

**THESE EXECUTIVE DOCTORATE IN BUSINESS ADMINISTRATION
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**HOW TO GAIN A COMPETITIVE ADVANTAGE IN A
MONOPSONIST INDUSTRIAL MARKET?**

**VALUE CREATION, BUYING CENTER AND SELECTION CRITERIA IN
THE DRILLING SECTOR OF THE OIL AND GAS INDUSTRY**

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Dedicated To

My Family

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“The meeting of two personalities is like the contact of two chemical substances: if there is any reaction, both are transformed.” Carl Jung (1875-1961).

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Abstract

This thesis focuses on the industrial buying behaviour in a monopsonist market. Previous research on industrial buying behavior has studied the specificities of the buying behavior in various industrial markets but not monopsonist markets. In this research, we analyze the characteristics of the buying behavior of a client in a monopsonist market that is the upstream oil and gas drilling sector. The oil sector is characterized in some markets by the monopsonist position of petroleum and natural gas companies such as Aramco, the Saudi Arabian Oil Company, in the Middle East.

The aim of this thesis is first to provide a better understanding of the competitive advantages and of the value creation through the value chain in a monopsonist market in the oil and gas industry, in the drilling sector (chapter 1). Second, the dissertation analyzes the buying center and the buying behavior in this sector, in the monopsonist case, that is in Saudi Arabia. The selection criteria of the supplier by the client are studied, with their specificities, depending upon the buying situation, modified rebuy or straight rebuy (chapter 2). Third, these selection criteria are compared for monopsonist and non monopsonist. The drilling sector in the oil and gas industry comprises both monopsonist markets (e.g. Saudi Arabia) and non monopsonist markets (e.g. Gabon). Therefore, the selection criteria can be compared between these markets and it can be ascertained whether or not the observed differences fit with what is expected from the sector and value chain analysis in monopsonist versus non monopsonist markets (chapter 3).

The case of monopsonist markets has not yet been studied in industrial buying behavior and in the literature on the buying center. This thesis is therefore conceptually anchored on the literature on monopsony and value chain analysis, but mainly on the industrial buying behavior and buying center research. More specifically, we focus on the Saudi Arabia case with the sole buyer, Aramco, for the drilling service providers in Middle East.

The methodology combines secondary and primary data collection, relying upon literature review, internal documents and documents from the sector, primary data collection with semi-structured in-depth interviews in Saudi Arabia with managers from the client and the service providers. It is also based upon quantitative analysis with questionnaires collected from managers in monopsonist and non monopsonist markets in the drilling sector of the oil and gas industry. One of the main difficulty in this research from a methodological point of

view is the fact that this research deals with sensitive issues for the respondents, who either work for the monopsonist client, Aramco, or for Schlumberger and its competitors. To collect reliable information through the semi-structured in-depth interviews or through the questionnaire, it was necessary not to introduce bias (reluctance to answer or on the opposite social desirability; and to avoid confidential questions). Developing trustful relations with the respondents was one of the issue of the data collection.

In this research, we identify the roles of the actors (buyer, influencer, decision-maker, initiator, user, and gatekeeper) involved in the buying process. We study the buying process itself with respect to the buying situations (modified rebuy and straight rebuy) as well as the supplier selection attributes for the monopsonist client. The buying center dimensions are studied, that is, the vertical and lteral involvements, the extensivity connectedness nd centrality of the buying center are studied. The selection attributes are compared between monopsonist and non monopsonist markets and we propose implications for the service providers, that is, the suppliers, to gain a competitive advantage in a monopsonist industrial market.

Introduction

This thesis focuses on the industrial buying behavior in a monopsonist market. Previous research studied industrial buying behavior with respect to roles and organizations specificities without examining the characteristics of the markets. In particular, they never examined industrial buying behavior in monopsonist markets.

In this research, we analyze the characteristics of the buying behavior of a supplier in a monopsonist market that is the upstream oil and gas drilling sector. The oil sector is characterized in some markets by the monopsonist position of petroleum and natural gas companies such as Aramco, the Saudi Arabian Oil Company in the Middle East. But such markets can be either monopsonist or oligopolistic. The choice of the drilling sector in the oil and gas industry has been made for conceptual and practical reasons. Conceptually, the drilling sector in Saudi Arabia fits the characteristics of a monopsonist market with one client, Aramco, and several suppliers (or service providers), Schlumberger and its competitors. Moreover, this sector comprises monopsonist markets (for example Saudi Arabia or Algeria) and non monopsonist markets (for example, Gabon, Venezuela, Indonesia, etc.), which will make the comparison possible between monopsonist and non monopsonist in our research. From an empirical point of view, this sector, which is conceptually relevant, presents the advantage of being a feasible field of analysis in terms of data collection. Based upon our ten years operational experience in this sector, we had access to multiple sources of information, with the possibility to mobilize key respondents for this research on the buying center, in order to define the roles, to understand and formalize the buying process, and to analyze the selection criteria of the monopsonist.

This thesis therefore has three objectives. The first objective is to provide a better understanding of the competitive advantages and of the value creation through the value chain in a monopsonist market in the oil and gas industry, in the drilling sector. This is the object of chapter 1. Chapter 1 develops the characteristics of a monopsonist market, with examples in various sectors, and then applies it to the oil and gas industry. It shows that some markets in the drilling sector are not monopsonist but rather oligopolist. It also shows how the analysis of the sector with Porter's five forces and the value creation via the value chain can be studied in the oil and gas industry for a monopsonist. It also questioned the Porter's value chain and its contribution for the issue at hand. We investigate the new value chain approach (Presutti and

Mawhinney, 2013) and assess its potential contribution to a better understanding of the value creation in the oil and gas sector. Implications for the analysis of the buying center and the buying selection process as well, as the selection criteria of the monopsonist are suggested. This first objective corresponds to our Research Question 1:

RQ 1: What are the sector characteristic and the value chain in a monopsonist market (Case of the drilling Sector in the Oil Industry)

The second objective is to analyze the buying center and the buying process in a monopsonist market. Many have investigated the issue of the buying process and there is a general agreement that the major components of industrial buying behaviour are: the buying process; the buying center; and various factors that may affect this buying process and the buying center (Bapista, 2001). Four different forces may influence the buying process (Webster and Wind, 1996): individual, social, organizational and environmental. In this research, we focus on individual and organizational forces. As for the social and environmental forces, we mainly take into account the political/social forces and environmental forces such as sustainability. Chapter 2 presents the core issue of the thesis that is the buying center, the buying process and the selection criteria when the buyer is a monopsonist, as it is in the drilling sector in the oil and gas industry in the Middle East. A brief review of the literature on industrial buying behavior and the buying center is presented, with the state of the art on this issue in the oil and gas sector. In order to explore the buying situations in this sector (modified rebuy and straight rebuy), the composition of the buying center with the various roles of the actors, and the way the buying process is organized, a thorough understanding of the phenomenon is necessary. There exists buy phases from the identification of a need to the purchase decision and the evaluation. These buy phases pass through eight different stages, starting with the acknowledgement of a need, ongoing through examine for and select the alternatives and the supplier, ending with performance feedback and evaluation (Robinson et al. 1967; Pras and Tarondeau, 1981; Webster and Wind, 1996). The buying process is a complex process over time that involves interaction between several individuals, who have different roles, both within and outside organizations (Pras and Tarondeau, 1981; Webster & Wind, 1996), and here within and outside the monopsonist. The organizations can be the unique client that is the monopsonist (Aramco), the service providers or suppliers (Schlumberger and its competitors) but other actors such as important personalities in the Saudi Arabian Kingdom. The buying center is not a formalized organization but comprises all the actors who play a role in the buying process. In order to collect relevant information, we needed to identify key informants. We

carried out a qualitative analysis with 17 key knowledgeable informants in order to explore the situations, the roles in the buying center, the buying process. Semi-structured in-depth interviews were carried out with senior staff of the monopsonist, that is the oil and gas client company and with the international drilling service providers companies working in Saudi Arabia. For the monopsonist, we conducted semi-structured in-depth interviews with managers in different departments and different roles, covering the variety of functions and roles: drilling technical department; drilling and operations departments, material and functions departments, operations departments. In the same way, the interviews were conducted with managers from all the relevant functions and roles in the international drilling service providers companies (Schlumberger, Baker, Halliburton, and NOV): operations and sales managers, senior product engineers and Designers, demand planner – logistics. The second objective corresponds to our Research question 2:

RQ 2: What are the Buying Center and the Buying Behaviour (Process, roles and Influences) in a monopsonist market? (Case of drilling Sector in the Oil Industry)

A third objective was to assess the importance of the selection criteria for a monopsonist. Still in chapter 2, the same qualitative analysis has been used to identify the selection criteria of the monopsonist under two situations, the straight rebuy and the modified rebuy situation. The importance of the criteria was also assessed, based upon the respondent's opinion. Internal documents also helped us estimate the potential competitive advantage of the competitors on these various attributes. This exploratory finding gives useful cues to service providers in order to build their competitive strategies. However, a quantitative analysis is needed to provide some external validity to these results. Chapter 3 presents the results of a quantitative analysis, with a structured questionnaire about the importance of the criteria (identified in chapter 2) in the selection of the supplier by the client. This questionnaire was administered over 77 respondents (managers from the monopsonist and from the service providers) in Saudi Arabia. The results analyze the responses with respect to what was expected regarding the qualitative analysis and the buying situations. This was done by using t-tests for paired comparison over 77 respondents between two situations, modified rebuy and straight rebuy. Moreover, we extended the quantitative analysis to compare the selection criteria between monopsonist and non monopsonist. Therefore, we added another monopolistic market (Algeria) to Saudi Arabia but also analyzed non-monopolistic markets (Gabon, Venezuela, Canada, Indonesia, Russia). The sample comprised 85 service providers and client managers in monopsonist markets, whose selection criteria were compared with 31 service providers and

clients' views in non monopsonist markets. From this 116 sample of managers we have been able to compare the selection criteria for monopsonists with those of non monopsonists, using t-tests for comparison of means for independent samples. The third objective corresponds to Research question 3:

RQ3: What are the important attributes in the buying center and how to gain a Competitive advantage in a Monopsonist market? (Case of the drilling sector in the Oil industry)

Globally, the methodology is a mixed methodology. For secondary data, we use multiple sources: internal and sectoral documents, internal notes from companies, press releases, journals web sites and articles, consulting reports. Our methodology combines secondary and primary data collection, relying upon literature review, documents, and primary data collection with semi-structured in-depth interviews in Saudi Arabia with managers from the client and the service providers, but also quantitative analysis with questionnaires collected from managers in monopsonist and non monopsonist markets in the drilling sector of the oil and gas industry. One of the main difficulty in this research from a methodological point of view is the fact that this research deals with sensitive issues for the respondents, who either work for the monopsonist, Aramco, or for the service providers, Schlumberger and its competitors. In order to collect reliable information through the semi-structured in-depth interviews or through the questionnaire, it was necessary to avoid bias (reluctance to answer or on the opposite social desirability; or to avoid confidential questions), which has been a real challenge in this sensitive sector. Developing trustful relations with the respondents was one of the issue of the data collection.

The implications of this research are also important. The identification of the roles of the actors (buyer, influencer, decision-maker, initiator, user, and gatekeeper) involved in the buying process as well as the decomposition of the buying process itself, with respect to the buying situation (modified rebuy and straight rebuy) has not been analyzed for a monopsonist to our knowledge. Furthermore, a thorough analysis of the selection attributes is vital. A significant proportion of Big Sized International Oil and Gas companies that operate in the Middle Eastern oil & gas drilling sector has no sizable presence in terms of market share. A better knowledge of the monopsonist expectations and of how to create value can help them gain a better access to the upstream oil and gas drilling sector and better shape their strategy for the future. Typically, International Oil/Gas Projects are widely spread all over the world

and various companies from different fields and businesses are involved in them. As for Saudi Arabia, it is the biggest hot spot in the world with enormous resources of Oil & Gas. Despite the current Oil and Gas crises, multinational companies (MNCs) become more interested in these projects and they invested massive amounts of money in Saudi Arabia (Agnihotri, 2015). Marketing in these projects is considered very complicated. Expectations need to be studied very carefully with a reliable methodology. Companies should have an excellent interpretation and understanding of the decision-making units and of each party's interests and necessities. Typically, in all projects, monopsonist companies are responsible for procurement and all the suppliers and sub-suppliers have to deal with them. So, suppliers have to understand monopsonist's versus non monopsonist's buying behavior and how to create value and gain competitive advantages.

Tables A and B summarize the research questions, the corresponding chapters and phases of the methodology. These tables will be used in the different chapters of the thesis to mark at what stage we are in the dissertation.

