ADOPTING APPROPRIATE PROCUREMENT STRATEGIES IN THE OIL AND GAS INDUSTRY

by

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Dedicated to my late parents, and my wife and children for their love, sacrifices and inspirations

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ABSTRACT

Global business trends have led the oil and gas industry to seek better solutions to overcome the emerging challenges and critical issues, such as the need for procurement strategies based on new values and contextual factors including multi cultural complexity. One way to overcome some of these critical issues is perhaps to adopt new innovative approaches to suit different locations, countries or regions while trying to incorporate the differences in business philosophy, culture or values within the oil and gas organisation themselves into these approaches.

New innovative approaches to procurement strategies are also required to meet the contextual needs found in different locations and countries around the world. These approaches also need to accommodate specific project needs and different values either in the business philosophy or culture within the oil and gas organization themselves or in the local practices. Oil and gas exploration and production is a highly risky business in a very complicated industry. It links government, owners of the natural resources with operators, investors of private capital, technology and equipment necessary for resource development, in a single industry where the stakes and risks, as well as the possible profit margins, can be very high.

The aim of this research study is to improve the understanding of procurement strategies of players and stakeholders (hereafter referred to as "decision makers") in an industry

that has gone beyond regions and boundaries. The objectives of the research study included: to explore current procurement practices and trends; to identify the different values adopted by players; and highlight the possible impact of multi cultural complexity on global procurement process and strategies. This research study included an in-depth analysis on these issues using data from literatures and collective responses from the decision makers within the industry.

Among the key conclusions and recommendations that can be derived from the research study includes the need to improve the current procurement process in the industry to achieve a more conducive, sustainable and fair working environment between clients and contractors. In the procurement process, decision makers must assess and link their company's type, resources, stakeholders and capabilities before any decision on procurement can be made. Conventional procurement methods, although very much in used by the industry, must be looked upon seriously and studied on its needs and relevance to avoid serious problems or failures in this complicated and complex industry.

Finally, a comprehensive procurement strategy guideline on selection processes to be used by decision makers in the industry was developed and produced comprising a set of phases and critical steps that needs to be followed and performed during the selection process. Major issues and associated elements identified in the research study were also incorporated into the guideline on the selection process. This will hopefully assist decision makers to make better analysis and assessment on the appropriate procurement strategy to be adopted in future oil and gas projects throughout the World.

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NUMBERING

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GLOSSARY OF TERMS AND ABBREVIATIONS

Bbl	Barrel (1 barrel = 35 imperial gallons approximately)
boe	Barrel of oil equivalent
bboe	Billion barrels of oil equivalent
bcfpd	Billions cubic feet per day
boepd	Barrel of oil equivalent per day
BRINDEX	The Association of British Independent Oil Exploration companies
Brown Fields	Fields currently in production or under development
CapEx	Capital expenditure: the costs of developing, designing and constructing a facility or asset up to the point at which it enters use.
CIB W92	Conseil International du Batiment or International Council for Building, supported by United Nations to provide an international platform for exchange and collaborations in research and technology development in the construction sector. Working Commission W92 deals with Procurement Systems.
CRINE	Cost Reduction in a New Era: an Industry Initiatives by DTI to promote cost reduction initiatives in the oil and gas industry.
Decision Makers	Stakeholders and high level management given the authority by the company to make important policies and decisions for the company
DTI	Department of Trade and Industry
EPC	Engineering, Procurement and Construction
EPCC	Engineering, Procurement, Construction and Commissioning
EPIC	Engineering, Procurement, Installation and Commissioning
EU	European Union
Guideline	Procurement Strategy Guideline on Selection Process unless otherwise described.
IADC	International Association of Drilling Contractors
IMCA	International Marine Contractors Association
Incentive	An inducement to motivate an organisation to place greater emphasis on achieving an objective or task.
JV	Joint Venture
LOGIC	Leading Oil and Gas Industry in Competitiveness
mboe	Million barrels of oil equivalent
Mbpd	Thousand barrels per day
MCC	Multi Cultural Complexity
NOC	National Oil Company
OCA	Offshore Contractors Association
OPEC	Organisation of Petroleum Exporting Countries
OpEx	Operational expenditure: the cost of operating a facility or asset once the construction phase is completed.
Partnering	A concept of collaborative working which has many definitions and ways of being implemented.
PILOT	Successor to the Oil and Gas Industry/Government Task Force

	(OGITF) initiated by the DTI
Players	Operator, Contractor, Supplier, Manufacturer, Fabricator and all related and associated Services and Trade in the industry
Procurement	In construction terms, how you go about buying/acquiring and maintaining construction asset (Broome 2002).
Procurement Method	In its broadest term and context to the oil and gas industry, is an approach required to acquire the design, material, labour, services, installation and commissioning inputs for a successful completion of a project
Procurement Process	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 Strategy	New approaches to acquire the design, material, labour, services, installation and commissioning inputs for a successful completion of a project which links to the business plan of an organization/company. This is to maintain a sustainable position for that organization/company within the total chain of the industry, which determines the success or survival of that organization/company
PRT	Petroleum Revenue Tax
Risk	A source of uncertainty in achieving defined objectives.
Risk Management	A structured process for identifying and evaluating risks before developing and implementing actions to reduce the likelihood and/or impact of their occurrence.
scfpd	Standard cubic feet of gas per day
SCM	Supply Chain Management
SCS	South China Sea
UKCS	United Kingdom Continental Shelf
UKNS	United Kingdom North Sea
UKOOA	UK Offshore Operators Association
Value	Used in a value management sense, whereby 'value' equals functionality divided by whole life cost.
Value Management	Value management can be divided into three stages/sets of sub-processes: • Value planning, which helps stakeholders to define what value means to them and then select the best outline scheme for maximising it; • Value engineering, which increases the value of the selected outline scheme, focusing more on reducing whole life costs than on increasing functionality; and • Value analysis, which is the review of an existing project or process to determine what lessons can be learned and applied to future projects.
WSCA	Well Services Contractors Association

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF RESEARCH

The new century brings significant challenges to the oil and gas industry, as it seeks to maintain high levels of investment against a background of volatile oil and gas prices. The oil and gas industry is one of the main contributors to the world economics and generates billions of dollars per day in revenue. Despite the numerous constraining issues and problems the industry has to deal with, exploration and production technology has improved in leaps and bounds in the last century with more land and seabeds being explored for the valued commodity. A classic example is that less productive and small oilfields are also given a new breath of life through innovative technological plants and equipment and economic management approaches such as joint venture exploration with shared risks.

However, there has been insufficient development away from traditional approaches in procurement, with most of the procurement systems being mere carbon copies from other industries. According to Pedwell *et al* (1998), this is probably due to the fact that there are relatively few players, that is project initiators (clients/owners) and implementers (contractors) in the industry. Furthermore, clients/owners have been found to have a wide variety of method for selecting contractors.

The oil and gas industry must also be looked upon as an individual and complex industry in its own right. Direct applications of lessons learnt in other industries, such as the construction, may not be appropriate, as the two industries may differ in many aspects relating to both the construction, operation and maintenance phases. For example, under the operation stage, the main goal for the oil and gas industry is production with high return whereas in construction, the use of the finished asset to produce goods or provide a service is the key goal. Wright (1996) has listed other characteristics associated with the oil and gas sector which include:

- high capital/investment;
- high level of uncertainty/risk due to its exploratory nature;
- high technology/heavy engineering;
- large scale/magnitude;
- large number of engineering disciplines and specialists from exploration to first oil and from production to decommission; and
- spasmodic delivery/supply schedule.

1.2 JUSTIFICATION OF AREA OF RESEARCH

Throughout the review of relevant articles and papers, it was obvious that a gap exists in the literature whereby little was found, mentioned or rather deliberated on regarding procurement aspects of the oil and gas industry. Out of approximately 200 articles found, only about 40 articles are closely related to procurement. This does not necessarily mean that there are no problems but may be a result of the commercial sensitivity associated with disclosing and sharing problems among what constitutes only a few players within a

very specialized industry. Also, such disclosures could have a negative impact on image, reputation and goodwill within a high-return industry.

Changes are beginning to take place within large corporations, for example Halliburton (2003) recently announced that it will no longer pursue the traditional Engineering, Procurement, Installation and Commissioning (EPIC) contracts, as there was "the growing imbalance in the risk and reward available on these offshore EPIC projects". Partnering, alliancing and joint ventures have also their fair share of problems. Creating trust, unclear roles and responsibilities and alignment to common goals in this high-risk industry are some of the problems faced by these types of procurement arrangements (McHaffie *et al* 1993). Short and long-term relationships within partnering arrangements have to be dealt with accordingly to avoid pitfalls and any untoward relationship that could be costly.

The UKOOA (2003) Report stated that further research on the area is required more now than ever before. This is because of considerable changes in the oil and gas industry scenario throughout the world today, with clients and contractors looking more for a win-win situation in their procurement arrangements. With the high cost of exploration and production today, the profit margins for clients are also decreasing. Selecting the right contractor with the right price can be a time consuming and risky business. The volatility of the current oil and gas prices has added to the need to reconsider clients' cost control procedures, in particular, procurement strategies. The recent development of marginal fields with tight budget and high risk has resulted in traditional procurement approaches

becoming unsuitable leading to the introduction of partnering/alliancing/joint ventures. The decline in production of matured oil and gas fields in the United Kingdom has increased its market prices for oil and gas as well as operational costs. This has also created the need for further exploration and production with poor combination of higher costs and increased risk.

1.3 AIM OF RESEARCH

The aim of the research is to improve the understanding of procurement strategies that need to be adopted by players and decision makers in the oil and gas industry.

1.4 OUTLINE OF RESEARCH OBJECTIVES

The main research objectives have been outlined below.

1. To identify problems/issues/barriers that the oil and gas industry may have with current global procurement methods/strategies.
2. To capture the magnitude and importance of the problems/issues to the industry and prioritise accordingly.
3. To identify previous research on procurement in the area and the gaps that need to be filled through literature search.
4. To develop the most appropriate research methodology to address the problems/issues highlighted.
5. To explore current procurement practices and trends used by players in the industry.
6. To explore specific project needs or values to be adopted in contracts used by players *i.e.* clients and contractors and in the oil and gas industry.

7. To analyse the impact of multi cultural complexities on procurement process and strategies in the oil and gas industry.
8. To develop a guideline for the selection of appropriate procurement strategies in the oil and gas industry.
9. To assess the suitability and validity of the procurement strategy guideline.

1.5 PROBLEMS IDENTIFICATION

Within the literature reviewed, most common problems/issues within the oil and gas industry were associated with the conventional procurement methods which include Lump Sum and EPIC contract failures and partnering/alliancing ventures turning sour. The high price of oil and gas may well be good news to operators but the high long-term cost of sustainable development for marginal oil and gas fields has becoming an increasingly important issue among operators and contractors alike (Ehret, 1992). This is a direct result of the depleting oil and gas production in the United Kingdom Continental Shelf (UKCS) and the rising operating and maintenance costs of installations in matured and marginal fields. The Cost Reduction In the New Era (CRINE) (Westbrook 1994); PILOT initiatives, a successor to the Oil and Gas Industry/Government Task Force (OGITF) introduced by the Department of Trade and Industry (DTI); and Leading Oil and Gas Industry in Competitiveness (LOGIC) agency were introduced as a means of reducing if not overcoming these challenges.

1.6 SCOPE AND LIMITATIONS OF RESEARCH

The research will only cover global procurement strategies highlighting problems/issues faced by major players in the oil and gas industry throughout the world as experienced within the regions of the UK North Sea (UKNS) and the Malaysian South China Sea (SCS). Malaysia has been chosen because it also represents a developing country with potential growth in the SCS region. This will allow and create an opportunity to explore cross-regional learning from different levels of cultural, technological, geographical and political perspectives. The scope of research also extends its coverage towards cross-sector learning with the construction industry chosen as the point of reference and source of information.

1.7 OUTLINE OF RESEARCH METHODOLOGY

In order to achieve the objectives of this research accordingly, relevant information was gathered through primary and secondary data. The sources of primary data collection comprised the following group of players across the oil and gas industry, which included major operators, *i.e. BP, Shell, Petronas (Malaysia) etc.,* statutory and regulating authorities/bodies, government/industry initiative agency, contractors, fabricators, manufacturers and service providers.

Primary data were collected from the above groups in order to prioritise the problems and help to develop research framework as well as proposed guidelines through interviews, survey questionnaires and case studies.

Secondary data were gathered through literature in order to identify problems, previous research and gaps from libraries – books, databases, journals, newsletters etc., professional societies/bodies, international forum/conference/seminars papers and the Internet. Detail methodological concepts and approach are explained in Chapter 2.

1.8 SUMMARY OF MAIN CONCLUSIONS

Initial and preliminary literature search found that there is certainly a gap in knowledge in the area of research. There is also the need to look at the industry on its own based on the different nature, value, complexity, number of players, competition and other external factors that may have certain influence on how procurement methods/strategies were being put to practice. Cross regional and sector learning is inevitable due to the effects of globalization and new procurement methods or strategies experienced by other sectors. Data obtained through interview, case study and questionnaire survey from players in the UK and Malaysia demonstrated that there are seemingly differences in the approach and also implementation of procurement methods/strategies in both country and regions.

The understanding and adopting of appropriate values by players in procurement methods/strategies in both country and regions are quite different from one another. The experienced UK players are trying their level best to deal with the issue of oil and gas depletion in the North Sea by using and experimenting new procurement methods/strategies lead by major players. The main obstacles are associated with high exploration, production, operational and maintenance costs which have turned them away from conventional procurement methods in search of a better way to overcome it. In

Malaysia on the other hand, the focus is still on basic issues of procurement process and contracts administration. Having a government-owned oil and gas company as one of the largest client in the region, the scenario and mode of procurement issues are certainly different and unique in its nature.

Apart from the need to focus on major multi cultural complexity factors in the oil and gas projects such as technological, complexity, geographical, location and business environment, other factors like cultural, local practices, political risk and manpower are nonetheless important and sometimes crucial to the successful completion, operation and maintenance of oil and gas projects. The understanding and appreciation of these factors are essential both to the players as well as their company's stakeholders.

The issue of the small number of players in the oil and gas industry has inevitably contributed and given effect to the overall research methodology and findings of the research. Although some may argue whether the number of feedbacks obtained really represent the views and understanding of the general oil and gas community, the fact that not many changes and improvement on procurement methods/strategies in the industry compared to other industries in the last two decades is a sure sign that the feedbacks are relevant and sufficient but just overdue.

Finally, the procurement strategy guideline that has been developed in the research study may need prior adjustments and modifications when used especially on critical elements of the major issues. Due care is needed to add or omit issues that may or may not be relevant in a particular project or that are not mentioned in the research study.

Nonetheless, it is hoped that the guideline will provide a significant contribution to the oil and gas industry on the understanding and implementation of procurement strategy in a competitive, challenging and multi cultural environment.

1.9 RESEARCH ACHIEVEMENTS

In the entirety of the research, the major achievement was to meet the aim of the research study in providing players in the oil and gas industry with reliable guidelines on procurement strategies which could be linked to the strategic management of their company or organisation. More specifically, the research achievements in terms of contribution to knowledge can be summarised in the following points:

- a detail review of current literature issues and gaps in knowledge on the subject;
- a detail review of player's perceptions on the subject through interviews, case studies and questionnaire surveys;
- a methodology for conducting and analysing important elements in the strategic procurement process; and
- a tool for analysing, decision making and monitoring of procurement strategies to be adopted by players in the industry.

The research outcomes were disseminated to the industry as well as academic peers through a number of publications and presentations as summarised in the following points:

- three peer reviewed conference papers discussing the research methodology, theoretical formulation of the initial framework and current issues in the industry.

The full conference title can be seen in the References section of this thesis. The papers were entitled "Procurement Strategies for the Oil and Gas Industry: Current Issues and Problems" (Mohammad, M.F. and Price, A.D.F. 2003), "Challenges on Procurement in the Oil and Gas Industry: Developing New Strategies" (Mohammad, M.F. and Price, A.D.F. 2004) and "Multi Cultural Complexity Impact on Procurement within the Oil and Gas Sector" (Mohammad, M.F. and Price, A.D.F. 2005);

- two working papers have been written and presented. The papers entitled "Procurement Strategies for the Oil and Gas Industry: Developing New Approaches" was presented at ARCOM Doctoral Workshop at the University of Reading and "The Impact of Multi-cultural Complexity on Procurement in the Oil and Gas Sector" was presented at a One Day Workshop at Loughborough University;

- two working papers have been written, submitted and are under review for potential publication in construction procurement and energy management journals. The first paper entitled, "Procurement Challenges in the UK Oil and Gas Sector" (Mohammad, M.F. and Price, A.D.F. 2006) addresses findings from case studies conducted in the UK and the second is entitled "Procurement Strategies Perception in the Oil and Gas Sector" (Mohammad, M.F. and Price, A.D.F. 2006a) presents the results and analysis of questionnaire survey conducted on major players in the industry; and
- a research report and draft procurement strategy guideline on selection process for the industry summarizing the findings of the research, the approach and tool developed

which will then be disseminated to all the respondents who had participated in and responded to the research questionnaires, interviews and case studies.

1.10 GUIDE TO THESIS

The links between chapters are shown in the Thesis Layout flowchart in Figure 1.1. The following guide to the thesis briefly explained what each chapter will present.

Chapter 1 introduces the research and set the foundation and purpose of the overall research. It starts off with the background of the research including the justification of the research. Aims and objectives of the research are clearly stated followed by problems identification. Scope and limitations of the research are deliberated and the brief outline of research methodology is explained. Main conclusions from the research are finally highlighted based on the research findings.

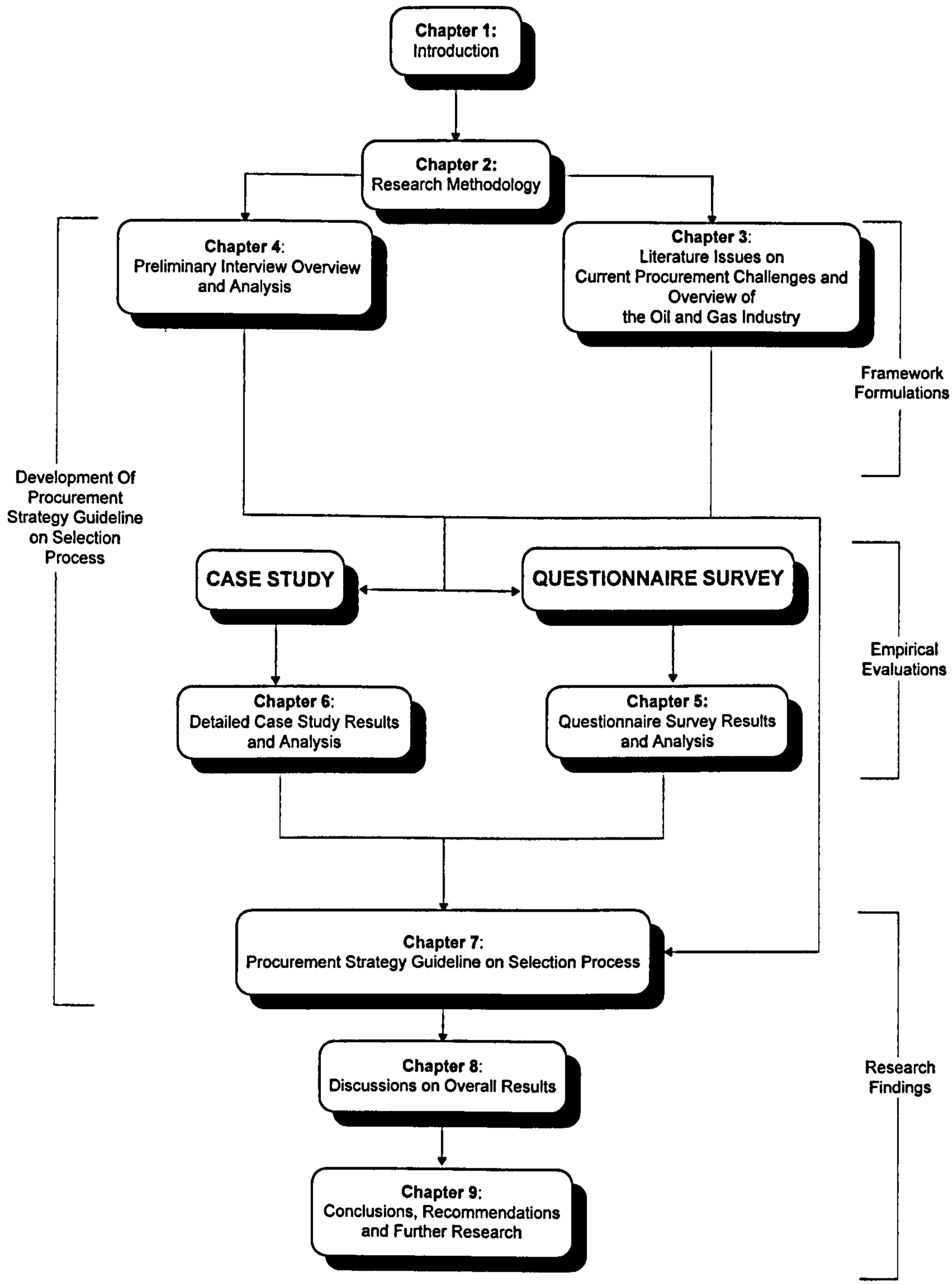

Figure 1.1 : Thesis Layout

Chapter 2 entirely focuses on the research methodology. The development and the proposed methodology for the research are discussed, exploring the possibility of addressing and achieving the aims and objectives of the research. The basis of selection of the most suitable methodological approach for the research will also be discussed, taking into consideration significant and relevant issues and factors which may have an impact on the type of research method to be used.

Chapter 3 seeks to address issues on current procurement challenges and trends within the industry through literature search. An overview of the background of the oil and gas industry has been presented to highlight the nature, players, development process and current issues in the industry. This provides the research with the overall scenario and understanding of the industry including putting forward important variables, limitations or perimeters that may have an impact on the selection of research methodology and possible outcomes. Three major issues or topics; conventional versus innovative approaches, current issues and problems and the impact of multi-cultural complexity on procurement in the industry were highlighted and discussed. These are the core issues of the research and also the secondary data for the research. Findings from this literature search will become the foundation for the development of the research framework and proposed procurement strategy guideline on selection process.

Chapter 4 covers the preliminary interview overview and analysis. These preliminary interviews were conducted on established as well as new players across the industry in the UK during the initial stage of the research. These interviews were conducted while

attending conference, seminar and workshop with participants and presenters alike. General overview and analysis from these interviews will be presented accordingly.

Chapter 5 presents the questionnaire survey results and analysis which are among the primary data for the research. Relevant and related research questions are put forward in this structured questionnaire survey. The results are based on the analysis of feedbacks received from responding organisations across the industry using the *Statistical Package for the Social Sciences* (SPSS) software. The survey analysis will include descriptive statistical findings of different perceptions and results between different types of players in the industry with various experiences in oil producing regions on critical issues on procurement methods/strategies.

Chapter 6 is dedicated to the detailed case studies results and analysis from prominent players in the oil and gas industry in the UK and Malaysia. This chapter not only supplements Chapter 6, but it also serves to validate some of the major issues discussed in the overall research. This chapter will also try to meet some of the research objectives based on the findings and lessons learnt.

Chapter 7 presents the development of the proposed procurement strategy guideline on selection process. Details of the guidelines will include its aims and purpose, specifications and procedures which will be deliberated further in this chapter. Industry validation will also be conducted on this guideline to gauge the industry's overall perception as well as obtaining feedback.

Chapter 8 deals with the discussions on the overall results and findings from the research. This includes findings from preliminary interviews, literature, case study and questionnaire survey. Discussion on the development of the guideline will also be included in this chapter.

Chapter 9 reports the findings and conclusions of the research and provides recommendations for further research on current and outstanding issues highlighted in the overall research.

CHAPTER 2: RESEARCH METHODOLOGY

2.1 INTRODUCTION

Research methodology was defined and described by Fellows and Liu (2003) as "the principles and procedures of the logical thought process which are applied to a specific investigation". This chapter introduces the design and process of this research study which include the rational behind chosen methods and techniques employed. It discusses and presents the planned research design and stages, which also relate to the research objectives and methodology adopted.

The scope and methodological approach to the research have been influenced by a number of critical issues that were rather unique to the oil and gas industry. They include: the number of players/potential respondents in the industry; the different oil and gas regions and practices; technological advancement and complexity; the limitation on the scope of study; duration of the research and the availability; and confidentiality of commercially sensitive data. These issues will be discussed and presented at the end of this chapter.

2.2 RESEARCH APPROACH

This research aims to develop a procurement strategy guideline on selection process to be adopted by players in the oil and gas industry. In order to achieve the aim, the research has been divided into three phases, as shown in Figure 2.1.

- The first phase was the framework formulation based on the secondary and primary data comprising literature overview and preliminary industry interviews.
- The second phase of the research involved empirical evaluation that incorporates data and analysis from phase one with case study and questionnaire survey through triangulated data collection and analysis, where both qualitative and quantitative techniques are then used to identify, modify, confirm and validate the framework (Fellows and Liu 2003).
- The third and final phase involved developing the proposed procurement strategy guideline on selection process and industry validation.

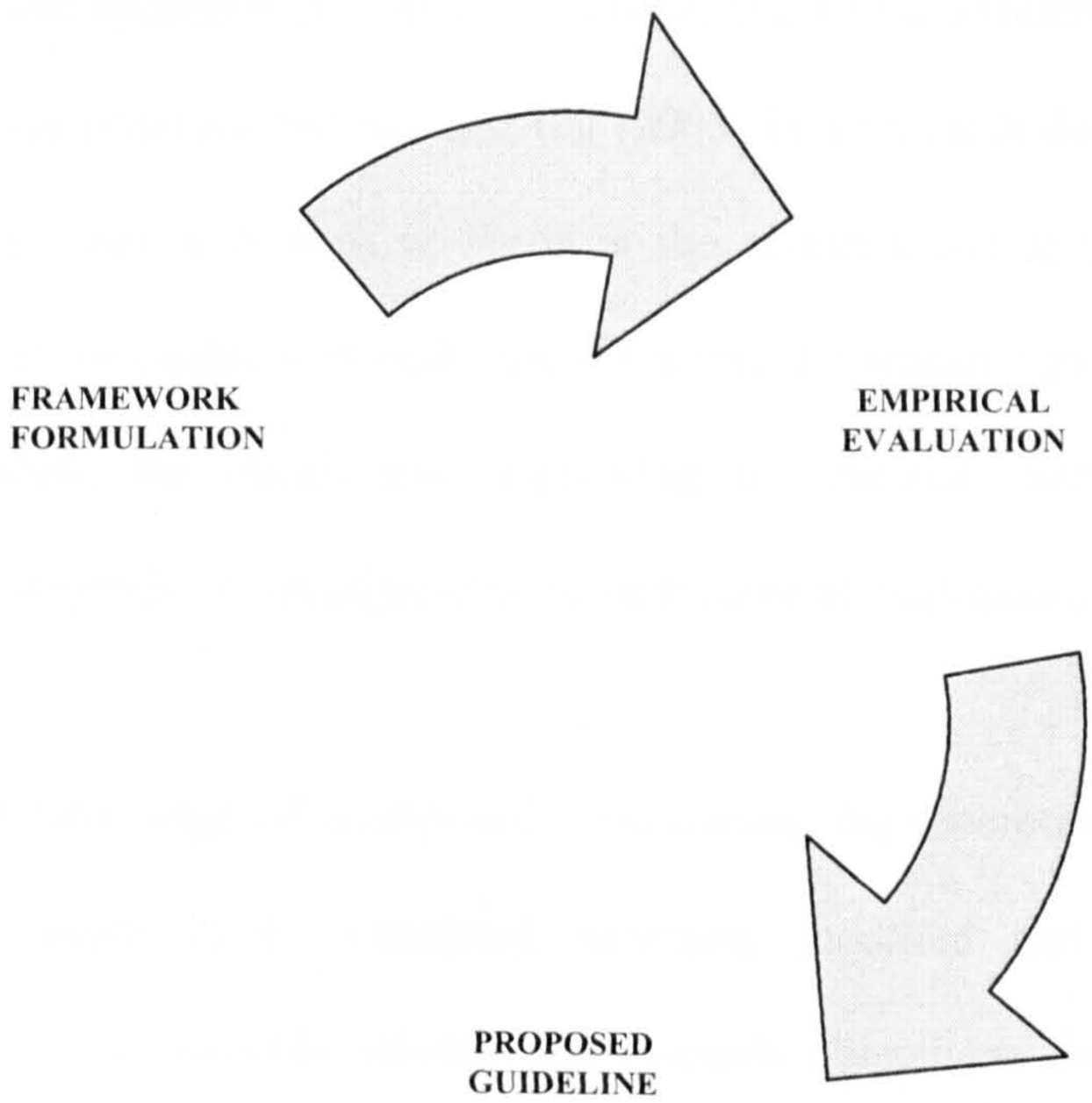

Figure 2.1: Development of the Proposed Guideline through Framework Formulation and Empirical Evaluation (Fellows and Liu 2003).

2.3 RESEARCH DESIGN

The research design is the backbone of any research work. It describes each of the research components and how they are incorporated and linked together in the process. There are many arguments about the correct research design approach but according to Royer and Zarlowski (2001), the quality of research design relates to the overall logic of the research and the coherency of its components. This is where the influential factors in the research design are important and critical which will be explained later in this chapter.

A triangulated approach that combines qualitative and quantitative research methods has been recommended by Fellows and Liu (2003) in a research design because it allows a detail representation of both methods in the research and at the same time can take advantage of the qualities of each method during the research process. Upon formulating the framework, the choice and sequencing of research methods for evaluating the framework depends on the objectives of each stage of evaluation, as shown in Figure 2.2.

During the first stage of framework formulation, the theoretically developed research framework needs to be identified, assessed, modified and enhanced taking into considerations its possible impacts on research objectives, design and methodology. Some of these research objectives could be achieved through qualitative techniques, such as expert interviews and case studies. Upon the completion of a qualitative evaluation and assessment, the resulting framework is considered to be a more established research framework that is ready for further confirmation and validation. In this case, a statistical technique may be required to further confirm and enhance the research framework. This can be done by employing the quantitative research methods such as an industry questionnaire survey. Upon the completion of the proposed guideline, an expert feedback and analysis is then required to validate the overall research framework and guideline to meet industry requirements and approval.

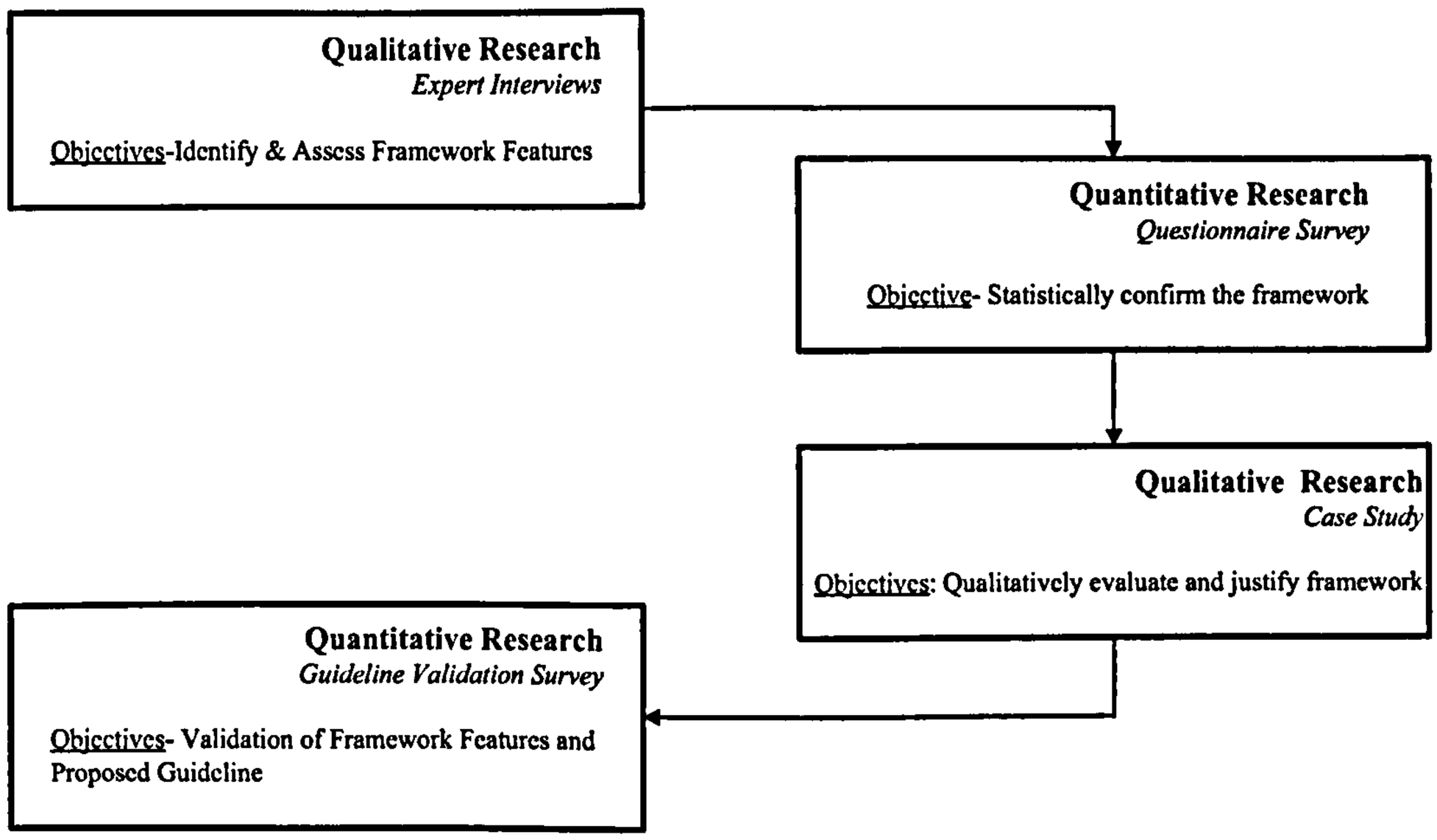

Figure 2.2 Using Various Research Methods in Testing Research Framework for Different Objectives

2.4 RESEARCH SCOPE

The initial theoretical formulation of the framework was developed through literature overviews based on current issues and problems within the industry across regions. This was later supplemented and reinforced by preliminary interviews which were done during the attendance to exhibitions, conferences and seminars in the UK initiated and conducted

by industry players. The preliminary interview covers the perception of general players across the industry with representatives from the operators, contractors, servicing companies, suppliers, manufacturers and fabricators. This helps to extend the scope of the research framework further within the oil and gas industry throughout the world in general.

The empirical testing of the research framework covers two different research scopes. The first one, which was the case study, covers only few key persons from major companies in the UK and Malaysia. On the other hand, the research scope of the questionnaire survey tries to cover respondents from companies/organisations with active participation and experience from various oil producing regions. They are therefore considered to be in the best position to represent the perception of players in the industry during the questionnaire survey exercise.

Validation of the proposed guideline was conducted with key persons from major companies within the industry. Apart from being actively involved in current oil and gas projects, they were also selected based on their role and position as Procurement Managers in the companies. Table 2.1 presents the scope of research covered throughout the different phases of the research.

Table 2.1: Research Scope in Terms of Methodology, Source, Company Type and Participation.

Research Phase	Methods	Source	Scope of Area covered/ participated by Respondent
Framework Formulation	Literature, preliminary interviews – During exhibition, conference, seminar and workshop in the UK	Library, internet domains, conferences, representatives from companies involved in the oil and gas activities	Mainly UKNS and other oil producing regions
Empirical Evaluation	Case study – interviews and telephone	Key persons from major companies in the sector in the UK/Malaysia	Mainly UKNS and Malaysia South China Sea regions
	Questionnaire survey – sending out questionnaires by hard and soft copies	Representatives from companies involved in oil and gas activities based in the UK/Malaysia	Various oil producing regions
Proposed Concept and Guideline	Questionnaire survey – sending out validation questionnaires by hard and soft copies	Key persons from major companies in the sector in the UK/Malaysia	Mainly UKNS and Malaysia South China Sea regions

2.5 RESEARCH PROCESS

By incorporating the elements in research design and scope, the research process was developed based on the three key phases of research stages described earlier. These key phases are the backbone of the research process where relevant tasks are undertaken and different approaches were used to achieve the objectives of the research. The proposed procurement strategy guideline on selection process was the result from the integration of findings through these framework formulations and evaluations. The schematic flowchart of the process has been illustrated in Figure 2.3. A description of each stage is discussed further in this chapter.

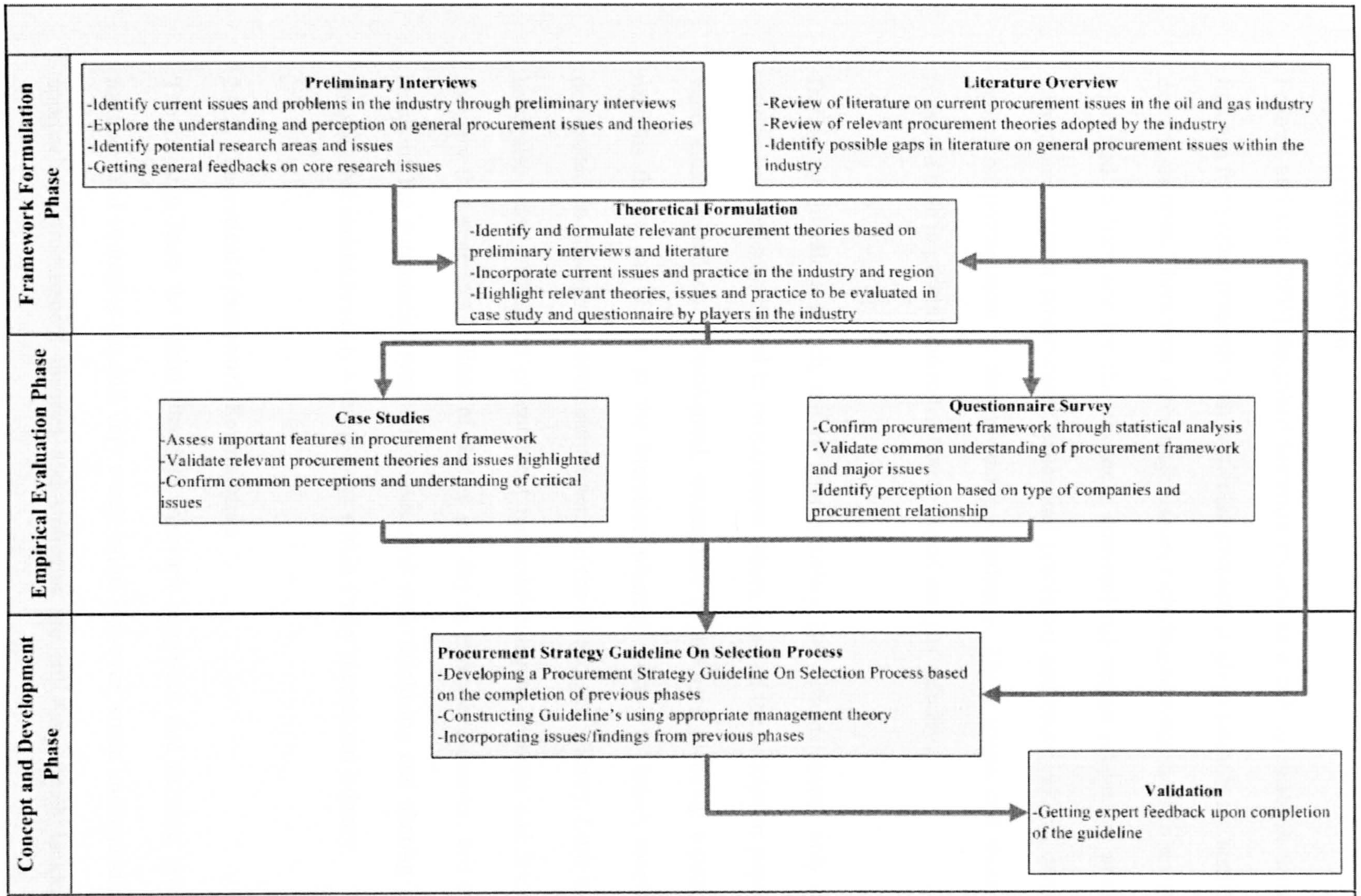

Figure 2.3: The Research Process

2.5.1 Literature Overview

Fellows and Liu (2003) described literature review as a task to establish theories and findings from other research with particular attention is given towards the application of existing theories. There were three major issues including relevant theories reviewed and addressed in literature for this research: conventional versus innovative procurement approaches; current procurement issues and problems; and multi cultural complexities impact on procurement in the oil and gas industry. These issues and theories were reviewed both in general and in relation to the oil and gas industry.

During the literature search, out of approximately 200 articles found, only about 40 articles were closely related to procurement where most of the articles or papers found were either based on technological, economics or strategic planning topics. It was obvious that a gap exists in the literature whereby little was found, mentioned or deliberated on regarding procurement aspects of the oil and gas industry. Little appears to have also been written on procurement methods/strategies, theories and issues in an industry that generates billions of dollars per day in revenue. However, this may be a result of the commercial sensitivity associated with disclosing and sharing problems among what constitutes only a few players within a very specialized industry.

2.5.2. Theoretical Framework Formulation

The findings from the initial literature overview suggested that existing procurement methods and strategies are still very much valid. However, some understanding of the approach to procurement theories and strategies are still very much lacking in the

industry. It is therefore quite logical to incorporate the existing procurement theories and framework into the development of a procurement strategy guideline. Creating a new procurement framework or theories from scratch into the industry may not be a good idea as this will cause a lot of confusion and rejection especially by players, therefore the procurement framework formulation has to be taken based on existing frameworks and processes. Among the existing founding procurement framework includes the theories and implementation of procurement methods, procurement strategies and the theory of complexity. These procurement frameworks formed the basis for the development of procurement strategy guideline later in the research.

2.5.3 Expert Interviews and Case Studies

Interviews are methods of acquiring and collecting data through face to face or voice to voice interactive dialogues in order to discover the opinions or feelings of people on certain subject (Hussey and Hussey, 1997). Six semi-structured expert interviews were conducted in the UK and Malaysia to assess, confirm or modify the framework. Semi-structured interviews were used because this type of interviews are said to allow people to answer more on their own terms than the standardised interview permits but still provide a greater structure for comparability over that of the focused interview (May 1997). Six case studies were developed from these interviews involving in-depth contextual analysis of a particular issues, theories or problems highlighted in the framework. These case studies were later compared and analysed by type of companies and regions to ascertain whether there are any significant effects on the frameworks.

2.5.4 Questionnaire Survey

A questionnaire is a survey exercise that concentrates upon the replies of respondents within a structured interviewing situation. Their responses and characteristics are then quantified and aggregated with others in the survey sample, in order to examine pattern or relationship between them by employing the techniques of statistical analysis (May 1997). The objective of the questionnaire survey in this research was to confirm the developed framework and the perception of players on current issues highlighted in literature or interviews through statistical analysis.

The questionnaire survey was conducted with 21 responses and a response rate of 35 per cent. The questionnaire covered relevant issues pertaining to the subject area of procurement theories, methods, strategies and implementation. The perceptions of key players were analysed and presented in detail in Chapter 6. The results from this analysis have become part of the development of the proposed guideline as described in Chapter 8.

2.5.5 Procurement Strategy Guideline on Selection Process (Guideline)

It was the objective of the research study to be able to develop a comprehensive concept on procurement strategy guideline on selection process to be used by oil and gas players across regions. The guideline on selection process has been developed based upon the scope, limitations and findings including the experiences of players obtained through the research methodology and process used in the study as illustrated in Figure 2.4.

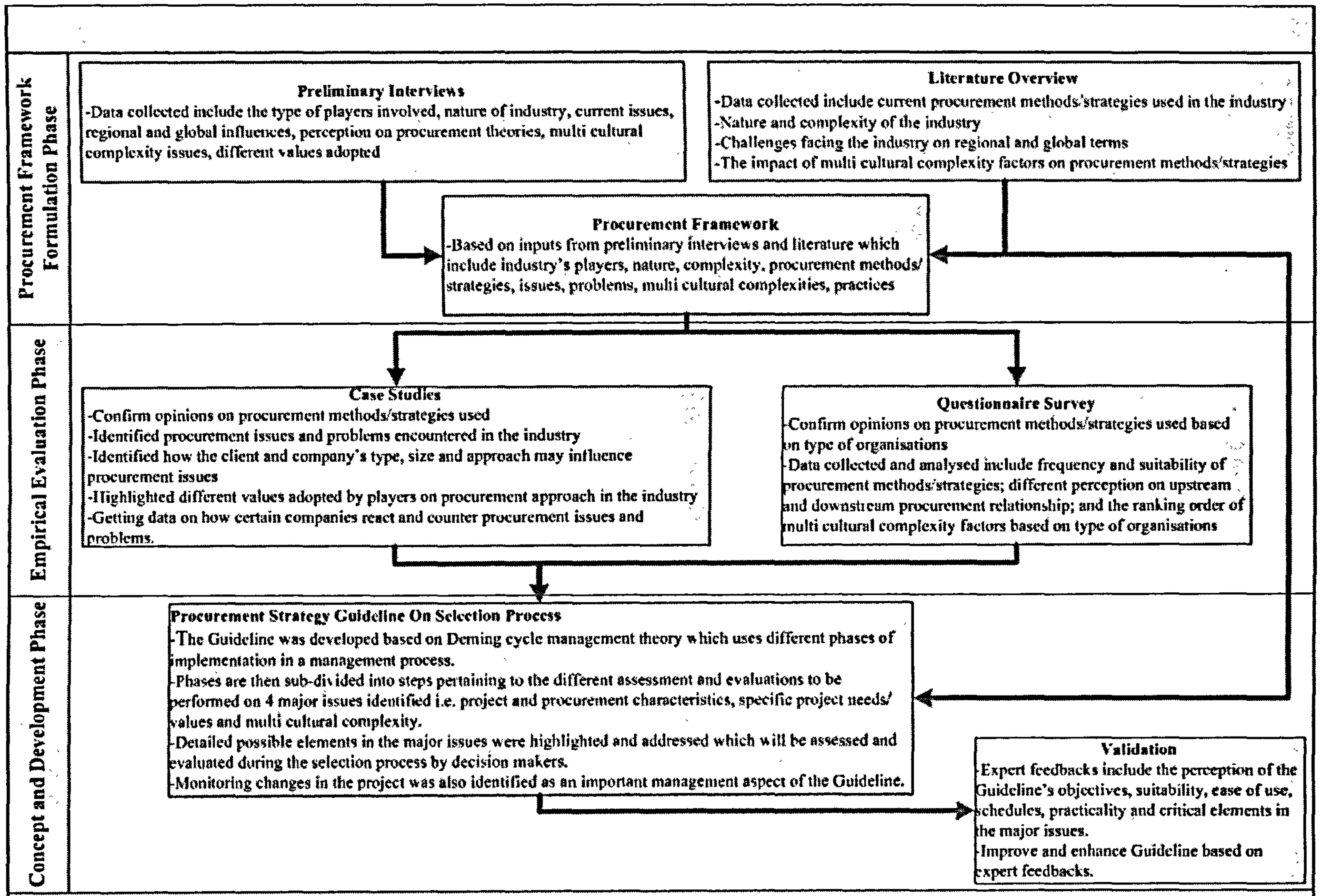

Figure 2.4: The Development of Procurement Strategy Guideline on Selection Process based on Data available during the Research Process

The procurement strategy guideline on selection process was specifically aimed at managers and stakeholders who were termed as decision makers in company or organisation within the industry. The guideline will focus on core issues on specific needs or values to be adopted in the contract and critical effects of multi cultural complexity factors. Large and established players may be looking at the guideline as a supplementing material to add to their many references while new players will hopefully take it on board as an important check list and major reference point to plan their procurement strategies successfully especially in new and untested regions. The detail about the guideline's steps and processes are described in Chapter 8.

2.5.6 Validation

It is crucially important, especially in the context of the oil and gas industry, to be able to validate research findings, theoretical framework or in this case a guideline on selection process concept by prominent players in the industry. This is also one way to test and evaluate the guideline on selection process to establish whether or not it has achieved the reasonable level of acceptance or full dismissal by the industry. In this task, a report on the guideline proposal and the proposed schedule of assessment were validated by prominent players in the industry with mix and expected outcomes.

2.6 LIMITATIONS AND CONSTRAINTS OF RESEARCH METHODS

The research methods used in this research carry within them inherent limitations, constraints and barriers to their use. The following section will discuss these limitations, constraints and barriers and the action taken to minimise their impact.

2.6.1 Limitations of Qualitative Research Methods

In the process of pursuing qualitative research methods, there are a number of limitations and criticisms that needs to be addressed or minimised which will be discussed in the following points with reference to Table 2.2 below.

Table 2.2: Qualitative Research Methods, Interviewing Method and Background of Respondents

Qualitative Research Method	Interviewing Method	No. of Respondents	Background and Experience
Pilot Interview	*Un-structured*	10	Procurement/Supply Chain Managers, researchers & staff from various oil and gas companies
Preliminary Interview	*Semi-structured*	15	Procurement/Supply Chain Managers from various oil and gas companies
Expert Interview (Case Study)	*Structured*	6	Selected (upon agreement) Procurement/Supply Chain Head/ Managers from major oil and gas companies
Total		31	

- *Pilot interview.* The pilot interview was conducted in the early stage of the research. This was done at an informal meeting while attending a seminar conducted by *LOGIC*, an industry initiative which was attended by managers, staffs and researchers from various oil and gas companies based in the UK. This exercise has become the key source of information about the industry as well as creating the groundwork for further research as to what are the current situation, trend and issues in the industry

pertaining to the research topic. Most of the participants attending this seminar are professionals with management and administration experiences and knowledge of procurement and supply chain in their respective companies. Although they came from various background and expertise from engineers to business and marketing managers, their knowledge about current issues and problems in the industry have proven to be very important and relevant as to where the research is heading.

- *Preliminary interview.* Based on the information gathered from the pilot study and initial reading, preliminary interviews were conducted. Semi structured interview questions were design to accommodate and address relevant and important issues about the research topic. It was done during two occasions; one at an international oil and gas conference and exhibitions and the other was conducted during a workshop on progressive partnership hosted by the industry major players. Respondents are chosen based on their willingness to participate in the interview and those only with procurement and supply chain knowledge and experience in the industry. Some of the key issues gathered from this interview have become the structure of the research methodology as to what are the most suitable approaches to be chosen for the research study.
- *Expert interview.* Expert interviews were conducted as the research objectives and methodology was clearly defined. Respondents were again chosen based on their willingness to participate in the study but more importantly they were carefully selected based on their current post, knowledge and experience on the subject matter from major and prominent oil and gas players. Interview questions were design to address more specific research issues while highlighting critical and important aspects

of the research study. Finding the right respondent who is willing to participate in the interview has always been a difficult task although every effort has been taken to get and pursue the best suited respondent for the interview.

- *Limited generalization capability*. The limited sample sizes and sampling methods used in qualitative research decreases their capability in generalizing the research outcomes/results. Within this research, the sample size includes ten in the pilot study, fifteen in the preliminary interviews and six case studies were conducted in the qualitative evaluation of the framework. The objective of the qualitative evaluation within this research was to provide an in-depth analysis of the framework from a varied sample to provide various points of view or perceptions. However, to supplement this, a broader sample was sought in the questionnaire survey which also complemented the qualitative research methods.
- *Subjectivity*. The strength of deeper understanding provided by qualitative methods is in itself a weakness as it limits the confidence in the results. In order to minimise the subjectivity in the data collection and analysis of the research, structured questions for the interviews was later utilized especially in the expert interview, although probing was used to explore issues further. The interviews were recorded, transcribed and documented for analysis. The analysis involved identifying and highlighting important points in pursuit of framework evaluation and general perceptions.
- *Lack of transparency*. The common argument about qualitative research was the process of collecting and analysing data is sometimes difficult to establish and thus, lacking in clarity. To minimise this limitation, data used in the qualitative research

method were compared, analysed and elaborated in as much detail as possible throughout this research.

2.6.1 Limitations of Quantitative Research Methods

In the process of pursuing quantitative research methods, there are a number of limitations and criticisms that needs to be addressed or minimised which will be discussed in the following points with reference to Table 2.3 below.

Table 2.3: Quantitative Research Methods, Questionnaire Method and Background of Respondents

Quantitative Research Method	Questionnaire Method	No. of Respondents	Background and Experience
Pilot Study	Semi-structured	7	Researchers and various professional disciplines from the industry
Questionnaire	Semi-structured	21	Procurement/Supply Chain Managers from various oil and gas companies
Guideline Validation	Structured	13	Procurement/Supply Chain Managers from various oil and gas companies
Total		41	

- *Pilot study.* Based on the draft questionnaire, a pilot study was conducted among fellow researchers and various professional disciplines in the industry to test the overall design, objectives and approach of the questionnaire. This was done in view to anticipate the perception of respondents towards the actual questionnaire.

- *Questionnaire.* Questionnaire survey was chosen as one of the method in the research study on the understanding that it could be easily designed and conducted within the parameters of the research questions and objectives. Although a pilot study was conducted prior to the distribution of the questionnaires, not much attention was given on the anticipated respond of the questionnaire survey until it was sent out. Only then it was realized that the method may not be that easy after all. Reminders through letters and emails were sent, telephone calls were made and constant follow up does not seem to have much effect on the number of respondents. The final course of action was to get hold of key procurement personnel in major oil and gas companies to represent their respective organisation in the survey. This can be seen on the final number of respondents in the survey.
- *Guideline validation.* The validation was conducted within the industry upon the completion of the proposed guideline and after getting feedbacks from a pilot test among researchers in the department. Questions were designed to gauge the usefulness of the guideline, its suitability and ease of use. Respondents were chosen from previous participants in the survey as well as respondents from new organisation. Again, although the responses were rather slow, the numbers are sufficient to draw a reasonable conclusion of the guideline.
- *Sampling limitations.* A sample by its nature cannot be identical to its population, and thus poses a limitation in terms of generalizing results and outcomes. This limitation, however, is of less extent in quantitative methods than in qualitative methods. Nevertheless, every effort has been made to acquire as many samples as possible in the survey which ended up with 21 responses. The justification for this number of

responses include: the small number of players in the industry; the limitations on the scope of research within certain region which in this case limited only to respondents based in the UK and Malaysia; and the availability and confidentiality of commercially sensitive data in the industry especially on procurement issues.

- *Non-response limitation.* The rate of non-response can affect how well the sample represents its population, and thus affects possible generalization of results. Numerous efforts and precaution were taken onboard in this task to maximise the response rate. However, having to deal with acquiring commercially sensitive data in an industry that has a small number of players can surely be an uphill task. Nevertheless, the response rate may not be ideal in this research but it represents players with the right experience and knowledge about the subject matter and their current and past involvements in various oil producing regions in the world.
- *Data collection errors.* Some limitations and errors are usually associated with how data is collected and documented. In certain cases for example, ambiguous questions or differences in understanding it may arise from different data collection methods or approach. To minimise such errors, all questions are designed to be precise but kept as simple as possible. A small pilot study was then conducted where the questionnaire was adjusted where necessary.
- *Data processing errors.* This problem was quite common when dealing with large amount of data that can lead to data processing errors. In this research, the collected data was coded and all entries were double checked through the data processing stage to minimise this type of errors and limitations.

2.7 SUMMARY OF CHAPTER 2

This research has been designed to adopt the hypothetico-deductive approach where a theoretical framework is developed and then empirically evaluated to confirm/modify it. At the same time, an empirical evaluation was conducted utilising the triangulated approach using both qualitative and quantitative techniques. The research methods were also identified based on the objectives of the relevant research stage and their sequencing was described in the research design. The research scope was overviewed, entailing the focus on specific companies within the oil and gas industry in the UK and Malaysia. The research process was initiated with a literature overview and preliminary interviews. A process for formulating the theoretical framework was then followed. Expert interviews for case study and questionnaire survey were conducted to confirm/modify the framework into a concept of an integrated framework. As a result, a proposed procurement strategy guideline on the selection process was developed. The proposed guideline was sent back to the industry for a validation and evaluation process by prominent players on the aspects of suitability, process, approach, major items and critical elements. Finally, the limitations of the research methods were identified and discussed, as well as appropriate actions taken to minimise them.

The following chapters will discussed all the relevant and important issues in the research process incorporating and utilising different research methodology approach as mentioned in this chapter.

CHAPTER 3: LITERATURE ISSUES ON CURRENT PROCUREMENT CHALLENGES WITHIN THE OIL AND GAS INDUSTRY

3.1 INTRODUCTION

This chapter discusses the formulation of theoretical framework needed in the research as mentioned in the research methodology in Chapter 2 and to study the underlying procurement theories based on current issues and problems in the industry. This will ensure that a sound theoretical framework can be achieved together with relevant inputs from Chapter 4 on preliminary interviews.

