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## **MULTI-CULTURAL COMPLEXITY IMPACT ON PROCUREMENT WITHIN THE OIL AND GAS SECTOR**

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### **ABSTRACT**

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 understanding of procurement strategies that need to be adopted by the oil and gas sector across the globe. This paper will focus on how certain complexity theories can be used to develop contextualised 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.

Keywords: Complexity, Cultural, Management, Oil, Gas, Procurement.

### **INTRODUCTION**

The construction industry encompasses many sectors, including building, civil, mechanical, electrical, process, heavy engineering, and oil and gas. According to Wright (1996), when compared to other sectors of the construction industry, most projects in the oil and gas sector have 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. The oil and gas sector also places considerable reliance on other specialist disciplines such as geology,

maritime and drilling. Although different in nature to many sectors in the construction industry, oil and gas projects typically comprise the usual project phases, i.e. inception, feasibility, design, construction, operation, maintenance and decommissioning. For example, in the oil and gas sector, during the operation stage, focus would be on the actual production of oil and gas for profit as the main income stream, whereas, in other sectors of the construction industry, the focus could be on how the completed project is being used to provide a service or product.

Oil and gas exploration and production is a highly risky business in a very complicated and complex sector. It links government, owners of the natural resources with the 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. However, 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.

The main aim of this research is to improve procurement strategies for the oil and gas sector. However, the objectives of this paper are: to identify MCC issues in the oil and gas sector; assess the influence, magnitude and importance of complexity theories on procurement strategies to the sector by conducting current literature search as well as looking at case studies; and finally, to lead players and stakeholders involved in the sector a better understanding and awareness on the impact of MCC issues may have on current procurement strategies.

## **CHALLENGES AND COMPLEXITY IN THE OIL AND GAS SECTOR**

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.

This paper deals with MCC issues which will be dealt with accordingly throughout this paper. 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.

## **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. According to Snieckus (2003), 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, according to them, 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.

## **COMPLEXITY THEORY AND THE UNDERSTANDING OF PROCUREMENT 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 describes 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) describes 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. And 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 1 below.

<b>Business culture</b>	<b>Trust and mutual respect</b>	<b>Relational contracts</b> High definition Target sum bidding Proactive behaviour Focus on efficiency	<b>Ad hoc alliances</b> Goal alignment Early involvement High integration Gain sharing Focus on effectiveness
	<b>Transaction based/traditional</b>	<b>Conventional contracts</b> High definition Lump sum bidding Reactive behaviour Claim/defence mentality	<b>Get out</b>
		<b>Simple</b>	<b>Complex</b>

**Business challenge**

**Figure 1.** 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 mixed 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 Russia.

## **CASE STUDY**

### **No.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). According to Howorth (2003), some companies are struggling to meet targets even though oil and gas prices have been high

lately. This struggle he added, will be tougher if oil and gas prices fall, particularly for large companies with significant production from relatively high-cost basin with modest returns such as the North Sea. 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.

## **No.2 The Sakhalin-2 Project, Russia**

One of the important objectives, in the case of oil and gas procurement strategy practised 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.

## **CONCLUSION**

According to McMillan (2004), complexity is viewed by many as scientific revolution that is creating new ways of explaining and describing the world. Complexity research on the other hand, is trying to answer all the questions that do not easily fit into conventional categories and to do so in new and often untried ways. On cultural complexity, Glinow and Mohrman (1990) stresses that complex task, knowledgeable people, different cultures and new technologies are needed to face globalisation challenges in terms of competitiveness and compatibility. Culture, according to Warner and Joynt (2002) can have a powerful impact on management decision and organizational behaviour, therefore awareness of culture helps us to understand each other better and is often the essence of successful management. Multi-cultural complexity (MCC) however, are unlikely



restricted to one single culture or subculture, but may involved a wider and detailed perspective which can be influenced by gender, ethnic background, profession, knowledge, department, division, work organization, political, geographical location, region, industry, nation or greater region such as Europe, America or Asia (Sackmann, 1997). Apart from identifying cultural differences and complexity as among major difficulties encountered when dealing with international projects, Gunhan and Arditi (2005) outlined a list of factors which will influence and determine the level of success in managing MCC. This include the company's track record, expertise, project management capability, international networking, technological advantage, financial strength, support for equipment, material and labour and more often than not, bribery in host country.

Wright (1996) has identified key trends and factors that will have an impact on procurement methods/strategies, particularly in the UK North Sea oil and gas sector, which include the increased contractors' risk, market polarisation, cultural changes, oil company specialisation, project timescales, technology and product-oriented solutions. In Russia or in Asia however, the factors would probably be more regionalised and specific to that region but nonetheless will have some elements of MCC that players in that region will have to content with.

