

Chapter 3: RESEARCH METHODOLOGY

Chapter Highlights

This chapter discusses the Research Methodology to study the emerging research gaps manifested in the existing Body of Knowledge pertaining to the ERM implementation in the Middle East Oil Industry; and identifies a method that would be relevant to the research project. A procedural or operational framework is established enhancing the clarity of facts and the due process thereof to formalize the next course of exploration in this academic work. From an existing exhaustive list of research approaches and tactics, the most suitable type applicable for this management research is chosen. The ultimate objective of this chapter is to adopt an acceptable and approved methodology that would eventually contribute and add value to the existing Body of Knowledge through the study undertaken.

Contents

3.0	Research Methodology.....	134
3.1	Background & motivation for the study.....	135
3.2	Research Statement.....	137
3.3	Research Strategy and process.....	138
3.4	Outline of Thesis Chapters.....	146
3.5	Limitations of the study.....	147
3.6	Contributions of the study.....	148
3.7	Future directions of research.....	148

3.0 Research Methodology

According to Remenyi *et al* (1998) Research methodology, especially in the business and management studies domain, is a life-long study which is continually evolving. The evolution in this subject has mostly been a movement away from the methodological techniques originally borrowed from the physical and life sciences, towards concepts developed for the human or social sciences. As this evolution progresses so does the field of research methodology in the field of business and management which becomes an increasingly rich, but sometimes bewildering set of choices.

Research is not a linear process and research studies are taken up in a recursive and reiterative way (Easterby-Smith *et al*, 1994; Gill *et al*, 1991). However, it is useful to have a *research program* or *structured plan* or *research process* (see Fig. 10) with an underlying research strategy to at least think about if not actually follow a step by step process (Remenyi *et al*, 1998).

To put the issues of research and its methodologies into perspective, it is useful to first define Research Methodology as stated by prominent authors.

- 'Research methodology refers to the *procedural framework* within which the research is conducted. It describes an approach to a problem that can be put into practice in a research process' (Remenyi *et al*, 1998).
- 'It is an *operational framework* within which the facts are placed so that their meaning may be seen more clearly' (Leedy, 1989).

While formalizing the Research Questions, Remenyi *et al* (1998) points that it can be established by working experience and literature review. Appropriate evidence is established through a Literature Review in order to manifest the incomplete knowledge (research gaps) in the field of interest. The essence of the research process is to answer the research questions in the study undertaken.

While Galliers (1992) has provided an exhaustive list of research approaches and tactics, authors like Remenyi *et al* (1998) highlight that all the approaches are not necessarily suitable for all types of business and management research. Some of the approaches and tactics are predominantly positivistic and some basically phenomenological and some are used with both the philosophical approach, that can eventually help *add something of value to the Body of Knowledge*.

3.1 Background and motivation of the study

In business and management studies there are perhaps even more unanswered questions than in many other areas of study because of the fast changing nature of the subject (Remenyi *et al*, 1998). Based on my experience and personal opinion, there are many *manipulative and causal relations* in the oil & gas industry which has lead to several unanswered questions within the energy business value chain.

The world's combined dependence on Oil & Gas has not diminished, in spite of supply shocks (Hartshorn, 1993), price turbulence (Hartshorn, 1993), recommendations from Stern's report (2005) and greener demand scenarios in various IPCC Assessment Reports (Manne *et al*, 1991). When more energy is needed, oil is usually the first choice. Likewise when the need for energy declines, oil is the first commodity to suffer. According to Yergin (2007), Petrodollars are fuelling political assertiveness in certain countries leading to petro-confidence. Apart from petro-confidence, some of the external drivers to risk in the oil & gas value chain is oil price volatility (James & Fusaro, 2006), climate change (Frankhauser, 1995), carbon foot print (James & Fusaro, 2006), clean development mechanism (CONCAWE, 2005; James & Fusaro, 2006), impacts of the Stern report (2005), IPCC reports, impact of the BRICS economy (Yergin, 2007) etc in the analysis. A very decisive techno-commercial risk driver is the burning issue of the balancing act being performed by refiners between two crucial forces viz., market survival vs. environmental stewardship. Furthermore, perspectives discussed by Noreg (2002) propound that the energy market is exposed to Terrorist risks, Economic risks, Political risks and Security risks. These risks in the light of the OPEC politics foment a