Table A Research questions and organization of the thesis

Research Questions, applied to the case of the drilling sector in the oil industry	Chapters and sections	Methodology
RQ1: What are the sector characteristics and the value chain in a monopsonist market	<p>Chapter 1: Monopsonist market and value chain in the oil industry</p> <p>Section 1. Monopsonist market and the drilling sector</p> <p>Section 2. Monopsonist market and Porter's five forces analysis</p> <p>Section 3. Monopsonist market and the value chain in the drilling sector</p>	<p>Literature review</p> <p>Secondary data</p>
RQ2: What are the Buying center and the Buying Behavior (process, roles and influences) in a monopsonist market	<p>Chapter 2: The Buying center and Buying process in the oil industry in a monopsonist market</p> <p>Section 1. Buying center, Buying process and specificities of the oil industry</p> <p>Section 2. Qualitative approach: methodology</p> <p>Section 3. Analysis of the buying center and buying behavior in Saudi Arabia</p>	<p>Literature review</p> <p>Primary data</p> <p>Qualitative analysis</p>
RQ3: What are the important attributes in the Buying center and how to gain a competitive advantage	<p>Chapter 2 (continued)</p> <p>Section 4. Identification of the important attributes in the buying center and how to gain a competitive advantage</p>	<p>Qualitative analysis</p>
	<p>Chapter 3 Important attributes in the Buying center of a monopsonist market (quantitative approach)</p> <p>Section 1. Quantitative methodology</p> <p>Section 2. Analysis in a monopsonist market</p> <p>Section 3. Comparison between monopsonist and non monopsonist markets</p> <p>Section 4. Other explanatory variables of differences</p>	<p>Quantitative analysis</p>

Table B Research questions and Methodology

Research Questions applied to the case of the drilling sector in the oil industry	Methodology	Data collection	Data analysis
RQ1: What are the sector characteristics and the value chain in a monopsonist market	Literature review Secondary data		Review and analysis of the literature and of secondary data: oil industry and drilling sector documents
RQ2: What are the Buying center and the Buying Behavior (process, roles and influences) in a monopsonist market	Literature review and Primary data	Analysis of internal data and secondary data about the role of the Kingdom	Literature review and analysis of Schlumberger internal documents
	Qualitative analysis	16 semi-structured in-depth interviews in Saudi Arabia with managers from suppliers (Schlumberger and competitors) and the supplier (Aramco)	Content analysis of the interviews
RQ3: What are the important attributes in the Buying center and how to gain a competitive advantage	Qualitative analysis	16 semi-structured in-depth interviews in Saudi Arabia with managers from suppliers (Schlumberger and competitors) and the supplier (Aramco)	Content analysis of the interviews in the Saudi-Arabian monopsonist market
	Quantitative analyses : Saudi Arabian monopsonist market	77 managers (41 managers from the suppliers: Schlumberger and competitors service providers; 36 managers from the client: Aramco)	t-tests: comparison of means for dependent samples (comparison between straight rebuy and modified rebuy) for
	Quantitative analyses : monopsonist versus non monopsonist markets	116 managers (85 in a monopsonist market and 31 in non monopsonist markets)	t-tests: comparison of means for independent samples (monopsonist versus non monopsonist)

1

Monopsonist market,
Structure of the sector
and Value chains
in the oil industry



Table A - Research questions and organization of the thesis

Research Questions, applied to the case of the drilling sector in the oil industry	Chapters and sections	Methodology
RQ1: What are the sector characteristics and the value chain in a monopsonist market	<p>Chapter 1: Monopsonist market and value chain in the oil industry</p> <p>Section 1. Monopsonist market and the drilling sector</p> <p>Section 2. Monopsonist market and Porter's five forces analysis</p> <p>Section 3. Monopsonist market and the value chain in the drilling sector</p>	<p>Literature review</p> <p>Secondary data</p>
RQ2: What are the Buying center and the Buying Behavior (process, roles and influences) in a monopsonist market	<p>Chapter 2: The Buying center and Buying process in the oil industry in a monopsonist market</p> <p>Section 1. Buying center, Buying process and specificities of the oil industry</p> <p>Section 2. Qualitative approach: methodology</p> <p>Section 3. Analysis of the buying center and buying behavior in Saudi Arabia</p>	<p>Literature review</p> <p>Primary data</p> <p>Qualitative analysis</p>
RQ3: What are the important attributes in the Buying center and how to gain a competitive advantage	<p>Chapter 2 (continued)</p> <p>Section 4. Identification of the important attributes in the buying center and how to gain a competitive advantage</p>	<p>Qualitative analysis</p>
	<p>Chapter 3 Important attributes in the Buying center of a monopsonist market (quantitative approach)</p> <p>Section 1. Quantitative methodology</p> <p>Section 2. Analysis in a monopsonist market</p> <p>Section 3. Comparison between monopsonist and non monopsonist markets</p> <p>Section 4. Other explanatory variables of differences</p>	<p>Quantitative analysis</p>

Table B Research questions and Methodology

Research Questions applied to the case of the drilling sector in the oil industry	Methodology	Data collection	Data analysis
RQ1: What are the sector characteristics and the value chain in a monopsonist market	Literature review Secondary data		Review and analysis of the literature and of secondary data: oil industry and drilling sector documents
RQ2: What are the Buying center and the Buying Behavior (process, roles and influences) in a monopsonist market	Literature review and Primary data	Analysis of internal data and secondary data about the role of the Kingdom	Literature review and analysis of Schlumberger internal documents
	Qualitative analysis	16 semi-structured in-depth interviews in Saudi Arabia with managers from suppliers (Schlumberger and competitors) and the supplier (Aramco)	Content analysis of the interviews
RQ3: What are the important attributes in the Buying center and how to gain a competitive advantage	Qualitative analysis	16 semi-structured in-depth interviews in Saudi Arabia with managers from suppliers (Schlumberger and competitors) and the supplier (Aramco)	Content analysis of the interviews in the Saudi-Arabian monopsonist market
	Quantitative analyses : Saudi Arabian monopsonist market	77 managers (41 managers from the suppliers: Schlumberger and competitors service providers; 36 managers from the client: Aramco)	t-tests: comparison of means for dependent samples (comparison between straight rebuy and modified rebuy) for
	Quantitative analyses : monopsonist versus non monopsonist markets	116 managers (85 in a monopsonist market and 31 in non monopsonist markets)	t-tests: comparison of means for independent samples (monopsonist versus non monopsonist)

CHAPTER 1: Monopsonist market, structure of the sector and value chains in the oil industry

The objective of this chapter is to answer the first research question.

Research question 1. RQ1. What are the sector characteristics and the value chain in a monopsonist market (the case of the oil and gas industries and of the drilling sector in Saudi Arabia)

In other words, the objective of this chapter is to understand the characteristics of the drilling sector and of the oil and gas industry, with the forces at work, following Porter's five forces model, but also the value chain characteristics in this domain. We shall investigate the evolution of the practices with the new value chain model.

This chapter gives a global understanding of the sector before going to the core of this research in chapter 2 and 3 with the other research questions. This will necessitate a review of the literature in industrial buying behavior, with first a qualitative analysis in Saudi Arabia a monopsonist market, then a quantitative analysis in and out of Saudi Arabia with monopsonist and non monopsonists markets non monopsonist markets. Therefore, we present below the main definitions and concepts related to monopsony power. First, we introduce the monopsony market with its application to the oil and gas industries and to Saudi Arabia. Then we analyzed the sector.

1.1 Monopsonist market

The concept of monopsony is not new. The monopsony theory has first been developed by Robinson (1944). There is a single buyer in the market, with a strong purchase power, that is a "monopsony power", which is the counterpart of the "monopoly power" (case of a single seller). **In a monopsonist market, the buyer can set prices to maximize its profits (without the constraints of a perfect competition) and to minimize its costs.**

Hundreds of articles in economics dealt with imperfect competition (monopoly, oligopoly, duopoly, oligopoly). A more limited number studied the monopsonist market, and most of them investigated the labor factor (Table 1.1; Table 1.2; Table 1.3) and not the products. In this research, we take a product- and service- oriented point of view, without

neglecting the organizational aspects. First, we examine the buying power of a monopsonist, second the characteristics of the drilling sector, the rules of the games. Buying power

A monopsonist has buying power in its market. This buying power means that a monopsonist can adventure its bargaining power with a supplier in negotiation, weather in lesser prices or special products or terms. The reduced cost of buying contributions increases their profit margins. Monopsony occurs in both product and labour markets. In this chapter, we concentrate on buying power in the markets for products and services, and the drilling services in the oil and gas industries, in order to understand the general benefits and drawbacks of monopsony for both parties, the seller side and the buyer side.

Table 1. 1 Examples of monopsony power

Examples of monopsony power
<ul style="list-style-type: none"> • British Sugar company buys almost the whole production of beef crop in UK • Premier Foods, a huge UK food manufacturer has asked its suppliers for payments to stay in the business: this has become the well-known “pay to stay” condition (2014) • Brewing giant Carlsberg unilaterally decided to extend its payment deadlines to to 93 days, in breach of European guidelines • Tata Steel has warned suppliers that if they don't cut prices by 30% they risk losing Tata's business (2015) • The UK is paying less for new cancer drugs than a number of other high-income countries, according to a report in The Lancet Oncology (2015) • Aramco forces its suppliers to double the percentage of locally-produced energy-related goods and services (2015). <p>(Source: www.saudiaramco.com)</p>

The monopsony power allows bigger companies to achieve purchasing economies of scale leading to lower long run average costs. They can also lower purchase costs, which bring about higher profits and increased returns for shareholder, and the extra profit might be used to enhance capital investment or research and development. Sometimes, the best prices that have been negotiated with manufacturers are passed on to consumers. This may result in improved value for money as in the case of the UK National Health Service which used its bargaining power to drive down the prices of routine drugs used in NHS treatments. Ultimately this means that cost savings allow for more treatments within the NHS budget. In some cases, the monopsonist can act as a useful countervailing power to the selling power of a monopolist, and helps protect the interests of consumers. Monopsony power can also take place at government levels. For example, countries like China secure arrangements such as the

purchase of mineral deposits from developing economies and less advanced countries, for example in Africa. In such a case, China they have a dominant buying power even if it is not the single possible buyer on the market.

But monopsonist power may lead to important disadvantages for the end customers and for the suppliers. For example, Amazon prices for water spike as Florida prepared for Hurricane Irma on September 2017. Krugman (2014) has also been critical of the monopsony power of Amazon in the book industry “Amazon is acting as a monopsonist, a dominant buyer with the power to push prices down. By putting the squeeze on publishers, Amazon is ultimately hurting authors and readers”. Monopsonist clients may also use their buying power to squeeze lower prices out of suppliers. This reduces the revenues of companies in the supply chain and can lead to lower incomes. Strong recent examples have been the battle of milk farmers to get a decent price from the dominant retailers, that is a price which at least that covers the farmers production cost. In oil and gas Industry, some services providers have been banned of the market by the monopsonist client, as it has been the case for NOV (National Oil Well Varco) in Saudi Arabia.

Monopsony is the buying-side equivalent of the selling-side monopoly. Much as a monopoly, which is the only seller in a market, monopsony is the only buyer. While monopsony could be analysed for any type of market, it has been mostly studied with respect to the labour market (Table 1.7). When the factor is a product or service, a single buyer completely controls the demand for this product or service. While the market for any type of good, service, resource, or commodity could, in principle, function as monopsony, this form of market structure tends to be most obvious for the exchange of factor services.

A monopsony is characterized by the fact that a single company buys the whole output in a market and completely controls the demand side of the market. It achieves a single buyer status since there are no other alternatives for the seller on the market. Finally, this single buyer status is reinforced when barriers to entry exist such as government license or control, resource ownership, high start-up costs, decreasing average total cost, patents and copyright. A monopsonist can even control the seller's entry in some cases or at least gives its approval. Thus, the presence of a single buyer, the absence of other alternatives, and the existence of barriers to entry are three important characteristics of a monopsonist market.

Table 1. 2 Monopsony among other imperfect competition market structures

	Monopoly	Oligopoly	Duopoly	Monopolistic competition	Oligopsony	Monopsony
<i>Sellers or suppliers</i>	One	Few	Two	Many	Many	Many
<i>Buyers</i>	Many	Many	Many	Number may vary	Few	One buyer
<i>Market power and market control</i>	Very high for the seller	High for the sellers	Shared between the duopolists	Some degree with respect to the uniqueness of the products	High for the buyer	Very high for the buyer
<i>Price</i>	Possibility to charge overly high prices, price discrimination	Higher prices for consumers	Incentives to cooperate in the Bertrand model	Non price competition	Relative control on market price	Profit maximization and cost reduction for the buyer
<i>Decisions and products</i>	Lack of substitute goods	Decisions of one firm influenced by the decisions of other firms	Possible product or localization differentiation	Highly differentiated products which are not real substitutes	Variety of supply and offer on the market	Analysis of the labor market, but also of product factors
<i>Barriers to entry</i>	High barriers	Relatively high barriers on the seller side	High barriers (brand loyalty, product differentiation economies of scale)	Few barriers to entry and exit	Relatively high barriers on the buyer side	High barriers to entry on the buyer side
<i>Authors</i>	Robinson	Robinson and Chamberlin	Bertrand, Cournot	Chamberlin	Robinson and Chamberlin	Robinson

Note: This table has been elaborated by the author by using multiple sources (Robinson, 1933; Chamberlin 1933; Bertrand () and Cournot ()); Rpert, 2004; Binder et al. (2001); etc)

1.2 Characteristics of the drilling sector in the oil and gas industry and monopsony

1.2.1 The petroleum industry and the drilling in the upstream sector

The petroleum industry comprises the upstream, the midstream and the downstream sectors.

1. The **upstream sector** includes exploration, production, and drilling.
2. The midstream sector includes pipeline, storage, distribution, and some processing.
3. The downstream sector includes refining and processing.

As shown in the figure below, these three sectors are vertically integrated. Many of the larger companies are fully integrated and include all three sectors in their core business.



Note: LNG includes pipeline, storage, distribution and some processing

Figure 1.1 Types of Oil and Gas markets based on Market Type
(Source : <http://www.xpertooffshore.com/>, 2011)

The **upstream sector** includes exploring for oil and gas fields, drilling of the exploratory wells. If hydrocarbons are found, drilling and operating the producing wells. Thus, exploration will switch to development. The upstream sector has historically been the most profitable of the three sectors and it the one we shall focus on.

1. *Exploring, which includes survey work and seismic methods*

- a. Survey work.* Initially survey work is conducted to find potential fields. It is typically both geological and geophysical in nature. Geological surveys are concerned with using the information that can be gathered from the earth's surface, using techniques to gain information from within the earth in order to locate the hydrocarbon. Geological surveys can be accomplished by doing field mapping or through the use of aerial and satellite imagery. Geophysical surveys are completed most commonly using seismic reflection methods but can also include techniques based on seismic refraction as well as on magnetic, gravity, and electromagnetic fields.
- b. Seismic Methods.* The predominance of seismic methods in petroleum exploration is due to various factors, the most important being high accuracy, high resolution, and great penetration capability of the method. Seismic reflection and refraction methods use sound waves that are sent into the ground

and are reflected and refracted off the subsurface strata back up to the surface where they are collected by seismic receivers.

2. Drilling

For land-based wells, a drilling pad is built for the drilling equipment and support services. The type of pad constructed depends on the geography, environmental concerns, cost, soil type, and any seasonal constraints. The rigs and support equipment are in the form of portable modules that can be easily assembled and disassembled when the job is done. These modules may include a derrick, generators, cement equipment, drilling and mud-handling equipment, and drill pipe, tanks for fuel and water, housing for the workers, canteen facilities, and IT/communications equipment. In more remote sites, a helipad may be required; a designated parking area for all vehicles may be included on the pad. There must also be provision for the handling of all waste materials at the drilling site.

Offshore drilling is handled using a mobile rig, referred to as a mobile offshore drilling unit (MODU). Depending on the ocean depth, seabed geography, average wind speed, average wave height, currents, environmental concerns, and cost, a particular type of MODU will be selected. The most common types include jack-ups, semisubmersibles, drill ships, and water barges.

The drill pads and rigs often generate a high level of environmental concern. Very detailed environmental impact studies are usually required before the drill site can be set up.

