objective is identified, the tactics, in terms of identifiable projects, must be outlined in order to achieve this objective.

The program manager must sustain the organization's focus by continuing to identify and drive the implementation of projects that will ultimately support the strategic objective. Successful program managers are able to move the organization toward achievement of the strategic objective in a timely manner without interrupting the day-to-day operations of the organization.

In summarizing the strategic role, PMFORUM (2001) stated that organisations need programs and portfolio management to implement Strategy providing strategic role of each conception in relation to each other in achieving strategic objectives. Table 4 shows each conception and relationships in achieving strategic objectives.

Conception	Project	Program	Portfolio
Relationship and Strategic Involvement	<p>Delivers a single unique product or service that is tied to delivering business value.</p> <p>It may be part of a program focused on a strategic objective, but does not stand alone in delivering the end objective).</p> <p>Has a defined start and end date.</p> <p>It is usually done at the tactical or operational level (implementing part of a strategy).</p> <p>It is s schedule-, activity-, task-, and resource-driven.</p>	<p>Has a portfolio of related projects focused on a strategic objective.</p> <p>Identifies projects that will achieve the strategic objective.</p> <p>It is done at the strategic level;</p> <p>Requires coordinated effort in terms of risk, resources, communication, and other project management</p> <p>Processes across multiple projects and business units;</p> <p>May not have a defined start and end date.</p>	<p>Delivers a strategic business objective</p> <p>Takes into consideration multiple aspects of an organization</p> <p>May require changes to the organization's structure, policies, processes, procedures, and technology.</p> <p>It may require the organization to transform itself.</p> <p>The strategic vision of the organization will drive the program, and projects will be identified and prioritized over time to fulfil the strategic objective.</p> <p>These types of programs span business units and are generally undertaken at the corporate level.</p>

Table 2 The Project, Program and Portfolio Management in Strategic Involvement, (PMFORUM, 2001)

During the strategic planning process of an organisation it is recommended that organizations create a set of strategic objectives to gain competitive advantage and achieve business growth. Strategic objectives are the *results* an organization wants to achieve within a specified strategic horizon. Programs are then developed to create the means to achieve the objectives. For each program, a program strategy is developed to define how the program will contribute to the achievement of the strategic objective, and serves as the guiding vision to align the resulting project work. The Portfolio strategy then guides the behaviour required to achieve the business results.

The conclusion is that good strategic management practices (strategies) identify what an organization wants to achieve (strategic objectives) and how these strategies will be achieved over the strategic time horizon – typically three to five years (Strategy). Companies then start projects to achieve the strategic objectives.

When projects are to be taken to achieve these objectives and internal resources are not enough or capable of handling these projects, Corporate Strategy along with all Strategies of Program, Portfolio and Project might opt for outsourcing these projects. So, Outsourcing, become strategic and involve outside parties. Outsourcing Strategy is then to be embedded.

Freytag (2002) stated that when preparing Outsourcing Strategy, a company must take into account both its own position in the network as well as how the company develops. It is also necessary for the company to clarify its own strengths and weaknesses, and draw up an overall mission and strategy for the company in general. However, it was explained that for companies to live up to its mission and implement its strategy, it must interact actively with its surroundings. In other words, the company's mission and strategy must be adapted to the surroundings, as must the way in which in/out-sourcing takes place. The question of who you are and what you want can only be seen with the surroundings. This includes the parties as they part of the surroundings.

The above process introduces a Supply Chain to be managed. Stuart (1997) explained that the growing dependency on out-sourcing will increase the role and involvement of the Supply Chain Management (SCM) in the corporate strategy. This is because of the relationship development brought through the SCM such as strategic supply alliances. The growing recognition of SCM is through achieving its long overdue position, along with marketing and operations as key element in corporate strategy.

It was also seen in the review of Corporate and Business Strategy that strategic decisions may also have to manage and perhaps change relationships and networks outside the organisation, for example with suppliers, distributors, customers and services providers. This gives further rise to exploring the SCM strategies.

SCM therefore might be a separate strategic process or a strategic practice which is to be seen and explored in the next chapter.

3. Supply Chain Management and Introduction to Procurement

This section intends to review the Literature on how Supply Chain Management (SCM) contributes to Strategic objectives achievement, and introduces Project Procurement.

As mentioned previously, SCM is a discipline to be attained by Organisations in managing projects for outsourcing these projects to achieve the business objectives. Hence, whenever outsourcing is involved, SCM comes into picture for strategic position of organisation. Also, SCM is the strategic management of relationships which will be seen.

3.1 Supply Chain Management and Strategy

Introduction and definition of SCM are given from Literature to understand the concept and then the strategic role of SCM is explored.

3.1.1 Understanding SCM – Introduction and Definition

SCM seeks to enhance competitive projects by closely integrating the internal functions within a company and effectively linking them with the external operations of suppliers and channel members. Elmutti (2002) describes SCM as a network or web that brings the supplier, distributor and the customer into one cohesive process and shows how each interacts with the others. Supply Chain Strategy is defined as taking into account coordinating all the different pieces of the chain as quickly as possible without losing any of the quality or customer satisfaction while keeping the costs down.

The importance of SCM has risen in outsourced services sector as in the other sectors such as manufacturing. Ellram et al. (2004), in discussing supply chain of out sourced services, defined SCM as the management of information, processes, goods and funds from the earliest supplier to the ultimate customer, including disposal. It was explained that in recent years, services have become an increasingly important force in the U.S. economy. Services have taken on an escalating level of importance as manufacturing became hollowed out in the 1980s and 1990s due to outsourcing to Asia, Mexico, South America and Eastern Europe.

Yet, from academic and practical standpoints, the emphasis of supply, supply chain and operations management is still strongly skewed toward the manufacturing sector. Figure 6 illustrate the discussion of SCM enrolment in the services sectors in the US.

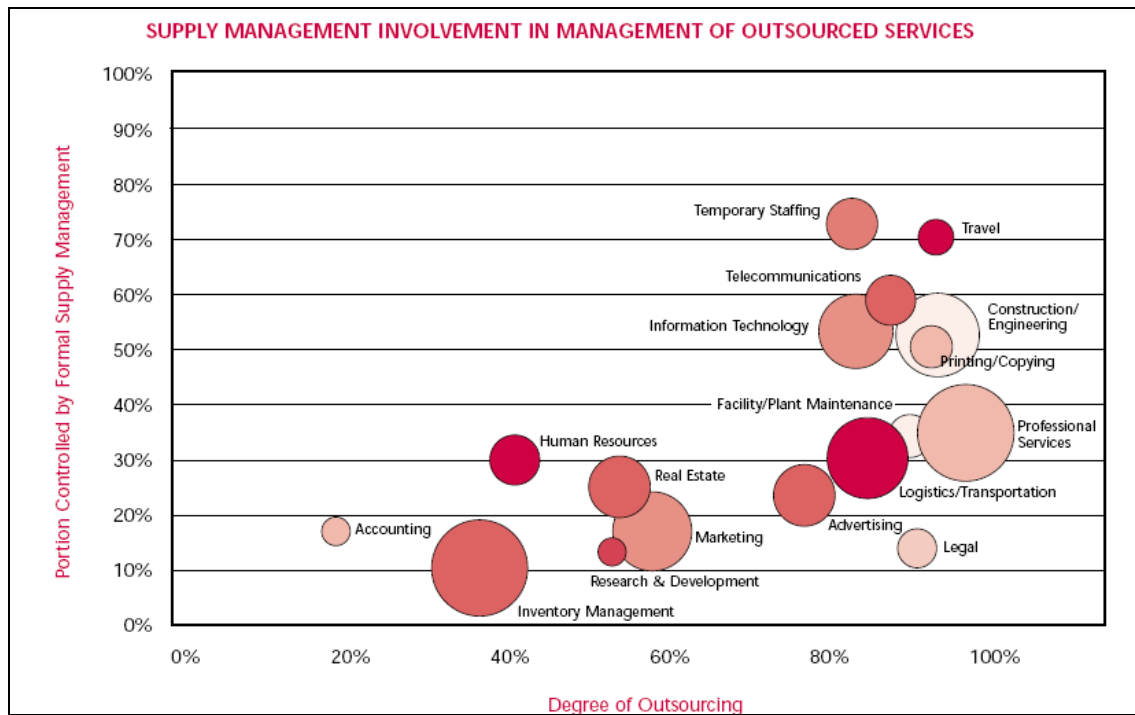
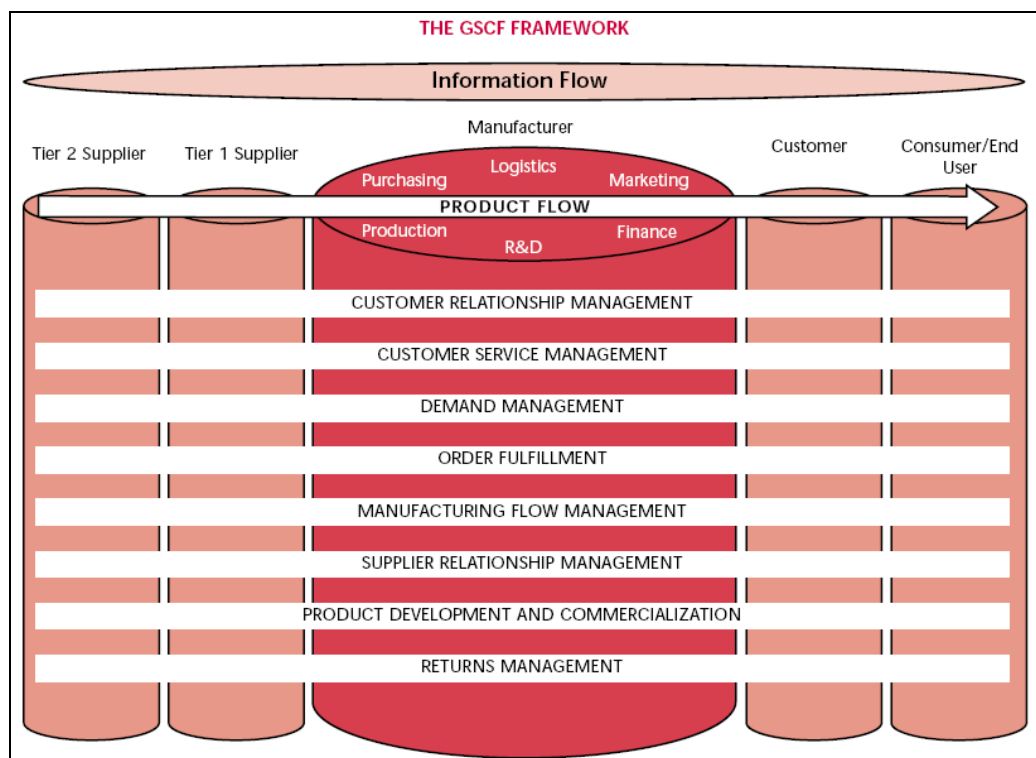
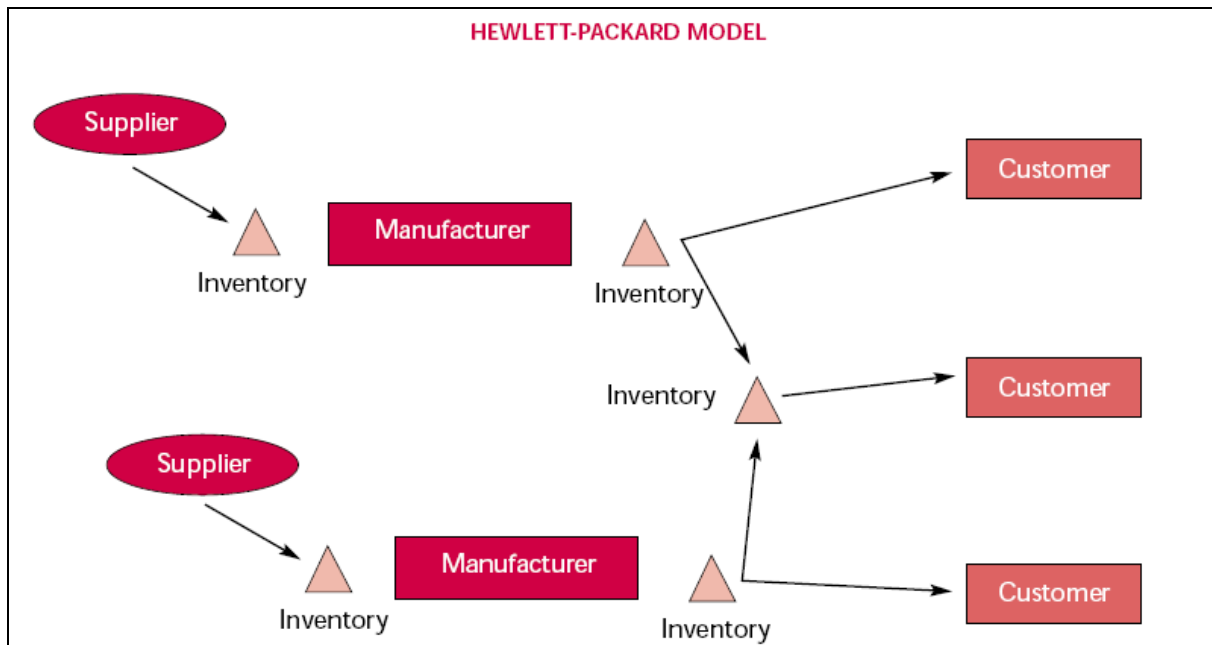


Figure 6 Supply Chain in the Services Sector, (Ellram et al., 2004)

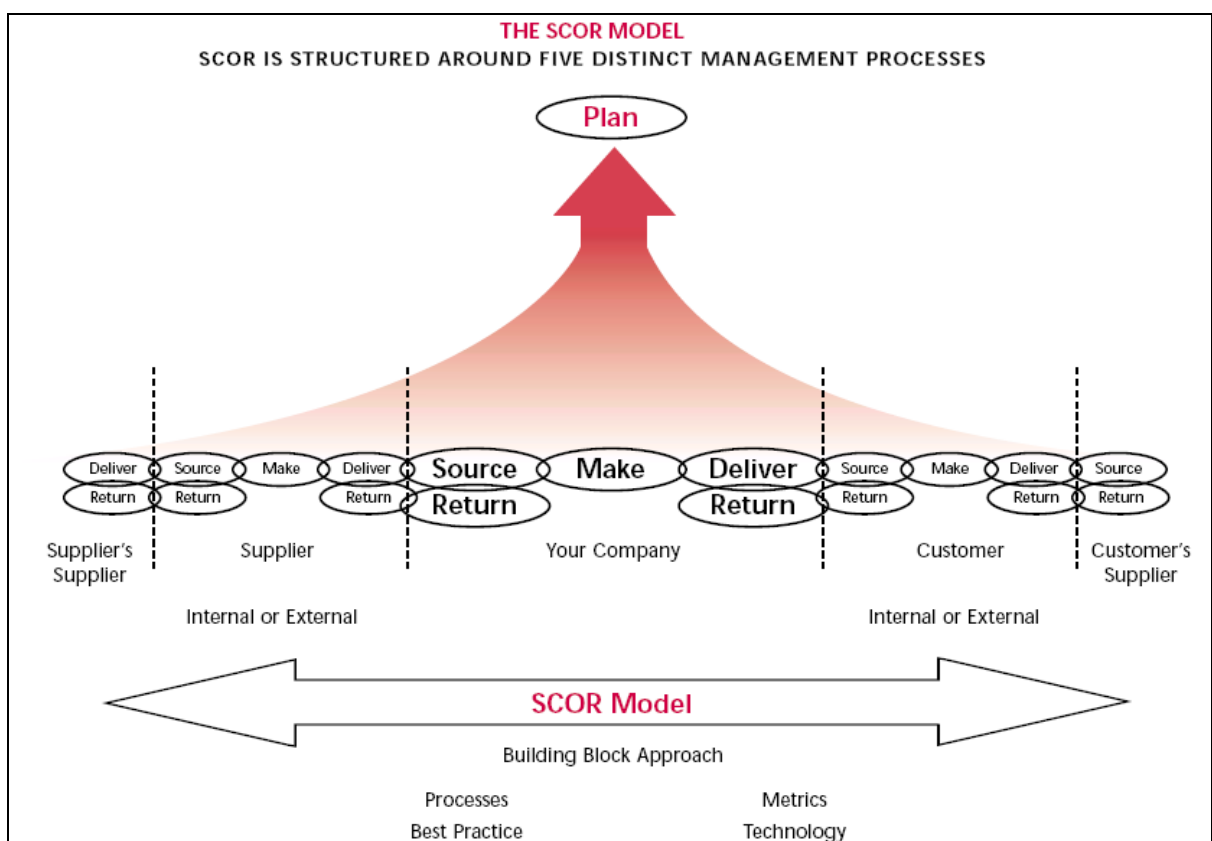
Hence, a supply chain framework appropriate for a services supply chain was developed by comparing and contrasting the applicability of three product-based manufacturing models: Global Supply Chain Forum Framework, SCOR and Hewlett- Packard’s Supply Chain Management Model as in Figures 7 a, b and c.



(a)



(b)



(c)

Figure 7 a, b & c Supply Chain in the Manufacturing, (Ellram et al., 2004)

It was explained that Services are significant, and the spend is large and growing. Attention to the services supply chain by practitioners is necessary for improvement, cost control and minimization of value leakage. Similarly, more attention to the services supply chain is needed by academics as they educate future practitioners and conduct research.

Disseminating information on best practices and trends in managing the services supply chain and services purchases could help businesses retain their competitive advantage in the growing global economy. Improved management of services spending could represent the next major area of cost reduction and value enhancement for organizations. Supply management academics and practitioners can play a significant role in this improvement strategy.

Hence, SCM should suggest models and ways for the supply management executives to understand and implement. Lan (2003) suggested an Integrated Supply Chain Management (ISCM) that directly involves linking suppliers and customers with internal supply processes of an organisation. The model is illustrated in Figure 8.

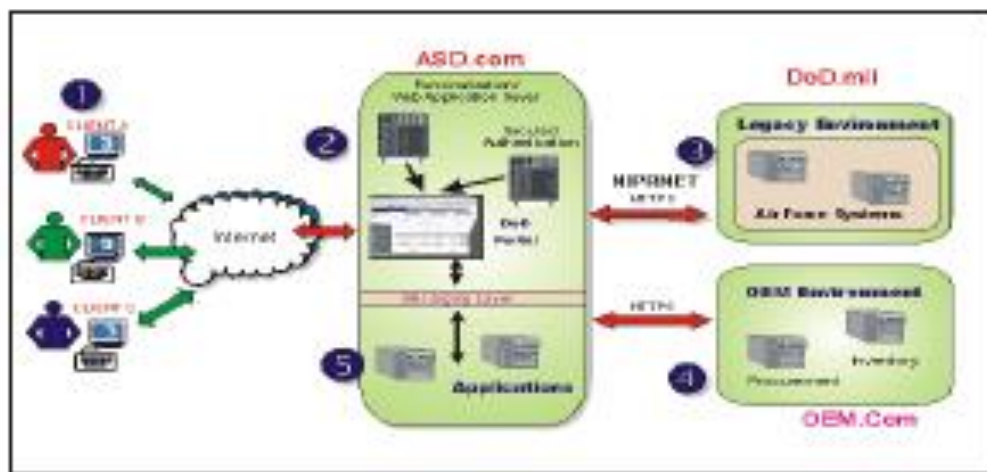


Figure 8 ISCM integration Architecture, (Lan, 2003)

It is suggested that ISCM solutions allow organisations to automate workflows concerning the execution and analysis of planning, sourcing, making, delivering, returns handling and maintenance.

3.1.2 Strategic Role of Supply Chain Management

In view of strategic involvement, SCM contributes to Strategic position of an organisation. Ogden et al (2005) stated that SCM becomes more involved in Strategic decisions to identify supply strategies that lead to significant improvements over the next 5-10 years. Strategies such as increased integration, information sharing and collaboration among supply members will have the largest impact on organisations once implemented.

As companies move toward increased global competitiveness, the strategic issues surrounding supply management increasingly demands the attention of firms. Increasing

demands for reduced costs, increased quality, improved customer service and continuity of supply have significantly elevated supply management's stature within organizations.

It was further discussed that strategy is defined as being a discernible pattern over time in a stream of corporate decisions. The purpose of business- and functional-level strategies is to develop and sustain competitive advantage.

It was stated that previous research has found that supply management is a strategic function that has an impact on overall firm performance. As supply management continues its shift from a passive/tactical function to a strategic/integrative function, its goals, objectives and strategies need to change as well. However, the strategies that supply management departments adopt need to both support and complement an organization's overall goals, objectives and strategies.

Strategic supply management has been empirically linked to firm performance through measures of return on investment, profit as a percent of sales, market share and market position. Additionally, supply management's involvement as a strategic function has been associated with supplier evaluation and building relationships/partnerships with suppliers, both of which have resulted in greater corporate financial performance. On the other hand, a misaligned supply management strategy is a recipe for disaster. Therefore, selecting the correct supply management strategy becomes crucial to overall competitiveness.

It was explained that SCM assist strategic position of organisations in:

- Globalization
- Supply base optimization
- Collaboration
- Outsourcing
- Integration and partnerships
- Early supplier involvement in new product development
- Supplier development
- and other strategies as a means of reducing cost, increasing quality and enhancing a firm's overall competitive position.

Hence, SCM supports corporate goals. Petersen et al (2005), in examining collaborative planning effectiveness and supply chain, stated that many organisations are attempting to gain competitive advantage through supply chain integration, using some degree of

collaborative planning between supply chain partners. This calls for greater strategic and operational cooperation between buyer and supplier firms. It was explained that to realize the full potential of supply chain management, it is necessary to integrate firms in a supply chain. Consequently, it was explained that supply management has become more involved in developing and implementing strategies and enjoys a larger role in formulating corporate strategies.

This is how SCM contribute to achieving strategic objectives. To keep the link, SCM also specifies relationship management, organisation culture and organisation change as strategic objectives. Cheung (2006) confirmed that there are numerous activities that asset owners can do and undertake to achieve strategic alignment of their objectives to selected supply chain management strategies. It was noted that successful implementation of relationship management, client organisation can obviously influence the supply chain culture and commitment to the goals and objectives of an organisation.

The dimensions have been explored and come to the conclusion that SCM requires strategic activities from clients as illustrated in Figure 9 below.