dislocation in the Energy supply and demand. The irony is that OPEC is still alive and going strong despite repeated announcements of its demise and occasional allegations of the irrelevance of oil in humanity's daily day-to-day needs by developed economy. Various literatures as early as Sampson's Seven Sisters (1975) to Huettner (2000) state that in economic terms, the oil market has an oligopolic structure dominated by few sellers and intrinsically unstable, making oil supplies more volatile than demand. Various authors state that the world oil market has repeatedly performed in ways that appear to violate basic laws of economics as oil prices seem to move independently of supply and demand, and vice versa. Terrorist, Economic, Political and Security risks as discussed by Noreg (2002) can be classified into Financial, Operational, Compliance and Strategic categories (COSO, 2004) as indicated in the COSO Cube.

Basis the above point of view, what intrigues me in this industry is the ***impact of the plethora of variables in the upstream/downstream value chains*** that induce risks in the intrinsic business processes, business interfaces and associated business sectors. ERM seeks to strategically consider the interactive effects of various risk events with the goal of balancing an enterprise's portfolio of risks to be within the stakeholder's appetite for risk (Beasley et al, 2007). With a broader perspective of how silo risk management affects the enterprise strategic risks at large, an organization is in a better position to achieve its strategic objectives. However, an apparent caveat in ERM system is that ***there is no standard approach to implementing the system***. Having realized this fact, I intend analyzing the gaps in the ERM implementation which are more or less interrelated. This gives me an opportunity to reflect on the array of factors in a wholesome way and derive an understanding at a corporate level. In deed this should provide an answer for the stakeholders to their question: 'What went wrong?' & 'How can we do it better?' with respect to the ERM implementation in the Middle East Oil Companies dealing with a Strategic Commodity (Bromley, 1991) i.e., oil.

A study on ERM requires a specialist-generalist aptitude and this study offers credence to my 18 years of professional exposure through this academic study. With this attribute, it gives me an opportunity to document and contribute to the 'Body of Knowledge' with a

hands-on familiarity with an inter-disciplinary experience within the value chain in its business environment. oil & gas industry at large and energy industry as a whole. Furthermore, a fulfilling corporate level engagement providing Assurance Services to the Board of Directors at the *first oil refinery in the Middle East* and other engagements with prominent Business Groups give me the requisite confidence to discuss the nuances in Corporate Governance, Risk Management and Internal Controls in the Arab world.

3.2 Research Statement

Based on the literature review presented in Chapter 2, it is decided to adopt the following statement as the research topic:

'Enterprise Risk Management (ERM) application in the Oil Industry: A study towards a better implementation in the Middle East Oil Industry'

The research questions unfolding from the Literature survey are the following:

- (1) What is the understanding of the nature of ERM within the oil industry?***
- (2) What are the value drivers to develop ERM in the oil companies?***
- (3) How do oil companies structure ERM for effective implementation?***
- (4) What challenges do oil companies face in implementing ERM?***
- (5) How do oil companies measure the performance of ERM?***

The statement of the research problem envisages investigating the above research questions on the emerging topic 'ERM' to achieve the following two objectives:

- 'To provide answer to the research questions'***
- 'To recommend the best practice approach for successful ERM implementation'***

In an attempt to provide answers to the research questions and address the objectives, the research study will examine the ERM system in the oil & gas sector through a *Comparative Case Study Method* (Kasanen & Suomi, 1987; Yin, 1989; Smith, 1990; Huber & Van de Ven, 1995; Yin, 2003; Eisenhardt & Graebner 2007). The scope of the research study pertains to the GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates).

In order to investigate the answers for the research questions and provide the best practice solutions thereof, the following aspects are compared across each case.