Once drilling starts, a drill pipe with a drill bit is fed down the borehole and drilling fluid or mud is continuously circulated down the pipe and back to the surface. After initial testing and drilling is completed, the pad is dismantled. If commercial quantities of hydrocarbons have been identified, a wellhead valve assembly is installed.

When a potential hydrocarbon field is identified, appraisal wells are drilled to better determine the size and extent of the field. Information from the exploration well in conjunction with the geological and geophysical survey information helps to determine the required number of appraisal wells. These wells are drilled in the same manner as the initial exploration wells. Directional drilling may be used to drill at an angle from the site to get

information from other parts of the reservoir. This type of drilling limits the footprint and can mitigate environmental concerns.

3. *Production, which includes development and production facilities*

- a. Development.* After the field has been defined, production wells are drilled. These are also referred to as development wells as they allow the field to be developed commercially. The number of wells required varies with the size of the reservoir, subsurface geology, surface geography, access, and budget. Offshore drilling of development wells requires permanent structures to support the required facilities. The development platform is installed to serve as the gathering and processing center for the field. Numerous development wells may be drilled directionally from the same platform. Additional satellite platforms may be required for very large fields; these are connected by subsea pipelines. In deep water locations, ships and semisubmersibles serve as floating platforms. Multiple production wells can be drilled from the same drilling pad to reduce the environmental footprint as well as reduce infrastructure costs. Before the drill rig can move offsite from the well, it has to be prepared for the next phase which is production. The heavy drill pipe is replaced with lighter weight tubing. The blowout preventer is replaced by a control valve assembly called a Christmas tree.
- b. Production facilities.* Production facilities serve as a gathering site for the hydrocarbons when they reach the surface. A production facility processes the hydrocarbon fluids and separates oil, gas, and water. The size and type of production facility depends on the type of reservoir, the volume of hydrocarbons to be processed, environmental regulations, access, and budget. When the oil comes into the facility, it needs to be cleaned up of any dissolved gas before it can be exported. Natural gas needs to be stabilized and cleaned up of any liquids, hydrogen sulphide, carbon dioxide, and other unwanted components. Some of the functions that occur in a typical producing well include monitoring of the hydrocarbon flows, maintenance of all equipment, periodic downhole servicing of the well, and overall safety and security of the personnel and equipment. After the commercial production has reached an end,

the installations must be decommissioned and the area rehabilitated as defined by environmental standards. Ongoing monitoring of the area is usually required for a defined period of time after the site has been closed.

The midstream and downstream sector, which are not the object of our analysis are presented in Table 1.3, to let have a comprehensive view of the industry.

Table 1. 3 Midstream and downstream sectors

<i>Midstream and downstream activities</i>
<p><i>Midstream sector</i></p> <p>Midstream operations include elements of traditional upstream and downstream business, but often, midstream operations are included in the downstream category. The midstream activities take place after the initial production phase and include storage, pipeline, and distribution. But this sector may include some processing as well.</p> <p>The midstream sector provides the link between the petroleum- producing areas and the population centres where most consumers are located. Because of this, transmission pipeline companies play a major role in this sector. The midstream components for natural gas include gas-gathering systems, gas-processing facilities, pipelines, gas marketers, and natural gas liquid (NGL) marketers. Gas-processing facilities include plants that use fractionation, cryogenic processing, and treating and separation.</p> <p>This sector may include facilities that gather, process, and transport gas for third-party shippers, operators who act as merchants utilizing the assets for their own buy/sell needs, or combinations of both. Before World War II, midstream distribution models rarely dealt with any cross border trade in natural gas.</p> <p>Successful managing of midstream operations requires clearly defined processes and systems. Midstream operations with customers may include contracts, nominations, scheduling, allocations, settlements, imbalance, inventory, and accounting. Additional processes may include collecting, organizing, and analysing measurement data to prepare for operational and commercial processing. Right-of-way management for gathering facilities is also a vital but challenging part of midstream operations.</p>
<p><i>Downstream sector</i></p> <p>The downstream sector includes oil refineries, petrochemical plants, petroleum product distributors, retail outlets, and natural gas distribution companies. In the refining process, crude oil is converted to three primary products: gasoline, middle distillates, and heavy fuel oils. The downstream industry includes products such as gasoline, jet fuel, diesel, heating oil, asphalt, lubricants, synthetic rubber, plastics, fertilizers, antifreeze, pesticides, pharmaceuticals, natural gas, and propane.</p> <p>In the refining process, various components of crude oil are separated by their boiling points. Some of the refining products include heavy gas oil, light gas oil, kerosene, naphtha, and straight-run gasoline. Refineries also produce pure chemicals called feedstocks such as methane, ethylene, propylene, butylene, and naphthalene. Methane is the most common hydrocarbon and is the gas from pipelines that is burned in homes and industry.</p>

1.2.2 Vertical Integration: generate competitive advantages

With a vertically integrated structure, a company finds, produces, transports, refines, and markets oil as one continuous operator. Vertical integration may lead to market

concentration and less-than-competitive pricing. An industry that is dominated by vertical integration has little need to procure supplies on a daily basis or to manage price risk. With vertical integration, longer-term contracts are important in managing a continuous flow from source rock to gas tank without slowing down. Some argue that the nature of petroleum itself shapes the industry structure. When the flow is interrupted, shortages show up quickly. It can also be argued that vertical integration may be self-reinforcing as it increases costs for those not integrated.

One of the incentives for companies to become vertically integrated is to facilitate contract enforcement with industry service companies across international boundaries. Without vertical integration, this can become quite difficult, transforming the value chain and the competitive advantages.

1.2.3 Industry Organization and Competition: types of competing firms

1.2.3.1 Oil Companies

The oil and gas industry is composed of three key categories of participants:

- 1- Internationally owned oil companies (IOCs)
- 2- National oil companies (NOCs) that operate as corporate entities
- 3- Government-sponsored oil enterprises (GSEs) that operate as government agencies.

Frequently, we find these groups establishing strategic alliances to facilitate their mutual objectives. In addition, there may be several groups involved, such as the governments of distinct countries, service companies, and independent oil companies. The largest investor-owned companies are ExxonMobil, Royal Dutch Shell, British Petroleum (BP), Total, and Chevron, more commonly known as the Big Five.

Out of the top 20 oil/gas producers, 14 are NOCs. Government-sponsored enterprises regularly enjoy access to areas that may be denied to external companies.

Individual countries can limit access and force production targets. Service companies saw significant growth during the oil boom from 2005 to 2008. The current shale gas boom has been profitable for many small independents.

1. *Internationally Owned Oil Companies (IOCs)*

IOCs are mainly investor owned and primarily pursue to increase shareholder value and make investment decisions constructed on economic influences. These companies typically move rapidly in growth and production of the identified reserves and sell their output in the global market. Although these business corporations are affected by the laws of the countries in which they produce oil, all decisions are ultimately made in the interest of maximizing profit for their diversified shareholders, not for a government (Soligo & Jaffe, 2007).

IOC shares are actively traded and they publish annual reports while enduring by the rules put forth by the Securities and Exchange Commission (SEC) and other bodies.

The difference between IOCs and NOCs is not always clear because, over time, some NOCs such as British Petroleum (BP), Total, and Eni S.p.A. have been privatized to some degree. There are companies such as Statoil and Petrobras that, although partially privatized, still seem to operate in a manner that returns the interests of their national governments. The largest three U.S.-based international oil companies (ExxonMobil, Chevron, and ConocoPhillips) are accountable to their shareholders, not the U.S. government.

The IOCs have competitive advantages in project and risk-management capabilities and techniques, and in access to technology, capital, and downstream markets. IOCs have a strong potential to define markets for new products, whereas other entities do not.

But how did the IOCs expansion global power? John D. Rockefeller in 1870 formed the largest oil conglomerate of the time and named it Standard Oil. In 1890, antitrust regulation was established, resulting in the breakup of Standard Oil in 1911, ultimately resulting in the formation of four of the Seven Sisters: Exxon, Mobil, Chevron, and Texaco.

A nationalistic push in the Middle East to control more of the hydrocarbon production, distribution, and price resulted in the formation of the Organization of

Petroleum Exporting Companies (OPEC) on September 14, 1960. OPEC was premeditated to fight price cuts by Standard Oil of New Jersey, later renamed as Exxon, and to reduce the increasing power of the seven sisters. OPEC along with many others, considered the seven sisters to be the world's most powerful oil cartel at that time. Some of the countries during that same time that had a significant quantity of production by foreign IOCs included Saudi Arabia, Iran, Iraq, Kuwait, Qatar, United Arab Emirates, Nigeria, Libya, Algeria, Angola, Venezuela, Ecuador, Mexico, Philippines, and Indonesia.

Throughout the recent history of the IOCs, mergers have caused in fewer but much larger oil conglomerates. Starting in the mid-80s, the industry structure was evolving in the direction of alliances and mergers of companies. For example, in 1984, Chevron acquired Gulf and Mobil Oil acquired Superior Oil. During the period from 1987 to 1998 BP, Sohio, and Amoco were merged into one entity and the Saudi's give the Americans their shares and Aramco become completely National Company.

The original seven sisters were decreased to only four sisters to include ExxonMobil, Chevron, BP, and Royal Dutch Shell. Other consolidations included BP obtaining the refineries and distribution system of ARCO, Chevron acquiring Unocal, and Shell acquiring Pennzoil. In 2002, ConocoPhillips was formed through the consolidation of Conoco, Phillips, and Tosco with the Alaskan resources of ARCO. IOCs are only accountable to their shareholders, not the government, but they still must stand by the applicable regulations including those of an environmental nature within the country they are operating.

Table 1.4 Large Upstream Non-OPEC Companies

Company Name	Home Country	Ticker (NYSE)
ExxonMobil	U.S.	XOM
BP	UK	BP
Lukoil	Russia	LUKO.PK
Royal Dutch Shell	UK & Netherlands	RDS-A
Total	France	TOT
TNK-BP	Russia	
Chevron	U.S.	CVX
Surgutneftegaz	Russia	
ConocoPhillips	U.S.	COP
Tatneft	Russia	
Repsol-YPF	Spain	REP
Occidental	U.S.	OXY
Gazprom	Russia	
Petro-Canada	Canada	
Hess Corporation	U.S.	HES
Suncor Energy	Canada	SU
Devon Energy Corporation	U.S.	DVN
Apache Corporation	U.S.	APA
Bashneft	Russia	
Anadarko Petroleum	U.S.	APC
Marathon Petroleum Corporation	U.S.	MRO
BHP Billiton	Australia	BBL
EnCana Corporation	Canada	ECA

2. National Oil Companies (NOCs) (Monopsonist and Non-Monopsonist)

The NOCs are a hard group to define and in fact some companies, such as Statoil, have shifted between the NOC and IOC definitions overtime. NOCs have close relationships with the government of the country in which they are based, but that association can range from complete arrangement with the government to an arm's-length relationship that is minimally impacted by any change in the ruling party. NOCs can be further defined as oil companies predominantly owned or controlled or both by a single national government.

The government role can range from 100% state control to more of a stakeholder role, in which a minority "golden share" is retained by the government. This part usually has associated approval/veto powers. Both Eni and Petrobras are examples of the latter relationship.

The Arab oil embargo in 1973 awakened oil-consuming nations to have better control over their energy provisions, and hence many NOCs were created. These first

NOCs included British National Oil Company (BNOC), Japanese National Oil Company (JNOC), Petro-Canada (Canadian ownership), and StatOil (Norwegian ownership). But as the industry continued to evolve, JNOC was disbanded and PetroCanada was privatized. As defined, a majority of the largest oil companies are state-owned NOCs, not IOCs.

NOCs purpose as an extension of a government or a government agency. NOCs have exclusive rights to explore and develop petroleum resources within the home country. They decide on the degree to which they necessitate participation by private companies.

It is important to note that NOCs do not classically operate based on market principles. Their objectives might include creation of jobs, economic growth, and energy security. NOCs can also be a conduit for the government to realize its foreign policy goals, often through IOCNOC or NOC-NOC alliances. They can add to the general economic development through technology transfers into other industry segments and through fuel subsidies to targeted industries.

A number of supplementary businesses are often associated with NOCs, including electric power generation, chemicals, minerals, and all mode of infrastructure. Some interests are in non-energy retail and commercial assets. These objectives may be critical to the national government but may not allow for expansion of shareholder value.

To understand the motivations of NOCs, one must therefore look beyond the oil fields and refineries.

In terms of energy security goals, NOCs often think outside security of supply to also include security of demand which means avoiding having one consumer becoming of critical importance and effect to the NOC.

NOCs may use similar investment-funding mechanisms to those used by the IOCs. These comprise, but are not limited to, equity and debt securities in public capital markets.

For example, several NOCs in the Middle East have established retained earning funds to tap into when their oil revenues may be running low. NOCs may also follow the model where they concern all net proceeds to their governments. This tactic necessitates that the NOC compete for government funds on a continuing basis. This model makes it difficult at best to sustain and achieve long-term development objectives.

Many NOCs follow the vertical integration model for the same reasons IOCs do. There is added value in producing and selling petroleum products in addition to the core products of oil and gas. The diversification leads to lower levels of risk, and vertical integration supports a greater degree of diversification.

According to Bloomberg, PetroChina still ranks first in market capitalization when compared to some of the other large NOCs (Table 1.5). Many NOCs are not publicly traded and thus cannot be easily valued.

Table 1.5 NOC Market Capitalization

Company	Country	Market cap (billions USD/2013)
Petrobras (PBR)	Brazil	79.9
StatOil (STO)	Norway	65.14
Ecopetrol (EC)	Columbia	86.11
PetroChina (PTR)	China	216.16
CNOOC Ltd (CEO)	China	74.3

Abbreviations: CNOOC, China National Offshore Oil Corporation; USD, U.S. dollars.

In NOCs, measures of productivity are not so accurate because there may be hidden subsidies perhaps in the form of access to the oil/gas or government sponsored marketing. Many NOCs are considered to be inefficient organizations with comparatively low investment rates. There often is more of a manipulation approach in an attempt to create short term gains for the economy or for the rulers of the nation or both. Some claim that incompetent operations of the NOCs can be a weakening factor in the world oil market. The objectives of NOCs may not include using global best practices in managing production, exploration, and development. There is specific concern with the best practices of transparency and responsibility.

NOCs in the OPEC countries may not have the same rigorous level of transparency and accountability, especially to the outside world. But as demonstrated by their profit margins and energy variation programs, other best management practices are in place. The annual OPEC World Oil Outlook Report is a very thorough and well-organized statistical report that is openly shared with the outside world via the web.