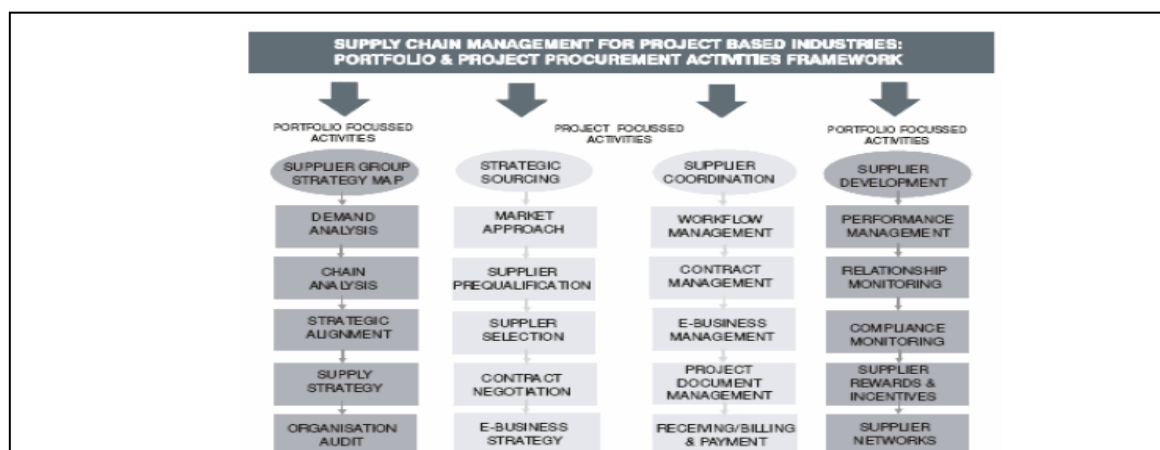


Figure 9 The Strategic clients activities of SCM and relationships, (Cheung, 2006)

However, these goals in the supply chain must be explicitly stated in the both the client policy and the conditions of contract and must be fully understood by all parties for a project. This builds and improves the organisational relationships to cut costs, increase technological innovation, increase profitability and productivity, reduce risks, and competitiveness to successfully complete the project and achieve intended objectives. Then, as can be seen from the Figure 6, Procurement Strategy is necessary for strategic sourcing.

Procurement with improving relationships can provide a positive contribution to sustainability and help to satisfy client and stakeholder interests. It is a sustainable approach to the industry in terms of people, environment and economics. Clients and contractors/suppliers can potentially make savings in their operations under a relationship management regime and specified Procurement method through sharing and exchanging technical and commercial knowledge of the project. Thus, the true benefits of procurement can only be achieved if there is a change of culture in the industry – in the client, contractor and supply chain sectors. Sustainable supply chain requires proactive Procurement, relationship management and the development of an appropriate organisational change.

The connection therefore between SCM and Procurement is that SCM brings the arrangements in Procurement such as Partnering, Alliances and the integration. Khalfan (2005) explains that one of the key elements in innovative procurement methods is the management of the supply chain. Further, a number of organisations and individuals within the construction industry are already moving towards supply chain integration through the use of partnering, framework agreements and techniques to rationalise their supplier base.

Innovative procurement methods are often considered as a tool to integrate the construction supply chain because it provides:

- openness,
- trust,
- cooperation,
- harmony of decisions,
- sharing of benefits,
- intangible and long term investments,
- collective working routine,
- and fair allocation of risk.

Many organisations have taken up the challenge to introduce new procurement initiatives such as partnering into their organisations. Supply chain specifies how to make partnering and other methods successful, how to appoint suppliers, how to manage the integrated supply chain, how to build trust and who will lead the whole process. It further added that SCM brings the integration in Procurement. This is through the role and power of clients, the responsibility of contractors, subcontractors, suppliers and manufacturers in the whole chain. Thus, we can see that SCM in the context of projects involves Procurement in managing relationships and delivery methods. SCM Strategy is the successful implementation of

Procurement systems within projects. This helps to successfully complete the project and achieve intended objectives.

Hence, SCM was seen to be connected to Corporate / Business Strategy for Outsourcing and to Procurement for strategic relationship management such as Alliances and Partnering. Procurement Management and Strategy are then to be explored.

3.2 Introducing Project Procurement Strategy

Many practitioners nowadays confuse the term Procurement with either Contracts or Purchasing. Procurement is however a wider term that should include both in terms of supplying goods and services to the wide areas of projects management. Dulaimi (2006) provided two definitions of Procurement:

- Procurement as a strategy to satisfy client's development and/or operational needs with respect to the provision of constructed facilities for a discrete life cycle, (CIB W92).
- Procurement as the organisational structure adopted by the client for the implementation, and at times eventual operation, of a project, (Masterman, 2002)

The above definitions introduce a Procurement Strategy. Koolwiji and Vrijhoef (2005) defined Procurement Strategy as the achievement of joint benefit through a collective process of progressive development of value and costs; and thus added value to Clients and profits for supplying parties that can be achieved through Procurement methods and arrangements such as alliance contracting to achieve goals of the parties.

Procurement Strategy for projects is also a mean of identifying and selecting the best options for applying contracting management and assessing risks strategies and transfer. APM (1998) defined Procurement Strategy as a way in which suppliers of goods and services are used to suit the objectives and nature of a project and the Client. It may be dictated by law, government policy, financial bodies and specific organisation procedures and should further include a Contract Strategy that forms an agreement on the objectives, priorities and risks of the project plus attention to how these may change during the work to be done.

As mentioned, Procurement is a wider concept than managing purchases or contracts. Procurement Strategy assists in improving relationships, achieving projects and Business objectives. Morledge et al. (2006) argued that Procurement Strategy not only creates a unique set of social relationship but also forms a power structure within a coalition of

competing or co-operating interest groups. It was reported that it had been possible to reduce cost by 5% through selection of the most appropriate procurement methodology. Failure to select an appropriate procurement approach is well recognised as a primary cause of project failure. Project success was further defined. It was stated that for some construction professionals Project overall success is a comprehensive assessment arising out of a consensus of all key stakeholders. However, this is far too complex and others believe that a client satisfactory with the final outcomes is perhaps the most appropriate indicator of project's success.

If the key objectives to be isolated, there is evidence that the selection of an appropriate procurement strategy which matches the objectives of the key stakeholders is an important contributor to project overall success. An appropriate Procurement Strategy should be developed and set at an early stage of a project and adopted throughout the project.

Procurement Strategy also specifies risks management. H.M Treasury (1997) stated that setting a Procurement Strategy should select the best option in assessing alternative risk transfer strategies after identifying risks in Design and Build, client design and management contracting. A more in depth study of the Procurement Strategic objectives and processes are undertaken in the next chapter.

4. Project Procurement Strategies and Processes

In the previous chapter, it was seen how Procurement falls form SCM. Procurement Management and Procurement Strategy were defined. As also seen earlier, the essence of strategy is the way a company defines its business and links together the resources such as relationships, organization's competencies and suppliers and contractors which really matter in today's economy. Procurement Strategy in the Supply Chain contributes to such a way. Thus Procurement strategies are further to be explored in details.

4.1 Procurement Strategies

To see the wide range of Procurement, Procurement Strategies around the world can be investigated. Morledge et al. (2006) stated that there are procurement strategies that achieve:

- Certainty of cost and time for a design developed by architect employed by client but this traditional procurement process is sequential and consequently low
- Relative speed and cost certainty – but the design will be a greater or lesser extent the responsibility of a contractor (develop and construct or design and build respectively)
- Speedy completion for a design developed by an architect employed by the client (either management contracting or construction management) – but this case cost is uncertain until close to completion).

Then, that most appropriate selection of a Procurement Strategy has two components:

- Analysis – assessing and setting the priorities of the project objectives and client attitude to risk
- Choice – considering possible options, evaluating them and selecting the appropriate.

Oyegoke (2001) provided a framework for comparing construction management contracts in the UK, US and Japan by reviewing previous studies on construction practices prevailing there and exploring the main procurement delivery methods. An examination was undertaken for construction management contracting types, processes and procedures and interaction between the construction manager and other stakeholders. A careful analysis was undertaken of the Contracts Management systems within each practice and between both practices; the distribution of responsibilities and risks both in pre-construction and during the construction stages; and allocation of responsibility or alike.

It was explained that practices amongst US, UK and in Japan can be differentiated and is obvious in user's requirement, project finance, internal construction process, and feedback and learning information. The differences between the contracting systems lie in the contractual ties and assignment of responsibilities of the parties, the contracts within the system, and their performance requirements. Finally, the importance of having clear divisions of scope from owners regardless of differences in systems was highlighted.

For international comparisons, Xiao and Proverbs (2002) advised that international comparisons of contract allow contractors in different countries to distinguish their own strengths and weaknesses and improve their competitiveness accordingly. On a recent survey of contractors in Japan, the UK and the US have evaluated and compared contractor time performance. It was disclosed that Japanese contractors achieve shorter construction times and higher levels of time certainty than their UK and US counterparts. Anticipated delays are far shorter in Japan and levels of client satisfaction are significantly higher than in the US and UK. The superior performance of Japanese contractors may be attributed to their working practices which were characterized by the use of a larger workforce on site, detailed planning, close working relationships with their subcontractors, and an overriding focus on time certainty.

Focusing on Procurement selection, in Hong Kong for example, Cheung et al (2001) stated that one of the key concerns of Procurement selection is how to enhance objectivity. A method was selected using Multi-Attribute Utility Technology (MAUT) and the Analytical Hierarchy Process (AHP).

In MAUT, utility factors corresponding to various procurement strategies can be assigned by experts to create a utility factor table. For the purpose of catering for individual project characteristics, the relative importance weightings of the selection criteria can be assessed using the analytical hierarchy process. Final selection can be then based on the highest utility value derived from the procurement strategies, taking into account the relative importance of the selection criteria.

Thus, Procurement for projects should also aim at achieving value to organisations. In U.K. for example, H.M (1997) stated that procurement in construction is to achieve the best value for money and accountability for public funds must not be used as an excuse for missing opportunity to deliver this. The key features of achieving the best value for money in construction procurement are:

- Integrating value and risk management techniques within project management;
- Defining the project carefully to meet user needs;
- Not appointing consultants and contractors on the basis of lowest initial price alone.

Procurement Strategies around the world can thus be said to be quite varied. Some strategies might be familiar and others are totally new.

APM (1998) specified the contents of projects' Procurement Strategy that achieves objectives and affects Strategic decisions, which are:

1. Priorities of the project to employ other organisations to supply good and services and the availability and suitability of Clients resources.
2. The suitability, capability and selection of suppliers and/or contractors.
3. The responsibility matrix including defining requirements, scope of work, standards, design, quality, fitness for purpose, supervision, operating and maintenance, health and safety, approvals, schedules, equipment installation, inspection, testing and commissioning.
4. Terms and Motivation Of Payments
5. Commercial and Procurement Procedures.
6. Contract Formation and Management
7. Risks allocation, Changes, Variations and Claims Management.

The resulting Procurement Strategy should respond to all the above elements. This can be seen in details in the next sections.

4.2 Strategic Project Delivery Methods and Procurement Systems

As a Strategic objective, the right Delivery method and Procurement system should be selected in every project. Literature proposed many developed Procurement methods for projects compared to Traditional procurement methods which result in problems.

4.2.1 Project Delivery Methods

One method proposed in Literature is Alliances; Stuart (1997) explained that Alliancing is a key element in corporate strategy in the discussion of Supply Chain Strategy's organisational influence. It is proposed that Alliance practising firms will display an increase in involvement and management support in the corporate strategic-making process. Alliancing practising

firms should experience increased benefits (productivity, quality and ultimately competitive advantage) which serve to reinforce and improve SCM strategic posture. A common element of an Alliance is the emphasis on joint problem-solving because of the need for cooperation, trust and information sharing to affect such an approach.

Other procurement methods in projects are the Design and Build (DB) and Partnering methods. Koskela (2003) looked at renewal of construction suggesting D/B and Partnering for projects' procurement methods. It is explained that separation of design and building has presented problems in construction.

Thus, it is no wonder that great expectations have been attached to D/B procurement of construction projects, where these two stages are organisationally integrated from the outset. In this case, the client gives a single contract for the execution of both design and construction to one company (usually a contractor). The performance of the D/B delivery system in comparison with other major delivery systems has been studied and the results indicate that, statistically, D/B outperforms the Traditional process in several respects; however, the differences are not great.

On the basis of statistical analysis, the construction speed of D/B is 12% faster than the speed of Traditional methods and the total delivery speed is 30–33% faster. In the UK, the share of projects ending up above budget by more than 5% was 21% in D/B projects in contrast to 32% in traditionally procured projects. In the USA, the corresponding figures were 38 and 51%. The diffusion of D/B has been relatively rapid and several variants have evolved in the speedy process of the procurement method of Partnering. It is mentioned that Partnering is used mostly in USA and UK primarily to improve relationships and cooperation in all project management levels. It achieved superior results in controlling costs and technical performance and in satisfying customers compared with other projects.

A further explanation revealed that a US study shows that there appear to be no correlation between the use of alliances and project resulting in long-term contractual relationships between owners and contractors which are intended to promote efficiency in capital projects. In addition it is not the alliances but the substance of work processes that produces the result but the problem of Partnering is visible when the long term trust for improvement is not achieved so there is evidence of improving long term relationship and trust.

Chritamara et al (2001) also suggested the D/B method that allows the client to introduce the contractor's design at any stage resulting in the possibility of having different levels of initial scope establishment. It was suggested that the client's main criteria for selecting D/B procurement are to reduce the time and cost of projects through one point responsibility. An analysis of the experiment with the model developed shows that D/B fast-track construction with fixed design and construction schedule is most effective in saving time, whereas organisations use Traditional method separating the two D/B phases for cost savings.

As advancing the method, it was further explained that D/B method handed over to the D/B contractor is employed through System Dynamics Modelling (SDM). There are many categories for SDM. However, they can be classified under six main categories as: (1) traditional design and build, (2) package deal (including turnkey contracts), (3) design and manage, (4) design manage and construct, (5) novation design and build; and (6) develop and construct. Turner (1995) classified the D/B approach into four main categories: (1) package deal; (2) turnkey; (3) all-in service; and (4) develop & construct. Figure 10 illustrates the categories.

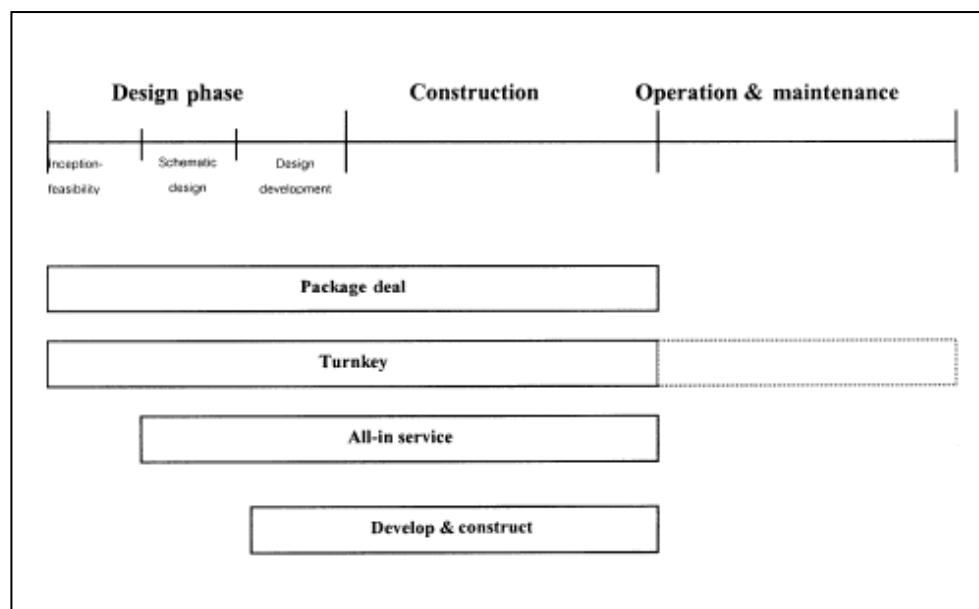


Figure 10 SDM of Project Procurement Selection Method, (Chritamara et al., 2001)

A cause problem was identified as the lack of clarity in the amount of design left to be performed by the construction contractor is in Traditional procurement methods. It is observed that much control of Design by the contractor means that cost benefits of buildability and integration of programs of design and construction in D/B methods. Also, there may be significant delay or cost overrun due to unclear scope from the client in the Traditional methods. Splitting The D/B phases causes loss of control of design by the

contractor which means that the cost benefits of buildability and integration of programs of design and construction are lost.

Further, in D/B construction projects, there are two main parties responsible for the execution of the project, the client and the contractor or a group of contractors. In theory, the client assigns all responsibility to the contractor. The client's role is to respond by identifying requirements and by inspecting how well the product accords to the specification. However, in practice, the contractor may be assigned to the contract with varying levels of information. The contractor may start working on the project from the conceptual design or may start the project with almost complete design from the client. Further they introduce the importance of Information management in such procurement method. They say that Construction knowledge and information sharing between client and contractor are essential for project success.

Dulaimi et al (2003) further mentioned that the D/B method in suggesting enhancing integration and innovation for Singapore's construction industry. It was stressed out that one of the major causes of low productivity is lack of integration across the value chain. A recommendation of two key changes and initiatives to encourage greater integration in Singapore's construction industry was emphasized. The first is the promotion of the D/B procurement method through providing an environment for the D/B arrangement. The second is for the client to play a catalytic role by embracing D/B and tendering methods that emphasize greater integration across the value chain. Their emphasis on innovation that requires initiatives from professional companies to enhance productivity and therefore the image of industry resulted in adaptation of new procurement methods. These procurement methods improve the ability of the industry to provide more integrated and innovative solutions to customer needs and expectations.

D/B is conclusion is proven to be the strategic most effective procurement method in construction to meet project objectives. El – Sayegh (200) studied evaluating different procurement methods in construction and concluded that the study results indicated that D/B methods are more effective in meeting most project objectives followed by construction management at risk, construction management and lastly the traditional design-bid-build. Design-build is relatively more effective in ensuring the shortest project duration than Construction Management methods. The traditional delivery methods are not effective in ensuring the shortest duration. Construction management method is the most effective in ensuring staying within budget. The results also show that the Design-Bid-Build methods

provide the greatest flexibility to incorporate changes during the design and construction of the project. However, this may come at a higher cost. Design-Build is better suited to handle changes and ensuring the highest quality. The organizations with limited experience required a delivery method that included a construction professional to be present at the early phases.

Design-Build methods do not allow a high level of involvement by the owner. Using Alternative delivery methods and minimizing the number of contracting parties help minimizing adversarial relationships. With regards to project characteristics, design-build method is more effective than construction management at risk, construction management and design-bid-build (in that order) in handling essential, complex and unfamiliar projects. Selecting the appropriate project delivery method is a key decision that has to be made in the early phases of the project. There are many delivery methods that can be used on any project.

The decision is usually based on certain factors of importance to the owner. Owners are usually tempted to use the delivery method that they are familiar with. However, this might be a great mistake since familiar methods are not necessarily effective in all situations. The effectiveness of the delivery methods vary according to the factors. Owners must rank their objectives and choose the method that maximizes the effectiveness in achieving the project objectives.

4.2.2 Project Procurement Systems

Procurement systems also aim at achieving business and project objectives. Seely (1997) discussed measurement of Project Procurement Management (PPM) in the Public Sector in Canada. It is stated that PPM plays a determining role in achieving the projects' objectives and should form an integral part to the project management process. It was argued that such systems are required to monitor and control the time of delivery on the project. Without such systems stakeholders of a project will wait longer time on procurement. It is not acceptable to project stakeholders to wait five to ten years from the start of major project procurement.

Finally stating the measures of PPM, it is explained that the approach addresses both the requirements for corporate accountability and the normative of the PPM function. The solution to the insight that project stakeholders do not have on their investment into project procurement is to initiate the PPM measurement.

However, the right procurement system should be chosen to ensure the achievement of objectives. Morledge et al. (2006) provided procurement systems that achieve strategic development in organisations. These procurement systems are identified as Privately financed public sector projects (PFI), Public private partnerships (PPP), Performance Information Procurement System (PIPS) and some other systems like US systems (Design and Build and Low-bid-award), the French System and Chinese approach.

It was explained that a system that benefits both the client and contractor should adopted and implemented. This is argued to been seen most in the PIPS system which its core duty is to update and maintain the contractor's performance information and in price based environment.

PIPS is a system developed by Dean T. Kashawagi, Director of the performance based studies Research Group (PBSRG) at Arizona state University (ASU). It is an information based procurement system that uses best value selection and performance contracting approach. It is developed for US construction markets but was able to be used in UK markets. The objectives of the system are to be seen in the next section. It was explained that through PIPS:

- 98% customer satisfaction has been achieved.
- There are no contractor-generated cost increase change orders.
- Projects are completed on or before contract time
- It can reduce the client's construction management and inspection role by 80 %.

These systems are of general purposes that serve general organisations strategic objectives. There are procurement systems that are closely applied to projects objectives. Kumaraswamy (2006) provides the full project procurement system and its subsystems that can be selected in a project.

Figure 11 shows the breakdown of a Procurement System into its subsystem. Figure 10 shows a template for assembling a project specific procurement system from various set of options. The figure also shows the sub-sub-system of a subsystem indicating a break down of a subsystem. It is explained that each subsystem has series of options.