- ❑ *Comparison of perception of ERM.*
- ❑ *Comparison of driving forces for ERM.*
- ❑ *Comparison of ERM model as practiced.*
- ❑ *Comparison of structural, operational and technical challenges in implementing ERM.*
- ❑ *Comparison of the means of measuring the performance of ERM.*

The research will explore ERM system in the GCC oil industry by presenting case studies of six GCC countries and attempt to answer the five research questions, while addressing the two research objectives.

3.3 Research Strategy and process

Research Strategy

According to Lipset (1996), 'Those who know only one country know no country.' As a renowned political sociologist he has worked in several comparative case studies. Another renowned social and political scientist, Karl Wolfgang Deutsch, states that, 'A large part of human learning has always occurred through comparison.' According to Kasanen & Suomi (1987), Smith (1990) and Yin (2003), case study method of research is a frequent mode of thesis in many disciplines and fields. Many authors like Pettigrew

(1973) and Yin (1989, 1993) have also endorsed the use of comparative case method in various management disciplines. Pettigrew (1973) has emphasized the use of case studies often studying one case in greater depth to deduce a theory or apply a general model to explain empirical instances. In general case studies provide a very valuable addition to the aggregate survey material since they can provide 'qualitative context that amplifies and enriches the meaning derived from 'quantitative methods' (Yin, 1994). Furthermore, Huber & Van de Ven (1995) recommend to the scholars and researchers engaged in organizational studies to utilize the comparative case study method to understand the dynamics of organizational life and to *developing and testing theories* of organizational adaptation, change, innovation and redesign.

Yin (1989, 1993) defines case study as an empirical enquiry that 'investigates a contemporary phenomenon within its real life context, when the boundaries between the phenomenon and context are not clearly evident, and in which multiple sources of evidence is used.' Yin (1993), propounds five research strategies. One of them being the 'case study' method depends on what kind of questions, control over behavioural events and focus on contemporary events. These factors shall be mapped by formulating '**How, Why**' questions around the Research Question. However, Remenyi *et al* (2000) differ to recognize 'research strategy' as acknowledged by Yin (1993, 2003) and argue that it is more a 'research tactic', since strategy is reckoned at a higher level. They consider Case Study as 'pedagogy', as an 'evidence-collection approach' and as a separate 'research tactic' in its own right for business and management dissertations, as it can accommodate the complexity which is often inherent in such studies. They also add that a case study comes into its own when a '**How, Why or Who**' question is being asked about a contemporary phenomenon. Furthermore, Schramm (1971) states that case study method tries to illuminate a decision and set of decisions through '**How, Why, and What**' questions to achieve a more focused view of the case study beyond the notion of it as an evidence-collection approach, as it also attempts to illustrate or explain the decisions and motivations that underlie the observed processes.

According to Bell (1993), the case study methodology has also been an '*umbrella term*' for a family of research methods having in common the decision to focus on *an enquiry around a specific instance or event* (Bell, 1993) or *phenomenon* (Yin, 2003).

Remenyi *et al* (2000) further add that the philosophy behind the case study is that sometimes only by looking carefully at a practical, real life instance can a full picture be obtained of the actual interaction of variables or events. The case study allows the investigator to concentrate on specific instances in an attempt to identify detailed interactive processes which may be crucial, but which are transparent to the large-scale survey. They conclude that the aim of this method is *to provide a multi-dimensional picture of the situation* under study.

Remenyi *et al* (2000) and Yin (2003) have commented on the *flexible nature* in the case study method of study. They state that the study may be an almost entirely positivistic or almost entirely phenomenological study or anything between these two extremes. As case study is an 'umbrella term' (Bell, 1993) it includes a wide range of evidence capture and analysis procedures, all the various orientations, study approaches and analytics may fall within its domain (Remenyi *et al*, 2000).