During the period of high oil and gas prices in the late 70's and early 80's, the operators (BP, Exxon, Shell etc.) were focused on ways and means of high volumes of oil and gas from the rich and easily accessible sources. In their rush for early oil production, there was a tendency to use construction techniques and equipment that were on the market at that particular time. Because of limited financial resources, early operators were more concerned with the capital cost of construction and equipment than running and operation with little attention given to long-term procurement strategies. This resulted in concern by the operators that some contractors had adopted a 'sell and forget' approach that resulted in a poor image of after-sales service. The operators were also facing the risk of plant and equipment failure, which could lead to a major operational shutdown and loss of production. This experience, together with the oil and gas price crash in 1986, led the operators to look at other innovative options in procurement approaches, which not only based on cost, time and quality but also shared risks and profit. Lessons on procurement,

including Design and Build/ Engineering, Procurement and Construction, Partnering/Alliancing/Joint Ventures and Performance-Based contracts from other industries were tested but with mixed outcomes.

The oil and gas industry has always made a major impact to the world and UK's national and local economies. According to the UKOOA (2003) Report, the UK economy alone has benefited from £190 billion (2002) in taxes since extraction began in the mid-1960's. Less productive and smaller oilfields are also being given a new breath of life through innovative technological plant and equipment, and more economic management approaches such as joint venture exploration with shared risks. However, there has been insufficient development away from traditional approaches in procurement, with most of the procurement systems being mere carbon copies from other industries. According to Pedwell *et al.* (1998), this is probably due to the fact that there are relatively few players, that are project initiators (clients/owners) and implementers (contractors) in the industry. Furthermore, clients/owners have been found to have a wide variety of method for selecting contractors.

The oil and gas exploration and production in developing countries is a highly risky business in a very complicated industry. It links government, owners of the natural resources with operators, investors of private capital, technology and equipment necessary for resource development, in a single sector where the stakes and risks, as well as the possible profit margins, can be very high. For example, the oil and gas industry has for some time become one of the main contributors to the rising Malaysian economy and

an excellent source of foreign exchange revenue. Sidhu (2003) reported that Petroleum Nasional, (Petronas) the government backed oil and gas operator, have secured a production sharing contract worth RM10.41 billion (GBP 1.7 billion) according to their financial year report which ended 31 March, 2003. They have also managed to earn a sum of RM31.91 billion (GBP 5.2 billion) through oil, gas and petroleum products export in the year 2002 and forecast an increase in revenue for this year.

Although there are new technological breakthroughs in exploration and production especially after the oil and gas price crash in the late 80's, there has been little development from the traditional to the latest approaches in procurement where most of the methods used were a carbon copy from other industries' experiences. According to Wright (1996), the main instruments in restructuring the industry has been technological improvement, cost reducing initiatives such as CRINE (Cost Reduction In the New Era) and revised procurement strategies such as alliancing/partnering and leasing.

The construction industry encompasses many sectors, which includes building, civil, mechanical, electrical and heavy engineering. The oil and gas industry, however, places greater reliance on other specialist disciplines or sectors such as geology, maritime and drilling. The oil and gas industry is different in nature to construction industry although the typical stages of a project are design, construction, operation, maintenance and decommissioning. For example, in the oil and gas industry, during the operation stage, focus would be on the actual production of oil and gas for profit as the main income stream, whereas, in the construction industry, the focus would be on how the completed

project is being used to provide a service or product. When compared to construction, most projects in the oil and gas industry have:

- higher capital/investment cost;
- higher levels of uncertainty/risk due to the exploratory nature;
- higher technology and more heavy engineering work;
- increase spasmodic delivery/supply schedule;
- larger scale/magnitude of projects; and
- larger number of engineering disciplines from exploration to first oil and production to decommissioning.

During the literature search, most of the papers found were either technological, economics or strategic planning based but also included aspects of procurement and contracts. Little appears to have been written on this 'softer issues' of procurement methods/strategies in an industry that generates billions of dollars per day in revenue. This could be due to the complexity and nature of the industry itself.

3.2 DEFINITIONS

3.2.1 Procurement

According to the reference made to Bloomsbury (1994), procure simply means "*to obtain, purchase or come into possession of something*", whereas for procurement, he described it as the act of obtaining or purchasing. Broome (2002) described procurement as "*in construction term, how you go about buying and maintaining a construction*

asset". Ukalkar (2000) went further in defining procurement as "*the means by which a company acquires needed products, services and resources to produce its own products and services*". Lester and Benning (1989) described procurement in context of the process industry as a term given to "*the series of operations concerned with purchasing, expediting, inspecting and shipping materials, equipment or other goods for use by the purchaser*". However, a definition according to Craig (1999) which was developed by the International Council for Building under its Working Commissions W92 (CIB W92) defined procurement in context of building and construction as " *...the framework within which construction is brought about, acquired or obtained*". McEwen (2004) further explained that apart from to obtain, purchase or acquire, "*the word procurement may also imply that great care is taken to identify precisely what is required and then making every effort to obtain a suitable product that fully meets what is required*".

3.2.2 Procurement Method

Procurement method can be defined based on the definitions above as the type of approach/route used to acquire, obtain or purchase suitable products, services and resources required by a company. However, for this research study and in its context of the oil and gas industry, procurement method is defined as an approach required to acquire the design, material, labour, services, installation and commissioning inputs for a successful completion of a project.

Procurement method can be seen to be used on two distinct occasions. As a player in the industry, usually you are either:

- to be procured/being procured, as in the case of a contractor being procured by the client or a sub-contractor/supplier being procured by the contractor or a supplier being procured by the subcontractor (also described as an upstream relationship); or
- to procure/procuring, as in the case of a client to procure a contractor or a contractor to procure a sub-contractor/supplier or a subcontractor to procure a supplier in a project (also described as a downstream relationship).

3.2.3 Procurement Strategy

Strategy in the military context means generalship or manageability in a war. Ukalkar (2000) described strategy as *"an integrated pattern of decisions made and subsequent actions taken to reach specified goals"*. He added that strategy must be *"expressed in terms of both the intent (i.e. goals or objectives) and means, i.e. actions to be undertaken"*. Procurement strategy or strategic procurement approaches according to Lamming and Cox (1997) is *"the development of an external sourcing and supply strategy which links the total business plan of an organisation (public or private) so as to maintain a sustainable position for that organisation in the total value chain"*. Ukalkar (2000) shared the same view but also added that it is also *"a collective pattern of coordinated decisions that act upon the formulation, reformation and deployment of procurement resources to provide support to the overall strategic initiative directed towards achieving the company's vision"*. However, in context of this research, procurement strategy is termed as new approaches to acquire the design, material, labour, services, installation and commissioning inputs for a successful completion of a project which links to the business plan of an organization/company. This is to maintain a

sustainable position for that organization/company within the total chain of the industry, which determines the success or survival of that organization/company.

3.3 OVERVIEW OF THE OIL AND GAS INDUSTRY

3.3.1 Introduction

One of the key issues mentioned on research methodology in Chapter 2 with regard to this research was the nature of the oil and gas industry. Being in the situation where oil and gas are the most sought after commodity in the world today has brought the industry into the limelight and becoming the most sensitive industry in the modern world today. It can be critical to national economic strategies and crucial to international politics. Oil and gas exploration and production is a unique business in a complex industry. It links governments (owners of the natural resources) and companies, (investors of private capital who will provide the expertise, technology and equipment necessary for resource development) in a single sector where the stakes and risks as well as the possible profit margins can be very high (Gao 1994).

Since the emergence of the modern oil and gas industry at the turn of the 20th century, oil and gas exploration and production have been controlled by multinational companies rather than the countries themselves because the latter lacked the capital and expertise necessary for the extraction of the resources. However, this was soon changed as the oil producing countries have begun to realise that they needed some form of control and capability to balance the role of multinational companies and therefore the birth of

national oil companies (NOCs). Some of these NOCs who have been working hand in hand with multinational companies in order to learn the trade, business and technology in the past have even prospered and started their expansion to other regions as well. In short, the oil and gas industry has always been prone to changes in the form of economics (oil and gas prices), technology, management, risk, market polarisation, cultural, oil company's specialisation and project timescale (Wright 1996).

There are many factors that can contribute to the changes in the industry. It can be within the oil company itself through changes in business philosophy, mission, vision and organisational structure. Governments have been known to change not just politically but also on imposing new regulations, tax regime, tariffs and even exploration licenses. External changes may be due to maturity of regions, hostile working conditions and multi cultural complexities of host countries. These factors may not only influence the decisions of players in the industry but their impact can also be disastrous and costly.

Therefore, in order to understand the complexity and unique features that lie deep within the industry, it is necessary and important to understand the basic fundamentals and nature of the industry itself. This chapter will attempt to disclose some of the important aspects of the industry that seem to be quite exclusive only to the small number of players around the world.

3.3.2 Brief History and Background of the Oil and Gas Industry

The centres of oil and gas exploration and production success around the world have varied through history. The modern oil and gas/petroleum industry is generally considered to have started with James Williams hand dug oil well in Southwestern Ontario in 1858 followed by the drilling of the Drake well in Pennsylvania the following year (Seba 2002). Some of the early work in Indonesia led to the birth of Shell's great worldwide petroleum empire. By 1938, just before the outbreak of World War II, Venezuela had become the largest producer of crude oil outside of the US and Russia. The first allocation of petroleum production licenses given by the UK government was back in January 1, 1964 for 74 licenses blocks in the North Sea to Shell/Esso (Shell 2003). However, the world's largest concentration of crude oil reserves lies in the Middle East.

The decade following the World War II has sometimes been referred to as the "ten golden years" of the oil and gas industry. Through this golden era, the international oil business was pretty much dominated by the "Seven Sisters" multinational oil companies which include British Petroleum (BP), Chevron, Exxon, Gulf (now Chevron), Mobil, Royal Dutch/Shell and Texaco (Seba 2002). Among their main principal objectives are to:

- maximise and expedite economic returns;
- receive reasonable return for degree of risk undertaken;
- minimise period during which investment capital is at risk i.e. payback period;
- ensure repatriation of funds and export of crude oil entitlement;

- retain ownership of the project and consequent claim on its profit;
- retain operating control to assure production economics;
- avoid creating precedent in contract terms that the company may wish to avoid in other countries;
- maintain global standards, efficiency and reputation;
- develop overseas managers; and
- balance worldwide crude oil supplies and increase oil reserves.

During the decades of the 70's, most oil producing countries in the world had established national or government oil companies (NOC) which espouse three principal objectives on behalf of their respective governments (Seba 2002). These are

- to reduce dependence on the multinational oil companies for their oil supplies;
- to provide governments with an "inside window" on the oil and gas industry to enable its bureaucracy to judge the performance of the multinationals within the specific country; and
- to assure continuity of supply at the crude oil producing, refining and marketing stages at home can be monitored.

Among the well known and best established NOC's are Petrobas of Brazil, Petro-Canada, CNPC of China, Statoil of Norway, Pertamina of Indonesia and Petronas of Malaysia. PDVSA of Venezuela's crisis as mentioned by Coronel (2003) was a sad case for a NOC that has been doing so well for so many years but due to mismanagement, suffered a heavy loss almost to the brink of bankruptcy.

The establishment of the Organisation of Petroleum Exporting Companies (OPEC) in 1960 by five founding member countries of Saudi Arabia, Iran, Venezuela, Iraq and Kuwait (which now stand at eleven member countries) was in protest against the Seven Sisters move to reduce posted prices for a number of exporting countries. Since 1982, OPEC has set quotas for its member's production in an effort to support a minimum world crude oil price.

3.3.3 Factors Differentiating the Oil and Gas Industry from Other Types of Business

It is important to understand the economic fundamentals of the oil and gas exploration and production as to how and why the entire industry from the oilfield's well to service station, is quite unique and differs from every other type of commercial enterprise. According to Seba (2002), the distinctive features of the oil and gas industry are as follows.

- It is an extractive industry – in extractive industries, where substantial royalties may exist, the royalty owner shares in any revenue while the owners working interest (i.e. operator) pay all cost and investment and share only in the net income after royalty, costs and investments. Producing equipment and assets are normally plugged and abandoned when the operator's net income from declining production no longer pays the cost of the operation. Thus an abnormally high royalty will force an earlier abandonment of the producing stream.
- It is a risky industry – participants in the oil and gas business may wish to reduce their interest in one venture in order to participate in others as a means of spreading

their risk. This is very similar to the insurance business where the carrier of a substantial policy will often "lay off a portion of the risk" by disposing part of his ownership to others.

- Petroleum producing wells may yield a variety of commercial streams – these include crude oil, casing head gas, natural gas, condensates, natural gas liquids and sulfur, all of which must be disposed of currently, commercially and within the limits of international standards and law.
- Petroleum may be produced from a number of separate sources or strata which underlying the same tract of mineral ownership – the ownership and Division of Interest may vary with different sources.
- It is an extremely capital intensive industry – looking across the whole industry from exploration to marketing, the single most important factor which distinguishes the oil and gas business from all others is its capital intensity. This capital intensity and the resulting high fixed costs and low variable or per barrel operating costs involves all phases of the industry from exploration through to marketing.
- Operating costs do not diminish appreciably with reduced throughput- one of the first effects of this capital intensive production investment is that you do not save any money by running it at a reduced capacity, so one is prompted to operate production at full volume. A similar situation exists throughout other segments of the industry as a direct result of a capital intensive nature of the business for example in transporting of liquid and gaseous petroleum by pipeline to ensure continuous full volume and safe delivery.

- The oil and gas business is comprised of a series of distinctive activities, phases or segments which include explorations, production, refining, transport and marketing.
- Exploration is the most economically and physically risk-prone of the segments – the upstream segment of the oil business involves geological risk where some development wells are dry holes. Geological risk, along with the industry's capital intensity represents the principle reasons for the surviving major oil companies being so large.
- The profitability of the several individual segments of the industry varies substantially and periodically, one from another – one rationalization of the variation in profitability among the segments is the time required to establish a successful operation in each individual activity, e.g. 10-15 years required to find and develop new oil production, 10 years to develop a substantial production marketing base but only 2 years to build an oil refinery.
- The principle assets of an oil company are usually its reserves in the ground of crude oil and natural gas. If these were acquired as the result of the company's own exploration effort, they do not show as an asset on the firm's balance sheet – standard business accounting methods seems unable to cope with this all important aspect.
- The oil business is the enigma of Wall Street – crude oil prices vary in a cyclic pattern which does not seems to match the general economic cycle. Variations in corporate financial performance per quarter which are such a mainstay of security analysis in most industries have little meaning to the oil and gas industry. Income from new capital expenditures in the upstream sector will take many years to achieve.

Cash flow per share replaces earning per share (EPS) as the best gauge of current financial performance of an oil company.

- The oil business is not self regulating – throughout its 140 years history, it has been susceptible to significant outside political and mercantile control. The number of competitors in the business had apparently little effect on the overall supply/demand of petroleum. There has always been a potential oversupply of both crude oil and natural gas, until recently.
- There are two ways of optimizing the Operations of the combined industrial segments which one company may control – alternate methods of optimizing cash flow may involved volume or margin, but not both as the OPEC keeps learning. The single exception would be Saudi Arabia whose reserves are so large and operating cost are so low that it may do either and effectively (barring political intervention) wipe out all of its crude oil producing competitors and take over to supply the world from its own sources for a long period of time.
- The industry is probably the most heavily taxed of all commercial enterprise – the petroleum, natural gas and petrochemical sectors of the industry have been a prime objective of the taxing authorities around the world almost since the industry began. One reason for this was the overall financial figures of the industry and its major players tend to be so tremendous in the eyes of the general public which they obviously think that the industry can and should afford to pay a lion's share of the cost of government.

3.3.4 The Nature and Complexity of the Oil and Gas Industry

3.3.4.1 Development of an Oil and Gas Field

A typical oil and gas field will go through several stages/phases during its lifetime, from initial discovery (first oil) to the final decommissioning and abandonment. The typical phases in developing an oil and gas field according to Wright (1997) as in Figure 3.1 are:

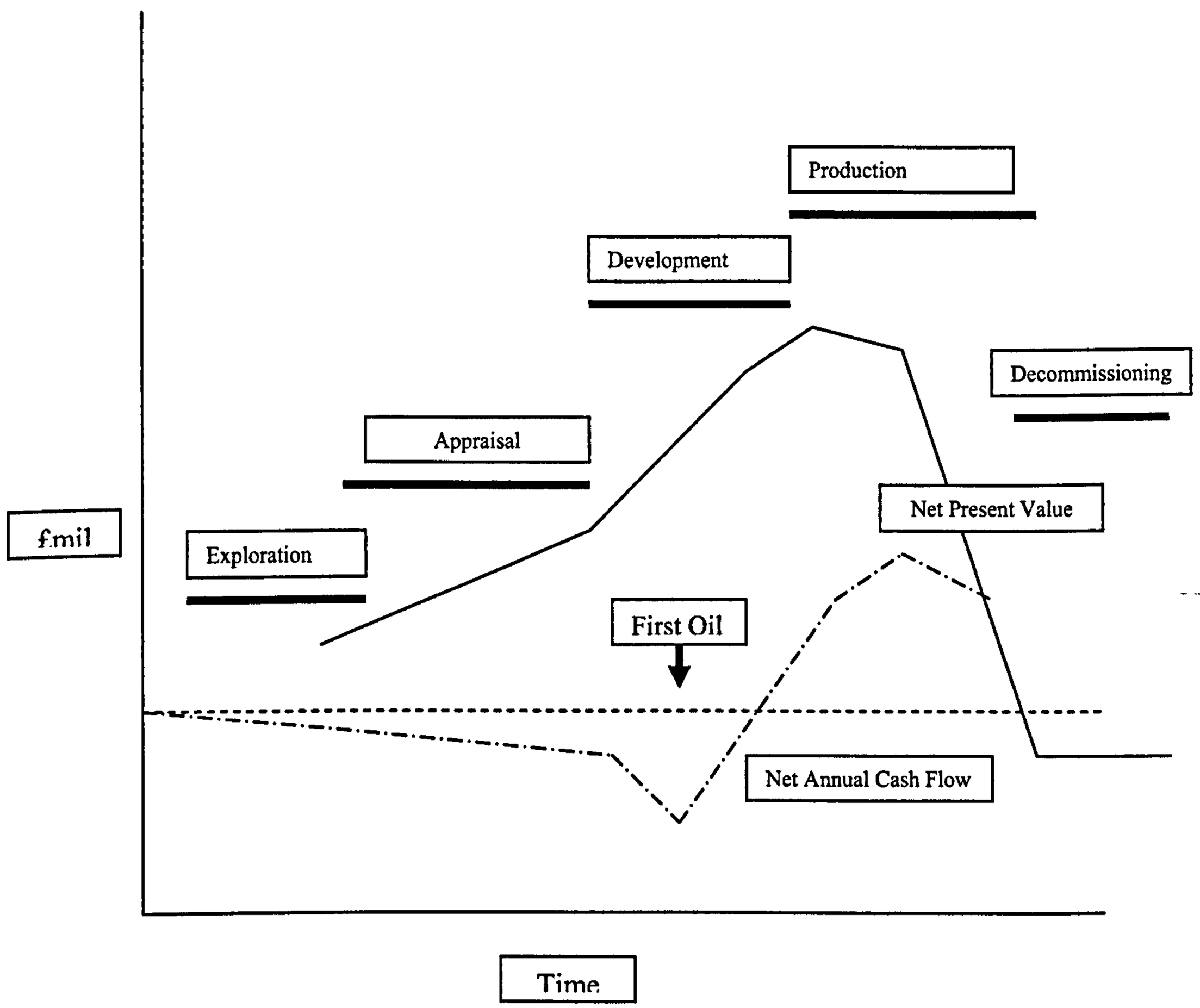

Figure 3.1: Typical Phases in the Development of an Oil/Gas Field (Wright 1996)

- **Exploration**

The life cycle of a typical oil/gas field begins with oil companies (operators) apply for licenses from the government to explore for hydrocarbons within designated onshore or offshore blocks. As the operator of the field, this company or companies will be responsible for managing the exploration phase and subsequent development including: the construction process for whatever production facilities are deemed appropriate; and the day to day running of the field once it is on stream. They will also have to provide their share of the necessary capital expenditure (capex) and the annual operating expenditure (opex).

In the first instance, seismic surveys will be undertaken to identify possible accumulations of hydrocarbons or prospects. Once a prospect is identified, the company will employ a mobile drilling rig for explorations phase. Drilling will be able to confirm the presence of any hydrocarbons under the ground.

- **Appraisal**

Once a significant discovery of oil/gas is made, the operator will perform further seismic surveys or appraisal drilling or both to ascertain the major characteristics of the field and confirm its commercial viability. At the same time, a series of detailed engineering studies will be commission to determine the most economical way to proceed with the development. Production facilities must be design to treat the hydrocarbons on site before transporting them economically to processing plants or storage facilities. Therefore, in the engineering feasibility studies, three important factors are put into consideration: the

primary process plant to produce stabilized crude or marketable gas or both; the type of facility necessary to support the process plant (this may be a fixed platform (onshore/offshore), a floating vessel or perhaps a subsea facility); and evacuation options for the oil and gas (i.e. pipeline or offshore loading or both to a shuttle tanker or onshore storage tank. The duration of the appraisal phase will depends on the complexity, design of facilities and size of the field.

- **Development**

Only when the operator has agreed to proceed and has sanctioned the project, they will apply to the government for a license to install permanent production facilities onshore or offshore. Simultaneously, the engineering contractor will start to perform conceptual and construction design as soon as possible thereafter. Again, timescales can be as quickly as three months but can also be extended for years depending on the complexity and foreseeable problems and risks of the project. There are three stages in the development phase comprising:

a. Construction

Construction/fabrication of the permanent production facilities will normally be undertaken in a fabrication yard. For onshore facilities, fabrication yards are usually placed close to the site to ease the transportation and installation of the large and heavy structures. For offshore production facilities, fabrication yards are usually located near a quayside or dock for easy access and transportation to their offshore locations. Fabrications involves the assembly and welding together of large steel components which typically include large diameter tubes, plate girders, stiffened plates and complex nodes.

The fabrication phase not only involves the assembly of the steelwork but also fitting out the completed units with the necessary equipment, electrical wiring, instrumentation and pipework. Timescales for the fabrication phase will vary depending on the size and design of the structures.

b. Installation

Once the structures are completed, they will be transported to the site in the oilfield. For onshore installation, large cranes or heavy lifting equipments and vehicles are used to transfer the completed structure to the desired location. As for offshore installation, the complicated and time consuming process of transporting and installing the permanent production facilities will begin. These activities are typically managed and performed by specialized installation contractors. It should also be noted that installation has become far less weather dependent due to the advances in crane vessel control and the reduced weight of permanent production facilities required nowadays.

c. Hook up

The next and final stage of the development phase before oil/gas production begins is what is termed as hook up. The hook up contractor is responsible for completing those items of construction that can only be completed on site either onshore or offshore including the commissioning of the facilities and utilities (i.e. electrical power, water, etc) and process systems. This critical work should preferably be finished as quickly as possible owing to the extremely high costs and risks of maintaining the resources and hook up equipment and facilities especially for offshore installations.

- **Production**

The longest phase of a field's life is that of production, which can range from two to perhaps forty years. During this period, the operating costs can easily match or exceed those expended during the development phase. It is therefore obvious that operators are eager to reduce these costs and squeeze the maximum output from the reservoir consistent with safety and long-term integrity of the facilities. Apart from the costs of operating the process systems and maintaining the wells, expenditure will be required on a wide range of other activities such as subsea (for offshore) and surface (for onshore) inspection, structural repairs, painting, equipment/machinery periodical servicing and wear and tear parts replacement. All these services are usually provided by operations and maintenance contractors, under what is commonly known as maintenance and modification services contract (MMSC) which may be awarded for periods of up to five years. During this period, the contractor will become responsible for providing all maintenance services to a particular platform or operator via a pre-agreed schedule of rates with a minimum guaranteed base workload.

The beginning of the production phase is also known as the end of upstream and the start of the downstream activities in the industry. Downstream activities usually involve the refinery of oil and gas for end users and the petrochemical processing of petroleum by-products. This will also involves the specialist design, construction, installation and commissioning of these special facilities and equipments before the actual production can take place.

- **Decommissioning**

An operator will normally seek permission from relevant authorities to decommission or abandon a platform either onshore or offshore once the net present value (NPV) of future cash flows becomes negative or the daily operating costs exceed the income from product sales. However, there are mitigating circumstances where partners, being the owners of a valuable piece of ex-production facility real estate are likely to delay final abandonment in the case there are other recent discoveries in the vicinity. Pressure groups such as the Greenpeace movement will also pose a great heartache to operators as proven in the much publicized Brent Spar platform decommissioning case in the 90's in the North Sea.

3.3.4.2 Overview of the UK Continental Shelf (UKCS)/ UK North Sea Region

After more than 40 years, the North Sea is now a mature basin and the production is slowly and gradually declining. Most of the giant oil fields discovered to date are in the tail end of production while exploration activities are at the level equivalent to the late 1960's. The fields of the UKCS are estimated to hold an average of 30 Billion barrels of oil equivalent (bboe) reserves, only one tenth of those discovered in the 70's (PILOT 2002). These reserves lie deeper in more complex geologies with poor reservoir properties apart from being further away from the existing infrastructure facilities. Current developments are also hampered by ever-increasing commercial complexity whereby each new opportunity usually involves many partners with potentially different interest and also cost escalation. In simple terms, if the UK oil and gas industry does not address these issues accordingly, they will not be in the position to maximise recovery of the significant quantities of hydrocarbons that remain. Some companies according to

Howorth (2003) are struggling to meet targets even though oil prices have been high. This struggle will be tougher if oil and gas prices fall, particularly for companies with significant production from relatively high-cost basin with modest returns such as the UK North Sea.

It is also important that the industry in the UK must put a continuous effort to maintain and contribute to the health and well being of the local business environment in terms of investment, jobs and national energy requirements. In order to achieve this, the industry must: continue to innovate in all areas; to focus on value as well as cost; improving the style of working; and improving the commercial relationships between players, i.e. between operators and contractors and contractor with suppliers (PILOT 2002). In its 2003 Activity Survey, UK Offshore Operators Association (UKOOA 2004) with its 30 strong members suggested that to remain globally attractive and regionally strong, combined efforts between the industry, the supply chain and the government must be in placed through:

- sharing of best practices and embracing of new business models;
- improved application of technology whilst reducing development and operating costs;
- containing the increasing regulatory pressures; and
- appropriate fiscal incentives.

PILOT (2002) has pointed out that the relatively high unit operating and development costs in the UKCS means there is a fierce global competition from international opportunities which is challenging operators, contractors and suppliers in attracting

capital funds, human resources and key equipment. Players in the UKCS must decide if current commercial processes involving lengthy complex procurement practices are fit for purpose for the smaller and low production future of the UKCS.

According to Bakhtiari (2003), the global diminishing output from a highly secure and reliable region such as the North Sea which accounted for some 92% of Europe domestic oil production, cannot fail to have momentous consequences. He added that first and foremost, it will lead to a ramp up of imports and resulting in a heightened dependence on the former Soviet Union and the Middle East whilst creating competition with other customers such as the US, Japan and China. The transition from being an oil exporter to being a net oil importer after more than three decades of exports will prove most difficult for the UK where according to present projection should switch in the year 2005. However, due to openings and production of new oilfields in the North Sea and Irish Sea, this projection has been extended to a slightly later date.

3.3.4.3 Overview of the South China Sea (SCS) Region and Malaysia

On the other side of the globe, major oil producing countries in the South China Sea (SCS) region comprising China, Indonesia, and Malaysia which were ranked the world's top 25 oil producers together with Brunei and Australia, accounted for more than 36 billion barrels in proven reserves in the Brown fields with more expected to be found in the future (Kamiso 2004). However, Asia in general could face energy supply constraints in view of the region's fast economic growth, particularly in China.

To meet its domestic demand, China which currently imports up to one-third of its oil, uses 5.36 million barrels of oil per day according to a research conducted by PM Network (2003). They added that with a hungry appetite for consumption as well as growth, by 2025 China could import up to two-third, when consumption is expected to reach 10.9 million barrel of oil per day. That is why currently Chinese companies through its NOC are quite aggressive looking for upstream oil assets not only within its borders but across neighbouring countries and regions. As part of the intensifying competition for energy resources, China is looking to develop Iran's Azadegan oilfield with a joint venture with Russia. This together with the extensive exploration for oil and gas in the South China Sea region by the NOC will hopefully help to reduce its dependency on other regions' productions and trying to meet the country domestic demand for energy resources.

Malaysia, being one of the prominent players in the South China Sea (SCS) region was not being spared with the knock-on effects of the current rise in operational and production costs in the region. However, Petronas, an integrated oil and gas company wholly owned by the Malaysian government with assets worth more than RM239 billion /£34 billion (as at March 31, 2005), believed that the rising costs of exploration and production to more than 50% over the past two years have made no immediate impact on their profits (Adnan 2006). They were able to mitigate the rising cost through long-term contracts for drilling oil rigs, which were anticipated well ahead of the price increased. Currently its production of 720,000 barrels of oil equivalent per day (boepd) and 5.5 billion cu ft of natural gas per day will not be affected but the increased in capital expenditure and the capacity shortage in contracting services would result in the

deferment and delays of some projects. Currently it has 30 drilling rigs in the SCS with more to come especially with the recovery of the Kikih oilfield offshore Sabah which is Malaysia's first deepwater development where recoverable reserves are estimated to be around 400 million to 700 million barrels.

3.3.5 Current Issues in the Oil and Gas Industry

3.3.5.1 General Issues

Competition for exploration and production funds is consistently fierce within an operating company. These multinational companies with the usual international portfolio to manage, will closely examine the prospectivity, operating conditions, fiscal terms and political stability of each of the world basins and reserves when determining their global investment strategies. At the same time, greater stock market focus on profits and shareholder value has put pressure on the corporate capital expenditure forcing structural changes within the industry. According to Hannon et al. (2003), there are critical elements that the industry should look at:

- behaviour of business trends;
- complexity of commercial arrangements;
- business culture and practices;
- perception of risk versus reward (companies, staff etc.);
- technology advancement;
- government policy/resources;
- fit for purpose regulation and legislation (including cost of regulation);

- competition versus collaboration;
- leveling the competitive playing field to allow markets to work efficiently; and
- operator/contractor's role to develop new procurement strategies, sharing risk and reward i.e. profit margin versus the need to sustain and develop business.

3.3.5.2 Procurement/Supply Chain Innovation and Issues

New procurement innovation and cooperation models are emerging between client and contractor, for example, the development of incentive schemes approach that secures the commitment of the main contractors to the overall economy of each project which will bring huge benefits to the client under current economic situation (Moum and Laskemoen 1993).

Offshore oilfield development is also associated with various types of technical uncertainties, i.e., reservoir-related, field-development-related (e.g., cost and schedule overruns), and operations-related. Combined with economic and technical assessments, using an advanced life cycle performance approach through simulation model will provide decision support when a production system is optimized. This includes taking into account the effects of reliability, maintenance and operations on the production stream (Ostebo 1993). He added that there are potential savings in capital and operating expenditures if an effective and systematic reliability analysis method could be integrated into these evaluations.

According to Kusaka et al (1997), in 1996, BP Exploration has developed a new perforating method using a new large-bore mechanical valve called the Formation Isolation Valve (FIV) tool. The development of the FIV tool was made possible by a new operator/contractor relationship through an alliancing procurement method. The provision of this new procurement approach has allowed the integration of the operator and contractor project teams and the setting of common goals which have changed the way servicing companies traditionally develop new technologies.

BP has also decided to explore a departure from its standard business strategies i.e. competitive bidding and traditional risk allocation approaches that generally resulted in mistrust and conflict between the contracting parties (Sakal 2005). They also realised that a radical change in behaviour was necessary to achieve a more effective procurement method. Therefore, to achieve this, a "painshare-gainshare" compensation programme was introduced into their Project Alliancing contract which involves complete open-book accounting, sharing all "uninsurable" risks between all project members and setting an initial target cost generated by the whole project team. With the successful and incredibly good results that they achieved with the new innovative procurement approach which was put on trial in the Andrew Oilfield, BP has continued to use the approach as a means to compete with and differentiate itself from its competitors (Sakal 2005).

According to PILOT (2002), improvements in procurement/supply chain approaches especially in the tender bidding process could lead to tangible cost savings. For example, a normal bid tender preparation process will cost an average drilling contractor £20,000

to complete. If there are 40 rigs on the UKCS, each can drill 6 wells per year. Of the resulting 240 wells, approximately 160 will be tendered. Most of these bids will go out to an average of seven drilling contractors. Therefore:

Cost to drilling contractors – 160 x 7 x £20,000 = £22.4 million per year

Cost to operators: assuming about 60% of the above = £13.4 million per year

Total cost to submit/evaluate tenders = £35.8 million per year

3.4 CONVENTIONAL VERSUS INNOVATIVE PROCUREMENT APPROACH

3.4.1 Current Procurement Practices in the Oil and Gas Industry

In comparison to the construction industry, the oil and gas industry involves relatively few major players, i.e. project initiators (clients/owners) and implementers (contractors). However, the existence of few owners and few engineering/contracting organizations, in Pedwell's *et al.* (1998) opinion, has still created an environment in which a considerable number of formal and informal relationships are formed between parties. The quality of these relationship and mutual dependencies directly affects total project costs and the risks associated with the outcomes of formal contracts. Pedwell *et al.* (1998) again reiterated that procurement methods or techniques may differ from one country or from one region to another, consequently this lack of standard procedures for procurement in

the oil and gas industry results in too few guidelines (or constraints) on the owner's selection of the procurement method to be used or contractor selected.

3.4.1.1 Conventional Approaches

According to Pedwell *et al.* (1998) and Huse (2002), the most common types of procurement methods used by the oil and gas industry are:

- Lump Sum;
- Cost Plus;
- Unit Price;
- Engineering, Procurement and Construction (EPC)/Turnkey; and
- Service Type.

Conventional cost or unit price-based methods of procurement, such as Lump Sum or unit price, stress capital cost and price competition between contractor's proposals that meet the minimum requirements stated in the tender. This approach as cited by Gransberg and Ellicot (1997), has several obvious advantages:

- a simplified, though time consuming, tender preparation and report;
- a simplified selection process in which the lowest responsive, responsible offer wins; and
- it is difficult to protest as the aggrieved must show how the process is flawed since the lowest tender is readily apparent.

Conversely, Gransberg and Ellicot (1997) stressed that the disadvantages of this approach include the following:

- it makes a selection based only on initial price or capital cost which could be too risky for a complex and exploratory oil and gas industry;
- it assumes perfect (unambiguous) plans and specifications which, in the oil and gas industry, is frequently not the case;
- it assumes that the minimum requirements meet the client's needs and that exceeding minimum standards does not enhance the project; and
- the process may have the tendency to select a contractor with the lowest bid but at the end of the day may not be able to deliver.

Under the cost plus approach, the client pays the contractor for costs incurred plus a predetermined margin of profit. The margin or fee can be fixed, fluctuating or determined as a percentage of actual costs. This type of approach may create no incentive to work economically or rapidly, since, for example, the greater the cost, the greater the profit, irrespective of progress. However, in order to compensate for this lack of incentive, the client may include an incentive mechanism as part of the pricing provisions of the contract (Gao, 1994).

In the case of EPC or turnkey approach, Huse (2002) stated that the contractor is entirely responsible for both the design and construction of the work. The client, at the end of the day, receives a completed project in accordance with his performance specifications. As far as the performance and quality of the works are concerned, he needs to look no further than the contractor. Yeo and Ning (2002) outlined the number of challenges faced by EPC projects such as:

- interdependence of activities;
- phase overlaps;
- work fragmentation;
- complex organizational structure; and
- uncertainty in accurate prediction of desired outcomes.

Similarly, as in the case of Lump Sum, the contractor will only be paid according to the agreed price at the beginning of the project. This type of contract may prove to be too risky in an oil and gas environment as experienced by Halliburton (2002). In their press release statement, Halliburton (2002) announced that they will no longer pursue EPC contracts for their offshore oil and gas industry where it is required to make a Lump Sum, fixed price commitments. They also added that their decision to exit this sector of the business stems from the growing imbalance in the risk and reward available on these offshore EPC projects.

The exploration for and exploitation of hydrocarbons involves a wide range of inter-related activities. It is therefore common to find a contractor or supplier entering into contracts with third party contracts for various services (Wilkinson 1998). The service type approach acts as a support element to the major procurement method and is widely used as and when necessary during the construction, operation and maintenance stages of an oil and gas fields. The services to be provided by a third party can vary based on location, type and purpose. This can range from procurement for drilling works, supply for standby vessel, seismic acquisition, maintenance and engineering works to the

provision of food supplies and spare parts for equipments and plants to the oil and gas fields. This service type approach usually involves competitive tendering based on the lowest bidder. It can be effective in driving down the price of services to be provided but drives up clients' internal costs in the tendering process and may also prevent suppliers from achieving sufficient profit.

3.4.1.2 Innovative Approaches

Like many mature industries, costs, prices and investment are reducing and driving the industry towards greater efficiency. In the oil and gas industry, in particular, exploration and production activities are no longer in the position where it is good enough to "get it done at any price", as financial realities prevail. Fortunately, a fair deal of commercial and technological development has taken place, giving the industry opportunities to continue to provide cost effective solutions to their rising operational costs based on other industries experiences. Among the innovative approaches used were:

- Partnering/Alliancing/Joint venture (Wright, 1996);
- Performance-based (Kashiwagi and Al-Sharmani, 1997; Kumaraswamy and Dulaimi, 2001);
- Supply chain management (Yeo and Ning, 2002; Lamming and Cox, 1997));
- Risk management (IQPC Oil and Gas, 2003; Broome, 2002);
- Incentive schemes (ECI Report 2003; Broome, 2002);
- Leasing (Wright, 1996); and
- Contract to produce. (Wright, 1996).

Partnering/alliancing/joint ventures have as many definitions as there are partnering agreements. According to Henry (1992), partnering can be defined as a contractual arrangement in which a client and a contractor/supplier agree to work closely together to the increased benefit of both. According to the CIOB (2003), *"In broad terms, partnering teams agree mutual objectives that take account of the interests of all the parties; establish co-operative methods of decision making including procedures for resolving problems quickly; and identify actions to achieve specific improvements to normal performance"*. To be more precise as in Percival, *et al.* (1992) and Wright, (1996) partnering is seen as a relationship where:

- both parties see Win-Win solutions;
- value is placed on long-term relationships;
- trust and openness are norms;
- an environment for profit exists;
- both parties are encouraged to openly address any problems;
- both understand that neither benefits from exploitation of the other;
- innovation is encouraged; and
- each partner is aware of the other's needs, concerns and objectives, and is interested in helping their partner to achieve such.

Ukalkar, (2000) stresses that partnering provides a platform that could help trigger continuous improvement in projects and accumulate benefits by:

- providing a framework that ties efforts together;
- providing a vehicle for identifying best practices;

- providing a structure for sharing knowledge and learning the methods and techniques which partners can use to make improvements;
- allowing employees of both companies to speak the same language regarding goals;
- fostering teamwork across the company; providing the ability to accelerate continuous improvements; and
- enabling partners to effectively manage change and sustain continuous improvement.

However, as in any new approach, partnering does have some drawbacks and there have been failures. According to Percival, *et al.* (1992), this is probably due to:

- a lack of understanding of each other's core values and its importance;
- a lack of vision of a long-term relationship coupled with lack of commitment to espouse them;
- unclear roles and responsibilities and alignment to common goals; and
- failure of creating trust between parties.

The performance-based approach includes the following characteristics: (Kashiwagi and Al-Sharmani, 1997; and Kumaraswamy and Dulaimi, 2001)

- it does not require pre-qualification;
- it awards a project on the best available price and performance in a one-step, competitive bid procurement;
- it motivates a contractor to continuously improve;
- it selects the best available contractor for the best price for each unique requirement as defined by the client whereby the selection is based on documented and verified performance;

- it allows all innovative solutions to be compared and the comparison is based on proven and documented performance;
- it identifies the best price for different levels of construction performance; and
- it allows the client to procure a "level of performance" defined by the client.

Supply Chain Management (SCM) according to Yeo and Ning, (2002), is a process of strategically managing the movement and storage (if necessary) of materials, parts and finished product from supplies, through the manufacturing process and on to customers or end user. The SCM approach advocates that a company should extend its internal focus to suppliers and supplier's suppliers, thus creating the chain. The essences of SCM are (Yeo and Ning, 2002 and Burton and Lanciault, 1999):

- enhancing trust among supply chain members;
- re-engineering the business process to build a networked enterprise model;
- co-ordinated procurement process in the whole chain; and
- collaborative attitude among all of the chain members.

In a high-risk, high-return industry, such as the oil and gas, an innovative approach in Risk Management is essential. Risk Management according to Broome, (2002), is a structured process for identifying and evaluating risks before developing and implementing actions to reduce the likelihood and/or impact of their occurrence. Failure to mitigate risk exposure with an effective approach could be costly. In a high competitive and changing world, an effective Risk Management strategy is the considered a tool to increase financial success and improve operational security. In the

IQPC Oil and Gas review (2003), the elements covered by the Risk Management approach, included:

- avoiding contractual pitfalls;
- implementation of effective indemnities for major capital projects in order to fully understand risk position;
- assess the benefits of standard and non-standard contracts; and
- shaping insurance contracts to safeguard against financial damage.

Incentive according to Broome, (2002) is an inducement to motivate an organisation or individual to place greater emphasis on achieving an objective or to act in a certain way. An incentive can take many forms but is usually based around money. Generally, according to Broome, (2002), there are a number of incentives schemes that can be incorporated into the procurement methods, as summarised below.

- Performance incentive - an incentive usually in monetary form placed against a pre-stated measurable unit at the end of project performance for the completed asset, for example time.
- Process incentive – an incentive based on a measure of how a consultant or contractor delivers the project, for example the level of programming.
- Gatepost incentive – an incentive paid for achieving a set level of performance, for example a lump sum payment for completing by a set date. If this performance is not attained, no incentive is paid.
- Graduated incentive – an incentive paid per unit of performance, for example an amount per day added or subtracted for early or late completion.

However, according to ECI (2003), incentive schemes for contractors and suppliers were not intended as a panacea but rather to provide an alternative procurement route when methods that are more conventional were likely to create potential conflicts, with subsequent detrimental effects on the overall success of the project. The success of incentive schemes depends on several key factors (Richmond-Coggan, 2001):

- trust, a key factor to success;
- potential benefits must be justified commercially;
- a higher level of administrative effort;
- only to be undertaken by those with the appropriate knowledge and skills due to high risk;
- good documentation and communication with all parties to the contract;
- acquisition of new skills, especially in the area of communication; and
- be seen as aiming to drive down inefficiency and costs rather than contractors and suppliers profit margins.

Wright (1996) acknowledges that some contractors have started to lease facilities to operators through variable, fixed or negotiated financial arrangements. This is another strategy for the contractor to ensure work for its design offices, fabrication yards, installation fleets, operational staff and even its tankers. Although to date, leasing for example, in the North Sea has concerned only the Floating Production and System Offloading (FPSO), other process modules and permanent production jack-ups have been mooted as suitable candidates. Leasing is most cost-effective for small fields with short

lives, as in marginal fields, where capital expenditure cannot be fully recovered. However, for larger fields with longer lives, it is more advantageous for the operator to own the facilities.

The next step from partnering/alliancing and leasing, according to Wright (1996), is for contractors become directly involved in what is termed as 'contract to produce'. This entails a life-of-field approach and requires a capability on the part of the contractors to develop and operate oil and gas fields rather than just servicing them. This is considered by many to be the future direction for procurement strategy in the oil and gas industry. Large broad discipline contractors such as Brown and Root and Halliburton, for example, are actively recruiting oil companies' expertise to assist them in achieving their 'contract to produce' procurement strategy. By adopting such strategy, the major contractors will become quasi oil companies, with oil companies or operators, only maintaining responsibility for finding and selling oil and gas.

3.4.2 Current Procurement Issues

3.4.2.1 Conventional Type

Most conventional approaches to procurement deal with capital cost/fixed price only. With the currently high operational and maintenance costs that the oil and gas industry has to cope with, there is a desperate need to look at costing on a Whole Life Cycle basis as stated by ECI (2003a). Most clients argue that by using the conventional approach, most of the risks are to be borne by them. This could be too risky especially when the

client has to venture into marginal fields once the production of oil and gas is starting to decline. High capital investment for small field reservoirs may be too risky for clients to handle alone.

3.4.2.2 Innovative Approach Type

In order to overcome the problems or offer potential solutions to help the industry's future survival, a few innovative approaches to procurement strategy have been put forward by the players in the industry, these include:

- cooperation rather than competition among contractors and suppliers (Wright, 1996; Stabell and Sheehan, 2001; McHaffie, *et al.* 1993; and Adam, 1992);
- effective supply chain management to increase efficiency and improvements in clients/supplier relationship (Yeo and Ning, 2002; Stabell and Sheehan, 2001);
- partnering/alliancing/joint value enhancement to be looked at in accordance to today's market environment (Chan, *et al.* 2003; Brunsman, *et al.* 1998; Bruce and Shermer, 1993);
- cost effectiveness with regards to operational management (Wright, 1996); and
- effective incentive schemes for contractors and supplier (Richmond-Coggan, 2001).

3.4.3 Innovative Approaches to Procurement

There is a need for innovative procurement strategies in the oil and gas industry, as cited by Dittrick (1999) in a survey of integrated oil and gas companies in the US, which stated the following.

- Project procurement in the oil and gas industry is a capital-intensive process. As 90-95 per cent of project costs are paid to contractors and suppliers to ensure project success, it is critical that any corporate or business strategies should incorporate and integrate with the capital project procurement process from start to finish.
- Must submit to total system of cost and evaluation throughout the procurement process such as Whole Life Cycle costing.
- Must have some form of standardization programme and specification reviews
- A strategic outsourcing must be in place such as in supply chain management
- A contractor and supplier management and incentive programme must exist in order to secure the commitment of contractors and suppliers to the overall success of the project.

Wright (1996) stated that the adoption of these new procurement strategies by the key players in the UK North Sea has been instrumental in rejuvenating the industry by allowing cost-effective development of smaller and more marginal oil and gas fields. The CRINE initiatives have also helped to create the appropriate environment for more open contractual arrangements.

3.5 CURRENT PROCUREMENT ISSUES AND PROBLEMS

3.5.1 Industry Challenges on Procurement

The new century brings significant challenges to the oil and gas industry, as it seeks to maintain high levels of investment against a background of volatile oil and gas prices.

Despite the numerous constraining issues and problems the industry has to deal with, exploration and production technologies have continued to improve in leaps and bounds with more land and seabeds being explored for their valued commodity. However, there appears to have been little development to move away from traditional approaches into a more innovative procurement strategies in the oil and gas industry. This is perhaps because there are relatively few major players, that is project initiators (clients/owners) and implementers (contractors), in the oil and gas sector. Furthermore, clients/owners have been found to have a wide variety of method for selecting contractors.

In light of the rising oil and gas prices and operational costs, the oil and gas industry is being challenged on the issues of cost, safety, the environment, technology, resourcing, competitiveness and procurement. Procurement lessons learnt from other industries have also been tested but with mixed outcomes. However, procurement issues and problems in the oil and gas industry are not so pronounced as in other industries due to the small number of players and the need to maintain good image, reputation and goodwill amongst themselves.

3.5.2 Current Literature Issues

Many regional issues have surfaced from articles read to date, these include: Iraq with no central authority and trying to mend and picking up the broken pipes from the effects of war MSNBC News (2003); the Russians are in hot pursuit claiming their promised oil share during the pre-war era (Neftegaz RU 2003); Venezuela's oil and gas industry collapse with workers on strike and political pressure as reported by Coronel (2003);

China's emergence as the new global player in the oil and gas industry with joint ventures investment with major contractors (Clifford 2001); and the UKOOA (2003) Report on UK oil and gas industry agreeing to improve on capital and operational efficiency. Other key issues that have emerged include:

- increased cooperation rather than competition among oil and gas contractors (Stabell and Sheehan, 2001; McHaffie *et al.* 1993);
- effective supply chain management (UKOOA 2003);
- partnering/alliancing/joint value enhancement (Wood, 2003; Manning, 2003; Bruce and Shermer, 1993);
- environmental issues and costs to be addressed by the industry (Gao, 1994; Westbrook, 1994);
- cost effectiveness with regards to technological factors (Adams, 1992);
- Engineering, Procurement, Installation and Commissioning (EPIC) procurement system failures and why some major contractors are shying away from it (Halliburton, 2003; Stevenson *et al*, 2003);
- contract risk management (IQPC, 2003; Stell, 2002);
- standardisation/best practices (Fowler *et al,* 2003); and
- industry initiatives in leading and delivering changes (Todd *et al*, 2003)

3.5.3 Procurement Problems

Not many issues on procurement problems appear in the papers or articles but that does not mean everything is in good order. One key issue that was discussed and deliberated at length was the integration of supply chains and critical chain concepts in EPIC

contracts in order to enhance some of its flaws and weaknesses (Yeo and Ning 2002). According to Stevenson *et al* (2003), in order for a supply chain management system to work, integration is needed instead of fabrication. The usual conventional versus EPIC contracts is also becoming a key issue. Among the problems encountered in EPIC contracts, apart from the above, is that the contractor shoulders the risk when there is a variation order. Variation orders are common in the oil and gas industry because there are many uncertainties associated with the exploration and production of oil. Yeo and Ning (2002) also added that among the challenges faced by EPIC projects are the interdependence of activities, phase overlaps, work fragmentation, complex organisational structure and uncertainty in accurate prediction of desired outcomes.

Partnering and alliancing have also had their fair share of problems. Creating trust, unclear roles and responsibilities and alignment to common goals are some of the problems faced by this type of procurement arrangement. Poor definition during conceptual stage of the project between parties can also lead to volatility in the execution and outcomes.

Deployment of an inappropriate contracting strategies and failure to reflect geographical, political and cultural influences according to Stevenson *et al* (2003) are evident in current contract and commercial models in the oil and gas industry. This is sadly the common features of disastrous projects, which is the joint responsibility of clients and contractors.

3.5.4 Procurement Strategies

In order to overcome some of the existing problems and offer potential solution, a few innovative approaches to procurement have been put forward by the players in the industry, these include:

- cooperation rather than competition among contractors and suppliers (Wright, 1996; Stabell and Sheehan, 2001; McHaffie, *et al.* 1993; and Adam, 1992);
- effective supply chain management to increase efficiency and improvements in clients/supplier relationship (Yeo and Ning, 2002; Stabell and Sheehan, 2001; Stevenson *et al*, 2003);
- partnering/alliancing/joint value enhancement to be looked at in accordance to today's market environment (Chan, *et al.* 2003; Brunsman, *et al.* 1998; Bruce and Shermer, 1993);
- cost effectiveness with regards to operational management (Wright, 1996);
- effective incentive schemes for contractors and supplier (Richmond-Coggan, 2001);
- leasing (Wright, 1996); and
- contract to produce (Wright, 1996).

3.6 MULTI CULTURAL COMPLEXITY (MCC) IMPACT ON PROCUREMENT IN THE OIL AND GAS INDUSTRY

Recent global business trends have led the oil and gas sector to seek better solutions to overcome new challenges, such as the impact of multi-cultural complexity (MCC) on procurement strategies. Although some changes have taken place in the development of innovative procurement strategies, more still needs to be done within the oil and gas

sector, which needs to be considered in its own right as it has its own characteristics, for example the size of the projects, small key players in the sector, the advanced technologies being used and the multi-cultural nature of its project teams. The MCC of the sector needs to be addressed because different approaches may be required to take into account the context that can be found in different locations and countries, not to mention the differences in business philosophy or culture within the oil and gas organisation themselves. The difference in the level of physical condition and maturity of oil and gas fields, combined with cultural issues has made competition even more demanding. The overall aim of this research is to improve the understanding of procurement strategies that need to be adopted by the oil and gas sector across the globe. This research will also focus on how certain complexity theories can be used to develop contexturalised solutions for the sector, the nature of the sector and case studies could help to lead players and stakeholders to a better understanding of procurement strategies within the sector.

According to Haswell (2003), other factors, primarily MCC need to be addressed in the context of global strategic business development. MCC issues range from challenges and complexity of technical, physical, internal organisation, competition and cultural differences between countries across the globe. The effects of these issues on companies operating in the oil and gas sector across national borders can either be positive or negative (David 2003). The advantages, as classified by David (2003), includes capitalising on reducing unit costs through cheaper local labour, less competition, reduced tariffs, lower taxes and perhaps favourable political treatment in certain

countries. He also added that many governments offered varied incentives and by incorporating joint ventures with them, enabling organisations to learn the culture and business practices of other people. Reid (2004) however, cautioned new comers to the international oil and gas arena to be aware of certain factors such as local experience, practices, data, influences, competition, local content and cultural issues that will certainly affect their management style or approach and perhaps added costs.

3.6.1 Challenges and Complexity in the Industry

As the world demand for oil increases, some regions traditionally recognised for their massive oil and gas reserves have entered the final production phase. The impending decline of North Sea crude oil production provides evidence of accelerating global oil depletion (Bakhtiari 2003). In order to prolong its life, as deliberated by Townson and Knight (2003), the region has several options: closer cooperation with the UK to maximise cross border extraction; a change in licensing regime to encourage exploration and maximise development in mature areas; extension of existing fields and opening up of new areas for exploration. In the UK and Norwegian sectors of the North Sea, a number of small to medium players have been buying into the region as the major players exit in search of deeper water and larger fields. Downsizing and mergers are becoming a common trend for major players and according to Townson and Knight (2003), what is happening now in the North Sea provides a very good indication as to the future course of offshore oil and gas exploration trends worldwide.

However, as explorations are going into deeper waters and opening up new frontiers in search for oil and gas, it has become more technologically demanding resulting in higher drilling and production costs. According to Condray (2002), the demanding conditions in the North Sea have resulted in one of the highest producing costs in the world, even in the large fields of the past. Therefore, he added, to be successful in this pursuit will require in-depth technical and historical knowledge of UK geology and production systems, the ability to leverage global resources and the application of existing and development of new leading edge technology- all integrated by creative geoscientists and engineers.

The oil and gas sector can be broadly categorised into several MCC issues which includes:

- the physical nature of the project (Stevenson et. al 2003);
- location, magnitude, field maturity, technical constraints, internal organisation of players (Condray 2002 and David 2003);
- business philosophy, type of organisation, share/stakeholders, personnel, competition (Reid 2004 and Oyegoke 2004);
- number of players, specialists, risks (Pedwell *et al.* (1998); and
- local cultural influences (Reid 2004, Oyegoke 2004, Haswell 2003 and David 2003) in accordance to regional/country, political, practices, knowledge, local content, monetary and language.

3.6.2 Multi Cultural Complexity (MCC)

According to Stevenson et. al (2003), the demands of physical and technical complexity in the oil and gas exploration has somehow played an important role towards the approach to management, organisational structure and culture of oil and gas companies. Snieckus (2003) added that this is especially true even for major players as in the case in the North Sea. Being a matured basin and into the depleting stage of production, oil and gas operators have to take appropriate steps to reorganise, integrate and adapt to new management and organisational approaches in order to stay competitive and productive in the short and long run. Although these steps could be costly, on a positive note, having the ability to adapt their organisation quickly to the physical changes and needs in the North Sea have given them the competitive advantage over operators from other regions.

The availability, depths and reliability of economic and marketing information in different countries vary extensively, as do business structures and practices, and the number and nature of regional/local organisations (David 2003). This source includes local information that will influence oil and gas companies' economic, technical and management approaches, such as the level of technical support needed, health and safety requirements, reliability of local companies, and the need for on-time delivery, innovation, standardisation, response and cost (Haswell 2003). David (2003) also added that gaining an understanding of local and regional organisations; i.e. EU, ASEAN, etc, way of doing business is also an uphill task but nonetheless necessary. According to Oyegoke (2004), differences in contracting systems between countries like US, UK and Japan, with the increasing global competition for example, have influenced the business

practices of major players resulting to outsourcing of non-core activities through the establishment of sourcing alliances.

Free and open competition (Condray 2002), has time and again been demonstrated to afford the best opportunities for interested and competent players as well as in the best interest of nations and consumer. Small enterprises must be permitted to compete with larger players or new entrants with established players on a level playing field. David (2003), however, stresses that weaknesses, strengths and performance of competitors in different regions are difficult to estimate, thus creating more challenges when doing business internationally. This include changes in economic factors such as inflation, which will not hit every competitor in exactly the same way, because labour, components and raw materials cost rises are not identical in all countries (Hussey and Jenster 2000). Improving their supply chain relationships and collaboration with local competitors according to Haswell (2003), are strategic ways to get competitive in a global market.