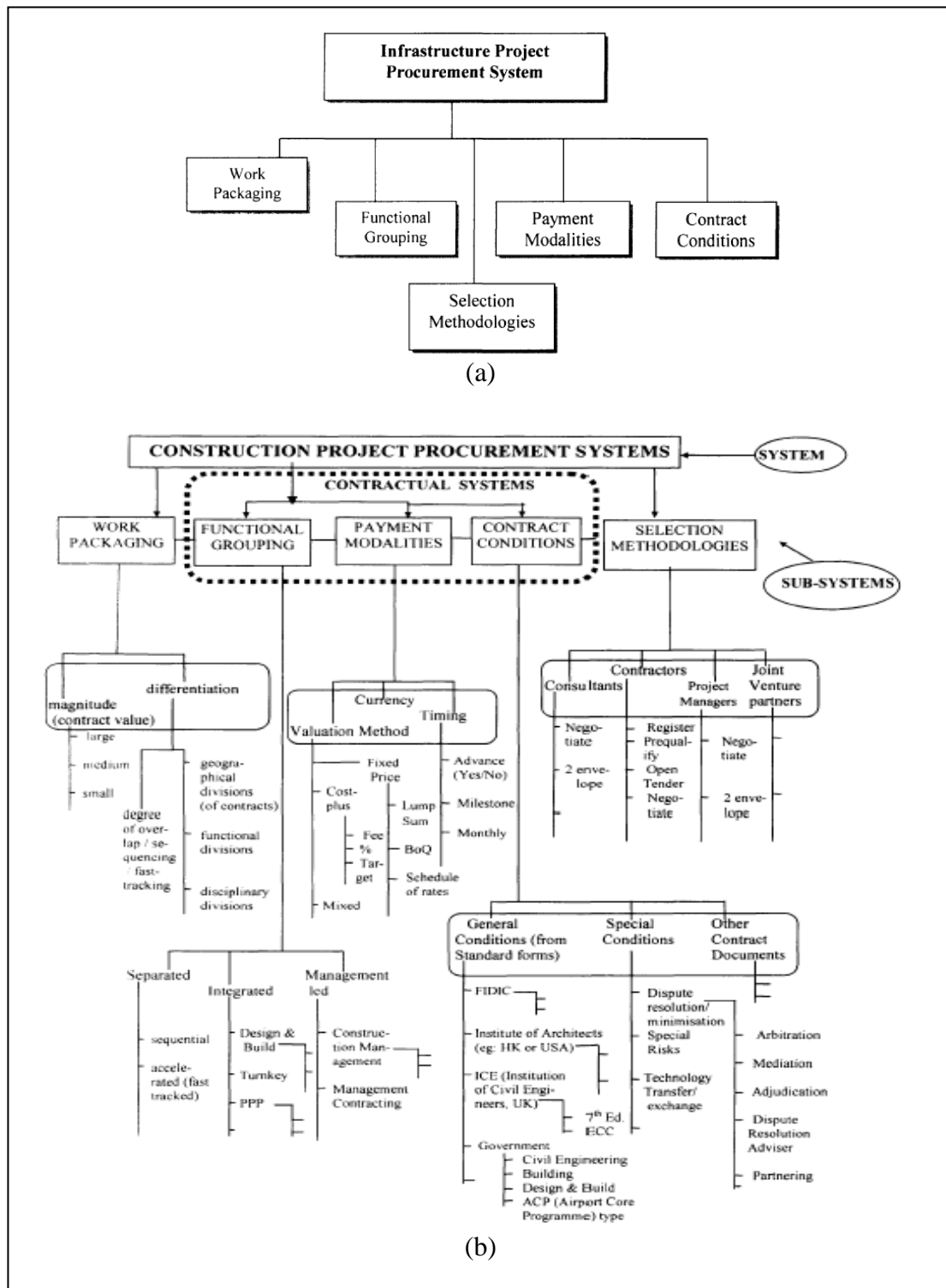


Figure 11 Project Procurement System and Sub-Systems, (Kumaraswamy, 2006)

We can see from figure that the structure gives full system of a project procurement including also contractual systems and selection methodologies for contractors and consultants. Hence procurement systems are also specifies contractor / consultants selection criteria. It is assumed that no change to current Contractor Selection / Evaluation practices will be undertaken without a Procurement proper method. The importance of Contractor selection and evaluation is to be seen.

4.3 Strategic Criteria for Contractors Selection and Evaluation

Contractor Selection and Evaluation Criteria is another Strategic objective specified by Procurement for Projects. As seen before Morledge et al. (2006) provided the PIPS system which its core duty is to update and maintain the contractor's performance information and in price based environment. The objectives of PIPS in selecting a contractor are:

- Selecting the best value contractor who can minimize the construction risk of the client.
- Assisting the best value contractor to minimise his or her risk of non performance
- Ensuring that the contractor uses the best practices principle of reviewing the project in detail.
- Minimising any misconceptions and potential problems before construction.

The PIPS process is to:

- Force contractors to accept responsibility for their references
- Compel contractors to know and find out about their performance from their references.
- Transfer the liability of data collection from project manager to the contractor.
- Prevent client bias entering into the past performance numbers.
- Defuse contractor protests and arguments about the inequity of the process.

The important point after all this is choosing the right contractor. Sifri (2003) pointed out that when penetrating in today's leaner economy, choosing the right contract vehicle (Procurement) is as important as choosing the right Contractor. Investigating on how Procurement Strategy affects Contractors Selection Criteria, Wong et al (2001) explained that the lowest-price wins philosophy has been a consistent theme of contractor selection over the years. An investigation showed that a Multi-Criteria Selection (MCS) tender price selection to comprehensively elucidate the preference and use it in bidder evaluation process. It provided further insight into the evaluation of contractors' attributes.

Levels of importance assigned for each criterion were analysed like quantitative analysis of differences in opinions and variance amongst respondents in a multivariate statistical method. A contrast was made between the MCS approach and the lowest-price wins option amongst surveyed construction clients. It was found out that cost has to be tempered with the evaluation of lowest-price wins and the attempt of construction clients searching for a new

evaluation paradigm (i.e. adoption of MCS approach rather than basing on the lowest price wins alone.

Mahdi et al (2002) described a Multiple-Criteria Decision Support System (MCDSS) for the selection of the most appropriate contractor. Their system can accommodate the unique characteristics of a project in addition to qualifications and capabilities of those contractors assessed. It can also evaluate the list of contractors by matching their qualifications with specific project conditions.

A short list of eligible contractors is thus selected. Furthermore, a comparison was done with regards to capabilities of the short listed contractors and their plans for the project under consideration, to select the most appropriate contractor. They said the system can be easily modified to adopt specific conditions of the proposed project and also to facilitate the decision maker in explaining the reasons for the elimination of excluded contractor.

Hence, Procurement further enhances the ways in Contractor evaluation and selection Criteria in Projects moving away from traditional ways. This is seen for Contractors / Consultants selection. With regard to Contractors / Consultants Evaluation, It is a critical part in achieving objectives. Simpson et al. (2002) explained that without careful monitoring of suppliers performance firms are unable to assess whether their suppliers are meeting their needs and suppliers are unable to respond to unexpressed partner needs.

The issues associated with evaluation of suppliers become problematic since a supplier is instrumental in providing value to a firm and serving as a source of competitive advantage. Prahinski and Fan (2007) stated that one tool used to manage suppliers is the supplier evaluation which communicates the buying organisations' perceptions of the suppliers' performance and capabilities. For the buying organisations, supplier evaluation can be used for supplier selection, supply base reduction decisions, supplier development and benchmarking. For the suppliers, the supplier evaluation can provide information about the buying organisation's perceptions regarding the strengths and weakness of the suppliers' process and performance.

It was also explained that the buying organisation's ultimate goal in instituting supplier evaluations is to improve the supplier's performance and capabilities to meet the organisation's current and future needs. It was further explained that strategic factors such as the supplier's flexibility and capabilities, have become more commonly used in the

performance measurement. This is explained the process might also motivate suppliers to enhance performance and feel loyalty to maintain long relationship.

With regard to relationships, Vonderembse and Tracey (1999) explains that in manufacturing to build more effective relationships with suppliers, organisations are using Supplier Selection criteria to strengthen the selection process and using supplier involvement to improve decision making and continuous improvement efforts. Procurement in improving relationships is to be seen.

4.4 Procurement in Improving Relationships of Projects Parties

The relationship between parties is an important part of Procurement Strategy that is more detailed and shaped as managing contracts. In viewing the Literature for SCM, it was seen how aspects of managing relationships maintains procurement strategies in projects. Wessels (2007) stated that organisations have come to realize that they can't stay in business if they cannot manage their projects to ensure better products delivery to internal and external customers effectively and efficiently. Therefore, Procurement improves relationships when customers and clients are satisfied with services and products.

Procurement is seen as driving a project to success when improving relationships. Kumar (2007) said that one of the most important aspects that decide the success or failure of any project is the nature of relationship that develops between the Client and the Contractor. In office environments which are increasingly becoming paperless, the importance of personal relationships cannot be over emphasised. Absolutely, there must be an existing mutual understanding between the clients and contractors. Givers and takers are basically present in a transaction and each has its role to play. The essential factor is the development of permanent policies for each Company in dealing with their Clients or Contractors. Company values and policies should be highly implemented to be able to maintain status.

Parties therefore intend to achieve their own objectives through procurement. Cox and Ireland (2002) intended to overcome problems and failure to understand the circumstances that are facing industry players which prevent clients, contractors and suppliers from achieving their own objectives. The current problems are further compounded by the advice espoused by government-sponsored industry reports advocating generic approaches. Their intention was to provide practitioners with a theoretical framework for understanding supply chains of construction industry. The attributes of buyer and supplier power, the appropriateness of certain relationships according to the firm's power position within the

construction supply chain and the circumstances where the recent industry initiatives and an integrated supply chain approach may be implemented for success.

Finally in setting a Procurement Strategy, clients should carefully examine their attributes and contributions to contractors and consultants. Lim et al (2000) made it clear that a Clients' financial status towards characteristics management competency and construction experience can have significant effects upon the attainment of project success. A survey proved that consultants and contractors are aware that client related attributes have influence on the project outcome. Their data were collected via a mailed questionnaire. Results showed that all clients related attributes are important and played a major role in the success of every project.

The predicted five attributes are: 1. client sets down project objectives clearly, 2. client is credit worthy, 3. client does not contribute to project complexity, 4. client is not litigious, and 5. client trusts project team members. This model provides consultants and contractors with a tool to evaluate their clients. It was recommended that clients focus on the more important attributes to ensure project success.

Kadefors (2005) concentrated on causes and effects of fairness perceptions in construction project relations, mainly fixed price contracts procured by competitive tendering. In such projects it was uncertain if the results in continuous post contract award problem-solving and negotiations and fairness concerns may have incremental but significant influence on the terms of exchange. A case study of client-contractor interaction was used in two projects to discuss how fair norms are related to strategies and industry culture. There was an intuitive cost-based norm of fair pricing shapes interaction in construction projects but the consequences vary between projects. The norm may favour contractors but is also related to poor risk management and client distrust. In conclusion, therefore to improve performance, clients need to design procurement practices and communication so that perceptions of contractor losses are counteracted.

There is an extent of Clients contribution to a project. Chritamara et al (2001) pointed out that there are two main parties responsible for the execution of the project, the client and the contractor or a group of contractors. The client assigns all responsibility to the contractor. The client's role is to respond by identifying requirements and by inspecting how well the product accords to the specification. The contractor can start project from the conceptual design or may start the project with almost complete design from the client.

Hence, to managing relationships and roles of parties, legal implications and contracts management need to be looked at. Turner (2004) stated that every client should move towards to increasing relationship with contractors and consultants. On the other hand, Contract Management should reconsider developing contracts. A contract strategy to overcome the problems was proposed. There are different types of contracts and risks. These types of contracts are: Fixed Price, Cost Plus, Reimbursable and Re-measurable contracts. A further incentive on contracts to improve relationships was emphasized.

4.5 Legal Implications, Contract Management and Strategy

Managing contracts has its relation to improving relationships, understanding of responsibilities and documentations of agreed principles. Pollington (1999) focused on the current relationships between post-construction liability, insurance, procurement and the concept of sustainable development. It is suggested that issues identified as impacting on procurement are: ethical and human rights, higher environmental standards, eco-design principles, life cycle implications, performance specification and understanding clients' cultural values. Alternative procurement strategies will be required to incorporate sustainability issues to promote the impact of the environment and related matters on the liability that presents increased risks which commonly resulted in new forms of insurance coverage for all environmental risks.

Hence, an important process in projects procurement is the management of contracts that include all these risks areas. Turner (2004) explained that the purpose of project organization is to create a cooperative environment. Contracts are the method by which the owner creates a project organization to employ resources to achieve their development objectives. Contracts should aim to produce a cooperative organization, aligning the contractors' objectives with the owners. A three-dimensional vector (reward, risk, safeguard), adapted from the Transaction Cost Economics Literature, is used to analyse the efficacy of contract types to do this. It is also explained that Contracts are also unavoidably incomplete. They need to respond to unforeseen circumstance. A four-dimensional vector (incentive intensity, adaptiveness, reliance on monitoring and control, reliance on the courts), also from the Transaction Costs Economics Literature, is used to analyse the governance efficacy of contract types. The results are used to develop a contract selection strategy, depending on whether the uncertainty is controlled by the client or the contractor, the project is simple or

complex, and the uncertainty is in the project's product, method of delivery or both. Hence, it is important to understand what a Contract is.

A contract is a binding agreement between a project promoter (Owner) and a Project executor (Contractor) to accomplish execution of a project required. Chen-Wishart (2005) defines a contract as a promise or an agreement which is enforced or recognized by the law. It is explained that contracts according to contract law have three elements: Promise, Agreement, and Recognition by the law. Further, the requirements for enforcing a contract are: Signatures of parties authorized agents, Method of Dispute Resolution and Applicable Law. Every contract has terms and conditions.

Terms and conditions of a contract are not included to squeeze the contractor's arm to do the work as many owners may practice. They are included for clarity on how the work could be delivered to meet the objectives of the contract for the project. Therefore, conditions of contract are developed to address the needs and protect the interests of both parties, the Owner and the Contractor. This is all addressed in Contracts Law and enforcement of a contract.

4.5.1 Contract Law and enforcement of a Contract

Contracts are made usually by owners on projects and suppliers / contractors accept them after reviewing its terms and conditions. Every party agrees on the contract would like the other party to abide the contents. This is assured when the contract is enforced. Bank guarantees can protect purchasers against works or services performed. However, what guarantees suppliers and contractors rights of payments and other contractual issues is the enforcement of the contract. What enforces the contract is the Law. By law, what enforces a contract and agreement between two parties is when one gives an offer and the other accepts it. Furthermore, contracts are what contract law applies to although no definition of it exists in common law.

What is important to understand is that whatever a contract might have that doesn't contradict the governing law becomes enforceable to both parties under the law. Habboub (2007) provided a framework of laws and regulations in relation to Contracts and Procurement with particular application to UAE and similar jurisdictions.

It is explained that within any jurisdiction, the collection of laws and regulations in relation to contracts (e.g. Contracts Law) forms part of a legal system. The judicial structure in UAE is

either Federal or Emirate based. The judicial structure consists of adjudicated processes such as Litigation, Arbitration and Finance Construction. In UAE, laws in relation to Contracts are found in more general codes such as “Commercial”, “Civil”, “Joint Venture” and “Civil procedures” laws. Laws that are in relations to Contracts are referred to as “Contract Law”. The sources of Contract Law are explained to be:

1. Statute or Codified Laws
2. Common or Case Law (including legal principles derived from Appellate Court decisions)
3. Civil Legal system (e.g. Civil Courts and Administration of civil procedures)
4. Other recognised legal systems (e.g. Shariah, Tribal, and other regulations by authorised regulators like ministries and government authorities)
5. International Law (Multinational conventions or treaties)

What is more important to understand is that contract law specifies the enforcement of a contract. It said that elements of a contract to be enforced are:

- Offer
- Acceptance
- Subject (Legal matter)
- Scope of Contract
- Invitation to treat
- Considerations
- Mutual obligations
- Intention
- Competency (Capability and Capacity of parties)
- Specification of date and venue (in some jurisdictions)

The types of contracts according to Contract Law are:

- Oral / Verbal
- Established practice
- Written
- Letters of Intent (LOI)
- Heads of Agreement (Letter of Acceptance)
- Service Level Agreements (SLA's)
- Service / Maintenance
- Sales & Products
- Technology

Finally it was explained that main legal terms and conditions of a contract are:

- Force Majeur : i.e. by saying The employer accepts no liability or non fulfilment of any terms of any order by a hired caused by force majeure which includes War, Strikes, Lock outs, Accidents, Fire, Scarcity of Materials or any other cause not within owners control.
- Liquidated Damages: charges for non fulfilling requirement other than those specified as Force Majeur.
- Liability: The extend of responsibility in contracts
- Insurance: Objects based responsibility, usually and involvement of third party to partial of full responsibility.
- Warranty: Time related responsibility and liability.

Addressing Legal implications, Projects Procurement management to understand a contract and its management is the basis for proper coordination and communication. Mineva (2005) stated that as companies grow, the volume and complexity of its relationships increase exponentially. The contracts that describe these relationships have touch points to multiple functions such as sales, finance and legal. Effective management of these contracts requires a high level of coordination and deep understanding of the roles of parties.

It is explained that a well known fact is that Companies don't involve their legal department in creative business endeavours because they are overwhelmed with tasks such as projects planning and day to day activities to complete projects. The following are the issues of this situation:

1. Inability to keep up with contract events such as renewal and expiration dates
2. Inability to find documents and provisions
3. Little or no reuse of work products
4. Lack of leverage during a legal or diligence audit
5. Lack of tools for the efficient review of acquisition targets

Hence, as solutions to above situations is the use of contract management systems that come from perspectives and different tasks as stated bellow:

1. Home grown systems – such as spreadsheets, MS access which are useful for organising
2. Document Management Systems – that prioritise and organise documents for searches
3. Enterprise Contract Management Systems – that organise events, record communications data and give alerts to expiry and renewals

4. Legal document analysis systems – that needs to focus on corporate legal interests

It was recommended that the above are very helpful in growing services organisations that handle multiple services provided internally and externally. Hence, as part of project's procurement, managing contracts is important for successful projects management. However the focus here is how Contracts Management as part of project's procurement contributes to strategic involvement and strategic objectives achievement.

This is established when Contracts management includes a proper Contracting Strategy that specifies the relationships and roles of parties to the project. APM (1996) stated that a contract should be designed to be the basis for successful project management. To do so it has to be right in principle (the right contract strategy) and right in detail (right terms and conditions). Contract Strategy is therefore needs to be set before forming the contract and the Agreement documents.

4.5.2 Contract Strategy:

Since forming a contract is basically an agreement between two parties (Purchaser and Supplier) on the objectives, the theory of Contract Strategy sets the basics of forming a contract for responsibilities, priorities, risks of the project, and payments, plus how these may change during services to be carried. Manchester notes [3] (2006) explains that Contract Strategy specifies terms of a contract that defines:

- Who is responsible for defining objectives and priorities, financing, innovations, design, quality, operating decisions, safety studies, approvals, scheduling, procurement, software, construction, equipment, installation, testing, commissioning and managing each of these
- Who is to bear the risks of investing in the project, defining it, specifying performance, design risks, selecting sub-contractors and their defaults, site productivity, delays, mistakes and insurance..

Hence, setting basics of contract strategy can be mainly summarized by:

1. Setting a Clear Scope:

How well defined are the objectives of project. Through a clear Scope of Services, deliverables are stated and claims and variations are minimized.

Chritamara et al. (2001) stated the necessity of a well-established project scope. It was explained that many research works have indicated the problems resulting from improper identification of project scope. It was suggested that clear establishment of the initial scope of a project (or the completeness of the client's brief) is a critical factor in project success.

2. Risks Management:

How risks are controlled and managed. Allocating of risks and responsibility are essential. Risks borne by the purchaser (Company) are those stopping the work by forces beyond Contractor's control. Project investment risks, Acts of God, and Force Majeure are usually not recoverable. APM (1998) says that "Experienced customers and analysts of completed projects agree that only rarely should bids be invited for a contract on the basis that a supplier must bear all the risks. The argument against this type of contract is that suppliers would have to cover themselves by including high contingency sums in their estimates."

In industrialized countries, risks responsibility should be allocated to the party which is best able to manage it to suit the objectives of a project. This gives the purchaser the best value of money. One should bear in mind that risks shall be in a way that supplier is motivated to meet projects objectives. Once risk is identified, appropriate measures can be made to deal with it, by avoidance, reducing its likelihood, by transferring responsibility for it, or by insuring against it. Insuring against risks should be economic decided and insured risk should be quantifiable, pure risk that is potential for harm not gain, and loss must be unintentional. Both parties should know that some risks are uninsurable. Contract Strategy specifies the risk management of a project whether transferring to one party, jointly taking the risk or allocating it to the party that can best manage it.

When procuring a project, joint risk allocation and management can be considered. Rahman and Kumaraswamy (2002) have conducted research through three planned questionnaire surveys in the first phase of a broader Hong Kong based study on 'Joint Risk Management' (JRM). Their survey compared perceptions on both present and preferred risk allocation, including JRM, in construction contracts. The respondents were having working experience in Hong Kong from various professionals and practitioners representing broad groups of academics, consultants, contractors and clients. The results showed the divergences in perceptions on both present and preferred risk allocation, both within and between different contracting parties.

Despite such divergences, respondents professed a general enthusiasm towards JRM, irrespective of their contractual or professional affiliation. They said that respondents preferred to assign reduced risks from either one or both contracting parties to JRM, rather than shifting more risks to the other party. This is indicative of a perceived trend towards more collaborative working environment.

Rahman and Kumaraswamy (2005) stated that exhaustive risk allocation cannot be achieved through contract conditions, because all risk items cannot be foreseen at planning stage. An effective management of unforeseen risks/events at post contract stage needs the collective efforts of all major contracting parties. Furthermore, a theoretical construct was examining a series of recent Hong Kong based studies on joint risk management. The results lead to the development of a framework for building a coalesced team that includes owners, consultants, contractors, subcontractors and suppliers. Project partners need to be conditioned, starting with their selection processes, by incorporating appropriate relational qualities as important selection criteria. They need to work under suitable teambuilding protocols, with flexible contract conditions and appropriate adjustment mechanisms that would all be tailored to suit each specific project.

Therefore, strategic position of Procurement in Contracts greatly helps in properly managing risks. Oil & Gas projects mostly incur lump sum type of contracts that places most risk to the Contractor. Alternative methods should be adopted as stated above.

3. Terms of Pricing and Payment:

The best terms of payments are those suiting the project to motivate both parties to achieve objectives of the project. The payment terms mostly know are Fixed Price (Lump Sum) payment, Activity Milestone payment, Unit Rate payment, Cost-Reimbursement, Target cost, and mixed terms of payments. Whatever term of payment is used, it should be the best suiting the nature of project. This is however the confusion in using the terms Pricing and Payments. Blansky et al. (2006) explain the differences between Pricing and Payment and the different methods in both. It is stated that Pricing methods are how you come to an overall price for the work/services. Different types of contract have different pricing methods. Some contracts can only have one type, others can have many types. Payment Methods are how, where and when the prices are turned to receive payments.