In many OPEC countries, oil revenues are often considered the private property of the inner circle of power players surrounding the government ruler. Transparency and

accountability remain very low with the NOCs in these countries. However, the IOCs operating in these nations provide full disclosure reporting to their shareholders, which can often lean-to a more accurate light on the NOC reserves.

Table 1. 6 List of NOC (National Oil Companies and percentages of government ownership

List of NOC (National Oil Companies)
<p>These companies are 100% owned by the national governments. Some of them are not 100% owned (e.g. 70% owned). In this cases, the percentage of government ownership is indicated:</p> <ul style="list-style-type: none"> • ADNOC: United Arab Emirates • CNOOC 71%: China • INOC: Iraq • KPC: Kuwait • NOC: Libya • Sonangol: Angola • NIOC: Iran • NNPC: Nigeria • ONGC 71.4%: India • PDVSA: Venezuela • Pemex: Mexico • Pertamina: Indonesia • PetroChina 90%: China • Petronas: Malaysia • QP: Qatar • Rosneft 75.16%: Russia • Saudi Aramco: Saudi Arabia • Sonatrach: Algeria • Statoil 70.9%: Norway <hr/> <p>By purchasing Aramco, the Saudi government finalized the complete break between the interests of OPEC and that of the major oil companies.</p>

3. IOC-NOC Alliances

The principal disadvantage of an alliance for many NOCs and governments is that alliances may deliberate equity interests to a foreign entity. The advantages for the NOC or government are huge, however. It's quite common for an IOC to get an exploration license, take all the exploration risk, and then be required to allow an NOC to get a large stake if exploration succeeds.

The greatest challenge in an IOC-NOC alliance is how to effectively exercise the NOC privileges into the terms of the joint venture. An IOC might enter into a venture with an NOC to gain access in an NOC preferred location or an NOC may enter an alliance with an IOC to gain access to a process or technology with which the IOC has significant experience, and this is was the case with Saudi Aramco till they broke it back a decade. The NOC might be the

common partner and be legally and contractually vested with formal controls but lack the in-country experience and internal competence and resources to exercise those rights in practice. **The key reason for an IOC-NOC alliance is to maximize profitability; to a lesser extent, it may be to strengthen strategic political relationships.**

IOC-NOC alliances visibly expose the national resources to outside entities. The trade-off is often a competitive return on revenue (ROR) versus access to expertise and best practices. Additionally, there could be a decrease of political risk faced by the IOC, at least while both sides' interests continue aligned.

Table 1. 7 Examples of IOC (International Oil Companies) and NOC (National Oil Companies) alliances

Examples of IOC- NOC alliance
<p>BP and Statoil created (and then dissolved 10 years later) a joint venture for international exploration and production activities</p> <ul style="list-style-type: none"> • Texaco set up downstream U.S. joint ventures with Saudi Aramco, first the Star Enterprise venture and then (along with Shell) the Motiva venture • Abu Dhabi National Oil Company (ADNOC) reached into an agreement with Occidental Petroleum whereby ADNOC will hold a 60% interest and Occidental will hold a 40% interest in a 30 years deal to develop reservoirs in the Shah Field, southwest of Abu Dhabi city. • Eni and PetroChina entered into a memorandum of understanding to develop unconventional resources (such as shale gas) in China and Mozambique. • Sinopec agreed with Australia Pacific (AP) LNG to purchase a 15% stake in the AP LNG project from ConocoPhillips and Origin Energy Limited. <p>An additional category of alliance includes the NOC-NOC arrangement. Some cases of this type of alliance include:</p> <ul style="list-style-type: none"> • Petroleos de Venezuela (PDVSA) and Ecuador's NOC, Petroecuador entered into oil and gas co-operation deals to develop blocks in Ecuador and explore blocks in Venezuela <p>ADNOC and the Korea National Oil Corporation (KNOC) created a joint venture for the exploration and development of three blocks with estimated reserves of 340–570 million barrels of oil in Abu Dhabi.</p>

1.2.3.2 Other players: The Service Companies

The IOCs have competitive advantages in project and risk management, access to technology, capital, and downstream markets. They can absorb and transfer risk to a greater degree better than many other market players. These competences are what they have historically offered to NOCs and host governments on a contractual basis. But some of the other industry players who can provide many of the same services include oilfield service companies, project management companies, and oil companies operating exclusively in the downstream sector. Service companies also include accounting and information management companies, financial institutions, and law firms. These entities are in direct competition with IOCs to work with the NOCs.

The number of service companies started rapidly increasing between 2005 and 2008 as the number of IOCs started decreasing. Exhibit 1.8 provides a list of some of the larger upstream service/support companies. Mainly service companies are suppliers in the oil and gas industries.

Table 1.8 Upstream Service/Support Companies

Company	Ticker (NYSE)	Specialization
Schlumberger Ltd.	SLB	Oil Services
CGG Veritas	CGV	Oil Services
Petroleum Geo-Services (PGS)	PGEJF	Oil Services
Diamond Offshore Drilling, Inc.	DO	Drilling
Nabors Industries, Inc.	NBR	Drilling, equipment, and services
Noble Corp.	NE	Drilling, equipment, and services
Transocean Inc.	RIG	Drilling
ENSCO Intl	ESV	Drilling
Rowan	RDC	Drilling
TODCO	THE	Drilling
Baker Hughes, Inc.	BHI	Drilling
Halliburton Company	HAL	Oil equipment and services
National Oilwell Varco, Inc.	NOV	Oil equipment and services
Weatherford Int'l, Inc.	WFT	Oil equipment & services
Cooper Cameron Corp.	CAM	Oil equipment and services
Keppel Corp (Singapore)	—	Rig builder
SembCorp (Singapore)	—	Rig builder
Daewoo Shipbuilding (Korea)	—	Rig builder
Samsung Heavy Industries (Korea)	—	Rig builder

Service companies play a key role in the oil and gas industry, especially as the industry continues to require very specialized services that IOCs and NOCs do not have the time and energy to develop within their own frameworks. A niche service company with a strong research department can provide several client companies with high-quality services at a lower cost than if the companies developed the same research outcomes on their own. It is often much less expensive for a large corporation to purchase the required technology from a service company, rather than developing the technology from scratch by themselves.

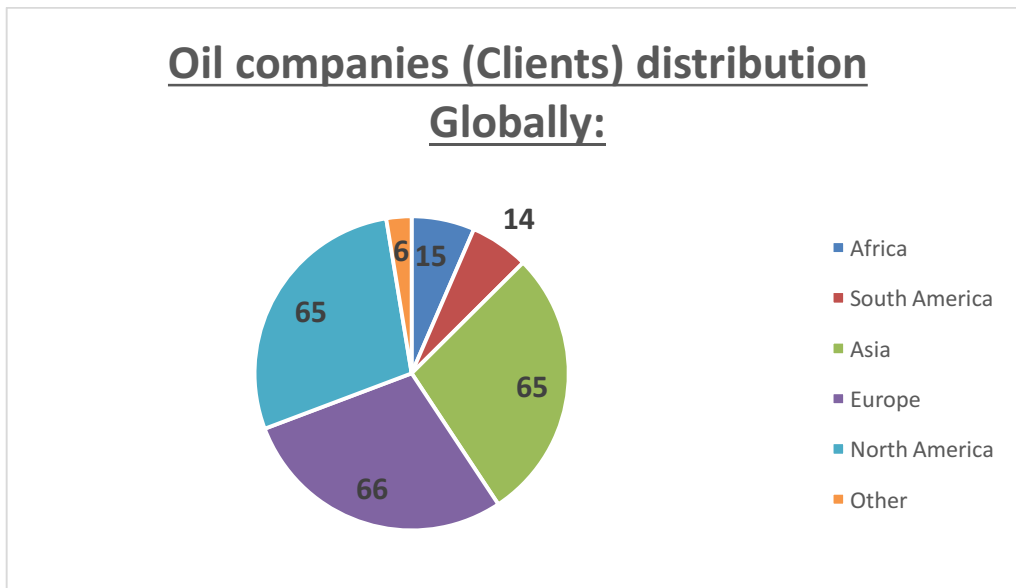


Figure 1.2 List of Oil Companies Globally

(Source: <https://www.slideshare.net/KiNgOfSmile/market-analysis-oil-and-gas-sector>, 2013)

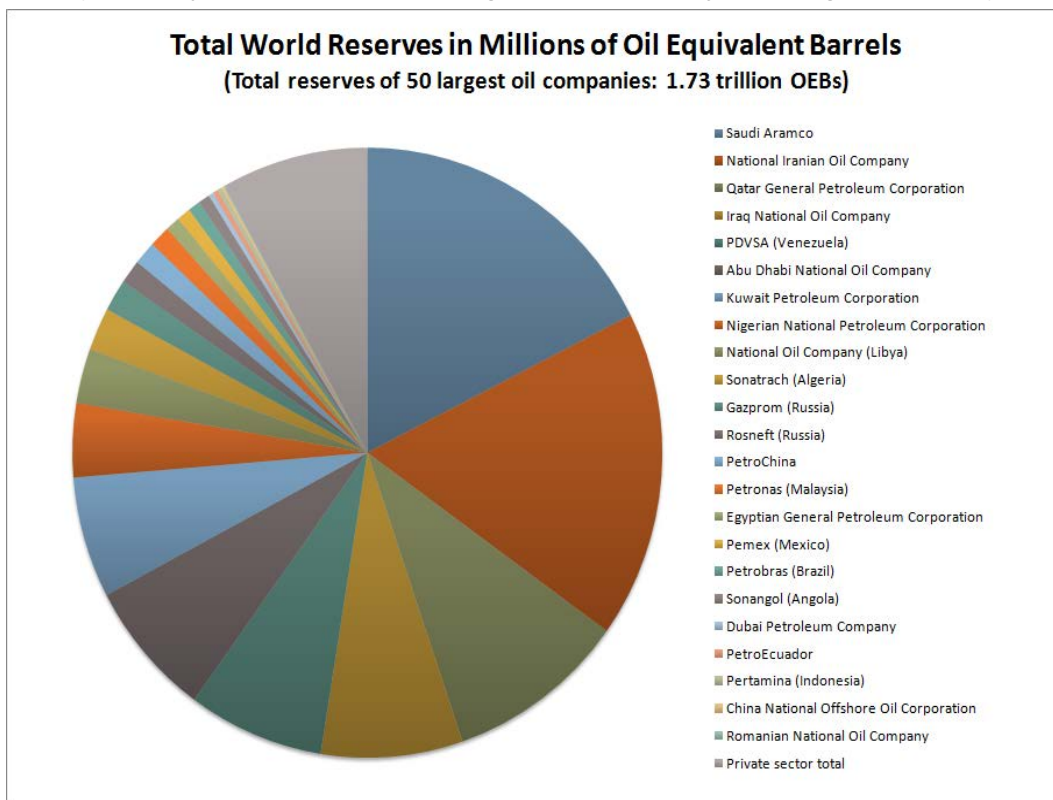


Figure 1.3 Total Oil World reserves

(Source: https://en.wikipedia.org/wiki/Petroleum_industry, 2013)

1.2.4 Monopsony in the drilling sector of the oil industry and rules of the game: elastic versus inelastic supply

The monopsony power in the oil industry is impacted by three factors: the elasticity of the market supply, the number of buyers and the interaction between buyers.

- *Elasticity of market supply*

The less elastic the market supply, the greater the monopsony power.

If there is only one company its demand curve is the market demand curve, because the demand for oil is fairly inelastic (at least in the short run), OPEC could raise oil prices far above marginal production cost during the 1970s and early 1980s. The elasticity of market demand limits the potential monopoly power of individual producers.

- *Number of buyers*

The fewer the number of buyers, the less elastic the supply and the greater the monopsony power. The table below shows the type of markets based on geographical area: (Table 1.9).

Table 1. 9 Type of markets based on geographical area in the drilling sector

Geographical Area	Type of Market	Number of Buyers per Country
Middle East (MEA)	Monopsonist	1 Client
North America (NAM)	Non-Monopsonist	Numerous
South America (SAM)	Monopsonist	2 to 3 Clients
Europe	Monopsonist*	1 Client
Africa	Non-Monopsonist	Numerous
North Africa	Monopsonist	1 Client (Algeria)
Russia	Non-Monopsonist	Numerous
Asia	Non-Monopsonist	Numerous

- **Interaction Among Buyers**

The less the buyers compete, the greater the monopsony power.

1.2.4.1 Monopsony Power: Elastic versus Inelastic Supply

Monopsonists are common in some small towns, where only one large firm provides the majority of employment, or Oil and gas industry, and other energy services related to national security.

Because of their buying power, monopsonists are able to influence the price they pay compared with buyers in more competitive markets. Pure monopsonists are rare because suppliers normally have alternative outlets for their good or service. However, monopsony power is significant in certain sectors of the economy.

Two areas are worthy of mention, including the monopsony power of the large superstores, who can command terms to smaller suppliers, and the monopsony power associated with buyers of employment in the labor market.

In the case of superstores, as with other dominant buyers, the price paid to suppliers is often forced down so that the supermarkets can reduce costs and generate higher profits.

Alternatively they can reduce their prices, assuming they operate a cost plus pricing strategy. In turn this can threaten competitor suppliers, so increasing the monopsony power of the major superstores. In an increasingly globalized world the superstores are free to source supplies from around the world, thus making it hard for smaller suppliers to compete.

- Oligopsony: Market with only a few buyers.
- Monopsony power: Buyer's ability to affect the price of a good.
- Marginal value: Additional benefit derived from purchasing one more unit of a good.
- Marginal expenditure: Additional cost of buying one more unit of a good.
- Average expenditure: Price paid per unit of a good.