When a phenomenon can be studied in a real life situation, the case study is considered to be a research strategy of greater relevance. Eisenhardt & Graebner (2007) state that 'a major reason for the popularity and relevance of theory building from case studies is that it is one of the best of the bridge from rich qualitative evidence to mainstream deductive research.' The case study is built around a deductive approach where the researcher wants to find information that suit the existing theories. The topic on ERM is akin to the various works carried out by such renowned organizational researchers. Consequently, the proposed Research Methodology in this academic work shall be through '*Comparative Case Study Method*' for further explorations.

Case Study Design

'Unit of analysis' and 'time boundaries' are critical to the research issues and needs to be related to the way the research questions have been defined. The unit of analysis normally refers to the type of organization that is to be studied. Time boundaries are essential as they help determine the limits of evidence collection and analysis.

Yin (2003) states that every type of empirical research has an implicit, if not explicit, research design and proposes the idea that all empirical research has a research design that follows a logical sequence connecting empirical data and the study's initial research questions finally leading to its conclusions. The research design can be defined as 'the plan that guides the investigator in the process of collecting, analyzing, and interpreting observations.' Yin (2003) discusses four different types of research designs relevant for case studies; single case designs, multiple case designs, holistic designs and embedded designs; as shown in the matrix below.

STRATEGY	SINGLE CASE DESIGN	MULTIPLE CASE DESIGN
<i>Holistic (Single unit of analysis)</i>	Type - 1	Type - 2
<i>Embedded (Multiple units of analysis)</i>	Type - 3	Type - 4

Single case study may be sufficient when a well-formulated theory may be tested (Remenyi *et al*, 2000; Yin, 2003). The single case can be used to discover whether the theories developed are relevant and if there are ways in which they can be extended and further developed. When the same study contains more than a single case the use of a multiple case design becomes relevant i.e., there exist several individual units of analysis that as a whole can be considered as multiple case designs. Commentaries by Remenyi *et al* (2000) acknowledge that multiple case studies are **more compelling** and the results are **more robust**.

The single and multiple case studies can be holistic or embedded. The embedded case study involves more than one unit of analysis and attention is also given to sub-units.

When no logical sub-units can be identified or when there is a global nature of the problem, the holistic design is preferable.

In this thesis, the *embedded multiple case studies* methodology shall be used to further explore the ERM application in the Middle East Oil Industry towards a better implementation of the same; with a defined *time boundary between 2005 up until 2010*.

Data Collection Methods - Sources of Primary & Secondary data

Eisenhardt (1989) states that case studies typically combine data collection methods such as archives, interviews, questionnaires and observations. The evidence may be qualitative, quantitative or both.

Primary data collection (Hussey *et al*, 1997) will be through the observations garnered from the following sources:

- Data from Risk Managers, ERM implementing personnel, Internal Audit department from oil companies within the GCC. Line Managers also prove to be the best resource for getting insights into developing risk strategy. I intend meeting Line Managers in the Operations, Marketing & Sales, Engineering, Finance, Projects, Security, IT, Corporate Planning, Quality Management etc.
- A semi structured type of interview is envisaged to have a mix of interviewing, observing and analyzing strategy to primary data collection. Furthermore, appropriate Questionnaires/ Check lists are envisaged to be designed around the 8 categories in the COSO cube with respect to the Oil industry; followed by its analyses.
- My personal enthusiasm for empirical data collection at work which I have garnered through my Internal Auditing, Business Development, Contracts and Project Management skills and other general exposure.

Data gathering and response to Questionnaires/ Check lists will be carried out through appropriate personal contacts at the various oil & gas companies in the region. It should be noted that most companies in GCC are national oil companies. The upstream and

downstream companies in some cases are merged (eg. Bahrain, Saudi Arabia) and some oil companies also have a parent oil company which controls upstream and downstream businesses (eg. Kuwait).