Pricing Methods in contracts are:

- Lump Sum: Price for the whole of the contract, Global exposure, Only adjustable in limited circumstances as set out in the contract, Easier and less expensive to administer, Must allow time and information to calculate realistic price, Time and cost of tendering can be very great, Need to get a proper breakdown of the Lump Sum.
- Unit Price / Re-measurable: Price of the project calculated in accordance with actual work done, Price established by multiplying units of work done, by unit of prices set out in BOQ or Schedule of Rates, Used in amount of work is not certain, Employer has the risk of number of units changing, Employer has the risk of unit price changing, Recent trend to allow limited changes to the unit prices, Higher administration costs than lump sum contracting.
- Cost Plus / Cost – Reimbursable: Employer pays for all costs incurred by the, contractor plus an agree fee for profit, The Fee can be fixed, fluctuating or % of actual costs, Cost plus generally used where it is impossible to, estimate price/quantities, Usual to include an incentive mechanism with cost, plus e.g. target costing, Sometimes only reasonable costs can be recovered, Employers need large administrative teams to police, cost plus, Many records are generated by cost plus.
- Target Costing: Setting a Target Cost, Any costs above Target Cost means Contractor contributes to overrun (Pain Share) and his fee is reduced, Any costs above Target Cost means Contractor, shares in savings (Gain Share) and his fee is increased, Need experience to set the Target Cost, Promotes good common working practices, Heavy administrative burden, Flexible method of pricing.
- Guaranteed Maximum Price (GMP): setting the maximum, Contractor bears cost of everything in excess of GMP, Limited chance to adjust GMP, it is in effect a cap on a lump sum cap but contractors tend to set a higher GMP than if lump sum pricing
- Time Cost: mostly for Consultants and at Agreed rates.

The Payment Methods in Contracts are:

- Advance Payments
- Payment after completion

- Very rare and only for simple work
- Payment attached to Schedule of Tasks
- Milestone Payments at:
 - Completion of each milestone or
 - Periodically (for all milestones completed in that period)
 - Often combined with progress payments
- Progress payments
 - Periodic interim payments (calculating work done)
 - Periodic interim payments (% of Contract Price)

The above process is usually decided by the Owner; however, there is no harm to decide it with the help of Contractor since at the end he will be the receiving party. Also, whatever the term of payment adopted, the purchaser should consider risks of these payments before inviting the bids. Payment risks given by APM (1998) are:

- a. Bonds or Guarantees are required: upon receiving bids from suppliers.
- b. Effects of inflation: for lump sum contracts, upon standard cost index data, extra payment can be made to supplier to compensate for inflation of his costs.
- c. Currency rate fluctuation: for lump sum contracts, this can be allowed in purchaser's budget.
- d. Payments due on termination: including an option of terminating a contract, with terms setting any payment due.
- e. Payment Security: the purchaser ability to pay should be considered and upon main supplier's payment, sub-contractors' payment should be made

4. Liquidated Damages (LD's) and Incentives:

The contract should clearly specify within the terms and conditions the LD's terms. Webb (1996) defined LD's as a clause that is inserted into a contract to provide a financial remedy to the customer for a failure by the contractor regarding some aspect of the work. The LD's are specified as follows:

1. The late charge method should be clearly specified; i.e. by saying "a 1% up to 10% of contract price will be deducted from contractor's payments" in case of delays.
2. It is necessary to review LDs on projects' case by case basis. It should allow the use of Milestones. Since a Contractor might meet certain milestones, he should be

charged for milestones delayed. However if no milestones are incorporated the general LDs clause (in point 1) can be retained.

3. Also, since there is a “LDs” article, there should also be “incentives” article for early completion which might avoid Contractors from putting contingencies assuming worst cases, as there will be a balance in requirements. This increases innovation in project execution, and also assures the Client that Contractor may not include this charge in the price. If “Incentive” clause is not present, Clients may end up paying double prices if Contractors have already put the charge amount in the price.

4.5.3 Dispute Resolution:

No matter how clear contract Strategy is specified, disputes in a project can arise for many other reasons. Cheung and Suen (2002) stated that Disputes are inevitable in construction projects and Dispute Resolution Procedures such as litigation, arbitration, mediation, dispute adviser and negotiation are widely practised. A decision-making model was created using the Analytical Hierarchy Process (AHP) and Multi-Attribute Utility Technique (MAUT). The model comprises four parts: selection criteria, dispute resolution strategies, collection of utility factors and selection criteria weightings. These were gathered from an empirical data collected through an interview survey with selected experts in the field.

Then, a model was designed to identify in a systematic manner an appropriate dispute resolution strategy rather than relying on subjective decisions. It is tested using a hypothetical scenario in which three case studies were evaluated. The selection criteria are: overall duration; relative cost; flexibility in issues, strategy and agreement; confidentiality; preservation of relationship; binding decision and enforcement; degree of control by parties; and degree of control by the third party neutral.

It is important to set a dispute resolution in the contract before it goes through litigation judgments. When represented to court, dispute resolution route may be questioned to what extent the parties came finally to litigation. Manchester Notes [12] provides the means and methods of Dispute resolutions in projects. Through Dispute resolution, stages of resolving a conflict is drawn that might take the conflict into settlement before representing it to the courts.

Dispute Resolution can be obtain by considering the following stages:

- Amicable Settlement; which says that if disputes arise, parties shall recommit to resolve disputes in an amicable, professional and expeditious manner to avoid losses, delays and disruptions to works. Any disputes shall be first referred to the parties for amicable settlement by representatives with high authority specified in the agreement.
- Alternative Dispute Resolution (ADR); which says in case the above settlement fails, the conflict may be escalated to a Joint Dispute Resolution Committee to resolve the dispute. Usually this committee consists of three directors or senior managers who are not involved in a day to day management of the agreement. In case the committee resolved the dispute it shall be binding for both parties.
- Arbitration; which says that in the event that ADR fails to resolve the dispute, the dispute shall be settled by Arbitration. It is important to specify the location where arbitration takes place, rules center of arbitration, national law that governs arbitration, and number of arbitrators. Usually the country of the project is the place of arbitration and the governing law, International Chamber of Commerce, unless other is specified, is rules center and deciding number of arbitrators which is usually three. Then, arbitrators' decision becomes final and binding on both parties. Also, Judgment may be entered in any court having jurisdiction.

Further, the contract should mention whether works or services under the contract shall be pending or disturbed during resolving a dispute. It was proven that ADR holds the best practice being an effective method in projects.

ADR avoids legal procedures that take long period to issue a decision on settling a dispute. Pollington (1999) explained that many legal issues such as ADR and mediation are impacting procurement which bring extensive savings to industry. Industry should look more in trained mediators to take role in projects. Hill (2003) explained that ADR has benefited many sectors and specially private sectors. ADR has mainly benefited sectors that are unrepresented or represented by lawyers primarily interested in fees. Many private sectors do not know to what extent whether their lawyers fees are realistic upon successful cases. It was further explained that ADR is less expensive than litigation, time effective and processed at convenience of the parties. Parties can form the ADR as they prefer.

It is also explained that laws and regulations encourage more comprehensive use of ADR. ADR's might be formed in involving a third party or only higher management from both

parties. If a third party is involved in ADR, he is usually referred to as a mediator. It is explained that Mediators are preferred to have Project Management, Commercial, Government and Legal background in order to give sound judgment from all aspects. Furthermore, since higher management are involved in ADR, process of resolution is assumed to be faster. Hence, ADR for a strategic solution to resolve disputes, or claims and delays that turn into disputes.

4.6 Procurement in Handling Claims and Delays

Procurement Strategy should also specify methods and systems to deal with Claims and Delays along with Dispute Resolution that should be properly covered. Harris and Scott (2001) described methods of dealing with delay claims. This is followed by a discussion of results from a survey aimed at finding out exactly how professionals in the UK construction industry approach these difficult issues. It appeared that those who deal with delay claims in the UK are likely to use a critical path method network to do this and generally approve of a methodology that attempts to understand how well the contractor would have fared but for the existence of employer-responsible delays. However, there is less agreement about who should be said to 'own the float', but as is explained in their paper, it is possible for this matter to be dealt with by the insertion of a clause in the contract documents.

Turner (1995) explains that to better control delays and claims in the project, client contractor interface should be managed. It is explained that client and contractor are the parties to the contract, which will be signed on their behalf by directors. However the administration of the contract and the management of the project will be delegated to typically a project manager and/or engineer. Both companies will delegate powers, duties and responsibilities to these individuals to act on their behalf. When changes occur to the contract including delays to the agreed schedule, the matter should be reported to directors if beyond the individuals control to decide.

To avoid all this, the client and contractor should put in place an administrative procedure to manage the contract and performance. Such procedure should include review meetings and document control procedure. The review meeting should be as follows:

- Strategic Review meeting between client and contractor directors
- Progress review meetings between client and contractor project managers
- Technical review meeting (design or compliance) between engineers.

An example is given of a variation order being issued by junior engineers at progress control. Often junior engineers can be commercially naïve, with managing consequences for their employer, whether the client or contractor. Worse still if the client has a history of cost plus contracts, the engineers sometimes behave as if they have the authority to change the specification or design. This explains the involvement of higher management in changes.

Morledge et al. (2006) explains that the client should specify mechanisms for the changes in the contract. To avoid changes, the client project manager's objective should be to assist contractor to be successful. He/She should understand that if the contractor is highly performing, the clients representatives work is minimized and the other way around. If changes are made by client then more time and change in schedule should be adopted. However, if the contractor is delaying with no changes, there are two options for the client regarding low performance. One is to penalize the contractor financially; two is to assist the contractor to become better performing. It is explained that option two leads to client's understanding of how to address and adopt changes.

No matter what ways and methods to be adopted, the argument is that in the presence of proper Procurement Strategy, proper ways and methods are deployed. If one of the project objective is to complete the project on schedule, Procurement methods on handling delays and claims ensure the objective is met either by specifying in the contract document or better management of the contract administration phase. Blanksby [1] (2006) stated that delays in a project affect both the client and contractor; hence, it should be clearly stated in the contract to be bound between them. Contract also specifies provisions to extend this completion if reason of delay is due to additional work, bad weather, employer's delays and other circumstances.

The all abovementioned show the objectives of a Procurement Strategy contributing to achieve enhancement and betterment of any organisation's projects. Next section shows the summary of findings from Literature.

4.7 Summary of Literature Findings

Through Literature Project Strategy is placed through Portfolio and Program to the heart of achieving strategic Business objectives which also form parts of the Hypothesis of the research. SCM was found to be placed at Strategic position and linked to Corporate / Business Strategy for projects Outsourcing. Literature also found dealing with project procurement as part of the SCM. This modifies the hypothesis model given in Figure 1 details of which will be given in Chapter 6. Thus, SCM was found linking Procurement to Corporate / Business through strategic relationships arrangement such as Alliancing and Partnering. Procurement was found when concentrating on strategic objectives promotes for strategic arrangements such as Alliancing, Partnering, PFI, PPP, and to some extent D/B and PIPS. When however focusing on projects objectives it was found promoting methods such as mainly D/B and PIPS, construction management and other procurement systems and subsystems viewed in Literature.

We have also seen the contents of Procurement Strategy for projects which are:

1. Procurements selection and Delivery Methods and Systems of Projects
2. Relationships of Projects Parties
3. Selection and Evaluation of Contractors
4. Risk Management of projects
5. Contracts Management and Strategy
6. Handling Claims, Delays and Dispute Resolution in Projects

Through Literature review, little research is observed to link project Procurement to Corporate / Business Strategy. However, the link of Project Procurement Strategy to Project Strategy was able to be seen. Hence, the link to Corporate / Business Strategy as stated on the hypothesis, aim and objectives is further to be explored. Also Literature reviewed involved industries such as Construction, Building and manufacturing and in many cases other countries than UAE. The situations can be applied to Oil & Gas in industry in UAE; however, more research including Oil & Gas should be carried. Problems encountered in Oil & Gas industry projects in UAE because of miss-linking Procurement Strategy to Business Strategy should be assessed. This is also to prove the essence to link Procurement Strategy of a projects to Business / Corporate objectives in any industry and as well as Oil & Gas industry in the UAE.

All the above will be uncovered through research questions leading to research methodologies in the next Chapter.

5. METHODOLOGY AND EMPIRICAL WORK

This section of the Dissertation is intended to show the research methodologies adopted to respond to the open research questions from Literature findings. The open research questions Literature led to are:

1. Why should a Project Procurement Strategy be linked to Corporate / Business Strategy and how?
2. What are the bases of setting different Procurement Strategies and Processes in an Oil & Gas Project?
3. What are the problems encountered in an Oil & Gas project due to a non-linked Procurement Strategy of the Project to Corporate / Business Strategy?
4. What are the actions and strategies needed to improve and solve the problems?
5. Is linking a Procurement Strategy of an Oil & Gas project to Corporate / Business Strategy solving the problems?
6. Does an effective Procurement Strategy for a Project improve its Performance?

The research methodologies adopted will assess the complete research objectives and test hypothesis of Procurement Strategy for Oil & Gas industry projects in the UAE through the data collected.

Before introducing the research methodology, review of a Corporate / Business Strategy in Oil & Gas industry in the UAE is given to understand the strategic objectives to be achieved through projects. The Corporate / Business Strategy reviewed is for an organisation in the Oil Refining industry within the Oil & Gas industry in UAE. For confidentiality, a TK Co. name will be used as the name of the organisation.

5.1 Corporate / Business Strategy for TK Co.

TK Co. (2005) provides the detailed information about the company. TK Co. was established in 1999 as a public joint stock company to take over the responsibility of refining operations. Two refineries now constitute TK Co.'s core business. Refinery 1 is located within Abu Dhabi Area with a capacity of 88 Kilo Barrels Per Day (KBPD). Refinery 2 is located 250 Km from Abu Dhabi city toward Saudi and Qatar boarder with a capacity of 140 KBPD. The company's areas of operation include the refining of crude oil and condensate, supply of petroleum products and production of granulated Sulphur in compliance with domestic and international specifications. Refinery 1 is mainly for domestic demand and Refinery 2 is for export to other Emirates and International market. The main products supplied are:

- Liquefied Petroleum Gas (LPG)
- Unleaded Gasoline (ULG) Octane 91 (Plus), ULG 95 (Special), and 98 (Premium).
- Reformate and Naphtha
- Aviation Turbine Kerosene (Jet Oil) and Domestic Kerosene.
- Gas Oil, Straight Run Residue (SSR) and Liquid Sulphur.

TK Co. is responsible for developing the refining industry. The company is also in charge of implementing national strategies aimed at enhancing the role of downstream industries in the local economy of UAE. The number of Employees is near 1,800 from 40 Nationalities. TK Co. was targeting to increase the Number of UAE nationals over 50 % by 2007.

Aiming at becoming a leader in the oil refining business, TK Co. is now working on expanding its activities in the downstream sector. It is also exerting all possible efforts to face the challenges of the 21st century in a rapidly-changing market. Hence, a large number of projects are developed to facilitate the growth. Billions of UAE Dirhams (Dhs.) are invested in these projects.

TK Co.' Vision

To be world class, reliable, cost effective, quality focused in oil refining and related business by implementing best practices, highest HSE standards, Environment protection and retaining motivated professionals.

TK Co.'s Mission

The company's mission statements are:

- To be a pacesetter and global player in the oil refining business
- To identify and deploy product and process technologies, techniques and methodologies that provide a competitive edge.
- To maintain the highest standards in health, safety and environmental aspects
- To be domestically dominant and competitive in refining business
- To achieve the predetermined Nationalisation targets
- To actively enter into new business in fields that draw on its fundamental strengths in oil refining.

TK Co.'s Corporate and Business Objectives

TK Co.'s Corporate / Business objectives come from being recognised as a pacesetter in creating sustainable value growth through innovative energy solutions. In implementing this, it aims to link its technical strength and regional stature with the speed and agility of its enterprise and willingness to do things differently. As it works to build the future, its goal is to achieve the highest level of success for the country, society and employees.

Its professional activities are governed by set of principles which define its teams' relationships with all parties involved. The main guidelines of these principles are quality backed by professional excellence, the highest standards of honesty, integrity and fairness. Also, to conduct its business with highest standards of honesty, integrity and fairness to offer opportunities for success to all its suppliers and contractors in spirit of fair competition and mutually rewarding collaboration. It will work on enhancing its performance to meet its overall objectives of cost control and adopt state of art equipment and technology to optimise operations.

Finally, objectives of the Company come from actively pursuing its role towards greater achievements for the benefit of the country and its people. It will exert all possible efforts to seize today's opportunities and meet tomorrow's challenges. These efforts will result in adding substantial increases to UAE's refining business.

Hence, the Corporate / Business objectives of TK Co. with regard to HSE, Operations, Organisation and Value are:

HSE:

- Manage and operate the Company facilities in a manner that protects the environment, provides a safe, healthy and rewarding workplace for employees, contractors and communities in which it does business.
- Maintain the highest HSE standards in compliance with Abu Dhabi / UAE laws and adopted Oil & Gas international standards.
- Achieve a cleaner environment, minimize flaring and hydrocarbon losses.

Operations:

- Ensure efficient/economical operations and achieve higher rating in international benchmarking standards.
- Continually improve operations & related processes/ technologies to compete in the refinery industry, both regionally and globally, and become a leading refiner.
- Implement strategies to enhance safety, reliability, availability, operability, and productivity of Plants.
- Maintain reliable supply of refined products to local and international markets.

Value:

- Enhance corporate performance/ returns through continuous improvement in business processes, competencies, technologies and best practices.
- Envisage and implement expansion, diversification and value-addition projects on time, within cost, quality and performance parameters.
- Acquire materials & services by implementing appropriate strategies to ensure on time delivery, cycle time reduction, product/ service quality and optimum cost.

Organization:

- Provide high quality working environment/ support services to enhance employee satisfaction.
- Create / maintain Company's progressive image in the industry and society.
- Enhance staff competency level through effective professional training.
- Achieve UAE workforce target as per plan and develop nationals to achieve high professional standards.

5.2 Data Collection

To answer the open research questions from Literature, Data is to be collected by gathering responses from two groups. First group are professionals working in the area of Project Procurement directly to assess their opinion on linking Project Procurement to Corporate / Business Strategy. The second group are management staff (Projects Division Manager and Contracts Manager) and the Project Management Staff for particular projects under study and survey (Project Manager, Project Coordinators and Engineers) to assess their feedback on Procurement process and practices adopted for those particular projects. Data then will be collected through the methodologies adopted. The methodologies adopted to collect the data are explained in the next section.

5.3 Research Methodology

To collect the data mentioned, two methods are adopted for this research, a quantitative and qualitative method. The methods are: 1. A Survey on Strategic Procurement, as a quantitative method, which includes particular questions on aligning Procurement to Overall Business Strategy (Questionnaire). 2. Case Studies, as qualitative method, for studying different projects in Oil & Gas (either Interviews or on paper Study Survey) to assess the impact of the Procurement practices, process and strategies undertaken in the projects.

These two methods are found most appropriate since the topic is of a highly specialized area of Management of Projects and methods adopted should ensure responses on support to the hypothesis, aim and objectives of the research. The first method will assist in examining linking Procurement Strategy to Overall Business Strategy in Oil & Gas industry from respondents working in the area of Project Procurement. The second method will assist in assessing Procurement processes and practices in Oil & Gas Projects. This is to examine linkage of Procurement Strategy of a particular project to Corporate / Business Strategy in Oil & Gas to investigate the problems in the missing link.

5.4 Survey Questionnaire – Quantitative Method

A Survey Questionnaire form, as a quantitative method, was developed. The questionnaire consists of questions on linking Procurement Strategy to Business Strategy in Oil & Gas and on the contents of the Procurement Strategy achieving Business objectives. The Questionnaire was distributed to 60 professionals dealing directly or indirectly with the Project Procurement in the Refining industry in Oil & Gas, out of which 35 are working for Refining industry (Client) and balance 25 for Consultancy (Contractor) firm. 29 professionals

responded to the Questionnaire (19 respondents from Client and 10 from a Contractor) as illustrated in Figure 12.

Figure 12 (a) shows the total population requested. Figure 12 (b) shows the percentages of Client and Contractor respondents out of the total population and (c) shows the percentages of the two groups from the responded sample.

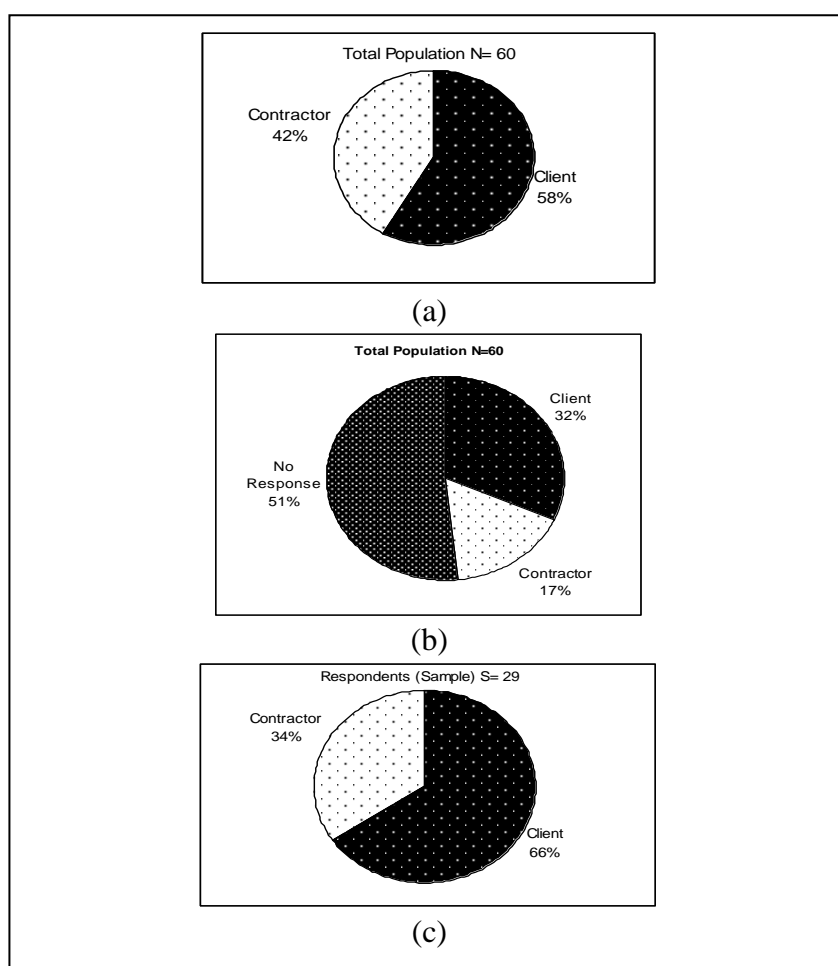


Figure 12 The percentages of Total Population requested, Total Responses and Sample Responses

Questions were phrased in terms of eliciting a ‘Yes’, ‘No’ or ‘Maybe’ answer to ensure that questions are:

- Time effective for the respondents.
- Easy to be answered.
- Exact views can be accurately obtained.