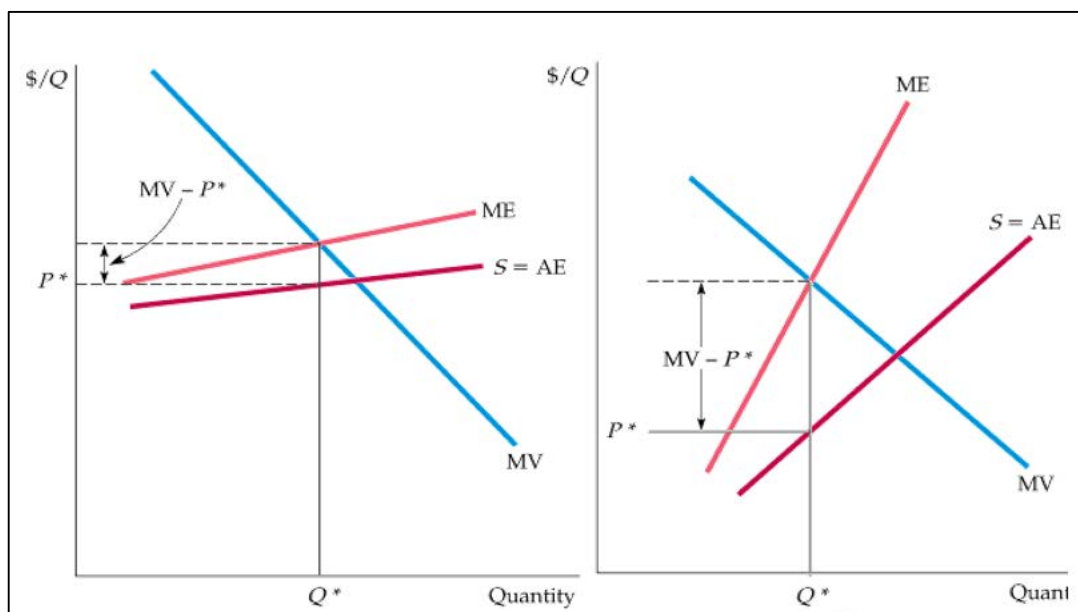


Figure 1.4 Monopsonist Vs Non-Monopsony

(Source: http://www.economicsonline.co.uk/Competitive_markets/The_labour_market.html, 2016)

Monopsony power depends on the elasticity of supply. When supply is elastic, as in (a), marginal expenditure and average expenditure do not differ by much, so price is close to what it would be in a competitive market. The opposite is true when supply is inelastic, as in (b).

Monopsonist Buyer

The market supply curve is monopsonist's average expenditure curve AE. Because average expenditure is rising, marginal expenditure lies above it. The monopsonist purchases quantity Q^*_m , where marginal expenditure and marginal value (demand) intersect.

The price paid per unit P^*_m is then found from the average expenditure (supply) curve. In a competitive market, price and quantity, P_c and Q_c , are both higher. They are found at the point where average expenditure (supply) and marginal value (demand) intersect.

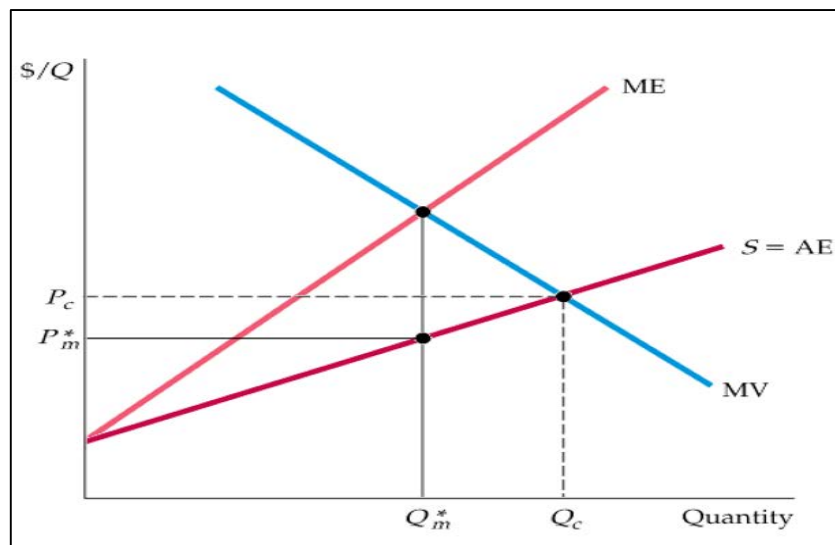


Figure 1.5 Monopsonist's average expenditure curve

(Source: http://www.economicsonline.co.uk/Competitive_markets/The_labour_market.html, 2016)

Monopoly and Monopsony

These diagrams show the close analogy between monopoly and monopsony.

- (a) The monopsonist produces where marginal revenue intersects marginal cost. Average revenue exceeds marginal revenue, so that price exceeds marginal cost.
- (b) The monopsonist purchases up to the point where marginal expenditure intersects marginal value. Marginal expenditure exceeds average expenditure, so that marginal value exceeds price.

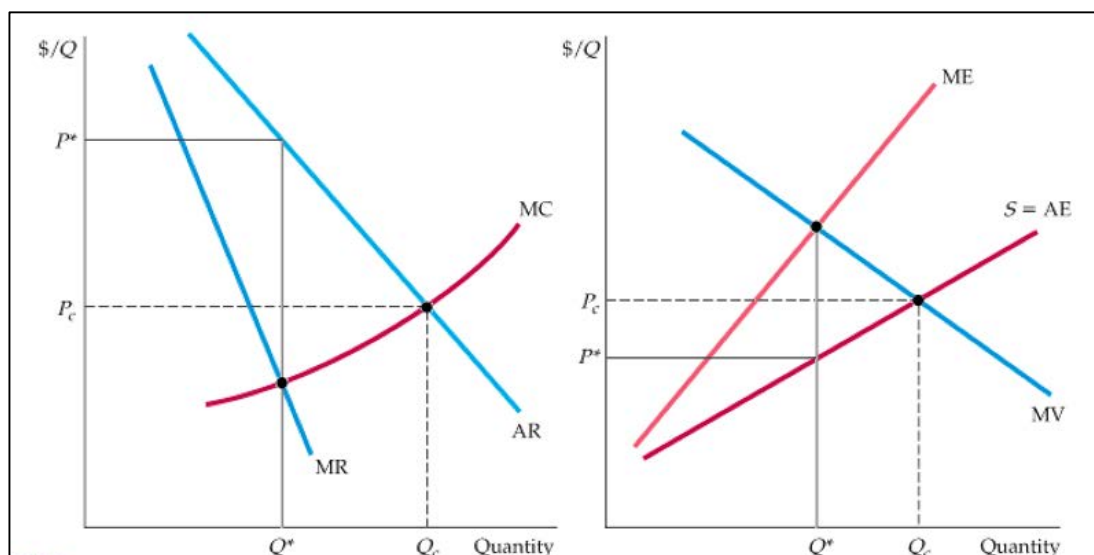


Figure 1.6 Analogy between monopoly and monopsony

(Source: http://www.economicsonline.co.uk/Competitive_markets/The_labour_market.html, 2016)

1.2.4.2 Suppliers success strategy in a monopsonist market

Is My Supplier Holding Five Aces? The Bargaining Power of Suppliers Overview
 a company's profitability can be strongly influenced by the bargaining power of suppliers. Your company may be a supplier with bargaining power. Alternatively, your company may purchase materials from a supplier with a great deal of bargaining power. The purpose is to outline the factors that determine supplier bargaining power. The theory underlying gains from trade is that all transactions are equally helpful and that the opportunity cost of buyers and vendors drives the final price. Buyers don't have to purchase the good from a given company; they can buy from that company, from one of its competitors, or not at all. Buyers must recognize that companies also have choices; they can sell to a given buyer or to another buyer. And if no price is adequate to cover costs, they may not sell at all. In general, the greater the array of alternatives to the sellers relative to those of the buyers, the greater the bargaining power of the seller. Let's create a hypothetical scenario to illustrate the influence of the bargaining power of suppliers on prices (Ayres & Braithwaite, 1992).

The factors that determine the bargaining power of suppliers (International Drilling oil and gas companies). One potential source of supplier bargaining power is the degree of industry concentration among sellers relative to buyers. Monopsonist can earn economic profits over the long run because market barriers keep potential competitors from entering the industry. In this chapter, we will discuss oligopolies, which are industries dominated by relatively few sellers. In general, few is usually defined as 4 to 10 companies.

Cournot Oligopoly

The key factor underlying an oligopoly is that, as the industry is highly concentrated, each Company must consider the reaction of each of its competitors when initiating a price change. Economists express various models of oligopolies. One such model is the Cournot oligopoly. In the Cournot oligopoly, few companies serve many consumers, market barriers exist, the firms may or may not sell differentiated products, and each firm makes production decisions based on the output of its competitors. This type of oligopoly is best understood if we assume there is one company in the industry.

Stackelberg Oligopoly

If one company is dominant and able to take the first mover advantage in production decisions, a Stackelberg oligopoly may better describe the outcomes. The difference here is that the leader chooses an output level and the followers afterward determine their own profit-maximizing output.

Recognizing the supporter's reaction function, it knows that the competitors will choose their output based on what the leader does. Consequently, the leader must regulate the point along the followers' reaction functions that will maximize the leader's profit and produce the corresponding level of output.

Bertrand Oligopoly

A large concentration of suppliers does not guarantee more profit. The oligopoly model developed by French economist Joseph Bertrand shows vigorous competition that eliminates each firm's economic profit. The Bertrand oligopoly shares the same characteristics as that of the other oligopolistic models in terms of a small number of firms serving a large number of consumers and the existence of market barriers. In this case, the companies are also assumed to be producing identical products with a constant marginal cost. Moreover, each firm engages in price competition and reacts to the price charged by the competition.

That the Bertrand oligopoly leads to normal profits for each company it should be easy to understand. As long as their products are identical, clients will purchase from the lowest-priced company. The result is a price war that ends when the companies charge prices that yield normal profits.

1.2.4.3 Proactive Strategies to Prevent the Bertrand Oligopoly

1- Building Brand Loyalty

The Bertrand model shows that severe price competition between two companies that produce identical / similar products can lead to normal profits for each firm. The most direct tool for avoiding the Bertrand trap is to differentiate one's product. And this is exactly the case with the Schlumberger and Big drilling companies that can have patent to differentiate their products, product differentiation results in less price-sensitive buyers who may become brand loyal.

Building brand loyalty is not restricted to product differentiation. Most airlines offer frequent-flier programs as a way to install loyalty. Many foods retailers offer punch cards that can earn frequent buyers a free meal.

2- Price Matching

Another tool to avoid the Bertrand trap is through price matching. This strategy is quite ordinary. A company advertises that it will not be understated and offers to match any price offered by a competitor. At first look, this appears to be a highly competitive client friendly strategy. But is it? Price wars are usually generated by each company's attempt to undercut the price of its competitors. But what happens if all companies in an oligopoly institute price-matching strategies? Clearly, there is no benefit to undercutting the competitor's price because the price will be promptly met. As no company gains by undercutting prices, the price remains higher than it would have been otherwise.

Note that the price-matching strategy eliminates the need for the company to monitor its competitor's prices. The typical strategy needs the buyer to present proof of the competitor's price, usually in the form of an advertisement. And this is not the case in our case in Aramco, Monopsonist client. It's all related to the contract with fixed product price.

3- Randomized Pricing

Another strategy that can help the firm avoid the Bertrand trap is randomized pricing. Information technology makes this a feasible strategy. Prior to the evolution of IT, price setting, and more prominently price changing, was an unwieldy process.

Today, companies can set and reset prices quickly and easily. With online shopping, consumers can use search bots to rank the prices of specific goods from lowest to highest. This gives competitor companies an opportunity to monitor the competitors'

prices relatively easily and to undercut them by a slim enough margin to be the low-priced seller. If a company changes its price relatively frequently, it becomes more difficult for rival companies to undercut one's price. Randomized pricing also makes it harder for consumers to find the low-priced vendor because its identity may change from day to day or even hour to hour, and this is not the case in the Oil Industry generally because the drilling is more related to the application that we will drill so the Client can't pick the bit from drop down list.

4- Dependency on the Industry for Revenues

In addition to selling the products to customers, many companies sell them to other businesses. Some companies service many industries. Theory suggests that a company will set the price and quantity that will maximize profits from each industry services. Suppose that a given industry represents a generous percentage of the company's overall revenue. In such cases, the company may be willing to make price concessions to avoid losing industry revenues altogether. The less dependent the company is on the industry's revenues, the more bargaining power it has over the buyer, and the International Drilling companies are using this strategy on two ways, initially drilling water well for example , are less profitable but decent revenue out of Oil and gas industry.

5- Buyer Switching Costs

The supplier has more bargaining power when the buyer faces high switching costs. The higher the buyer's switching cost, the less elastic the buyer's demand curve and the less likely the buyer will change suppliers in response to higher prices. An example of new technology Patent for the supplier with price recovery, new technology equal higher price as an example of Rolling Cutters offered from Smith Bits A Schlumberger company.

6- Degree of Product Differentiation

A common thread to the Five Forces Model is the degree of product differentiation. The greater the differences between one company's product and those of its competitors, the more inelastic the demand and the more market power afforded the suppliers. Drilling abrasive formation in entire Saudi Arabian Market is dominant by Smith bits which is charging triple price for any other competitor products because of the product differentiation of Onyx-360 rolling cutters which is patent form Schlumberger Smith bits and over perform any other drilling product.

7- Lack of Substitutes

To get the best deal possible, buyers need to shop around. The less the number of available alternatives, the less elastic the demand, and the more influence goes to the seller. If a company enjoys a monopoly with no close substitutes, the customers' only alternative to buying from the monopolist is to do without. This makes demand more inelastic, which gives more leverage to the company in setting a price and generating profit. This leverage is strengthened when market barriers block the potential entry of competitors.

We should also recap the importance of the increasing elasticity of demand over time. Because the price of a good represents opportunity cost to the buyer, consumers are always seeking ways to obtain the same or similar good at a lower price. Hence, a company that has bargaining leverage in the short term may not continue to have such leverage over the long haul. Each International drilling company working in Saudi Market try to do similarly and gain the bargaining power in each drilling product size to secure the market, for example the 34'' Milled tooth product, no one can compete with Varel Price which lead to more than 85% of the Saudi Market go for Varel, on the other hand, Schlumberger Smith Bits doing the same for the challenging application but with slightly different strategy is to create the lake of substitutes but with performance driven products.

8- Threat of Forward Integration

Most persons think of a manufacturer as a company that sells either to wholesalers or directly to retailers. Vertical integrated companies are those that control both the production and distribution of the good. Which is the case in the drilling bits business, Forward integration occurs when the company expands forward to oversee product distribution. Shell and BP, for example, control both the refineries and the distribution channels. Vertical integration can be useful if it can reduce a firm's transaction costs. Consider all International drilling Oil and gas service companies hold this Vertical integration. In the business world, transactions costs may be much higher if they require a specialized argument. Alternatively, the relationship between the buyer and seller requires dedicated assets. Because the suppliers will invest to manufacturer special product for each application related to the client need. Specialized exchanges, on the other hand, may require costly negotiations. They may also result in underinvestment.