Most players involved in global market are more often than not, being confronted by different local issues either demographic, social, environment or governmental which will make communication and agreement difficult (David 2003). Hussey and Jenster (2000) stressed that changes in economic circumstances may trigger different social trends and opinions, which may then cause political pressure to be brought to bear and eventually the political view may result in changes in legislation and perhaps agreement. Reid (2004) however, believes that it is the duty of players to make an effort to know and understand local scenarios because there is nothing more disruptive than finding out only

too late that you are faced with huge problem, which you could have either dealt with earlier or avoided altogether.

David (2003) also highlighted the fact that language, culture and value system/ national value differ among countries, thus creating barriers to communication and problems in managing people. Differences in national values as mentioned in Carr and Harris (2004) have often been suggested as one explanation for differences in managerial practices. There are cases, according to Schein (1985), that managers of different national backgrounds have been found to hold different underpinning values, different assumptions regarding the environment and different expectations about relationships among people.

Finally, but nonetheless important, dealing with two or more monetary and banking system can complicate international business operations and unnecessary additional cost (Astley 2003 and Reid 2004). A classic example can be found in Astley (2003) whereby in their case study, it was found that most Russians do not trust banks, hate bank charges and prefer dollars to pounds in business transactions.

3.6.3 Complexity and the Impact of MCC on Procurement Methods/Strategies

There are many definitions and deliberations on the theory of complexity. Complexity itself is considered by many scientists and authors to have enormously wide-ranging applications, with considerable potential for understanding the nature of the universe and

its multitude of complex systems. However, one that best describe the theory in context of this paper was found in McMillan (2004) whose ideas and principles of complexity were based on and incorporating the chaos theory. The author describes 'Chaos' as *"not an aberration in the planned scheme of things, but reflects deeper more complex patterns and swirls of order than had previously been expected and understood. They are processes that have their own kind of internal order and their own kind of process principles"*. She also added that notions of order and disorder, predictability and unpredictability, regularity and chaos are features of complex systems. Glinow and Mohrman (1990) stresses that in a complex system such as the high technology industry, most projects have multiple puzzles to be solved, and all their solutions have to be compatible with one another. Design, fabrication and construction for example, have to be compatibly resolved and must fit into a system that works.

On a worldwide management perspective, Koot (1997) described the theory of three ideal type strategies for multi cultural global management and cooperation which can be distinguished as the ethnocentric, polycentric and geocentric approaches. The ethnocentric approach is characterised by the pursuit of unity, efficiency, monitoring by the parent company and strong appreciation of the values of the home country. The underlying idea behind this type of approach is the perception of Western managers that their management styles are the most successful and therefore should be universally applicable. This approach is usually applicable to large multi national corporations where the "one best way" strategy is the prevailing approach in their global corporate management. The polycentric approach begins with the idea that a universal strategy is

not possible and that international business enterprises should accommodate to the local situation. Diversity is allowed and appreciated and monitoring from the corporate level is substituted by relative autonomy of local branches. Finally, the geocentric approach, which assumes that some central rules are required to achieve corporate efficiency and the outlook of the local managers, should be a global one. Everyone should realise that he or she is part of a global company and balance must also exist between the local and central values. These theories play an important role in the understanding, identifying and selecting the most appropriate procurement approach as far as multi cultural global management is concerned.

Looking back at the construction industry scenario, Masterman (1997) recognised that one of the principal reasons for the construction industry's poor performance globally is the inappropriateness of the procurement methods that have been chosen, i.e. haphazard, ill-timed and lacking in logic and discipline. The author added on by saying, *"that it is therefore essential for the future success of individual projects and the industry as a whole that, a time when such systems are proliferating and where projects are becoming more complex, the correct choice is made"*. In choosing the appropriate procurement method for oil and gas projects for example, the correct choice is sometimes as difficult, complicated and complex as the project itself. However, according to Scott (2001), the basis of procurement strategies, business and complexity can be broadly described as in Figure 3.2 below.

Business Culture			
	Trust and Mutual Respect	***Relational Contracts*** High definition Target sum bidding Proactive behaviour Focus on efficiency	**Ad hoc alliances** Goal alignment Early involvement High integration Gain sharing Focus on effectiveness
	Transaction Based/Traditional	***Conventional Contracts*** High definition Lump sum bidding Reactive behaviour Claim/defence mentality	**Get out**
		Simple	**Complex**

Business Challenge

Figure 3.2: Procurement Strategy versus Complexity and Challenge (Scott 2001)

The impact of MCC on procurement strategies has long been recognised and necessary measures have been taken to get the best possible solution, but with mix results. However, each situation is sometimes based on local scenarios and subjected to individual player's perception, judgement and evaluation on the impact itself and how it will affect their own organisation. Some of these examples and experiences can be taken from oilfield operations in the North Sea and the Sakhalin in Russia.

3.6.4 Case Study

3.6.4.1 The North Sea

The physical culture changes of the North Sea basin from a region of ever-increasing oil output in the 1970's to a matured and decline production now, certainly have made an impact to players in this sector in their task and strategies of maintaining profitable oil and gas production in the region (Bakhtiari 2003). Downsizing and mergers among major players are on the cards although a number of small to medium players have been buying into the region (Townson and Knight 2003). The biggest reorganisation and integration of a single major player in the North Sea according to Snieckus (2003) is a vision of its long- term future in the matured area, driven by the changes of business environments and the need to adapt effectively to give them a competitive advantage.

The change of physical culture of the North Sea has forced players to change their organisational structure and culture in order to become competitive, relevant and well into the robust game. Haswell (2003) has outlined strategies on how players can become competitive in the oil and gas sector, which include mapping internal processes to eliminate waste, improve supply chain relationship, collaborate, and the need of their organisation to become e-enabled. Adaptation is something players have to live with whether it has to do with the organisation's structure and culture or the way in which they deploys people, technology or capabilities (Snieckus 2003).

The impact of MCC on procurement methods /strategies in the oil and gas sector is quite evident, as changes are beginning to take place within large corporations. Halliburton for

example, has announced that it will no longer pursue the traditional Engineering, Procurement, Installation and Commissioning (EPIC) contracts, as there was *"the growing imbalance in the risk and reward available on these offshore EPIC projects"* (Halliburton 2003). Partnering, alliancing and joint ventures although have set the trends on innovative procurement, also had their fair share of problems. Creating trust, clarifying roles and responsibilities and alignment to common goals especially in this high-risk sector are some of the problems faced by these types of procurement arrangements (McHaffie *et al.* 1993; Donnelly, 2003). Short and long-term relationships within partnering arrangements have to be dealt with accordingly to avoid pitfalls and any untoward relationship that could be costly (Stevenson *et al* 2003).

The UKOOA (2003) Report stated that further research on the area is now required more than ever before. This is because of considerable changes in the oil and gas scenario and the impact of MCC throughout the world today has force clients and contractors to look more for a win-win situation in their procurement arrangements. With the high cost of exploration and production today, the profit margins for clients are decreasing. Selecting the right contractor with the right price to work in certain parts of the world can be a time consuming and risky business. The volatility of the current oil and gas prices has added to the need to reconsider clients' cost control procedures, in particular, procurement strategies. The recent development of marginal fields with tight budgets and high risks has resulted in traditional procurement approaches becoming unsuitable, thus leading to the introduction of partnering/alliancing/joint ventures. Traditional contracting structures and cultures according to Scott (2001), frequently create misalignment between the

individual contractors and has no incentive to work in a way that is most efficient for the project as a whole or to work proactively (by pooling skills, expertise and resources if appropriate).

In the Norwegian shelf of the North Sea, procurement changes have also taken place due to the MCC issues (Emhjellen et al 2003). A consensus was reached in the Norwegian petroleum sector to implement a number of organisational and contractual changes. This include passing over the project management tasks, that were previously been carried out by the operator, to the contractor. In addition to that, there will also be an even split of cost overruns and savings relative to a target sum introduced between the operator and contractor, thus, a higher percentage of risk is now to be borne by the contractor.

3.6.4.2 The Sakhalin-2 Project, Russia

One of the important objectives, in the case of oil and gas procurement strategy practiced in Russia, is to maximise local content in the project and to give them every opportunity to submit bids with international bidders (Astley 2003). An example of how this is done can be seen on a procurement method used by a major player, based on an incentivised reimbursable method. After securing the main contract, the main contractor will then break down the defined scope of works into small lump sums, linked to timed deliverables and naturally, find local companies to deliver or perform the work. Contractual language needs to be precise when discussing terms and conditions especially with respect to the names of companies and official authorities. This special care and attention is desperately needed whenever one is securing and making business

deal in Russia. However strange it may be, because of the volatile political conditions, companies can change ownership structure and names without any due notice to their business partners or counterpart. The different fiscal regime and the six tax treatments such as: profits tax, VAT, turnover tax, property tax, income tax and social tax imposed by the Russian government, affect the parties to a contract. Currency preferences for different type of transactions, i.e. Roubles when paying tax but dollars in commercial transactions, have caused complications and confusion to expatriates and foreign business organisations alike. However, Astley (2003) also stresses that being conscious of cultural differences can encourage a greater degree of creativity and can be significant to a world-class and complex project such as the Sakhalin-2. He concluded by saying that neither Russians nor the western aspects of culture should be judged right or wrong but instead, should be identified and understood.

3.7 SUMMARY OF CHAPTER 3

Throughout the general reading of articles and papers related to the research topic, it was obvious that there was a gap in the literature whereby little was found, mentioned or rather the few numbers of research work that has been done on the procurement aspects of the industry. There are already calls made within the oil and gas industry that not enough effort has been made on the development of procurement strategies compared to other industries, (by the number of written and documented literature on the subject and research conducted).

The understanding and appreciation on the complexities and nature of the oil and gas industry is truly necessary and essential if one is to embark on a research study that is closely related and directly involved with the industry. Apart from being distinctively different in nature, there are other underlying factors that contributed to the changes, methods and understanding of the industry such as the history, development process and regional influences.

In order of priority, it has been established through the literature that cost cutting, cost reduction and risk management appeared quite frequently in recent articles, thus needs to be addressed first. Cooperation, competitiveness and organizational strategy are the keywords in most of the articles although no linked to procurement system/strategy are directly mentioned in the articles.

However, Wright (1996) identified key trends and factors in procurement, particularly in the UK North Sea oil and gas industry, that need to be addressed accordingly which include the increased contractors' risk, market polarisation, cultural changes, oil company specialisation, project timescales, technology and product-oriented solutions. In other regions, such as Russia or Asia however, the factors would probably be more regionalised and specific to that region but nonetheless will have some elements of multi cultural complexity that players in that region will have to content with.

There is also the need to look in-depth at new and innovative approaches to procurement strategies for the oil and gas industry. However, the overall summary of this chapter can

be best described by Luu, *et al.* (2003) as mentioned in their findings that in order to face the challenges on procurement strategy in the industry, the key factors that need to be considered are:

- external parameters which include political, financial, economical, sociological and competitiveness;
- project risks with reference to industrial, political and technological constraints;
- client's long and short-term objectives, such as Whole Life Costing and on-time completion;
- client's involvement in risk allocation, such as their willingness to be involved, trust towards other parties and willingness to take risks;
- client's characteristics which include strategy, experience and capabilities;
- project physical characteristics to meet demanding technological, administrative and legislative requirements; and
- project complexity, which is an important issue to be addressed in the selection of procurement system.

These key factors together with the related issues on procurement theories, overview of the complex industry together with preliminary interviews in Chapter 4 will become the foundation to the formulation of theoretical framework for the research. This framework will then be evaluated and dealt with accordingly in Chapter 5 (Questionnaire Survey) through quantitative method and in Chapter 6 (Case Study) using qualitative approach.

CHAPTER 4: PRELIMINARY INTERVIEW OVERVIEW AND ANALYSIS

4.1 INTRODUCTION

This chapter was a continuation from Chapter 3 on the overview of the oil and gas industry but looking through the eyes and minds of the players. In order to understand the perception of players in the industry, the best logical approach is to get the answers and feedbacks straight from the players. Therefore, during this initial phase of framework formulation, the idea of conducting preliminary interviews with players in the industry was put forward. This approach was also seen to supplement and compliment literature findings in Chapter 4 in view of getting the 'real picture' from the industry's players and practitioners.

Interviews, according to May (1997) will yield rich insights into people's experiences, opinions, aspirations, attitudes and feelings. He further reiterated that there are four types of interviews commonly used in research which include the structured, semi-structured, unstructured and group interviews. The differences lie in the constraints placed on the respondent and the interviewer (Fellows and Liu 2003) including the purpose of the interview, the time limitation and under what condition the interviews will be conducted. These preliminary interviews were conducted using the semi-structured and group interviews. The justification for this will be explained later in the chapter.

4.2 PRELIMINARY INTERVIEW BACKGROUND

4.2.1 Objectives

Among the main objectives of the preliminary interviews are to:

- identify current issues and problems in the industry;
- explore the understanding and perception of players on general procurement issues and theories;
- identify and highlight potential research issues and areas; and
- obtain general feedbacks on core research issues.

4.2.2 Scope and Limitations

These preliminary interviews were conducted with fifteen respondents from UK based as well as international oil and gas related companies. They represented various types and sizes of companies or organisations which are actively involved in the exploration and production oil and gas activities throughout the world in their capacities from procurement managers to business and marketing executives including researchers from universities.

The approach and venues for conducting these interviews varies from utilising international oil and gas exhibitions, conferences and seminars to special industry task group workshops. Opportunities were taken during visits and attendance to these functions including participating in briefings and presentations, questions and answers sessions, informal interview and conversation with attending or visiting participants.

These venues have provided a mixture of local and foreign respondents which has given these interviews a blend of local and global perception on core research issues. This is also where the group interviews sometimes apply because it allows a better focus upon a group, players or industry norms and dynamics around issues which are to be investigated (May 1997).

4.2.3 Interview Questions

In line with the objectives of the preliminary interviews, the questions were generally designed towards achieving these objectives. However, to ease the analysis process, semi-structured interviews with objective focus questions and some probing are used in the exercise. Among the questions put forward during these preliminary interviews are categorised but not limited to:

- UKNS critical issues on oil and gas depletion, matured basin and its future;
- major global/other region/industry current issues;
- procurement issues in the industry; and
- the role and importance of Industry Initiatives to assist players and in promoting the industry.

4.3 PRELIMINARY INTERVIEW RESULTS AND ANALYSIS

4.3.1 Summary of Respondent's Perception on the UK North Sea (UKNS) Issues

The single major issue that is surrounding those who are involved in the oil and gas activities in the UK North Sea was the issue of oil and gas depletion in a mature basin.

How much crude is left, how will it affects the business chain? How long can they sustain the existing businesses and what are the next course of action for players in this region are to name but a few common questions that are getting the most attention and interest among players in the industry and the government alike. Eight out of the fifteen respondents (53%) interviewed believed that the case in the UK North Sea was not any worse than in the Middle East or the Gulf of Mexico (Table 4.1). Despite having to deal with crude depletion and decreased production, they have a bigger number of platforms to operate, maintain and repair which are not cheap to be undertaken individually as well as for the whole oilfield. With the price of oil is soaring, they see the UKNS region is still competitive and has a potential future for further development and investment.

Table 4.1: Respondent's Perception on the UK North Sea (UKNS) Issues

Issues	Respondent's Perception
UK North Sea (UKNS)	Comparison was made with other matured basins such as in the Middle East and the Gulf of Mexico. Although the UK North Sea may not produce as much oil and gas as in the Middle East region, they have less platforms or operating structures to handle and maintain. This in turn will make the UK North Sea more competitive and a good potential for investment. There is the need to have an appropriate balance between collaboration and competition. Too many collaborations or too much competition may have a negative impact on the industry especially in a matured basin such as the North Sea The UK has got the necessary ingredients to export their knowledge to other regions. This is based on current findings that the UK has the right: • Experience; • Knowledge; • Technology; • Safety leadership; and • Supply chain experiences On the UK North Sea further exploration of smaller oilfields in a harsh environment, it may require new approaches to face demanding technical and business challenges. It is also an ideal environment for partnership apart from the possibilities that that there may not be other suitable options.

Although collaboration between players may be preferable under the current conditions in the North Sea, there needs to be an appropriate balance between collaboration as well as competition within the industry in the region. Too much collaboration may be good news to some but having too many competitions in a tough and saturated environment will surely create a lot of problems especially to new players and small enterprises.

On a positive note, the UK oil and gas industry has got the necessary ingredients required to export and expand their knowledge to other oil producing regions. Having to work under the deep waters and harsh conditions in the offshores of the North Sea that requires innovative technological solutions has left them with the experience, knowledge, forefront technology, safety leadership and supply chain experiences that can be utilized or may be applied in other regions.

The exploration and production ventures within the small and marginal fields in this region may require new approaches to face demanding technical and business challenges including the approach to procurement methods/strategies. Partnering is most likely the choice considering the conditions and environment but other methods such as contract to produce may also be considered.

4.3.2 Summary of Respondent's Perception on Global/Other region/Industry Issues

Although cost effectiveness on operational management at every level and phases of exploration and production is currently being pursued at every opportunity, players especially operators and contractors may also have to look at the risks involved, the

returns in terms of oil and gas prices and the desired timescale. In other words, cost reduction or cost cutting may not be feasible especially when there are elements of risks and time constraint in hand on the task to be pursued or executed, considering the type of project, the complex environment and the demanding industry.

Among other issues highlighted in the interviews as shown in Table 4.2 include the issues about trust and transparency by established player in the effort to boost the industry; standardisation; high cost of tendering; and government taxes and tariffs which have created a negative impact to the industry in many ways. Critical factors that may influence exploration decisions in the future were also highlighted and proposed which include: oil reserve and price; political risk; labour relations (as efficient as in Norway); infrastructure position/ export route; tax regime/ government share; exploration and development costs; capital exposure/investment risk; and the maturity and proven knowledge of the basin.

Table 4.2: Respondent's Perception on Global/Other region/Industry Issues

Issues	Respondent's Perception
Global/Other Regions/ Industry	The issues on the operational cost cutting need to look at the risks involved, the oil and gas price and the time scale. Cost effectiveness on operational management should be pursued at every opportunity. Utilizing and developing skills of the trade in the industry should become a priority and how government collaboration is needed in tackling the industry skill labour problem. There are also some critical issues highlighted: • Trust and transparency in helping the industry to grow by established players; • Wasted effort and cost by contractors who failed in their bids for work; • Standardization which has become a major issue from the type of plant and materials used to clauses in the contract; and • The effects of government taxes and tariffs to the overall viability of the more demanding oil and gas

	fields Factors that may influence the decision whether or not to start an exploration will much depends on: • Oil and gas reserve size; • Price/cost of oil per barrel; • Political risk; • Labour relations (as efficient as in Norway); • Infrastructure position/ export route; • Tax regime/ government share; • Exploration and development costs; • Capital Exposure/investment risk; and • Maturity of basin/proven/knowledge of the basin On the bigger issue of risk, there was a claim that the industry is now more risk adverse than ever. The players are quite reluctant to test new developed techniques/processes due to unforeseeable risks and multi cultural complexities (MCC) elements that come with it according to different regions. It was also suggested that for any new exploration area, this equation should apply: →Design Fit for Purpose + Hi-Tech + MCC Sensitivity = Assured Outcome A few guidelines were suggested for both the operator and the contractor within the industry. **The Operator MUST**: • Ensure that adequate definition of the project is in place; • Maintain a sensible project schedule; • Reappraise the current tender evaluation process; • Align operational contract to EPC whenever possible; • Ensure they have reliable personnel on the project team; • Use the most appropriate procurement methods/strategies and commercial model; and • Not let Senior Management to sanction projects without proper definition and justifications. **The Contractor SHOULD**: • Screen and evaluate projects based on sensible client and appropriate procurement strategies; • Utilize 'front end loading' estimating approach in the preparation of tenders or execution of bidding strategy to lower their risk in the project; • Select their partners early and to align their strategies in future commercial terms; • Understand the market practicalities in the form of local contents, tax, legislation or culture; • Stick to their own corporate business philosophy and best practices; and • Clearly define their requirements to the operators and other contractors/suppliers/fabricators. Some issues and questions put forward for the industry to respond include: • The oil and gas supply issues and the impact on crude prices; • The globalization issue where there was a novel characterisation made of the good, the bad and the ugly side of it. The good part is that, it **creates opportunity**. The bad part is it also **heightens expectations** and finally the ugly part would be the **asset and security risk will be at stake;** • The evolution of commercial terms and practices – why partnership and alliances rarely worked?; and • Is the industry business driven or equity market driven?

There were strong perceptions by the fifteen respondents interviewed on the issues of what is termed in the industry as unforeseeable risk which also includes multi cultural complexity (MCC) elements in which many new players has fallen prey to and suffered expensively. Apart from having a poor definition of the project, the issues of multi

cultural complexities were not taken seriously by a number of players which have led to disastrous projects and unnecessary extra costs. Due to the complexity of project caused by regional influences, they therefore need to be assessed and evaluated accordingly to suit local requirement, inputs and environments. It was also suggested that for any future exploration work, the following equation should apply:

→ ***Design Fit for Purpose + High Technology + MCC Sensitivity = Assured Outcome***

A few guidelines were put forward by respondents during the interviews which may be of interest to the operators and the contractors. They were among others, the responsibilities of operators as well as contractors to ensure that management of projects are not only limited according to their needs and instructions but also in line with other important factors such as using the appropriate procurement methods/strategies; not letting senior management to dictate or sanction projects without proper definition and justifications; and the need to evaluate projects based on sensible demands and strategies.

Finally, on the issue of globalization, there was a novel characterisation made of the good, the bad and the ugly side of it. The good part is that, it creates opportunity. The bad part was it also heightens expectations and finally the ugly part would be the asset and security risk on whatever ventures undertaken will be much at stake.

4.3.3 Summary of Respondent's Perception on Procurement Issues

Cooperation or working together was the keyword in most procurement issues gathered from respondents during the interviews (Table 4.3). These include the need to work

together among players and between players and governments to expedite critical processes which can lead to the unnecessary loss of expenses and time; the need to concentrate on the volatile market capitalization together rather than utilising and maintaining conventional adversarial approach or relationship; and the need to incorporate integration rather than fabrication in the supply chain management approach within the industry in order to become more effective and successful.

Table 4.3: Respondent's Perception on Procurement Issues, Sustainability and Method

Issues	Respondent's Perception
Procurement ***Issues***	On procurement issues, among the points highlighted were: • The time taken for bidding/negotiation/development order process to be endorsed by authorized government bodies are taking far too long. This has resulted in lost of resources in terms of man hours and other indirect costs by the contractors. This may not even be recovered if the contractor failed in their bid for the work; • There is a need to work together to capitalize the market rather than using the adversarial approach as what was happening in the normal procurement arrangements; and • In order to work better and more efficient, you need integration, not fabrication in the supply chain management.
Sustainability	Sustainability of the supply chain management in other regions can only be successful if the followings are included: • Understanding what the host country wants; • Learning about the multi cultural complexities under local conditions; • Incorporate the policy of "localization" – putting locals first in business and manpower opportunity; • Develop indigenous supply chain capabilities; • Competence assurance must be applied to all; and • The need to establish an efficient remote supply chain support system.
Method	On the issues of Lump Sum contracting approach, many strongly believed that it is here to stay. However, some cautioned the contractors saying that they should: • Not confuse risk transferences with commercial integrity in their execution; • Be sensible in allocating risk within their capability; and • Be flexible to revert to reimbursable scopes where definition, local content or other variables dictate.

The issue of sustainability in supply chain management was also highlighted in the interviews concerning player's participation in other regions. Among the appropriate steps suggested to be taken in order to be successful and be able to sustain supply chain

capability in other regions includes: the inevitable need of players to learn, understand and develop local supply chain capabilities and systems; incorporating the policy of localization; maintaining standards and competence assurance; and to establish an efficient remote supply chain support system to ensure sufficient supply chain requirement can be met upon urgent request.

Ten out of the fifteen (67%) respondents believed that the Lump Sum procurement method is very much here to stay while the rest have mixed perceptions about it. One of the reasons why it was usually preferred to other type of methods is simply because most players in the industry are so used and quite comfortable with it that they do not see any valid reason why it should be replaced by other methods. In a Lump Sum contract, the client is considered by many respondents to be in a better position and advantage apart from having to gain control of the project as the paymaster. Contractors may capitalise on certain loopholes or weaknesses that existed in this type of approach but they were cautioned by a few respondents that wherever possible, they should: not confuse risk transferences with commercial integrity in their execution; be sensible in the allocation of risk within their knowledge and capabilities; and be flexible to revert to reimbursable scopes where definition, local content or other variables dictate.

Eight out of the fifteen (53%) respondents also believed that Engineering, Procurement and Construction (EPC) method of procurement has been poorly administered and executed in the industry (Table 4.4). The number of contractors who has declined to participate in EPC contracts has risen especially due to its imbalance between risk,

accountability and profit. Therefore, the industry needs to reappraise other procurement approaches on major projects to assess or look for any suitable options in line with the changes in business behaviour and strategies in the industry.

Table 4.4: Respondent's Perception on Procurement Trends, Problems and Other Issues

Issues	Respondent's Perception
Procurement ***Trends and Problems***	Among the procurement trend and problems in the industry that need to be considered are: • Complexity of projects by regions and locality – eg the different approaches needed when working in West Africa, Sakhalin Island in Russia, China and/or the Caspian region; • EPC projects has continued to be executed poorly; • The number of contractors who have declared their decision not to participate in EPC Lump Sum projects is rising; • The industry needs to reappraise the approaches in major EPC projects to look for changes in business behaviour and strategies; • Poor definition and approach during the conceptual stage of the project especially on procurement strategies can lead to volatility in execution and outcome; • The industry must invest in sensible conceptual exercise prior to project sanction and also prior to EPC tenders; and • Deployment of inappropriate procurement strategies is a common feature of a disastrous project which is the joint responsibility of client and contractors.
Other Issues	Among other issues which were also highlighted are: • Contractors must always try to retain their participation of major contracts for complex projects in order to acquire valuable experiences; • Most of the current procurement and commercial models failed to reflect geographical, political and cultural influences; • Long-term opportunities in the exploration area/region needs to be considered including project specific needs or added values; • Players should also learn to contribute to local small and medium enterprises (SME) including transferring relevant knowledge and skills to local players; • The industry must make an honest assessment of whether current practice is ultimately serving shareholders interest; • Although clients are in desperate need of a competent and committed contractors but then alignment and recognition of interdependency is even more critical; • The industry is going through an increasingly challenging environments that include business, social, political and cultural constraints; • The need to inject local content in the supply chain as part of the industry's contribution in creating jobs and developing skills to the local population whereby the wealth must be shared and spread to the local population and players should not adopt what was normally termed as 'fly in, fly out' attitude; • Partnership with local players is also essential and 'enterprise centers/networks' must also be in place and fully supported by the industry. Partnership/networks have become increasingly relevant but more information exchange is needed in order to execute it successfully; and • The need to develop management guideline and best practices model worldwide, that is a process of converting 'what needs to be done' to 'how can it be done' accordingly.

According to eleven respondents (73%), most of the current procurement and commercial models failed to reflect geographical, political and cultural influences. Complexity of projects must be seen and evaluate by regions and locality, thus the importance of understanding the critical elements of multi cultural complexities and the need to apply different approaches when working in different locality or region.

There is also the need to inject local content in the supply chain system as part of the industry's contribution in creating jobs and developing skills to the local population whereby the wealth needs to be shared and spread to the local population. Players should not adopt or avoid committing what was normally termed as 'fly in, fly out' attitude when working in other regions especially in the developing countries. Players should also learn to contribute to local small and medium enterprises (SME) including transferring relevant knowledge and skills to local players. Where possible, partnership with local players is also considered to be essential and 'enterprise centres or networks' must also be in place and fully supported by major players and the industry. Partnership or networks have become increasingly relevant in the developing countries but more information exchange is needed in order to execute it successfully. In short, players need to commit themselves to what is termed as corporate social responsibility towards the local population.

In general, eleven respondents (73%) agreed that poor definition and approach during the conceptual stage of the project especially on procurement strategies can lead to volatility in execution and outcome of a project. Therefore, not only the industry but players must

be willing to invest in a sensible conceptual exercise prior to any project development to ensure proper steps are taken to minimise failures and problems during the project stage.

The oil and gas industry is currently going through an increasingly challenging environment that includes business, social, political and cultural constraints. They must also make an honest assessment of whether current practice is ultimately serving shareholders interest or simply taking advantage of the current situation or opportunities. At the same time, they need to develop appropriate management guidelines and best practices model worldwide that can be used by players across the region. This process is better known as converting 'what needs to be done' into 'how can it be done' accordingly.

4.3.4 Summary of Respondent's Perception on Industry Initiatives Issues

Industry initiatives are efforts by players or government or the integration of both, to establish a reliable platform to assist and working side by side with the industry in addressing, developing, improving and promoting critical issues that might be of interest to players and government alike. They could be a private or governmental entity but must be impartial in their scope of work which is only to the best interest of the industry as a whole (Table 4.5).

Table 4.5: Respondent's Perception on Industry Initiatives Issues

Issues	Respondent's Perception
Industry Initiatives	The industry should focus on the initiative of business sustainability. This include suggestions that: • Industry initiatives would not work unless players are fully committed and willing to do it for an example, to assist and invest in training of local players; • The issue of local cultures, political and environment needs to be taken care of seriously and sensibly by industry initiatives especially during this difficult times; • The need to expose these industry initiatives to the players and given the necessary time needed for the players to agree on it before any move is made for enforcement; • The idea of having one-stop initiative agency is much appreciated and awaited compared to the number of initiatives already created in the industry; and • Whether the initiatives can work or not will much depend on its acceptance by the players. The role of the UK Department of Trade and Industry (DTI) is to assist the development and monitoring of the industry, therefore the formation of the PILOT initiatives is a good example of how the government has proven its commitment to work together with players in the industry. This initiative is formed to work on a common vision designed to be of benefit to both players and the industry. It will also act as an integrated government/industry task force working together to secure the long term future of the UK oil and gas industry. Among its main aims and objectives include: • To develop and promote technology as a means of enhancing the competitiveness of the UK oil and gas sector, for both domestic and export markets; • Working within the government to fund new and innovative technologies and practices for the oil and gas industry; and • Working with the Industry Technology Facilitator (ITF) to ensure the matching of industry funding and technology meet the capabilities for the research and innovation community.

The basic aims of industry initiatives should be in line with player's project specific needs and other added values including addressing current critical issues and problems. Industry initiatives would not work unless players are fully committed and willing to do it for an example, to assist and invest in training of local players to encounter the shortages of skilled manpower in the industry. However, there is the need to expose these industry initiatives to the players and giving them the necessary time needed to agree on it before any move is made for enforcement. The idea of having one-stop industry initiatives agency is much appreciated and awaited compared to the number of initiatives already created in the industry, but whether the initiatives can work or not will much depend on its acceptance by the players.

An example of a government type industry initiative is the UK Department of Trade and Industry (DTI) PILOT initiative which was formed exclusively to assist the development and monitoring of the oil and gas industry. The formation of the PILOT initiative is a good example of how the government has proven its commitment to work together with players in the industry. It promises and committed: to be of benefit to both the players and the industry as a whole; to develop and promote technology as a means of enhancing the competitiveness of the UK oil and gas sector, for both domestic and export markets; to work within the government to fund new and innovative technologies and practices for the oil and gas industry; and to work with the Industry Technology Facilitator (ITF) to ensure the matching of industry funding and technology meet the capabilities for the research and innovation community.

4.4 SUMMARY OF CHAPTER 4

The preliminary interviews successfully provided not only relevant data for the framework on theoretical formulation but also have managed to identify and highlighted current important and critical issues in the industry. They provided the research with a sound foundation of core issues on procurement as perceived and currently practiced by players in the industry.

UKNS region although seen as a matured basin with gradual reduction in oil and gas production in the future, is also seen to provide other means of resources which is in knowledge, experience, forefront technology, safety leadership and supply chain

experiences that can be utilized or may be applied in other regions. In addition to that, they have a strong support and assistance either from long established players in the industry or the government through various industry initiatives in developing, improving as well as monitoring critical issues or even promoting the industry to other regions.

The industry is currently faced with problems of trying to apply and maintain cost effectiveness on operational management. Although the price of oil has increased, the unnecessary high cost of tendering and the raising of government taxes and tariffs have created a negative impact to the industry in many ways. Some players argued about the poor definition of the project by the client during tender, while the issues of multi cultural complexities were not taken seriously by a number of players which have led to disastrous projects and unnecessary expenditures.

There is an urgent need to cooperate or work together among players in the industry and between players and governments to expedite critical operational and management processes which has proven to be very costly. Supply chain management concerning player's participation and contribution in other regions must also be in place. The decline in the participation of contractors in EPC contracts was due to its imbalance features between risk, accountability and profit. There is also the need to understand the critical elements of multi cultural complexities and the need to apply different approaches when working in different locality or region. It was also both the players and the industry's role and responsibility to create jobs and developing skills to the local population whereby the wealth must be shared and spread among the local population.

Poor definition and approach during the conceptual stage of the project especially on procurement strategies can lead to volatility in the execution and final outcome of many projects in the industry. Therefore, there is obviously the need to develop appropriate management guidelines and best practices model within the industry to be used and followed by players across the region.

The main agenda of an industry initiative is to address, develop, improve and promote critical and important issues that might be of interest to players and government alike in the industry. It must also be aligned to player's project specific needs and other added values. However, in order for them to become an effective force to be recognised with in the industry, strong support and contribution from players are needed to achieve its aims and objectives.

Finally, this chapter provided real issues from real players in the industry. Together with Chapter 3 on literature overview, a sound theoretical framework can be developed for the research. This will then need to be evaluated through quantitative and qualitative means in the coming Chapters 5 and 6 before the procurement strategy guideline on selection process can be developed and designed. Together with Chapter 3 on literature overviews, this chapter will also help to identify core issues and addressing key questions in the composition and design of the questionnaire survey and case study questions in Chapters 5 and 6.

CHAPTER 5: QUESTIONNAIRE SURVEY RESULTS AND ANALYSIS

5.1 INTRODUCTION

This chapter deals with the evaluation of research framework through quantitative methods as previously mentioned in Chapters 3 and 4. In view of improving the industry's participation in the research study and as a means of evaluating the research framework, a questionnaire survey exercise was proposed initially as one of the best chosen methodology for the research. This involved getting respondents from companies not only based in the UK with active participation in other oil producing regions, but also companies in Malaysia with similar participations. These companies were not only actively involved in upstream oil and gas activities (exploration and production) but also in the downstream oil and gas business activities (processing, petrochemicals and retail).

Detailed survey questions were designed taking into consideration the important aims and objectives of the research study. Critical issues found in the literature search and preliminary interviews were also highlighted and addressed accordingly in the questionnaire survey to gain better perspectives and current views from players across the industry. The sample of the questionnaire survey can be found in **Appendix A1.**

5.2 BACKGROUND OF QUESTIONNAIRE SURVEY

5.2.1 Objectives

The questionnaire was used to gather primary, relevant and current data from the oil and gas sector in order to support and validate data obtained from literature review and case studies. This approach has made an important contribution to the understanding and retrieving of information about the latest trends, perceptions, changes and challenges in a competitive and dynamic sector.

5.2.2 Methodology, scope and limitations

To overcome the anticipated outcomes of primary data collected from the small number of organisations within a sector, the main research methodology was designed to involve primary data collection that included perceptions of most of the key types of organisations across the sector (Table 5.1). During the initial/preliminary interview stage, individuals from various organizations, ranging from operators to suppliers and manufacturers were approached and interviewed and about their perceptions on numerous general and specific issues on procurement and supply chain. These interviews were conducted and took place during specific events such as exhibitions, conferences, seminars and workshops that involved participation from players across the sector. The case studies were tailored towards data collection from a smaller number of key organizations, including operators, contractors and industry initiative agency. The questionnaire survey was purposely aimed towards the perception of major players in the sector based in the UK and Malaysia. Although the response rate may not seem to be

enough in terms of numbers and company types, but due to the fact that there are not many prominent players in the sector, they are sufficient to be taken as a point of reference that represents the overall perception of major players in these countries. By having different stages with different methodologies and types of respondent during the primary data collection exercise, a good composition of data has been achieved.

During the questionnaire survey stage, standard questionnaires were sent specifically to the Procurement/Supply Chain Managers of oil and gas companies based in the UK and/or Malaysia. Their company's participation in the oil and gas sector was characterized as either local or across a number of regions. A set of structured questionnaires were designed to retrieve and gather data about the respondents' perceptions on trends, suitability, challenges and influential factors on specific procurement issues which are within the limit of the proposed research framework.

Table 5.1: The proposed stages in research methodology on the primary data collection

	Stage/Approach	Respondent	Area participated by respondent
1	Initial/preliminary interviews – During exhibition, conference, seminar and workshop in the UK	Representatives from companies involved in the oil and gas activities	Mainly UKNS and other oil producing regions
2	Case study – interviews and telephone	Key person from major companies in the sector in the UK/Malaysia	Mainly UKNS and Malaysia South China Sea regions
3	Questionnaire survey – sending out questionnaires by hard and soft copies	Representatives from companies involved in oil and gas activities based in the UK/Malaysia	Various oil producing regions

5.2.3 Number of respondents and justifications

Considerable effort was made to obtain as many respondents as possible from this small, competitive, complex and commercially sensitive sector. In this survey, 150 respondents from oil and gas companies and organisations based in the UK and Malaysia were identified, approach and given the questionnaires. The survey finally managed to get 21 completed replies from major companies and organisations (14% response rate) which represents a reasonable portion of key players in the sector. These are quite acceptable given that the requested information could be considered as potentially commercially sensitive. The respondents tended to have very different backgrounds from procurement managers to senior management and worked for different sizes and types of companies and agency across the sector. They also worked in different countries and regions. Their collective experience and knowledge are considered to provide a representative picture of the general perception of players across the sector. All respondents for this survey represented the views of company in major procurement and supply chain matters and decisions.

5.2.4 Questionnaire survey questions and method of analysis

The survey questionnaire comprises more than 16 key structured and open ended questions (refer to **Appendix A1**). They were divided into three sections on procurement methods, strategies and general questions. In the context of this research and the questionnaire survey, procurement method has been defined as an approach required to acquire the design, material, labour, services, installation and commissioning inputs for a successful completion of a project. Procurement strategy on the other hand, is broadly

defined as new approaches to acquire all the required inputs for a successful completion of a project which also links to the business plan of a company/organisation. This enables the company/organisation to maintain a sustainable position within the total chain of the sector to ensure the success or survival of that company in the long run.

The questions on procurement methods and strategies were designed to consider the different approaches to procurement relationships i.e. *upstream relationship* (in the case when they are being procured) and *downstream relationship* (when they are to procure). Completed structured questionnaires were analysed using *SPSS* (Statistical Package for the Social Sciences Version 12.0) software. Cross tabulations and a summary of descriptive statistical results was produced and has been discussed below.

5.3 QUESTIONNAIRE SURVEY RESULTS

The questionnaire survey results are based on the analysis produced by the *SPSS* software from respondents comprising representatives of prominent and leading oil and gas companies and organisation based in the UK and Malaysia. The detailed results are presented in **Appendix A2**. The following analysis in this chapter will be the summary and analysis of the detailed results shown in these tables.

5.4 QUESTIONNAIRE SURVEY ANALYSIS

5.4.1 Introduction

The initial results presented in **Appendix A2** were analysed and summarised in tables which are more comprehensive and concise in this section. The main section of the analysis comprises:

- the background of responding organisations;
- responding organisations perception of Procurement Methods;
- responding organisations perception of Procurement Strategies;
- responding organisations perception of Multi Cultural Complexity Factors; and
- responding organisations perception of General Issues on Procurement Methods/Strategies

The analysis is generally based on the average points gathered by each type of companies/organisations on each given questions or specific issues in each sections. These average points are then listed and ranked in order of the highest average points obtained for each questions. This is to allow consistency and fairness to take place and to make the survey more meaningful and significant among different number and types of respondents from participating companies/organisations.

The analysis also involved identifying the effects of business/procurement relationships which was either an upstream or downstream relationship in the supply chain. Upstream

relationships or being procured is a case where a contractor is being procured by the client or a sub-contractor/supplier being procured by the contractor. It was also sometimes referred to as an up-line link relation between contractor and the client.

Another type of business/procurement relationship is known as downstream relationships or to procure. This is a case where the client is to procure a contractor or a contractor to procure a sub-contractor or a sub-contractor to procure a supplier or manufacturer. They are also referred to as a down-line link relation. The main reason for incorporating this two way approaches of upstream and downstream relationships in the survey is to find out whether there are any significant effects of business/procurement relationships on the procurement methods/strategies from different types and sizes of responding organisations.

The survey also involved the analysis and findings on the frequency of use and the suitability of a particular procurement method/strategy. This is done to illustrate the most used or popular methods/strategies according to the responding organisations and whether there are any links between frequency of use and suitability over procurement methods/strategies.

Important and critical Multi Cultural Complexity (MCC) factors are also listed and put to the test in the survey. MCC factors are broadly defined as any influential factors within or beyond the organisation that are closely related to the project which include the physical, technical, business, type of organisation, cultural influences, practices and specialisation

that may be considered to be critically and essentially influential in managing this complex and unique in nature project. Responding organisations are given a list of 23 potential MCC factors that could influence their company's decision on which procurement strategies to be adopted. They are then required to rate these factors in ranking order of importance and priority according to the best of their knowledge of the company's policy and practice.

Finally, the responding organisations were tested on general issues pertaining to procurement methods/strategies. The questions are generally about the perception on the person or party responsible for making decisions on the type of procurement methods/strategies to be used in a project and whether the current methods/strategies in desperate need of a change or improvement.

5.5 RESPONDING ORGANISATIONS BACKGROUND

5.5.1 Type and Number of Respondents

Six major types of responding organisations and a single operator/contractor were successfully identified in the survey. There were eight contractors who represent the most participation and they were the largest group in the survey as shown in Table 5.2 below with seven servicing companies in close second. The servicing companies include companies involved in both the upstream and downstream oil and gas facilities and activities. The two respondents from the oil and gas operators who participated in the survey are well known, established and prominent players in the industry across regions.

The government stated in the survey was represented by a wholly government owned company/agency that specialized in the oil and gas business. This company has also involved in foreign ventures in other oil producing countries either through government to government arrangements or through the normal procurement procedure and process. The consultant is a multi national company with participation and branches all over the world. The manufacturer is a well established company that deals with fabrication and installation of oil, gas and chemical facilities onshore and offshore. Finally, the operator/contractor is a multi national company that not only design and construct oil and gas facilities but also operates them during the exploration and production stages.

Table 5.2: Type and number of responding organizations

Type of organisation	No. of participation	%
Contractor	8	38.1
Servicing	7	33.3
Operator	2	9.5
Government/Client	1	4.8
Consultant	1	4.8
Manufacturer	1	4.8
Operator/Contractor	1	4.8
Total	**21**	**100.0**

5.5.2 Responding Organisations Participation

Oil and gas regions currently or previously participated by responding organisations (Tables 5.2a and 5.2b) are mostly well known oil producing regions throughout the world. With the Far East and UK regions being the most and largest participation for

these responding organisations, it is anticipated that a better and more conclusive results and findings within the industry can be achieved from this survey.

Experiences and knowledge gathered by these responding organisations from working in these various regions hopefully will be taken on board in the survey and reflected in the results. Since one of the objectives of the research is to study cross regional practices and perception, the selection of the responding organisations for this survey may just help to achieve that.

Table 5.2a: Oil and gas region currently participated by responding organisations

Oil and gas region	No. of participation by responding organisation	%
Far East (FE)	5	23.8
Middle East (ME) & FE	2	9.5
UK, North America (NA), ME & FE	2	9.5
UK, NA, ME, Africa & FE	2	9.5
UK, NA, ME, Africa & South America (SA)	1	4.8
UK, NA, ME, Africa, FE & SA	1	4.8
UK, ME & FE	1	4.8
UK, Africa & FE	1	4.8
UK, ME & Africa	1	4.8
NA, ME & FE	1	4.8
UK, ME, FE & Australia	1	4.8
ME	1	4.8
ME, Africa & FE	1	4.8
UK	1	4.8
Total	**21**	**100.0**

Table 5.2b: Oil and gas regions previously experienced by responding organisations

Oil and gas region	No. of participation by responding organisation	%
UK	5	23.8
FE	5	23.8
ME	2	9.5
ME & FE	2	9.5
UK, NA,ME & FE	2	9.5
UK, ME, FE & Australia	1	4.8
UK, Africa & F.E	1	4.8
UK, NA & FE	1	4.8
UK, NA & ME	1	4.8
Other	1	4.8
Total	21	100.0

5.5.3 Position of Contact Person in Responding Organisations

The position of the contact person in the responding organisations that was providing the answers to the questionnaire survey as shown in Table 5.3 are mainly senior employees that are closely related to procurement or contracts administration in the organisation. This indirectly implied that they are the right person or individuals with the authority, experience and relevant knowledge on procurement matters in the organisation whom should respond to the questionnaire survey.

Table 5.3: Position of contact person in responding organisations

Position	No. of participation	%
Procurement and Supply Chain	12	57.1
Technical	2	9.5
Other	2	9.5
Director	1	4.8
Senior Buyer	1	4.8
Senior Contracts Engineer	1	4.8
Technical & Mgt	1	4.8
Business Manager	1	4.8
Total	21	100.0

5.6 RESPONDING ORGANISATIONS PERCEPTION ON PROCUREMENT METHODS

5.6.1 Summary

This section deals with the responding organisations perception on procurement methods. Procurement methods in its broadest definition and context to the oil and gas industry is an approach required to acquire the design, material, labour, services, installation and commissioning inputs for a successful completion of a project.

This survey also involved the perception of responding organisations on the effects of upstream and downstream business relationships on procurement methods. The results have shown that there are differences on the approach to procurement methods between

the upstream and downstream relationships. Different type of organisation will resolve to different type of approach to suit their business practices and purpose.

The overall findings are somewhat expected but there are also a few unexpected results. Among others, it was found that the frequency of use of certain method may not necessarily mean it will be the most suitable method, either in upstream or downstream relationships. This unexpected result may have indicated that changes or improvement on certain methods are inevitable and need to be looked at by practitioners and players within the industry.

5.6.2 Frequency of Responding Organisations Involvement in the Type of Procurement Methods for the past 3 years

(In reference to **Appendix A2,** Tables A2.1.1a – A2.1.1h and Tables A2.1.2a –A2.1.2h)

The respond from the eight (8) contractors in the survey seems to have quite clearly indicated that they are still much involved in a Lump Sum method of procurement in both types of contractual relationships with an average point of 3.5 which represent a 34-66% of usage (Table 5.4a). In upstream relationships, EPCC method came close second with a 34-66% of usage while Partnering and Cost Plus are third and fourth respectively with 1-33% of usage. This order however changes slightly in downstream relationship where Supply Chain Management is much more in use with a 34-66% of usage compared to Partnering and Cost Plus with 1-33% of usage.

The only possible explanation for this could be that in upstream relationships, methods are usually dictated by clients, whereby contractors are not much in control of which one

to use. On the other hand, given the opportunity as in a downstream relationship, the contractors would prefer a Supply Chain Management method perhaps due to its fast and user friendly approach through the many supply chain on-line services provided by agents, suppliers and manufacturers. Supply Chain Management has for the last few years proven to be one of the most used methods in many sectors and industries as far as procurement method is concerned. In a complex, dynamic and fast moving oil and gas sector, this method is much used by the contractors and is certainly here to stay.

Table 5.4a: Contractor's Involvement in the Type of Procurement Methods for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	Lump Sum	3.5	34-66%	Lump Sum	3.5	34-66%
2	EPCC/Design and Build	3.0		Supply Chain Management	3.0	
3	Partnering/Alliancing/Joint Venture	2.6	1-33%	Contract to Produce	2.3	1-33%
4	Cost Plus	2.4		EPCC/Design and Build	2.3	
5	Incentive Schemes	2.3		Partnering/Alliancing/Joint Venture	2.1	
6	Supply Chain Management	1.9	0%	Cost Plus	2.0	
7	Contract to Produce	1.1		Incentive Schemes	2.0	
8	Leasing	1.0		Leasing	1.8	0%

It is a much straight forward respond from the seven (7) servicing companies as illustrated in Table 5.4b. They have been using Lump Sum method more than other methods in both upstream downstream relationships (34-66% usage). This seems to be the method preferred and chosen by their clients as in upstream relationships over any thing else. In downstream relationships, however, given the opportunity, the servicing companies tend to use a variety of procurement methods. This is to enable them to

incorporate the fit for purpose approach whereby each method is chosen based on their strong characteristics and merits on that particular project as seen appropriate by the servicing companies.

Table 5.4b: Servicing Company's Involvement in the Type of Procurement Methods for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	Lump Sum	2.6	1-33%	Lump Sum	3.6	34-66%
2	Partnering/Alliancing/Joint Venture	1.9	0%	Cost Plus	2.1	1-33%
3	Cost Plus	1.7		EPCC/Design and Build	2.1	
4	Supply Chain Management	1.7		Supply Chain Management	2.1	
5	EPCC/Design and Build	1.6		Incentive Schemes	2.0	
6	Leasing	1.4		Leasing	2.0	
7	Incentive Schemes	1.3		Contract to Produce	1.9	0%
8	Contract to Produce	1.1		Partnering/Alliancing/Joint Venture	1.4	

Being in the position of clients has probably turned the two (2) operating companies whom responded in the survey to opt for methods which could give them that little edge of control and authority over the management of projects. Having to use EPCC methods quite frequently (34-66% usage) in upstream as well as downstream relationships (Table 5.4c) would certainly gave the operating companies to be directly involved in the design, construction and commissioning of projects especially on the aspects of time, quality and costs. The experiences they have gathered using this method all these years could have also contributed to its frequent use in both the upstream and downstream relationships. They have either minimal or not use the Supply Chain Management, Leasing and Contract to Produce methods which may have something to do with the ease of use and suitability of these methods compared to the much familiar options in the industry.

Table 5.4c: Operator's Involvement in the Type of Procurement Methods for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	EPCC/Design and Build	3.5	34-66%	EPCC/Design and Build	3.0	34-66%
2	Lump Sum	2.5	1-33%	Lump Sum	2.5	1-33%
3	Cost Plus	2.5		Cost Plus	2.5	
4	Partnering/Alliancing/Joint Venture	2.5		Incentive Schemes	2.0	
5	Supply Chain Management	1.5	0%	Partnering/Alliancing/Joint Venture	2.0	
6	Incentive Schemes	1.5		Supply Chain Management	1.5	0%
7	Leasing	1.5		Leasing	1.5	
8	Contract to Produce	1.0		Contract to Produce	1.0	

It is quite obvious that the single government organisation in this survey who was acting as clients, only deals in downstream relationships (Table 5.4d). In this survey, they have been found to use the Lump Sum and EPCC methods more than anything else in the list (67-99% usage). Partnering and Supply Chain Management methods have become quite popular especially in the Far East region through the Production Sharing Contracts (PSC) between governments and operators as well as the active involvement of governments with contractors, suppliers and manufacturers throughout the world to incorporate supply chain initiatives in the procurement process.

Table 5.4d: Government's Involvement in the Type of Procurement Methods for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1				Lump Sum	4.0	67-99%
2				EPCC/Design and Build	4.0	
3	- Not applicable -			Partnering/Alliancing/Joint Venture	3.0	34-66%
4				Supply Chain Management	3.0	
5				Incentive Schemes	2.0	1-33%
6				Leasing	2.0	
7				Contract to Produce	2.0	
8				Cost Plus	2.0	

The single consultant who responded to the survey seems to be the strong supporter and user of the Supply Chain Management method (100% usage) although the Lump Sum method (67-99% usage) is still much in use in their projects (Table 5.6.2e). The consultant has always championed the use of Supply Chain Management in procurement within the industry through initiatives such as First Point Assessment Ltd (FPAL) and e-procurement which are on-line networking and business ventures. EPCC method is still proven to be a favourite method chosen by client as indicated in upstream relationships while Partnering has also being frequently used by consultant in a number of projects. Understandably, Leasing and Contract to Produce are not or seldom being used due to the nature of work and services of the consultant.

Table 5.4e: Consultant's Involvement in the Type of Procurement Methods for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	Supply Chain Management	5.0	100%	Supply Chain Management	5.0	100%
2	Lump Sum	4.0	67-99%	Lump Sum	4.0	67-99%
3	EPCC/Design and Build	4.0		Incentive Schemes	3.0	34-66%
4	Partnering/Alliancing/Joint Venture	3.0	34-66%	EPCC/Design and Build	3.0	
5	Cost Plus	2.0	1-33%	Partnering/Alliancing/Joint Venture	3.0	
6	Incentive Schemes	2.0		Cost Plus	2.0	1-33%
7	Leasing	1.0	0%	Leasing	2.0	
8	Contract to Produce	1.0		Contract to Produce	2.0	

The only manufacturing company that took part in the survey uses the Lump Sum method in almost all of their procurement practices that they have involved within the industry with 34-66% usage in upstream and 67-99% in downstream relationships (Table 5.6.2f). Again, the nature of their work and services that they are providing may have contributed strongly to this trend. However, it would not be long until other methods will be adopted

by manufacturing companies within the industry especially with Partnering and Supply Chain Management which are becoming more popular and being proven to be client and user friendly during the procurement process.

Table 5.4f: Manufacturer's Involvement in the Type of Procurement Methods for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	Lump Sum	3.0	34-66%	Lump Sum	4.0	67-99%
2	Cost Plus	1.0	0%	Cost Plus	2.0	1-33%
3	EPCC/Design and Build	1.0		EPCC/Design and Build	1.0	0%
4	Partnering/Alliancing/Joint Venture	1.0		Partnering/Alliancing/Joint Venture	1.0	
5	Supply Chain Management	1.0		Supply Chain Management	1.0	
6	Incentive Schemes	1.0		Incentive Schemes	1.0	
7	Leasing	1.0		Leasing	1.0	
8	Contract to Produce	1.0		Contract to Produce	1.0	

For this one company that actually involves in a project as an operator as well as contractor, the choice of procurement methods to be adopted may not be that simple. However, in this particular survey, this company seems to have chosen and adopted the three most commonly used methods which are the Lump Sum, EPCC (67-99% usage) and Partnering (34-66% usage) as the only methods being used by their company either in upstream or downstream relationships (Table 5.6.2g). New approaches to procurement such as the Supply Chain Management, Cost Plus and Incentive Schemes have never been tested by this company. This can either be they are pretty much comfortable and have gained much experience with the ones they are using or just not bothered to adopt new methods which obviously needs learning and understanding before using it.

Table 5.4g: Operator/Contractor's Involvement in the Type of Procurement Methods for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	Lump Sum	4.0	67-99%	Lump Sum	4.0	67-99%
2	EPCC/Design and Build	4.0		EPCC/Design and Build	3.0	
3	Partnering/Alliancing/Joint Venture	3.0	34-66%	Partnering/Alliancing/Joint Venture	3.0	34-66%
4	Cost Plus	1.0	0%	Cost Plus	1.0	0%
5	Supply Chain Management	1.0		Supply Chain Management	1.0	
6	Incentive Schemes	1.0		Incentive Schemes	1.0	
7	Leasing	1.0		Leasing	1.0	
8	Contract to Produce	1.0		Contract to Produce	1.0	

5.6.3 Responding Organisations Ranking on the Suitability of Procurement Methods

(In reference to **Appendix A2,** Tables A2.2.1a – A2.2.1h and Tables A2.2.2a –A2.2.2h)

Using or adopting a certain procurement method more than the others may not necessarily mean they are suitable or fit for purpose for a particular project. Other factors, values or even type of project may determine whether they are suitable to meet project or client requirements. For upstream relationships (Table 5.5a), the eight (8) contractors have chosen Cost Plus, EPCC, Incentive Schemes and Partnering to be the suitable methods over the others. For downstream relationships, Lump Sum method is chosen to be very suitable by the contractors. Contract to Produce is also found to be suitable by the contractors in downstream relationships probably when dealing with manufacturers, suppliers and service providers.

Table 5.5a: Contractor's Ranking on the Suitability of Procurement Methods

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Cost Plus	3.8	Suitable	Lump Sum	4.1	Very Suitable
2	EPCC/Design and Build	3.5		EPCC/Design and Build	3.4	Suitable
3	Incentive Schemes	3.3		Partnering/Alliancing/Joint Venture	3.4	
4	Partnering/Alliancing/Joint Venture	3.0		Supply Chain Management	3.4	
5	Supply Chain Management	2.8	Least Suitable	Incentive Schemes	3.4	
6	Lump Sum	2.6		Cost Plus	3.2	
7	Contract to Produce	2.5		Contract to Produce	3.1	
8	Leasing	2.4		Leasing	2.0	Least Suitable

The suitability of a procurement method in the seven (7) servicing companies will depend much on the type of relationships (Table 5.5b). In upstream relationships, most methods are found to be suitable, with the exception of Leasing and Contract to Produce. On the other hand, in downstream relationships, Supply Chain Management, Cost Plus and Leasing are least suitable for servicing companies. Understandably, Lump Sum and Incentive Schemes methods are high in the list of suitable methods due to the simplicity of the procurement process when using these methods. Incentive Schemes method would also motivate servicing companies to perform better in order to gain its remuneration and benefits.