Annexure 2 shows an example of a duly filled Questionnaire received from a Consultant. From the Questionnaire forms, data was then gathered and analyzed and weightings are assigned to different responses. The Case Study survey of the projects is the second method.

5.5 Projects Case Study Survey – Qualitative Method

As a qualitative method, a Case Study of four projects in TK Co. to investigate problems encountered in Procurement process was developed. The Case Study was either through interviews or on paper, as per the individuals' preferences. The Interview (or on paper survey) included questions on identifying Procurement selections, processes and practices in the projects. The Case Studies of projects are assessed in lieu of the Corporate / Business objectives seen before.

First a Contracts Manager in TK Co. was interviewed for Projects Procurement selections, practices and bases also using the some of questions on the survey form. Then, Projects Division Manager was interviewed on the approaches in managing projects such as higher management involvement, Strategic objectives, Project objectives and the relations to Procurement of the projects. Finally, project managers and different project team members of the projects were interviewed / surveyed in detail using the questions developed. Those members stated the Procurement routes in the projects, the procurement processes, bases of selections projects and the problems encountered in the projects as asked. As also asked, they gave their suggestions to improve current processes and practices.

Annexure 3 shows an example of the on paper Project Study Survey dully filled by a Project Manager of one of the projects. From the Survey, the objectives, either Strategic or Project based, are assessed to draw the links while viewing the Corporate / Business objectives. The details of the projects and the surveys are given in the in the next chapter.

After Data gathering, results were analyzed to arrive at the solutions and recommendations aimed at improving the current Procurement processes in the Oil & Gas industry in UAE and the links intended. The analysis of results is also in the next chapter.

6. PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

This chapter is intended to present, analyse and discuss the data collected from the methods.

6.1 Presentation of Results – 1st Methodology (Questionnaire)

This section will present the results from first methodology, analyse them and provide a discussion in line with Literature findings.

Tables 3 and 4 show the responses to the Questionnaire developed on linking Procurement Strategy to Business Strategy (Table 3) and the results of the contents that effectively link Procurement Strategy to Business Strategy (Table 4).

In Table 3, the ranks of strategic activities of Procurement are given in hierarchies as per the number of respondents agreeing.

Rank	Strategic Procurement Activities for Oil & Gas Projects	Number of Respondents N = 29 out of 60 (19 Client and 10 Contractor)		Total
		Agreeing (Client)	Agreeing (Contractor)	Agreeing
1	Improves Business and organisational relationships	15	10	25
2	Should be towards achieving Overall Business Objectives	13	8	21
3	Lacks advanced Strategies	7	10	17
4	Requires developments	7	10	17
5	Should involve Higher Management decisions	9	7	16
6	Should be part of strategic plans, vision and mission	8	6	14
7	Affects Project's Performance	5	4	9

Table 3 Responses to Linking Procurement Strategy to Business Strategy in Oil and Gas

Figure 13 shows the chart to further illustrate the hierarchies of responses from Client, Contractor and both. Numbers 1 - 7 on the x-axis represent the activities in Table 3.

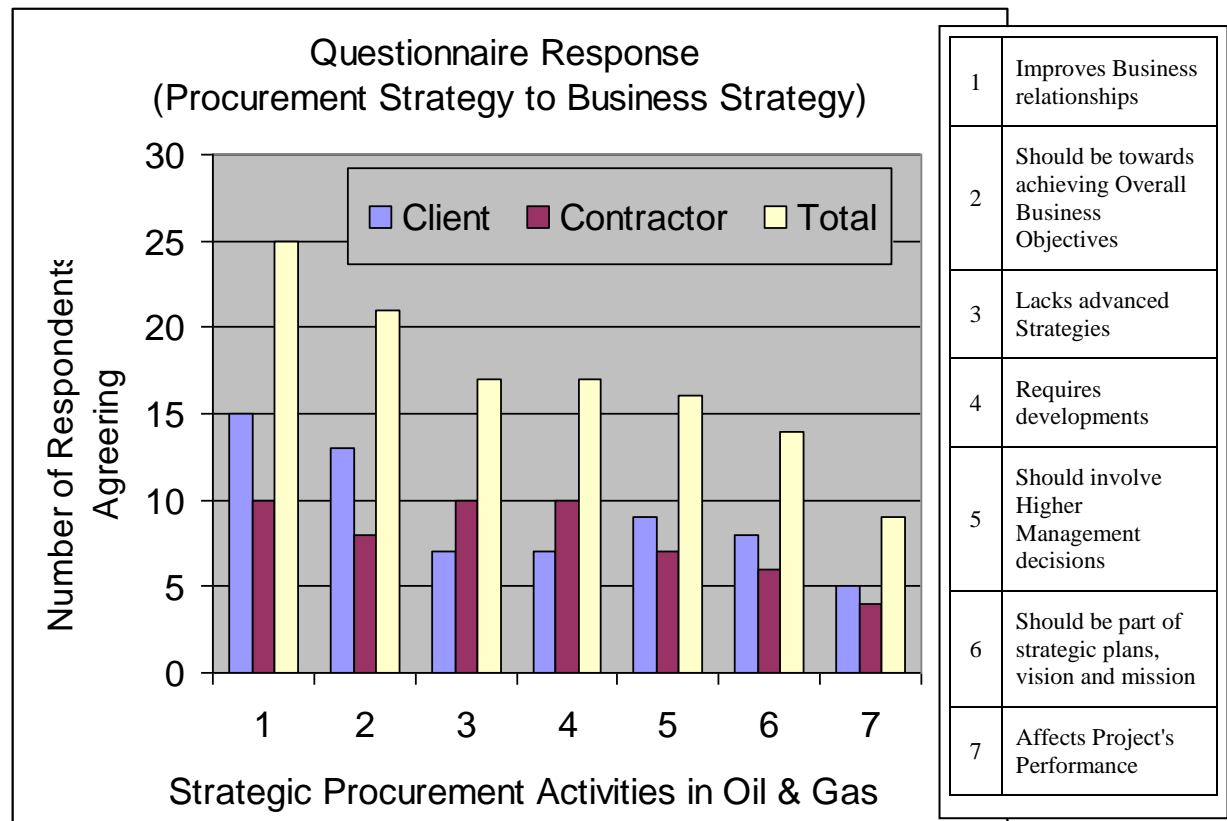


Figure 13 Numbers of Respondents Agreeing to Strategic Activities of Procurement Strategy in Oil & Gas

In Table 4, the ranks of the contents of Procurement Strategy in achieving Business objectives in Oil & Gas are given in hierarchies as per the number of respondents agreeing.

Rank	Contents of Procurement Strategy for projects in Oil & Gas industry that achieve Business objectives	Number of Respondents N = 29 out of 60 (19 Client, 10 Contractor)		Total
		Agreeing (Client)	Agreeing (Contractor)	Agreeing
1	Contract Strategy	19	10	29
2	Procurement Systems and Methods	18	10	28
3	Financial Rights and Payment Terms	17	10	27
4	Risk Management	15	10	25
5	Relationship Management	15	9	24
6	Dispute Resolution, claims & delays	13	10	23
7	Project Performance	11	6	17

Table 4 Responses on Contents of Procurement Strategy in Oil & Gas

Figure 14 shows the chart to further illustrate the hierarchies of responses from Client, Contractor and both. Numbers 1 - 7 on the x-axis represent the contents in Table 4.

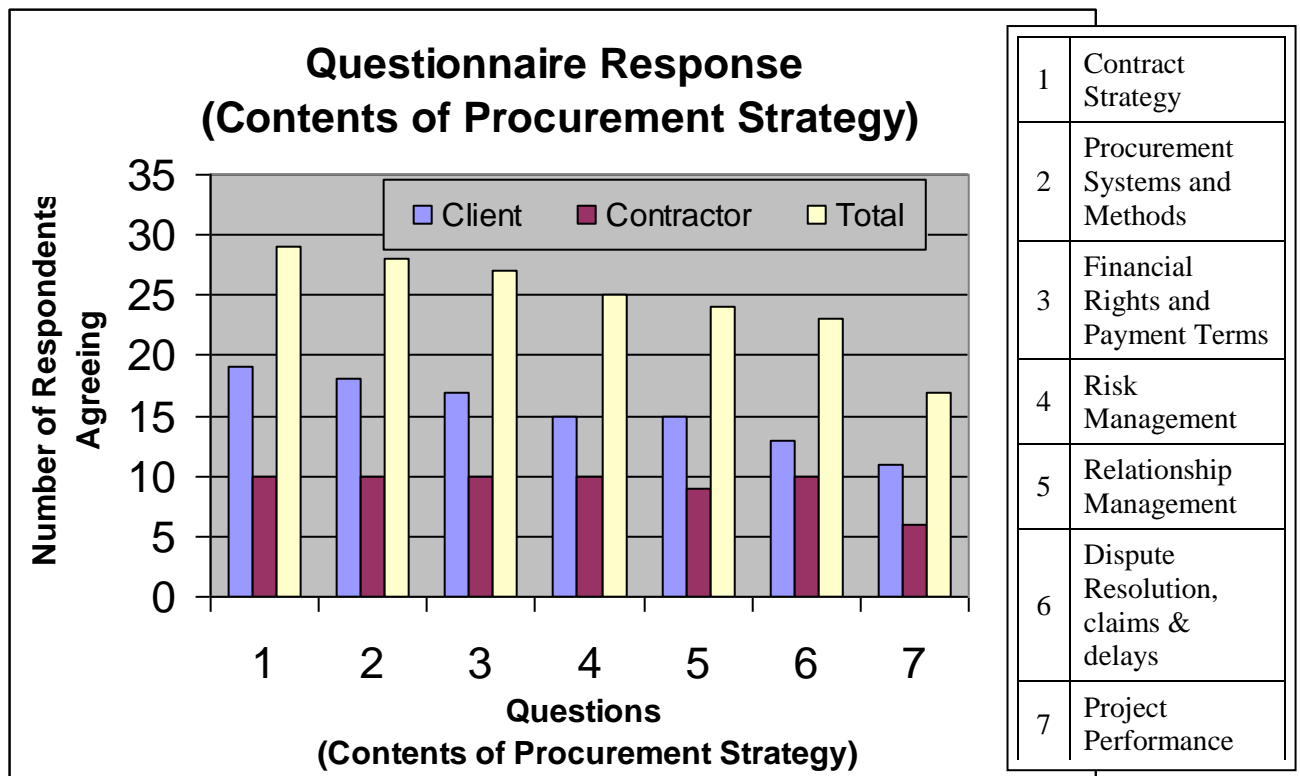


Figure 14 Numbers of Respondents Agreeing to Contents of Procurement Strategy in Oil & Gas

6.1.1 Analysis of Results and Discussion – 1st Methodology

The results of data presented previously will be analyzed and discussed in this section.

6.1.1.1 Linking Procurement to Business Strategy (Analysis of Survey Questionnaire Data)

From Table 3 above, the quantitative data on strategic activities of Procurement in Oil & Gas as per the number of respondents agreeing are analyzed in percentages as in Table 5 for the discussion purpose.

Rank	Procurement Strategy for Projects in lieu of Business Strategy in Oil & Gas	% from the Sample Responses N = 29 out of 60 (19 Client and 10 Contractor)		Total
		Agreeing (Client)	Agreeing (Contractor)	Agreeing
1	Improves Business and organisational relationships	79%	100%	86%
2	Should be towards achieving Overall Business Objectives	68%	80%	72%
3	Lacks advanced Strategies	37%	100%	59%
4	Requires developments	37%	100%	59%
5	Should involve Higher Management decisions	47%	70%	55%
6	Should be part of strategic plans, vision and mission	42%	60%	48%
7	Affects Project's Performance	26%	40%	31%

Table 5 % of Responses to Linking Procurement Strategy to Business Strategy in Oil and Gas

Figure 15 shows the chart to illustrate the response percentages. Detailed discussion of the analysis is in the following section.

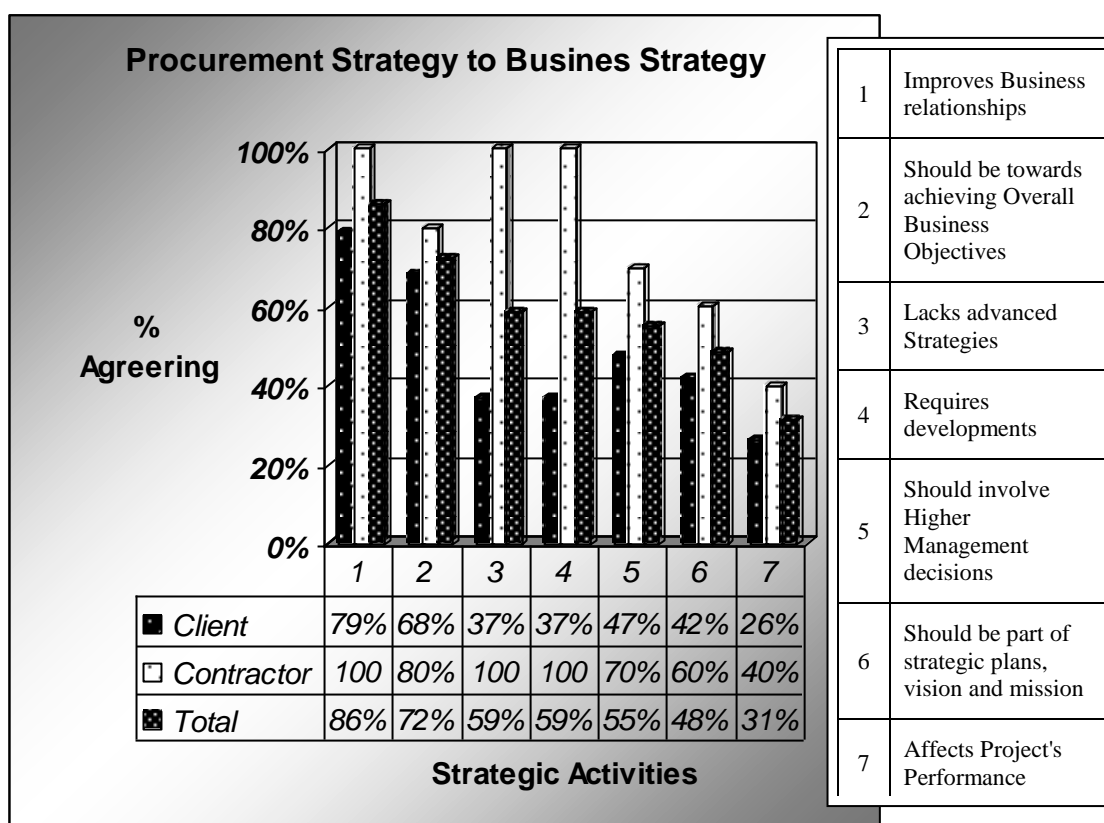


Figure 15 % of Responses Chart to Linking Procurement Strategy to Business Strategy in Oil and Gas

6.1.1.2 Discussion (Linking Procurement to Business Strategy)

From the percentages above we can see that a high percentage of respondents (86%) are for adopting Procurement Strategy to improve contractor/client relationships. It was seen from Literature the link of SCM to Corporate / Business Strategy for Outsourced Projects, Freytag (2002) and Stuart (1997). Then, it was explained that Supply Chain Strategy is basically how clients and suppliers work together to achieve overall business objectives, Elmutti (2002), Ellram et al. (2004), Lan (2003) and Ogden et al. (2005). Then, it was seen from Literature the importance relationship management to link Procurement to SCM, Cheung (2006) and Khalfan (2005). Hence, Procurement Strategy is linked to Supply Chain and Business Strategies in that aspect.

The relatively high percentages on Procurement achieving Overall Business Strategic objectives (72% of respondents) reveal the strategic clout of procurement. Hence, Procurement Strategy should be linked to Overall Business Strategy. Although relatively lower percentages (59% of respondents) stressed on Procurement in Oil & Gas lacking advanced strategies and requiring developments, it does indicate that more than half agree with this perception. Also 55% of respondent agreed that Procurement Strategy should involve higher management and 48% agreed that it should be part of strategic plans.

In summation, at least focusing on Strategic objectives can reveal the acceptance of linking Procurement Strategy to Corporate / Business Strategy. It can be said that the surveys confirm acceptance of the Hypothesis of the research or as was found in Literature that placing Procurement Strategy to Overall Business Strategy is to be through SCM to close the loop. This was also suggested by one respondent (see next section).

6.1.1.3 Contents of Procurement Strategy (Analysis of Survey Questionnaire Data)

From Table 4 above, the quantitative data on strategic contents of Procurement in Oil and Gas as per the number of respondents are analyzed in percentages as in Table 6.

Rank	Contents of Procurement Strategy for Oil & Gas projects in achieving Strategic objectives	Number of Respondents N = 29 out of 60 (19 Client, 10 Contractor)		Total
		Agreeing (Client)	Agreeing (Contractor)	Agreeing
1	Contract Strategy	100%	100%	100%
2	Procurement Systems and Methods	95%	100%	97%
3	Financial Rights and Payment Terms	90%	100%	93%
4	Risk Management	79%	100%	86%
5	Relationship Management	79%	90%	83%
6	Dispute Resolution, claims & delays	68%	100%	79%
7	Project Performance	58%	60%	59%

Table 6 % of Responses on Contents of Procurement Strategy in Oil and Gas

Figure 16 shows the chart to illustrate the response percentages. Detailed discussion of the analysis is in the next section.

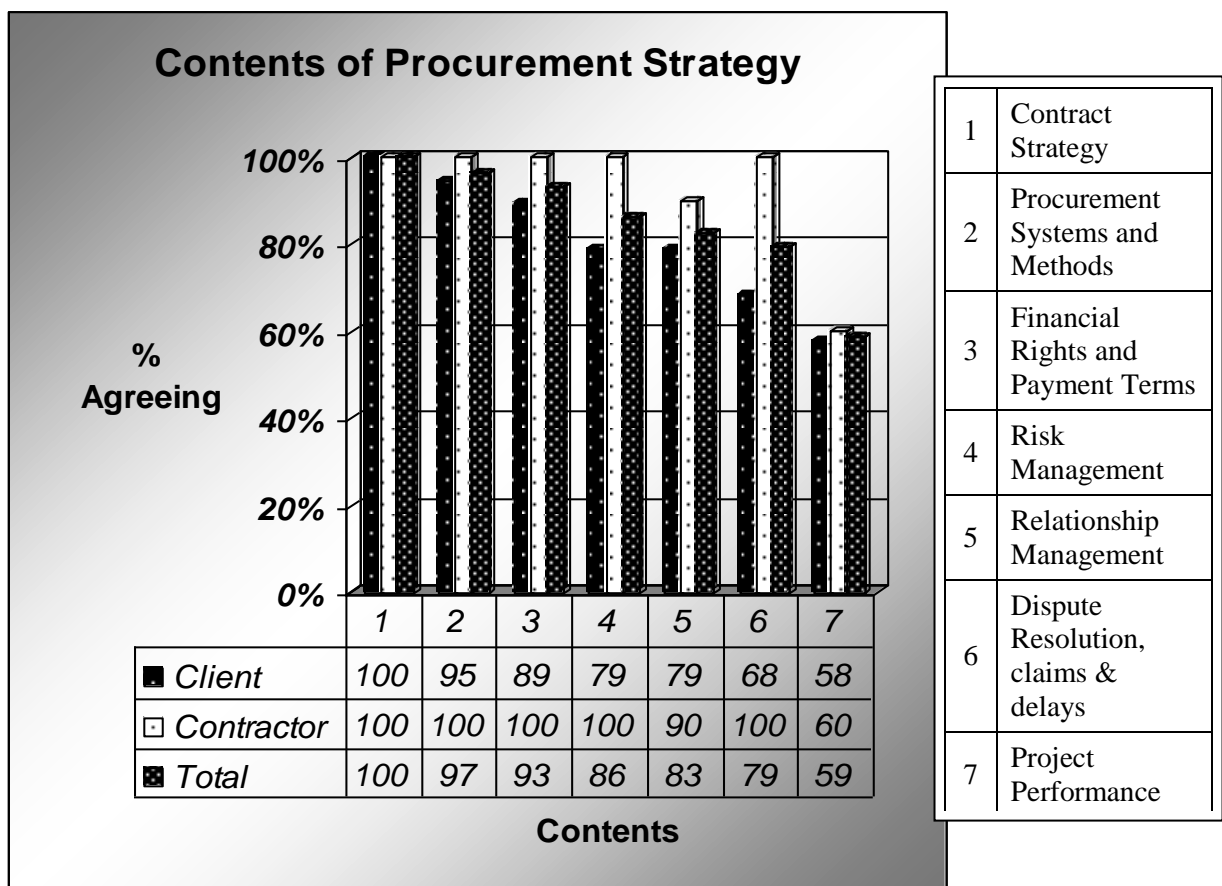


Figure 16 % of Responses Chart to Contents of Procurement Strategy in Oil and Gas

6.1.1.4 Discussion (Contents of Procurement Strategy)

To confirm the strategic objectives of Procurement Strategy, from the percentages above, we can see the highest percentage (100% of respondents) accept that an Effective Procurement Strategy should include Contract Strategy. It was seen from Literature that (Sifri (2003), Turner (2004) and APM (1998) suggested Procurement Strategy should include Contract Strategy that is basically the document which clients and suppliers agree on to achieve project objectives.

Also, high percentages of respondents agree that Procurement Strategy should include Procurement Systems and Methods, and Financial rights and Payments (97% and 93% of respondents, respectively). We have seen from Literature – Chritamara et al (2001), Dulaimi, Ling, Ofori and Silva (2003), Koskela (2003), Koolwiji and Vrijhoef (2005) and H. M. Treasury (2007) – that different procurement methods and systems suggest Procurement Strategy should include on procurement methods. We have seen examples of Procurement Systems and Sub Systems from Kumaraswamy (2006).

We can also see other items of Effective Procurement Strategy being agreed to by respondents – 86% of respondents accept inclusion of Risks Management as also seen in Literature by Rahman and Kumaraswamy (2002 & 2005). A total of 83% of respondents agreed to inclusion of Relationship Management. This was seen in the earlier section.

79% of respondent agree on inclusion of Dispute Resolution, Claims and Delays; which Literature explained in detail, Hill (2003), Pollington (1999), APM (1998), Harris and Scott (2001), Cheung and Suen (2002) and Blanksby (2006).