Contracts between the client and supplier occur because the transactions costs are much higher if the parties attempt to engage in a spot transaction. If the supplier

reengineers the product to suit the buyer's needs, the buyer must have obligations on its end. The contract also eliminates the possibility that one side will try to take advantage of the other's sunk investment. Responsibilities and liabilities are written into the contract, and any breach is illegal. Meanwhile in the Monopsonist Market no obligation on the client part to use the product delivered by the supplier and there is a consignment basis to trial test the product for free till it will pass the monopsonist client requirement than , this product can be add to the client list to buy later on an based on the operations need.

Vertical integration is an attractive option only when the transactions costs are lower than those associated with contracts. Bonding two companies as divisions of a single larger company removes the need for contracts and eliminates the possibility that one party could take advantage of the other's sunk costs. Nevertheless, vertically integrated firms incur transactions costs of their own. If the joint interests of the supplier and distributor are to be aligned, the efforts must be coordinated by a higher authority. Because the suppliers and distributors individual interests may not be aligned with those of the joint venture, coordination may be very costly. In general, the more precise the assets in the buyer–seller relationship and the greater the potential for resourcefulness, the greater the costs of contracting relative to the costs of vertical integration, (Klein, Crawford, and Alchian 1978).

Many attempts to vertically integrate are based on defective reasoning. A common rationale for integrating is to reduce volatility in earnings. However, the earnings of the manufacturer and distributor are often positively related. The same decline in demand that weakens retailer profits will inhibit manufacturer sales.

Others argue that owning the input supply eliminates the option of market foreclosure, unfair prices, or supply and demand differences in the market for intermediate products. This may be a valid reason to integrate if one party has excessive market power which is the Saudi Arabian Marker case. In spirit, economic theory asserts the following: if the marketplace at each stage of the supply chain is competitive, vertical integration will not add to the companies' collective profits.

Stuckey and White (1993) offered a litmus test for firms considering vertical integration. In general, vertical integration can be beneficial if:

- 1- The market is too risky and unreliable.

- 2- Companies in the adjacent stages of the supply chain have more market power than companies in your stage.
- 3- Integration would create market fences or allow for more effective price discrimination across market segments.
- 4- The market is young and firms must integrate forward to develop a market, or, alternatively, the market is declining and independent companies are pulling out of adjacent stages.

Summary of suppliers market power in a monopsonist market

- The greater the concentration of suppliers in the industry relative to buyers, the greater the market power of the suppliers.
- The Cournot oligopoly model, in which each supplier determines its output in response to that chosen by its competition, demonstrates potential gains.
- In the Stackelberg oligopoly model, a dominant supplier can take the first-mover advantage. The remaining companies will determine their output based on the decision of the dominant supplier. Here, the dominant supplier should declare its first mover advantage by producing a large quantity of output and a dominant market share. The remaining supplier will accommodate this decision because it is in their interests to do so.
- The Bertrand oligopoly, in which the suppliers produce identical goods and compete based on price, results in vigorous price competition that results in normal profits. This can be avoided through product differentiation, price matching, or randomized pricing.
- The supplier has more market power when it is less dependent on this particular market for revenues, when Client switching costs are high, and when there is a lack of substitutes available to purchasers.
- The supplier has more market power when it can threaten frontward integration. Forward and backward integration rarely add to the supplier collective wealth and should be considered only when integration leads to lower transactions costs than contracting, licensing, franchising, or other alternatives to spot transactions.
- Vertical integration can be beneficial if the market is too risky and untrustworthy, if companies in the adjacent stages of the supply chain have more market power than companies in your stage, if integration would create market barriers or allow for more effective price.

Suppliers must integrate forward to develop a market, or if the market is declining and independent firms are pulling out of adjacent stages.

1.3 Porter's Five forces in the drilling sector of the Oil and Gas industries

There is no doubt that the Five forces of Porter model (1980) is relevant for analyzing the drilling sector of the oil and gas industry. An attempt has been made on the

oil industry in general (Pitatzis, 2016) but we will focus here on the drilling sector and a monopsonist market, Saudi Arabia with Aramco. A key point of the model which is not often put forward is the key role of the State, which influence any of the Five forces by editing new rules or facilitating new entrants in the market, etc. In the case of the monopsonist Aramco, the role of the royal family is particularly important with respect to the new investment policy which has been initiated a few years ago. It should be also noticed that the theme of product differentiation arises repeatedly in the Five Forces Model. When products are undifferentiated, consumer demand is highly elastic. If competing products are virtually indistinguishable, consumers are driven by price. This results in stiff price competition that leads firms to normal profits. The less substitutable the goods, the more inelastic the demand, and the greater the price flexibility afforded the company. It is important to think of product differentiation as a variety rather than as a separate differentiated or undifferentiated choice set.

There is no doubt that the oil/energy industry is extremely large. According to the Department of Energy (DOE), fossil fuels (including coal, oil and natural gas) makes up more than 85% of the energy consumed in the U.S. as of 2008. Oil supplies 40% of U.S. energy needs. (Visit the U.S. Department of Energy's, Energy Sources information page, for more insight) . Saudi Aramco is the biggest NOC in the world and the top 5 service providers are also present in Saudi Arabia (Schlumberger, Baker Hughes, Halliburton, National Oilwell Varco, Varel international).

Top five drilling bits suppliers in oil and gas industry

in Saudi Arabia

Schlumberger

Schlumberger is the biggest leading service provider of technology, integrated project management, and information solutions for oil and gas exploration and production industry. Historically Schlumberger has invented the wireline logging technique in France which is used to get downhole data from the oil and gas well. They operate in the service market with three main business group “verticals”, which include reservoir characterization, drilling, and production.

Smith Bits is the biggest drilling bits segment at Schlumberger: 53% of the market and three new technology patents.

Baker Hughes (GE)

Baker Hughes traditionally was the world leader for drilling bits invention and the first drilling bits supplier globally. It led this market for over than 100 years until Schlumberger Smith Bits took over the lead in 2011.

As well it is considered a service provider in the supply of oilfield services, products, technology, and systems used in the oil and gas industry. Its last patent offers smooth and consistent performance.

Halliburton

Politically Halliburton is the leading provider of products and services to the upstream industry. They provide services throughout the development of the reservoir which includes locating hydrocarbon exploration, geological data management, drilling. They are supplying the conventional bits , with no real market differentiator. They only try to play with bits designs to compete with Schlumberger and GE.They have their operations under two major segments - the completion and production segment and the drilling and evaluation segment.

National Oilwell Varco (NOV)

It has one of the best cutters technology . National Oilwell Varco is the leading provider in the designing, manufacturing, and sale of various equipment and components in oil and gas drilling, completion, and production of oilfield services to the upstream oil and gas industry. They have a strong patent for cutter technology to drill abrasive formation.

The company operates in four segments which include rig systems, rig aftermarket, wellbore technologies, and completion and production solutions.

NOV main strength is the cutter technology patent (deep leach) which NOV is making big chunk of money from it because of their patent and most of other bit suppliers are using it specially in drilling abrasive formation.

Varel International

A French company Varel is engaged in the manufacture and service application of oil and gas drill bits. They manufacture roller cone and fixed cutter drill bits in Mexico.

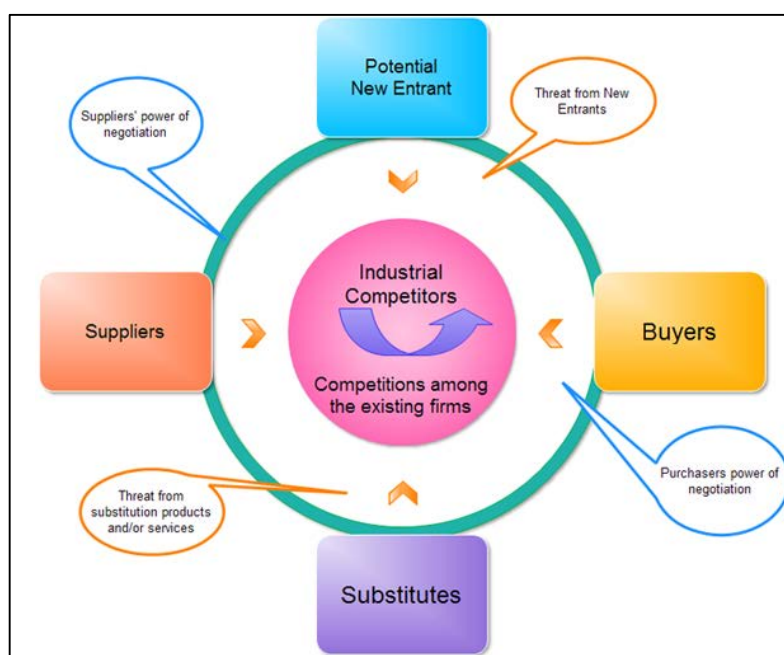


Figure 1.7 Porter's 5 Forces Analysis (1980)

The five forces that determine the long-run profitability in the sector are in the drilling sector in Saudi Arabia:

- Suppliers/Service Company (Schlumberger and its competitors)
- Buyer/ Client (Saudi Aramco)
- Entry/Exit Barriers

- Substitutes
- Rivalry

They are characterized by the power of the suppliers, the power of the client, the threat of market entry, the threat from substitutes, the intensity of rivalry, and the role of the royal family.



Figure 1.8 Porter's 5 Forces Analysis: Power and threats (Porter, 1980)

1.3.1 Power of suppliers: consolidate a power as strong as possible

An industry that produces products necessitates raw materials. This leads to buyer-supplier relationships between the industry and the companies that provide the raw materials. Depending on where the influence deceits, suppliers may be able to exert an influence on the producing industry. A segment is unappealing when a supplier can: 1) increase prices without suffering from a reduction in volume; 2) decrease the quantity supplied; 3) make arrangement in a formal or informal manner; 4) compete in an environment with comparatively few substitutes; 5) deliver a product that is important for the client; 6) switching costs on their customers when they depart ; 7) integrate downstream by purchasing or controlling the distribution channels.

In Saudi Arabia but also in many countries, Schlumberger Smith bits is considered having the strongest power among suppliers. The best defence in mitigating the power of suppliers is to build win-win relationships with suppliers or arrange to use multiple suppliers. But, in a monopsonist market, the client does not need to elaborate defensive

plans since he has grabbed the power. In non monopsonist markets, the question of the supplier power may then be more sensitive for the clients.

Power of suppliers

Powerful suppliers affect the market through charging higher prices, limiting production, and/or integration (Porter, 2008) The first two elements were made obvious during the 70's when embargos by the oil producing countries directed to dropping the world's oil production and this oil supply shortage led to a huge upsurge in the insignificant price of a barrel of oil (Library of Congress 2010) from \$2.7 to \$11.2 during the period from 1973 to 1974 (Backus et al. 2000).

Another example is the move of Esso (Exxon Mobile today) in 1959 to influence Middle East oil prices, which led to the creation of OPEC, whose decisions play a part in oil prices today (Library of Congress 2010). As suppliers, oil and gas companies bring power to the recipient countries through international vertical integration.

In Saudi Arabian, the top five international service companies are present in the drilling oil and gas market. Aramco cannot drill without their drilling bits products, and the technology patent influences the market share for each company. Schlumberger as Baker Hughes are using are using top innovative technology are dominate several related market segments.

1.3.2 Power of buyers: develop superior offers to mitigate their control

The power of buyers defines the influence clients have on an industry. When buyer power is strong, the association to the manufacturing industry becomes closer to what economists term a monopsony, where there is a single buyer and many sellers. Under these market conditions, the buyer has the most impact in defining the price. Few pure monopsonist actually exist. Aramco in Saudi Arabia is one of them. The bargaining power of buyers rises in pure monopsonist cases but also when they: 1) are prepared by controlling the procedures, others providing alike products and services; 2) buy a product that represents a significant fraction of the buyer's costs, 3) purchase a product that is undistinguishable; 4) experience low substituting costs when they change suppliers; 5) are price dedicate, with other obtainable choices; 6) anticipate upstream, to acquire the providers of the goods.

To mitigate the control of buyers, suppliers can seek to select buyers with less power to negotiate, switch suppliers, or develop superior offers that strong buyers cannot refuse. In the case of Saudi Arabia, developing superior offers is a "natural" strategy, other options being not available.

Power of buyer(s)

Major oil Client companies outsource much of their field operations to oil and gas service companies. As buyers, oil companies are in a powerful position to bargain prices, demand better quality or supplementary service.

Oil and gas client companies seek to obtain rights to invest in exploration and production areas internationally. These rights are acquired in Monopsonist Markets in countries which have one or maximum two Oil Owners company, as our case in Middle East, Saudi Aramco is the only buyer in the biggest market globally. In other non monopsonist markets, they are doing Joint Venture through buying a percentage of another company's right or through participating in licensing.

1.3.3 Barriers to Entry/Exit: high in the drilling sector

The opportunity of new companies entering the business influences rivalry. Firms in the market have to assess how easy it is for a new player to enter an industry. The most attractive situation has high entry barriers and low exit barriers. While any company should be able to enter and exit a market, each industry presents varying levels of difficulty, commonly driven by economic factors. Manufacturing-based businesses are more difficult to enter than many service-based industries. But in any industry, there exists barriers to entry, sometimes insurmountable, sometimes very weak.

Equally, when incomes decline, we would expect some companies to exit. Some factors can discourage potential new entrants such as falling prices, large or random start-up expenses, and market uncertainty and risks. Barriers to entry can be created or exploited to enhance a firm's competitive advantage. Obstacles to entrance ascend from numerous sources such as: 1) patents and new technology;) monopsonist client requirements (particularly in terms of technology, of ownership control or sharing, of local localization of facilities or R&D); economies of scale; government involvement. Barriers to exit work correspondingly to barriers to entry. Several factors which deter potential entrants, are present in the Saudi Aramco cases for example the importance of patents and technology or the rising level of investments and of local facilities

Barriers to entry: Threat of potential extracts

Patents of technology and innovation work as driving forces of cost reduction and differentiation (Santos et al.1999; Le Nagard-Assayag and Manceau, 2015). As an example, of the two big players Schlumberger and GE which have the biggest investments capabilities in early 2011, Schlumberger enhanced bit durability by reinforcing the diamond thickness of conventional PDC cutters, which helped Schlumberger Smith bits to lead the global market share for the first time since the drilling bits market started in early 19th century from Baker Hughes and reached 31% Market Share.

Technical patent barriers are minimized as the technology involved in drilling bits is widely known. The barriers for entry growing from large capital requirements and economy of scale are also minimized and sometimes do not help as barriers to entry in efficient oil and gas markets such as the Saudi Arabian market.