Table 5.5b: Servicing Company's Ranking on the Suitability of Procurement Methods

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Incentive Schemes	3.8	Suitable	Lump Sum	3.6	Suitable
2	Lump Sum	3.6		Incentive Schemes	3.3	
3	EPCC/Design and Build	3.4		EPCC/Design and Build	3.3	
4	Cost Plus	3.3		Partnering/Alliancing/Joint Venture	3.0	
5	Supply Chain Management	3.2		Contract to Produce	3.0	
6	Partnering/Alliancing/Joint Venture	3.1		Supply Chain Management	2.8	Least Suitable
7	Leasing	2.7	Least Suitable	Cost Plus	2.7	
8	Contract to Produce	2.4		Leasing	1.8	

For upstream relationships, the two (2) operators have found that EPCC method to be suitable (Table 5.5c). Contract to Produce, Partnering, Lump Sum and Cost Plus methods are suitable when dealing with clients, unlike Supply Chain Management, Incentive Schemes and Leasing were found to be least suitable. It was slightly different in downstream relationships where Lump Sum, EPCC and Partnering methods are very suitable while again the likes of Supply Chain Management, Incentive Schemes and Leasing methods are found to be least suitable in the eyes of the operators.

Table 5.5c: Operator's Ranking on the Suitability of Procurement Methods

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	EPCC/Design and Build	4.5	Very Suitable	Lump Sum	4.0	Very Suitable
2	Contract to Produce	3.5	Suitable	EPCC/Design and Build	4.0	
3	Partnering/Alliancing/Joint Venture	3.5		Partnering/Alliancing/Joint Venture	4.0	
4	Lump Sum	3.0		Cost Plus	3.5	Suitable
5	Cost Plus	3.0		Contract to Produce	3.0	
6	Supply Chain Management	2.5	Least Suitable	Supply Chain Management	2.5	Least Suitable
7	Incentive Schemes	2.5		Incentive Schemes	2.5	
8	Leasing	2.0		Leasing	2.0	

For the single government agency, choosing the Contract to Produce method to be the most suitable method would be most likely linked to the fact that it will mean less involvement and participation on their part in the design, construction and completion of the project (Table 5.5d). Partnering will give them certain amount of control and authority on the project which may sometimes become necessary. Other methods will deemed to be suitable based on each individual project criteria, background, type or/and special requirements.

Table 6.5d: Government's Ranking on the Suitability of Procurement Methods

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1				Contract to Produce	5.0	Most Suitable
2	- Not Applicable -			Partnering/Alliancing/Joint Venture	4.0	Very suitable
3				Lump Sum	3.0	Suitable
4				Cost Plus	3.0	
5				EPCC/Design and Build	3.0	
6				Supply Chain Management	3.0	
7				Incentive Schemes	3.0	
8				Leasing	3.0	

The consultant exhibited mixed feelings about procurement methods whereby much will depends on the type of relationships to be adopted. In upstream relationships, Partnering, Cost Plus and Incentive Schemes methods are found to be very suitable whereas Leasing and Contract to Produce are identified to be the least suitable methods (Table 5.5e). Lump Sum and Supply Chain management are very suitable in downstream relationships according to the consultant while Incentive Schemes, Leasing and Contract to Produce are the least suitable methods. It is quite refreshing to see the consultant is willing to try out different approaches to procurement methods depending on type of relationships and the characteristics of each individual method.

Table 5.5e: Consultant's Ranking on the Suitability of Procurement Methods

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Partnering/Alliancing/Joint Venture	4.0	Very suitable	Lump Sum	4.0	Very suitable
2	Cost Plus	4.0		Supply Chain Management	4.0	
3	Incentive Schemes	4.0		Cost Plus	3.0	Suitable
4	Lump Sum	3.0	Suitable	EPCC/Design and Build	3.0	
5	EPCC/Design and Build	3.0		Partnering/Alliancing/Joint Venture	3.0	
6	Supply Chain Management	3.0		Incentive Schemes	2.0	Least Suitable
7	Leasing	2.0	Least Suitable	Leasing	2.0	
8	Contract to Produce	2.0		Contract to Produce	2.0	

The manufacturing company has always been comfortable with Lump Sum methods which they found to be very suitable method when dealing with clients in upstream relationships, together with Supply Chain management and Partnering (Table 5.5f). They also found Contract to Produce and Incentive Schemes methods to be suitable under this type of relationships. However, they found Contract to Produce methods to be the most

suitable method when dealing with suppliers, service providers and the like in downstream relationships compared to Supply Chain management and Partnering. Cost Plus and EPCC methods may only proved to be suitable for them under downstream relationships.

Table 5.5f: Manufacturer's Ranking on the Suitability of Procurement Methods

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Lump Sum	4.0	Very suitable	Contract to Produce	5.0	Most Suitable
2	Supply Chain Management	4.0		Partnering/Alliancing/Joint Venture	4.0	Very suitable
3	Partnering/Alliancing/Joint Venture	4.0		Supply Chain Management	4.0	
4	Contract to Produce	3.0	Suitable	Lump Sum	3.0	Suitable
5	Incentive Schemes	3.0		Cost Plus	3.0	
6	Leasing	2.0	Least Suitable	EPCC/Design and Build	3.0	
7	Cost Plus	2.0		Incentive Schemes	2.0	Least Suitable
8	EPCC/Design and Build	2.0		Leasing	2.0	

For this operator/contracting company, the Lump Sum, Cost Plus, EPCC and Partnering methods are considered to be the most suitable methods to be adopted under upstream relationships (Table 5.5g). They also found that Leasing and Contract to Produce methods are not suitable for them under this type of relationships. To them, the Lump Sum is the most suitable method when dealing with your suppliers, subcontractors and the like. EPCC and Partnering are also very suitable to them in downstream relationships especially under current economic trends and global competition but are against Cost

Plus, Incentive Schemes, Leasing and Contract to Produce methods under these relationships and conditions.

Table 5.5g: Operator/Contractor's Ranking on the Suitability of Procurement Methods

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Lump Sum	5.0	Most Suitable	Lump Sum	5.0	Most Suitable
2	Cost Plus	5.0		EPCC/Design and Build	4.0	Very suitable
3	EPCC/Design and Build	5.0		Partnering/Alliancing/Joint Venture	4.0	
4	Partnering/Alliancing/Joint Venture	5.0		Supply Chain Management	3.0	Suitable
5	Supply Chain Management	3.0	Suitable	Cost Plus	1.0	Not suitable
6	Incentive Schemes	3.0		Incentive Schemes	1.0	
7	Leasing	1.0	Not suitable	Leasing	1.0	
8	Contract to Produce	1.0		Contract to Produce	1.0	

5.7 RESPONDING ORGANISATIONS PERCEPTION ON PROCUREMENT STRATEGIES

5.7.1 Summary

Procurement strategy has been broadly defined in the research not only as new approaches to acquire the desired inputs for a successful completion of a project but it also links to the business plan of an organisation/company. This is to maintain a sustainable position for that organisation/company within the total chain of the industry, which determines the success or survival of that organisation/company. The difference in types, sizes and locations of the responding organisations in this questionnaire survey has

provided a good platform to find out about their perceptions on procurement strategy as practiced in the industry.

This analysis involved looking at the perception of responding organisations on the effects of upstream and downstream business relationships on procurement strategies. The results have shown that there are similarities with the approach to procurement methods between the upstream and downstream relationships whereby different types of organisation will try to search for different types of approaches/strategies to suit their business practices and purpose. For example, the operator will find partnering to be very suitable in upstream relations but finding whole life cycle costing strategy to be their top choice in downstream relationships.

The overall findings based on the limited number of respondents are somewhat mixed but there are also a few straightforward results. Among others, it established that the contractors do not seem to find the whole life cycle costing strategy to be suitable for both upstream and downstream. This was probably due to the fact that this approach will only forced them extra workloads during tendering not only trying to determine the current construction cost but also the future operating and maintenance costs which may not be reliable and justified under future market and business conditions.

Effective supply chain management strategies happen to be the choice of many responding organisation especially in downstream relationships. This is probably due to the major improvement and development of supply chain operations within the industry

with the introduction of e-procurement, one-stop supply chain agency and on-line ordering of standard parts and components.

5.7.2 Frequency of Responding Organisations Involvement in the Type of Procurement Strategies for the past 3 years

(In reference to **Appendix A2,** Tables A2.3.1a – A2.3.1h and Tables A2.3.2a –A2.3.2h)

In upstream relationships (Table 5.6a), issues and factors on cultural, geographical and climate are seen to have played an important role to the eight (8) contractors when dealing with clients especially across different oil and gas regions (34-66% usage). Cost effectiveness on operational management is also important to ensure that all resources for the project are well within the estimated cost and at the same time, meeting all the operational requirements as well. Looking at downstream relationships, effective supply chain management (34-66% usage) with the down-line chain of suppliers, subcontractors and manufacturers is considered to be important to the contractors to maintain a smooth and effective construction process and performance to meet anticipated costs, standards and time schedule.

Table 5.6a: Contractor's Involvement in the Type of Procurement Strategies for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	Cultural, Geographical and Climate factors	3.1	34-66%	Effective Supply Chain Management	3.0	34-66%
2	Cost Effectiveness on Operational Mgt	3.0		Cooperation rather than competition	2.6	1-33%
3	Cooperation rather than competition	2.8	1-33%	Cultural, Geographical and Climate factors	2.5	
4	Effective Incentive Schemes	2.5		Partnering/Alliancing Enhancement	2.5	
5	Effective Supply Chain Management	2.5		Cost Effectiveness on Operational Mgt	2.5	
6	Other Industry's Lesson and Experience	2.5		Whole Life Cycle Costing	2.3	
7	Partnering/Alliancing Enhancement	2.4		Other Industry's Lesson and Experience	2.3	
8	Whole Life Cycle Costing	2.4		Effective Incentive Schemes	2.0	

According to the seven (7) servicing companies, cooperation rather than competition was found to be an important strategy (Table 5.6b) when dealing with clients in upstream relationships (1-33% usage). Having to cooperate with other servicing companies to meet client requirements and demand is one way to ensure better services and continuous business opportunity in the long run. Cultural, geographical and climate factors are important especially when dealing with clients from other regions with special needs and demands to suit their management style and practices. Again here, effective supply chain management is crucial when dealing with suppliers and subcontractors in downstream relationship (1-33% usage) to ensure all services provided are delivered as planned, as requested and up to the desired standards.

Table 5.6b: Servicing Company's Involvement in the Type of Procurement Strategies for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	Cooperation rather than competition	2.9	1-33%	Effective Supply Chain Management	2.8	1-33%
2	Cultural, Geographical and Climate factors	2.6		Cost Effectiveness on Operational Management	2.7	
3	Cost Effectiveness on Operational Management	2.6		Cooperation rather than competition	2.4	
4	Effective Supply Chain Management	2.3		Partnering/Alliancing Enhancement	2.4	
5	Whole Life Cycle Costing	2.1		Whole Life Cycle Costing	2.4	
6	Other Industry's Lessons and Experiences	2.1		Effective Incentive Schemes	2.2	
7	Partnering/Alliancing Enhancement	2.1		Other Industry's Lessons and Experiences	2.2	
8	Effective Incentive Schemes	2.0		Cultural, Geographical and Climate factors	2.0	

The two (2) operators are more concerned about cost effectiveness on operational management strategy (Table 5.6c) when dealing with their clients in upstream relationships (67-99% usage). They are also willing to get involved in cooperation and partnerships with other operators (34-66% usage) where possible to share whatever risks as well as profits or losses in exploration and production venture especially in matured and depleted basins and new frontiers. Cost effectiveness on operational management is again seen to be the key issues (67-99% usage) as well as an effective incentive schemes when dealing with down-line contractors, suppliers and service providers in downstream relationships. These will all lead to a better and effective overall performance in the construction and production processes to ensure all operations are running smoothly,

according to schedule and most importantly within the estimated costs and desired standards.

Table 5.6c: Operator's Involvement in the Type of Procurement Strategies for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	Cost Effectiveness on Operational Management	4.5	67-99%	Cost Effectiveness on Operational Management	4.0	67-99%
2	Cooperation rather than competition	3.5	34-66%	Effective Incentive Schemes	4.0	
3	Partnering/Alliancing Enhancement	3.5		Cultural, Geographical and Climate factors	3.5	34-66%
4	Effective Incentive Schemes	3.0		Partnering/Alliancing Enhancement	3.0	
5	Effective Supply Chain Management	2.5	1-33%	Cooperation rather than competition	2.5	1-33%
6	Whole Life Cycle Costing	2.5		Effective Supply Chain Management	2.5	
7	Other Industry's Lessons and Experiences	2.5		Other Industry's Lessons and Experiences	2.5	
8	Cultural, Geographical and Climate factors	2.0		Whole Life Cycle Costing	2.0	

The government agency would certainly looked at the important issues on cultural, geographical and climate (67-99% usage) in order to strategize their procurement approach to suit their policies, regulations and practices whenever they are dealing with operators, contractors or service providers in downstream relationships (Table 5.6d). Looking at other industry's lessons and experience (34-66% usage) is also important to ensure that there will be no double standards, inconsistency and unfairness in their procurement approach and perhaps the best practice is chosen from various industry experiences. Cooperation is another common issue nowadays (34-66% usage) where Production Sharing Contract (PSC) is vastly used by governments across the globe with operators and contractors in the exploration and production of new oilfields.

Table 5.6d: Government's Involvement in the Type of Procurement Strategies for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	- Not Applicable -			Cultural, Geographical and Climate factors	4.0	67-99%
2				Other Industry's Lessons and Experiences	3.0	34-66%
3				Cooperation rather than competition	3.0	
4				Effective Supply Chain Management	3.0	
5				Partnering/Alliancing Enhancement	3.0	
6				Cost Effectiveness on Operational Management	3.0	
7				Effective Incentive Schemes	3.0	
8				Whole Life Cycle Costing	2.0	1-33%

The consultant has always been the promoter for cost effectiveness on operational management strategy in upstream relationships (100% usage) as shown in Table 5.6e. Being a technically complex and high cost industry, getting the correct balance to achieve cost effectiveness between the two can be an uphill task. Whole life cycle costing is another possible means to achieve cost effectiveness in the long run by forecasting the possible cost or expenditure throughout the life of the installations. In downstream relationships, cultural, geographical and climate, effective supply chain management and learning from other industries are the equally important strategies (67-99% usage) to be used when dealing with respective players down the line. By incorporating these strategies, a better understanding of current business trends and practices especially in

other unfamiliar region can be achieved and thus a conclusive decision can be made on procurement approaches.

Table 5.6e: Consultant's Involvement in the Type of Procurement Strategies for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	Cost Effectiveness on Operational Management	5.0	100%	Cultural, Geographical and Climate factors	4.0	67-99%
2	Whole Life Cycle Costing	4.0	67-99%	Effective Supply Chain Management	4.0	
3	Other Industry's Lessons and Experiences	4.0		Other Industry's Lessons and Experiences	4.0	
4	Effective Supply Chain Management	3.0	34-66%	Cost Effectiveness on Operational Management	3.0	34-66%
5	Partnering/Alliancing Enhancement	3.0		Effective Incentive Schemes	3.0	
6	Cultural, Geographical and Climate factors	3.0		Whole Life Cycle Costing	3.0	
7	Cooperation rather than competition	2.0	1-33%	Cooperation rather than competition	2.0	1-33%
8	Effective Incentive Schemes	2.0		Partnering/Alliancing Enhancement	2.0	

Cultural, geographical and climate factors are obviously important and thus frequently used (67-99% usage) by the manufacturer when dealing with clients in upstream relationships (Table 5.6f). The effects of these factors may well influence or will have an impact on the manufacturer's procurement approach especially when dealing with unfamiliar regions with different cultures and local practices. Cooperation, effective supply chain management and cultural issues are found to be the equally important ingredient for an effective procurement strategy (34-66% usage) when dealing with suppliers and service providers in downstream relationships for the manufacturer. This is to ensure that they could achieve a clear advantage over competitors if they can provide

better and efficient product and services to meet the high demand by clients in the global landscape.

Table 5.6f: Manufacturer's Involvement in the Type of Procurement Strategies for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
1	Cultural, Geographical and Climate factors	4.0	67-99%	Cooperation rather than competition	3.0	34-66%
2	Other Industry's Lessons and Experiences	3.0	34-66%	Effective Supply Chain Management	3.0	
3	Partnering/Alliancing Enhancement	3.0		Cultural, Geographical and Climate factors	3.0	
4	Cost Effectiveness on Operational Management	3.0		Cost Effectiveness on Operational Management	2.0	1-33%
5	Effective Incentive Schemes	3.0		Effective Incentive Schemes	2.0	
6	Whole Life Cycle Costing	2.0	1-33%	Whole Life Cycle Costing	2.0	
7	Cooperation rather than competition	2.0		Other Industry's Lessons and Experiences	2.0	
8	Effective Supply Chain Management	2.0		Partnering/Alliancing Enhancement	2.0	

Without a doubt, this operator/contracting establishment regarded cultural, geographical and climate factors to be the most important issues (100% usage) when dealing with clients or suppliers as far as procurement strategy is concerned (Table 5.6g). Having to work in different regions and different environment, they are constantly faced with these critical issues and have learnt to deal with it as they go along. Being an operator as well as a contractor has given them that extra advantage among competitors because all the work as well as tackling any problems are done in-house and thus eliminate the adversarial relationship in a normal operator/contractor situation which causes a lot of management problems. Effective supply chain management, partnering enhancement,

cost effectiveness on operational management and whole life cycle costing are equally important strategies (67-99% usage) to ensure better results and performance in their overall operation and cost control effort in a project.

Table 5.6g: Operator/Contractor's Involvement in the Type of Procurement Strategies for the past 3 years

Rank	*Upstream* Relationship	Average Points	Average Frequency of Use	*Downstream* Relationship	Average Points	Average Frequency of Use
	Cultural, Geographical and Climate factors	5.0	100%	Cultural, Geographical and Climate factors	5.0	100%
1	Effective Supply Chain Management	4.0	67-99%	Effective Supply Chain Management	4.0	67-99%
2	Partnering/Alliancing Enhancement	4.0		Partnering/Alliancing Enhancement	4.0	
3	Cost Effectiveness on Operational Management	4.0		Cost Effectiveness on Operational Management	4.0	
4	Whole Life Cycle Costing	4.0		Whole Life Cycle Costing	4.0	
5	Cooperation rather than competition	2.0	1-33%	Cooperation rather than competition	2.0	1-33%
6	Other Industry's Lessons and Experiences	2.0		Other Industry's Lessons and Experiences	2.0	
7	Effective Incentive Schemes	1.0		Effective Incentive Schemes	1.0	

5.7.3 Responding Organisations Ranking on the Suitability of Procurement Strategies

(In reference to **Appendix A2,** Tables A2.4.1a – A2.4.1h and Tables A2.4.2a-A2.4.2h)

Frequency of use may not necessary reflect the suitability of procurement strategies to be adopted by players. This is shown by the contractors in both upstream and downstream relationships whereby in their opinion, cooperation rather than competition to be very suitable under current circumstances and trends (Table 5.7a). Partnering and cost effectiveness on operational management are also considered being very suitable strategies when dealing with clients in upstream relationships. For some unknown reason,

other industry's lessons and experiences is found to be the least suitable strategy for the contractors in both upstream and downstream relationships.

Table 5.7a: Contractor's Ranking on the Suitability of Procurement Strategies

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Cooperation rather than competition	4.1	Very suitable	Cooperation rather than competition	4.0	Very suitable
2	Partnering/Alliancing Enhancement	4.1		Effective Supply Chain Management	3.8	Suitable
3	Cost Effectiveness on Operational Management	4.0		Cost Effectiveness on Operational Management	3.8	
4	Cultural, Geographical and Climate factors	3.8	Suitable	Partnering/Alliancing Enhancement	3.5	
5	Effective Incentive Schemes	3.6		Effective Incentive Schemes	3.3	
6	Effective Supply Chain Management	3.5		Whole Life Cycle Costing	3.1	
7	Whole Life Cycle Costing	3.3		Cultural, Geographical and Climate factors	3.0	
8	Other Industry's Lessons and Experiences	2.4	Least Suitable	Other Industry's Lessons and Experiences	2.6	Least Suitable

The servicing companies may share some similarities with the contractors over the issue of suitability in procurement strategies to be adopted. Cooperation and effective supply chain management strategies remain the top two of the ranking order in both upstream and downstream relationships (Table 5.7b). They also found that learning from other industry's experiences is a least suitable strategy in upstream relationships especially when the procurement methods are usually dictated by the clients. Whole life cycle costing for some unknown reason is found to be least suitable when dealing with suppliers and manufacturers in downstream relationships.

Table 5.7b: Servicing Company's Ranking on the Suitability of Procurement Strategies

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Cooperation rather than competition	3.8	Suitable	Effective Supply Chain Management	3.9	Suitable
2	Effective Supply Chain Management	3.7		Cooperation rather than competition	3.6	
3	Partnering/Alliancing Enhancement	3.4		Cost Effectiveness on Operational Management	3.3	
4	Cost Effectiveness on Operational Management	3.4		Cultural, Geographical and Climate factors	3.3	
5	Effective Incentive Schemes	3.3		Partnering/Alliancing Enhancement	3.1	
6	Cultural, Geographical and Climate factors	3.1		Effective Incentive Schemes	3.0	
7	Whole Life Cycle Costing	2.7	Least Suitable	Other Industry's Lessons and Experiences	2.9	Least Suitable
8	Other Industry's Lessons and Experiences	2.5		Whole Life Cycle Costing	2.3	

Partnering, cost effectiveness on operational management and cultural, geographical and climate are equally very suitable strategies to be adopted by the operators when dealing with clients in upstream relationships (Table 5.7c). The ever increasing price of oil and gas including exploration and production costs, depleted basins and oilfields and the higher risks involved may have led the operator to find out that these strategies to be very suitable. In downstream relationships, the operator seems to appreciate whole life cycle costing as the single most suitable strategy when dealing with contractors, suppliers and the likes. Effective incentive schemes, cooperation, partnering and cost effectiveness on operational management are regarded to be very suitable by the operators in downstream relationships but found effective supply chain management to be the least suitable.

Table 5.7c: Operator's Ranking on the Suitability of Procurement Strategies

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Partnering/Alliancing Enhancement	4.5	Very suitable	Whole Life Cycle Costing	5.0	Most suitable
2	Cost Effectiveness on Operational Management	4.5		Effective Incentive Schemes	4.5	Very suitable
3	Cultural, Geographical and Climate factors	4.5		Cooperation rather than competition	4.0	
4	Effective Incentive Schemes	3.5	Suitable	Partnering/Alliancing Enhancement	4.0	
5	Cooperation rather than competition	3.0		Cost Effectiveness on Operational Management	4.0	
6	Effective Supply Chain Management	3.0		Cultural, Geographical and Climate factors	3.5	Suitable
7	Whole Life Cycle Costing	3.0		Other Industry's Lessons and Experiences	3.0	
8	Other Industry's Lessons and Experiences	2.5	Least Suitable	Effective Supply Chain Management	2.5	Least Suitable

Cultural, geographical and climate factors, whole life cycle costing, partnering and cooperation are found to be very suitable strategies by the government agency in upstream relationships although they may not necessarily be dealing with those issues in practice (Table 5.7d). However, partnering, cultural, geographical and climate and effective incentive schemes are found to be the most suitable strategies to be adopted when dealing with operators, contractor and suppliers in downstream relationships. Incentive schemes is considered to be an important procurement strategy to be given serious attention because by having incentives, it will allow players down the line to perform better through dynamic initiatives and encourage good working and team spirit.

Table 5.7d: Government's Ranking on the Suitability of Procurement Strategies

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Cultural, Geographical and Climate factors	4.0	Very suitable	Partnering/Alliancing Enhancement	5.0	Most suitable
2	Whole Life Cycle Costing	4.0		Cultural, Geographical and Climate factors	5.0	
3	Partnering/Alliancing Enhancement	4.0		Effective Incentive Schemes	5.0	

4	Cooperation rather than competition	4.0		Cooperation rather than competition	4.0	Very suitable
5	Effective Supply Chain Management	3.0	Suitable	Whole Life Cycle Costing	4.0	
6	Cost Effectiveness on Operational Management	3.0		Effective Supply Chain Management	3.0	Suitable
7	Effective Incentive Schemes	3.0		Cost Effectiveness on Operational Management	3.0	
8	Other Industry's Lessons and Experiences	3.0		Other Industry's Lessons and Experiences	3.0	

The consultant has found that cooperation rather than competition could be the most suitable strategy when dealing with clients in upstream relationships (Table 5.7e), especially under current economic and business conditions and trends. They also found that strategies on effective supply chain management, effective incentive schemes, whole life cycle costing and learning other industry's experiences should be in place to support the cooperation initiatives. In order to deal with players in downstream relationships, cost effectiveness on operational management is found to be the most suitable strategy to adopt and put into practice by the consultant. Whole life cycle costing and other industry's lessons and experience are equally very suitable strategies to be adopted in downstream relationship and are gaining popularity due to its integrated means of long term cost and value forecasting and the possibility of adopting new experiences from other industries.

Table 5.7e: Consultant's Ranking on the Suitability of Procurement Strategies

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Cooperation rather than competition	5.0	Most suitable	Cost Effectiveness on Operational Management	5.0	Most suitable
2	Effective Supply Chain Management	4.0	Very suitable	Whole Life Cycle Costing	4.0	Very suitable
3	Effective Incentive Schemes	4.0		Other Industry's Lessons and Experiences	4.0	
4	Whole Life Cycle Costing	4.0		Effective Supply Chain Management	3.0	Suitable

5	Other Industry's Lessons and Experiences	4.0		Partnering/Alliancing Enhancement	3.0	
6	Cultural, Geographical and Climate factors	3.0	Suitable	Effective Incentive Schemes	3.0	
7	Partnering/Alliancing Enhancement	3.0		Cultural, Geographical and Climate factors	3.0	
8	Cost Effectiveness on Operational Management	3.0		Cooperation rather than competition	2.0	Least Suitable

Looking at the manufacturer's opinion on procurement strategy (Table 5.7f), other industry's lessons and experiences can be very suitable during upstream relationships but can also become least suitable in downstream relationships. In other words, what turn to be good for them when they are dealing with clients may not necessarily turn out to be the same when they are dealing with players down the line. Effective supply chain management and partnering are found to be very suitable strategies by the manufacturer when dealing with suppliers and down-line players as far as competition and overall performance are concerned. These strategies are to ensure competition is kept to a minimum and production can be improved to meet strict datelines.

Table 5.7f: Manufacturer's Ranking on the Suitability of Procurement Strategies

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Other Industry's Lessons and Experiences	4.0	Very suitable	Effective Supply Chain Management	4.0	Very suitable
2	Cooperation rather than competition	3.0	Suitable	Partnering/Alliancing Enhancement	4.0	
3	Effective Supply Chain Management	3.0		Cooperation rather than competition	3.0	Suitable
4	Partnering/Alliancing Enhancement	3.0		Cultural, Geographical and Climate factors	3.0	
5	Cost Effectiveness on Operational Management	3.0		Cost Effectiveness on Operational Management	3.0	
6	Effective Incentive Schemes	3.0		Effective Incentive Schemes	3.0	
7	Whole Life Cycle Costing	3.0		Whole Life Cycle Costing	3.0	
8	Cultural, Geographical and Climate factors	2.0	Least Suitable	Other Industry's Lessons and Experiences	2.0	Least Suitable

Although this operator/contractor may find using other industry's lessons and experiences is the least suitable strategy in both upstream and downstream relationships, it has found that using the whole life cycle costing can be very suitable and quite rewarding in the long term either in upstream or downstream relationships (Table 5.7g). According to them, cost effectiveness on operational management was also a very suitable strategy to use when dealing with clients in upstream relationships. Cultural, geographical and climate factors and partnering are very suitable strategies when you are dealing with down-line players in downstream relationships especially in untested regions where local partners are desperately needed.

Table 5.7g: Operator/Contractor's Ranking on the Suitability of Procurement Strategies

Rank	*Upstream* Relationship	Average Points	Average Suitability	*Downstream* Relationship	Average Points	Average Suitability
1	Cost Effectiveness on Operational Management	4.0	Very suitable	Cultural, Geographical and Climate factors	4.0	Very suitable
2	Whole Life Cycle Costing	4.0		Whole Life Cycle Costing	4.0	
3	Effective Supply Chain Management	3.0	Suitable	Partnering/Alliancing Enhancement	4.0	
4	Partnering/Alliancing Enhancement	3.0		Effective Supply Chain Management	3.0	Suitable
5	Effective Incentive Schemes	2.0	Least Suitable	Cost Effectiveness on Operational Management	3.0	
6	Cooperation rather than competition	2.0		Effective Incentive Schemes	3.0	
7	Other Industry's Lessons and Experiences	2.0		Cooperation rather than competition	2.0	Least Suitable
8	Cultural, Geographical and Climate factors	2.0		Other Industry's Lessons and Experiences	2.0	

5.8 RESPONDING ORGANISATIONS PERCEPTION ON MULTI CULTURAL COMPLEXITY (MCC) FACTORS

5.8.1 Summary

One of the critical issues discussed in the literature overview was about the importance of MCC factors and its impact to procurement methods/strategies within the industry. The MCC factors are identified through literature search, interviews and case studies. In this survey, 23 important and critical MCC factors are listed and presented to the responding organisations for their assessment.

The results of the survey have shown that different types of responding organisation have different perception of MCC factors in accordance to their preference/importance. However, one possibility could be that different type of responding organisations may have different understanding of the MCC factors and its application to the different regions that they were involved in. For example, a player who is involved in a project in certain region may have to adapt to different values and approach to suit the regional practice or to meet the requirement imposed by countries in that particular region. This will certainly gave them a broader perception of things and in this case the different perception of MCC factors compared to the ones who only relies on local knowledge and experiences.

Internal organisation set up may also affect the perception on MCC factors such as a small or large corporation; their mission, vision and objectives; type, number and

qualification of personnel; and the involvement of local players and inputs. Current and future business, market trends or environment will also effect the perception of MCC factors and thus the different order of importance and priorities by responding organisations.

5.8.2 Responding Organisations Ratings in Ranking Order on Multi Cultural Complexity Factors that will influence their company's decision on which Procurement Strategies to be adopted

(In reference to **Appendix A2,** Tables A2.5.1a – A2.5.1z)

The volatility of the oil and gas prices in the world today has altered business and market conditions and environment of many sectors of the oil and gas industry especially in the oil exploration and production. The eight (8) contractors have found that this factor and also their potential paymaster to be very important factors (Table 5.8a) when they are to decide suitable procurement strategies to be used in different regions of the world. Capital exposure and risk, technological and complexity of project are also important when dealing with a lot of uncertainties and problems in unchartered territory or new frontiers. Stakeholders' requirement may be least important to the contractors including tax regime, political risk and reservoir size.

Table 5.8a: Contractor's Ratings in Ranking Order on Multi Cultural Complexity Factors that will influence their company's decision on which Procurement Strategies to be adopted

Rank	Multi Cultural Complexity Factors	Average Points	Average Importance
			1.0 Not Important 2.0 Least important 3.0 Important 4.0 Very Important 5.0 Most Important
1	Business/market environment	4.0	Very Important
2	Paymaster (Client)	4.0	
3	Capital exposure/risk	3.9	Important
4	Technological	3.8	
5	Complexity of project	3.8	
6	Manpower/labour	3.5	
7	Company's specialization	3.3	
8	Company's vision and objectives	3.3	
9	Goodwill/good image/reputation	3.3	
10	Comfortable/experience with certain procurement method	3.3	
11	Sustainability	3.1	
12	Project timescale	3.0	
13	Transport route/access	3.0	
14	Stakeholders/shareholders	2.9	Least Important
15	Infrastructure position/existence	2.9	
16	Price of oil and gas	2.8	
17	Cultural, geographical and climate difference/changes	2.8	
18	Maturity of basin	2.6	
19	Political risk	2.6	
20	Government legislation	2.5	
21	Tax regime/tariffs/duties	2.4	
22	Incentives schemes	2.4	
23	Reservoir size	2.3	

For the seven (7) servicing companies, technological factors not only will influence their decision on procurement strategies to be adopted but also will become the core issue as far as competition and sustainability in the small and specialized industry are concerned (Table 5.8b). Complexity of project, business/market environment, sustainability including the price of oil and gas are rather important to these servicing companies when it comes to pricing and strategies for tenders to ensure continuity of work and company's

survival. Project timescale, government legislation and tax regime are least important and considered to be less influential in their decision making process.

Table 5.8b: Servicing Company's Ratings in Ranking Order on Multi Cultural Complexity Factors that will influence their company's decision on which Procurement Strategies to be adopted

Rank	Multi Cultural Complexity Factors	Average Points	Average Importance
			1.0 Not Important 2.0 Least important 3.0 Important 4.0 Very Important 5.0 Most Important
1	Technological	4.0	Very Important
2	Complexity of project	3.7	Important
3	Business/market environment	3.7	
4	Price of oil and gas	3.4	
5	Sustainability	3.4	
6	Company's specialization	3.4	
7	Goodwill/good image/reputation	3.4	
8	Manpower/labour	3.3	
9	Paymaster (Client)	3.3	
10	Capital exposure/risk	3.2	
11	Reservoir size	3.1	
12	Infrastructure position/existence	3.1	
13	Company's vision and objectives	3.1	
14	Stakeholders/shareholders	3.1	
15	Incentives schemes	3.0	
16	Maturity of basin	3.0	
17	Cultural, geographical and climate difference/changes	3.0	
18	Transport route/access	3.0	
19	Political risk	3.0	
20	Project timescale	2.8	Least Important
21	Tax regime/tariffs/duties	2.8	
22	Government legislation	2.6	
23	Comfortable/experience with certain procurement method	2.6	

The two (2) operators have found that cultural, geographical and climate differences to be the single most important factors and will definitely influence their company's decision on procurement strategies to be adopted (Table 5.8c). Government legislation, paymaster, maturity of basin, reservoir size, stakeholders, capital exposure and political risk will

certainly contribute to the economics of exploration and production of oil and gas in different regions and thus they are very important factors to be considered by any operators in the industry. All other factors are also considered to be important to the operators and have to be given some attention when making decisions on procurement strategies to be adopted.

Understandably, the government agency have found that the five most important factors to be given most attention would be the price of oil and gas, business environment, stakeholders requirements, political risk and goodwill/good image (Table 5.8d). These factors would certainly be the core issues that will be considered by the government when deciding the best procurement strategies to be adopted in a particular project. Recent development in the sudden increased in the price of oil and gas have influenced many decisions on the approach to oil and gas fields management by governments including the amount of exploration activities and the production volume of oil and gas within their region. Economic factors such as tax regime, capital exposure and sustainability are also nonetheless very important to the government when considering the best approaches in procurement strategies.

Table 5.8c: Operator's Ratings in Ranking Order on Multi Cultural Complexity Factors that will influence their company's decision on which Procurement Strategies to be adopted

Rank	Multi Cultural Complexity Factors	Average Points	Average Importance
			1.0 Not Important 2.0 Least important 3.0 Important 4.0 Very Important 5.0 Most Important
1	Cultural, geographical and climate difference/changes	5.0	Most Important

2	Government legislation	4.5	Very important
3	Paymaster (Client)	4.5	
4	Maturity of basin	4.0	
5	Reservoir size	4.0	
6	Stakeholders/shareholders	4.0	
7	Capital exposure/risk	4.0	
8	Political risk	4.0	
9	Tax regime/tariffs/duties	3.5	Important
10	Goodwill/good image/reputation	3.5	
11	Comfortable/experience with certain procurement method	3.5	
12	Manpower/labour	3.5	
13	Company's specialization	3.0	
14	Company's vision and objectives	3.0	
15	Technological	3.0	
16	Complexity of project	3.0	
17	Infrastructure position/existence	3.0	
18	Transport route/access	3.0	
19	Project timescale	3.0	
20	Price of oil and gas	3.0	
21	Business/market environment	3.0	
22	Sustainability	3.0	
23	Incentives schemes	3.0	

The consultants have found that economical, technological as well as company's management factors to be most important and most certainly will influence their decision on procurement strategies to be adopted. These include the capital exposure/risk, paymaster, technological advancement, company's specialisation, vision and objectives and last but not least political risk (Table 5.8e). The consultants have also found that the price of oil and gas is least important and less influential in their decision as long as they have the rest of the factors mentioned fully considered.

Table 5.8d: Government's Ratings in Ranking Order on Multi Cultural Complexity Factors that will influence their company's decision on which Procurement Strategies to be adopted

Rank	Multi Cultural Complexity Factors	Average Points	Average Importance
			1.0 Not Important 2.0 Least important 3.0 Important 4.0 Very Important 5.0 Most Important
1	Price of oil and gas	5.0	Most Important
2	Business/market environment	5.0	
3	Stakeholders/shareholders	5.0	
4	Political risk	5.0	
5	Goodwill/good image/reputation	5.0	
6	Tax regime/tariffs/duties	4.0	Very Important
7	Paymaster (Client)	4.0	
8	Comfortable/experience with certain procurement method	4.0	
9	Capital exposure/risk	4.0	
10	Sustainability	4.0	
11	Government legislation	4.0	
12	Cultural, geographical and climate difference/changes	4.0	
13	Technological	4.0	
14	Complexity of project	4.0	
15	Manpower/labour	4.0	
16	Company's specialization	4.0	
17	Company's vision and objectives	4.0	
18	Maturity of basin	4.0	
19	Reservoir size	4.0	
20	Infrastructure position/existence	3.0	Important
21	Transport route/access	3.0	
22	Incentives schemes	3.0	
23	Project timescale	3.0	

Table 5.8e: Consultant's Ratings in Ranking Order on Multi Cultural Complexity Factors that will influence their company's decision on which Procurement Strategies to be adopted

Rank	Multi Cultural Complexity Factors	Average Points	Average Importance
			1.0 Not Important 2.0 Least important 3.0 Important 4.0 Very Important 5.0 Most Important
1	Capital exposure/risk	5.0	Most Important
2	Paymaster (Client)	5.0	

3	Technological	5.0	
4	Company's specialization	5.0	
5	Company's vision and objectives	5.0	
6	Political risk	5.0	
7	Government legislation	4.0	Very Important
8	Tax regime/tariffs/duties	4.0	
9	Comfortable/experience with certain procurement method	4.0	
10	Sustainability	4.0	
11	Incentives schemes	4.0	
12	Project timescale	4.0	
13	Cultural, geographical and climate difference/changes	4.0	
14	Goodwill/good image/reputation	4.0	
15	Complexity of project	4.0	
16	Manpower/labour	4.0	
17	Business/market environment	3.0	Important
18	Stakeholders/shareholders	3.0	
19	Maturity of basin	3.0	
20	Reservoir size	3.0	
21	Infrastructure position/existence	3.0	
22	Transport route/access	3.0	
23	Price of oil and gas	2.0	Least Important

The manufacturers consider factors that are closely linked to the economics to be very important which include capital exposure/risk, paymaster, complexity of project and sustainability (Table 5.8f). The type and background of the paymaster for the project will determine their project cash flow situation and also will affect their sustainability in the industry's manufacturing chain. On the other hand, the complexity of the project will determine the level of capital exposure/risk that they are about to face in the project. These factors certainly will have an effect on their company's decision on procurement strategies. The reason why they consider the price of oil and gas, technological and project timescale to be least important is because these factors may not be that critical in their operations and decision making process compared to the ones mentioned above.

Table 5.8f: Manufacturer's Ratings in Ranking Order on Multi Cultural Complexity Factors that will influence their company's decision on which Procurement Strategies to be adopted

Rank	Multi Cultural Complexity Factors	Average Points	Average Importance
			1.0 Not Important 2.0 Least important 3.0 Important 4.0 Very Important 5.0 Most Important
1	Complexity of project	4.0	Very Important
2	Capital exposure/risk	4.0	
3	Sustainability	4.0	
4	Paymaster (Client)	4.0	
5	Business/market environment	3.0	Important
6	Stakeholders/shareholders	3.0	
7	Cultural, geographical and climate difference/changes	3.0	
8	Manpower/labour	3.0	
9	Company's specialization	3.0	
10	Company's vision and objectives	3.0	
11	Maturity of basin	3.0	
12	Reservoir size	3.0	
13	Infrastructure position/existence	3.0	
14	Transport route/access	3.0	
15	Government legislation	3.0	
16	Political risk	3.0	
17	Goodwill/good image/reputation	3.0	
18	Comfortable/experience with certain procurement method	3.0	
19	Price of oil and gas	2.0	Least Important
20	Technological	2.0	
21	Incentives schemes	2.0	
22	Project timescale	2.0	
23	Tax regime/tariffs/duties	2.0	

The operator/contractors have found that the paymaster and capital exposure/risk factors to be most important and will have great influences in their decision on procurement strategies to be adopted in a project (Table 5.8g). They also found that political risk, project timescale, technological, complexity and manpower to be very important and must be addressed accordingly when making important decisions. Maturity of basin and reservoir size are least important to them while the price of oil and gas, business/market

environments and shareholders are not important and thus will less effect their decision on procurement strategies.

Table 5.8g: Operator/Contractor's Ratings in Ranking Order on Multi Cultural Complexity Factors that will influence their company's decision on which Procurement Strategies to be adopted

Rank	Multi Cultural Complexity Factors	Average Points	Average Importance
			1.0 Not Important 2.0 Least important 3.0 Important 4.0 Very Important 5.0 Most Important
1	Paymaster (Client)	5.0	Most Important
2	Capital exposure/risk	5.0	
3	Political risk	4.0	Very Important
4	Transport route/access	4.0	
5	Project timescale	4.0	
6	Cultural, geographical and climate difference/changes	4.0	
7	Technological	4.0	
8	Complexity of project	4.0	
9	Manpower/labour	4.0	
10	Company's specialization	3.0	Important
11	Company's vision and objectives	3.0	
12	Sustainability	3.0	
13	Tax regime/tariffs/duties	3.0	
14	Infrastructure position/existence	3.0	
15	Government legislation	3.0	
16	Goodwill/good image/reputation	3.0	
17	Comfortable/experience with certain procurement method	3.0	
18	Maturity of basin	2.0	Least Important
19	Reservoir size	2.0	
20	Price of oil and gas	1.0	Not Important
21	Business/market environment	1.0	
22	Stakeholders/shareholders	1.0	
23	Incentives schemes	1.0	

5.9 RESPONDING ORGANISATIONS PERCEPTION OF GENERAL ISSUES ON PROCUREMENT METHODS/STRATEGIES

5.9.1 Summary

General issues on procurement methods/strategies put forward in the survey mainly deal with identifying the person or party responsible for making decision on which procurement methods/strategies to be used or adopted in their respective organisations. It was made to understand that during the preliminary interviews and from literatures, there were some critical views on this issue not only on the person responsible to decide and implement the right procurement methods/strategies but also the person who are responsible and willing to adapt to procurement changes and improvements within the organisation and industry as a whole.

The survey has shown that there were mixed results on this, indirectly it gave an indication that an important issue does exist and need to be addressed by the industry. However, different players have different perception especially on sensitive and confidential issues such as this. Although the results may be pretty much influenced by the number of respondents in the survey, the organisation's size, business nature and philosophy, experiences and business location are found to be the key drivers to this issue. This issue can also be regarded as a local issue because different country or region reacted differently to certain issue and unfortunately, this is one of them.

Finally, it was only the voice of the eight (8) contractors that feel changes to procurement methods/strategies were inevitable while the rest seems to remain comfortable with the traditional approaches.

5.9.2 Responding Organisations Ratings of General Issues on Procurement Methods/Strategies adopted within the industry

This was a set of question on the responding organisations perception on general issues on procurement methods/strategies currently being used within the industry. The first question as shown in Table 5.9a was whether current procurement methods/strategies within the industry are influenced and dictated by *those being procured more than those doing the procurement.* The consultant solely agreed that it was the case in the industry whereas most of the other respondents disagreed. It would have been a different perception if the statement was the other way round although some may also chose to either agree or disagree. However, based on data obtained from case studies and interviews, it would be more likely that procurement methods will be dictated by those doing the procurement. Procurement strategies on the other hand can be taken up either by those being procured or the ones doing the procurement.

Table 5.9a: The perception of Responding Organisations whether current procurement methods/strategies within the industry are influenced and dictated by *those being procured more than those doing the procurement*

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
Consultant				1		4	4.0
Contractor	1	3	2	2		21	2.6
Servicing		5	1	1		17	2.4
Operator		2				4	2.0
Government		1				2	2.0
Manufacturer		1				2	2.0
Operator/Contr		1				2	2.0

Still on the same issue but this time to find out whether it was being influenced and dictated by *a number of players, i.e. project initiators (operators) and implementers (contractors).* There was a conclusive agreement by most of the respondents on this statement which can also be described as true (Table 5.9b). Being a small, specialized and highly technical industry would certainly be the main reason why this could possibly be the trend and a suitable approach to procurement methods/strategies in the industry. However, with the rapid changes in business trends and environment, various external and internal constraints with players encroaching into other unfamiliar regions throughout the world in search of oil and gas, changes in procurement approaches are inevitable and can only be for the better.

Table 5.9b: The perception of Responding Organisations whether current procurement methods/strategies within the industry are influenced and dictated by *a number of players, i.e. project initiators (operators) and implementers (contractors)*

	(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
Servicing					4	3	31	4.4
Operator					2		8	4.0
Government					1		4	4.0
Consultant					1		4	4.0
Operator/Contr					1		4	4.0
Contractor		1	1		5	1	30	3.8
Manufacturer			1				3	3.0

The following question is still about this same issue, (Table 5.9c) only this time whether they are influenced and dictated by *senior managers and directors of company based on their experiences and preferences instead of seeking professional advices from consultants.* There was a split decision on the results whereby on one hand the two (2) operators, the single government agency, the sole manufacturer and seven (7) contractors seems to agree with this statement while on the other hand there was a split decision by the seven (7) servicing company, the single consultant and operator/contractor whereby they neither agree nor disagree. Again, looking back at the information available during the interview stages, there was a clear indication that this could be the case especially when all procurement matters are the sole responsibility of senior managers and company directors to manage and implement on behalf of the company.

Table 5.9c: The perception of Responding Organisations whether current procurement methods/strategies within the industry are influenced and dictated by *senior managers and directors of company based on their experiences and preferences instead of seeking professional advices from consultants*

	Strongly disagree (Pts) (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
Operator				2		8	4.0
Government				1		4	4.0
Manufacturer				1		4	4.0
Contractor			1	7		31	3.9
Servicing		2	1	3	1	24	3.4
Consultant			1			3	3.0
Operator/Contr			1			3	3.0

On the question of whether current procurement methods/strategies within the industry are influenced by *external issues more than the company's internal set up and objectives,* there was a three way answers received in the survey. The only consultant and manufacturer in the survey have indicated their agreement to this statement; the eight (8) contractors and the sole government agency chooses neither to agree nor disagree; and a split decision in the servicing companies and the two (2) operators while the single operator/contractor fully disagrees (Table 5.9d). The only sensible explanation for this could been caused by the different level of understanding of what constitutes external issues and also the differences in company or organisation set up and objectives between the respondents.

Table 5.9d: The perception of Responding Organisations whether current procurement methods/strategies within the industry are influenced by *external issues more than the company's internal set up and objectives*

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
Consultant				1		4	4.0
Manufacturer				1		4	4.0
Contractor		1	4	3		26	3.3
Government			1			3	3.0
Servicing	1	2	3	1		18	2.6
Operator		1	1			5	2.5
Operator/Contr		1				2	2.0

When asked whether current procurement methods/strategies within the industry are *outdated and have made little development to move away from traditional to innovative approaches in comparison to technological, economics or other strategic advancement in the industry,* six (6) out of the eight (8) contractors seems to agree to this statement (Table 5.9e). The single manufacturer chose to either agree or disagree while the rest of the respondents disagreed. Being an active participant and important player in the procurement and supply chain process within the industry either in upstream or downstream relationships, the contractors may be in a better position to say that the current methods or strategies are outdated and in desperately need of a change. Stiff competition, compulsory local input and high technical and economic demands in various oil producing regions throughout the world may have led the industry in need of a thorough overhaul and adjustment if not total changes in procurement approaches and process. This statement is again fully supported by data obtained from literatures and interviews.

Table 5.9e: The perception of Responding Organisations whether current procurement methods/strategies within the industry are *outdated and have made little development to move away from traditional to innovative approaches in comparison to technological, economics or other strategic advancement in the industry*

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
Contractor			1	6	1	32	4.0
Manufacturer			1			3	3.0
Servicing	1	3	1	2		18	2.6
Operator		1	1			5	2.5
Government		1				2	2.0
Consultant		1				2	2.0
Operator/Contr		1				2	2.0

Finally, the rather sensitive but important question on whether current procurement methods/strategies within the industry are *not so pronounced with regards to issues and problems because there is the need to maintain good image, reputation and goodwill amongst players in the industry to ensure sustainability and survival.* Again, there was a three way answers to this question with the single consultant and manufacturer seems to agree with the statement; the eight (8) contractors and single operator/contractor remain undecided with either to agree or disagree; and the two (2) operators, the seven (7) servicing companies and the government agency putting forward their disagreement on this statement (Table 5.9f).

Being regarded as a sensitive issue, maintaining good image, reputation and goodwill amongst players which include governments, operators, contractors and the like is important to the sustainability and survival of players in this small and competitive but

high financial input and output industry. More often than not, many inappropriate performances, bad services and internal problems amongst close players within the industry have always been kept under the lid in order to avoid jeopardising their image, reputation and future business opportunities. This practice has been going on as long as the industry itself. This is not just a wild accusation but based on information gathered through interviews, case studies and even the media. Numerous disclosure by the press in the past on certain oil and gas companies malpractices and disregard to the environmental issues could also justified this claim.

Innovative procurement methods/strategies aside, this issue can also lead to many unknown and undisclosed pre-contract agreements and signings between close players within the industry, which is also better known as selected negotiated contracts. This type of approach will certainly cut off fair competition and most likely will create an unhealthy trend which will affect most players in the supply chain in the industry across the regions. This fact was made known during interviews and highlighted in conferences and could possibly be one of the reasons why many clients and governments are quite reluctant to change or adapt to new procurement approaches or arrangements.

Table 5.9f: The perception of Responding Organisations whether current procurement methods/strategies within the industry are *not so pronounced with regards to issues and problems because there is the need to maintain good image, reputation and goodwill amongst players in the industry to ensure sustainability and survival*

	Strongly disagree (Pts) (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
Consultant				1		4	4.0
Manufacturer				1		4	4.0
Contractor		3	2	3		24	3.0
Operator/Contr			1			3	3.0
Operator		1	1			5	2.5
Servicing	2	2	1	2		17	2.4
Government		1				2	2.0

5.10 SUMMARY OF CHAPTER 5

As mentioned in the introduction to this chapter, this survey exercise was conducted to gather primary, relevant and current data from the oil and gas sector in order to support and validate data obtained from literature review and case studies. Although the number of respondents in this survey could be questioned, their position as senior managers in major companies and their experiences in this highly specialized industry including their participation and involvement in most oil producing regions in the world could be considered as a justification to represent the overall view of players in the industry.

Results produced in the survey gave the indication that there was no single way of doing things in the approach to procurement methods/strategies in the industry. Different type of responding organisations responded differently to the questionnaire according to the nature of their establishment, policy, practices, current and future business demand and environment.

Major findings from this survey include:

- frequency of use of a particular procurement method/strategy does not necessarily mean that they are suitable and meeting the needs and requirement of that particular player's organisation/company;
- there is a significant effect of upstream and downstream business relationships in procurement methods/strategies as shown in the results which has to be addressed separately;
- the perception and prioritization of Multi Cultural Complexity (MCC) factors most likely depends on the type, nature, size and location of responding organisations which certainly has a lot of influenced in their decision; and
- the results on the perception of the general procurement methods/strategies issues have shown that although they are not overwhelmingly in agreement with a few of the statements, it shows that there was certainly an issue that needs to be addressed by the industry.

Finally, all the results and findings obtained from this chapter, Chapter 6 (Case Study) and Chapter 3 (Literature Overview) were being used to develop and design the procurement strategy guideline on the selection process which will be discussed further in detail in Chapter 7.

CHAPTER 6: DETAILED CASE STUDY RESULTS AND ANALYSIS

6.1 INTRODUCTION

This chapter attempted to qualitatively evaluate the theoretical framework of the research as mentioned in Chapters 3 and 4 through case studies analysis conducted on players within the industry. These case studies were obtained from players by means of expert interviews in the UK and Malaysia with questions designed based on findings in previous chapters. A pilot study was conducted prior to the interviews to test the suitability and effectiveness of the case study questions.

Global business trends have led the oil and gas industry to seek better solutions to overcome the emerging challenges and critical issues, such as the need for procurement strategies based on new values and contextual factors including multi cultural complexity. Different regions have different technological, cultural, geographical, production and managerial challenges that need to consider. The UK North Sea (UKNS) region for example, have to deal with critical issues such as high operational and production costs, the depleting volume of the oil and gas production and successful collaborations. New innovative approaches to procurement strategies are also required to meet the contextual needs found in different locations and countries around the world. These approaches also need to accommodate the different values either in the business philosophy or culture within the oil and gas organization themselves or in the local

practices. One of the objectives of the research is to uncover how major players in the industry are dealing with current procurement challenges and critical issues in a harsh, difficult and changing regional and business environments such as in the UKNS region.

Ever since the UKNS region oil production began its downturn, bigger challenges have started to emerge. Less productive and smaller oilfields are being given a new breath of life through: innovative technological plant and equipment; and more economic management approaches such as joint venture exploration with shared risks. Players in this region are also forced to seek new ventures in other oil producing regions to sustain productivity and capitalised on their experience and knowledge earned working in a very harsh UKNS environment. At the same time, according to PILOT (2002), the advantages of locating resources and project work in the UK are:

- political stability;
- fiscal stability;
- fiscal incentives e.g. new incentives for research and development;
- existing world-class expertise and critical mass of sector, e.g. 6 of Shell's global centres of excellence are in Aberdeen;
- future domestic programme of oil and gas production;
- supply of high-calibre graduates; and
- convenience of location for Eastern Hemisphere.

In comparison to the Malaysian South China Sea (MSCS) region, there has been very little development from the conventional to innovative approaches in procurement

methods/strategies where the conventional methods used were a carbon copy from other industries' experiences. Most of the oil and gas operating companies within this region are either government-owned or government controlled companies. They are subjected to strict local government policies, practices and procedures. This also applies to the management and procedures on procurement methods/strategies to be implemented by the company. However, the challenges that this will create will be that some of the practices and procedures could be outdated and unsuitable with current business trends and demands, not to mention the higher risks involved in the sector. Perhaps, it could be time to change from the conventional to a more innovative procurement approaches which have been proven to be fair and more favourable by contractors and new players in the UKNS region which is currently facing the threat of depleting regional oil and gas production, world economy and high cost of maintenance.

There are also bigger challenges to this very complex sector in a demanding regional and global economy. Direct application of lessons learnt in other sectors or industries, such as construction, may not be appropriate, as the two are different in many aspects relating to the construction, operation and maintenance phases. For example, under the operation stage, the main goal for the oil and gas sector is production with high return whereas in construction the use of the finished asset to produce goods or provide a service is the key goal.

Many lessons can be learnt from both the UKNS and MSCS player's regional experiences and practices which could be adopted by players in the industry globally.

This chapter will first summarise three case studies conducted in the UK with two prominent operators and an industry initiative agency established by the DTI to develop and promote knowledge and expertise within the industry in the region. The next section will also deals with three case studies conducted in Malaysia with a contractor, consultant and a fabricator. The results include lessons learnt and the different innovative management and procurement approaches adopted by these players and agency to improve current practices in order to face current and new challenges.

6.2 BACKGROUND OF DETAILED CASE STUDIES

6.2.1 Objectives

The objective of the reported case studies is to gather relevant data from players in the industry on issues highlighted. The reported case studies not only will supplement but also to validate data obtained from the literature review and an earlier questionnaire survey. Conducting industry based case studies will definitely help to highlight recent issues that may not currently appear in published literature, therefore, it was certainly a significant method of understanding and retrieving information about the latest trends, perceptions, changes and challenges in an industry that has a small number of players.

6.2.2 Scope and Limitations

Interviews with selected respondents were conducted in the UK and Malaysia. Case studies were based on different companies' and organisations' experiences and perceptions about specific issues on procurement challenges and the industry in general.