However, we have seen low acceptance (31% of respondents) of Procurement Strategy affecting Project performance from last section (Table 5) as also compared to low acceptance (59%) on including Project Performance (Table 6). This is to be explained in Chapter 8, Conclusion and Further Research.

Further, as mentioned in previous section one respondent suggested to add SCM to be included in the Procurement Strategy (refer to Annexure 2). Literature however suggested that Procurement Strategy is rather part of the SCM. Lan (2003) explained that ISCM involves linking suppliers and customers with internal supply processes of an organisation. Cheung (2006) also explained that client organisation obviously influences supply chain

culture; commitment to the goals and objectives of an organisation is crucial in facilitating successful implementation of relationship management or organisational changes.

This modifies the hypothesis model given in Figure 1. Figure 17 shows the modified model of the links.

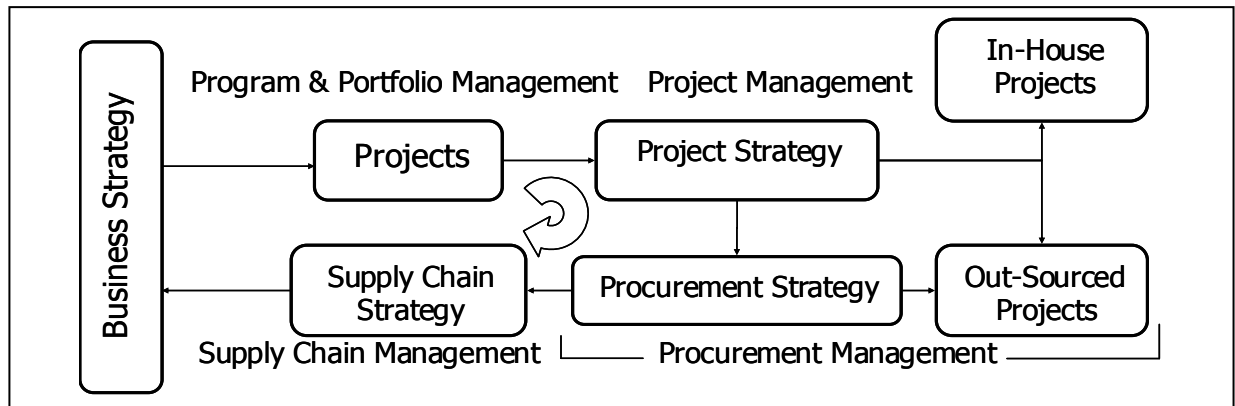


Figure 17 Business, Project and Procurement Strategies Modified Model

Presentation, Analysis and Discussion of Results – 2nd Methodology (Projects Case Studies)

This section will present the results from the second methodology, analyse them and provide a discussion in line with last section (Methodology – 1) and Literature review.

The case studies in detail serve the contents of Procurement Strategy that achieve Corporate Business Objectives seen. Alterations and improper utilization of such contents can cause problems that are to be seen in the projects

First the details of the projects studied are given. Then, the project team, detail results from survey and problems will be shown. Refer to Annexure 1 for the phases of a major project in Oil & Gas to understand the discussion. In the details, the difference between Scope of project and Project objectives is that the latter is the outcomes of the project executing the scope. Budget is the estimated cost and Price is the lowest or the awarded price.

6.2.1 Case Study 1: Halon Replacement from Refineries Project

The first case studied for investigating problems to Procurement Strategy and its contents is “Replacement of Halon System from Company’s Refineries Fire Extinguishing Systems project”. Table 7 summarizes the details of the project. Company here refers to TK Co.

Project Title	Replacement of Halon from Company’s Refineries Fire Extinguishing Systems
Business Strategic Objectives	<p>Complying with international HSE standards.</p> <p>International HSE standards stated that Halon decomposes toxic chemicals that are harmful to human beings and unsafe to environment when spread out to put up fire although it is a noble gas because.</p> <p>Hence, feasibility Study was not required.</p> <p>Company issued a policy to replace Halon with a safer gas that is noble and friendly to Human beings and Environment by Oct. 2007.</p> <p>Project to be carried out in Competition of tender to Contractors and Consultants.</p>
Project Budget and Price	<p>Total Budget is Dhs. 12 Mil. (2 Mill for FEED, 5 Mil. for EPC of Refinery 1 and 5 Mil. for EPC of Refinery 2)</p> <p>FEED price was Dhs. 2 Mil.</p> <p>EPC price was Dhs. 11 Mil. (6 Mil. For Refinery 1 and 5 Mil. for Refinery 2)</p> <p>Total price was 13 Mil. (1 Mill over budget)</p>
Stage of the project	FEED is completed. EPC phase is on going
Project Scope	<p>Scope of FEED included studying alternative gas agent and systems for both Refineries as follows:</p> <ul style="list-style-type: none"> - Carry detailed survey and data collection of existing buildings and operations - Carry out Qualitative Risk Assessment (QRA) for installation of the proposed Agent with the detection and alarm system - Develop a design of the system for the proposed gas agent including codes and international standards. - Submit full Engineering Design, reports and presentation to Company <p>Scope of EPC included FEED verification and implementation and replacement of Halon with the new agent including all systems modification and /or replacement.</p> <p>Contractor shall strictly comply and carry works in accordance with company procedures and the following international codes and standards:</p> <ul style="list-style-type: none"> - NFPA: National Fire Alarm code, National Electric code and Life safety code - BS: British standards for Fire Alarm System <p>EN54: European Fire Alarm Standard</p>
Project Objectives	<p>Removing Halon gas from the Refineries fire fighting systems by October 2007.</p> <p>Replacement with a new Agent.</p> <p>The proposed Agent and Systems shall be as per international standards specified.</p> <p>Achieve the targeted estimated cost which budget was allocated for.</p> <p>To complete the project within schedule. Maximum duration is 1 year from award.</p> <p>Warranty period for all works, materials shall be 12 months from completion.</p>

Table 7 Details of Halon Replacement Project

Project Team

The project team for the project consisted of:

- FEED Engineer (Consultant)
- Project Management Team from Company:
 - o Project Manager (from Projects Division)
 - o Project Coordinator (from Projects Division)
 - o 4 Project Engineers (2 from Projects Division and 2 from Refinery 1 and 2)
 - o 1 Contracts and 1 Procurement Engineers (From Projects Procurement Services Department)

Details of the Project

The case study of the project carried on surveying the Project manager, Project Coordinator and Contracts Engineer using the case study from in Annexure 3. After the survey, the details of project were given as follows:

Procurement selection was based on procedures of FEED and EPC. Feasibility Study of this project was not required because the Strategic objective was to comply with International HSE standards. Hence, the project was assumed feasible.

Three contracts were made: one for FEED and two EPC contracts for Refinery 1 and 2 separately. All Tenders were on competitive bidding. Contracts types were all Lump Sum price basis even for the FEED. Payments were on progress monthly basis against breakdown of the Total Lump Sum price.

The FEED was completed in Feb., 2006 and EPC's was awarded on 10 March, 2007. EPC will be completed in Feb., 2008.

FEED Engineer (Consultant), on lump sum basis, carried designing of the system that will replace the existing system of Halon. Consultant suggested "Inergen" gas to replace Halon and provided all necessary system modifications.

Then, both EPC's (for Refinery 1 and 2) were tendered out on the outcomes of FEED All EPC bidders were required to verify the FEED during Tendering. Discussion of and problems in the project are given next.

Discussion (Problems in the Project)

Consultant carried the design although Company didn't specify only one gas to be proposed. When the gas was approved by Company and FEED phase was completed earlier, it was complained by EPC bidders that Inergen was solely supplied by one agent in the UAE. This agent was also participating in the Tender which prevented other bidders from supplying it. Company strategic policy of tendering is to allow competitive bidding for EPC from different companies especially for a Major project. Other bidders however didn't want to bid against the bidder solely supplying Inergen because purchasing should have been through it.

Therefore other gases had to be accepted or Tendering will end up on a Single source basis. Also, every gas is having its own designing system. There are gases found to have exactly similar systems to Halon and require no system modification. Basically these gases would require just discharging Halon and use the same system. So, it was hard to implement the design provided by Consultant because it concerned Inergen only. This design had to be changed concerning other gases or only Inergen is to be supplied. To achieve a Company strategy on Tendering, Consultant was asked to consider other gases and perform designs accordingly. Every gas got accepted by Company a design was to be formed for it.

The Consultant did not accept changes in design with the same price because their design was approved by Company. For the change, and since FEED was Lum Sum, Consultant asked extra charges to perform the design concerning other gases. The additional price was found to be the same as of original price for Inergen. Company did not accept the additional price from Consultant. Lum Sum price was problematic for change. If FEED was on unit rates basis, the change could have been calculated.

Then, designing other gases systems were requested from the EPC bidders. It was conveyed to EPC bidders during Tendering that any bidder propping a gas different than Inergen has to perform the design and Engineering of it completely. However this can be waived from bidders proposing Inergen as the design of it is available from Consultant.

Again bidders proposing gases (decomposing of toxic chemicals) like Halon were excluded from the tender. Only gases that are of the same components to Inergen which are called Inert gases (not decomposing toxic chemicals) were accepted.

The additional designs were required to be within the EPC packages. As mentioned before only one bidder proposed Inergen and took advantage of situation. This bidder was lowest for EPC tender for Refinery 2

Another bidder proposing Argonite gas was the lowest for Refinery 1 EPC contract. This EPC contract exceeded the budget for it by 1 Mil. This is because designing was part of the EPC. The bidder who was lowest for Refinery 2 EPC and not requiring design formation was even higher in price than the one preformed the design. Many reasons can be associated to this; one reason is maybe the bidder didn't want to take both contracts for limitation of resources or other reasons.

6.2.2 Case Study 2: Inter-Refinery Pipeline (IRP) Project

The second project studied for investigating problems to Procurement Strategy is “Inter-Refinery Pipeline (IRP) project”. Table 8 summarizes the details of the project.

Project Title	Inter-Refinery Pipeline (IRP) Project
Business Strategic Objectives	<p>Minimizing marine ships movement of Crude and Oil Products to protect the Environment and reduce marine pollution.</p> <p>Minimizing road Tankers movement of Oil products to avoid accidents that results in hazardous effects of fire and explosion.</p> <p>Better operation control of transferring products between Refineries and to products stations such as Airport, Mussafah and Al Ain.</p>
Project Budget, Cost and Price	<p>Total Project Budget was Dhs. 400 Million</p> <p>Feasibility Study price: Dhs. 4 Million</p> <p>FEED price: Dhs. 7 Million</p> <p>EPC price: 350 Million</p>
Stage of the project	Feasibility and FEED phases are completed. EPC phase is on going
Project Scope	<p>Feasibility Study scope: To study the feasibility of connecting Company’s refineries through a pipeline network to minimize shipment and transfer of products</p> <p>FEED scope: complete engineering design of the pipeline network.</p> <p>EPC scope: Transfer the Straight Run Residue (SRR) by a new pipeline from Refiner 1 to Refinery 2 instead of current ship transfers.</p> <p>Transfer the Reformate and Naphtha by a new pipeline from Refinery 1 to Refinery 2 instead of current ship transfers.</p> <p>Transfer ULG 91, ULG 95, ULG 98, Jet Oil and Gas Oil by a new pipeline from Refinery 1 to Mussafah Terminal and from Mussafah Terminal to Abu Dhabi Airport and Al-Ain Terminal instead of road Tankers.</p> <p>Place all associated required equipments and materials such as control systems, pumps, valves, vessels, storage tanks and pipeline fitting and filters.</p>
Project Objectives	<p>Have an efficient multi-product pipeline as per scope and specifications of 12” and 16”.</p> <p>Have efficient product equipments described in scope of project as per specifications and sent for company’s review and approval.</p> <p>Agreed time for company’s review and approval of equipments delivered.</p> <p>Provide an overall reliable operation of the pipeline.</p> <p>Complete the project within schedule.</p> <p>Testing, Inspecting and Operating the new Pipelines by January of 2008.</p> <p>Achieve the targeted estimated cost which budget was allocated for.</p> <p>Comply with all rules and regulations as works will be carried out of company’s premises.</p>

Table 8 Details of IRP Project

Project Team

The project team consisted of:

- Feasibility Study Consultant
- FEED Engineer (Consultant)
- Project Management Team from Company:
 - o Project Manager (from Projects Division)
 - o Project Coordinator (from Projects Division)
 - o 4 Project Engineers (2 from Projects Division and 2 from Refinery 1 and 2)
 - o 1 Contracts and 1 Procurement Engineers (From Projects Procurement Services Department)
- Project Management Consultant (PMC)
 - o Project Manager

Details of the Project

The case study of the project carried on surveying the Project using the case study from in Annexure 3. Projects Division Manager and Contracts manager also referred to this project during the interview; refer to Annexure 4 & 5. After the survey and interviews, the details of project were given as follows.

Procurement selection was based on procedures of Feasibility Study, FEED, PMC and EPC as separate tenders. Four contracts were made: one for Feasibility Study, one for FEED, one for PMC and one for EPC. The Project Management Consultancy (PMC) contract was made to manage all phases and contracts of the project.

All Tenders were on competitive bidding. Contracts types were all Lump Sum price basis except for FEED and PMC which were on unit rates based on man-hour estimates. Payments were on progress monthly basis against breakdown of the Total Lump Sum / Estimated price.

The Feasibility Study was completed in Sept., 2003. The FEED was completed in June, 2004 and EPC was awarded on 05 April, 2005). EPC will be completed in Feb., 2008.

FEED Engineer (Consultant) carried complete designing of the pipeline. Then, EPC was tendered out on the outcomes of FEED. All EPC bidders were required to verify the FEED during Tendering. No EPC bidders were excluded. Discussion of and problems in the project are given next.

Discussion (Problems in the Project)

Consultant completed the FEED design and accordingly the successful contractor carried the EPC works. After, EPC was awarded; company has introduced a new product in the market (ULG 91). ULG 91 has to be incorporated in the new pipeline which would result in a dramatic change in the FEED. ULG 91 had to replace ULG 98 as the demand increase of ULG 91 will reduce the demand of ULG 98. FEED 2 was introduced to be carried to design the inclusion of the new product. The basis of FEED 2 should be FEED 1. The EPC was into the scenario of suspension or completion. Company decided to keep EPC running and upon completion of FEED 2, a variation order to EPC can be issued or a new EPC (EPC 2) can be started. Company was also in the scenario of either issuing a variation order for FEED. However, that was not seen feasible as the basis of FEED was the Feasibility study which didn't include ULG 91.

The final decision was to have another Feasibility study to incorporate ULG 91 and accordingly a new FEED to be carried and a new EPC. This results in keeping the current FEED and EPC running. Hence the project will end up have eight contracts. Four contracts are for the current Feasibility Study, FEED, EPC and PMC. Additional four contracts will be for Feasibility Study of including ULG 91, FEED, EPC and PMC for it.

This may result in a problem because the second Feasibility Study may suggest changes to original FEED and EPC which are being built since original EPC is near completion. The new design might suggest of removal along with additional facilities. This will result in partial lose of original EPC items. Contracts Manager was asked for this (Refer Annexure 5). As can be seen from the interview, he responded that there were many alternatives and the best one was found to separate the FEED and EPC for the new product. This is in line with management instruction and to allow for further competitive bidding strategy.

6.2.3 Case Study 3: Operational Improvement to Process Units Project

The third project investigated for the problems to Procurement Strategy is “Operational Improvement to Process Units at Refinery 1”. Table 9 summarizes the details of the project.

Project Title	Operational Improvement to Process Units at Refinery 1 Project
Business Strategic Objectives	<p>Reliable integrated operation of process units.</p> <p>Optimising processing and best use of equipments.</p> <p>Increase capacity and performance of units.</p> <p>Reduce overcapacity loads to current units.</p> <p>Increase production which maximizes profits.</p>
Project Budget, Cost and Price	<p>Total Budget: Dhs. 55 Million</p> <p>FEED price: Dhs. 3 Million and EPC budget: 52 Million</p>
Stage of the project	FEED phase of the project completed. EPC phase is on going
Project Scope	<p>FEED scope: to study the most optimal solution to various existing process units at refinery 1 to maximize productions, increase reliability and efficiency of the units. Outcomes suggested various items to be implemented such as additions of treatment units, unwanted products collectors to reduce density, regenerators, replacement with high efficiency pumps, increase / add tanks ..., etc.</p> <p>EPC: to implement FEED of improving the process units as follows:</p> <ol style="list-style-type: none"> Installation of listed items such as equipments and piping. Equipment evaluation and rating as per design standards. Integration of oily and storm water sewer system with existing facility. Instrumentation and Control Logics. Automation and Control system. Civil, structural works, supports, loading and soil investigation etc for equipment erection. Extension of fire hydrants and fire detection and protection system.
Project Objectives	<p>Develop utilities requirement facilities, drainage facilities, and sewer loadings required for equipments and integrate with existing system.</p> <p>Specify & include supply of 2 year operations spare parts requirements</p> <p>Specify & include necessary extended warranties/guarantees in material / construction work and overall system performance</p> <p>Ensure suitable and optimum solutions at site conditions during the implementation phase.</p> <p>Identify.</p> <p>Update current operating procedure in order to match the proposed modification.</p> <p>Turnkey engineering, detailed design, procurement, construction, installation, pre-commissioning, commissioning, testing, supply of two-year operating spares and twelve- (12) months warranty period for the twenty seven- (27) selected EPC items for implementation for the EPC project</p> <p>Complete the project within its schedule and budget.</p>

Table 9 Details of Operational Improvement Project

Project Team

The project team for the project consist of:

- FEED Engineer (Consultant) (refer to Details below)
- Project Management Team from Company:
 - o Project Manager (from Projects Division)
 - o Project Coordinator (from Projects Division)
 - o 4 Project Engineers (2 from Projects Division and 2 from Refinery 1 and 2)
 - o 1 Contracts and 1 Procurement Engineers (From Projects Procurement Services Department)
- Project Management Consultant (PMC) (refer to Details below)
 - o Project Manager

Details of the Project

The case study of the project carried on surveying the Project manager, Project Coordinator and Contracts Engineer using the case study from in Annexure 3. After the survey, the details of project were given as follows.

Procurement selection was based on procedures of FEED, PMC and EPC as separate tenders. Feasibility study was not carried as the project only asks for modifications of existing units. So, project was assumed feasible.

Two contracts were made: one for FEED and one for EPC. All Tenders were on competitive bidding. Contracts types were all Lump Sum price basis even for the FEED.

Payments were on progress monthly basis against breakdown of the Total Lump Sum price. PMC was part of FEED. The FEED consultant was required to carry the Project Management of the EPC works also. The FEED was completed in May, 2001 and EPC's tendering is still on. EPC will be awarded sometime in June, 2008.

FEED Engineer (Consultant) carried complete designing of the modification. suggesting modifications to current process units such as additions of treatment units, dehydration units, unwanted products collectors to reduce density, regenerators, replacement with high efficiency pumps and motors, increase / add tanks, drums, replacement with larger sizes equipments .., etc.

Then, EPC was tendered out on the outcomes of FEED. All EPC bidders were required to verify the FEED during Tendering. Discussion of and problems in the project are given next. First round of EPC tendering started in 2002 but was cancelled for limited number of bidders participating. EPC second round started in July, 2007. The problems to this will be seen.

Discussion (Problems in the Project)

EPC was tendered twice. As seen before, FEED was completed sometime in 2001. First EPC was started in 2002 and was cancelled after a long tendering cycle (around 1 ½ years).

The problems in cancelling the EPC tendering were:

1. Many bidders were incapable of undertaking the EPC works as the project call for supplying huge number materials and equipments.
2. Participation ended in short number of bidders (2 bidders)
3. Both bidders didn't agree on providing overall warranty. Warranty was to be provided separately on every item only. As the items were to be installed separately and since there is not integrity, the whole works can't be granted to be completed to the satisfactory of company.

Hence, Company decided that this tender to be cancelled and re-tendering to take place. Re-tendering took place in July 2007. Bidders list finalized having seven bidders. Three bidders declined to bid. The final technical bids were received from four bidders. The fourth bidder was excluded because of requesting a cost plus contracting basis and not Lump Sum type of contract. Company's strategy to keep fair, equal and consistent bidding has resulted in excluding this bidder as the rest agreed on Lump Sum price basis. Now, three bidders' technical bids are being evaluated.

Because of re-tendering, FEED's PMC part was not valid anymore. FEED Consultant didn't want to carry PMC on the open period and didn't also validate FEED being too old. For doing so, Consultant asked almost more than double price. Thereafter, Company looked for a PMC consultant to validate the old FEED and manage the EPC works when awarded. Company felt that there was no time to go on competitive bidding on PMC as award of EPC can be done anytime. The bidder who was excluded for requesting a cost plus contract was requested and accepted to carry PMC. Now, the PMC services tender from this bidder as single source is being finalized. This might turn in a whole problem as the bidder not accepting the contract type now will manage it on the basis of conflict.

6.2.4 Case Study 4 Refinery 2 Expansion Project:

The fourth project investigated for the investigating problems to Procurement Strategy is “Refinery 2 Expansion Project”. Table 10 summarizes the details of the project.

Project Title	Refinery 2 Expansion Project
Business Strategic Objectives	Increase capacity of the Refinery Meet the international and local demand of refined oil products Reduce loads on current units Increase production, Revenue and profitability through optimum processing
Project Budget, Cost and Price	Not provided
Stage of the project	Feasibility Study completed. FEED phase of the project is on going. EPC phase is still not initiated.
Project Scope	Feasibility Study scope: To study the feasibility of expanding the Refinery. The study should include all possible ways to extend the current refinery capacity from 120 KBPD to 250 KBPD. FEED scope: The design based on feasibility study should include all required process units additions and modifications of existing facilities, utilities and processing units. The study shall come up with full engineering design to the required works for expansion. EPC: to implement FEED of expanding the refinery as follows: <ul style="list-style-type: none">- Verify the engineering requirements for the expansion requirements- Installation, testing, commissioning of all units including trains, equipments as directed by company and consultant.- Installation of listed items such as equipments and systems.- Equipment evaluation and rating as per design standards.- Instrumentation, Automation and Control systems.- Civil, structural works, supports, loading and soil investigation etc for expansion requirements.
Project Objectives	Turnkey engineering, detailed design, procurement, construction, installation, pre-commissioning, commissioning, testing, supply of spare parts required for the expanded facilities. Develop units, equipments and utilities required for the expansion integrated with existing system. Specify & include necessary extended warranties/guarantees in material / construction work and overall system performance. Ensure suitable and optimum solutions at site conditions during the implementation phase. Complete the project within its schedule and budget.