Economies of scale do not prevent entry from occurring in an efficient oil market. Barriers to entry arising from government regulation have influenced the competitive strategies of the oil and gas service companies. As an example of the U.S. oil and gas companies have always succeeded in product

differentiation because of many years of advertising and development. However, this success did not stop independent markets from selling similar products at lower cost. Nonetheless, government regulations have shut out such independent markets. Jones et al. (1978) suggest that governments have conferred upon themselves some form of cartel power over the industry due to their regulations.

1.3.4 Substitute products: in relation with technology in the drilling sector

As more substitute products become available and affordable in a market, the demand becomes more flexible since clients a greater choice. However, substitute products may limit the capability of companies within an industry to raise prices and improve margins. New technologies contribute to competition though substitute products. Schlumberger and Baker introduced a new technology of drilling bits which substitute the conventional one especially in the challenging applications. But if the product is really original, this does not have a negative impact on price and margins.

Threat of substitutes

In Saudi Arabian Drilling bits Oil and gas market the major trends in the drill bits market is the integration of drill bits in bottom-hole assemblies. Currently, Aramco demands packaged solutions for their drilling operations instead of individual drill bits. These packaged drilling solutions for bottom-hole assemblies integrate motors, drilling systems, and bits, thereby reduce the time and energy needed to assemble and calibrate the individual components before use. In addition, the bundled drilling package helps optimize downhole drilling operations because it does not require special training for the operators (Aramco)

1.3.5 Rivalry: strong in a drilling monopsonist market

Companies struggle to secure a competitive advantage over their competitors. The intensity of competition varies within each industry and these differences can be important in the development of strategy. Industries that are “focused,” versus “disjointed,” often display the highest level of competition. A low concentration index in an industry reflects a competitive market. In pursuing an advantage over its rivals, a firm can choose between several competitive moves: 1) varying prices; 2) improving product differentiation; 3) using distribution networks; 4) using networks of distribution; 5) taking advantages of relationships with suppliers (or clients). Several factors can intensify competition: a declining market, a small number of clients, high fixed and storage costs, low levels of product differentiation and low switching costs, a diversity of firms with different cultures, histories, philosophies (etc.). Several of these factors have been or are present in the drilling Saudi market. The rivalry between suppliers is strong.

Service can also play a part in the industry's dynamics. Those competitors that provide superior service may bring an advantage to their competitive position if the industry/customer places value on this attribute. This is another point of differentiation and can be a key strategic element to consider. If a competitor has a service component that is difficult to replicate, it will prove to offer a strategic advantage.

Rivalry among competitors

High competition between existing competitors can limit industry profitability depending on the competition intensity and basis (Porter 2008). Major oil and gas service companies are relatively equal in size except for Schlumberger and GE, power and capabilities (Data monitor 2009 and Datamontor 2010). This increases the intensity of competition (Porter 2008) which can manifest itself in a price war if a competitor tries to influence prices (Menghini 1997). And this what exactly is happening from the small players like Varel, Chinese to reduce their product price to gain more market share, so far it is limited to the bigger soft section because of the technology limitation to do it in the challenging abrasive section which the big companies hold the edge of performance

Competition in any industry is intense if competitors have goals that go beyond economic performance (Porter, 2008). Declining profitability of upstream petroleum companies, Crude oil has factually been one of the most volatile supplies regularly proving that even the best forecasting models are unable of forecasting a realistic future price. The primary reason for this is the complex and interweaved value and supply chains that have been shaped due to over-dependence of almost all world economies on oil. And the competition in drilling bits business is the highest among any other business and any competitive advantage weather by patent, pricing will help specially the difference is not that much.

According to Bernstein et al. (cited in Kent 1991), one purpose of Joint Venture in the oil and gas industry is to manage competition through turning potential competitors into associates. As what happened in 2015, merge happened between Halliburton and Baker Hughes, meanwhile after less than a year, US Monopoly Low disqualified the merge and six Month Later, GE Acquired Baker Hughes. This is particularly critical in the oil and gas industry where there is little to distinguish rivals (Hennart et al. cited in Kent, 1991)

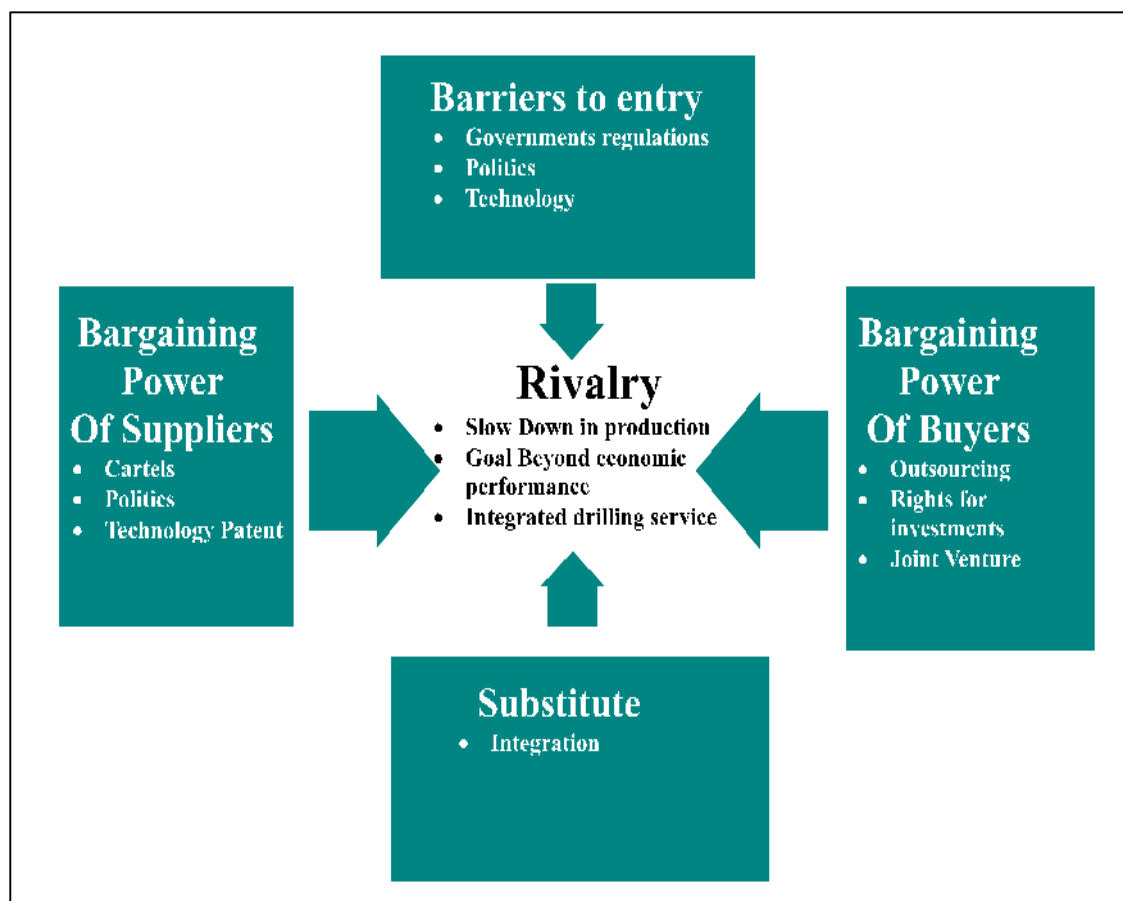


Figure 1. 9 Five Forces Porter in Monopsonist Market Driving Industry Competition

In Figure 1.9, we present a synthesis of the main elements that we identified as potential strategic moves for the actors on the drilling monopsonist market. This analysis is based on a review of previous studies (Pitatzis, 2016), industry documents and internal Schlumberger's documents as well as the researcher's 10 year experience in the field.

We will notice the important weight of dimensions that are not purely economic but that are related to technology, politics and integrated solutions, in an unstable environment. Competition is clearly exercised over dimensions that are not only technical. Firms try to gain sustainable competitive advantages that cannot be easily imitated by competitors (Hofer and Shendel, 1978).

1.4 Value Chain : Understanding the Dynamics of the Value Chain in the drilling sector

Since Porter's seminal work (1985) on the value chain, hundreds of articles have been written on the topic, focusing on some variables or on the global chain. Many sectoral studies and reports from consulting agencies have tried to identify where and how a company can

create value along the chain. The value chain is considered a powerful tool for management as it consists of the activities the firm uses to generate value and improve its margin. The principle is simple, the process clear.

The value chain has been applied to the oil and gas industries and the upstream sector, which includes drilling.. Therefore, we will present the concept of the value chain and its application to this upstream sector However, these studies in the drilling sector are essentially analytical, with technical solutions. In a monopsonist market, with a fierce competition, all the potentialities of value creation have to be explored; .

This criticism of the value chain is shared by Presentti and Mawhinney (2013) who propose an alternative model. It will be used in this with examples from the drilling sector since their propositions are fully in line with the concerns of suppliers in a monopsonist market.

1.4.1 Porter's value chain and the drilling sector

1.4.1.1 Porter's value chain

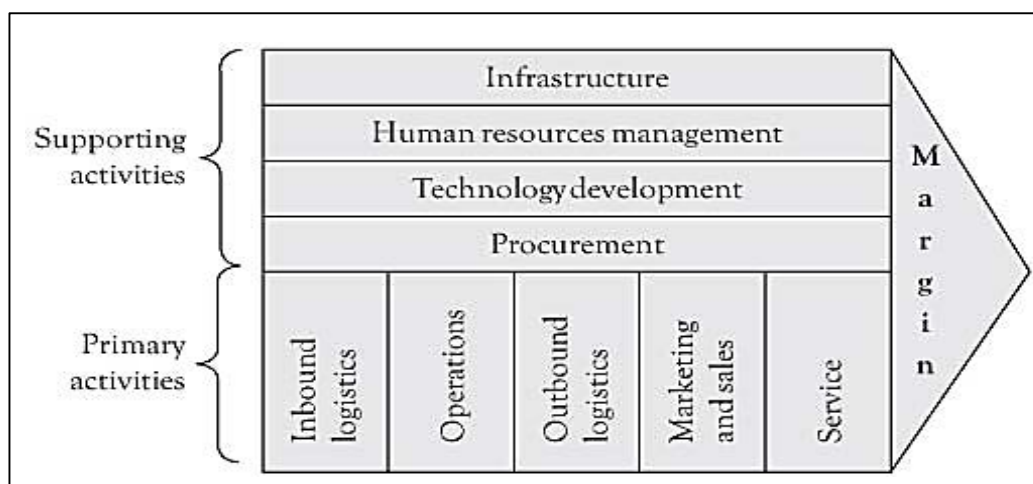


Figure 1. 10 Michael Porter's value chain (Porter, 1985)

For Michael Porter (1985) , a company must adopt a set of competitive advantages essential for the customers. The objective is to satisfy their needs so that they are willing to pay for the value in order to compete effectively in the global environment. Value chain analysis is a powerful instrument for the company to identify its core activities as having the potential to accomplish competitive priority and create superior performances.

Porter's value chain (1985) classifies nine activities broken down into five primary activities and four supporting activities (see Figure 1.10). The primary activities follow the

flow of product or services through the firm with the corresponding activities, starting with incoming logistics, then operations, outbound logistics, marketing and sales, and customer service. The supporting activities include a company's organization, human resource management, technology development, and procurement. A company may generate a competitive advantage at any phase of the process due to its managerial or organizational superiority.

Value can be created at any place along the value chain. The value chain includes the activities of sales, marketing, post-sale customer service, product research and development, technical support, as well as strategic positioning and even the firm's core competencies and leadership, which if done properly, will show up in the final product or service.

In addition, Porter set a company's value chain as one component of a great value system that includes the value chains of suppliers, distribution channel members, and clients. His value chain idea highlights the importance of linkages, horizontally among a firm's internal activities, and vertically among suppliers, channel members, and customers. The value chain is not a group of self-determining activities but a system of co-dependent activities. Value activities are connected by linkages within the value chain. Linkages are associations between the way one value activity is performed and the cost or performance of another.

This conception is original and important but the Porter's value chain is not really customer or client centric which is fundamental in a monopsonist market with a very strong purchasing power of the client.

1.4.1.2 Value chains in the oil industry (Monopsonist and Non-Monopsonist Market)

The oil and gas industry are under serious pressure to encounter the great and continuous demand of the world's market on realistic and secure energy stream.

To study and identify restrictions and opportunities in the oil and gas industry the concept of value chain analysis is consequently valuable in numerous ways such the ecological concerns in exploration is also vital. Several consulting firms or industry analyst also used the supply chain concept. The supply-chain in the oil and gas industry is international and linking international trade system.