It is hope that players and stakeholders in the oil and gas sector will understand the impact of these factors to their procurement strategies and business as a whole, and will react and deal with them accordingly.

## **REFERENCES**

Astley, P. (2003) The opportunities and challenges of cultural diversity on the Sakhalin-2 project, *The Cost Engineer*, Nov, Vol. **41** (6), pp 12-15.

Bakhtiari, A.M.S. (2003), North Sea oil reserves: half full or half empty? *Oil and Gas Journal*, Aug, Vol. **101.33**, pp 24-32.

Carr, C. and Harris, S. (2004) The impact of diverse national values on strategic investment decisions in context of globalisation, *International Journal of Cross Cultural Management*, Vol. **4** (1), pp 77-99.

Condray, A. (2002) North Sea investment and strategy- A global context, *The future for investment in the North Sea conference*, May, London.

David, F.R., (2003) *Strategic Management: Concepts & cases*, Ninth edition (International edition), Prentice Hall, New York.

Donnelly, J. (2003) Q & A with Michael Fleming, CEO, WellDynamics, *Journal of Petroleum Technology*, Aug., pp 19

Emhjellen, M., Emhjellen, K. and Osmundsen, P. (2003) Cost estimation overruns in the North Sea, *Project Management Journal*, Vol. **34** (1), pp. 23-29.

Glinow, M.A.V. and Mohrman, S.A. (1990) *Managing complexity in high technology organizations*, Oxford University Press, London.

Gunhan, S. and Arditi, D. (2005) Factors affecting international construction, *Journal of Construction Engineering and Management*, Vol. **131**, No.3, pp 273-282.

Halliburton, (2002) Halliburton announces second quarter charges, *2002 Press Release*, July 22, <http://www.halliburton.com>.

Haswell, L. (2003) Strategic business development: Aiming to succeed, *LOGIC Seminar on legal innovation in oil and gas*, Nov., Aberdeen.

Howorth, G. (2003) Assessing competitive scenarios for the new UK North Sea playing field, *Oil and Gas Journal*, Aug, Vol. **101.33**, pp 34-38.

Hussey, D. and Jenster, P. (2000) *Competitor analysis, turning intelligence into success*, John Wiley & Sons, Ltd, Chichester, pp. 53-55.

Koot, W.C.J. (1997) Strategic utilization of ethnicity in contemporary organizations, in Sackmann, S.A. (1997) *Cultural complexity in organizations: Inherent contrasts and contradictions*, Sage Publications, London, pp 315-339.

Masterman, J.W.E., (1997) *An introduction to building procurement systems*, E & FN Spon, London.

McHaffie, E.R., Jarvis, M.G. and Barber, S.A. (1993) Governments, Contractors seen headed for era of cooperation, *Oil and Gas Journal*, Apr., Vol. **91**(17), pp. 54-59.

McMillan, E., (2004) *Complexity, organizations and change*, Routledge, London.

Oyegoke, A.S. (2004) Developing strategies for improving owners' investment and contracting procedures in a construction project, *The Cost Engineer*, Feb., Vol. **42** (1), pp. 16-21.

Pedwell, K., Hartman, F.T. and Jergeas, G.F. (1998) Project Capital Cost Risks and Contracting Strategies, *Journal of Cost Engineering*, Vol. **40** (1), pp. 37-41.

Reid, T. (2004) Programme management of international projects, *The Cost Engineer*, Feb., Vol. **42** (1), pp 12-15.

Sackmann, S.A. (1997) *Cultural complexity in organization: inherent contrasts and contradictions*, Sage, London.

Schien, E.H. (1985) *Organizational Culture and Leadership*, Jossey Bass, San Francisco.

Scott, B. (2001) *Partnering in Europe, incentive based alliancing for projects*, ECI, Thomas Telford, London.

Snieckus, D. (2003) Shell centres its thinking on Europe, *Journal of the Offshore Engineer*, Sept., Vol. **28** (9), pp 16-18.

Stevenson, N., Lihou, C., Lacy, K., and Dingwall, H. (2003) Competitiveness in the supply chain – exportability of knowledge, panel debate, *Offshore Europe 2003 Conference*, Sept., Aberdeen.

Townson, S. and Knight, R. (2003) Copy cats in the North Sea, *Scandinavian Oil-gas Magazine*, Vol. **31** (7/8), pp. 26-28.

UK Offshore Operators Association (UKOOA) (2003) Competing in a global economy, *2003 Economic Report*, Feb., London.

Warner, M, and Joynt, P. (2002) *Managing across cultures: issues and perspectives*, 2<sup>nd</sup> Ed., Thompson, London.

Wright, P.J.C. (1996) *The North Sea contracting industry – Key issues and companies*, Pearson Professional Limited, London.