The approach to the interviews was more of a case study nature and structure. A set of standard or structured case study questions were prepared for each interview to ensure focus and ease the analysis process.

6.2.3 Respondents

Respondents were selected on the basis that their company/organisation's are among major and prominent players with active participation and contribution to the UK and Malaysian oil and gas industry. They were managers/senior managers in procurement or supply chain with vast experience and knowledge On the subject matter. A total of three case studies based on interviews were obtained from players in the UK and another three were obtained in Malaysia. Prior to this, a pilot study and preliminary interviews were conducted as illustrated in Table 2.2 in Chapter 2.

6.2.4 Questions

A semi-structured approach was taken to the interview sessions based around the following four topics:

- perception of the overall oil and gas industry on critical issues;
- perception on procurement methods;
- perception on procurement strategies; and
- Challenges to be addressed and proposed actions to be taken.

6.3 DETAILED CASE STUDY ANALYSIS IN THE UK

6.3.1 Summary of Case Study

Being in a sector that is currently under the threat of oil depletion and high operative/maintenance costs, many players in the UKNS are looking into new approaches for managing, cost planning/control and sustaining the current oil and gas exploration and production processes. At the same time, business opportunities within and beyond the region must be fully capitalised to make use of the high price of oil and experiences gained by others players that had worked within the harsh environment of the region. There is a general consensus in the sector that cost effective technology, cutting down on waste, increasing overall performance and enhancing supply chain relationship need to be pushed forward in every aspect.

Within changing perceptions of the procurement process and supply chain management, players are beginning to recognise the importance of having the most suitable procurement approach for the context being considered. Procurement processes need to be streamlined to meet certain values and deliver organisational strategy, systems and tools for different market environments. Being a high risk sector, making comparison and learning from past experiences and developing new approaches may prove to be critical and necessary for players to improve and compete in the global arena. There is also the need to adapt and improve certain approaches to suit specific requirements and values especially when dealing with multi cultural complexity.

New approaches and strategies that could refine current practices to enhance and improve overall performance and values under current circumstances and constraints must be welcome. This includes raising the level of knowledge, competency and awareness of players on the regional and global demands on technology, skills, values and multi cultural complexity issues. Standardisation and synchronisation of procurement processes in the industry needs to be designed, coordinated, translated and promoted especially by the industry initiative agency, in view to overcome the challenges facing players in the industry on the implementation and coordination of the overall procurement process.

6.3.1.1 Case Study A

Case Study A is based on the interview of a Procurement Manager working in an international and multi-national oil and gas operator, contractor and consultant company that was established more than 30 years ago in upstream and downstream oil and gas activities. This company's business philosophy is to sustain an active participation in the oil and gas activities regionally and globally. The company strongly supports and maintains the continued development and explores other areas within the UKNS region using the existing regional business assets and expertise. The major stakeholders are from Netherlands as well as from UK with offices in most cities in oil producing countries.

6.3.1.2 Case Study B

Case Study B is also based on the interview of a Regional Procurement Manager working in a UK based international and multi-national operator, contractor and consultant in upstream and downstream oil and gas activities. The company has 30 years of experience in the field and their business philosophy includes venturing, sustaining position and extending their expertise regionally and globally. The company, which has a stronghold and large number of assets in the UKNS region, is investing heavily in the exploration of potential areas within the region. They maintain the confidence that the region will still produce substantial amount of oil and gas. The major stakeholders are from the UK with offices in major cities around the world.

6.3.1.3 Case Study C

Case Study C is based on the interview of a Business Manager in an industry initiative agency that specifically deals with the development of oil and gas sector in the region. The company was established by the DTI more than 10 years ago to assist, support, develop and promote knowledge and expertise within the industry in the region and beyond. Their business includes promoting, conducting, educating and implementing various tasks to assist players in the industry to better equip themselves with the necessary knowledge, particularly on issues like competitiveness, management and standard contractual procedures while at the same time try to assist players to promote and extend their expertise and experience beyond the regional boundaries.

6.3.2 Perception of the Overall Oil and Gas Industry

The results of the respondents' perceptions of the current oil and gas sector issues in the region have been summarised in Table 6.1 below. The rising price of oil and gas, and the resulting opportunities expected to emerge as a consequence, have been the focus of attention in the sector. Major decisions include looking for cost effective technology, prioritising development and opportunities and creating not only regional but also global strategies. These are seen to be the move forward towards sustaining the current development and operation in the sector. There is also the need to look at new contractual approaches and revised contract agreement, moving away from the traditional methods.

6.3.3 Perception of the Industry in the UK North Sea (UKNS) Region

In a region where oil production is declining, players are inevitably forced to look at other regions for ventures and investment while trying to sustain oil and gas production in the UKNS by reducing wastages and using cost effective technology on existing assets. Increasing consumer demand, higher price of oil and increased gas production in the region will help to compensate the high cost of operational and maintenance that the region is currently suffering. There is also the need to carry on staying and keeping the business in the region despite the decline in oil production, considering the substantial numbers of established and matured businesses that have already been in place over the time in the region. One of the solutions to overcome these shortcomings is to use the "managed decline" approach of management, apart from promoting the best value, collaboration and fair competition trend among businesses within the region.

Organisations and companies in this region certainly have had the upper hand in terms of the skill and experience of working in harsh environment with the state of the art technology. They also have considerable knowledge which could undoubtedly be exported to other regions or when venturing into new frontiers where others may not dare to go. However, different region or country with different circumstances, require different strategies, therefore adapting to new environment are crucial when exporting skills or developing training programmes. An industry initiative agency could well be the best platform for knowledge transfer and development of the UKNS region's experience on technology, skilled workers and management approach to other regions.

6.3.4 Perception of Procurement Methods

6.3.4.1 Problems and Issues

The interviewee's perceptions of procurement methods used in the UKNS region have been summarised in Table 6.2. Currently, there are problems of finding better ways to work together in the sector to remove waste, unnecessary cost and expedite projects through effective collaborations. Procurement methods and processes need to be streamlined, managed and improved to meet certain values which include using industry tools and electronics digitising (e-procurement) to reduce time and duplication. Long-term contractual relationships between clients and contractors will create better

Table 6.1: Perception of the oil and gas players in the UKNS region on the overall oil and gas industry on critical issues

	CASE STUDY A	CASE STUDY B	CASE STUDY C
1. Current Oil & Gas Critical Issues			
1.1 Sector's Overall Performance	Finding more oil reserves, improving and increasing production; looking for new cost effective technology; lowest operative cost structure; looks regionally and globally for investment opportunities.	Huge demand for oil has spurned a lot of activities; with the high oil price comes bigger business opportunity; prioritising development and opportunities; creating global and regional strategies.	Not many improvement and development on contractual issues; sector need new and revised contracts; industry initiative need to address and perform specific task on specific issues.
1.2 UK North Sea region	Needs to sustain maximum life of interest despite continued oil decline; gas production is increasing due to demand.	Staying in UKNS despite the decline in production; a lot of matured businesses and opportunities; using 'managed decline' approach.	Sustaining cost on operation and maintenance; the need for detail contract; to cut down waste; best value and fair competition; *Supply Chain Code of Practice.*
1.3 Region's experience toward global ventures	Working in very difficult and harsh environment, extremely deep water, high technology, 30 years experience; region depletion may lead to looking at global opportunity, knowledge and experience may certainly be an advantage.	Using experience to assist local energy companies; different circumstances require different strategies; adopting and adapting common processes and technologies to suit own environment; exporting skills and developing training programmes.	Harshest working environment; a lot of knowledge and experience – technology, skilled workers and management approach. Industry Initiative could become a platform for knowledge transfer to other regions.

understanding and management of client's strategic sourcing, from the planning stage to delivering specific demands and values. Innovative procurement approaches and tools are needed to be developed to suit different market environments, rising costs and at the same time to balance the cost effectiveness and high technology in this unique and complex industry. Industry tools such as First Point Assessment (FPAL), in-house assessment system like Supply Performance Management and electronics digitising may be able to assist players to manage, assess and establish a much more long-term contractual relationship and successful collaborations.

6.3.4.2 Procurement is considered as a 'Soft Issue' in the Industry

This perception is fast changing due to the fact that currently, 80 percent of the operating expenses involved a direct financial implication to the supply chain system in the organisation or companies. It has also been recognised to be an extremely important business process and management tool and therefore essential and critical to the successful implementation of their business strategies. The need to promote and impart the knowledge of procurement systems and issues in the industry have become a challenge especially for the industry initiative agency as demands for procurement courses have reached an all time high.

6.3.4.3 Providing and Enhancing Values to Procurement Method

There is the need for players to evaluate and balance technological innovations and advancement against cost effectiveness as the nature of oil and gas projects demand long-term investment, planning and continuous operations. In a high risk oil and gas industry,

players more often than not have to submit to certain values and strict performance levels in order to avoid the heavy penalties should they fail to deliver. Different values on specific needs and procurement methods may be necessary, because there are different values on the outcome and implementation in the industry. The strategies for best values are therefore based on the right questions in order to get the best solutions for a business, region or commodity.

6.3.4.4 Most Suitable and Reliable Procurement Method

By differentiating where the money is spent and what is the best and most suitable strategy to fit into pre-planned categories of a project, the profile of the most suitable procurement approach could be found. On the other hand, the contractors who are involved in an oil and gas projects must understand the impact and risks of particular procurement methods because the level of risks is relative to profit gains as well as losses. The best suitable method however, would be to initially understand the characteristics, values and multi cultural complexity factors associated with the proposed procurement method on a specific project. This is would enable clients and contractors to better understand the demands and level of risks of that particular project better, thus pushing the success rate of the chosen method higher. The industry's inconsistent implementation of procurement methods in the past has led its players into a lot of difficult situation, therefore it is recommended that the industry initiative agency is given the task to assist, guide and standardised these practices and procedures along with other research establishments.

Table 6.2: Perception of the oil and gas players in the UKNS region on procurement methods

		CASE STUDY A	*CASE STUDY B*	*CASE STUDY C*
2	*Procurement Methods*			
2.1	**Problems and Issues**	Finding better ways to work together to remove waste, unnecessary cost and expedite projects through effective alliances; managing, assessing performance and working out long-term contract and relationships with contractors.	Streamlining procurement processes to meet certain values; using industry tools First Point Assessment (FPAL) to reduce duplication in procurement process; using Supply Performance Mgt (SPM) to deliver strategic sourcing.	Specific demands and values such as quality and time; rising cost of services and maintenance have change attitude towards the need to balance cost effectiveness and high technology.
2.2	**Procurement is considered as a 'soft issue' in the sector**	Perceptions have change; 80% of operating expenses on a supply chain system, therefore deserved better attention.	Recognised to be an extremely important business process; SPM has been recognised as an important management process tool.	Procurement is the most sought after learning programme in the sector; players found it to be extremely important and essential to their business strategies and survival.
2.3	**Providing values to procurement method**	A combination of values on specific needs and procurement methods; comparison is good to learn past experiences, success and failures in order to improve.	Differences in value on outcome and implementation within the same industry; strategy for best values are based on the right questions, to get the best solution for a business, region or commodity.	Need to adapt and improve approach to suit specific needs and values of a unique and complex sector; need to keep pace with values of global demand, different market trends and continuous research to improve.
2.4	**Most suitable & reliable procurement method**	Using company's own *'standard category'* by differentiating where money is spent and what is the best and suitable strategy to fit into each category; the right strategy depends on the characteristics and value of the category, proven to be effective.	Certain procurement factors need to be considered thoroughly; contractor must understand the impact and risks of particular procurement methods; level of risks is relative to profit gains.	Sector's inconsistent implementation of procurement methods leads to problem, therefore industry initiative to assist, guide and standardised practices and procedures; joint venture effort within the sector to develop new approaches.

6.3.5 Perception of Procurement Strategies

6.3.5.1 New Procurement Strategies

The interviewees' perceptions of procurement strategies have been summarised in Table 6.3. Current procurement methods need refining and improvement, taking into account global perspectives and influences. However, there is the need to search and ascertain the balance between technological innovation and new cost effective procurement strategies in the long run. Venturing into other regions requires new strategic resource planning and supply chain including collaborations with local partners. This also demands good understanding of local practices, restrictions and constraints, therefore to succeed, procurement strategies not only have to adopt technological innovative and be cost effective but also in the long-term, economically viable.

6.3.5.2 Value over Selection of Procurement Strategies

There are different perceptions on values to be adopted in the industry, thus resulted in the different modes of strategies implemented by players. Since the trend and strategy are value driven procurement, the industry needs to find efficient ways to ease the procurement processes whilst reducing waste. Values to be adopted on a selected strategy have to be assessed based on current data and information that may be obtained from different resources, different regions and different business environment. Making value assessment for each project to suit the best strategy will also depends on relevant input and knowledge that are specifically related to the project. However, it is difficult to gauge and document the performance of the industry's procurement strategies based on value,

due to the high degree of confidentiality among players and the uphill task of obtaining the commercially sensitive data.

6.3.5.3 Good Procurement Strategies to be adopted in the next 3 to 5 yrs

The chosen strategy must be able to assist players to extend their leverages further and one that will enable them to foster ways of working together in the long run. The future trend seems to be buying on value, therefore there is a need to look at more efficient ways to ease the procurement processes including utilising electronic transactions. There is also a novel procurement strategy introduced by the industry initiative agency called the Progressing Partnership Work Group (PPWG) where clients, contractors, suppliers and manufacturers in the sector are gathered under one roof to discuss current and future projects. This partnership programme allows players to discuss these projects to enable them to identify possible cost effective methods or problems that may be encountered in the projects. Further discussions with potential partners will result in the selection of the appropriate procurement methods to suit a proposed project. This strategy on early partnership arrangement is designed to help players to establish potential and reliable partners during the early stage of the project to work together and try to take away waste out of the system and identify possible obstacles resulting in a more cost effective and faster procurement selection process to suit specific projects.

Table 6.3: Perception of the oil and gas players in the UKNS region on procurement strategies

	CASE STUDY A	CASE STUDY B	CASE STUDY C
1.0 Procurement Strategies			
1.1 New procurement strategies	Refining current practices to improve strategies; creating *Business Performance Review (BPR)* to evaluate, discuss and manage new technology effectively to improve performance; looking more at global perspective and influence.	The need to develop and raise level of competency; adapting to different regional demands and practices; to operate cost effectively in regions with local restrictions, constraints and harsh environment.	Finding the balance between technological innovation and economically effective in the long run; managing offshore logistics and labour through resource planning and collaborations; *Master Deeds* – lease contract to specialist contractor.
1.2 Value over selection of procurement strategies	Still looking for best ways and strategies to improve current procurement methods; making value assessment for each project for the best strategy will depends on relevant input and knowledge.	Keeping a standard template of success stories on values for assessment within company only; selection of strategies will depends on the specific values for specific projects.	Difficult to benchmark and document industry's performance based on value in procurement strategies due to confidentiality; different perception on values resulted in different mode of implementation.
1.3 Good procurement strategies to be adopted in the next 3 to 5 yrs	One that will assist them to extend their leverages and to foster ways of working together; buying on value therefore need to look at efficient and more ways to ease processes-electronic transactions.	Using Progressing Partnership Work Group (PPWG) platform with suppliers to take away waste out of the system; using First Point Assessment (FPAL) industry initiatives to avoid duplication.	Using the Management Contractors approach; open up possibilities of partnership and collaborations.

6.3.6 Challenges to be addressed and proposed Actions to be taken

6.3.6.1 Introduction

The literature overview and case studies highlighted a number of issues pertaining to the challenges that the sector is currently facing. They spans from the current situation in the industry to the challenges in addressing current and innovative procurement methods and strategies. The proposed actions are based on the findings from literature and case studies with additional remarks to support the proposals as summarized in Table 6.4 above. Although these case studies may be representing the perception of major players in the industry, the business and procurement processes are quite similar to large or small companies. Every effort has been made to take into account the interest of other players in the industry which is nonetheless important and crucial in the successful implementation of the overall procurement or supply chain process across the sector.

6.3.6.2 Current Oil and Gas Critical Issues

With the volatility and ever increasing of the oil price currently, demand for the commodity has never been higher and much sought after than anyone can remember. The depletion of oil production in this region however, has forced players to rethink their current strategies on maximising short term profit against long term continuous production and investing in cost effective technology. A few prominent players have started to incorporate "managed decline" approach" in their business strategy including supporting and sustaining matured local business who have been the backbone to their operations in the North Sea region.

Table 6.4: Summary of challenges to be addressed and proposed actions to be taken in context of oil and gas industry in the UK on current issues and procurement methods

Issues	Challenges	Proposed Actions	Remarks
1 Current oil & gas critical issues			
1.1 Local and regional	High price of oil demands new findings but the depletion of oil production in the region requires immediate and long- term actions by players.	Finding more reserves in the region using cost effective technology; capitalising on the high price of oil to develop other business opportunity using 'managed decline' approach.	The increased in gas production has balanced the revenue in oil production. The need to look at new strategies regionally and globally. Matured local businesses need to be supported and sustained.
1.2 Global	The demand for oil and gas worldwide may require exploration and production beyond own boundary, especially with the current high price of oil.	Using experience to venture into global arena; the need to adapt and adopt processes and technologies to suit local cultures and practices; exporting skills and developing training programmes.	These are already in place but require the participation of more local players, partners etc. The need to maximise local inputs and content while contributing to local development.
2 *Procurement methods*			
2.1 Problems/issue	Depletion of oil in the region and the current high price of oil are changing the business trends and approaches; the need to develop the right strategies to maximise leverages; how to manage, assess performance and work out long-term contract when the future is uncertain.	Finding better ways to work together through effective alliances; streamlining procurement process to meet certain values; understanding global market segments and local trend and practices to deliver strategies; improving systems and tools for different market environments and trends.	The need to have a different approach to this high risk sector, to cope with specific demands and values. Understanding the multi cultural complexities of different locations, markets, practices, cultures and constraints should be placed as top priority.
2.2 Values to be adopted	Choosing the best values based on the right questions; different values will have different approach, implementation and outcomes; finding values that cater for specific demands, high risk and complex sector.	Adapting and improving current approach to achieve best values; the need to find the right strategy and solution to arrive to the best value for the different businesses, regions or commodity.	When taking examples from other sectors on values to be adopted, care is needed not to compare an apple to an orange. This sector is unique and needs to be look upon as an individual and complex sector.
2.3 Most suitable & reliable method	Finding the right approach to get the best outcomes; current approach may be sufficient but inconsistently implemented; global and multi cultural influence may have to be incorporated in the strategy.	Understanding and incorporating factors that could have an impact and influence the final outcomes; industry initiatives should play major role in developing and finding suitable approach.	Previous success and failure cases should be studied and learn. The successful approach will depend on the knowledge of the characteristics, values, multi cultural factors and effectiveness of each particular approach to achieve specific demands.

Table 6.5: Summary of challenges to be addressed and proposed actions to be taken in context of oil and gas industry in the UK on procurement strategies

Issues	Challenges	Proposed Actions	Remarks
Procurement Strategies			
Innovative approaches	The need to adapt to different regional demands and practices; the difficulty of implementing strategies and values with many local restrictions, constraints and cultures; local capabilities and supplies may not be the same standard as in the UK.	Refining current practices to improve approach and strategies; understanding regional and local demands, practices and cultures; develop and raise the level of competency of local partners; to find the balance between technological innovations and economical factors.	Globalisation has changed the business trends and scenarios throughout the world. This sector has long been involved in globalisation, thus explains the small number of players. When oil and gas are becoming harder to find, new innovative approach on all aspects of the sector is desperately needed.
Value over selection of strategies	Difficult to ascertain due to confidentiality of information between players; different perception on values resulted in different mode of implementation of procurement strategies and process.	Industry initiatives should play a much more prominent role in developing and finding suitable solution on values to be adopted; players must be encouraged to participate actively without jeopardising their business opportunity or competition.	Industry initiatives must be able to educate, synchronise and standardise this issue while being impartial and neutral at the same time. Incentives must be in place to those who participated and involved in the exercise.
Good procurement strategies to be adopted in the next 3 to 5 yrs	The one that can assist players to achieve best value and final outcome in the procurement process; one that can help them when venturing into global markets and locations; the challenges of working together in partnership and alliances.	Since buying on value, there is the need to look at efficient ways and approaches in procurement process; industry initiative can assist to avoid duplication and waste to get better value; to foster better ways to work together.	To improve contractual relationship, conventional adversarial manner needs to change. To look into efficient relationship management in partnership or collaboration in view of achieving improved performance.

The effect of the high oil price has become the major reason why players are searching for oil not only within the UKNS region but also elsewhere around the globe. The decades of experience gained from working in oilfields in the rough North Sea region have more or less equipped them with the right tools, knowledge and management skills to be used in other parts of the world in their search for oil. However, a word of caution about these experiences was that, it may need to be adjusted and adopted prudently according to local practices, cultures and needs to achieve the best possible results.

6.3.6.3 Procurement Methods

The fast changing of the business trends and approaches in the industry has indirectly changed many business perception and strategies of major players in the industry (Table 6.4). The right and most suitable strategies need to be develop not only to maximise leverages but also one that could meet certain values including local business practices and requirement. These are important as the future trend will be more towards buying on value, therefore the right questions on the approach, implementation and outcome of the values on the procurement method to be used need to be ascertained and addressed accordingly.

Understanding and incorporating the required values would certainly have an impact and influence on the final outcomes, especially when practising it in other regions. The success and failure of these approaches will depend much upon the acceptance of the local business community and how they are delivered and executed. Finding the right approach while trying to understand and incorporating values to the methods could also

have an impact and influence on the final outcomes. . The successful approach also depends on the knowledge of the characteristics and values of a particular procurement method to be used.

6.3.6.4 Procurement Strategies

This industry has long been subjected to globalisation, hence the small number of established players around the world today (Table 6.5). When oil and gas are becoming harder to find and higher in price, new innovative strategies on all aspects of the sector are desperately needed. This will include the need to adapt to different regional demands and practices; implementing strategies and values within local restrictions, constraints and cultures; and understanding that local capabilities and supplies may not be the same standard as in the UK. It is also a good step forward to refine current practices to improve certain approaches and strategies while trying to develop and raise the level of competency of local partners.

Different perceptions of value have resulted in different mode of implementation of procurement strategies and process by players in the industry. The best strategy would be the one that not only will assist players to achieve best value and successful final outcome in the procurement process but also the one that can help them when venturing into global markets and foreign locations. Since buying on value will be the focus in current and future business trend, there is the need to look at efficient ways and approaches in the procurement process to avoid duplication and waste while fostering better ways to work together.

Finally, to improve contractual relationship, conventional adversarial manner needs to change. Players in the industry across the globe need to look and venture into a much more efficient relationship management in partnership or collaboration, in view of achieving improved performance and better results in the overall procurement process.

6.4 DETAILED CASE STUDY ANALYSIS IN MALAYSIA

6.4.1 Summary of Case Study

Most of the issues highlighted in the case studies are confined within the local and regional issues. Players seem to be fully occupied and faced with the challenges of client-related problems and issues of price fluctuation rather than the bigger agenda of global ventures and multi cultural complexity. Although there are steps taken to pursue or invest in international ventures, they are limited to the privileged few that are financially strong, technically capable and skillfully experienced. There is a strong objection against the one way adversarial style of client-contractor relationship and the contractor is being forced to be on the receiving end when it comes to price fluctuation, overall risks and increased workloads. There is also a strong demand currently by players in this industry on how to achieve a balance between adopting client's values and being competitive and profitable at the same time when preparing their strategies. Ranking on good procurement strategies among the players vary in terms of priority and company's internal policies.

In a country where the largest oil and gas operator/client is partially owned by the government, any changes in management and implementation of innovative procurement approaches could be a huge challenge faced by the operator. On the other hand, these changes and improvement if any are quite timely, on demand and in accordance with current situation and trend. These changes would also be welcomed by contractors, fabricators and service providers alike not only within the region but also across the globe.

6.4.1.1 Case Study D

Case Study D is based on the interview of a Procurement Manager working in a Malaysian based contracting company with more than 15 years of experience in upstream and downstream oil and gas facilities, maintenance and refurbishment. This company's business philosophy is to sustain an active participation in the oil and gas activities within the region, especially in the petrochemical and oil and gas terminals. A public listed company with major stakeholders from Malaysia.

6.4.1.2 Case Study E

Case Study E is gathered from the interview of a Regional Procurement Manager working in a French based international and multi-national consultant in upstream and downstream oil and gas activities. With more than 20 years of experience in the field, the company's business philosophy includes venturing, sustaining position and extending their expertise regionally as well as globally. The company which has long established itself in the region is moving towards China and Vietnam in search of new opportunities

within the region. They maintain the confidence that the region may still produce substantial amount of oil and gas. Major stakeholders are from France with offices in major cities around the world.

6.4.1.3 Case Study F

Case Study F is based on the interview of the Procurement Head of a Malaysian based company that specifically deals with the fabrication and construction of oil and gas facilities. The company was established more than 20 years ago and had been involved in the fabrication and construction of marine facilities, offshore platforms and shipbuilding for customers within the region. They pride themselves for being the few Malaysian companies that were able to contribute and meet the sector's needs and requirements on the fabrication and construction of offshore facilities in the region. Majority stakeholder is the government through the national oil company.

6.4.2 Perception of the Overall Oil and Gas Industry

High price of oil and gas make new ventures more viable and profitable in the long run as described by one of the responding organisation in the case study as stated in Table 7.6. The high demand for source of fuel to sustain global consumption especially from new and rising economies like China desperately requires new find and bigger reservoir volume. On this aspect, local players in Malaysia are actively looking towards exploring and venturing into new areas in the deep waters of the state of Sabah and Sarawak as well as other countries in the region like China, Vietnam and the Philippines.

Table 6.6: Perception of the oil and gas players in the Malaysian South China Sea (MSCS) region on the overall oil and gas industry on critical issues

	CASE STUDY D	CASE STUDY E	CASE STUDY F
1 Current Oil & Gas Critical Issue			
1.1 Industry's Overall Performance	High price of oil & gas make new ventures profitable; local players looking for foreign market like China, Vietnam & Philippines.	High demand for source of fuel to sustain global consumption requires new find; exploration is not effected because they are long-term ventures.	The rising price of raw materials (from 20% to 30% within 6 months) complicate costing and bidding; no allowance for price fluctuation in contract.
1.2 Malaysian South China Sea (MSCS) region	Activities are still very much consistent and good; new finds has reactivated offshore construction and services in the area; bigger players have found new fields in Sabah and Sarawak; will carry on at least another 10 to 15 years.	A lot of exploration works the last 2 to 3 years; quite cautious and careful not to be tempted by the rise of oil price; new finds in marginal fields have attracted new players; Vietnam has good potentials with new discovery.	More exploration in the deep to marginal deep sea area; with the high price of oil, marginal fields can proved to be an economically viable venture, mostly undertaken by seasoned and experience players.
1.3 Region's Experience toward global ventures	Time and opportunity will tell if locals are capable to venture elsewhere; few large local companies have shown good track record in foreign ventures; need sound financial funding and expertise; mostly still in learning stages.	Being an international company helps to be in the international arena; secured many prestigious overseas projects; good track record; current project in China is being managed by nearly 80% local Malaysian staffs.	Malaysia capitalised on venturing into countries where others are reluctant to go; an excellent learning and training ground; established good ties between governments; political stability is main criteria; less competition.
1.4 Complexity issues	Understanding the design, processes and knowledge; large corporations have capitalised on this issue and gathered a lot of knowledge and experience, nothing is complex to them	a. understand the process requirement, b. using sophisticated material and/or method for design, construction and safety to achieve maximum output; involved a lot of uncertainties and unforeseeable risks.	Design of offshore facilities are complicated and complex with various high-tech systems; one platform, 2 operations- exploration (drilling) and production; design to consider many variables; all in accordance to international standards.
1.5 Multi Cultural Complexity (MCC)	Working ethics or style of working; working culture and perception of expatriates are not the same; compromise on decisions, team rather than individual decision.	Difficult to understand working cultures of different countries, with local contractors and trading cultures even after 10 years in China.	Working cultures are quite complex to understand; eg. Chinese workers prefer long new year holidays; Japanese are hardworking but regimented.
1.6 3Ms (monitor, measure and maintain) MCC	Based on final outcome, results oriented; auditing and assessment system ISO 9001; measure achievements and failures at regular intervals.	Using previous experiences and results; may need to adapt to suit different country or region; utilising local associates is the best way to deal with local issues.	Westerners usually insists on using their 'preferred' management system; submitting periodical reports; participating actively to ensure continuous monitoring.

On the other hand, the sharp rise on the price of raw materials especially steel has complicate costing, bidding, ordering and construction of new installations especially when there are no allowance made for price fluctuation on current contracts. The difficulty of getting and sustaining skilled workers on the fabrication yard has led to other problems to contractors, manufacturers and fabricators like delays in delivery and unnecessary costs.

6.4.3 Perception of the Industry in the Malaysian South China Sea (MSCS) Region

Undoubtedly, the rising price of oil and gas has made new ventures viable and profitable especially in this region. However, the sudden and unforeseeable rise of steel price within a short period of time has tended to complicate the costing of and bidding for new and on going projects in the oil and gas industry in this region. New oil and gas fields found in this region have helped to attract new players and stimulate offshore construction and services activities. Vietnam and China have good potential but require the involvement of seasoned and experienced players. This also includes the need to have a good track record and sound financial funding with the necessary skills and local expertise. Establishing good ties between governments that possess political stability and commitment are essential ingredients for a successful foreign venture, in addition to learning and being sensitive about local cultures and practices. Complexity issues that still surround this sector include understanding the complicated and sophisticated design, processes and knowledge of high-tech systems which at times, involved a lot of risk and uncertainty (Table 6.6). Local as well as international ventures requires the 3M's (monitor, measure

and maintain) of multi cultural complexity issues to suit different country or region's local conditions, practices and working ethics.

6.4.4 Perception of Procurement Methods

The need to improve the adversarial style of upstream relationship between client and contractor is inevitable and necessary. Under the current trend of competitive bidding on fixed sum, the contractor tends to be in the risk of suffering for survival especially with the raising price of material and yet no allowance is made for price fluctuation in the contract. Clients are also seen as handing over all risks and workload to the contractor but are not willing to compromise or being flexible on certain issues like price fluctuation or time. Although values such as time, quality, cost and performance are equally important, but in an industry that is filled with complexity and unforeseeable issues, it can make do without the lowest tender selection method. Procurement methods must also submit to stakeholders' expectation and requirements. (Table 6.7)

Table 6.7: Perception of the oil and gas players in the MSCS region on procurement methods

	CASE STUDY D	CASE STUDY E	CASE STUDY F
2 Procurement Methods			
2.1 Problems and Issues	Upstream relationship between contractor and client depends on method and client; client's normally holds better advantage, not a win-win situation.	Under current trend, contractor looses out in competitive bidding; real project value was uncertain, not much lee way to negotiate; contractor suffer to make profit and survival with high risk factors.	Raising cost of imported material, yet no allowance in contract; bidding on fixed sum can be quite difficult because of competition; turn-over of skilled personnel are quite high; clients are handing all risk and workload to contractor
2.2 Type mostly used	Lump sum with suppliers but with client, either lump sum or cost plus.	Lump sum fixed price; may include variations like incentives with sub contractor or supplier.	EPC, EPIC and straightforward lump sum for fabrication and repair works.
2.3 To provide Values	For small players, most important values would be competitiveness and profitability; when we deliver, quality, time, cost and performance values; goodwill; make do without lowest tender method.	Lump sum methods are driven by time and cost values, at times quality may be compromised; ideally these values are all important, in reality it is difficult to achieve due to complexity or time frame.	Important values in long term relationship would be client's overall fairness, flexibility to change, variation order for price fluctuations and able to compromise on unforeseeable issues.
2.4 Stakeholders Needs	We have the obligation to meet our stakeholders' expectation and requirements, so far the results are good.	Lump sum and cost plus methods have so far lived up to stakeholders expectations	We are bringing decent profit to company but as managers, are against EPIC work whereby a lot of time are spent on management.

Table 6.8: Perception of the oil and gas players in the MSCS region on procurement strategies

	CASE STUDY D	CASE STUDY E	CASE STUDY F
3 Procurement Strategies			
3.1 New approaches/ values	Based on company's policies, guidelines and procedures; adopt values to suit clients, sub-cons, suppliers and stakeholders' requirements.	Need to improve as sector becoming more sophisticated and complex; to look into production cost efficiency, environmental and safety values.	Need to deliver the best value of products and services to clients in a complex, demanding and competitive sector.
3.2 Value over Selection of strategy	Clients should be more flexible in contractual obligations to have a win-win value, competitive bidding should be minimised; contractual relationship value needs a new approach.	Clients should be committed to promote and adopt new values such as environmental, safety and cultural; quality should not be compromised over time and cost value	Value on time and performance will depends on management (including procurement) of labour and materials; decent strategy needed to overcome problems of price fluctuations etc.
3.3 Partner/Collaboration	Global trend; suitable for high investment and risks, shared among partners, jointly responsible and accountable to project's success and failures; not easy to adopt and sustain in long term.	Open up business opportunity without much competition; accepted by many specialist contractors; still need some refinement and improvement on relationship.	Provided there is a Management Contractor to lead; in a complex sector, may be difficult to identify the party responsible should problems arise; must practice 'open book' style of management.
3.4 Risk issues	Need to deal with risk issues during construction and production; higher than most industries; mistakes can cause large legal and business implications; requires best personnel and equipments.	Always a major issue in a complex sector; usually requires specialist company and specialist consultants to be involved; allowances and provisions for anticipated and possible outcomes are high.	Higher risk than building construction; need to balance documented and possible risks; too many allowances on risk will not be good to bids, less allowances may not be comfortable when bid accepted.
3.5 Good Procurement Strategies			
3.5.1 Risk	Monetary, human factors, technological and unforeseeable risks are major worries.	Needs special attention and allowances on risk factors.	Special attention on risk factors for EPIC contracts.
3.5.2 Clarity of Contract	Mostly in client's favour and adversarial manner.	Can be costly if certain aspects not spelled out properly especially in foreign contracts.	Any abnormalities, amendments or changes must be highlighted and made known to all parties;
3.5.3Flexibility of Change	None, other than max. 10% variation order, clients fully in control;	Although may be allowed in contracts, not easily given;	Some flexibility should exist in a complex and complicated sector, fluctuation clause will help on rising material cost;
3.5.4 Incentiv	None from clients but we did gave out incentives to sub contractors and suppliers;	Token for early completion but not many successes, help to improve and ensure continuous good value performance;	To boost performance and as token of appreciation for job well done;
3.6 Rank of priority on strategies	1. Stakeholders 2. Risk 3. Clarity of contract 4. Flexibility of change 5. Incentives	1. Clarity of contract 2. Risk 3. Flexibility of change 4. Incentives 5. Stakeholders	1. Stakeholders 2. Risk 3. Flexibility of change 4. Clarity of contract 5. Incentives

6.4.5 Perception of Procurement Strategies

Most procurement strategies reflect company policies, guidelines and procedures while at the same time, every attempt is made to suit and adopt the needs of other players in the supply chain. There must also be a balance between adopting the client's values and concurrently being competitive and profitable when preparing procurement strategies. The more established clients are expected to play an important role of promoting and introducing new innovative procurement approaches that include opening up supply chain opportunities without too much competition, improving client/contractor relationship and being less adversarial in their approaches. Good procurement strategies should incorporate stakeholders' requirements, calculation of risks, clarity of contracts and flexibility of change as well as introducing incentive schemes (Table 6.8).

6.4.6 Challenges to be addressed and proposed actions to be taken

The literature overview and case study have highlighted a number of issues pertaining to the challenges that the industry is currently facing. It spans from the current situation in the industry to the challenges in addressing current issues and procurement methods (Table 6.9) and procurement strategies (Table 6.10). The proposed actions are based on the findings from literature and case studies with additional remarks to support the proposals. Although these case studies may be representing the perception of major players in the industry within the MSCS region, the business and procurement process are quite similar to other large or small companies. Every effort has been made to take into account the interest of other players in the sector which is nonetheless important and crucial in the successful implementation of the overall procurement or supply chain process across the sector.

Table 6.9: Summary of challenges to be addressed and proposed actions to be taken in context of oil and gas industry in Malaysia on current issues and procurement methods.

Issues	Challenges	Proposed Actions	Remarks
1 Current Oil & Gas Critical Issue			
1.1 Local	High price of oil demands new findings, new fields need to be explored while sustaining the existing production.	More extensive explorations within the country's offshore especially in Sabah and Sarawak.	Already in place but require more local players participation and require some form of financial assistance (loan, tax relief etc).
1.2 Regional	The demand for oil and gas worldwide may require exploration and production beyond own boundary, especially with the current high price of oil.	Prospective neighbouring countries such as Thailand, Vietnam and Philippines may require assistance, expertise and participation by Malaysian companies.	Could be agreed upon through regional forum i.e. ASEAN, APEC etc.
1.3 Global	The greatest challenge for local companies to compete and perform among experienced players in a globalised economy and opportunity; multi cultural complexity would also become a challenge when competing.	Government to government agreements; venturing and exploring new countries/ frontiers where major players dare not go; partnership/collaboration with experienced players in the region.	Has been done by selected few but new players should be encouraged and given technical and financial assistance to participate.
2 Procurement Methods			
2.1 Values to be Adopted	Methods chosen were based upon past experiences without looking into the real values that should be adopted for a specific job or project.	In a complex sector, the true values to be adopted must be spelled out and given priority according to its ranking and importance to achieve the best overall results.	This would assist contractors and suppliers greatly on the bidding strategy and costing.
2.2 Relationship	Upstream relationship between client and contractor has been adversarial for decades, to implement new innovative approach, this could pose a challenge.	The "Master and servant" relationship should gradually be changed into some form of a trading partner or teamwork relationships.	This may not be an easy task or could happen overnight as the situation is quite normal in a small sector and perhaps a new culture of tolerances should be introduced,
2.3 Stakeholders	Expecting only the end results (profit/loss) without the understanding of procurement processes, values and risks involved would be difficult and at times unfair to players especially the down-liner of the supply chain.	Some form of exposure through current literature must be in place to educate and inform parties involved in this business of the latest trends, challenges and the influential factors in a procurement process.	Current oil and gas literatures are biased to news on technical advancement rather than on improving management and procurement/supply chain.

Table 6.10: Summary of challenges to be addressed and proposed actions to be taken in context of oil and gas industry in Malaysia on procurement strategies.

Issues	Challenges	Proposed Actions	Remarks
Procurement Strategies			
Innovative approach	Conventional methods are still largely used and this alone is creating a challenge to the sector.	The use of innovative procurement approaches in this sector is inevitable looking at current and future trends. The technical parameters and business constraints are changing and there is a desperate need to keep pace with that.	Globalisation will definitely change the business and trading scenarios of countries around the world. Competition and opportunities will be widely open to foreign companies giving local and new players a tough time.
Value over selection	Unclear values over the selection of the most suitable strategies have created a difficult procurement process especially to contractors and suppliers.	Clients should promote and adopt win-win values with contractors and suppliers; implement and monitor these values as work progress; feedbacks are highly important to evaluate current and future strategies.	Government department/agency or operator/client should initiate by introducing new and improved measures on procurement based on specific values in this complex sector.
Risk	The current change of global business trends and exploration for new oil fields is pushing the limit of players, thus escalating the risk involved in this sector even higher.	Research and development on risk management and forecasting has to be in place to help players aware of what to expect and how to respond to risk factors in the near future.	Being a complex and sophisticated sector, it is recommended that Malaysia should be thinking about creating an industry initiative agency to act as a platform for research and development in this sector.
Good Procurement Strategies	Difficult to implement as most players relies on stakeholders' requirements and company's policies and guidelines. Persuading the client to adopt these strategies is also an uphill challenge.	Innovative procurement approaches; ensuring continuous good value performance by contractors will improve client/contractor relationship.	Should be initiated and promoted by the government or industry initiative agency through extensive research and participation by all parties involved. Eg. Latham Report on Good Practice.

6.5 LESSONS LEARNT

6.5.1 UK's Experience

6.5.1.1 Challenges due to Resource Depletion and Multi Cultural Complexity (MCC)

The depletion of oil and gas production and rising costs of operation and maintenance are the major challenges in this region and have great influence on the player's management directions and strategies. Existing assets need to be cost-effectively operated and maintained and future exploration and production needs to be valued prudently to ensure they are viable in the long term. The current high price of oil and gas may have helped to balance the capital and operational costs of new oil field exploration and production in this region. Using new high technology and drilling into small fields in search of new hydrocarbon reserves that may not be economical in the past could be like pushing the limit of experienced and new players alike. However, to ignore the matured local/regional businesses and assets to concentrate entirely on foreign ventures may not be a wise move, considering the experience and contributions that these businesses have made to the local industry, country and the region.

The need to adapt and adopt to new market environment and new approaches in technological, financial and management are among the way to sustain activity in the region. Overcoming and handling MCC issues within the UKNS region may become a major challenge by itself to the players, due to its demanding work, technical and business environment. However, these case studies have shown that major players are capable of addressing these issues within their

organisation and over the years have dealt with these issues in other regions across the globe due to the availability and accessibility of resources in their organisation. It would be a different task in the case of smaller or new players in the industry who have limited and restricted resources to complement what they have in their organisation. Their survival in the business will depend on how well they capitalised on whatever business opportunity or venture left in the region and the need to adopt the style of "managed decline" approach like most of the major players in the region.

6.5.1.2 Innovative Procurement Approaches as the New Global Trend

Globalisation has influenced business trends and results in new scenarios throughout the world and the UKNS region is no exception. This industry has long been involved in globalisation and inter-regional ventures, thus contributing to the small number of players in this oil and gas business. When oil and gas resources are becoming harder to find, production and operational costs are soaring and the risks are high, new innovative approach on all aspects of the industry is desperately needed, including finding the right approach to procurement to sustain the business. However, any significant changes or re-organisations within the industry can lead to major issue and resistance by major players and thus restrict innovations. The reluctance to change has also becoming an issue in most client organisation due to the unfamiliar and untested proposed changes especially on procurement approaches. These have become barriers to innovation and need to be addressed accordingly by the industry through collaborations in research and government initiatives.

With decades of vast experience and knowledge on technology and management to offer, major players in this region could make an impact and successful ventures into other oil producing regions. Major players with local and regional experience on management and procurement issues can be put to good use when venturing into other regions. However, the approach and understanding of the influence of multi-cultural complexity issues and different values in other countries and regions would definitely helps in the process of procurement and management of projects. Innovative trends in global procurement approaches such as enhancing the Joint Ventures (JV) or Production Sharing Contract (PSC) must be developed to ensure successful foreign ventures where local content and participation are inevitable and expected. This will include the incorporation of regional MCC guidelines or tools to support the procurement process and thus giving it a more globalised approach, content and touch. This would also mean taking into consideration that different circumstances demand different strategies and approaches to suit local business practices and environment. The way players deal with these critical issues will determine their competitive level and chance of survival in a much bigger global market.

6.5.2 Malaysia's Experience

6.5.2.1 Challenges Faced in the Region

Since most of the oil and gas operating companies within this region are government-owned, they are understandably subjected to the local government rulings, practices and policies. This also applies to the management and procedures on procurement methods/strategies that could be unfavourable to some, especially to new players under the current trend of world economy and

high price of oil. Being a complex and demanding industry in terms of high technology and risks, some form of innovative procurement approaches such as partnership and incentives will be much in favour of new and local players, as this will lead them to a better chance of survival and sustainability in the region and can look ahead to become another strong player in the global arena.

Looking at the UK North Sea scenario for example, the depletion of oil and gas in the region and changes in the global business trend and economy has led players to extend their leverages into foreign regions and new frontiers. Malaysia and other countries in the region must learn and be prepared for this by looking at the development of other alternative approaches in management, particularly on procurement methods/strategies.

Developing their own local training programme to produce local labour and enhancing management expertise are critical to avoid relying heavily on other countries. There is knowledge to be learnt, tested and improved especially in the aspects of management and procurement of oil and gas projects in Malaysia. One way to accelerate the learning process is by continuous participation and involvement of personnel in new projects locally as well as in other country. Relevant governmental departments or agencies (such as DTI in the UK) should initiate and encourage research and development in the area of management and innovative procurement in this industry using collective data and information obtained from major and experienced players in Malaysia and around the region. This will help to enhance and improve the knowledge and

management skills of local players to equip them with the latest knowledge and technology necessary to allow them the capability to venture into other regions.

6.5.2.2 Regional Influential Factors

Although falls into the same oil and gas region; Malaysia, Philippines, Vietnam and China for example, are different in many ways as far as management of influential factors are concerned. They may have shared the same oil and gas field or the same technological approach in drilling and production of oil and gas, but they may not necessarily share the same approach and practice on management and procurement methods/strategies. Several literature and case studies have shown that the influence of multi cultural complexity (MCC) between each country within the region does exist and need to be addressed accordingly by local and foreign players. Local conditions, perception, trading practices, working ethics and cultures are to name but the few influential MCC factors that desperately require local expertise and assistance.

It is also fair to highlight the fact that one of the important influential factors in today's oil and gas price hike is caused by the high demand for oil by China, currently the world's fourth biggest economy and the USA. With the future demand for oil and gas seems far from decreasing, the search for new oil fields in deeper waters and in new frontiers are setting new challenges to players offering higher risks and demanding financial budget, which will also indirectly influenced the approach to management and procurement strategies of participating players.

6.5.3 Developing Guidelines on Procurement Strategies based on Case Study Findings

Major issues found in the case studies have been used to develop, structure and enhance the research study framework and simultaneously will be use in the development of the proposed guidelines on procurement strategy for the oil and gas industry. The four core issues identified are project characteristics, procurement characteristics, values to be adopted and last but not least multi cultural complexity. Irrespective of regions, these issues have become the most important and critical factors which will have an enormous impact to the successful implementation of procurement process or strategies in the industry.

Project characteristics mainly involved the physical, technical and logistical aspects of the complex project in the high risk industry. By comparison, on-land and deepwater oil and gas exploration and production are two different projects with two significant differences in almost all aspects of the work although they may be similar on the technical process. The worst project scenario can be found in the UKNS where not only that they have to work in a deepwater exploration and production site, the harsh weather and sea conditions can proved to be very demanding at times not only to the expensive platform structures and equipments but also to the workers.

Different stages of the exploration and production process may require different approaches to the procurement methods/strategies. Selecting the right and most appropriate procurement methods/strategies can be a challenging task to clients and contractors alike due to the different impact each methods/strategies would have on the procurement process. The changing business

and market trends regionally and globally have added to the risk of choosing the right procurement method/strategy for the right job. The sudden rise of market price for steel recently has put an extra burden to fabricators and manufacturers and if necessary precautions on price fluctuation were not allowed in the contract, they will be facing a difficult time ahead.

The changes that have taken place in many aspects of the current oil and gas industry globally have forced players like clients, contractors and suppliers to look closely at the type of values they need to adopt in their current procurement methods/strategies. The common values on time, quality and cost may not be sufficient enough to ensure that their multi million if not billion dollar investment are giving them the returns what that their stakeholders are expecting. Values such as risk needs to be well calculated and forecast based on extreme possibilities. The clarity of contracts will be of certain value to ensure that they have a strong stand on financial claims to avoid unnecessary losses. The contract must also be flexible enough to absorb certain unforeseeable circumstances and unfavourable economic situation such as sudden material price hike or high inflation.

The single most significant issue found in these case studies must be the challenges that players in the industry must face on multi cultural complexity issues. Each region brings its own and unique issues and problems which require different approaches and attention. The issues are vast and critical in some regions where appropriate steps and precautions are necessary to ensure successful ventures. The proposed procurement strategy guidelines in Chapter 9 will hopefully

help players to identify and address these four core issues, particularly on multi cultural complexities.

6.6 SUMMARY OF CHAPTER 6

The case studies have highlighted several issues and different perceptions on procurement methods/strategies within the industry in the UK and Malaysia. The case studies also serve to validate some of the findings of the literature overview as far as procurement methods/strategies are concerned.

Players actively involved in the oil and gas industry in the UK need to respond to the following issues.

- Introducing innovative procurement approaches within the industry incorporating critical issues in the region on oil and gas depletion, rising production costs and successful collaborations.
- Introducing innovative procurement approaches that are adaptable to suit global business trends, challenges and demands for global ventures.
- Identify and prioritised multi-cultural complexity (MCC) issues that will have an impact on the successful implementation of procurement methods or process locally as well as in other regions to avoid or reduce unforeseen circumstances in the procurement process and project.

- Improving client/contractor relationships in view of a successful business/project partnership or ventures especially in the case of global partnership or collaborations.

In addition, apart from demonstrating the need to gather relevant data from key players in a complex sector that has a small number of players, the case study has also successfully highlighted several critical issues and perceptions on procurement methods/strategies in the industry in Malaysia.

From the case studies conducted, it was found that players involved in the oil and gas industry in Malaysia need to address the following issues.

- Improving procurement methods/strategies not only to suit local practices and requirements but also to look at new global business trends, challenges and demands as well as incorporating new approaches.
- Identifying and prioritising values to be adopted in procurement methods/strategies within the region and globally which include stakeholders' requirements, calculation of risks, clarity of contracts and flexibility of change to be able to get the best possible results and successful procurement process.
- Identify and prioritising influential economic factors as well as multi-cultural complexity (MCC) issues that will have an impact on the successful implementation of procurement methods or process especially by contractors and service providers.
- Improving client/contractor relationship in view of achieving successful and continuous business/project partnership or ventures.

- Promoting and contributing more actively towards research and development efforts including the willingness to share knowledge and experiences within the industry and across regions.

The evaluation results and findings from this chapter and Chapter 5 which were integrated and incorporated into Chapter 7, provided the critical elements and ingredients needed in the development of the procurement strategy guideline on procurement process. These evaluations by means of quantitative (Chapter 5) and qualitative methods as elaborated in this chapter, also provided strong justifications on the major issues and elements chosen for the development of the procurement strategy guideline on selection process which will be discussed further in Chapter 7.

CHAPTER 7: PROCUREMENT STRATEGY GUIDELINE ON SELECTION PROCESS

7.1 INTRODUCTION

The final task of the research objectives is to develop a procurement strategy guideline on selection process (referred to hereafter as the "Guideline") to be adopted by managers and key stakeholders (referred to hereafter as "Decision Makers") in the oil and gas industry. Previous chapters have provided the Guideline with the necessary structure and ingredients for its construction. The Guideline was developed based on the inputs and results gathered from specific tasks in the research process as explained in earlier chapters and as illustrated in the flowchart in Figure 7.1. These include its development through: the theoretical formulations in Chapter 3 and 4; empirical evaluations and analysis in Chapters 5 and 6; and finally towards the design of the Guideline which will be discussed in this chapter.

The Guideline was developed in view of its potential benefits and possible contribution to improve the decision maker's understanding of procurement and supply chain systems and processes in the industry. It also helps to provide new entrants to the business the essential points of procurement, new ideas and perspectives on procurement strategy. The developed Guideline is shown in **Appendix B1**. There are four main areas to be covered in this chapter which are the background of the Guideline, using the Guideline, phases and steps in the selection process and industry validation. Each area will be explained in detail in the following sections.

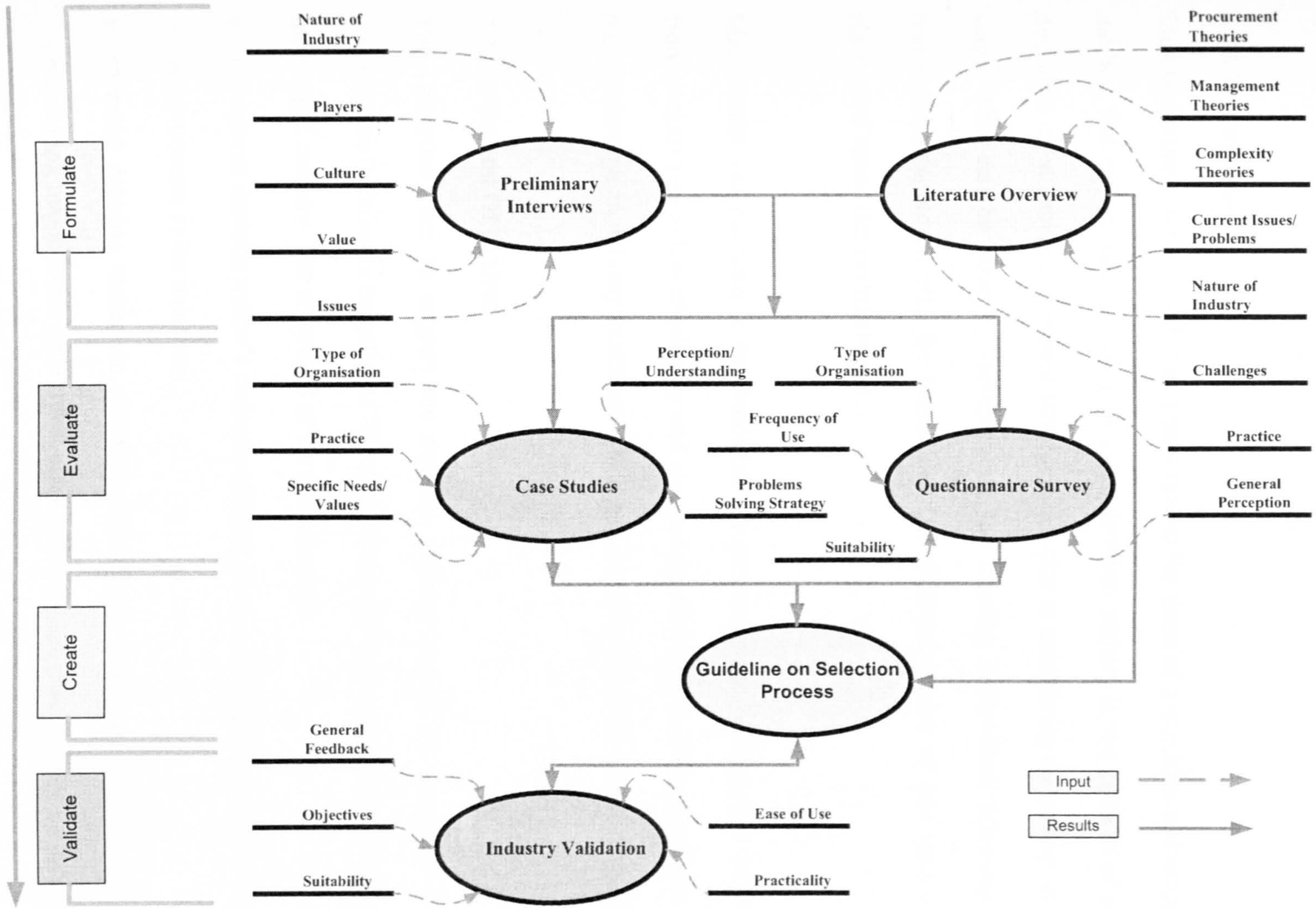

Figure 7.1: The Flowchart of Critical Inputs and Results in the Development of Procurement Strategy Guideline on Selection Process

7.2 BACKGROUND OF THE GUIDELINE

7.2.1 Introduction

This Guideline can be considered to be a tool in the form of a checklist and assessment method that can be used not only to assist decision makers in the process of making decisions on suitable procurement strategies but also in monitoring the project at a later stage. This can be done by incorporating the Deming cycle/wheel (Deming 1986) management approach into the Guideline. The different phases of this approach are elaborated upon later in this chapter.

Main issues and elements in the Guideline are gathered from findings and information from various research methodology and approaches. The Guideline has also been put to the test through an industry validation which will be discussed at the end of this chapter.

7.2.2 Aims and Objectives

The Guideline aims to support the decision making process by managers and key stakeholders (referred to hereafter as "Decision Makers") on procurement strategies in the oil and gas industry. The objectives of the Guideline are:

- to improve decision maker's understanding of procurement and supply chain systems and processes in the industry;
- to assist decision makers in planning, identifying, analysing, implementation and monitoring major issues and critical elements in the selection process of procurement strategies;

- to assist decision makers in the selection process of suitable procurement strategies to be used or adopted in a particular oil and gas project;
- as a guide for decision makers in the industry in identifying key issues on project specific needs or values; and
- as a guide for decision makers in the industry in identifying key issues on multi cultural complexities especially for new and unfamiliar regions.

7.2.3 Scope and Limitations

This Guideline has been developed based on research findings from literature, interviews and questionnaire survey. Case studies and questionnaire surveys were conducted on players based in the UK and in Malaysia but with current and previous active participation in various oil producing regions. Nevertheless, every effort has been made where possible to include issues or practices in other oil producing regions through literature search as well as interviews to reflect the views of the industry as a whole.