Table 10 Details of Refinery 2 Expansion Project

Project Team

The project team consisted of:

- Feasibility Study Consultant
- Project Management Team from Company:
 - o Project Manager (from Projects Division)
 - o Project Coordinator (from Projects Division)
 - o 4 Project Engineers (2 from Projects Division and 2 from Refinery 1 and 2)
 - o 1 Contracts and 1 Procurement Engineers (From Projects Procurement Services Department)

Details of the Project

The case study of the project carried on surveying the Project manager, Project Coordinator and Contracts Engineer using the case study from in Annexure 3. Annexure 3 shows the responses from the Project Manager. After the survey, the details of project were given as follows.

Procurement selection was based on procedures of Feasibility Study, FEED, PMC and EPC as separate tenders. Feasibility study was completed in June, 2007. FEED tendering started in July, 2007.

One contract is made for Feasibility Study. Feasibility Study was on competitive bidding and so will be all Tenders of next phases. FEED tendering is on going. FEED was tendered out on units rates based on man-hour rates. FEED award is projected to happen in March, 2008. EPC and PMC Tendering will start upon completion of FEED. Contracts types will be Lump Sum for EPC and units rates based on man-hours rates for PMC.

Payments were on progress monthly basis for Feasibility study, however adopted for milestone activities based on percentages of total estimated price for the FEED. This is adopted when one of the bidders rejected progress payments tender.

Feasibility Study consultant carried complete study of Refinery expansion setting the basis of all designs. FEED started on the basis of Statement of Requirements from Feasibility study. Discussion of and problems in the project are given next.

Discussion (Problems in the Project)

This project is considered the most critical and strategic project to company. Upon completion of this project, strategic objectives such as meeting international and local demands and increase profitability, production, and capacity of units will be achieved. The project (EPC) is forecasted to be completed by 2010.

Feasibility Study has delayed the start of FEED because of changes in requirements from Company. Feasibility Study has taken double time its original completion period. Award of Feasibility Study was in May, 2005 with completion period of one year. However, as seen before completion took place in June, 2007. Three variation orders were issued to the Feasibility study until completed.

FEED started on competitive basis of consultants and technical bids evaluation have been completed. Upon approval of the technical evaluation, prices will be invited from consultants. As seen before, some bidders of FEED didn't accept monthly progress payments tendering. Then this was then changed to percentage milestones as preferred. This is logical since the contract type is based on units rated of man-hours.

Next section is concluding findings of common problems that are seen in Procurement practices in the projects studied. It will be seen how these problems affected most of the projects to achieve objectives that are inline with the reviewed Strategic objectives of TK Co.

6.2.5 Conclusion (Procurement Practices Problems in the Case Studies)

From the details and the responses of the case studies of projects given above, the Procurement practices mostly identified in the projects were observed to be:

1. The split contracts of the project phases appeared in all projects
2. Contract Types of being Lump Sum appeared in many projects
3. Payment methods of progress payment appeared in almost all projects
4. Traditional methods of Tendering Procedures and lowest price wins

These practices were informed to be procedural; however they were seen permanent to almost all projects without being adapted to different project objectives and strategic objectives for the particular project. In the first Case Study, Lump Sum price for FEED was seen to be problematic when changes were made. Having a Lump Sum contract type couldn't

allow the basis for calculations of the change. If unit rates were implemented, the problems would have been solved and the change would have been transparent. Units rates based contract was seen in Literature as one of the contract types and should have been implemented here.

Also, to link strategic objectives, the above further entail combination of FEED to EPC (D/B method seen in Literature). The separation of FEED and EPC was seen problematic in achieving strategic objectives of the project. Some strategic objectives of the project in case study 1 were:

- Complying with HSE standards
- Allowing for competitive advantage

Because FEED was separated from EPC, it limited the competitive advantage in the EPC when Inergen was proposed and seen solely supplied by one party. Hence, Strategic objective of complete bidding was about to be altered. Also, HSE standards didn't specify one gas, so choosing multiple gases didn't contradict the strategic objective of complying to international HSE.

In Case Study 2, when the new product (ULG 91) was introduced. If D/B (FEED + EPC) was considered to be implemented from the start, as also agreed by the Contracts Manager, there wouldn't be a need for FEED 2 and EPC 2. The changes in FEED 1 and EPC 1 that would result in loss wouldn't have to be a concern. The strategic objective of receiving the best value of cost is altered.

Further, in Case Study 3, we have seen the problems of FEED being invalid for the long period of EPC. The combination of the two would have carried the validity together. The strategic objectives of increasing productivity, increasing capacity and optimizing processing are not achieved when EPC was seen not able to be carried.

There are no many problems can be seen in Case Study 4; however following the same manner would also result in the same problems. Feasibility Study for the project was seen gone through almost three variations. Again FEED and EPC will carry problems if same procedures of the other three projects are carried. This is the most critical and strategic project to Company so lessons should be learnt from other projects. Also, although contract type was on units rates based on man-hours, still progress payments was retained. As complained by bidders this was then changed to percentages of milestones payments.

The tendency to select the final contractor / consultant and award on lowest price basis was appearing in all projects studied. There is no specific problem to this; however, this explains the long period or tendering cycle which increases the costs of overheads. To ensure that all prices submitted were technically feasible; a long cycle of clarification process is taken place in every tender. Bidders had to confirm technical requirements after they submit technical offers. It took so much time to achieve a uniformity of technical revised proposal before receiving prices. This also results in receiving high prices on the revised offers. Again this alters the strategic objectives of receiving the best value for costs and prices.

Fixing these above Procurement practices and process, in the projects studied and not linking them to specific project needs, results in problems to achieve projects objectives that are inline with strategic objectives seen. Table 11 below shows the resulting problems appeared or likely to appear because of these practices as expressed in the survey.

No.	Project Manager, Coordinators, Engineers and Contracts Engineers
	Problems encountered in Procurement Processes for the projects
1	Improper Payments Systems (delayed and unlinked payments to work milestones).
2	Improper Risks allocation and control because of Lump Sum contracts.
3	Improper understanding of responsibilities of parties (Client's and Contractor's).
4	Owner incorrect interference in Contractor/Consultant's Activities.
5	Lengthy Procedures of Tendering (Cycle Time for Contract Award).
6	Improper Consultant and Contractors Selection Criteria
7	Lack of Visibility: Ambiguities in requirements.
8	No Contractor / Consultant Relationship Management / Profile / Performance.
9	Unlawful acts or practices for not understanding legal aspects.
10	No Linked Incentives / Motivation to Liquidated Damages.
11	Improper Commercial Register – Ratings of Contractors and Consultants

Table 11 Problems Identified in Procurement Processes for the Oil & Gas Projects Surveyed

The above problems additionally affect achieving the projects objectives, as seen in the case studies, and ultimately achieving strategic objectives of the projects.

Suggestions from respondents for these problems along with the advanced strategies addressed in Literature to improve the current Procurement processes for Oil & Gas projects will be covered in details in the next Chapter, Recommendations (Chapter 7).

7. RECOMMENDATIONS

This section of the Dissertation is intended to propose recommendations and offer solutions to the problems investigated in research methodologies (Cases Studies). This is also by referring to the objectives and hypothesis of the research supported by Literature and the first research methodology developed (Linking Procurement to Business Strategy).

The hypothesis to the research proposes that Procurement Strategy is to be linked to Corporate / Business Strategy for outsourced projects. This is to better serve the projects objectives achievement.

However, hypothesis model was modified to include SCM in the process for attaining strategic goals and involvement of Procurement (Refer Figure 17, Chapter 6).

Hence, in order to maintain the link to Business Strategy and achieve Strategic objectives, it is recommended that Oil & Gas Project Procurement Strategy should adopt advanced strategies mainly in the following areas:

1. Advanced Procurement Methods and Systems
 - Relationship Management: Partnering, D/B, etc.
 - Systems and Sub-Systems selection
 - Right Contractors and Consultants Selection
2. Proper Contracting Strategy
 - Contractor / Client Roles and Rights
 - Responsibilities of each party
 - Incentive contracts, Payment Systems and Risks Management
3. Realization of Corporate Business Strategy
 - Implementation of Proposed Model of Procurement Strategy
 - Implementation of a Procurement Strategy checklist developed for a project

Hence, the details of these identified Procurement Strategy areas with recommendations for improvement will be given next.

7.1 Strategic Procurement Methods and Systems for Oil & Gas Projects

Procurement Strategy includes Procurement methods, such as Partnering and Alliancing. We have seen in Literature these strategic arrangements which translate into long term benefits for organisations and firms. Adopting such strategies will involve higher management, place Procurement within the strategic plans of the organisation and improve relationships. These arrangements might not seem viable for normal projects, however, they should be considered for critical projects affecting strategic goals of the organisation (i.e. long term supply of Oil products and long term purchase of Power). Once these strategies are adopted, we will obviously recognize the strategic position of Procurement in Oil & Gas.

For Major Projects, it is recommended that Oil & Gas industry considers the D/B method clearly explained in Literature. We have seen the FEED and EPC phases of an Oil & Gas Major project. Although EPC refers to Engineering, Procurement and Construction, this is a different method from the D/B method used in the Building and Construction industry, as suggested in Literature.

An Oil & Gas 'Major Project' still carries a FEED phase which represents the Design phase in Building and Construction industry. Therefore, FEED and EPC phases can be combined together to eliminate problems for Major Projects resulting from separating Design and Implementation phases, as highlighted in Literature. There is a confusion, which needs to be clarified, that many practitioners in Oil & Gas think that EPC is similar to D/B in construction; however, as shown above, Design phase is separated from Implementation since FEED phase is separated from EPC. Therefore, EPC is basically only the Construction phase; and the Engineering part of it is just the actual implementation of the Engineering Design (FEED).

Hence it is recommended that Oil & Gas adopt the D/B method used in Building and Construction industry in Procuring for a Major Project which suggests that Design and Implementation of a project is handed to one Contractor. However, the current method can be kept if desired for small projects where minor Design or no Design is required.

Procurement Strategy also entails Procurement Systems. We have seen in Literature the advanced strategies proposed, such as what Cheung et al (2001) offered for procurement selection by enhancing objectivity. The systems they selected (MAUT and the AHP) as critical procurement selection criteria and procurement strategies commonly used in Hong Kong can be suggested here.

The justification is that against these criteria, utility factors corresponding to various procurement strategies can be assigned by the experts. As they explained, to cater for individual project characteristics, the relative importance weightings of the selection criteria can be assessed using the analytical hierarchy process. Final selection can be then based on the highest utility value derived from procurement strategies, taking into account the relative importance of the selection criteria. We have also seen procurement systems and sub-systems for a project proposed by kumaraswamy (2006). Refer to Figure 11.

Literature also suggested several criteria and systems for selecting contractors and suppliers. It also offered contractor's evaluation criteria. Hence, it is suggested that Oil & Gas gives up traditional methods in selecting contractors and evaluating the bids based on lowest price scenario.

As Literature highlighted, evaluating commercial bids and selecting contractors based on lowest price bid basis has proven to be an ineffective approach. It is suggested to look at the new evaluation paradigms such as what Wong, Holt, and Harris (2001) proposed, a Multi-Criteria Selection (MCS) tender price matrix to comprehensively evaluate preferences and use the same in bidder evaluation process, as in Mahdi, Riley, Fereig and Alex (2002) Multiple-Criteria Decision Support System (MCDSS) for the selection of the most appropriate contractor. Their system can accommodate the unique characteristics of a project in addition to the qualifications and capabilities of those contractors assessed.

Their system first evaluates the list of contractors by matching their qualifications with specific project conditions. A short list of eligible contractors is thus selected and MCDSS then compares the current capabilities of short-listed contractors and their plans for the project under consideration, to select the most appropriate contractor. It is claimed that the system can be easily modified to adopt specific conditions of the project and also to facilitate the decision maker in explaining the reasons for the elimination of excluded contractor.

7.2 Contracts Management and Strategy for Oil & Gas Project

Contracts Management and Strategy was seen in Literature as part of Procurement Strategy (APM, 1998). Contracts Management and strategy cover the relationship and responsibilities of parties in the contract document, Contract Type, Terms & Conditions, Pricing, Payment, Liquidated Damages and Risk Management which should clearly placed in the contract. As it was stated in Literature these contracts should be formed for smooth execution of the project

and not to add complications to the project. For effective contract Strategy these contract related issues should move from traditional practices such as Lump Sum contracts and Risks allocated to contracts to a more collaborative contracts responding to projects and strategic objectives. Just like project and strategic objectives of the project differ from one project to another, these contract implication should be dynamic to projects needs. One of the suggestions is that Setting liquidated damages should have Incentives clause against it. As seen in Literature if contractors are being penalized for delays, they should be motivated for early completion and high performance. Another suggestion is that not all types of contracts should Lump Sum basis as consultancy services should be in basis of consultants' hourly, daily or monthly rates. Company is found relaying on Lump Sum contracts to avoid monitoring and counting of quantities to calculate the total rates.

Reference is also made to the study carried by Oyegoke (2001) on the framework for construction management contracts practices in the UK and the US by exploring the main delivery methods. As construction management contracting types, processes and procedures and interaction between construction manager and other stakeholders, Contracts Management systems within each practice and between both practices; the distribution of responsibilities and risks both in pre-construction and during the construction stages; and allocation of responsibility in both practices were examined.

Differences were found in US, UK and Japanese approaches as manifested in user's requirement, project finance, internal construction process, feedback and learning information. Further, these differences between the contracting systems are the contractual ties and assignment of responsibilities of the parties, the contracts within the system, and their performance requirements. Finally the importance of having clear divisions of scope from owners regardless of differences in systems was highlighted.

As they identified it, the superior performance of Japanese contractors is attributed to their working practices which were characterized by the use of a larger workforce on site, detailed planning, close working relationships with their subcontractors, and an overriding focus on time certainty. it is not clear whether these issues deal directly with Procurement Strategies.

As also suggested from the surveys Procurement processes should consider different actions to resolve problems in projects. Table 12 below shows all suggestions by respondents to resolve the problems in the Procurement Process for the projects and managing contracts.

No.	From Project Manager, Coordinator, Engineer and Contracts Engineer
	Actions, Strategies and Suggestions for Improving Procurement Processes for Oil & Gas Projects
1	Understanding legal systems and the role of law in contracts
2	Understanding and linking Financial Systems (i.e. Pricing Basis, Payments Terms and Bank Guarantees) to Scope of Project.
3	Motivating Contractors / Consultants through Incentives systems not just penalties. Proper Risks allocation and control.
4	The added Value and Collaborative Contracts Management: Better understanding of responsibilities of parties.
5	The right Tendering and Contractor / Consultant Selection practices
6	Techno-Commercial Evaluation and Commercial Transparency
7	Improving Internal Contract Management Procedures.
8	Contractors Performance Data Maintenance.

Table 12 Suggestions and Actions by in Procurement Processes for Oil & Gas projects Surveyed

7.4 Project Procurement Strategy in Oil & Gas to Realise Business Strategy.

It is seen in Table 12 the suggestions in Procurement processes for Oil & Gas projects identified by the projects respondents. In summary, the contention is that Procurement processes in Oil & Gas should realise the Business needs and Strategy. This is established when Procurement Strategy links the objectives of a project to Business objectives.

In addition, the responses emanating from the survey of an Oil & Gas Project respondents as summarized in Table 12 are recommended to not only solve the problems but also to develop the effective Procurement Strategies (linked to Corporate / Business Strategy) for projects. Oil & Gas should consider such suggestions from its practitioners.

We have seen the emphasis in which perceptions on Corporate / Business objectives where altered in the problems of the projects studied. It was also seen the procurement problems in managing FEED and budget of the project. The recommendation here is that a balance between Strategic objectives, project objectives, costs should be obtained in order to achieve the best value of the project to Company. A balanced management will optimise the value to Company through proper Procurement Strategy. As for project Strategy, linking Project needs and objectives to business requirements should be formed at end of every stage such as

the FEED and EPC phase to ensure viability for Implementation. Projects are carried to fulfil business needs otherwise there is no use for them. Project Strategy inline with Business Strategy is realized in achieving the value intended which is through implementing proper Procurement Strategy for the value of the project.

One of the methods as also Literature suggests is the strategy review at every stage of project development. In the first project studied, Company's strategy doesn't constrain specific gas to be designed rather the most valuable gas to replace Halon to comply with HSE standards. Therefore the gases which require no system change to Halon were worth to be selected for the optimum gas identical to Halon. Therefore, it is recommended here to manage the procurement involved during FEED phase and the involvement in the EPC phase. The use of proper procurement strategies such as D/B can help achieving this desire. If FEED was included in the EPC, the optimum design that's handled by the same Contractor / Consultant can follow the EPC. As the strategic objectives are aligned with project objectives, they should be aligned to Procurement Strategy to receive the necessary viability of FEED to EPC.

Hence realisation of Strategic objectives is through the following:

- Corporate / Business objectives review: Portfolio and Program Management.
- Project objectives setting in lieu of Business objectives
- Defining Project's Scope in lieu of Project objectives
- Setting the Proper Project Strategy for Project's Scope
- Setting the Proper Procurement Strategy for Project's Strategy
 - Procurement Methods and Systems
 - Contract Strategy: Contract Type and Payment Method
 - Relationship Management: Contractor Selection, Dispute Resolution, Delays and Claims management.

Covering the above and specifically for a project, a Procurement Strategy selection checklist is developed in Annexure 6. However, the developed Model of Procurement Strategy for projects in Oil & Gas Industry to realize Corporate / Business Strategy is shown Figure18. This is suggested to Oil & Gas projects; however, also applicable to projects concerning other industries endeavour management by projects.

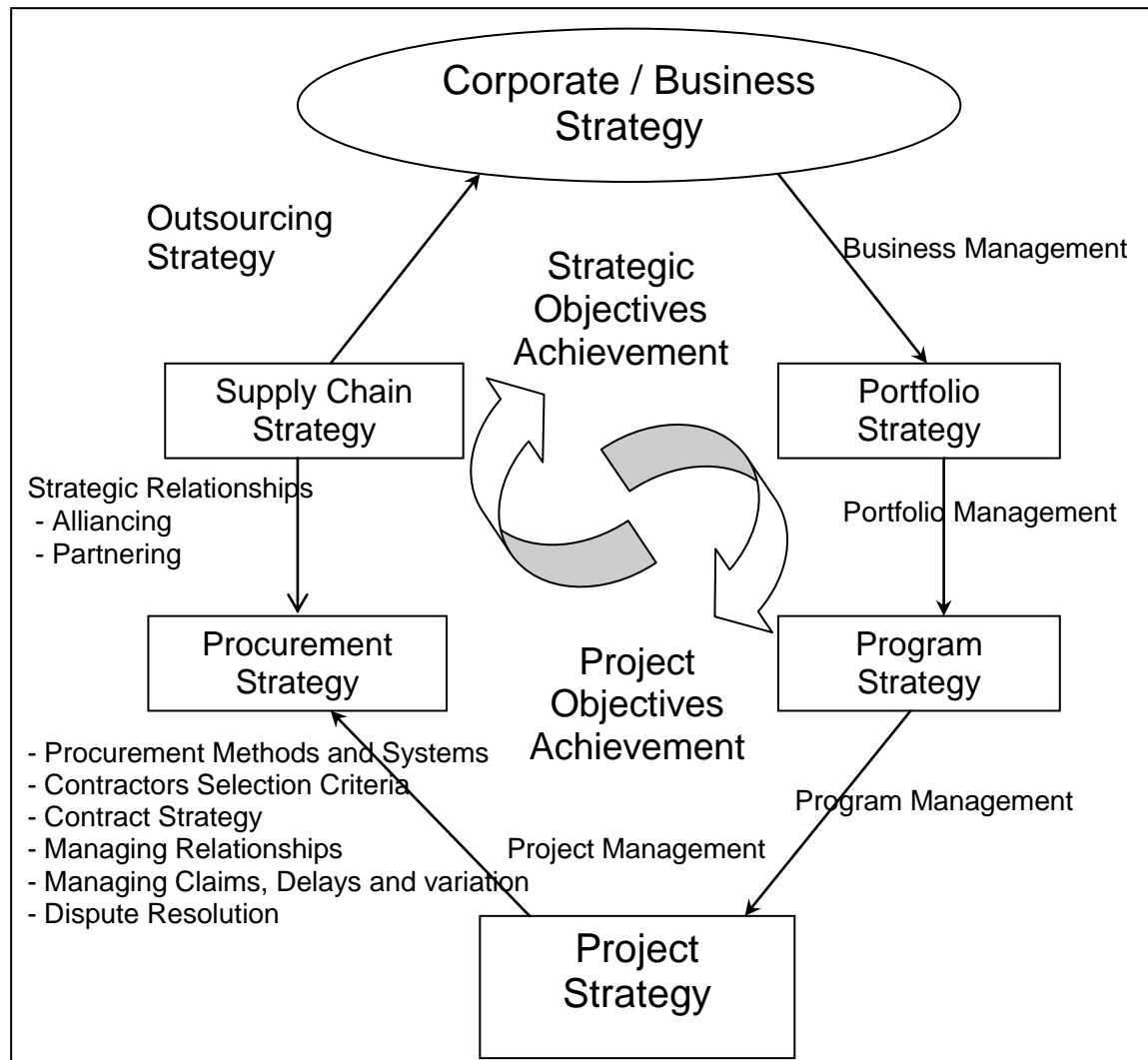


Figure 18 Procurement Strategy Model Suggested for Oil and Gas Projects

As we have seen in the analysis and discussion section, Procurement Strategy should be linked to overall Business Strategy. As we have also seen in Literature, Johnson and Scholes (1999) stated that Business Strategy is likely to be concerned with long term direction of an organisation, especially for a big multinational company; Strategy facilitates achieving a prominent position of becoming the “industry standard” recognized by suppliers and buyers.

Also we have seen, relationship management is what links procurement to SCM and hence to Overall Business Strategy; as seen in Cheung’s (2006) explanation of sustainable supply chain which requires a proactive relationship management. Hence it is recommended that Oil & Gas consider improving its relationships with Contractors and Suppliers which can be applied through Procurement Methods. The second part of the Hypothesis to the Dissertation suggests that an Effective Procurement Strategy includes Procurement Systems, Procurement Methods, Contract Strategy, Contract Types, Contractor/Client Relationships, Financial

issues, Risks Management, and performance of the project for it to be effective. The Literature and research methodologies have also supported and accepted this part.

All the above are recommendations to current procurement processes and practices for projects in Oil & Gas for implementation. Also the above, once implemented in Oil & Gas and used in other industries should support the hundreds of on-going projects in UAE and the retention of Consultants and Contractors expertise, share and potential interest from all over the world in the development of this country.