To extend knowledge (Remenyi *et al*, 2000) further in the Energy Industry with the backdrop of ERM, I intend to collect Secondary data through the following sources:

- Articles from various magazines published by Institute of Management Accountants (IMA, USA).
- Articles from various magazines published by Institute of Internal Auditors (IIA, USA).
- Articles from various magazines published by General Association of Risk Managers (GARP, USA).
- World Bank Reports, Energy Bulletins, World Energy data, International Energy Agency (IEA), Centre for Global Energy Studies (CGES).
- Proceedings from ERM workshops and conferences.
- News paper articles and Regional reports within GCC.
- Deloitte & Touche, KPMG, Booz, McKinsey, and Ernst & Young reports.
- University of Bahrain, Libraries and Information services.
- Bahrain Petroleum Company's Libraries (my employer).
- Reports from the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

Research process

Marshall and Rossman (1995, 2006) have used the famous analogy of a funnel in the research process of selecting a research problem. The various phases in the research process of this study are presented in the Figure 3.1. To start with, an introduction to the contemporary topic on Enterprise Risk Management has been carried out chronicling the various drivers to the ERM in the industry as presented in Chapter -1. Further a wide survey of literature was carried out and presented in Chapter -2. The literature review

unfolded the gaps in the study and it was decided to adopt the following statement as the research topic:

‘Enterprise Risk Management application in the Oil Industry: *A study towards a better implementation in the Middle East Oil Industry*’

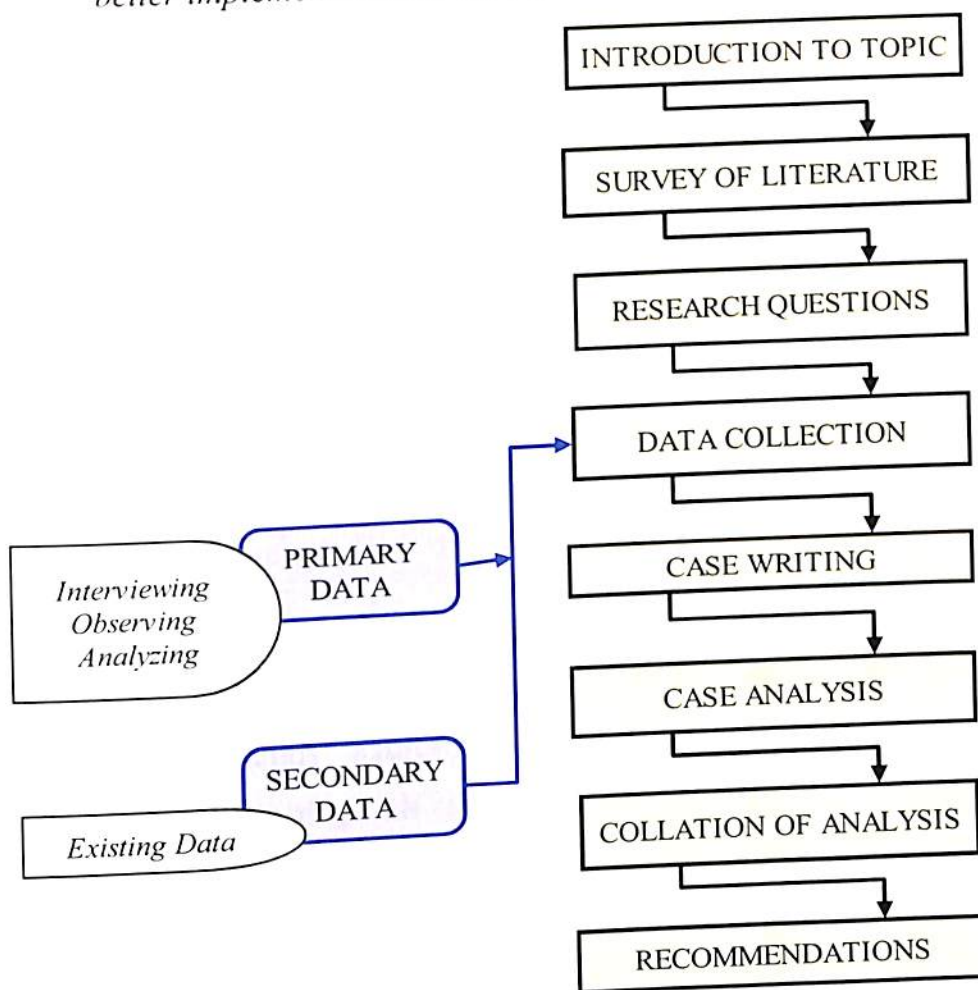


Fig. 3.1, The Research Process (Source: Easterby-Smith *et al*, 1994 & Gill *et al*, 1991)