7.2.4 The Deming Cycle Management Approach

The Deming cycle, which was also referred to as the Deming wheel or plan-do-study-act (PDSA) cycle was introduced by Dr W. Edwards Deming (Deming 1986, Walton 1989, Latzko and Saunders 1995) as a systematic approach to planning, analysis, problem solving and continuous improvement (Kerzner 2003). Initially, it was referred to as the Shewhart cycle or plan-do-check-act by Dr Deming, named after his teacher but subsequently replaced the 'check' by 'study' as the word reflects the actual meaning more accurately (Gardiner 2005).

The underlying principles of the Deming cycle approach (Figure 7.2) according to Gardiner (2005) and Kerzner (2003) can be described as:

1. **Plan** – Plan the objectives and methods for the best possible results;
2. **Do** – Execute the plan by taking small steps in controlled circumstances;
3. **Study/Check** – Study and check results against objectives and methods; and
4. **Act** – Take action to implement process; standardise or improve process through monitoring, immediate remedies and further actions and adopt to changes.

7.3 USING THE GUIDELINE

Schedules are used in the Guideline to ease the compilation of important data or critical information relative to the project in a single tabulated form. This was also done in view of future development of this Guideline using computer based approach including artificial intelligent assessment and analysis of data to assist, expedite and maintaining consistency in the decision making process.

The overall steps on using the Guideline can be seen on the flowchart in Figure 7.2 and the overall Guideline phases and steps in Figure 7.3. The detailed steps on how to use the schedules and tables are presented and explained in section 7.4. In order to use the Guideline to the selection process effectively and successfully, the following three main sections/contents of the Guideline must be used together.

1. The Guideline overall phases and steps as in Table 7.1.

2. The respective Guideline schedules for specific purposes including examples of major issue elements as in Tables 7.2a-7.2h.
3. Examples of completed Guideline schedules and assessments for an oil and gas project included in the Guideline as an Appendix.

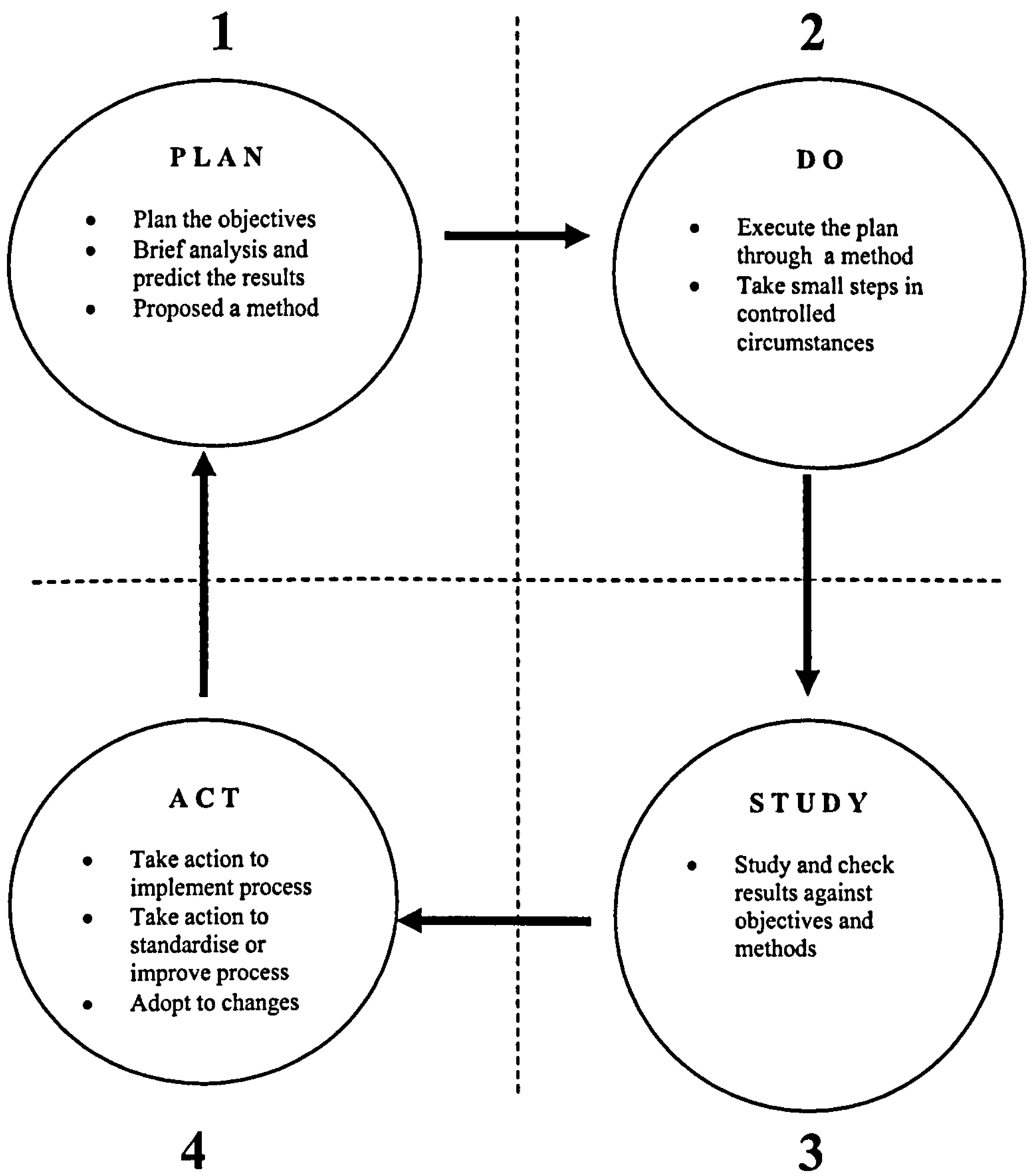

Figure 7.2: The Deming Cycle (Deming 1986, Gardiner 2005 and Kerzner 2003) or Shewhart Cycle (Latzko and Saunders 1995)

7.4 PHASES AND STEPS IN THE SELECTION PROCESS

In order to understand the Guideline process better and to use it most effectively, this Guideline is divided into four (4) distinct phases in accordance to the Deming cycle/wheel and six (6) steps of proposed actions. Each step represents the process that needs to be considered and undertaken before proceeding towards the next step or phase as shown in Table 8.1.

The assessment for the selection process in the Guideline are categorised into four major components/issues which include project characteristics, procurement characteristics, special project procurement needs/values to be adopted in contract and multi cultural complexity factors. Separate schedules were designed, allocated and used for each of the major issues (Tables 7.2a – 7.2d) which indicate that each issue needs to be considered thoroughly and addressed independently. These separate schedules can also be distributed to relevant departments within the company or organisation prior to the analysis stage for them to scrutinize, deal with and fill in accordingly to the best of their knowledge and experiences.

In each schedule, decision makers will be asked to identify and fill in detail on important elements based on the project details and list of examples provided in the tables, that they think or anticipate most likely to be relevant and critical to the project in accordance to the type of business relationship they are undertaking (i.e. procuring or being procured).

Each of these major issues comprised elements that could be potentially important, influential and critical towards the success of the project. How decision makers perceived these elements would be different depending on the type of relationships (procuring or being procured) and under different project scenarios. The examples of these elements can be found in the schedules.

7.4.1 Step 1: Procuring or being Procured

This first step is also known as the inception phase where decision makers will clarify the company's role in the procurement of a particular project (either procuring or being procured). This decision will have a different impact to the selection of procurement strategies to be used by the company. If they are being procured, the company will have less control over the procurement method which is subjected to the client's choice but only be able to plan on the procurement strategy. On the other hand, when procuring, the company will have the control over both the procurement method and strategy to be adopted. Therefore, the assessment, analysis and implementation of the actions in the Guideline selection process may not be the same under these two circumstances.

This decision on the company's role in procurement is important and must be clarified before any commitment towards the project can be made. Once a decision has been made either procuring or to be procured, then the next step would be to look at all the necessary ingredients and elements in a project which are needed for the selection process all as presented in the Guideline's schedules as in Table 7.2a which include project's reference, name, estimated starting and completion date, duration and estimated value.

In order to understand and identify relevant elements in the major issues, some examples which are by no means limited or restricted, are also listed in the schedules for reference. These examples are gathered from data available from literatures and interviews with industry players.

A list on the possible selection of procurement methods and strategies are also provided in Table 7.2e. These are some of the examples of methods and strategies known to be used in current practice within the industry. However, possible changes for new and innovative procurement approaches in the near future are inevitable to suit company/organisation's needs, technological advancement and economic/business changes in this competitive and demanding industry as well as to meet global business trend and environment.

7.4.2 Step 2a: Assess Project Characteristics

The first step (S2a) is to complete the project and contract details as stated in Table 7.2a and also critical elements pertaining to the project and contract as listed as examples in the schedule. An assessment of the project's overall characteristics must be included in the schedule based on the particulars and information gathered from the project.

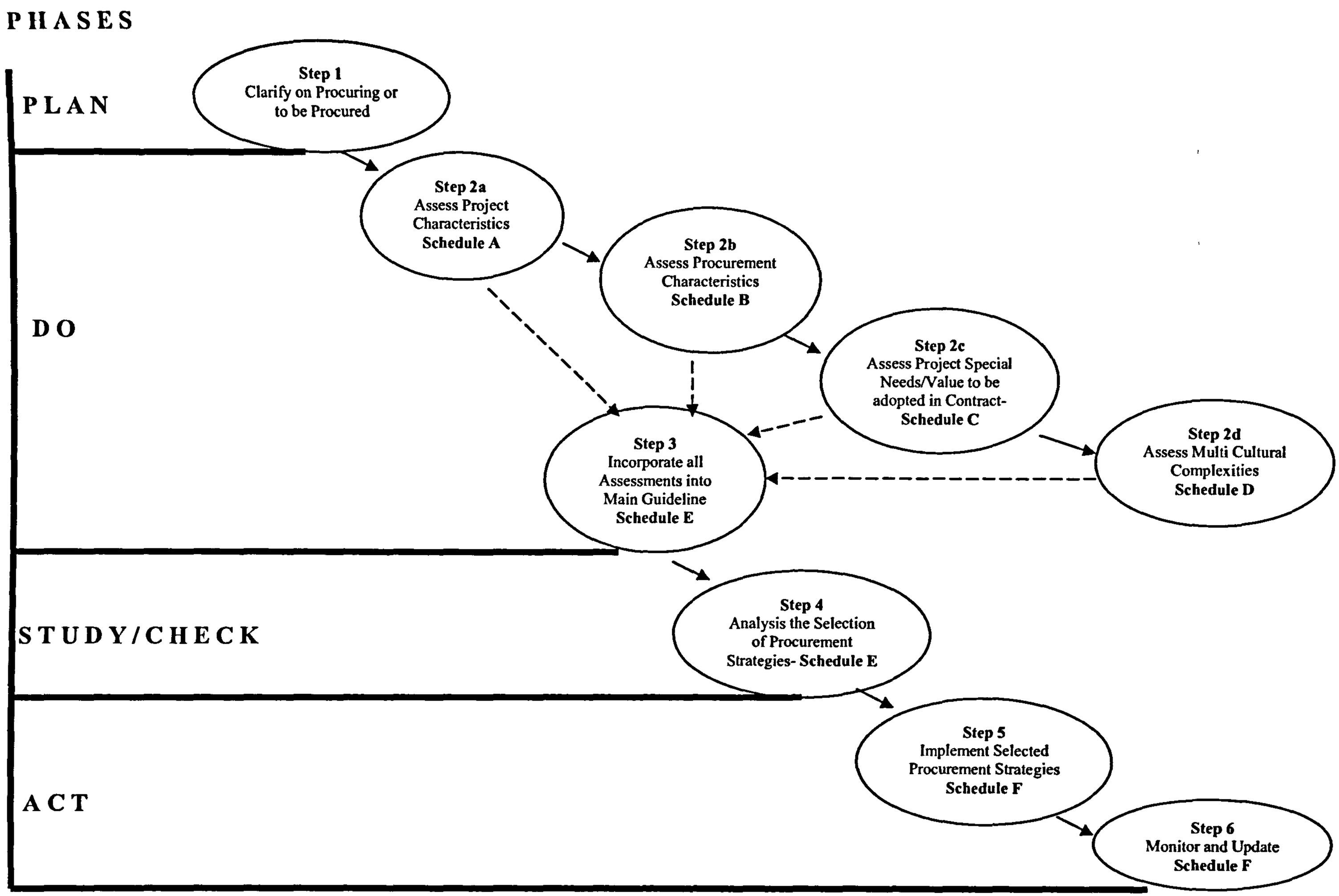

Figure 7.3: Flow Chart on the Steps of Using the Guideline

Table 7.1: Overall Phases and Steps of the Guideline on Selection Process

Phase	Step	Actions To Be Taken
Plan	S1	**Clarify on Procuring or being procured:-** Company's role in the procurement of a particular project (either procuring or being procured). This role will create a different approach to procurement strategies whereby when being procured, the company will have less control over the procurement methods which is subjected to the client's choice but only be able to plan on the procurement strategies. On the other hand, when procuring, the company will have the control over both procurement method and strategy to be adopted. Therefore, the assessment, analysis and implementation of the actions in the Guideline selection process may not be the same under these two circumstances. Once the decision on the company's role in the procurement is clarified, the analysis and selection process can begin.
Do	S2a	**Assess Project Characteristics:-** With reference to **Schedule A.** Filling in the project and contract details as stated in **Schedule A** and also critical elements pertaining to the project and contract listed as examples in the schedule. An assessment of the project's overall characteristics must be included in the schedule based on the particulars and information gathered from the project.
	S2b	**Assess Procurement Characteristics:-** With reference to **Schedule B.** Filling in the project and contract details as stated in **Schedule B** and critical elements pertaining to the procurement characteristics listed as examples in the schedule. An assessment of the project's procurement characteristics must be made and included in the schedule based on the particulars and information gathered from the project.
	S2c	**Assess Project Special Needs/Value to be adopted in the contract:-** With reference to **Schedule C.** Filling in the project and contract details as stated in **Schedule C** and critical elements pertaining to the contract listed as examples in the schedule. In this schedule, the project's special needs/value elements to be adopted in contract not only need **to be highlighted** but must also be **ranked** in order of its priority in the project. An assessment of the project's special needs/value to be adopted in contract must then be made based on the ranking order and included in the schedule.
	S2d	**Assess Multi Cultural Complexities:-** With reference to **Schedule D.** Filling in the project and contract details as stated in **Schedule D** and critical elements pertaining to multi cultural complexities listed as examples in the schedule. In this schedule, the project's multi cultural complexity elements not only need **to be highlighted** but must also be **ranked** in order of its effects/impact to the project. An assessment of the project's multi cultural complexities must then be made and included in the schedule based on the particulars and information gathered from the project.
	S3	**Incorporate all Assessments in Steps 2a-2d into Main Guideline Schedule:-** With reference to **Schedules A-D** and **Schedule E.** Filling in the project and contract details as stated in **Schedule E,** incorporating all assessments in **Schedules A-D** and the type of procurement methods/strategies to be adopted listed as examples in the schedule (as per √ in the schedule). The overall assessment/recommendation column of this schedule will be dealt with in the next stage.
Study/Check	S4	**Analysis Decision on the Selection of Appropriate Procurement Strategy:-** With reference to **Schedules A-D** and **Schedule E.** Filling in the overall assessment of the project and the appropriate recommendations on the type of procurement methods/strategies to be adopted (as per √) in **Schedule E,** based on all assessments made in **Schedules A-D** and the type of procurement methods/strategies to be adopted listed as examples in the schedule. In the overall assessment column of this schedule, the project's list of probable procurement methods/strategies not only need **to be highlighted** but must also be **ranked** in order of its priority and probable affects i.e. risks, complexity etc. to the project.
Act	S5	**Implement Selected Procurement Strategy:-** With reference to **Schedule F.** Filling in all the necessary details and decisions made on the overall assessment of the project as per the Main Schedule (**Schedule E**) and all further actions to be taken (as per √) in **Schedule F.** This decision is to be disseminated to all department concerns for further actions and implementation.
	S6	**Monitoring and Updating:-** With reference to **Schedule F.** Monitoring and updating current details on all relevant information related to the project (as per √) in **Schedule F** in a periodic manner (weekly or monthly) as the work progresses. This will include highlighting any **significant changes or alterations** made to the contract details (i.e. duration, cost etc.) that may affect or change the decision previously made on the overall assessment of the project as per the Main Schedule (**Schedule E**).This monitoring and updating of details and information is critically important to the company and therefore need to be disseminated to all department concerns from time to time for further action, implementation and/or feedback.

7.4.3 Step 2b: Assess Procurement Characteristics

The next step (S2b) is to produce the project and contract details as stated in Table 7.2b together with critical elements pertaining to procurement characteristics. An assessment of the project's procurement characteristics must be made and included in the schedule based on the project particulars and relevant information gathered from the project.

7.4.4 Step 2c: Assess Specific Project Needs/Value to be adopted in contract

This (S2c) step include completing the project and contract details as stated in Table 7.2c together with critical elements of specific project needs/value to be adopted in the contract. In this schedule, the specific project needs/value elements to be adopted in the contract not only need to be highlighted but must also be ranked in order of its priority or importance to the project. An assessment of the specific project needs/value to be adopted in contract must then be made based on the ranking order and included in the schedule.

7.4.5 Step 2d: Assess Multi Cultural Complexities

The (S2d) step involve registering the project and contract details as stated in Table 7.2d and critical elements pertaining to multi cultural complexities. In this schedule, the project's multi cultural complexity elements not only need to be highlighted but must also be ranked in order of its effects to the project. An assessment of the project's multi cultural complexities must then be made and included in the schedule based on the particulars and information gathered from the project.

7.4.6 Step 3: Incorporate Steps 2a-2d into the Main Guideline Schedule

This (S3) step on the main guideline schedule is about integrating all the information about the project and contract details as stated in Table 7.2e, incorporating all assessments in Tables 7.2a-7.2d and the type of procurement methods/strategies to be adopted (as per √ in the schedule). The overall assessment/recommendation column of this schedule will be dealt with in the next step.

By incorporating all these four major issues and respective elements in a single schedule would allow decision makers to have a bigger and wider picture of what are the project's potential issues or critical elements to be expected in the proposed project. This is also the best way to analyse the proposed project much more prudently in order to decide the best possible options to be used on procurement strategy.

7.4.7 Step 4: Analysis Decision on the Selection of Appropriate Procurement Strategy

This (S4) step will include filling in the overall assessment of the project and the appropriate recommendations on the type of procurement methods/strategies to be adopted (as per √) in Table 7.2f, based on all assessments made in Tables 7.2a-7.2d and the type of procurement methods/strategies to be adopted as listed in Table 7.2e. In the overall assessment column of this schedule, the project's list of probable procurement methods/strategies not only need to be highlighted but must also be ranked in order of its priority, strength and probable affects i.e. risks, complexity etc. to the project.

There are many ways to analyse data that has been collected and transferred into the main guideline schedule (Table 7.2e). One way is by listing and ranking them in order of priority or importance to the particular project. For example, analysing the top five elements of each major issue with one another may create possible links or relation which can then lead to the selection of the most appropriate procurement strategy for the project. However, having said that, there are no hard or fast rules on the approach to the analysis method but most importantly, the analysis are all based on the important data and information available from the project as stated in the main guideline schedule.

Identifying, ranking and highlighting important elements in each of the four major issues schedules will also help decision makers to be more focus and aware of any potential and possible threats or constraints much earlier in the project. This is to allow them to have better understanding and therefore the ability to relate and analyse all elements in the major issues before deciding on the best possible solutions or in this context, the best possible options on the selection of procurement strategies. Detailed elaborations, in-depth justifications and lengthy discussion among decision makers are expected during this stage which will determine to draw a final decision on the selection of the appropriate procurement strategy for the project.

A note of caution though, this may not be the best possible approach of analysing these major issues especially for inexperienced decision makers but this Guideline will certainly provide them with the necessary and essential ingredients that they need in order to make strong justifications and decisions on the most appropriate procurement strategy

to be used in a project. It is also suggested that further studies on the best method of analysing these elements to be conducted in the future.

7.4.8 Step 5: Implement Selected Procurement Strategy

This (S5) step include completing all the necessary details and decisions made on the overall assessment of the project as per the Main Schedule (Table 7.2e) and all further actions to be taken (as per √) in Table 7.2g. This decision is to be disseminated to all department concerns for further actions and implementation.

Once the final conclusion and decision on the type of procurement strategies to be adopted has been determined from the Main Guideline schedule, the implementation of these strategies can then be pursued. During this step, a schedule of the proposed procurement strategies will be produced (Table 7.2g). All further actions and information necessary to implement these strategies during the procurement process will also be introduced and explained.

This schedule on the implementation of procurement strategies will become the major reference to the decision makers and relevant departments during and after the procurement process. Decision makers will have to ensure all relevant departments are well informed and consistent with whatever decision that has been made to allow a successful and effective implementation of the selected procurement strategies.

7.4.9 Step 6: Monitoring and Updating

This (S6) step involves monitoring and updating current details on all relevant information related to the project (as per √) in Table 7.2h in a periodic manner (weekly or monthly) as the work progresses. This will include highlighting any significant changes or alterations made to the contract details (i.e. duration, cost etc.) that may affect or change the decision previously made on the overall assessment of the project as per the main guideline schedule (Table 7.2e). This monitoring and updating of details and information is critically important to the company and therefore need to be disseminated to all department concerns from time to time for further action, implementation and/or feedback.

The schedule needs to be updated or amended where and when necessary from time to time as the work on the project progresses. This is to be sure of their relevance and suitability to the project with regards to current situation which can always be subjected to change especially in a project of this nature and complexity. Significant changes in project scenarios may result in changes or modifications of the proposed procurement strategies made during initial stage of the project. Changes or modifications in the contract or procurement strategies during the construction stage will certainly have a large economic and legal impact to the client or service providers i.e. contractor, supplier, manufacturer or fabricator. Updating and proper records on the implementation of these strategies can also be used as a reference in future project's decision making process

Table 7.2a: *Schedule A*: Project Characteristics Schedule - Types, Categories and Assessment

Ref No.	Name of Project	Est. Start Date	Est. Complet Date	Dur. (Wks)	Est. Value (£)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommissioning	Categories Supply/Deliver/ Install/ Test & Comm./ Servicing	Special Requirements (HSE, Local and International Regulations)	Other Constraints Risks/Legal/ Resources/ Technology/ Business/ Management	Assessment of Overall Project's Characteristics
						Onshore –Easily accessible; Not easily accessible; Distance from nearest town/city; Subjected to extreme weather **Offshore** –Deep water (>100 meters); Shallow water (<100 meters); Distance from nearest town/ city/port; Subjected to extreme weather **Climatic Influence** – Tropical; Seasonal; Desert; Artic; Others	**Exploration** – Platform facilities; Sub-sea facilities Drilling; Laboratory; Plant/equipment **Production**-Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Hook up**- Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Maintenance** – Periodical/Planned; Unplanned; Immediate Repairs **Decommissioning** - Testing and decommissioning; Dismantling; Removal from site	**Supply** –Material; Labour; Specialist; Plant/equipment; Platform facilities **Delivery**– **a. To site** –Material; Labour; Specialist; Plant/equipment; Platform facilities **b. From site** –Material; Labour; Specialist; Plant/equipment; Platform facilities **Installation** –Complete fabrication, construction and installation; Complete dismantling **Testing and Commissioning** – Material; System; Plant/equipment; Platform facilities **Servicing** –Material; System; Plant/equipment; Platform facilities	**HSE**- Workmen safety; fire, gas and heat; materials used; escape route; special plants & equipment **Local Regulation**- Environmental; health; social; local input; infrastructure **International Regulation**- Green house gas emission; safety; protection of flora/fauna	**Risks**- Technological; resources; business and finance; legal; political; environmental; terrorist **Legal**- Type of legal practice/procedure; justice systems; statutory requirements; legal expenses **Resources**- Trade unions; standard/level of skills and knowledge; training; safety; availability of critical resources. **Technology**- Cost/value of hi-technology; technology benefits over cost; sustainability; output **Business**- Winning tenders despite being competitive; economic crisis; money devaluation **Management**- across company/organisation; between players involved; between interfaces of potential packages; critical resources;	

Table 7.2b: *Schedule B:* Procurement Characteristics Schedule - List of Methods and Assessment

Ref No.	Name of Project	Est. Start Date	Est. Complet Date	Dur. (Wks)	Est. Value (£)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommissioning	Categories Supply/Deliver/ Install/ Test & Comm./ Servicing	Type of Procurement Methods	Other Constraints Risks/Legal/ Resources/ Technology/ Business/ Management	Assessment of Overall Project's Characteristics
						Onshore –Easily accessible; Not easily accessible; Distance from nearest town/city; Subjected to extreme weather **Offshore** –Deep water (>100 meters); Shallow water (<100 meters); Distance from nearest town/ city/port; Subjected to extreme weather **Climatic Influence** – Tropical; Seasonal; Desert; Artic; Others	**Exploration** – Platform facilities; Sub-sea facilities Drilling; Laboratory; Plant/equipment **Production**-Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Hook up**- Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Maintenance** – Periodical/Planned; Unplanned; Immediate Repairs **Decommissioning** - Testing and decommissioning; Dismantling; Removal from site	**Supply** –Material; Labour; Specialist; Plant/equipment; Platform facilities **Delivery**– **a. To site** –Material; Labour; Specialist; Plant/equipment; Platform facilities **b. From site** –Material; Labour; Specialist; Plant/equipment; Platform facilities **Installation** –Complete fabrication, construction and installation; Complete dismantling **Testing and Commissioning** – Material; System; Plant/equipment; Platform facilities **Servicing** –Material; System; Plant/equipment; Platform facilities	**Conventional**- Lump Sum; Cost Plus; Unit Price; EPIC; EPCC **Innovative**- Partnering/Joint Venture; Whole Life Costing; Supply Chain; Contract to Produce; Leasing; Others	**Risks**-Technological; resources; business and finance; legal; political; environmental; terrorist **Legal**- Type of legal practice/procedure; justice systems; statutory requirements; legal expenses **Resources**- Trade unions; standard/level of skills and knowledge; training; safety; availability of critical resources. **Technology**- Cost/value of hi-technology; technology benefits over cost; sustainability; output **Business**- Winning tenders despite being competitive; economic crisis; money devaluation **Management**- across company/organisation; between players involved; between interfaces of potential packages; critical resources;	

Table 7.2c: *Schedule C*: Specific Project Needs/Values to be adopted in contract and Assessment Schedule

Ref. No.	**Name of Project**	**Est. Start Date**	**Est. Complet. Date**	**Dura. (Wks)**	**Est. Value (£)**	**Specific Project Needs/Value to be adopted in contract Elements**	**Specific Project Needs/Value to be adopted in contract Elements** *(Ranked by order of priority)*	**Other Constraints** Risks/Legal/Resources/ Technology/Business/ Management	**Assessment of Specific Project Needs/Value to be adopted in contract**
						Performance – Completion Time/Delivery; Tender Cost; Cost Effectiveness; Quality/Standards; Clarity of Contract; Flexibility of contract **Business** –Stakeholders Requirements; Market condition/trend; Profitability, Sustainability; Competitiveness; Price Fluctuation; Risk; Whole Life Cycle Costing; Incentives **Miscellaneous** –Safety; Environment; Flexibility of contract, Cooperation; Goodwill, Good image/reputation; Long term relationship; Research & Development (R & D)		**Risks-** Technological; resources; business and finance; legal; political; environmental; terrorist **Legal-** Type of legal practice/procedure; justice systems; statutory requirements; legal expenses **Resources-** Trade unions; standard/level of skills and knowledge; training; safety; availability of critical resources **Technology-** Cost/value of hi-technology; technology benefits over cost; sustainability; output **Business-** Winning tenders despite being competitive; economic crisis; money devaluation **Management-** across company/organisation; between players involved; between interfaces of potential packages; critical resources;	

Table 7.2d: *Schedule D*: Multi Cultural Complexities (MCC) Schedule - List of Types, Categories and Assessment

Ref. No.	Name of Project	Est. Value (£)	Dura. (Wks)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommission.	Type of MCC Internal/ Regional/ Global	List of MCC Categories and Elements	MCC Elements Effecting Project *(Ranked in order of priority)*	Assessment of MCC Categories and Elements
				Onshore –Easily accessible; Not easily accessible; Distance from nearest town/city; Subjected to extreme weather **Offshore** –Deep water (>100 meters); Shallow water (<100 meters); Distance from nearest town/ city/port; Subjected to extreme weather **Climatic Influence** – Tropical; Seasonal; Desert; Artic; Others	**Exploration** –Platform facilities; Sub-sea facilities Drilling; Laboratory; Plant/equipment **Production**-Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Hook up**- Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Maintenance** – Periodical/Planned; Unplanned; Immediate Repairs **Decommissioning** - Testing and decommissioning; Dismantling; Removal from site	**Internal**-within own organisation/subsidiaries structure, philosophy and practice **Regional**-Within the operational designated region like North Sea, South China Sea, Mexico Bay, Middle East **Global**-Across operational designated region including new frontiers	**a. Business**-Price of oil; Market Environment; Tax Regime; Paymaster/Client; Sustainability; Capital risk; Trading Standards; Trading Agreements; Incentives **b. Project**-Physical nature; Location; Reservoir Size; Field Maturity; Technological Constraints; Expertise; Timescale; Transport Route/Access; Infrastructure **c. Player**-Number of Players; Company Type; Business Philosophy; Stakeholders; Personnel; Specialisation; Manpower; Knowledge/R&D; Experience; Goodwill/ Good Image/Reputation **d. Local Issues**-Clients; Work Culture; Practice; Knowledge; Political risk; Legislation; Bureaucracy; Local Content; Flexibility of contract; Monetary; Language; Environment; Bribery		

Table 7.2e: *Schedule E*: Main Guideline Schedule for Procurement Strategies Assessment and Selection

Ref. No.	Name of Project	Est. Start Date	Est. Compl. Date	Dur *Wks*	Est. Value (£)	Type of Procurement Method and Relationship (Procuring or being Procured)	Project Character. Assessment *(Schedule A)*	Procurement Character. Assessment *(Schedule B)*	Specific Project Needs/Value To Be Adopted in Contract Assessment *(Schedule C)*	Multi Cultural Complexity Assessment *(Schedule D)*	Overall Assessment/ Recommendation on the Type of Procurement Methods/Strategies to be Adopted
√	√	√	√	√	√	**Procurement Methods** **Definition:** Procurement methods in its broadest definition and context to the oil and gas industry is an approach required to acquire the design, material, labour, services, installation and commissioning inputs for a successful completion of a project. **Conventional-**Lump Sum; Cost Plus; Unit Price; EPIC; EPCC **Innovative-** Partnering/Joint Venture; Whole Life Costing; Supply Chain; Incentive Schemes; Contract to Produce; Leasing; Private Finance Initiatives; Others **Procurement Strategies** **Definition:** Procurement strategies are broadly defined as new approaches to acquire the desired inputs but also links to the business plan of an organisation/company. This is to maintain a sustainable position for that organisation/company within the total chain of the industry, which determines the success or survival of that organisation/company. **Examples:** Cooperation rather than competition; Risk Analysis and Management; Effective Supply Chain Management; Partnering/Alliancing Enhancement; Cost Effectiveness on Operational Management; Effective Incentive Schemes; Cultural, Geographical and Climatic Factors; Whole Life Cycle Costing; Other Industry's Lessons and Experiences	√	√	√	√	X

Table 7.2f: *Schedule E*: Main Guideline Schedule for Procurement Strategies Assessment and Selection (Overall Assessment)

Ref. No.	Name of Project	Est. Start Date	Est. Compl Date	Dur *Wks*	Est. Value (£)	Type of Procurement Method and Relationship (Procuring or being Procured)	Project Character. Assessment *(Schedule A)*	Procurement Character. Assessment *(Schedule B)*	Specific Project Needs/Value To Be Adopted in Contract Assessment *(Schedule C)*	Multi Cultural Complexity Assessment *(Schedule D)*	Overall Assessment/ Recommendation on the Type of Procurement Methods/Strategies to be Adopted
X	X	X	X	X	X	X	X	X	X	X	√

Table 7.2g: *Schedule F*: Schedule for Selected Procurement Strategies and Further Action to be taken

Ref. No.	Name of Project	Est. Start Date	Est. Compl. Date	Dur (Wks)	Est. Value (£)	Decision on Overall Assessment as per Main Guideline Schedule	Any other necessary updating or relevant information	Further Actions to be taken	To the Attention of/ Dept.	Remark
√	√	√	√	√	√	√	X	√	√	√

Table 7.2h: *Schedule F*: Schedule for Selected Procurement Strategies and Further Action to be taken (Monitoring and Updating)

Ref. No.	Name of Project	Est. Start Date	Est. Compl. Date	Dur (Wks)	Est. Value (£)	Decision on Overall Assessment as per Main Guideline Schedule	Any other necessary updating or relevant information	Further Actions to be taken	To the Attention of/ Dept.	Remark
√	√	√	√	√	√	X	√	√	√	√

7.5 INDUSTRY VALIDATION

7.5.1 Introduction

Validation phase of a scientific method according to Bock (2001) is to decide whether the objective of the research task had been achieved and added that peer reviews as a possible method for validation. McGraw-Hill Encyclopedia of Science and Technology (2002) suggested that validation of a model can be achieved if it is accepted as reasonable for its intended purpose by people who are knowledgeable about the system under study and is termed as face validity. The validation approach for this Guideline was pursued through seeking industry's expert and practitioner's judgement and feedback.

7.5.2 Aims and Objectives

The aim of the task was to validate the Guideline (Appendix C1), which in this case is achieved through expert or practitioner feedback or judgement on various aspects of the Guideline. The validation exercise was performed using a Validation Sheet as shown in **Appendix B2**, which was enclosed together with the Guideline which was then sent to the experts and practitioners in the industry for their feedbacks. The objectives of this task include:

- to validate the aims and objectives of the Guideline;
- to validate the usefulness of the Guideline to their respective organisation and the industry;
- to validate the structure and approach to the Guideline which include the theoretical phases and controlled steps to be undertaken throughout the selection process;

- to validate the framework of the Guideline comprising four major issues such as project characteristics, procurement characteristics, specific project needs/values and multi cultural complexities;
- to validate key elements in the major issues which are essentially important to the content of the Guideline; and
- to validate the user friendliness of the Guideline whether they are easy to understand, to fill in or sufficient enough to assist them in their assessment of major issues.

7.5.3 Scope and limitations

The design of the validation sheet expressed the overall aim of the research: i.e. to find out whether the Guideline is useful and could assist decision makers in their selection process for an appropriate procurement strategies to be adopted in their project. However, due to the limitations of the research: i.e. time, scope and other resources, this Guideline has its own limitations:

- to act only as a tool for decision making process (Kerzner 2003) but not in any way to influence or giving specific instructions on how to perform a suitable analysis before the decision could be made;
- can only be effective and reliable if the inputs are current, correct and as detail as possible (Deming 1986);
- needs to be updated periodically to allow for the monitoring of changes to the project details and information (Deming 1986) which could have an impact on the contract and costs; and

- needs to be standardised and consistent in its documentation process (Gardner 2005) to allow easier monitoring and analysing as well as to be a reliable and potential source of reference for future use.

7.5.4 Respondents

To solicit the views of expert and practitioners in the industry, the proposed Guideline and a validation sheet containing samples and questions with regard to the Guideline were sent to respondents participating in the empirical evaluation of the research as well as other organisations. The validation sheets were completed either through e-mails or telephone, at the preference of the expert. Some email responses entailed multiple correspondences for clarification or for gaining a deeper understanding of the expert views. Most of the respondents rejected postal correspondence due to the length of time taken and unsuitable to their mobile working style. Table 7.3 below presents the final numbers and type of respondents who participated in the validation exercise.

Table 7.3: Type and Number of Respondents Participated in the Validation

Type of Organisation	No. of Participation	%
Contractor	7	53.85
Operator	3	23.08
Servicing	2	15.38
Consultant	1	7.69
Total	**13**	**100**

7.5.5 Validation Results and Discussion

This Procurement Strategy Guideline on Selection Process (Guideline) was designed and developed to be used by players in the industry particularly on the aspects of how to conduct the selection process accordingly. It was designed only as a tool to assist decision makers in the selection process. However, it neither makes decisions for the user nor suggests the best method to conduct the analysis or assessment of critical elements. At the moment, this will be left to the decision makers to make within their respective companies based on the input of data available in accordance and as required by the Guideline.

The industry's validation on this Guideline was conducted only to test the validity of the Guideline on selection process. It was discovered that certain respondents in this validation exercise however, may have misunderstood this key aspect of the Guideline and thus were expecting more from this Guideline. This includes raising the issue on how to make the correct analysis and assessment to achieve the best decision over the various major issues and critical elements in a project. Although that could be the ultimate aim of this Guideline, but due to fact that the time and resources needed to undertake that extra task in this research was enormous, it was suggested that further research about this is to be conducted in the near future.

7.5.5.1: Responding Organisation's General Perception of the Guideline

On the general perception of the Guideline presented in Table 7.4a, 11 (85%) respondents agreed that the Guideline was easy to understand/follow. In addition, 7 (53%) respondents disagreed that they can use the Guideline without modification whereas 10 (77%) agrees/strongly agrees that the

Guideline can be adopted after some form of modification is undertaken before it can be used in their company. Finally, 8 (62%) respondents disagrees/strongly disagrees that the Guideline needs total change and approach and that it was quite acceptable in its current format. Overall, the Guideline was accepted by majority of respondents in its present form but need further upgrading or modifications to suit respective companies of different types, size and specialisation.

7.5.5.2: Responding Organisation's Ratings of the Guideline

On the ratings of the Guideline as in Table 7.4b, 12 (92%) respondents agrees/strongly agree about the usefulness of the Guideline to decision makers in their company. All (100%) of the respondents agreed that the Guideline will be useful/very useful to decision makers in other companies as well as agreeing to the point that the guideline will be making a useful contribution to the industry. The high ratings have illustrated and proven that the Guideline can be very useful to decision makers not only to be used within their company or organisation but also within the industry. This is mainly because apart from identifying and highlighting key issues and critical elements that needs to be considered by decision makers, the Guideline will also help to establish a standard or consistent approach to the procurement strategy selection process in the industry.

7.5.5.3: Responding Organisation's Perception of the Guideline's Objectives

One of the important purposes of the validation was to find out whether the Guideline has managed to meet its objectives (Table 7.4c). It was found that 10-13 (77-100%) respondents agree that the Guideline did achieve or meet its five (5) key objectives. There were only small

percentages between 7.6 to 15 % of the respondents who disagree/neither agree nor disagree with some of the objectives of the Guideline.

Table 7.4a: Responding Organisation's General Perception of the Guideline

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
a Is easy to understand			1	11	1	52	4.00
b Could be fully adopted and used by your company **without** modification		7	3	3		35	2.69
c Could be fully adopted and used by your company **with** modification		1	2	8	2	50	3.85
d Needs total change and approach altogether	2	6	4	1		30	2.31

Table 7.4b: Responding Organisation's Ratings of the Guideline

(Pts)	Not Useful (1)	Least Useful (2)	Useful (3)	Very Useful (4)	Most Useful (5)	Total Points	Average Points
a The **usefulness** of the *Guideline* to decision makers in your company		1	7	5		43	3.31
b The **usefulness** of the *Guideline* to other companies decision makers			10	3		42	3.23
c The *Guideline* **useful contribution** to the industry			9	4		43	3.31

Table 7.4c: Responding Organisation's Perception of the Guideline's Objectives

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
a will improve decision maker's understanding of procurement and supply chain systems and processes in the industry	1	2	9	1		49	3.77
b can assist decision maker's in planning, identifying, analysing, implementation and monitoring major issues and critical elements in the selection process of procurement strategies			10	3		55	4.23
c can assist decision makers in the selection process of suitable procurement strategies to be used or adopted in a particular oil and gas project		1	11	1		52	4.00
d can be used as a guide for decision makers in identifying key issues on project specific needs or values		2	9	2		52	4.00
e can be used as a guide for decision makers in identifying key issues on multi cultural complexities especially for new and unfamiliar regions.		4	7	2		50	3.85

Among the additional suggestions/remarks made by some of the respondents about the Guideline include the following.

- The guideline should have links to questions/format use in typical computer based applications.

- The guideline need to say how the key elements identified during the analysis phase will give an impact on the decision to be made. For instance which elements will help to make a decision on the remuneration model, on the type of contract etc.
- The proposed guideline addresses the majority of the issues. However, it does not say how one should combine the information gathered during the analysis phase and the key project drivers to define the overall strategy and the detailed strategy for each work-package. A clear decision-making guideline for each step should be included.
- Own organization's structure and capabilities need to be clearly included and analyzed / study as a main process flow solution. Own organization's internal strength as well as constraints may impose a great impact in winning/losing tender bids or resuming ongoing project.
- It was such an excellent guideline that can be very useful as a guide for monitoring, analyzing and for decision making on procurement matters in their company.

7.5.5.4: Responding Organisation's Perception of the Guideline's Schedules

This results analysis is specifically about the Guideline schedules based on Tables 7.4d to 7.4j below. Generally, the perception of respondents on questions about Project Characteristics schedule (Table 7.4d) which include the essentials and nature of project characteristics, understanding of the schedule and filling in relevant information are acceptable with 10 (77%) respondents agrees/strongly agrees on these points. However, on the question whether this schedule was sufficient enough to assist the assessment of project characteristics, only six (46%) of respondents agrees/strongly agrees. This sort of perception was more or less the same with the Procurement Characteristics schedule (Table 7.4e).

On the schedule for Specific Project Needs/Values to be adopted in Contract (Table 7.4f), between 9-13 (69-100%) respondents agrees/strongly agrees to all questions regarding this schedule. However, a slightly lower percentage can be seen for the Multi Cultural Complexities schedule (Table 7.4g), whereby only 7-11(54-85%) respondents agrees/strongly agrees over all the questions about the schedule. There are 5 (38%) respondents neither agrees nor disagrees whether the schedule is sufficient enough to assist decision makers in the assessment of multi cultural complexities for the project.

In the main guideline schedule for procurement strategies assessment and selection (Table 7.4h), between 10-13 (77-100%) respondents agrees/strongly agrees to all the questions about this schedule. Positive feedbacks were given to the schedule for the Selected Procurement Strategies and further action to be taken for a proposed oil and gas project (Table 7.6j) where 9-12 (69-92%) respondents agrees/strongly agrees to all the questions about this schedule.

On the whole, the questions about the ease of understanding of the schedules, ease of filling in the relevant information and the description about the essential and nature of each schedules received 9-13 (69-100%) positive feedbacks from respondents. There are 3-7 (23-53%) respondents that disagree and neither agrees nor disagrees about the schedules being sufficient enough to assist decision makers to make appropriate assessment of the major issues. Although it represents a small percentage in the overall perception of the respondents on the schedules, particular attention and improvement may be required on certain aspects of the schedules to rectify this perception.

Table 7.4d: Responding Organisation's Perception of the Guideline's Schedule A: Project Characteristics Schedule - Types, Categories and Assessment

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
a is sufficient to describe the essentials and nature of Project Characteristics		1	2	8	2	50	3.85
b is easy to understand			3	7	3	52	4.00
c is easy to fill in the relevant information needed in the schedule		1	2	8	2	50	3.85
d is sufficient enough to assist the assessment of Project Characteristics		2	5	5	1	44	3.38

Table 7.4e: Responding Organisation's Perception of the Guideline's Schedule B: Procurement Characteristics Schedule - List of Methods and Assessment

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
a is sufficient to describe the essentials and nature of Procurement Characteristics		1	2	10		48	3.69
b is easy to understand				12	1	53	4.08
c is easy to fill in the relevant information needed in the schedule		1	2	10		48	3.69
d is sufficient enough to assist the assessment of Procurement Characteristics		2	5	6		43	3.31

Table 7.4f: Responding Organisation's Perception of the Guideline's Schedule C: Specific Project Needs/Values to be adopted in Contract and Assessment Schedule

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
a is sufficient to describe the essentials of Specific Project Needs/Values to be adopted in Contract			3	9	1	50	3.85
b is easy to understand				12	1	53	4.08
c is easy to fill in the relevant information needed in the schedule		1	2	10		48	3.69
d is sufficient enough to assist the assessment of Specific Project Needs/Values to be adopted in Contract			4	9		48	3.69

Table 7.4g: Responding Organisation's Perception of the Guideline's Schedule D: Multi Cultural Complexities (MCC) Schedule - List of Types, Categories and Assessment

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
a is sufficient to describe the essentials and coverage of Multi Cultural Complexities for the project		1	3	8	1	48	3.69
b is easy to understand		1	1	10	1	53	4.08
c is easy to fill in the relevant information needed in the schedule		1	1	11		50	3.85
d is sufficient enough to assist the assessment of Multi Cultural Complexities for the project		1	5	7		45	3.46

Table 7.4h: Responding Organisation's Perception of the Guideline's Schedule E: Main Guideline Schedule for Procurement Strategies Assessment and Selection

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
a Is easy to understand				10	3	55	4.23
b Is easy to fill in the relevant information needed in the schedule		1	1	11		52	4.00
c Is sufficient to assist the assessment process on the Selection of Appropriate Procurement Strategies			3	10		49	3.77

Table 7.4j: Responding Organisation's Perception of the Guideline's Schedule F: Schedule for Selected Procurement Strategies and Further Action to be taken for a proposed oil and gas project

(Pts)	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)	Total Points	Average Points
a Is easy to understand		1		11	1	51	3.92
b Is easy to fill in the relevant information needed in the schedule		1	3	9		47	3.62
c Is useful during the management and monitoring of the procurement process			3	9	1	50	3.85

7.6 SUMMARY OF CHAPTER 7

The Guideline aimed to assist decision makers to select appropriate procurement strategies to be adopted in an oil and gas project. It was developed based upon the framework of research findings through various methodology, approaches and finally through an industry validation process. It was designed to be user friendly, easy to understand and could provide a useful tool for decision makers in the industry when making assessment on procurement strategies.

The different phases categorised in this Guideline are based on the Deming cycle management approach (plan-do-study/check-act). This theoretical management approach was found to be most suitable as it involves every aspect of managing a project as in this case the procurement strategy selection process from planning, analysing, implementation and monitoring. Six controlled steps are then incorporated into the Guideline to allow a well defined activities or tasks to be performed throughout the procurement process. Schedules are introduced to ease the compilation of data and help to achieve consistent and standard approach for the purpose of making assessments of major issues in the project which will then lead to the final decision making. These schedules could also be extended with the used of computer based analysis and assessment programmes in the future to enhance the usefulness of the Guideline to decision makers in the industry.

The industry validation exercise was important to gauge the perception of the Guideline in terms of its usability, functionality and purposes by players in the industry. The overall results from the

validation exercise were positively good and mostly in favour of the Guideline. The Guideline was generally accepted and perceived by respondents to be very useful, easy to use, easy to fill in the relevant information and most importantly will be able to assist company's decision makers in their selection process in search of the appropriate procurement strategy for a project. Majority of the respondents also agrees that the Guideline has managed to meet its aim and objectives. However, an extended research on the Guideline need to be conducted especially on suitable analysis and evaluation methods of elements in major issues which could further enhanced the usability and functionality of the Guideline to decision makers in companies of various types, sizes and specialisation within the industry. Further recommendations and major conclusion on the research in general and the Guideline in particular, will be addressed and discussed in the concluding chapters.

CHAPTER 8: DISCUSSIONS ON OVERALL RESULTS

8.1 INTRODUCTION

There are four key tasks being undertaken during the research study where each and every one had their own specific function and objectives. Initially, the research methodology (Chapter 2) set the agenda and direction for the coming chapters. During the framework/theoretical formulation phase, literature overview (Chapter 3) and preliminary interviews (Chapter 4) which involved qualitative evaluation, were conducted. On completion of this phase, results from these tasks were then used and tested in the empirical evaluation phase which involves quantitative (Questionnaire Survey as in Chapter 5) as well as qualitative (Case Studies as in Chapter 6) evaluations. The results mainly from these four key tasks were then incorporated and integrated into the final task of developing the proposed procurement strategy guideline on selection process (Chapter 7).

This chapter summarises and discusses the important results and significant findings from these tasks during the research study. This was to establish how each task was carried out and also to allow the assessment of each tasks and its contribution to the research study before the final conclusions were made in Chapter 9.

8.2 FINAL RESULTS AND DISCUSSIONS

8.2.1 Preliminary Interview

The preliminary interviews conducted with players in the industry had successfully identified and confirmed some of the current and critical issues in the industry as highlighted in the literature overview. These interviews were conducted during visits to conferences, seminars and workshops in the UK as described in Chapter 4. With respondents from various backgrounds and organisations, it had also provided the research study with a solid basis on key issues on procurement as perceived and currently practiced by players in the industry.

One important single findings that can be made from the interview was that although UKNS region was seen as a matured basin with gradual reduction in oil and gas production in the future, they can also be seen to provide other means of valuable resources which are knowledge, experience, forefront technology, safety leadership and supply chain experiences that can be utilized or may be applied in other regions. Most of the respondents in the interview seems to agree that the UKNS region have a strong support and assistance either from long established players in the industry or the respective governments through various industry initiatives in developing, improving as well as monitoring critical issues or even promoting the industry to other regions.

The industry especially in the UKNS region according to those being interviewed is currently faced with continuing problems of trying to apply and maintain cost

effectiveness on operational management. These problems according to them were caused by:

- the high cost of tendering and the high government taxes and tariffs on critical resources during exploration and production;
- the poor definition of the project by the client during tender; and
- the issues of multi cultural complexities not taken seriously by players which have led to disastrous projects and unnecessary expenditures.

It was also established during the interview that healthy and successful cooperation among players in the industry and between players and governments are desperately needed to expedite critical operational and management processes which have proven to be very costly. There were also strong suggestions from those being interviewed that there was the need to understand the critical elements of multi cultural complexities and the need to apply different approaches when working in different locality or region. Some respondents even voiced their concern over the poor understanding, definition and approach on these critical elements during the conceptual stage of the project especially on procurement strategies that can lead to volatility in the execution and final outcome of many projects in the industry. There was also a uniform agreement from the respondents about the need to develop an appropriate guideline or best practice model that could be aligned to specific project needs or values during the selection process of procurement strategies to be used by decision makers in companies across regions.

The preliminary interview provided the research study with the much needed feedback from across the industry including relevant information about current procurement practices and critical issues in the industry. This helped in the design of the case study approach as well as questionnaire survey questions.

8.2.2 Literature Overview

Continuous literature search and updating were conducted throughout the research study in view of keeping abreast with the latest development in the research study subject area and interest. During this process, a number of articles on specific issues which were closely related to the research study were presented and published in conferences and workshops in the UK and abroad. Feedbacks and comments on these articles during these presentations were taken on board in the research study wherever possible.

Throughout the literature search process and while searching for relevant articles for the construction of research papers, not many literatures were found and can be used particularly on procurement matters or issues in the oil and gas industry. There was certainly a gap found in the literature whereby little was mentioned or discussed on the procurement aspects of the industry compared to issues on technological or operational advancements or achievements. The only other options are to look into other industries practices and experience such as the construction industry as a guide or comparison when dealing with procurement matters. However direct application may not be appropriate or recommended as the oil and gas industry is unique and complex in nature compared to other industries.

One of the reason of this literature gap perhaps may be due to the fact that issues on procurement are regarded by most players in the industry to be commercially sensitive and exclusive to each individual company or organisation, therefore, discussing this issue in the open may be taken as giving away your company secrets to your competitor in this high risk and high gain business. The stiff competition and the small number of players in the industry may also be taken as the contributing factors towards this trend. Nevertheless, there have been calls made especially by industry initiatives that not enough effort was put through on the development of procurement approaches and strategies compared to other industries (by the number of written and documented literature on the subject and research conducted).

Throughout the literature search, there are many issues written about the economics of the technologically oriented industry but few on procurement. One of the prominent authors on procurement within the industry in the UK, Wright (1996), has identified key trends and factors in procurement that need to be addressed accordingly, particularly in the UK North Sea oil and gas industry. These include the increased contractors' risk, market polarisation, cultural changes, oil company specialisation, project timescales, technology and product-oriented solutions. In other regions such as Russia or Asia however, the influential factors are probably more regionalised and specific to that country or region but nonetheless will involve some elements of multi cultural complexity that players working in that region will have to content with. However, Luu, *et al.* (2003) mentioned in their findings that in order to face the challenges on procurement strategy in the industry, the critical factors that need to be appropriately

considered and addressed in a project are external parameters of the company/organisation, project risks, client's long and short-term objectives, client's involvement in risk allocation, client's characteristics, project physical characteristics and project complexity.

Generally, the literature overview presents and discussed current literature issues and challenges faced by the industry including elaborating on certain examples and case studies of oil and gas projects across the globe. Three critical issues on procurement were identified, addressed and also published which include conventional versus innovative procurement approach, current industry challenges on procurement and multi cultural complexities impact on procurement in the industry. These literature issues were later become the foundation of the research and put to the test in the empirical evaluation phase that includes case studies and questionnaire survey which were assessed and validated by major players in the industry.

8.2.3 Case Study

The case studies that were conducted in the UK and Malaysia have highlighted several issues on procurement apart from the different perceptions on procurement methods/strategies within the industry in the two countries and regions. While players in the UK are already looking into extending their business venture and knowledge to other regions, players in Malaysia are still trying their level best to cope with contractual issues of demanding local clients and changes in business and market trend. However, these case studies have also proven and reaffirmed the fact that understanding local issues are

just part and parcel of understanding the multi cultural complexities of a project relative to that country or region.

The case studies conducted in the UK have found that players in the industry need to respond and address the following issues:

- to introduce innovative procurement approaches and strategies to suit or in line with critical issues in the region as well as conforming to global business trends or demands;
- to identify and prioritised specific project needs/values in a contract and multi-cultural complexity issues that will have an impact on the successful implementation of procurement methods or process locally as well as in other regions; and
- to improve/adopt client/contractor relationship which is away from the adversarial style approach especially in project partnership or joint venture initiatives.

On the other hand, the case studies conducted in Malaysia have successfully disclosed certain local practices and procurement issues which may not be similar to other country or region. According to the case studies, having the government owned oil company as the biggest client in the country may have its share of disadvantages for players down the supply chain as far as procurement matters are concerned. The drawbacks will include the need to follow rigid/conventional governmental procurement practice and procedures; the difficulty in making claims and adjustments when unforeseeable changes or variation occurs during the contract and players have to content with the fixed price procurement

approach without having the provision in the contract for future price fluctuations. In conclusion, key issues that have surfaced during the case studies that need to be addressed by both the clients and players involved in the industry in Malaysia are the need:

- to improve current procurement methods/strategies practices by introducing innovative procurement methods/strategies not only to suit local practices and requirements but also to suit the changes in global market trends, challenges and demands as practiced by multi national companies;
- to identify and prioritised specific project needs/values to be adopted in procurement methods/strategies within the region and globally which include stakeholders' requirements, calculation of risks, clarity of contracts and flexibility of change to be able to get the best possible results and successful procurement process;
- to include and prioritised influential economic factors such as inflation and price fluctuation as well as multi-cultural complexity issues that will have a critical impact on the successful implementation of procurement methods or process;
- to adopt an approachable and teamwork style of client/contractor relationship in view of a long term and continuous business/project partnership or ventures; and
- to promote and contribute more actively towards research and development efforts within the local industry and across regions including the willingness to share knowledge and experiences.

Although known to be an effective method of obtaining data from players in the industry, case studies have its own limitations too. Whether the type of data required for the

research can be made available by responding organisations is one thing but whether they are allowed to disclose those data to a person outside the organisation is another. This was mainly due to strict company policy apart from procurement itself being a sensitive issue in its entity, especially when it involves stiff competitions from players within the industry and deals with the survival of the company.

Nonetheless, the case studies conducted in the UK and Malaysia have provided the major player's view and perception about procurement issues and challenges in two different countries and regions. The way they handled and addressed these issues were also highlighted in some of these cases including ways and means to improve current procurement practices. Innovative steps and approaches were also taken and introduced by a number of these players when dealing with certain issues that may also prove to be useful to other players.

8.2.4 Questionnaire Survey

This questionnaire survey exercise was chosen for the research study at the outset because it was identified as one of the best methods to gather primary, relevant and current data across the industry for the purpose of conducting empirical analysis to support and validate data obtained from preliminary interview, literature overview and case studies. Although the number of responding organisations in this survey could be questioned, what was more important was that their participation and experiences in this rather small but highly specialized industry including their participation and involvement

in most oil producing regions in the world could be considered as a strong justification for them to represent the general view of players within the industry.