With regard to Procurement and Project performance, a little research was carried in this regard. We have seen Literature addressed the issue and related it to procurement. Xiao and Proverbs (2002) tackled the issue examining contractors' performance in different countries to distinguish their own strengths and weaknesses to improve their competitiveness accordingly. However, this was to serve the purpose of contractors' selection criteria and not the performance of the project. This is highlighted in the conclusions in the next chapter.

8. CONCLUSIONS AND FURTHER RESEARCH

The Hypothesis to the research on linking Procurement Strategy to Corporate / Business Strategy can thus be said was acceptable through research methodologies and shaped through Literature review. Objectives also were achieved throughout the research. Hence, Procurement Strategy when aligned to Corporate / Business Strategy will aim at achieving Project and Business Objectives, improve Contractor/Client relationship, and get its due share in Business Vision, Mission and long term strategic plan. Procurement processes in Oil & Gas require advanced strategies which are recommended for implemented.

However, a Procurement Strategy that avoids Project-stage ambiguities and helps to drive Projects to success in terms of performance was not achieved through research. This was not the main aim of the research; however, the issue was highlighted in Literature with rather poor results in research methodologies. Hence, this particular view is recommended for further research. Future research can examine Procurement Strategy's effect on Project Performance. Whether effective Procurement Strategies improve Project Performance can be further assessed. This is an important area for further research as it can be seen to complete the full picture of Project Procurement. This research aimed at Strategic effect of Procurement in an organisation. Inline with it if a research in the suggested area is carried will give the complete research on procurement from top (Strategic position) to down (Project performance) of an organisation.

Annexure 1

***Phases and Activities of Oil and Gas Major Projects,
(TK CO., 2004)***

The general phases and activities of a Major Project in Oil & Gas industry are:

1. Feasibility Study and Project Initiation Phase

The broad description of project needs, requirements and Scope. The activities during this phase are:

- Identifying Stakeholders of the project by corporate management.
- Identifying Strategic needs, requirements, and benefits.
- Viewing Project's essence in lieu of Business plans.
- Carrying Project's Feasibility Study.
- Establishing Project's initial Statement of Requirements (SOR).
- Carrying Project's Conceptual Design and Engineering.
- Review engineering disciplines required from functional Departments.
- Meetings and forming the Project team.
- Identifying and allocating tasks to team members.

2. Project Front-End Engineering Design (FEED) Phase

Including PRE-FEED phase in which project plans are set; and the actual FEED phase in which Design plans are worked out and FEED engineer proposals are reviewed. The activities are:

- Finalizing FEED requirements from the SOR.
- Choosing among alternatives available.
- Appointing the proper FEED Engineer.
- Establishing preliminary plans for the Project.
- Establishing preliminary cost estimates for the Project.
- Identifying applicable standards such as HSE and QA/QC plans.
- Developing Project Charter which outlines key information.
- Supervising and managing services of the FEED Engineer.
- Reviewing the FEED to ensure conformance with Project requirements.
- Market analysis and searching on products specified to review availability.
- Communicating comments on the FEED with the Engineer.
- Coordinating Design Outputs to concerned departments and users.
- Carry out final modifications in coordination with FEED Engineer.
- Approving and proceeding with the final FEED for EPC Tendering.

3. EPC Tendering Phase

Transferring the FEED into EPC Tender Package and communicating it to EPC Contractors for implementation. The activities are:

- Setting Scope of Work (SOW), Drawings and Specifications from FEED.
- Preparation of Enquiry Documents for the EPC (Tender Documents).
- Setting the Procurement plans for the EPC Tendering.
- Selecting EPC bidders and pre-qualifications process.
- Issuing the EPC Tender to bidders.
- Responding to clarifications by EPC bidders on the FEED Design.
- Reviewing and Evaluating EPC bids to ensure compliance to FEED design.
- Technical and Commercial evaluation process as per procedures.
- Awarding EPC to successful Contractor.

4. EPC Implementation Phase

In which the project after award to the successful contractor is kicked-off, executed and handed over to Company.

- Kick-off Meeting with the Successful Contractor.
- Monitoring Procurement of Materials and Implementation as per SOW.
- Supervision of EPC Project Execution.
- Reviewing, Issuing and monitoring Contractor's invoices and payments.
- Preparations of Value Engineering to ensure activities are as per schedule and plans as in terms of Time progression and Budget provisions.
- Contract Administration activities

Annexure 2

Questionnaire Form

Questionnaire – Procurement Strategy for Oil & Gas Projects				
QUESTIONS (PLEASE ADD YOUR REMARKS)	ANSWERS			REMARKS
	YES	NO	MAYBE	
Should a Procurement Strategy for Oil & Gas projects be part of Business Strategic Vision, Mission and long / short term plans?			x	Need to know direction of business.
Should Procurement Strategy for Oil & Gas Projects aim at achieving overall Business / Organisational objectives?	x			Achieving overall business objectives is very important
Should higher management in Oil & Gas be involved in setting Procurement Strategy for the Projects?	x			
Should the Procurement Strategy of Oil & Gas improve Organisational and Business relationships?	x			This should come with the business strategy.
Do you think Project Management in Oil & Gas lacks understanding of advanced Procurement Strategies?		x		What are advanced Procurement Strategies?
Are there Procurement Strategies and Practices in more developed countries (i.e. UK, USA, Japan etc) which can be implemented here?			x	
Does an effective procurement Strategy improve project performance?	x			
What areas should a Procurement Strategy include to be most effectively linked to Overall Business / Corporate Strategy: (respond to the areas proposed and/or suggest others)				
1. Procurement Systems and Methods?	x			Other areas: 8. Supply Chain 9. 10. 11. 12. 13.
2. Contractors / Consultants Selection?	x			
3. Contract Management & Strategy?	x			
4. Risk Management?	x			
5. Financial rights and Payment Terms?	x			
6. Project Performance		x		
7. Relationship Management	x			
8. Dispute, Delays, Claims, and Variations?			x	
OTHER COMMENTS				
Name: Hardip Kartar Industry: Construction Designation: Regional Bid Manager Qualifications: BEng CEng MICE MIEM				

Annexure 3

Project Case Study Survey Form

Procurement Strategy for an Oil & Gas Project

Procurement in this research covers all commercial aspects of a project (i.e. Materials, Contracts Management, Tendering, Bidding, Awarding and Contract Administration)	
PROJECT TITLE	REFINERY 2 EXPANSION STUDY
BRIEF SCOPE	<p>Feasibility Study scope: To study the feasibility of expanding the Refinery. The study should include all possible ways to extend the current refinery capacity from 120 KBPD to 250 KBPD.</p> <p>FEED scope: The design based on feasibility study should include all required process units additions and modifications of existing facilities, utilities and processing units. The study shall come up with full engineering design to the required works for expansion.</p> <p>EPC: to implement FEED of expanding the refinery.</p>
What is the stage of the project (Conceptual Design, FEED, EPC) and whether (Under Tendering, or % Completed)	<p>Increase capacity of the Refinery</p> <p>Meet the international and local demand of refined oil products</p> <p>Reduce loads on current units</p> <p>Increase production, Revenue and profitability through optimum processing</p>
What is the Budget, Costs and Prices of the Project?	Not provided
What are the Corporate / Business Objectives for undertaking the Project?	Feasibility Study completed. FEED phase of the project is on going. EPC phase is still not initiated.
What are the Project specific Objectives?	<p>Turnkey engineering, detailed design, procurement, construction, installation, pre-commissioning, commissioning, testing and supply of spare parts required for the expanded facilities.</p> <p>Develop units, equipments and utilities required for the expansion integrated with existing system.</p>
Any Project Objectives for other purposes than those of business (i.e. Legal, Environment, Political ... etc)?	Project will Comply with Environmental standards
What is the Procurement Method selected (i.e. Partnering, Design (SOR or FEED), Build (EPC), Design and Build (FEED & EPC), Prime Contracting, ...etc) Please explain	EPC model is option pursued with competitive bidding.

Was the basis of the Procurement selection to achieve Project and Strategic objectives? Or Traditional, Procedural and others? – Please explain in details.	EPC model as described above.
What is the Type of Contract selected? (i.e. Lump Sum, Unit Rates, Cost plus, ...etc) Please explain if also mixed types are selected.	Project is in FEED phase which is reimbursable based on estimated man-hours. Technology provision is lump sum.
Was the basis of the Contract Type selection to achieve Project and Strategic objectives? Or Traditional, Procedural and others? – Please explain in details.	In accordance with Company Procedures and Standards
For Tendering and Award, what was the basis of Bidders selection, Final Contractor / Consultant selection?	FEED and Technology Provision based on competitive bidding
Were the bidders competitive (Technical Capabilities, Organisation Sizes, Commercial Capabilities, Manpower, Profession, ...etc)	Major Engineering Contractor Bid FEED. Technology to be supplied by one of two Technology providers
Has any bidder been excluded? What were the reasons, for exclusion / non-exclusion?	None
What were the Payment Terms selected (i.e. Milestone payments, Progress payments, percentage payments, Reimbursement, ...etc) Please explain	Both Milestone and Progress payment for services provided
What is the basis of Payment Terms selected? (i.e. Contract Standard, Traditional, Policy, Nature of project, some specific reasons) – please explain	Contract Standard in accordance with Company procedures
Does the contract specify any Risks allocated to Company? Or all Risks are placed to Contractor / Consultant? Please explain	There is limited liability clause for FEED engineering and Technology provided
What are schemes specified in the Contract for handling Claims, Delays, and Disputes? (i.e. Agreed with contractor, standard contract, changed with the nature of contract, Strategic ...etc)	Company Standard covered in Agreement
Did any Contractor / Consultant during tendering complain for not accepting any commercial matters such as (Procurement method, Contract Type, Terms and Conditions, Risks allocated, Payment Terms, etc)? If any, how were they resolved?	Negotiations to reach mutual Terms and Conditions were protracted
Do you think any of the Procurement activities / processes specified above caused any problems to the project in achieving Project or Strategic objectives? Please explain how.	Today's Market is difficult due to high commodity prices and high demand for Oil & Gas services Projects
Any general problems occurred in the project (i.e. Delivery of Materials, Delays, Progress, Performance, Claims, Disputes on the Contract, Paymentsetc) Please state the problems and bases.	None Yet. Just entering FEED

What changes and developments do you think should be made to the project Procurement activities / process specified above or in general to serve the project better? How would these changes or developments contribute to a better project, say in achieving objectives or strategic objectives?	None specific
Did higher management (i.e. GM, AGM, and Division Manager) involve in any of the Commercial Matters specified above (Procurement Method, Contract Type Selection, Contractor / Consultant selection, Payment Terms, Terms and Conditions of Contract, Risks Allocation, Claims Delays and Disputes? And when problems arise? Please Explain their involvement on each.	High Management are involved in all cases
What activities / phases of the Project did you involve higher Management in (Project initiation, Planning, Procurement, Start, Execution, Closing, Meetings ... etc)? and how? Please explain where and when they were to be involved, informed, asked for decision or not required.	As above with discussions at Projects Steering Committee – Approval through Tender Board and finally Chairman of the Company
OTHER COMMENTS NOT COVERED OR TO BE ADDED	NONE
Thank you so much for your time, your responses will greatly help in developing the research.	
Name: Philip Harrison	
Designation: Senior Project Manager	
Qualifications: B. Tech., MICHEME, C. Eng.	
Signature: 23.01.08	

Annexure 4

Interview with Projects Division Manager

S: After greeting, I am doing a research as a part of my Project Management program. The research I am doing is examining the link between Procurement Strategy of our Company's projects to our Company's Corporate and Business strategies. The argument is there is a missing link between projects undertaken to the strategic objectives of the Company. It is proposed that Procurement Strategy in projects fills this missing link or the gap that's why projects undergo many problems. It will help further to develop the research if I ask your opinion on this and ask you a couple of questions on how the projects you handle are procured as your position is at the middle between higher management and project managers reporting to you.

D: Sure, very good, that's a very good program and I wish you all the best. This is a very interesting topic also and I will do my best to support and assist you in your research with all information you need.

You might already know our Division's structure. We have many project managers (around 8 or 9) and all are handling different types of projects. Our projects vary in nature, size, criticality, disciplinary and costs and estimates. All the project managers have projects teams from engineers to secretaries working on the projects whether the team is from our division or constituting of members from other functional departments. What would you like to know? You may ask me general questions and you can see other project managers and team for specific questions.

S: Sure, then I would like to know the strategic objectives of undertaking a project and some projects' objectives. Also, how procurement of a project is carried, what are the processes, criteria and basis of procuring a project? I would like to know your involvement and how you involve higher management in procuring a project. You may give me examples as you prefer.

D: As far as strategy of the projects, Business Development Division takes care of all strategic requirements of undertaking a project. They review on Business cases whether a project should be launched. They review with general management the necessity of starting a project. Many projects have deemed unnecessary to be undertaking and many others have been launched for their strategic objectives or specific functional requirements. All the projects launched to us have gone through a market research and feasibility study on Business requirement and impact from the Business Development Division. Of course my self and all project managers know and get involved in the

strategic background of the projects and the projects objectives. We know that strategic objectives of projects can vary from developing the company and its operations to higher standards, support the environment or development of country's and its economy.

As far as procurement, we have within our division a contracts department team who also report to the Procurement and Contracts Division within our company which you are part of. Contracts department team prepare all the tendering requirements, tender documents, and pre award activities of our projects. Our project managers work closely with contracts department on procurement of the project. Of course procurement in my opinion is linked to projects objectives which are at the end linked to Business objectives.

I agree on the principle that project procurement should be linked to Business Strategy; however, whether this is carried in practice, I am not sure this is done through procurement and contracts division and I am sure they have basis of carrying procurement of a project to predefined requirements they have within their core of functionality. I however emphasise that as a minimum requirement for procurement of a project is to suit the project's requirements to support achieving Business requirements. It is more important that a project achieves Business strategies than procurement itself to do so.

S: Is there an example of a project to illustrate all this?

D: I have worked as a project Manager for sometime for the IRP project.

The strategic objectives of the project were to minimize the marine ship movement and the road tankers movement which reduce marine pollution, protect the environment and decrease the rate of accidents that cause explosion of the tankers. The project objective was to complete the project successfully without delay to ensure quick implementation of the strategy. Another is to assign the best consultants and a contractor to achieve the desired needs to the highest value and quality to both the project and company. Finally, the objective was to implement, operate and maintain the pipeline network to the specified standards. These were the strategic and project objectives.

S: What about Procurement processes of the project in lieu of these objectives?

D: Generally Procurement involved different contracts to different stages. Contracts involved Feasibility Study Consultant, FEED Consultant and EPC Contractor. Procurement of the project was following company procedures and standards which were suiting the project. There were no major concerns as I recall. I can't comment much on Procurement and best is to see the project manager and team. Also, best is to see the Contracts' Manager for specific answers.

S: Sure, I will continue discussing Procurement of this project with the team. Thank you very much for your discussion support in the interview.

Interview with Projects Procurement Services (Contracts) Manager

- S: After greeting, I am doing a research as a part of my Project Management program. The research I am doing is examining the link between Procurement Strategy of our Company's projects to our Company's Corporate and Business strategies. The argument is there is a missing link between projects undertaken to the strategic objectives of the Company. It is proposed that Procurement Strategy in projects fills this missing link or the gap that's why projects undergo many problems. It will help further to develop the research if I ask your opinion on this and a couple of questions on the projects and their procurement as you are a contracts manager and a focal point in projects procurement.
- C: Sure, this is a very good topic. However, we have to be careful since projects are always inline with Business strategic objectives. Procurement of a project is in support of the project to achieve objectives of the project to Company's policy, procedures and standards. Now, procurement itself is a strategic process and the project goes through it as part of strategic objectives. You are talking about Procurement Strategy which is part or set by Business Strategies in delivering a project.
- S: But don't you think that objectives whether specific to projects or strategic change from project to another? What is the case of Procurement, does it change with the project and shouldn't it change with the changing objectives?
- C: There are procedures and Procurement policy which are given by management and projects with their objectives should go through and abide by the rules and procedures. We deviate sometimes from procedures for some of projects needs; however, this is decided by management.
- S: What can be an example of this?
- C: For some projects we had to change from competitive bidding strategy to single source when services are only provided by one company. This is again a Company policy to have a competitive advantage however for the project's need; we justify to management such deviation. Also, Procurement of a project should be in away to minimize the problems that cause in delays and prevent it from achieving objectives.
- S: If we chose a project, like the IRP and ask you the basis of selecting Procurement routes and contract types. Projects Division Manager was interviewed for this project; however, he advised to contact you for specific concerns regarding procurement of this project.
- C: Sure, Procurement for this project was to standards it started with Feasibility Study, FEED and EPC. The objectives of this project along with strategic objective did not

require deviations from procedures and policy. Feasibility Study, FEED and EPC were all through competitive bidding till the last selection of a consultant / contractor awarded.

S: Separation of phases and contracts of the project didn't result in problems?

C: This process is according to procedures and problems are inevitable in any project. Most important is that problems get resolved.

S: Any changes made to the project that affected Procurement routes?

C: Yes, when requirement was changed to include ULG 91, we had to form a contract with another consultant to study inclusion of this product to the pipeline.

S: Why not as a change order to the current study?

C: The Feasibility and FEED were completed by then and EPC started and was near completion when the product was introduced.

S: However, don't you think this change and the new study may result in many changes that most of deliverables in recent FEED and EPC might go in loss?

C: Yes, but we have studied different solutions and this was the best solution felt by management.

S: You don't think there were other solutions like FEED to combined to EPC.

C: Yes, but this is not the procedure and if it was from beginning; however the phases were and had to be separated from beginning.

S: So, you think it is better to combine phases of FEED to EPC?

C: I don't agree because there is no company capable of both. Most EPC contractors lack Engineering capabilities which will require them to subcontract the activities. This is the other way around to Consultants. Since the activities are majors and critical to a major project, it is rather to form a contract with a main party than subcontracting them which company will have no control over.

S: I see, but the concern here is the losses that original arrangements go through.

C: We have evaluated all proposals and picked the ones that we think will not result in major changes or losses to the original contracts.

S: Selection of final Consultant for change was not based on lowest price?

C: It was through lowest bid price; however during technical evaluation we made bidders to change proposals to maintain this and bidders didn't confirm this were excluded. We have gone through many clarifications and negotiations and this is how we reached to the final acceptable offers.

S: There were no other problems like deviations requests from consultants to terms and conditions, payment terms or legal issues?

C: There were many deviations mainly to terms and conditions from some consultants however all were withdrawn to maintain the fair competition. The concerns regarding

payment terms, we have considered some and changed to percentages milestones from the standard progress payments after management agreed. Any legal deviations against corporate policies were rejected.

S: Any bidders were excluded because of this?

C: No, they all agreed after explanations and negotiations before inviting price bids.

S: Don't you think that this might increase prices?

C: Yes but maintaining procedures and policies are more important.

S: Also, prices are competitive and there are bidders who did not request deviations who submitted competitive pricing, right?

C: Yes.

S: Last question, is what do you think should have been changed in procurement of the project if anything to be changed.

C: I think we should have given the new contract of studying the inclusion of the new product to the same consultant carried the initial study.

S: Why was this not implemented?

C: First, to comply with procedures, then to ensure valued prices and finally this was what management advised to achieve.

S: Sure, thank you for your time and your valuable responses which are very helpful.

C: Sure, and Good luck in your research.

Proposed Procurement Strategy Checklist for Oil & Gas Project

1. PROJECT TITLE :

2. OBJECTIVES :

Strategic Objectives for the Project: <ul style="list-style-type: none">▪▪▪▪▪▪▪
Project Specific Objectives: <ul style="list-style-type: none">▪▪▪▪▪▪

3. PROJECT BRIEF SCOPE :

<ul style="list-style-type: none">▪▪▪▪▪▪▪

4. PROJECT CONTRACT TYPE :

<ul style="list-style-type: none">▪ Services▪ Works▪ Consultancy▪ EPCOther, _____	Reason for Selection / Link to Objectives:
---	---

5. PROJECT BUDGET / ESTIMATE :

▪ Phase 1 (_____)	Dhs. _____
▪ Phase 2 (_____)	Dhs. _____
▪ Phase 3 (_____)	Dhs. _____
▪ Phase 4 (_____)	Dhs. _____

6. CONTRACT PRICE BASIS :

▪ Lump Sum Price	
▪ Total Estimated Price	
▪ Unit Price	
Reason for selection / Link to Objectives:	

7. PAYMENT METHOD :

▪ Progress	
▪ Milestones	
Other, _ _ _ _ _	
Reason for selection / Link to Objectives:	

8. ADVANCE PAYMENT

▪ Yes	
▪ No	

9. PROJECT COMMENCEMENT DATE

▪ Award Date	
▪ Non-Letter of Award Date	
▪ Specific Date	

10. WARRANTY

▪ 12 Months	
▪ More than 12 Months	
▪ Special Warranty	

11. PROJECT COMPLETION

▪ Completion Date	
▪ % Completed to date	

12. LIQUIDATED DAMAGES

▪ ___ % of Contract Price	
▪ Fixed Value/Occurrence	

13. SPECIAL CONDITIONS / MODIFICATIONS

▪ (Yes, please specify)	
▪ None	

Glossary of Terms

AHP	–	Analytical Hierarchy Process
Company	–	Refers to the Client in Oil & Gas (TK Co. as in the case studies)
Contract	–	Agreement between Company and Consultants or Contractor
Contractor	–	The EPC Contractor for the Project
Consultant	–	Oil and Gas Consultant for FEED, Feasibility Study or PMC
D/B	–	Design and Build Procurement Method used in Construction
EPC	–	Engineering, Procurement and Construction phase
FEED	–	Front – End Engineering Design phase
HSE	–	Health, Safety, and Environment
ISCM	–	Integrated Supply Chain Management
MAUT	–	Multi Attribute Utility Technologies
MCDSS	–	Multi-Criteria Decision Support System of Contractors
MSC	–	Multi-Criteria Selection of Contractors
PBO	–	Project Based Organisations
PM	–	Project Manager of Company
PMC	–	Project Management Consultancy
POO	–	Project Oriented Organisation
Project	–	Oil & Gas Project (Owner's Project)
QA&QC	–	Quality Assurance and Quality Control
SCM	–	Supply Chain Management
SOR	–	Statement of Requirements for the Project before FEED
SOW	–	Scope of Work for the Project after FEED
TQM	–	Total Quality Management

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