After finalization of topic for research, an appropriate research methodology was selected and defined in order to formalize the procedural and operational framework as presented in Chapter – 3. A justification for choosing the case study method has been presented in this chapter along with the sources for primary and secondary data collection envisaged for the case study units. Sources of primary data shall comprise of interviewing, observing and analyzing documents. In the Harvard Business Review, Coyne *et al* (2007), states that a semi-structured approach to data gathering can generate great ideas and works better than unfettered brainstorming or strict quantitative analysis or

questionnaire format. In this academic work, a *semi-structured interview* technique shall be followed for conducting interviews with personnel from various national oil companies in GCC through field trips and telephonic discussions. This shall be facilitated by use of notes, questionnaire and check list. Oil & gas being strategic and sovereign assets one has to pay attention to the organizational culture and cultural sensitivity in these countries. There are various leads and subtleness in their answering pattern which posed difficulty in deciphering the original idea. Some of the issues are translated from Arabic and furthermore, the topic of study is more to deal with the directions and deliberations at Board level and hence it was literally impossible to establish some data. However, the discussions have helped in authenticating the data available from the public domain. The participants in the discussion preferred to be anonymous and preferred not to be quoted in the research report keeping in line the cultural sensitivities in this region of the world. The data collected from these sources has been used for the writing of six case studies.

The purpose of these case studies is to report the results of a study examining Enterprise Risk Management practiced by the oil companies in the Middle East, particularly the GCC companies. The study explores the understanding, evolution, design and performance of the ERM in these oil companies and the challenges which they face in implementing ERM.

The following structure of case study has been followed in all case studies for an evaluation in the comparative analysis:

- ❑ *Business Value Chain*
- ❑ *Corporate Ethos*
- ❑ *Corporate Governance Framework*
- ❑ *Upstream Petro-Strategies*
- ❑ *Downstream Petro-Strategies*

The big picture of the Middle Eastern oil and gas industry with an overview of the GCC economy in particular and the general views on the corporate governance issues and petro

strategies thereof are presented in Chapter 4. The six case studies are presented at Chapter 5 and the analysis of the same been presented at Chapter 6. The analysis of these case studies covers a country-level comparison of GCC oil companies. Based on the analysis, appropriate strategies for GCC oil companies have been recommended in order to have a better implementation of the ERM system and are presented in Chapter 7.

3.4 Outline of Thesis chapters

This thesis is organized in the following order as described below.

- ❑ **Chapter 1** of the thesis introduces the concepts like risk management, internal controls and corporate governance highlighting and chronicling the evolution of ERM paradigm and the various drivers and trends in ERM mostly driven from the general industry, financial industry, insurance industry and the rating agencies.
- ❑ **Chapter 2** of the thesis presents a detailed review of literature covering works and studies on the popular works on ERM framework i.e., COSO ERM Framework. Finally, the review highlights on the various gaps in the implementation initiatives thus far in the oil & gas industry.
- ❑ **Chapter 3** of the thesis presents the details of research methodology adopted and spells out the research strategy, data collection methods, detail research process. The chosen research strategy for this thesis is case study method. It also covers the limitation of this research study as well as its contributions.
- ❑ **Chapter 4** of the thesis presents the big picture of the Middle Eastern oil and gas industry with an overview of the GCC economy in particular and the general views on GCC economy and business challenges in the hydrocarbon sector.