Generally, results that were produced from the survey have shown that different type of responding organisations responded differently to the questionnaire according to the nature of their establishment, policy, practices, current and future business demand and environment. A procurement method or strategy that has been frequently used by a certain player who has been procured according to the survey, are not necessarily favoured or deemed to be suitable in practice by them especially when they are being procured. Major findings from this survey include:

- the frequency of use of a particular procurement method/strategy does not necessarily mean that they are suitable and meeting the needs and requirement of that particular player's organisation/company;
- there is a significant effect of upstream and downstream business relationships in procurement methods/strategies as shown in the results which need to be addressed separately and individually;
- the perception and prioritization of multi cultural complexity factors will most likely depends on the type, nature, size and location of responding organisations which certainly has a lot of influenced in their decision; and
- the results on the perception of the general procurement methods/strategies issues have shown that there were certainly a number of important issues that needs to be appropriately addressed by the industry.

In the end, although the task was completed, data were analysed and results were produced, questionnaire survey approach can be very time consuming. This approach can be quite demanding especially in this research study where the targeted respondents are small in numbers and difficult to reach, issues or questions asked may not be to their interest and getting back the questionnaires was an uphill task. However, the results from this task can be considered to be sufficient enough to bring the research study to the next level which was developing the procurement strategy Guideline on selection process.

Apart from incorporating data and findings from preliminary interviews, literature overview and case studies, the results and findings from this survey have been taken on board as the essential framework and key ingredients to the development of the procurement strategy Guideline on selection process in this research study.

8.2.5 Procurement Strategy Guideline on Selection Process

The main achievement of the research is to be able to develop a functional and usable guideline process to assist decision makers in the oil and gas industry in the selection of appropriate procurement strategy. However, constructing and developing a specialized guideline on a management process involves studying and choosing the appropriate fundamentals or underlying theory or theories to support it. A number of related theories were studied but the Deming cycle (Deming 1986) was found to be the most suitable approach for the guideline due to its simplicity, practicality and proven records. Other considerations and criteria that made this theory suitable as the structure of the guideline include the necessity to have not just the planning and execution aspects in the approach

but also monitoring, as the oil and gas industry has always been known to be subjected to volatility and sudden changes.

Among the important characters of the Guideline were the introduction of the six process steps and the use of schedules. Process steps are aimed at first time Guideline users to understand the selection process better and also to maintain a standardised approach. The use of schedules in the Guideline will enable users to have an overall and thorough view of the relevant data inputs in order to analyse and evaluate major issues and elements during the selection process. This Guideline schedules is also one step closer to the introduction of computer based procurement strategy analysis programme that can be developed further in future research.

The validation of the Guideline by industry's expert and practicing procurement managers have come to the conclusion that it was easy to understand and also easy to use. Almost all responding organisations agreed/strongly agree that it has met its objectives in assisting decision makers in the procurement strategy selection process. Although it may not yet ready to be introduced into the industry as an important tool for the procurement strategy decision making process, it has surely made its mark and recognised as a potentially useful Guideline for that purpose by expert and practitioners in the industry.

8.3 SUMMARY OF CHAPTER 8

Results in the preliminary interviews have shown that the industry is currently facing series of issues and problems in relation to cost effectiveness and operational management. Industry initiatives have done their part and duties to improve and assist players in the industry to look into these problems but this effort may not be enough. Established players may have to lend a hand to overcome these problems but they too are tied up with their own internal management and stakeholders needs to be seriously attending this matter. However, the preliminary interviews have provided the research study with important results which was used in the framework formulation and then tested during the empirical evaluations. These include issues on multi cultural complexities and regional influences on the type of procurement methods/strategies to be adopted in a project.

Literature search or overview of the industry was an attempt to look at current and critical issues that was published in order to justify the research framework and objectives while at the same time looking for gaps within the research area. Not many books or articles were published under the theme or topic of procurement strategies in the industry and thus it is why this research study holds the potential benefits and will make a useful contribution to the industry as a whole. Three important issues were narrowed down from a wide range of procurement issues in the industry which include looking into current and conventional procurement methods/strategies, developing a new procurement approach and the impact of multi cultural complexity on procurement strategies. These issues later

became the foundation and basis of the empirical evaluation through case study and questionnaire survey.

Case study was one of the qualitative research methods used in the research apart from the preliminary interviews conducted earlier. It serves to provide the research with in depth information and knowledge about the subject matter from a number of prominent players and organisations in the industry. At the same time, it allows certain issues to be validated and answered by these players where some of them were giving out solutions through their experiences to some of the current problems facing the industry or organisations. With the case studies being conducted in the UK and Malaysia, comparison and analysis can be made pertaining to local issues, practices and constraints between the two countries as well as oil producing regions. This was also aim to give the research a taste of multi cultural and globalisation on the issues of procurement and regional influences which has become one of the major issues addressed in the research.

Above all, the quantitative research method using questionnaire survey was the most challenging task that had to be performed in the research study. Designing and developing the questionnaire was not the issue but getting them back from responding organisations was tedious and tough. Nevertheless, results from the questionnaire survey have proven a number of important points with regards to the approach to procurement methods/strategies. It was discovered from the results that the suitability of one type of procurement method/strategies to one type of organisation may not necessarily suit another type of organisation. This finding together with the different type of procurement

relationships of either procuring or being procured, is bound to create a different and individual approach to procurement methods/strategies for different type of organisation. These two important points were then incorporated into the design and development of the procurement strategy Guideline to selection process. Other issue such as specific project needs/values to be adopted in the contract and multi cultural complexities were also addressed in the questionnaire survey with the intention to find out its relevance and significance in oil and gas projects.

The final stage of the research was spent developing the Guideline which was the fruit of labour in this research study. It started off from framework formulation achieved from preliminary interviews and literature to empirical evaluation before ending up developing the design and concept for the Guideline. Based on the Deming cycle (Deming 1986) management theory, the Guideline was developed using all the inputs from results and findings from the early phases of framework formulation to the empirical evaluations. Schedules were used to establish a standard and consistent format for the assessment and evaluation exercise in the selection process which also includes monitoring of project. Major issues and critical elements which were found to be important and relevant to the selection process were identified and highlighted in the Guideline. Finally, the Guideline was validated by the industry's experts and practitioners where it was accepted to be very useful and helpful to decision makers in the procurement strategy selection process.

CHAPTER 9: CONCLUSIONS, RECOMMENDATIONS AND FURTHER RESEARCH

9.1 INTRODUCTION

The aim of the research as elaborated in Chapter 1 was to improve the understanding of procurement strategies that need to be adopted by players in the oil and gas industry. This was done by identifying, formulating (as in Chapters 3 and 4), linking, evaluating (Chapters 5 and 6) and finally incorporating the procurement strategy framework into the development of the Guideline on selection process (Chapter 7) which will help to assist decision makers in the industry to use or adopt in their company or organisation. In order to achieve this aim, four research objectives were outlined which were:

1. to explore specific project needs or values to be adopted in contracts used by players *i.e.* clients and contractors and in the oil and gas industry;
2. to analyse the impact of multi cultural complexities on procurement process and strategies in the oil and gas industry;
3. to develop a procurement strategy guideline to selection process to be used or adopted by decision makers in the oil and gas industry; and
4. to assess the suitability and validity of the guideline selection process for the oil and gas industry across regions.

A research design was carried out, explained in Chapter 2, to meet the research aim and objectives. A hypothetico-deductive approach of research methodology was undertaken that would develop a theoretical framework from preliminary interviews and current

literature, then test and evaluate the framework through triangulated empirical research methods.

Literature issues on current procurement challenges within the industry in Chapter 3 led to the discovery of critical issues such as gaps in knowledge that confirmed the research aim. The overview of the oil and gas industry aimed to highlight the nature, complexity, key players and major oil producing countries which in one way or another could be of great influence to the area of research and topic. Further research was conducted through preliminary interviews as discussed in Chapter 4 with players across the industry pertaining to issues highlighted in the overview of the industry and literature overviews as in Chapters 3. The framework concept resulted from the findings of these tasks later became the foundation of further research and analysis through empirical evaluations i.e. questionnaire survey and case studies as described in Chapters 5 and 6 respectively.

Investigation in the questionnaire survey in Chapter 5 discovered that there were different perspectives from different type of players responded to the survey i.e. operators, contractors and suppliers in terms of suitability and frequency of use of procurement methods and strategies within the industry. Different procurement relationships which was either procuring or being procured had also made an impact on the results gathered from the questionnaire survey. Case studies conducted on key players in the UK and Malaysia has further confirmed these differences as discussed in Chapter 6. These case studies have also highlighted issues of regional interest between the UK and Malaysia in terms of multi cultural complexities where both countries are facing but then, they are

addressing different key issues. Specific project needs or values in both countries are found to be relative to local needs, industry requirements and local practices.

Chapter 7 was the melting pot where all the ingredients from previous chapters are mixed together to create an integrated Guideline to the procurement strategy selection process comprising major issues and key elements found during the research process. This Guideline was developed to assist decision makers in the industry when conducting the selection process for appropriate procurement strategies for a project either when they are procuring or to be procured. This Guideline has also been validated by expert and practitioners in the industry to test its framework, usage, practicality and functionality within their respective organisations as well as in the industry.

Final results from the research are discussed in Chapter 8 where all major tasks in the research are being reviewed and their results discussed. This was done before the final conclusions are made in this chapter which also includes recommendations for the industry and suggestions for further work in the research area.

9.2 MAIN CONCLUSIONS

The main achievement of the research was the completion of the Procurement Strategy Guideline on Selection Process (Guideline) which was designed and structured to assist decision makers in the industry in their procurement method/strategy selection process.

This Guideline will provide all the necessary steps and ingredients for the next course of action in a procurement selection process which include:

- the selection of a suitable contractor/supplier/manufacturer using a particular/chosen procurement method and appropriate strategy in the case of procuring/ to procure; or
- whether a company has what it takes to bid for a tender based on the analysis and assessment in the Guideline including adopting a particular/chosen procurement method and appropriate strategies in the case of being procured/ to be procured.

Since the scope of research study was limited only to the development of a Guideline on the selection process, suggestions or recommendations for the suitable type of analysis and assessment methods for the selection process could not be made and included in the Guideline. What was also excluded in the research study and the Guideline was how to assess and link company type, resources, specialisation, stakeholders as well as company's external resources to the appropriate procurement strategies for a project. At the moment, this will be left much to the decision makers in their respective companies to ascertain and decide. Nonetheless, the research study has provided an excellent platform to launch further research into these areas in the future.

One of the important underlying principles of the Guideline apart from planning and implementation is monitoring. More often than not, this aspect was not given the right attention by decision makers during the procurement strategy selection process. What was more important to them was the decision on what to implement and how, rather than what to implement, how, where and what will happen along the way (monitoring). The

Deming cycle (Deming 1986) has provided this and combined with the issues on multi cultural complexities, the Guideline has managed to look into most of the important and critical aspects of the procurement strategy selection process.

The Guideline was also designed and developed based on the process of framework formulation through findings from literature and industry interviews on the subject matter. Among the issues that were looked into during this stage are current issues and problems in the industry. This includes addressing the issues and problems in the industry itself and also on procurement matters. Through the empirical evaluations conducted in the research, it was found out that both issues are very much linked and affecting each other during the procurement strategy selection process.

In the process of developing the Guideline, a number of key and related issues were addressed, highlighted, tested and validated by experts and practitioners in the industry. The conclusion drawn from these issues in the research can be summarised in the following points that will be discussed as separate subsections:

- current issues and problems in the industry;
- gaps in knowledge and research on procurement in the industry;
- procurement methods;
- procurement strategy;
- specific project needs/values to be adopted in contract;
- impact of multi cultural complexity on procurement; and
- suitability and validity of procurement strategy Guideline on selection process.

9.2.1 Current Issues and Problems in the Industry

In conclusion, the industry is currently trying very hard to address the following issues and problems:

- the volatility of the oil and gas prices, high oil and gas demands, depletion issues facing certain regions and the crisis in one of the largest oil and gas exporter Iraq. All these issues have inevitably given some form of impact to the business and market trend of the oil and gas commodities and subsequently to all the operating systems related to oil and gas exploration and production;
- the reduced yearly production caused by the gradual oil and gas depletion from the UK Continental Shelf has created another problem to the industry in the UK. New technology to be used in the deeper waters was introduced but still this will add more to the high cost of current methods of getting oil from the grown below the seabed; and
- Some players in the industry in Malaysia are already looking to emulate their UK counterpart when venturing into other oil producing countries or regions. This is where the awareness, understanding and appreciation of multi cultural complexities is critically important in order to successfully carry out the long term, high capital and operating costs of the project in unfamiliar countries or regions.

9.2.2 Gaps in Knowledge and Research on Procurement in the Industry

Among the conclusions that can be derived from this aspects of the research are:

- procurement is no longer a "soft issue" in the industry, considering the fact that it has now become focal point of discussion between players and decision makers in the

business or companies in this competitive industry. However, because of this situation and the stiff competition between players in the small industry, sharing and comparing commercially confidential data, information or strategies on procurement matters was strictly a no go situation; and

- since not many articles were written or research being conducted and published about procurement as found in the literature search during the research study, this research is quite timely and because it was impartial in its contents and presentation, it is hope that it will be able to fill in the gap on literature issues in procurement and to be well considered and accepted by players within the industry.

9.2.3 Procurement Methods

The issue of procurement methods in the oil and gas industry has become one of the key issues that were highlighted in the research study. Comparison and analysis between conventional and innovative procurement methods have found that:

- external factors such changing business and marketing trend, technology, competition, changing values and multi cultural complexities need to be appropriately addressed in the selection of procurement methods;
- although they were able to understand and appreciate the much needed change in their procurement methods approach, the reluctance of major clients and large organisations to utilize and adopt to new approaches has short-lived this change; and
- having the in depth knowledge and experience about the conventional procurement methods have also given these clients and organisations the upper hand and advantage

over the down line participants in the supply chain. That is why procurement methods in the industry remain much the same for the past three decades.

9.2.4 Procurement Strategies

In conclusion, there are many contributing factors that players in the industry should be prepared to look into new and innovative procurement strategies under current and future conditions includes:

- the changes and volatility of the oil price, current business trends, the type of clients, issues on oil and gas depletion are to name but a few good examples why conventional approaches may not be suitable. Partnering enhancement, production sharing initiatives, incentives and supply chain management have proven to be a win-win situation to all participants in an oil and gas contract; and
- the many aspects of cross regional and globalised project requirements that needs to be incorporated in the procurement strategies such as multi cultural complexities, specific project needs or values to be adopted in contract and the type of clients as far as procurement relationships of procuring or to be procured is concerned as proven in this research study.

9.2.5 Specific Project Needs/Values to be adopted in Contract

The uniqueness of the nature of the oil and gas industry is that it involves a multi disciplines and specialisation in almost all aspects and levels of its operations. In conclusion:

- project needs and values may arise from various reasons such as to meet the performance of the projects in terms of completion time, tender cost, quality and effectiveness; business values in terms of profitability, sustainability, competitiveness and price fluctuations; and to meet the values of goodwill and long-term relationships;
- the factors of risk, resources, technology used, business achievements and the overall management of the project could certainly give effect to the success and failure of a project;
- specific project needs/values to be adopted in contract may also very much rely on the project's location, duration, climatic influences, type of client, local practices, statutory regulations and the availability of resources; and
- cooperation and the development of training programmes for local apprentices have also been known to be included in the contract especially in developing countries.

9.2.6 Impact of Multi Cultural Complexity on Procurement

The conclusions that can be drawn from the multi cultural complexities issues are:

- the effects of the high oil and gas prices with the sudden high demand by China and the US together with the crisis in the oil producing and exporter countries in the Middle East have shown that the industry can be very multi culturally complicated and inter-linked;
- through the globalisation of the industry almost ever since oil was discovered in different parts and regions of the world, many players in the industry has gone

through the process of learning the important knowledge and experiences of multi cultural complexity factors in various oil producing countries;

- many players had also been exposed and subjected to changes in these critical external factors which could make or break their expensive ventures. These vital changes could be caused by business issues such as trading agreements, paymaster and capital risk; project issues such as climatic influence, location, timescale and expertise; and local issues such as work culture, bureaucracy, local content and practice; and
- the internal factors including the type, structure and cultural aspects of a company or organisation would certainly have an impact on the type of procurement methods/strategies to be used in a project.

9.2.7. Suitability and Validity of Procurement Strategy Guideline on Selection Process

The basis for the Guideline was founded on theoretical framework formulation, which was developed from preliminary interviews and literature search. These theoretical frameworks were later analysed through empirical evaluations through qualitative and quantitative research methods. The Guideline, which aimed to assist decision makers in the industry on the selection process of an appropriate procurement strategy, was then design, produced and validated by experts and practitioners in the industry. Based on the validation exercise conducted, it can be concluded that:

- the Guideline was found to be suitable, practical as well as meeting its objectives and purposes;

- the Guideline has its own limitations. This limitation was regarding to the completeness of the Guideline in terms of providing suitable analysis and assessment methods for the major issues and its elements to ease and expedite the evaluation process by decision makers towards achieving the final decision on the appropriate procurement strategies; and
- there is the need to extend the Guideline further by incorporating computer based application together with a study on the analysis and assessment methods. However, as explain earlier in Chapter 7, due to time and resource constraints, this could not be undertaken in this research study but recommended further in future research.

9.3 RECOMMENDATIONS FOR THE INDUSTRY

As a result of this research and its conclusions, the following recommendations are made for the industry and practice. These recommendations are categorised into three main subjects which are procurement methods, procurement strategy and procurement strategy guideline on selection process.

9.3.1 Procurement Methods

Among the recommendations on procurement methods for the industry are as follows.

- Prominent players or industry initiatives should lead the research to conduct an in-depth study on current procurement methods used by the industry. This is to investigate whether current methods used are still suitable, reliable or meeting the

current situation on business/market trends, type of companies that were using it and procurement relationships (procured or being procured).

- The supply chain of client/contractor/supplier relationships need to be improved in the procurement process to achieve better working environment, partnership and sustainability to all parties involved in a project. Conventional procurement methods that adopt adversarial values should be change or at least improved.

9.3.2 Procurement Strategies

These are some recommendations for the industry based upon the findings throughout the research study.

- Procurement strategies to be adopted by players in the industry should be based upon the type of procurement relationships, i.e. procuring or being procured. This is to allow all players in the supply chain to adopt the most suitable strategies under different procurement relationships or circumstances.
- Procurement strategies to be adopted should create a win-win situation to all parties involved. Partnering and incentive schemes should be encouraged in the industry while cooperation between foreign and local companies needs to be enhanced and improved.

9.3.3 Procurement Strategy Guideline on Selection Process

During the development and validation of the Guideline, it was found that further considerations, inclusions and due care by decision makers may be needed to improve

and enhance the Guideline in terms of its usability and flexibility. Here are a few recommendations.

- Based on the industry's validation, this Guideline was found to be suitable as a basis for decision making on the selection of an appropriate procurement strategy. However, it is recommended that decision makers should consider assessing and linking their company's type, resources, stakeholders and capabilities in the analysis and assessment during the selection process.
- This Guideline should also be used by different type of companies in accordance to the appropriate procurement relationships i.e. procuring or being procured. Suitability and preferences may differ from one company to another and thus, care needs to be exercised when using this Guideline.
- There is a high possibility that the Guideline may also be adopted and applied to other industries as well. Therefore, it is recommended that comparison be made with other industries such as the construction, aerospace and defence to see what can be learnt form these industries and vice versa on procurement strategies.
- Cross regional data on this Guideline must also be compared and analysed from time to time by industry players to ascertain its suitability and compatibility within the industry in different parts of the world.

9.4 RECOMMENDED FURTHER RESEARCH

Based on this research and the conclusions previously discussed, future research is also recommended on three core issues as follows.

9.4.1 Innovative Procurement Methods

The issue on procurement methods has long been discussed and scrutinised by the industry's players but so far, changes in its approach were not so much visible. The traditional or conventional procurement methods are still very much in used, although in some cases it ended up in failure if not serious problems. Therefore, to overcome or at least to reduce that, here are a few suggestions for the industry.

- Detailed case study research on players in the industry needs to be conducted on the effectiveness of conventional procurement methods against current economic/business trends/environment, type of organisation, stakeholders' needs, local/regional influence, impact of globalisation and multi cultural complexities.
- Further research and development for a separate guideline on the selection process for the appropriate procurement methods for the industry can be very useful to the industry's players.
- Research study on innovative procurement methods for the industry as practiced and experience by players in the industry should be conducted including making comparison and looking into other industries experiences.

9.4.2 Improving Procurement Strategies

Procurement strategies are dynamic in nature and hence, it will change in accordance to the changes in its influential factors and different environments. This research on procurement strategies that has been conducted may be good for the next five years but even so, nothing much can be guaranteed even before that period. It was therefore

suggested that a number of steps need to be taken to ensure that procurement strategies to be adopted are suitable and in line with current situations.

- Research study on innovative procurement strategies for the industry as practiced and experience by players in the industry needs to conducted and continuously monitored including making comparison and looking into other industries experiences.
- Further research and detailed case study with players in the industry on their experiences on improving current procurement strategies and what lessons that can be learnt to enhance it.
- Continuous regional and local inputs across the industry on how to perform and improve procurement strategies need to be studied and incorporated into the Guideline.

9.4.3 Using Computer-based Analysis for Procurement Strategy Guideline on Selection Process

The developed Guideline only serves to provide decision makers with the appropriate approach and necessary inputs required during the procurement strategy selection process. It utilizes specially design schedules and standard elements identified in the research to assist decision makers in the selection process. Currently, this will be done manually and can also be quite tedious and time consuming. Time is what not many decision makers in a busy company have these days especially with the tight project schedules, complexity and nature of the industry. Therefore, to further enhance the usefulness and practicality of Guideline, it was suggested that the following actions should be undertaken.

- The basic structure, approach, content and elements of the Guideline have provided an excellent platform to develop the Guideline's analysis and assessment method using a computer-based programme/software.
- Further research on the ways to make the Guideline even more users friendly and practical in assisting decision makers making better and faster decisions which may include using company's Local Area Network (LAN) facilities to link and acquire inputs from relevant departments within the company/organisation.
- Whatever computer based system chosen, it must be able to link into the company/organisation management and resource profile throughout the entire organisation to allow better analysis and assessment based on the real and current company's resources and situation; against project and procurement characteristics need; and meeting multi cultural complexity issues.
- Whatever computer based system chosen, it must also be able to be used to analyse and assess appropriate procurement methods when procuring.
- Finally, an efficient reporting and monitoring system in the form of software support tool is needed for the Guideline to be implemented efficiently.

The objective of the support tool is to provide an automated mechanism to aid in the analysis and assessment of the procurement strategy selection process mentioned above and to provide decision makers with the necessary information for better and faster decision-making. The function of such as a tool could be: to store relevant data that relates to project characteristics, procurement characteristics, specific project needs/values to be adopted in contract and multi cultural complexities issues; and the

availability of company's current and future resources and capabilities in an informative manner for decision makers. Suitable reports need to be developed that include a signaling mechanism to highlight the current project situation, performance and perhaps cash flow throughout the company to allow immediate actions to be made by respective departments within the company. These reports also need to track relevant trends and provide an informative picture on the latest development in the project as well as in the company. Given the objective and functions of the software support tool, it appears that the most appropriate automation method would be via a database management system (DBMS).

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APPENDIX A1: SURVEY OF OIL AND GAS INDUSTRY'S PERCEPTION OF PROCUREMENT METHODS/STRATEGIES (SAMPLE QUESTIONNAIRE)

Loughborough University

Department of Civil and Building Engineering
Loughborough University
Leicestershire LE11 3TU
UNITED KINGDOM

SURVEY OF OIL & GAS INDUSTRY'S PERCEPTIONS OF PROCUREMENT METHODS/STRATEGIES

GENERAL INSTRUCTIONS AND INFORMATION

1. All individual responses to this questionnaire will be kept STRICTLY CONFIDENTIAL.

2. Based on your experience, please give your honest impressions and to the best of your knowledge on procurement methods/strategies in the oil and gas industry.

3. If you think you are not the right person to answer the questionnaire, please pass it to somebody with experience in procurement or other person whom you think might be knowledgeable to answer it.

4. If you wish to make any comment, please feel free to use the space provided at the back cover of the questionnaire.

5. Please return the completed questionnaire in the enclosed self-addressed, stamped envelope at your earliest possible convenience.

6. If you would like to receive the Summary of Results of this survey, please write down your e-mail address below or enclose a business call card.

   Your E-mail address : _____

*** THANK YOU FOR YOUR PARTICIPATION ***

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SECTION A: ORGANIZATION/COMPANY PROFILE

This section is about your organization/company. Please be as specific as possible in order to allow the researcher to relate the specific company profile to specific issues or problems.

Please insert X where appropriate

1. Organization/company **type** or best described

	Government		Operator		Servicing
	Consultant		Contractor		Other (Please specify)

2. Organization/company's **participation by region**

	UKCS		Middle East		Far East
	North America		Africa		Other (Please specify)

3. Responses to this questionnaire is **based on experiences** on the following regions

	UKCS		Middle East		Far East
	North America		Africa		Other (Please specify)

4. Your current position in the organization/company

	Technical		Director
	Management		Other (Please specify)

5. Number of years the organization/company has been **established** in the oil and gas industry.

Please state: ___ years

SECTION B: PROCUREMENT METHODS

This section relates to procurement methods that you and your organization/company deal with. Procurement methods in its broadest definition and context to the oil and gas industry, is an approach required to acquire the design, material, labour, services, installation and commissioning inputs for a successful completion of a project. As a player in the industry, usually you are either:

1. **BEING PROCURED**, as in the case of a **contractor** being procured by the client or a **sub-contractor/supplier** being procured by the contractor or a **supplier** being procured by the subcontractor (**UPSTREAM relationship**); or

2. **TO PROCURE**, as in the case of a **client** to procure a contractor or a **contractor** to procure a sub-contractor/supplier or a **subcontractor** to procure a supplier in a project. (**DOWNSTREAM relationship**).

6. How **OFTEN** has your organization been **involved** in any of these for the **past 3 years**?

Please insert X where appropriate

a. In **UPSTREAM relationships (BEING PROCURED**

	Never	Seldom	Often	Frequently	Always
Percentage (%) of Use	0	1 -33	34 - 66	67 - 99	100
Lump sum					
Cost plus					
EPCC/Design and build					
Partnering/Alliancing/Joint Venture					
Supply chain management					
Incentive schemes					
Leasing					
Contract to produce					
Other (please specify)					

b. In **DOWNSTREAM relationships (TO PROCURE**)

	Never	Seldom	Often	Frequently	Always
Percentage (%) of Use	0	1 -33	34 - 66	67 - 99	100
Lump sum					
Cost plus					
EPCC/Design and build					
Partnering/Alliancing/Joint Venture					
Supply chain management					
Incentive schemes					
Leasing					
Contract to produce					
Other (please specify)					

7. As far as **procurement methods** (either ***upstream or downstream***) are concerned, have there been any **noticeable trends** over the **past 3 years**? Please state and describe.

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8. In general, who **decides** the **type of procurement method to be used**? Please state.

a. In **UPSTREAM relationships (BEING PROCURED)**: .....

b. In **DOWNSTREAM relationships (TO PROCURE)** : .....

9. Please **RATE** in terms of **SUITABILITY** the following types of **procurement methods,** as experienced by your organization/company.

Please insert X where appropriate

a. In **UPSTREAM relationships (BEING PROCURED)**

	Not suitable	Least suitable	Suitable	Very suitable	Most suitable
RATINGS	0	1	2	3	4
Lump sum					
Cost plus					
EPCC/Design and build					
Partnering/Alliancing/Joint venture					
Supply chain management					
Incentive schemes					
Leasing					
Contract to produce					
Others (please specify)					

b. In **DOWNSTREAM relationships (TO PROCURE)**

	Not suitable	Least suitable	Suitable	Very suitable	Most suitable
RATINGS	0	1	2	3	4
Lump sum					
Cost plus					
EPCC/Design and build					
Partnering/Alliancing/Joint venture					
Supply chain management					
Incentive schemes					
Leasing					
Contract to produce					
Others (please specify)					

10. In **UPSTREAM relationships (BEING PROCURED)**, please identify and describe:

a. Three **(3)** main **root causes** of **problems** in the **procurement methods used,** faced by your organization/company for the **past 3 years**.

.....

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b. Three **(3)** possible **solutions/ways** how **procurement problems** could be improved.

.....

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11. In **DOWNSTREAM relationships (TO PROCURE)**, please identify and describe:

a. Three **(3)** main **root causes** of **problems** in the **procurement methods used,** faced by your organization/company for the **past 3 years**.

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b. Three **(3)** possible **solutions/ways** how **procurement problems** could be improved.

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SECTION C: PROCUREMENT STRATEGIES

This section particularly covers your organization/company approach to procurement strategies and for what reason. Procurement strategies is broadly defined as new approaches to acquire the design, material, labour, services, installation and commissioning inputs for a successful completion of a project which links to the business plan of an organization/company. This is to maintain a sustainable position for that organization/company within the total chain of the industry, which determines the success or survival of that organization/company.

12. How **OFTEN** has your organization/company **adopted** any of these **procurement strategies** over the past **3 years**?

Please insert X where appropriate

a. In **UPSTREAM relationships (BEING PROCURED)**

	Never	Seldom	Often	Frequently	Always
Percentage (%) of Use	0	1 -33	34 - 66	67 - 99	100
Cooperation rather than competition					
Effective supply chain management					
Partnering/alliancing enhancement					
Cost effectiveness on operational management					
Effective incentive schemes					
Whole Life Cycle costing					
Other industry lessons and experiences					
Cultural, geography and climate factors					
Others (please specify)					

b. In **DOWNSTREAM relationships (TO PROCURE)** **Please insert X where appropriate**

	Never	Seldom	Often	Frequently	Always
Percentage (%) of Use	0	1 -33	34 - 66	67 - 99	100
Cooperation rather than competition					
Effective supply chain management					
Partnering/alliancing enhancement					
Cost effectiveness on operational management					
Effective incentive schemes					
Whole Life Cycle costing					
Other industry lessons and experiences					
Cultural, geography and climate factors					
Other (please specify)					

13. Please **RATE** in terms of **SUITABILITY** the following types of **procurement strategies**, as experienced by your organization/company.

a. In **UPSTREAM relationships (BEING PROCURED)**

	Not suitable	Least suitable	Suitable	Very suitable	Most suitable
RATINGS	0	1	2	3	4
Cooperation rather than competition					
Effective supply chain management					
Partnering/alliancing enhancement					
Cost effectiveness on operational management					
Effective incentive schemes					
Whole Life Cycle costing					
Other industry/sector lessons and experiences					
Cultural, geographical and climate factors					
Other (please specify)					

b. In **DOWNSTREAM relationships (TO PROCURE)**

	Not suitable	Least suitable	Suitable	Very suitable	Most suitable
RATINGS	0	1	2	3	4
Cooperation rather than competition					
Effective supply chain management					
Partnering/alliancing enhancement					
Cost effectiveness on operational management					
Effective incentive schemes					
Whole Life Cycle costing					
Other industry/sector lessons and experiences					
Cultural, geographical and climate factors					
Other (please specify)					

14. Please **RATE** factors that will **influence your organization/company's decision** on which **procurement strategies** to be adopted according to their **IMPORTANCE/PRIORITIES.**
Please insert X where appropriate

	Not important	Least important	Important	Very important	Most important
RATINGS	0	1	2	3	4
Price of oil and gas					
Business/market environment					
Tax regime/tariffs/duties					
Paymaster (Client)					
Stakeholders/shareholders					
Capital exposure/risk					
Sustainability					
Incentives schemes					
Project timescale					
Cultural, geographical and climate difference/changes					
Technological					
Complexity of project					
Manpower/labour					
Company's specialization					
Company's vision and objectives					
Maturity of basin					
Reservoir size					
Infrastructure position/existence					
Transport route/access					
Government legislation					
Political risk					
Goodwill/good image/reputation					
Comfortable/experience with certain procurement method					
Other (please specify)					

SECTION D: GENERAL

This section aims to ascertain your perception of procurement methods/strategies within the industry. **Please insert X where appropriate**

15. In your opinion, do you **agree** that **procurement methods/strategies** for the oil and gas industry are **currently**:

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a.	Influenced and dictated by those **being procured more than** those **doing the procurement** ?					
b.	influenced and dictated by a **number of players**, that is project initiators **(operators)** and implementers **(contractors)**?					
c.	dictated by **senior managers and directors** of organization/company based on their experiences and preferences instead of **seeking advices** from consultants?					
d.	influenced by **external issues** more than organization/company's **internal set up and objectives**?					

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
e.	**outdated** and have made **little development** to move away from traditional into a more innovative approaches **compared** to the technological, economics or other strategic advancement in the industry?					
f	**not so pronounced** with regards to issues and problems because there is a need to **maintain good image, reputation and goodwill** amongst players in the industry to ensure sustainability and survival?					

16. Are you willing to provide **CASE STUDIES** of recent **SUCCESSES of traditional/innovative procurement methods/strategies** and **examples**, as experienced by your organization/company?

No	Yes

Thank you for taking the time to complete this questionnaire. Your assistance in providing this information is very much appreciated. If there is anything else you would like to tell us about this survey or other comments you wish to make that you think may helps us in our research, please do so in the space provided below.

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Please return your completed questionnaire through e-mail to:
M.F.Mohammad@lboro.ac.uk

Fadhil Mohammad
Researcher
Department of Civil and Building Engineering
Loughborough University
Leicestershire LE11 3TU, UK.

THANK YOU FOR YOUR PARTICIPATION

APPENDIX A2: DETAILED QUESTIONNAIRE SURVEY RESULTS

Tables A2.1.1a – A2.1.1h and Tables A2.1.2a –A2.1.2h

Tables A2.2.1a – A2.2.1h and Tables A2.2.2a –A2.2.2h

Tables A2.3.1a – A2.3.1h and Tables A2.3.2a –A2.3.2h

Tables A2.4.1a – A2.4.1h and Tables A2.4.2a –A2.4.2h

Tables A2.5.1a – A2.5.1z

DETAILED QUESTIONNAIRE SURVEY RESULTS

6.6.2 Frequency of Responding Organisations Involvement in the Type of Procurement Methods for the past 3 years

6.6.2.1 Upstream Relationships

Table A2.1.1a: Frequency of use of the Lump Sum method in upstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant					1		4	4.0
Other					1		4	4.0
Contractor			2	1	4	1	28	3.5
Manufacturer				1			3	3.0
Servicing		1	3	1	2		18	2.6
Operator			1	1			5	2.5

Table A2.1.1b: Frequency of use of the Cost Plus method in upstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Operator			1	1			5	2.5
Contractor			5	3			19	2.4
Consultant			1				2	2.0
Servicing		3	3	1			12	1.7
Manufacturer		1					1	1.0
Other		1					1	1.0

Table A2.1.1c: Frequency of use of the EPCC/Design and Build method in upstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant					1		4	4.0
Other					1		4	4.0
Operator				1	1		7	3.5
Contractor			3	2	3		24	3.0
Servicing		3	1	2			11	1.6
Manufacturer		1					1	1.0

Table A2.1.1d: Frequency of use of the Partnering/Alliancing/Joint Venture method in upstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant				1			3	3.0
Other				1			3	3.0
Contractor			4	3	1		21	2.6
Operator			1	1			5	2.5
Servicing		3	2	2			13	1.9
Manufacturer		1					1	1.0

Table A2.1.1e: Frequency of use of the Supply Chain Management method in upstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant						1	5	5.0
Contractor		1	4	2			15	1.9
Servicing		3	2	1			12	1.7
Operator		1	1				3	1.5
Manufacturer		1					1	1.0
Other		1					1	1.0

Table A2.1.1f: Frequency of use of the Incentive Schemes method in upstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Operator		2					2	1.5
Contractor		1	4	3			18	2.3
Consultant			1				2	2.0
Servicing		5	2				9	1.3
Manufacturer		1					1	1.0
Other		1					1	1.0

Table A2.1.1g: Frequency of use of the Leasing method in upstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Operator		1	1				3	1.5
Servicing		5	1	1			10	1.4
Contractor		6	2				8	1.0
Consultant		1					1	1.0
Manufacturer		1					1	1.0
Other		1					1	1.0

Table A2.1.1h: Frequency of use of the Contract to Produce method in upstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Contractor		7	1				9	1.1
Servicing		6	1				8	1.1
Operator		2					2	1.0
Consultant		1					1	1.0
Manufacturer		1					1	1.0
Other		1					1	1.0

6.6.2.2 Downstream Relationships

Table A2.1.2a: Frequency of use of the Lump Sum method in downstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant					1		4	4.0
Manufacturer					1		4	4.0
Other					1		4	4.0
Government					1		4	4.0
Servicing			1	2	3	1	25	3.6
Contractor			1	2	5		28	3.5
Operator			1	1			5	2.5

Table A2.1.2b: Frequency of use of the Cost Plus method in downstream relationships

	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
(Pts)							
Operator		1	1			5	2.5
Servicing	2	2	3			15	2.1
Consultant		1				2	2.0
Manufacturer		1				2	2.0
Government		1				2	2.0
Contractor	2	4	2			16	2.0
Other	1					1	1.0

Table A2.1.2c: Frequency of use of the EPCC/Design and Build method in downstream relationships

	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
(Pts)							
Government				1		4	4.0
Operator		1		1		6	3.0
Other			1			3	3.0
Consultant			1			3	3.0
Contractor		6	2			18	2.3
Servicing	1	2	4			15	2.1
Manufacturer	1					1	1.0

Table A2.1.2d: Frequency of use of the Partnering/Alliancing/Joint Venture method in downstream relationships

	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
(Pts)							
Government			1			3	3.0
Consultant			1			3	3.0
Other			1			3	3.0
Contractor	1	5	2			17	2.1
Operator		2				4	2.0
Servicing	3	2	1			10	1.4
Manufacturer	1					1	1.0

Table A2.1.2e: Frequency of use of the Supply Chain Management method in downstream relationships

(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant					1	5	5.0
Government			1			3	3.0
Contractor	1	1	3	3		24	3.0
Servicing	1	2	4			15	2.1
Operator	1	1				3	1.5
Manufacturer	1					1	1.0
Other	1					1	1.0

Table A2.1.2f: Frequency of use of the Incentive Schemes method in downstream relationships

(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant			1			3	3.0
Government		1				2	2.0
Operator		2				4	2.0
Contractor	2	4	2			16	2.0
Servicing	2	3	2			14	2.0
Manufacturer	1					1	1.0
Other	1					1	1.0

Table A2.1.2g: Frequency of use of the Leasing method in downstream relationships

(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Servicing	1	5	1			14	2.0
Consultant		1				2	2.0
Government		1				2	2.0
Contractor	3	4	1			14	1.8
Operator	1	1				3	1.5
Manufacturer	1					1	1.0
Other	1					1	1.0

Table A2.1.2h: Frequency of use of the Contract to Produce method in downstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Contractor		2	3	2	1		18	2.3
Consultant			1				2	2.0
Government			1				2	2.0
Servicing		3	2	2			13	1.9
Operator		2					2	1.0
Manufacturer		1					1	1.0
Other		1					1	1.0

6.6.3 Responding Organisations Ranking on the Suitability of Procurement Methods

6.6.3.1 Upstream Relationships

Table A2.2.1a: Suitability of the Lump Sum method in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Other						1	5	5.0
Manufacturer					1		4	4.0
Servicing			1	2	3	1	25	3.6
Consultant				1			3	3.0
Operator				2			6	3.0
Contractor			3	3	1	1	21	2.6

Table A2.2.1b: Suitability of the Cost Plus method in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Other						1	5	5.0
Consultant					1		4	4.0
Contractor				3	4	1	30	3.8
Servicing			1	3	3		23	3.3
Operator				2			6	3.0
Manufacturer			1				2	2.0

Table A2.2.1c: Suitability of the EPCC/Design and Build method in upstream relationships

(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Other					1	5	5.0
Operator				1	1	9	4.5
Contractor			5	2	1	28	3.5
Servicing		1	3	2	1	24	3.4
Consultant			1			3	3.0
Manufacturer		1				2	2.0

Table A2.2.1d: Suitability of the Partnering/Alliancing/Joint Venture method in upstream relationships

(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Other					1	5	5.0
Consultant				1		4	4.0
Manufacturer				1		4	4.0
Operator			1	1		7	3.5
Servicing		2	2	3		22	3.1
Contractor			2	4	2	32	3.0

Table A2.2.1e: Suitability of the Supply Chain Management method in upstream relationships

(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Manufacturer				1		4	4.0
Servicing		2	3	2		21	3.0
Consultant			1			3	3.0
Other			1			3	3.0
Contractor	1	1	4	2		23	2.8
Operator		1	1			5	2.5

Table A2.2.1f: Suitability of the Incentive Schemes method in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Consultant					1		4	4.0
Servicing				2	4	1	27	3.8
Contractor			1	4	3		26	3.3
Manufacturer				1			3	3.0
Other				1			3	3.0
Operator			1	1			5	2.5

Table A2.2.1g: Suitability of the Leasing method in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Servicing		1	2	2	2		19	2.7
Contractor		2	2	3	1		19	2.4
Operator			2				4	2.0
Consultant			1				2	2.0
Manufacturer			1				2	2.0
Other		1					1	1.0

Table A2.2.1h: Suitability of the Contract to Produce method in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Operator				1	1		7	3.5
Manufacturer				1			3	3.0
Contractor		1	3	3	1		20	2.5
Servicing		1	3	2	1		17	2.4
Consultant			1				2	2.0
Other		1					1	1.0

6.6.3.2 Downstream Relationships

Table A2.2.2a: Suitability of the Lump Sum method in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Other						1	5	5.0
Contractor				2	3	3	33	4.1
Consultant					1		4	4.0
Operator					2		8	4.0
Servicing			1	2	3	1	25	3.6
Manufacturer				1			3	3.0
Government				1			3	3.0

Table A2.2.2b: Suitability of the Cost Plus method in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Operator				1	1		7	3.5
Contractor			1	5	2		25	3.2
Consultant				1			3	3.0
Manufacturer				1			3	3.0
Government				1			3	3.0
Servicing			3	2	1		16	2.7
Other		1					1	1.0

Table A2.2.2c: Suitability of the EPCC/Design and Build method in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Operator					2		8	4.0
Other						1		4.0
Contractor				5	3		27	3.4
Servicing			1	3	3		23	3.3
Consultant				1				3.0
Manufacturer				1				3.0
Government				1				3.0

Table A2.2.2d: Suitability of the Partnering/Alliancing/Joint Venture method in downstream relationships

(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Operator			1		1	8	4.0
Manufacturer				1			4.0
Other				1			4.0
Government				1			4.0
Contractor		1	3	4		27	3.4
Servicing		2	4		1	21	3.0
Consultant			1				3.0

Table A2.2.2e: Suitability of the Supply Chain Management method in downstream relationships

(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Consultant				1		4	4.0
Manufacturer				1		4	4.0
Contractor		1	4	2	1	27	3.4
Other			1			3	3.0
Government			1			3	3.0
Servicing		1	2	2	1	17	2.8
Operator		1	1			5	2.5

Table A2.2.2f: Suitability of the Incentives Schemes method in downstream relationships

(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Contractor			5	3		27	3.4
Servicing		1	3	3		23	3.3
Government			1			3	3.0
Operator		1	1			5	2.5
Consultant		1				2	2.0
Manufacturer		1				2	2.0
Other	1					1	1.0

Table A2.2.2g: Suitability of the Leasing method in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Government				1			3	3.0
Consultant			1				2	2.0
Manufacturer			1				2	2.0
Operator			2				4	2.0
Contractor		2	4	2			16	2.0
Servicing		1	3	2			13	1.8
Other		1					1	1.0

Table A2.2.2h: Suitability of the Contract to Produce method in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Government						1	5	5.0
Manufacturer						1	5	5.0
Contractor		1	1	2	4		25	3.1
Operator			1		1		6	3.0
Servicing			2	3	2		21	3.0
Consultant			1				2	2.0
Other		1					1	1.0

6.7.2 Frequency of Responding Organisations Involvement in the Type of Procurement Strategies for the past 3 years

6.7.2.1 Upstream Relationships

Table A2.3.1a: Frequency of use of the cooperation rather than competition strategy in upstream relationships

	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
(Pts)							
Operator			1	1		7	3.5
Servicing		3	2	2		20	2.9
Contractor		3	4	1		22	2.8
Consultant		1				2	2.0
Manufacturer		1				2	2.0
Other		1				2	2.0

Table A2.3.1b: Frequency of use of the effective supply chain management strategy in upstream relationships

	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
(Pts)							
Other				1		4	4.0
Consultant			1			3	3.0
Contractor		3	3	2		23	2.8
Operator		1	1			5	2.5
Servicing	1	4	1	1		16	2.3
Manufacturer		1				2	2.0

Table A2.3.1c: Frequency of use of the partnering/alliancing enhancement strategy in upstream relationships

	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
(Pts)							
Other				1		4	4.0
Operator			1	1		7	3.5
Consultant			1			3	3.0
Manufacturer			1			3	3.0
Contractor		5	3			19	2.4
Servicing	2	2	3			15	2.1

Table A2.3.1d: Frequency of use of the cost effectiveness on operational management strategy in upstream relationships

(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant					1	5	5.0
Operator				1	1	9	4.5
Other				1		4	4.0
Manufacturer			1			3	3.0
Contractor	1	2	1	4		24	3.0
Servicing	1	3	1	2		18	2.6

Table A2.3.1e: Frequency of use of the effective incentive schemes strategy in upstream relationships

(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Operator		1		1		6	3.0
Manufacturer			1			3	3.0
Contractor		5	2	1		20	2.5
Servicing	2	3	2			14	2.0
Consultant		1				2	2.0
Other	1					1	1.0

Table A2.3.1f: Frequency of use of the whole life cycle costing strategy in upstream relationships

(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant				1		4.0	4.0
Other				1		4.0	4.0
Operator		1	1			5	2.5
Contractor	1	3	4			19	2.4
Servicing	2	2	3			15	2.1
Manufacturer		1				2.0	2.0

Table A2.3.1g: Frequency of use of adopting other industry lessons and experience strategy in upstream relationships

(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant				1		4	4.0
Manufacturer			1			3	3.0
Operator		1	1			5	2.5
Contractor	1	2	5			20	2.5
Servicing	3	2	2			15	2.1
Other		1				2	2.0

Table A2.3.1h: Frequency of use of adopting cultural, geographical and climate factors strategy in upstream relationships

(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Other					1	5	5.0
Manufacturer				1		4	4.0
Contractor	1	1	2	4		25	3.1
Consultant			1			3	3.0
Servicing	1	2	3	1		18	2.6
Operator		2				4	2.0

6.7.2.2 Downstream

Table A2.3.2a: Frequency of use of the cooperation rather than competition strategy in downstream relationships

(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Government			1			3	3.0
Manufacturer			1			3	3.0
Contractor		4	3	1		21	2.6
Operator		1	1			5	2.5
Servicing	1	2	2	2		17	2.4
Consultant		1				2	2.0
Other		1				2	2.0

Table A2.3.2b: Frequency of use of the effective Supply Chain Management strategy in downstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Consultant					1		4	4.0
Other					1		4	4.0
Contractor			3	2	3		24	3.0
Manufacturer				1			3	3.0
Government				1			3	3.0
Servicing		1	2	1	3		20	2.8
Operator			1	1			5	2.5

Table A2.3.2c: Frequency of use of the Partnering/Alliancing enhancement strategy in downstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Other					1		4	4.0
Operator			1		1		6	3.0
Government				1			3	3.0
Contractor			5	2	1		20	2.5
Servicing		1	3	2	1		17	2.4
Consultant			1				2	2.0
Manufacturer			1				2	2.0

Table A2.3.2d: Frequency of use of the cost effectiveness strategy on Operational Management in downstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Operator				1		1	8	4.0
Other					1		4	4.0
Government				1			3	3.0
Consultant				1			3	3.0
Servicing		1	2	2	2		19	2.7
Contractor		1	4	1	2		20	2.5
Manufacturer			1				2	2.0

Table A2.3.2e: Frequency of use of the effective Incentive Schemes strategy in downstream relationships

	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
(Pts)							
Operator			1		1	8	4.0
Government			1			3	3.0
Consultant			1			3	3.0
Servicing	1	3	2			13	2.2
Contractor	1	6	1			16	2.0
Manufacturer		1				2	2.0
Other	1					1	1.0

Table A2.3.2f: Frequency of use of the Whole Life Cycle Costing strategy in downstream relationships

	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
(Pts)							
Other				1		4	4.0
Consultant			1			3	3.0
Servicing	1	3	2	1		17	2.4
Contractor	1	5	1	1		18	2.3
Operator		2				4	2.0
Manufacturer		1				2	2.0
Government		1				2	2.0

Table A2.3.2g: Frequency of use of other industry's lessons and experience strategy in downstream relationships

	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
(Pts)							
Consultant				1		4	4.0
Government			1			3	3.0
Operator		1	1			5	2.5
Contractor	2	3	2	1		18	2.3
Manufacturer		1				2	2.0
Other		1				2	2.0
Servicing	2	2	1	1		13	2.2

Table A2.3.2h: Frequency of use of Cultural, Geographical and Climate factors strategy in downstream relationships

	(Pts)	Never 0% (1)	Seldom 1-33% (2)	Often 34-66% (3)	Frequently 67-99% (4)	Always 100% (5)	Total Points	Average Points
Other						1	5	5.0
Government					1		4	4.0
Consultant					1			4.0
Operator				1	1		7	3.5
Manufacturer				1			3	3.0
Contractor		1	3	3	1		20	2.5
Servicing		1	2	1	2		12	2.0

6.7.3 Responding Organisations Ranking on the Suitability of Procurement Strategies

6.7.3.1 Upstream Relationships

Table A2.4.1a: Suitability of the cooperation rather than competition strategy in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Consultant						1	5	5.0
Contractor				1	5	2	33	4.1
Government					1		4	4.0
Servicing				2	4	1	27	3.8
Operator				2			6	3.0
Manufacturer				1			3	3.0
Other			1				2	2.0

Table A2.4.1b: Suitability of the effective Supply Chain Management strategy in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Consultant					1		4	4.0
Servicing		3	3		1		26	3.7
Contractor		5	2		1		28	3.5
Operator		2					6	3.0
Government		1					3	3.0
Manufacturer		1					3	3.0
Other		1					3	3.0

Table A2.4.1c: Suitability of the Partnering/ Alliancing enhancement strategy in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Operator					1	1	9	4.5
Contractor					7	1	33	4.1
Government					1		4	4.0
Servicing				1	4	2	24	3.4
Consultant				1			3	3.0
Manufacturer				1			3	3.0
Other				1			3	3.0

Table A2.4.1d: Suitability of the cost effectiveness strategy on Operational Management in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Operator					1	1	9	4.5
Contractor				1	6	1	32	4.0
Other					1		4	4.0
Servicing				4	3		24	3.4
Consultant				1			3	3.0
Manufacturer				1			3	3.0
Government				1			3	3.0

Table A2.4.1e: Suitability of the effective Incentive Schemes strategy in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Consultant					1		4	4.0
Contractor				4	3	1	29	3.6
Operator				1	1		7	3.5
Servicing				5	2		23	3.3
Government				1			3	3.0
Manufacturer				1			3	3.0
Other	1						2	2.0

Table A2.4.1f: Suitability of the Whole Life Cycle Costing strategy in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Consultant					1		4	4.0
Government					1		4	4.0
Other					1		4	4.0
Contractor			1	4	3		26	3.3
Manufacturer				1				3.0
Operator				2			6	3.0
Servicing		1	1	3	1		16	2.7

Table A2.4.1g: Suitability of the adopting other industry lessons and experiences strategy in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Consultant					1		4	4.0
Manufacturer					1		4	4.0
Government				1			3	3.0
Operator			1	1			5	2.5
Servicing			3	3			15	2.5
Contractor		1	2	4			17	2.4
Other			1				2	2.0

Table A2.4.1h: Suitability of the adopting cultural, geographical and climate factors strategy in upstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Operator					1	1	9	4.5
Government					1		4	4.0
Contractor				3	4	1	30	3.8
Servicing			1	4	2		22	3.1
Consultant				1			3	3.0
Manufacturer			1				2	2.0
Other			1				2	2.0

6.7.3.2 Downstream Relationships

Table A2.4.2a: Suitability of the cooperation rather than competition strategy in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Operator					2		8	4.0
Government					1		4	4.0
Contractor			1		5	2	32	4.0
Servicing				4	2	1	25	3.6
Manufacturer				1			3	3.0
Consultant			1				2	2.0
Other			1				2	2.0

Table A2.4.2b: Suitability of an effective Supply Chain Management strategy in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Manufacturer					1		4	4.0
Servicing				3	2	2	27	3.9
Contractor				4	2	2	30	3.8
Government				1			3	3.0
Consultant				1			3	3.0
Other				1			3	3.0
Operator			1	1			5	2.5

Table A2.4.2c: Suitability of the Partnering/ Alliancing enhancement strategy in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Government						1	5	5.0
Operator					2		8	4.0
Manufacturer					1		4	4.0
Other					1		4	4.0
Contractor			1	3	3	1	28	3.5
Servicing			2	2	3		22	3.1
Consultant				1			3	3.0

Table A2.4.2d: Suitability of the cost effectiveness strategy on Operational Management in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Consultant						1	5	5.0
Operator				1		1	8	4.0
Contractor			1	4	2	1	27	3.8
Servicing			1	3	1	1	20	3.3
Government				1			3	3.0
Manufacturer				1			3	3.0
Other				1			3	3.0

Table A2.4.2e: Suitability of an effective Incentive Schemes strategy in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Government						1	5	5.0
Operator					1	1	9	4.5
Contractor				5	2	1	28	3.5
Servicing			2	3	2		21	3.0
Other				1			3	3.0
Manufacturer				1			3	3.0
Consultant				1			3	3.0

Table A2.4.2f: Suitability of the Whole Life Cycle Costing strategy in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Operator						1	5	5.0
Government					1		4	4.0
Consultant					1		4	4.0
Other					1		4	4.0
Contractor			3	1	2	1	22	3.1
Manufacturer				1			3	3.0
Servicing		1	3	3			16	2.3

Table A2.4.2g: Suitability of adopting other industry's lessons and experiences strategy in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Consultant					1		4	4.0
Government				1			3	3.0
Operator				1			3	3.0
Servicing			2	4	1		20	2.9
Contractor			4	3	1		21	2.6
Manufacturer			1					2.0
Other			1					2.0

Table A2.4.2h: Suitability of adopting cultural, geographical and climate factors strategy in downstream relationships

	(Pts)	Not suitable (1)	Least Suitable (2)	Suitable (3)	Very suitable (4)	Most suitable (5)	Total Points	Average Points
Government						1	5	5.0
Other					1		4	4.0
Operator				1	1		7	3.5
Servicing			1	2	3		20	3.3
Contractor		1	1	3	3		24	3.0
Consultant				1			3	3.0
Manufacturer				1			3	3.0

6.8.2 Responding Organisations Ratings on Multi Cultural Complexity Factors that would influence their company's decision on which Procurement Strategies to be adopted

Table A2.5.1a: The importance of the *price of oil and gas* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Government					1	5	5.0
Servicing		1	3	2	1	24	3.4
Operator			2			6	3.0
Contractor	1	2	3	2		22	2.8
Consultant		1				2	2.0
Manufacturer		1				2	2.0
Other	1					1	1.0

Table A2.5.1b: The importance of *Business/Market Environment* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Government					1	5	5.0
Contractor			2	4	2	32	4.0
Servicing			4	1	2	26	3.7
Operator			2			6	3.0
Consultant			1			3	3.0
Manufacturer			1			3	3.0
Other	1					1	1.0

Table A2.5.1c: The importance of *Tax regime/Tariffs/Duties* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Government				1		4	4.0
Consultant				1		4	4.0
Operator			1	1		7	3.5
Other			1			3	3.0
Servicing		3	1	2		17	2.8
Contractor	1	3	3	1		19	2.4
Manufacturer		1				2	2.0

Table A2.5.1d: The importance of *Paymaster (Client)* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Consultant					1	5	5.0
Other					1	5	5.0
Operator				1	1	9	4.5
Contractor				8		32	4.0
Government				1		4	4.0
Manufacturer				1		4	4.0
Servicing	1	1	1	1	2	20	3.3

Table A2.5.1e: The importance of *Stakeholders/Shareholders* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Government					1	5	5.0
Operator			1		1	8	4.0
Servicing		2	2	3		22	3.1
Consultant			1			3	3.0
Manufacturer			1			3	3.0
Contractor		3	3	2		23	2.9
Other	1					1	1.0

Table A2.5.1f: The importance of *Capital Exposure/Risk* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Consultant					1	5	5.0
Other					1	5	5.0
Operator			1		1	8	4.0
Government				1		4	4.0
Manufacturer				1		4	4.0
Contractor			3	3	2	31	3.9
Servicing			5	2		23	3.2

Table A2.5.1g: The importance of *Sustainability* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Government				1		4	4.0
Consultant				1		4	4.0
Manufacturer				1		4	4.0
Servicing			5	1	1	24	3.4
Contractor	1		4	3		25	3.1
Operator			2			6	3.0
Other			1			3	3.0

Table A2.5.1h: The importance of *Incentive Schemes* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Consultant				1		4	4.0
Servicing		2	3	2		21	3.0
Operator		1		1		6	3.0
Government			1			3	3.0
Contractor		6	1	1		19	2.4
Manufacturer		1				2	2.0
Other	1					1	1.0

Table A2.5.1j: The importance of *Project Timescale* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Consultant				1		4	4.0
Other				1		4	4.0
Contractor		2	4	2		24	3.0
Operator			2			6	3.0
Government			1			3	3.0
Servicing	1	1	3	2		20	2.8
Manufacturer		1				2	2.0

Table A2.5.1k: The importance of *Cultural, Geographical and Climate differences or changes* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Operator		1	1			5	5.0
Government				1		4	4.0
Consultant				1		4	4.0
Other				1		4	4.0
Servicing		2	3	2		21	3.0
Manufacturer			1			3	3.0
Contractor	1	2	3	2		22	2.8

Table A2.5.1m: The importance of *Technological Advancement* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Consultant					1	5	5.0
Servicing			3		3	24	4.0
Government				1		4	4.0
Other				1		4	4.0
Contractor			3	4	1	30	3.8
Operator			2			6	3.0
Manufacturer		1				2	2.0

Table A2.5.1n: The importance of *the Complexity of Project* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Government				1		4	4.0
Consultant				1		4	4.0
Manufacturer				1		4	4.0
Other				1		4	4.0
Contractor			3	4	1	30	3.8
Servicing			4	1	2	26	3.7
Operator			2			6	3.0

Table A2.5.1p: The importance of *Manpower/Labour* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Government				1		4	4.0
Consultant				1		4	4.0
Other				1		4	4.0
Contractor		1	4	1	2	28	3.5
Operator			1	1		7	3.5
Servicing			5	2		23	3.3
Manufacturer			1			3	3.0

Table A2.5.1q: The importance of *Company's Specialization* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Consultant					1	5	5.0
Government				1		4	4.0
Servicing			4	3		24	3.4
Contractor			6	2		26	3.3
Operator			2			6	3.0
Manufacturer			1			3	3.0
Other			1			3	3.0

Table A2.5.1r: The importance of *Company's Vision and Objectives* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Consultant					1	5	5.0
Government				1		4	4.0
Contractor		1	4	3		26	3.3
Servicing		1	5		1	22	3.1
Operator			2			6	3.0
Manufacturer			1			3	3.0
Other			1			3	3.0

Table A2.5.1s: The importance of *Maturity of Oilfield Basin* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Operator				2		8	4.0
Government				1		4	4.0
Servicing		2	3	2		21	3.0
Consultant			1			3	3.0
Manufacturer			1			3	3.0
Contractor		4	3	1		21	2.6
Other		1					2.0

Table A2.5.1t: The importance of *Oilfield Reservoir Size* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Operator			1		1	8	4.0
Government				1		4	4.0
Servicing		2	3	1	1	22	3.1
Consultant			1			3	3.0
Manufacturer			1			3	3.0
Contractor		6		1		16	2.3
Other		1					2.0

Table A2.5.1u: The importance of *Infrastructure position and existence* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Servicing		1	3	2		19	3.1
Operator			2			6	3.0
Consultant			1			3	3.0
Manufacturer			1			3	3.0
Other			1			3	3.0
Government			1			3	3.0
Contractor		4	1	3		23	2.9

Table A2.5.1v: The importance of *Transportation Route/Access* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Other				1		4	4.0
Contractor		3	2	3		24	3.0
Servicing		2	3	2		21	3.0
Operator			2			6	3.0
Government			1			3	3.0
Consultant			1			3	3.0
Manufacturer			1			3	3.0

Table A2.5.1w: The importance of *Government Legislation* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Operator				1	1	9	4.5
Government				1		4	4.0
Consultant				1		4	4.0
Manufacturer			1			3	3.0
Other			1			3	3.0
Servicing		3	4			18	2.6
Contractor	1	4	1	2		20	2.5

Table A2.5.1x: The importance of *Political Risk* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Government					1	5	5.0
Consultant					1	5	5.0
Operator			1		1	8	4.0
Other				1		4	4.0
Servicing		2	4		1	21	3.0
Manufacturer			1			3	3.0
Contractor		4	3	1		21	2.6

Table A2.5.1y: The importance of *Goodwill/Good Image/Reputation* on company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Consultant					1	5	5.0
Government				1		4	4.0
Operator			1	1		7	3.5
Servicing		1	4	2		24	3.4
Contractor		2	2	4		26	3.3
Manufacturer			1			3	3.0
Other			1			3	3.0

Table A2.5.1z: The importance of having the *Experience or to be Comfortable with certain Procurement Method* in relation to company's decision to adopt the appropriate procurement strategies

(Pts)	Not important (1)	Least important (2)	Important (3)	Very important (4)	Most important (5)	Total Points	Average Points
Government				1		4	4.0
Consultant				1		4	4.0
Operator			1	1		7	3.5
Contractor		1	4	3		26	3.3
Manufacturer			1			3	3.0
Other			1			3	3.0
Servicing		2	4			16	2.6

APPENDIX B1: PROCUREMENT STRATEGY GUIDELINE ON *SELECTION PROCESS*

APPENDIX B1

Loughborough University

PROCUREMENT STRATEGY GUIDELINE ON SELECTION PROCESS

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1.0 INTRODUCTION

The **Procurement Strategy Guideline on Selection Process** (referred to hereafter as the "Guideline") is aimed to support the decision making process on procurement strategies in the oil and gas industry with the following objectives:

- to improve decision maker's understanding of procurement and supply chain systems and processes in the industry;
- to assist decision maker's in planning, identifying, analysing, implementation and monitoring major issues and critical elements in the selection process of procurement strategies;
- to assist decision maker's in the selection process of suitable procurement strategies to be used or adopted in a particular oil and gas project;
- to act as a guide for decision makers in the industry in identifying key issues on project specific needs or values; and
- to act as a guide for decision makers in the industry in identifying key issues on multi cultural complexities especially for new and unfamiliar regions.