- ❑ Chapter 5 of this thesis presents the six case studies examining the ERM practiced in the six GCC oil companies.
- ❑ Chapter 6 of this thesis presents the comparative analysis of six case studies.
- ❑ Chapter 7 of this thesis is the last chapter of the thesis, collating the findings on the study examining the ERM practiced in the case studies. Finally this chapter suggests appropriate strategies and recommendations in order to have a better implementation of the ERM system in GCC oil companies.

3.5 Limitations of the study

The plausible limitations of this study can be summarized as below:

- ❑ The scope of the research study pertains to the GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates). Geographically, Middle East comprises of other countries which are rich in their hydrocarbon reserves like Iraq and Iran. There are valid reasons for not considering the above countries.
 - a) Although Iraq is an OPEC founder member, this study does not consider such a major participant. Due to many conflicting Iraqi oil reports ever since the 2003 invasion of Iraq, it has almost rendered it impossible to take up a study of this nature.
 - b) Information on the Iranian hydrocarbon industry is not easily available in the public domain owing to the political sensitivity, although IR Iran is a major contender in the oil and gas business value chain and also an OPEC founder member.
- ❑ There are limitations in terms of the research methodology used. The use of case study has been made precluding the use of other direct methods such as survey questionnaires.

- ❑ Based on the case study method, the primary data presented in the study is qualitative. The quantitative data is derived from secondary sources and carries the disadvantages typically associated with such data. For instance, some of the secondary data may be outdated, partly irrelevant or left partially unutilized for the purpose of analysis.
- ❑ The analytical methods used are deductive and discursive in nature limited to the nature of the methodology of case study used. Rigorous statistical methods could not be applied owing to the limitations of the case study method.
- ❑ This study explores and compares the industry structure of oil sector in GCC countries, for this purpose selected individual firms in the upstream and downstream oil sector are only discussed.
- ❑ In some CASES, participants from only the gas sector had responded and there was no response to validate variables of the CASE study in the oil sector.

3.6 Contributions of the study

This research report will endeavor to benefit Strategic think tanks, Scholars in Future Studies, Corporate Planning cell implementing long-term strategy for business sustainability in the oil industry, Oil & Gas Holding Companies deployed to face the Energy Security concerns at a country level, Risk Managers, Internal Auditors and Board of Directors of Oil Companies, Management Consultants at large and Academia.

The stake holders of this study of the ERM system are the shareholders, management and the board of directors of oil & gas companies, as well as the nation at large being a study addressing a 'Strategic Industry' (Bromley, 1991) as mentioned earlier.

3.7 Future directions of research

Perhaps this study is the first of its kind to report the results of a study examining ERM practiced by the oil companies in the Middle East, particularly the GCC companies. This

research may lead to some interesting future studies. Some of the future directions for research are suggested below:

- ❑ It has been widely acknowledged that ERM is a 'hot', 'contemporary' and 'emerging' topic and it is beginning to mature in various industries. Apart from being a catalyst for performance improvement, addressing solvency, banking supervision accords and good business practice; there is ample opportunity to evaluate the system due to the range of inter-disciplinary subjects being intertwined in the ERM process and function per se.
- ❑ This study offers a full range of opportunities for future studies to researchers, basis this similar framework of study, by extending empirical data from other oil and gas economies in the world.
- ❑ Further research gaps can be addressed by taking a similar approach for an in-depth analysis with a unique theme.
- ❑ An interesting possibility would be to evaluate if the foreign policies of the country match with the ERM strategy of the national oil company.
- ❑ The basic issues explored in the study could be approached with the aid of alternative research methodologies generating numerical data amenable to rigorous quantitative analysis.

On the whole, the research study can be considered as an attempt to push the boundaries of knowledge in the theoretical area of Enterprise Risk Management in the Oil Industry and the practical area of the Strategic Management of oil and gas industry.

After all, the present day modern management thinking in Risk Management has evolved from a whole range of influences over a period of time. As a consequence, this study can lend itself to a plethora of opportunities for future studies to researchers in management thinking within the precincts of the **Board Room** discussions in the oil and gas industry.

-----END OF CHAPTER 3-----