2.0 USING THE GUIDELINE

The overall steps on using the Guideline can be seen on the flowchart in Figure 1 on page 2. The selection process steps on how to use the schedules and tables are presented and explained in Section 4 on page 4 of this Guideline.

3.0 THE SELECTION PROCESS

In order to understand the Guideline process better and to use it most effectively, this Guideline is divided into four (4) distinct phases known as in the Deming (plan-do-study-act) cycle/wheel (Deming 1986[1], Walton 1989[2], Latzko and Saunders 1995[3]) and six (6) steps of actions. The Deming cycle/wheel according to Gardiner (2005)[4] and Kerzner (2003)[5] can be described as:

1. **Plan** – Plan the objectives and methods for the best possible results;
2. **Do** – Execute the plan by taking small steps in controlled circumstances;
3. **Study/Check** – Study and check results against objectives and methods; and
4. **Act** – Take action to implement and standardise or improve process through monitoring, immediate remedies and further actions.

Each step represents the action that needs to be considered and undertaken as shown in the overall phases and steps in the selection process (Table 1) on page 3.

[1] Deming, D.E. (1986) *Out of the Crisis*, Cambridge University Press, Cambridge.
[2] Walton, M. (1989) *The Deming Management Method*, Mercury, London
[3] Latzko, W.J. and Saunders, D.M. (1995) *Four Days with Dr Deming: A Strategy for Modern Methods of Management*, Addison-Wesley Publishing, Reading, Massachusetts.
[4] Gardiner, P.D. (2005) *Project Management: A Strategic Planning Approach*, Palgrave Macmillan, Basingstoke.
[5] Kerzner, H. (2003) *Project Management: A Systems Approach to Planning, Scheduling and Control*, John Wiley & Sons, London.

Figure 1: Flow Chart on the Steps of Using the Guideline

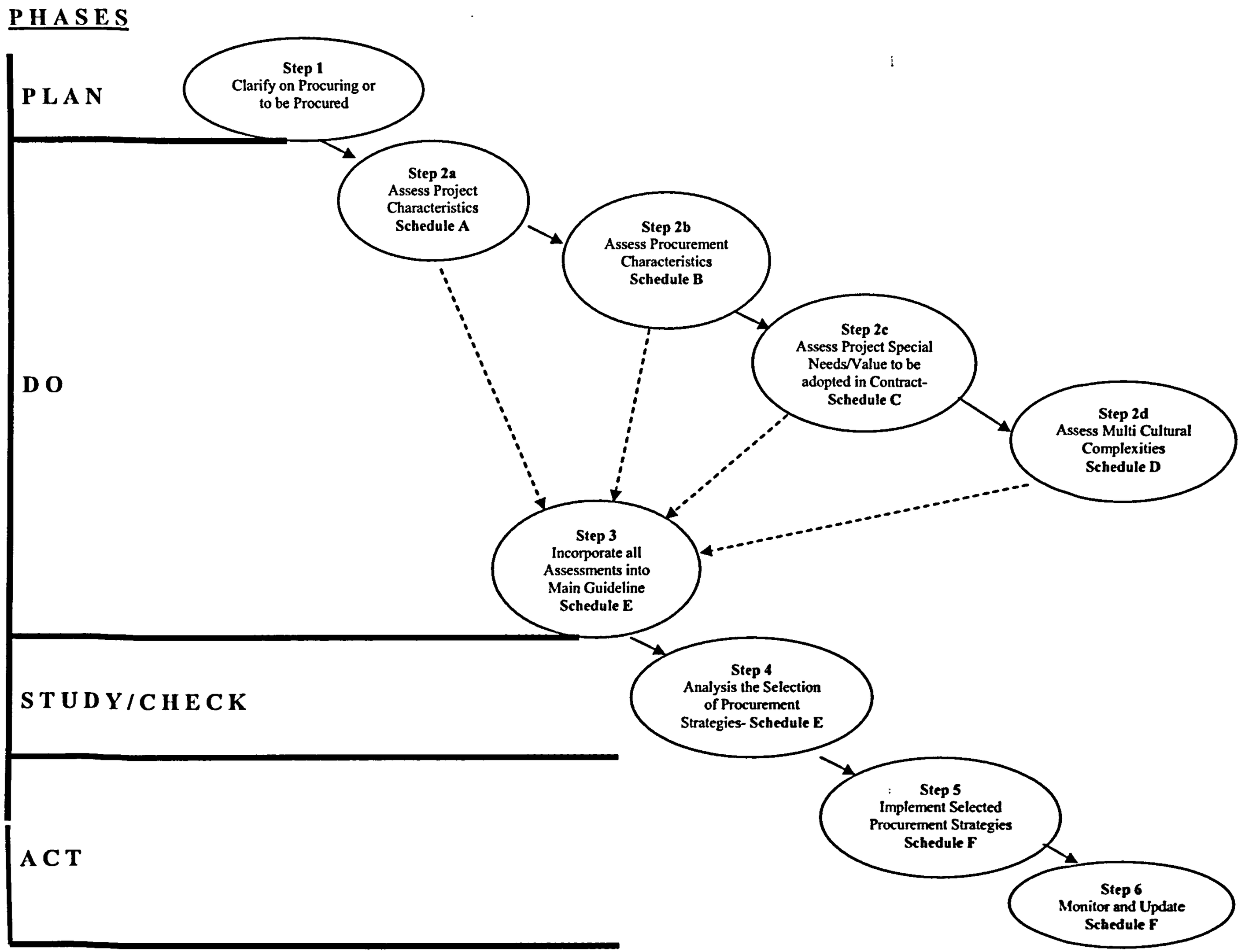

Table 1: Overall Phases and Steps of the Guideline on Selection Process

Phase	Step	Actions To Be Taken
Plan	S1	**Clarify on Procuring or being procured:-** Company's role in the procurement of a particular project (either procuring or being procured). This role will create a different approach to procurement strategies whereby when being procured, the company will have less control over the procurement methods which is subjected to the client's choice but only be able to plan on the procurement strategies. On the other hand, when procuring, the company will have the control over both procurement method and strategy to be adopted. Therefore, the assessment, analysis and implementation of the actions in the Guideline selection process may not be the same under these two circumstances. Once the decision on the company's role in the procurement is clarified, the analysis and selection process can begin.
Do	S2a	**Assess Project Characteristics:-** With reference to **Schedule A.** Filling in the project and contract details as stated in **Schedule A** and also critical elements pertaining to the project and contract listed as examples in the schedule. An assessment of the project's overall characteristics must be included in the schedule based on the particulars and information gathered from the project.
	S2b	**Assess Procurement Characteristics:-** With reference to **Schedule B.** Filling in the project and contract details as stated in **Schedule B** and critical elements pertaining to the procurement characteristics listed as examples in the schedule. An assessment of the project's procurement characteristics must be made and included in the schedule based on the particulars and information gathered from the project.
	S2c	**Assess Project Special Needs/Value to be adopted in the contract:-** With reference to **Schedule C.** Filling in the project and contract details as stated in **Schedule C** and critical elements pertaining to the contract listed as examples in the schedule. In this schedule, the project's special needs/value elements to be adopted in contract not only need **to be highlighted** but must also be **ranked** in order of its priority in the project. An assessment of the project's special needs/value to be adopted in contract must then be made based on the ranking order and included in the schedule.
	S2d	**Assess Multi Cultural Complexities:-** With reference to **Schedule D.** Filling in the project and contract details as stated in **Schedule D** and critical elements pertaining to multi cultural complexities listed as examples in the schedule. In this schedule, the project's multi cultural complexity elements not only need **to be highlighted** but must also be **ranked** in order of its effects/impact to the project. An assessment of the project's multi cultural complexities must then be made and included in the schedule based on the particulars and information gathered from the project.
	S3	**Incorporate all Assessments in Steps 2a-2d into Main Guideline Schedule:-** With reference to **Schedules A-D** and **Schedule E.** Filling in the project and contract details as stated in **Schedule E,** incorporating all assessments in **Schedules A-D** and the type of procurement methods/strategies to be adopted listed as examples in the schedule (as per √ in the schedule). The overall assessment/recommendation column of this schedule will be dealt with in the next stage.
Study/Check	S4	**Analysis Decision on the Selection of Appropriate Procurement Strategy:-** With reference to **Schedules A-D** and **Schedule E.** Filling in the overall assessment of the project and the appropriate recommendations on the type of procurement methods/strategies to be adopted (as per √) in **Schedule E,** based on all assessments made in **Schedules A-D** and the type of procurement methods/strategies to be adopted listed as examples in the schedule. In the overall assessment column of this schedule, the project's list of probable procurement methods/strategies not only need **to be highlighted** but must also be **ranked** in order of its priority and probable affects i.e. risks, complexity etc. to the project.
Act	S5	**Implement Selected Procurement Strategy:-** With reference to **Schedule F.** Filling in all the necessary details and decisions made on the overall assessment of the project as per the Main Schedule (**Schedule E**) and all further actions to be taken (as per √) in **Schedule F.** This decision is to be disseminated to all department concerns for further actions and implementation.
	S6	**Monitoring and Updating:-** With reference to **Schedule F.** Monitoring and updating current details on all relevant information related to the project (as per √) in **Schedule F** in a periodic manner (weekly or monthly) as the work progresses. This will include highlighting any **significant changes or alterations** made to the contract details (i.e. duration, cost etc.) that may affect or change the decision previously made on the overall assessment of the project as per the Main Schedule (**Schedule E**).This monitoring and updating of details and information is critically important to the company and therefore need to be disseminated to all department concerns from time to time for further action, implementation and/or feedback.

4.0 THE SELECTION PROCESS STEPS

In each schedule, decision makers must identify and fill in details on the contract particulars and the important elements as described in the examples provided which they think most likely to be relevant and critical to the project in accordance to the type of procurement they are undertaking (i.e. procuring or being procured).

Each of these major issues comprised elements that could be potentially important, influential and critical towards the success of the project. How decision makers perceived these elements would be different depending on the type and size of company/organisation, type of procurement (procuring or being procured) and under specific project circumstances or environmental scenarios. Steps 2a-2d are to be conducted simultaneously before the project overall assessment can be analysed in the Main Schedule. An example of completed schedules is shown in **Appendix A** on pages 12 to 16 of this Guideline.

4.1 Step 1: Clarify on Procuring or being procured

This is the phase where decision makers in companies have to clarify the company's role in the procurement i.e. the intention of the company either procuring or being procured of a particular project. Once the decision on the company's role in the procurement is clarified, the assessment, analysis and procurement strategy selection process for the project can begin.

4.2 Step 2a: Assess Project Characteristics

The project and contract details to be included are as stated in **Schedule A** together with the examples of the critical elements pertaining to the project. An assessment of the overall project characteristics must be made and included in the schedule based on the particulars and information gathered from the project. This assessment will be transferred to the Main Schedule (**Schedule E**) to be used for the analysis on the selection of the appropriate procurement strategy for the project.

4.3 Step 2b: Assess Procurement Characteristics

The project and contract details to be included are as stated in **Schedule B** together with examples of critical elements pertaining to the procurement characteristics. An assessment of the project's procurement characteristics must be made and included in the schedule based on the particulars and information gathered from the project. This assessment will also be transferred to the Main Schedule (**Schedule E**) to be used for the analysis on the selection of the appropriate procurement strategy for the project.

4.4 Step 2c: Assess Project Special Needs/Value to be adopted in contract

The project and contract details to be included are as stated in **Schedule C** together with critical elements pertaining to the contract. In this schedule, the project's special needs/value elements to be adopted in contract not only need **to be highlighted** but must also be **ranked** in order of its priority/impact to the project. An assessment of the project's special needs/value to be adopted in contract must then be made and included in the schedule which will then transferred to the Main Schedule (**Schedule E**).

Schedule A: Project Characteristics Schedule - Types, Categories and Assessment

No.	Name of Project	Est. Start Date	Est. Complet Date	Dur. (Wks)	Est. Value (£)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommissioning	Categories Supply/Deliver/ Install/ Test & Comm./ Servicing	Special Requirements (HSE, Local and International Regulations)	Other Constraints Risks/Legal/ Resources/ Technology/ Business/ Management	Assessment of Overall Project's Characteristics
						Onshore –Easily accessible; Not easily accessible; Distance from nearest town/city; Subjected to extreme weather **Offshore** –Deep water (>100 meters); Shallow water (<100 meters); Distance from nearest town/ city/port; Subjected to extreme weather **Climatic Influence** – Tropical; Seasonal; Desert; Artic; Others	**Exploration** –Platform facilities; Sub-sea facilities Drilling; Laboratory; Plant/equipment **Production**-Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Hook up**- Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Maintenance** – Periodical/Planned; Unplanned; Immediate Repairs **Decommissioning** - Testing and decommissioning; Dismantling; Removal from site	**Supply** –Material; Labour; Specialist; Plant/equipment; Platform facilities **Delivery**– **a. To site** –Material; Labour; Specialist; Plant/equipment; Platform facilities **b. From site** –Material; Labour; Specialist; Plant/equipment; Platform facilities **Installation** –Complete fabrication, construction and installation; Complete dismantling **Testing and Commissioning** – Material; System; Plant/equipment; Platform facilities **Servicing** –Material; System; Plant/equipment; Platform facilities	**HSE**- Workmen safety; fire, gas and heat; materials used; escape route; special plants & equipment **Local Regulation**- Environmental; health; social; local input; infrastructure **International Regulation**- Green house gas emission; safety; protection of flora/fauna	**Risks**- Technological; resources; business and finance; legal; political; environmental; terrorist **Legal**- Type of legal practice/procedure; justice systems; statutory requirements; legal expenses **Resources**- Trade unions; standard/level of skills and knowledge; training; safety; availability of critical resources. **Technology**- Cost/value of hi-technology; technology benefits over cost; sustainability; output **Business**- Winning tenders despite being competitive; economic crisis; money devaluation **Management**- across company/organisation; between players involved; between interfaces of potential packages; critical resources;	

Schedule B: Procurement Characteristics Schedule - List of Methods and Assessment

No.	Name of Project	Est. Start Date	Est. Complet Date	Dur. (Wks)	Est. Value (£)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommissioning	Categories Supply/Deliver/ Install/ Test & Comm./ Servicing	Type of Procurement Methods	Other Constraints Risks/Legal/ Resources/ Technology/ Business/ Management	Assessment of Overall Project's Characteristics
						Onshore –Easily accessible; Not easily accessible; Distance from nearest town/city; Subjected to extreme weather **Offshore** –Deep water (>100 meters); Shallow water (<100 meters); Distance from nearest town/ city/port; Subjected to extreme weather **Climatic Influence** – Tropical; Seasonal; Desert; Artic; Others	**Exploration** –Platform facilities; Sub-sea facilities Drilling; Laboratory; Plant/equipment **Production**-Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Hook up**- Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Maintenance** – Periodical/Planned; Unplanned; Immediate Repairs **Decommissioning** - Testing and decommissioning; Dismantling; Removal from site	**Supply** –Material; Labour; Specialist; Plant/equipment; Platform facilities **Delivery**– **a. To site** –Material; Labour; Specialist; Plant/equipment; Platform facilities **b. From site** –Material; Labour; Specialist; Plant/equipment; Platform facilities **Installation** –Complete fabrication, construction and installation; Complete dismantling **Testing and Commissioning** – Material; System; Plant/equipment; Platform facilities **Servicing** –Material; System; Plant/equipment; Platform facilities	**Conventional**- Lump Sum; Cost Plus; Unit Price; EPIC; EPCC **Innovative**- Partnering/Joint Venture; Whole Life Costing; Supply Chain; Contract to Produce; Leasing; Others	**Risks**- Technological; resources; business and finance; legal; political; environmental; terrorist **Legal**- Type of legal practice/procedure; justice systems; statutory requirements; legal expenses **Resources**- Trade unions; standard/level of skills and knowledge; training; safety; availability of critical resources. **Technology**- Cost/value of hi-technology; technology benefits over cost; sustainability; output **Business**- Winning tenders despite being competitive; economic crisis; money devaluation **Management**- across company/organisation; between players involved; between interfaces of potential packages; critical resources;	

Schedule C: Project Special Needs/Values to be adopted in contract and Assessment Schedule

Ref. No.	Name of Project	Est. Start Date	Est. Complet. Date	Dura. (Wks)	Est. Value (£)	Project Special Needs/Value to be adopted in contract Elements	Project Special Needs/Value to be adopted in contract Elements *(Ranked by order of priority)*	Other Constraints Risks/Legal/Resources/ Technology/Business/ Management	Assessment of Project Special Needs/Value to be adopted in contract
						Performance – Completion Time/Delivery; Tender Cost; Cost Effectiveness; Quality/Standards; Clarity of Contract; Flexibility of contract **Business** –Stakeholders Requirements; Market condition/trend; Profitability, Sustainability; Competitiveness; Price Fluctuation; Risk; Whole Life Cycle Costing; Incentives **Miscellaneous** –Safety; Environment; Flexibility of contract, Cooperation; Goodwill, Good image/reputation; Long term relationship; Research & Development (R & D)		**Risks-** Technological; resources; business and finance; legal; political; environmental; terrorist **Legal-** Type of legal practice/procedure; justice systems; statutory requirements; legal expenses **Resources-** Trade unions; standard/level of skills and knowledge; training; safety; availability of critical resources **Technology-** Cost/value of hi-technology; technology benefits over cost; sustainability; output **Business-** Winning tenders despite being competitive; economic crisis; money devaluation **Management-** across company/organisation; between players involved; between interfaces of potential packages; critical resources;	

4.5 Step 2d: Assess Multi Cultural Complexities

The project and contract details to be included are as stated in **Schedule D** together with the critical elements pertaining to multi cultural complexities. In this schedule, the project's multi cultural complexity elements not only need **to be highlighted** but must also be **ranked** in order of its effects/impact to the project. An assessment of the project's multi cultural complexities must then be made and included in the schedule based on the particulars and information gathered from the project. This assessment will be transferred to the Main Schedule **(Schedule E)** to be used for the analysis on the selection of the appropriate procurement strategy for the project.

Schedule D: Multi Cultural Complexities (MCC) Schedule - List of Types, Categories and Assessment

Ref. No.	Name of Project	Est. Value (£)	Dura. (Wks)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommission.	Type of MCC Internal/ Regional/ Global	List of MCC Categories and Elements	MCC Elements Effecting Project *(Ranked in order of priority)*	Assessment of MCC Categories and Elements
				Onshore –Easily accessible; Not easily accessible; Distance from nearest town/city; Subjected to extreme weather **Offshore** –Deep water (>100 meters); Shallow water (<100 meters); Distance from nearest town/ city/port; Subjected to extreme weather **Climatic Influence** – Tropical; Seasonal; Desert; Artic; Others	**Exploration** –Platform facilities; Sub-sea facilities Drilling; Laboratory; Plant/equipment **Production**-Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Hook up**- Platform facilities; Sub-sea facilities; Production facilities; Transportation Facilities; Laboratory; Plant/equipment **Maintenance** – Periodical/Planned; Unplanned; Immediate Repairs **Decommissioning** - Testing and decommissioning; Dismantling; Removal from site	**Internal**-within own organisation/subsidiaries structure, philosophy and practice **Regional**-Within the operational designated region like North Sea, South China Sea, Mexico Bay, Middle East **Global**-Across operational designated region including new frontiers	**a. Business**-Price of oil; Market Environment; Tax Regime; Paymaster/Client; Sustainability; Capital risk; Trading Standards; Trading Agreements; Incentives **b. Project**-Physical nature; Location; Reservoir Size; Field Maturity; Technological Constraints; Expertise; Timescale; Transport Route/Access; Infrastructure **c. Player**-Number of Players; Company Type; Business Philosophy; Stakeholders; Personnel; Specialisation; Manpower; Knowledge/R&D; Experience; Goodwill/ Good Image/Reputation **d. Local Issues**-Clients; Work Culture; Practice; Knowledge; Political risk; Legislation; Bureaucracy; Local Content; Flexibility of contract; Monetary; Language; Environment; Bribery		

4.6 Step 3: Incorporate Steps 2a-2d into the Main Guideline Schedule

The project and contract details to be included are as stated in **Schedule E,** incorporating all assessments in **Schedules A-D** and the type of procurement methods/strategies to be adopted listed as examples in the schedule (as per √ in the schedule). The overall assessment/recommendation column of this schedule will be dealt with in Step 4 on page 10.

Schedule E: Main Guideline Schedule for Procurement Strategies Assessment and Selection

Ref. No.	Name of Project	Est. Start Date	Est. Comp Date	Dur	Est. Value (£)	Type of Procurement Method and Relationship (Procuring or being Procured)	Project Character. Assessment *(Schedule A)*	Procurement Character. Assessment *(Schedule B)*	Specific Project Needs/Value To Be Adopted in Contract Assessment *(Schedule C)*	Multi Cultural Complexity Assessment *(Schedule D)*	Overall Assessment/ Recommendation on the Type of Procurement Methods/Strategies to be Adopted
√	√	√	√	√	√	**Procurement Methods** **Definition:** Procurement methods in its broadest definition and context to the oil and gas industry is an approach required to acquire the design, material, labour, services, installation and commissioning inputs for a successful completion of a project. **Conventional-**Lump Sum; Cost Plus; Unit Price; EPIC; EPCC **Innovative-** Partnering/Joint Venture; Whole Life Costing; Supply Chain; Incentive Schemes; Contract to Produce; Leasing; Private Finance Initiatives; Others **Procurement Strategies** **Definition:** Procurement strategies are broadly defined as new approaches to acquire the desired inputs but also links to the business plan of an organisation/company. This is to maintain a sustainable position for that organisation/company within the total chain of the industry, which determines the success or survival of that organisation/company. **Examples:** Cooperation rather than competition; Risk Analysis and Management; Effective Supply Chain Management; Partnering/Alliancing Enhancement; Cost Effectiveness on Operational Management; Effective Incentive Schemes; Cultural, Geographical and Climatic Factors; Whole Life Cycle Costing; Other Industry's Lessons and Experiences	√	√	√	√	**X**

4.7 Step 4: Analysis Decision on the Selection of Appropriate Procurement Strategy

The overall assessment of the project and recommendations on the type of procurement methods/strategies to be adopted (as per √) are to include project and contract details as in Step 3 of **Schedule E** including all assessments made in **Schedules A-D**, the type of procurement methods/strategies to be adopted and relationship (procuring or to be procured). In the overall assessment/recommendation column of this schedule, the project's list of appropriate procurement methods/strategies not only need **to be highlighted** but must also be **ranked** in order of its priority and probable affects i.e. risks, complexity etc. to the project.

Schedule E: Main Guideline Schedule for Procurement Strategies Assessment and Selection

Ref. No.	Name of Project	Est. Start Date	Est. Comp Date	Dur	Est. Value (£)	Type of Procurement Method and Relationship (Procuring or being Procured)	Project Character. Assessment *(Schedule A)*	Procurement Character. Assessment *(Schedule B)*	Specific Project Needs/Value To Be Adopted in Contract Assessment *(Schedule C)*	Multi Cultural Complexity Assessment *(Schedule D)*	Overall Assessment/ Recommendation on the Type of Procurement Methods/Strategies to be Adopted
X	X	X	X	X	X	X	X	X	X	X	√

4.8 Step 5: Implement Selected Procurement Strategy

All the necessary details and decisions made on the overall assessment of the project as in Step 4 of the Main Schedule (**Schedule E**) and all further actions to be taken or implemented (as per √) are to be included in **Schedule F**. This decision must then be disseminated to all department concerns for further actions and implementation.

Schedule F: Schedule for Selected Procurement Strategies and Further Action to be taken

Ref. No.	Name of Project	Est. Start Date	Est. Compl. Date	Dur	Est. Value (£)	Decision on Overall Assessment as per Main Guideline Schedule	Any other necessary updating or relevant information	Further Actions to be taken	To the Attention of/ Dept.	Remark
√	√	√	√	√	√	√	X	√	√	√

4.9 Step 6: Monitoring and Updating

The final step will be monitoring and updating current details on all relevant information related to the project (as per √) in **Schedule F** in a periodic manner (weekly or monthly) as the work progresses. This will include highlighting any **significant changes or alterations** made to the contract details (i.e. duration, cost etc.) that may affect or change the decision previously made on the overall assessment of the project as per the Main Schedule (**Schedule E**).This monitoring and updating of details and information is critically important to the company and therefore need to be disseminated to all department concerns from time to time for further action, implementation and/or feedback.

Schedule F: Schedule for Selected Procurement Strategies and Further Action to be taken

Ref. No.	Name of Project	Est. Start Date	Est. Compl. Date	Dur	Est. Value (£)	Decision on Overall Assessment as per Main Guideline Schedule	Any other necessary updating or relevant information	Further Actions to be taken	To the Attention of/ Dept.	Remark
√	√	√	√	√	√	X	√	√	√	√

5.0 General Notes

Finally, this Guideline to Selection Process of Procurement Strategies using the Deming cycle management approach:

- only act as a tool for decision making process (Kerzner 2003) but not in any way to influence the decision to be made;
- can only be effective and reliable if the inputs are current, correct and as detail as possible (Deming 1986);
- needs to be updated periodically to allow for the monitoring of changes to the project details and information (Deming 1986) which could have an impact on the contract and costs; and
- needs to be standardised and consistent in its documentation process (Gardner 2005) to allow easier monitoring and analysing as well as to be a reliable and potential source of reference for future use.

APPENDIX A – Example of Completed Schedules in the Guideline Selection Process

Schedule A: Project Characteristics Schedule - Types, Categories and Assessment

Ref No.	Name of Project	Est. Start Date	Est. Compl. Date	Dura. (Wks)	Est. Value (£)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommissioning	Categories Supply/Deliver/ Install/ Test & Comm./ Servicing	Special Requirements (HSE, Local and International Regulations)	Other Constraints Risks/Legal/ Resources/ Technology/ Business/ Management	Assessment of Project Characteristics
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	Feb 2007	July 2007	30 Wks	RM 30 million / GBP 4.5 million	**Offshore-** Deep water, distance from nearest town: Miri, 60 Nm, Malaysia **Climatic Influence:** Tropical/ Monsoon	**Exploration –** Platform facilities, Laboratory; Plant/equipment **Hook up-** Platform facilities, Laboratory; Plant/equipment	**Supply –**(As per Tender Specs): Material, Labour, Specialist, Plant/equip, Platform facilities **Delivery–** **a. To site** –Material, Labour, Specialist, Plant/equipment, Platform facilities **Installation –**Complete fabrication, construction and installation **Testing and Commissioning –** Material; System; Plant/equipment; Platform facilities	**HSE-**Workmen safety, fire, gas and heat; materials used, escape route, special plants & equipment **Local Regulation-** Environmental; health, social, local input, infrastructure	**Risks-**Resources **Resources** Availability of critical resources **Technology-** Cost/value of hi-technology **Business-** Winning tenders despite being competitive **Management-** Between interfaces of potential packages; critical resources;	**Core Issues:** Location; Duration; Availability of critical resources; Cost/value of hi-tech; Winning tenders despite being competitive; Management of potential packages and critical resources

Schedule B: Procurement Characteristics Schedule - List of Methods and Assessment

Ref. No.	Name of Project	Est. Start Date	Est. Complet Date	Dura. (Wks)	Est. Value (£)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommission.	Categories Supply/ Delivery/ Install/ Test&Comm./ Servicing	Type of Procurement Methods	Other Constraints Risks/Legal/ Resources/ Technology/ Business/ Management	Assessment of Procurement Characteristics
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	Feb 2007	July 2007	30 Wks	RM 30 million/ GBP 4.5 million	Offshore- Deep water, distance from nearest town: Miri, 60 Nm, Malaysia Climatic Influence: Tropical/ Monsoon	Exploration – Platform facilities, Laboratory; Plant/equipment Hook up- Platform facilities, Laboratory; Plant/equipment	Supply –(As per Tender Specs): Material, Labour, Specialist, Plant/equip, Platform facilities Delivery– a. To site –Material, Labour, Specialist, Plant/equipment, Platform facilities Installation –Complete fabrication, construction and installation Testing and Commissioning – Material; System; Plant/equipment; Platform facilities	Conventional- Cost Plus and Innovative- Whole Life Costing Being Procured	Risks-Resources Resources Availability of critical resources Technology- Cost/value of hi-technology Business- Winning tenders despite being competitive Management- Between interfaces of potential packages; critical resources;	Core Issues: Type of procurement methods to be used; Duration; Availability of critical resources; Cost/value of hi-tech of material/ plant/ equipment (whole life costs); Winning tenders despite being competitive; Management of potential packages and critical resources

Schedule C: Specific Project Needs/Values to be adopted in Contract and Assessment Schedule

Ref. No.	Name of Project	Est. Start Date	Est. Complet. Date	Dura. (Wks)	Est. Value (£)	Anticipated Specific Project Needs/Value to be adopted in contract Elements	Specific Project Needs/Value to be adopted in contract Elements *(Ranked in order of priority)*	Other Constraints Risks/Legal/Resources/ Technology/Business/ Management	Assessment of Specific Project Needs/Value to be adopted in contract
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	Feb 2007	July 2007	30 Wks	RM 30 million/ GBP 4.5 million	Performance – Completion Time/Delivery; Tender Cost; Cost Effectiveness; Quality/Standards; Clarity of Contract Business –Profitability; Sustainability; Competitiveness; Price Fluctuation; Whole Life Costing; Incentives Miscellaneous –Flexibility of contract; Cooperation; Goodwill; Good image/reputation; Long term relationship	Performance – Clarity of Contract; Tender Cost; Completion Time/ Delivery Business – Whole Life Costing; Competitiveness; Price Fluctuation (cost plus); Incentives Miscellaneous –Flexibility of contract; Cooperation; Good image/reputation	Risks-Resources Resources- Availability of critical resources Technology- Cost/value of hi-technology Business- Winning tenders despite being competitive Management- Between interfaces of potential packages; critical resources;	Core Issues- Clarity of Contract; Whole Life Costing; Competitiveness; Flexibility of contract; Availability of critical resources; Cost/value of hi-technology (whole life costs); Winning tenders despite being competitive; Management between interfaces of potential packages

Schedule D: Multi Cultural Complexities (MCC) Schedule - List of Types, Categories and Assessment

Ref. No.	Name of Project	Est. Value (£)	Dura. (Wks)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommission.	Type of MCC Internal/ Regional/ Global	List of MCC Categories and Elements	MCC Elements Effecting Project *(Ranked in order of priority)*	Assessment of MCC factors
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	RM 30 million/ GBP 4.5 million	30 Wks	Offshore- Deep water, distance from nearest town: Miri, 60 Nm, Malaysia Climatic Influence: Tropical/ Monsoon	Exploration – Platform facilities, Laboratory; Plant/equipment Hook up- Platform facilities, Laboratory; Plant/equipment	Internal-within own organisation/subsidiaries structure Global- Across operational designated region	a. Business-Paymaster/Client; Capital risk; Trading Agreement b. Project-Physical nature; Location; Expertise; Timescale c. Player-Personnel; Manpower; Experience; Goodwill/ Good Image/Reputation d. Local Issues-Work Culture; Practice; Bureaucracy; Local Content/input; Flexibility of contract	a. Business- Paymaster/Client b. Project-Location; Timescale; Expertise c. Player-Personnel; Manpower; Experience d. Local Issues- Bureaucracy; Local Content/input; Flexibility of contract	Core Issues- Paymaster/Client; Personnel, Manpower, Experience; Location, Timescale; Bureaucracy, Local Content/input

Schedule E: Main Guideline Schedule for Procurement Strategies Assessment and Selection

Ref. No.	Name of Project	Est. Start Date	Est. Comp Date	Dur	Est. Value (£)	Type of Procurement Method and Relationship (Procuring or being Procured)	Project Character. Assessment *(Schedule A)*	Procurement Character. Assessment *(Schedule B)*	Specific Project Needs/Value To Be Adopted in Contract Assessment *(Schedule C)*	Multi Cultural Complexity Assessment *(Schedule D)*	Overall Assessment/ Recommendation on the Type of Procurement Methods/Strategies to be Adopted
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	Feb 2007	July 2007	30 Wks	RM 30 million / GBP 4.5 million	**Conventional-** Cost Plus and **Innovative-** Whole Life Costing **Being Procured**	**Core Issues:** Location; Duration; Availability of critical resources; Cost/value of hi-tech; Winning tenders despite being competitive; Management of potential packages and critical resources	**Core Issues:** Type of procurement methods to be used; Duration; Availability of critical resources; Cost/value of hi-tech of material/ plant/ equipment (whole life costs); Winning tenders despite being competitive; Management of potential packages and critical resources	**Core Issues-** Clarity of Contract; Whole Life Costing; Competitiveness; Flexibility of contract; Availability of critical resources; Cost/value of hi-technology (whole life costs); Winning tenders despite being competitive; Management between interfaces of potential packages	**Core Issues-** Paymaster/ Client; Personnel, Manpower, Experience; Location, Timescale; Bureaucracy, Local Content/input	**To Consider Adopting-** Whole Life Cycle Costing approach- Type of Proc. Method, clarity and flexibility of contract, winning tenders despite being competitive; Risk Analysis and Management-Cost/ value of hi-tech, duration, location, personnel, manpower, Winning tenders despite being competitive; Effective Supply Chain Management- Availability of critical resources, competitiveness, location, Bureaucracy, Local Content/input; Cost Effectiveness on Operational Management- Cost/value of hi-tech, Management between interfaces of potential packages, personnel, manpower; Cultural, Geographical and Climatic Factors- Location, Duration, Availability of critical resources, Client, Personnel, Manpower, Experience, Bureaucracy, Local Content/input

Schedule F: Schedule for Selected Procurement Strategies and Further Action to be taken for a proposed oil and gas project

Ref. No.	Name of Project	Est. Start Date	Est. Compl. Date	Dur (*Wks*)	Est. Value (£)	Decision on Overall Assessment as per Main Guideline Schedule *(Schedule E)*	Any other necessary updating or relevant information	Further Actions to be taken	To the Attention of/ Dept.	Remark
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	Feb 2007	July 2007	30 Wks	RM 30 million/ GBP 4.5 million	**To Consider Adopting/Final Decision/Revised Decision-** Whole Life Cycle Costing approach- Type of Proc. Method, clarity and flexibility of contract, winning tenders despite being competitive; Risk Analysis and Management-Cost/ value of hi-tech, duration, location, personnel, manpower, Winning tenders despite being competitive; Effective Supply Chain Management- Availability of critical resources, competitiveness, location, Bureaucracy, Local Content/input; Cost Effectiveness on Operational Management- Cost/value of hi-tech, Management between interfaces of potential packages, personnel, manpower; Cultural, Geographical and Climatic Factors- Location, Duration, Availability of critical resources, Client, Personnel, Manpower, Experience, Bureaucracy, Local Content/input	**Project-** **Procurement-** **Specific Project Needs/Value To Be Adopted in Contract-** **Multi Cultural Complexities factors-** **Other Constraints**	**Dept. Meetings** **Dept Approval** **Dept Actions**	**Engineers** **Procurement Engineers** **Procurement Managers** **Business Advisor** **Head of Dept.**	

APPENDIX B2: GUIDELINE VALIDATION SHEET
(SAMPLE QUESTIONNAIRE)

Loughborough University

APPENDIX B2

PROCUREMENT STRATEGY GUIDELINE ON SELECTION PROCESS

VALIDATION SHEET

Section A – Respondent Particulars

Company Type: Operator/Contractor/ Manufacturer/Service/Others .....

Position: .....

Section B – Guideline on Selection Process

Please read the accompanied attachment on ***"Guideline on Selection Process"*** (referred to hereafter as the ***"Guideline"***) and kindly answer the following questions. *(Please tick **X** where appropriate)*

Q1. Do you **AGREE** that the proposed ***Guideline***:

	Strongly Disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly Agree 5
a. is easy to understand	[ ]	[ ]	[ ]	[ ]	[ ]
b. could be fully adopted and used by your company **without** modification	[ ]	[ ]	[ ]	[ ]	[ ]
c. could be fully adopted and used by your company **with** modification	[ ]	[ ]	[ ]	[ ]	[ ]
d. needs **total change** and approach altogether	[ ]	[ ]	[ ]	[ ]	[ ]

Q2. Please **RATE** the following aspects/impact of the proposed ***Guideline.***

	Not Useful 1	Least Useful 2	Useful 3	Very Useful 4	Most Useful 5
a. The **usefulness** of the ***Guideline*** to decision makers in your company	[ ]	[ ]	[ ]	[ ]	[ ]
b. The **usefulness** of the ***Guideline*** to other companies decision makers	[ ]	[ ]	[ ]	[ ]	[ ]
b. The ***Guideline*** **useful contribution** to the industry	[ ]	[ ]	[ ]	[ ]	[ ]

Q3. Do you **AGREE** that the proposed ***Guideline***:

	Strongly Disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly Agree 5
a. will improve decision maker's understanding of procurement and supply chain systems and processes in the industry	[ ]	[ ]	[ ]	[ ]	[ ]
b can assist decision maker's in planning, identifying, analysing, implementation and monitoring major issues and critical elements in the selection process of procurement strategies	[ ]	[ ]	[ ]	[ ]	[ ]
c can assist decision makers in the selection process of suitable procurement strategies to be used or adopted in a particular oil and gas project;	[ ]	[ ]	[ ]	[ ]	[ ]
d can be used as a guide for decision makers in identifying key issues on project specific needs or values	[ ]	[ ]	[ ]	[ ]	[ ]
e can be used as a guide for decision makers in identifying key issues on multi cultural complexities especially for new and unfamiliar regions.	[ ]	[ ]	[ ]	[ ]	[ ]

Q4. Are there any other suggestions for the ***Guideline*** on:

a. additional items or elements that have been left out?

.....

b. improving the approach or layout/format?

.....

***Note** - The examples given in the Guideline schedules below are based on an assumption of a probable oil and gas project. This is done to allow decision makers a better understanding on the correct approach and method when using and filling in the Guideline schedules on a real project.

Schedule A: Project Characteristics Schedule - Types, Categories and Assessment

Ref No.	Name of Project	Est. Start Date	Est. Compl. Date	Dura. (Wks)	Est. Value (£)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommissioning	Categories Supply/Deliver/ Install/ Test & Comm./ Servicing	Special Requirements (HSE, Local and International Regulations)	Other Constraints Risks/Legal/ Resources/ Technology/ Business/ Management	Assessment of Project Characteristics
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	Feb 2007	July 2007	30 Wks	RM 30 million / GBP 4.5 million	**Offshore-** Deep water, distance from nearest town: Miri, 60 Nm, Malaysia **Climatic Influence:** Tropical/ Monsoon	**Exploration –** Platform facilities, Laboratory; Plant/equipment **Hook up-** Platform facilities, Laboratory; Plant/equipment	**Supply –**(As per Tender Specs): Material, Labour, Specialist, Plant/equip, Platform facilities **Delivery–** **a. To site** –Material, Labour, Specialist, Plant/equipment, Platform facilities **Installation –**Complete fabrication, construction and installation **Testing and Commissioning –** Material; System; Plant/equipment; Platform facilities	**HSE-**Workmen safety, fire, gas and heat; materials used, escape route, special plants & equipment **Local Regulation-** Environmental; health, social, local input, infrastructure	**Risks-**Resources **Resources** Availability of critical resources **Technology-** Cost/value of hi-technology **Business-** Winning tenders despite being competitive **Management-** Between interfaces of potential packages; critical resources;	**Core Issues:** Location; Duration; Availability of critical resources; Cost/value of hi-tech; Winning tenders despite being competitive; Management of potential packages and critical resources

Q5. Do you **AGREE** that the schedule above:

	Strongly Disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly Agree 5
a. is sufficient to describe the essentials and nature of Project Characteristics	[ ]	[ ]	[ ]	[ ]	[ ]
b. is easy to understand	[ ]	[ ]	[ ]	[ ]	[ ]
c. is easy to fill in the relevant information needed in the schedule	[ ]	[ ]	[ ]	[ ]	[ ]
d. is sufficient enough to assist the assessment of Project Characteristics	[ ]	[ ]	[ ]	[ ]	[ ]

Schedule B: Procurement Characteristics Schedule - List of Methods and Assessment

Ref. No.	Name of Project	Est. Start Date	Est. Complet Date	Dura. (Wks)	Est. Value (£)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommission.	Categories Supply/ Delivery/ Install/ Test&Comm./ Servicing	Type of Procurement Methods and Relationship (Procuring or being Procured)	Other Constraints Risks/Legal/ Resources/ Technology/ Business/ Management	Assessment of Procurement Characteristics
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	Feb 2007	July 2007	30 Wks	RM 30 million/ GBP 4.5 million	**Offshore-** Deep water, distance from nearest town: Miri, 60 Nm, Malaysia **Climatic Influence:** Tropical/ Monsoon	**Exploration –** Platform facilities, Laboratory; Plant/equipment **Hook up-** Platform facilities, Laboratory; Plant/equipment	**Supply –**(As per Tender Specs): Material, Labour, Specialist, Plant/equip, Platform facilities **Delivery–** **a. To site** –Material, Labour, Specialist, Plant/equipment, Platform facilities **Installation –**Complete fabrication, construction and installation **Testing and Commissioning –** Material; System; Plant/equipment; Platform facilities	**Conventional-** Cost Plus and **Innovative-** Whole Life Costing **Being Procured**	**Risks-**Resources **Resources** Availability of critical resources **Technology-** Cost/value of hi-technology **Business-** Winning tenders despite being competitive **Management-** Between interfaces of potential packages; critical resources;	**Core Issues:** Type of procurement methods to be used; Duration; Availability of critical resources; Cost/value of hi-tech of material/ plant/ equipment (whole life costs); Winning tenders despite being competitive; Management of potential packages and critical resources

Q6. Do you **AGREE** that the schedule above:

	Strongly Disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly Agree 5
a. is sufficient to describe the essentials and nature of Procurement Characteristics	[ ]	[ ]	[ ]	[ ]	[ ]
b. is easy to understand	[ ]	[ ]	[ ]	[ ]	[ ]
c. is easy to fill in the relevant information needed in the schedule	[ ]	[ ]	[ ]	[ ]	[ ]
d. is sufficient enough to assist the assessment of Procurement Characteristics	[ ]	[ ]	[ ]	[ ]	[ ]

Schedule C: Specific Project Needs/Values to be adopted in Contract and Assessment Schedule

Ref. No.	Name of Project	Est. Start Date	Est. Complet. Date	Dura. (Wks)	Est. Value (£)	Anticipated Specific Project Needs/Value to be adopted in contract Elements	Specific Project Needs/Value to be adopted in contract Elements *(Ranked in order of priority)*	Other Constraints Risks/Legal/Resources/ Technology/Business/ Management	Assessment of Specific project Needs/Value to be adopted in contract
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	Feb 2007	July 2007	30 Wks	RM 30 million/ GBP 4.5 million	Performance – Completion Time/Delivery; Tender Cost; Cost Effectiveness; Quality/Standards; Clarity of Contract Business –Profitability; Sustainability; Competitiveness; Price Fluctuation; Whole Life Costing; Incentives Miscellaneous –Flexibility of contract; Cooperation; Goodwill; Good image/reputation; Long term relationship	Performance – Clarity of Contract; Tender Cost; Completion Time/ Delivery Business – Whole Life Costing; Competitiveness; Price Fluctuation (cost plus); Incentives Miscellaneous –Flexibility of contract; Cooperation; Good image/reputation	Risks-Resources Resources- Availability of critical resources Technology- Cost/value of hi-technology Business- Winning tenders despite being competitive Management- Between interfaces of potential packages; critical resources;	Core Issues- Clarity of Contract; Whole Life Costing; Competitiveness; Flexibility of contract; Availability of critical resources; Cost/value of hi-technology (whole life costs); Winning tenders despite being competitive; Management between interfaces of potential packages

Q7. Do you **AGREE** that the schedule above:

	Strongly Disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly Agree 5
a. is sufficient to describe the essentials of Specific Project Needs/Values to be adopted in contract	[ ]	[ ]	[ ]	[ ]	[ ]
b. is easy to understand	[ ]	[ ]	[ ]	[ ]	[ ]
c. is easy to fill in the relevant information needed in the schedule	[ ]	[ ]	[ ]	[ ]	[ ]
d. is sufficient enough to assist the assessment of Specific Project Needs/Values to be adopted in contract	[ ]	[ ]	[ ]	[ ]	[ ]

Schedule D: Multi Cultural Complexities (MCC) Schedule - List of Types, Categories and Assessment

Ref. No.	Name of Project	Est. Value (£)	Dura. (Wks)	Location Onshore/ Offshore/ Climate	Type Exploration/ Production/ Hook up/ Maintenance/ Decommission.	Type of MCC Internal/ Regional/ Global	List of MCC Categories and Elements	MCC Elements Effecting Project *(Ranked in order of priority)*	Assessment of MCC factors
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	RM 30 million/ GBP 4.5 million	30 Wks	Offshore- Deep water, distance from nearest town: Miri, 60 Nm, Malaysia Climatic Influence: Tropical/ Monsoon	Exploration – Platform facilities, Laboratory; Plant/equipment Hook up- Platform facilities, Laboratory; Plant/equipment	Internal-within own organisation/subsidiaries structure Global- Across operational designated region	a. Business-Paymaster/Client; Capital risk; Trading Agreement b. Project-Physical nature; Location; Expertise; Timescale c. Player-Personnel; Manpower; Experience; Goodwill/ Good Image/Reputation d. Local Issues-Work Culture; Practice; Bureaucracy; Local Content/input; Flexibility of contract	a. Business- Paymaster/Client b. Project-Location; Timescale; Expertise c. Player-Personnel; Manpower; Experience d. Local Issues- Bureaucracy; Local Content/input; Flexibility of contract	Core Issues- Paymaster/Client; Personnel, Manpower, Experience; Location, Timescale; Bureaucracy, Local Content/input

Q8. Do you **AGREE** that the schedule above:

	Strongly Disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly Agree 5
a. is sufficient to describe the essentials and coverage of Multi Cultural Complexities for the project	[ ]	[ ]	[ ]	[ ]	[ ]
b. is easy to understand	[ ]	[ ]	[ ]	[ ]	[ ]
c. is easy to fill in the relevant information needed in the schedule	[ ]	[ ]	[ ]	[ ]	[ ]
d. is sufficient enough to assist the assessment of Multi Cultural Complexities for the project	[ ]	[ ]	[ ]	[ ]	[ ]

Schedule E: Main Guideline Schedule for Procurement Strategies Assessment and Selection

Ref. No.	Name of Project	Est. Start Date	Est. Comp Date	Dur	Est. Value (£)	Type of Procurement Method and Relationship (Procuring or being Procured)	Project Character. Assessment *(Schedule A)*	Procurement Character. Assessment *(Schedule B)*	Specific Project Needs/Value To Be Adopted in Contract Assessment *(Schedule C)*	Multi Cultural Complexity Assessment *(Schedule D)*	Overall Assessment/ Recommendation on the Type of Procurement Methods/Strategies to be Adopted
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	Feb 2007	July 2007	30 Wks	RM 30 million / GBP 4.5 million	**Conventional-** Cost Plus and **Innovative-** Whole Life Costing **Being Procured**	**Core Issues:** Location; Duration; Availability of critical resources; Cost/value of hi-tech; Winning tenders despite being competitive; Management of potential packages and critical resources	**Core Issues:** Type of procurement methods to be used; Duration; Availability of critical resources; Cost/value of hi-tech of material/ plant/ equipment (whole life costs); Winning tenders despite being competitive; Management of potential packages and critical resources	**Core Issues-** Clarity of Contract; Whole Life Costing; Competitiveness; Flexibility of contract; Availability of critical resources; Cost/value of hi-technology (whole life costs); Winning tenders despite being competitive; Management between interfaces of potential packages	**Core Issues-** Paymaster/ Client; Personnel, Manpower, Experience; Location, Timescale; Bureaucracy, Local Content/input	**To Consider Adopting-** Whole Life Cycle Costing approach- Type of Proc. Method, clarity and flexibility of contract, winning tenders despite being competitive; Risk Analysis and Management-Cost/ value of hi-tech, duration, location, personnel, manpower, Winning tenders despite being competitive; Effective Supply Chain Management- Availability of critical resources, competitiveness, location, Bureaucracy, Local Content/input; Cost Effectiveness on Operational Management- Cost/value of hi-tech, Management between interfaces of potential packages, personnel, manpower; Cultural, Geographical and Climatic Factors- Location, Duration, Availability of critical resources, Client, Personnel, Manpower, Experience, Bureaucracy, Local Content/input

Q9. Do you **AGREE** that the Main Guideline schedule above:

	Strongly Disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly Agree 5
a. is easy to understand	[ ]	[ ]	[ ]	[ ]	[ ]
b. is easy to fill in the relevant information needed in the schedule	[ ]	[ ]	[ ]	[ ]	[ ]
c. is sufficient to assist the **assessment process** on the Selection of Appropriate Procurement Strategies	[ ]	[ ]	[ ]	[ ]	[ ]

Schedule F: Schedule for Selected Procurement Strategies and Further Action to be taken for a proposed oil and gas project

Ref. No.	Name of Project	Est. Start Date	Est. Compl. Date	Dur	Est. Value (£)	Decision on Overall Assessment as per Main Guideline Schedule *(Schedule E)*	Any other necessary updating or relevant information	Further Actions to be taken	To the Attention of/ Dept.	Remark
Blk PCG/ 24/H/ Kikih Miri	Constr, Fab & Instl. of Exploration Platform Facilities, Sarawak, Malaysia	Feb 2007	July 2007	30 Wks	RM 30 million/ GBP 4.5 million	**To Consider Adopting/Final Decision/Revised Decision-** Whole Life Cycle Costing approach- Type of Proc. Method, clarity and flexibility of contract, winning tenders despite being competitive; Risk Analysis and Management-Cost/ value of hi-tech, duration, location, personnel, manpower, Winning tenders despite being competitive; Effective Supply Chain Management- Availability of critical resources, competitiveness, location, Bureaucracy, Local Content/input; Cost Effectiveness on Operational Management- Cost/value of hi-tech, Management between interfaces of potential packages, personnel, manpower; Cultural, Geographical and Climatic Factors- Location, Duration, Availability of critical resources, Client, Personnel, Manpower, Experience, Bureaucracy, Local Content/input	**Project-** **Procurement-** **Specific Project Needs/Value To Be Adopted in Contract-** **Multi Cultural Complexities factors-**	**Dept. Meetings** **Dept Approval** **Dept Actions**	**Engineers** **Procurement Engineers** **Procurement Managers** **Business Advisor** **Head of Dept.**	

Q10. Do you **AGREE** that the schedule above:

	Strongly Disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly Agree 5
a. is easy to understand	[ ]	[ ]	[ ]	[ ]	[ ]
b. is easy to fill in the relevant information needed in the schedule	[ ]	[ ]	[ ]	[ ]	[ ]
c. is **useful** during the management and monitoring of the procurement process	[ ]	[ ]	[ ]	[ ]	[ ]