In the oil and gas sector, meaningfully, it is essential to follow the stages in the value chain, which are the stages of the oil and gas industry with upstream, midstream and downstream sectors. The actually describe the key elements and activities at each stage (Figure 1.11 and Figure 1.13)

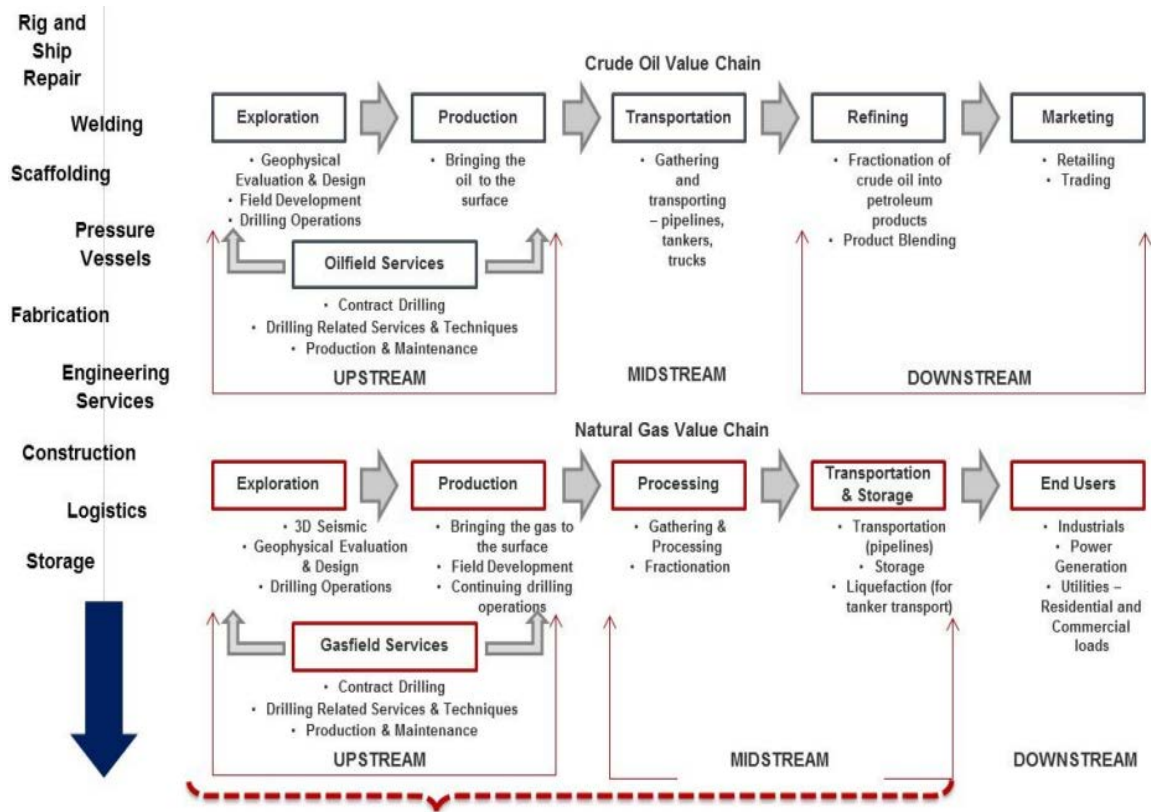


Figure 1.11 Oil and Gas Value Chain

(Source: <http://www.reportingoilandgas.org/wp-content/uploads/VALUE-CHAIN-IN-OIL-AND-GAS-SECTOR-FEBRUARY-2017.pdf>, 2017)

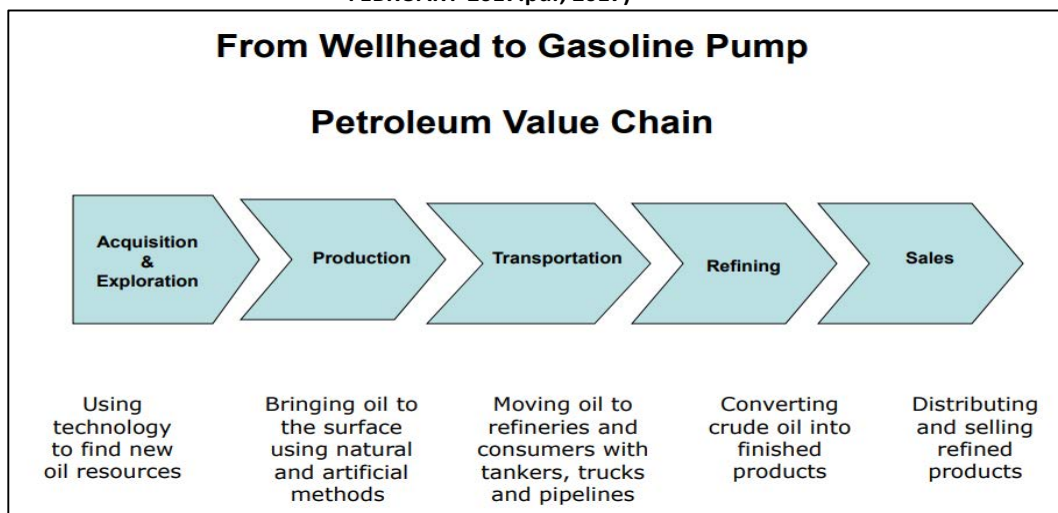


Figure 1. 12 Simplified Oil and Gas Value Chain (Source:

<http://www.scienceinthenews.org.uk/contents/?article=59>, 2009)

Other professionals made a focus on the upstream sector and again described the activities and actions at each step. These value chains are useful to understand the process but are not directly value oriented.

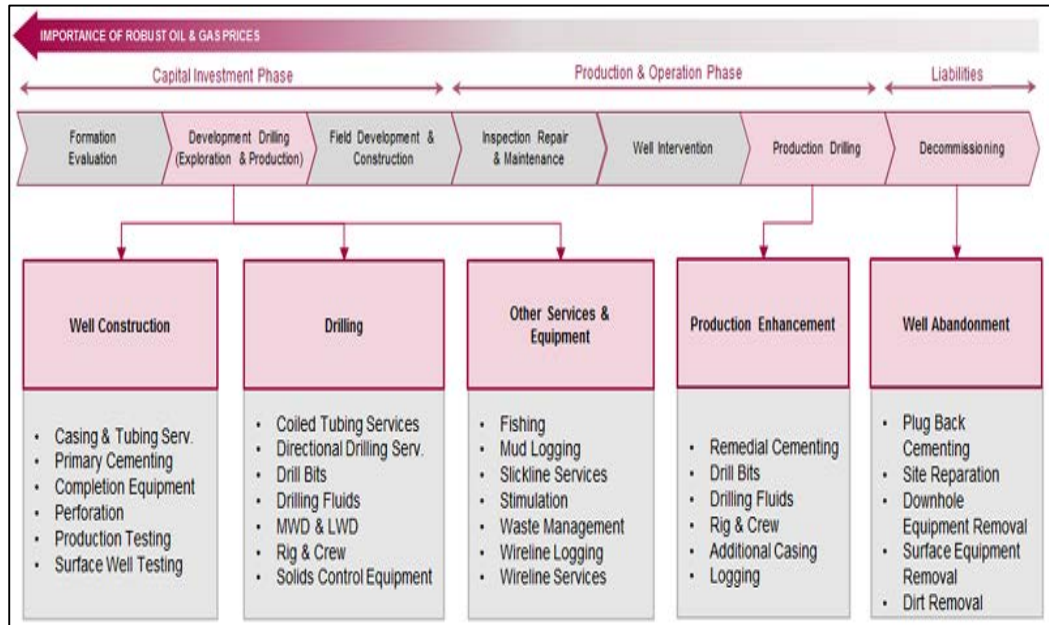


Figure 1.13 Upstream Oil and Gas Value Chain

(Source: <https://www.douglas-westwood.com/toolpusher-review/>)

In fact, the most interesting analysis in the oil and gas industries are not on the value chain itself but on the supply chain management, which is an element of the value chain, that is the process element.

Supply chain management is the procedure of enhancing the manufacturing and delivery of goods and/or services from the raw materials to the end user (Client) at the lowest possible cost to the commercial and the highest possible value to the customer.

Historically when vertical integration (the company control every step of production) was the only way companies knew how to make material, raw materials would come in through one door and an ended product would pop out of the other. In the old days, the accomplishments of what is now called “supply chain” were dealt as distinct functions and departments. These activities include raw materials gaining and acquiring (also known as procurement), selection of cohorts (for element manufacturing and/or services subcontracting), manufacture scheduling and planning, product manufacturing, assembly, testing, quality control, inventory management, spare parts, warehouse design and site, distribution fleet management, logistics and distribution management, order

tracking, delivery, and customer returns. Correspondingly, supply chain today includes all of the end-to-end processes from your supplier's supplier to your customer's customer.

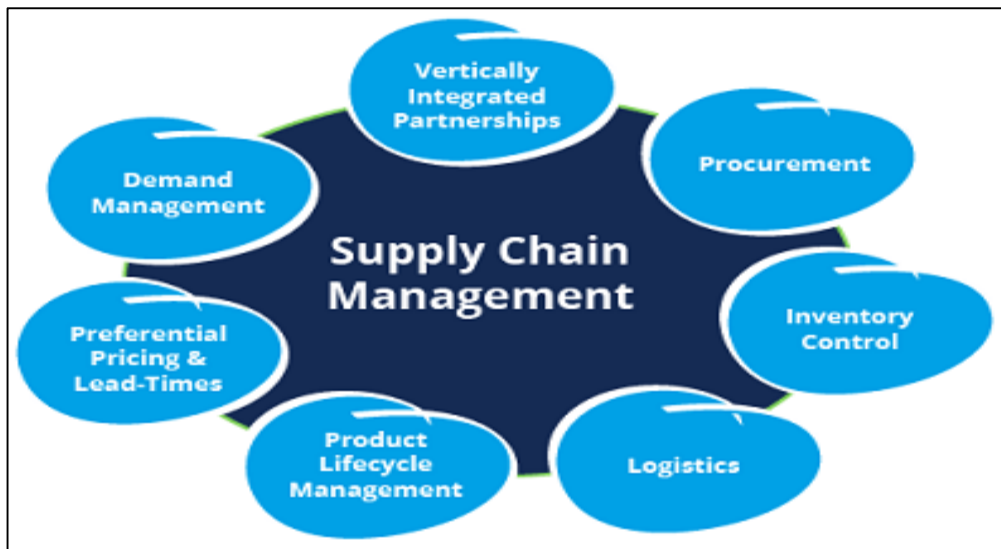


Figure 1.14 Supply Chain Management

(Source: <https://solutiondots.com/blog/benefits-of-supply-chain-management.html>, August 3, 2015)

Firms have to look at the entire process of taking a raw physical from start to finished product even outside their own client all the way to the end user and this precisely important in the case of an International Oil and Gas Service Provider firms which need to follow for their drilling Bits business.

But Supply chain does not include product development, sales and marketing (demand generation), research and development or certain elements of post-delivery customer support. The absence of a culture constituent is a restriction on this approach as for the Porter model, the supply chain management, now called procurement should be only a part of a more comprehensive approach in order to generate value for the client and the customer.

1.4.2 Contemporary value chain model in the drill monopsonist market

In the drilling monopsonist market, the power of the monopsonist is very high. In an extremely competitive and changing environment, where international oil and gas crises are relatively frequent, the pressure exerted by a client like Aramco on the drilling service

providers has increased. A few years ago, some service providers had even reported a change in behavior on the part of Saudi Aramco interlocutors, who became more authoritarian and even aggressive during the crisis. The relationships went back to normal later on, but these events are serious omens that call on suppliers to favor a more flexible and comprehensive approach. Managers should be able to adapt themselves and respond quickly and efficiently to the changing demands of the environment and create value for both the client and the supplier.

It is questionable whether Porter's value chain is still relevant to address the value creation issues in today's world. An important contribution of Porter's value chain was to systematically identify and analyse firm's activities and their interactions, with the linkages and interrelationships between the firm's primary activities and supporting activities. The linkages can be horizontal within the firm or vertical with the monopsonist client in the drilling sector. Since 1985, the environment has undergone profound changes and some researchers have reported the case of disrupted value chains (Wind and Thomas, 2010), which change traditional formats and relationships and the way organizations purchase products and services. This has a direct impact on how suppliers should sell their products and services when they face a complex and evolving environment

For Presutti and Mawhinney (2013), Porter's value chain is based upon a silo mentality, with well separated functions within which firms operate. In complex environment, even if well-defined functions may still be necessary, it is of paramount importance to get the whole picture of the competitive situation and of the forces at work. This is why Presutti and Mawhinney (2013) propose to consider the firm a holistic entity, with a shift of mind in order to efficiently manage the value chain.

Many of the points presented by Presutti and Manwhinney (2013) immediately echoed our knowledge of the drilling market in Saudi Arabia. It also reflects the state of mind and the practices of many suppliers who try to create value for themselves and for the monopsonist client.

Presutti and Mawhinney (2013) evoke a "shift of mind", with a shared commitment of the people involved in the value chain activities. One of the keys to building that shared commitment is leadership with its three pillars: goals and strategy, culture and project (organizational culture), infrastructure. The chain goes from the client needs to client value. The leader uses information management, budgeting and financial support as well

as external resources (idea generation, product development, supply chain management) to transform the identified client needs into client value and gain a competitive advantage (Figure 1.15).

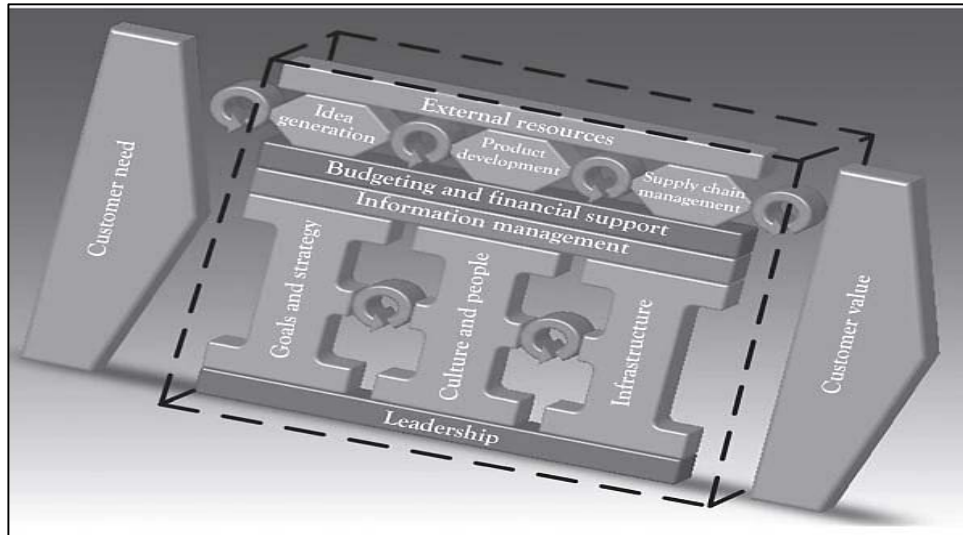


Figure 1.15 The Contemporary Value Chain or Presutti and Mawhinney's model

(Source: Presutti and Mawhinney, 2013)

In what follows, we will take examples from Schlumberger and its competitors, backed by internal documents and our experience, to illustrate the elements outlined in the Presutti and Mawhinney's model (2013) that they named the Contemporary value chain.

Leadership: a holistic view

In Presutti and Mawhinney (2013), the leader plays a key role. He needs to have a holistic view of the situation, with a comprehensive view of all the relations between the different factors. This is relevant in Saudi Arabian monopsonist context, where the leader must develop his ability to grasp a systemic view of the client's needs and quest for value, which is in line with the creative management promoted by Mary Parker Follet (1949, reprinted in 1985), whose vision was far ahead of her time. Monopsonist businesses there is a tendency for the control of a specific situation to go to the candidate with the largest knowledge of that situation. For Senge (1990), the leader is someone who "helps people see the big picture, (see) how different parts of the organization interact, and explains how local actions have longer-term and broader impacts than local performers realize" (Senge, 1990). This makes sense in the supplier and monopsonist Saudi Arabian context. Short-term decisions need to be consistent with long term goals.

In order to succeed, the leader must be able to rely on three pillars, which are goals and strategies, culture and people, and infrastructure.

a) Goals and Strategies: necessity of clear goals

A company needs to be clear on how it intends to compete in the marketplace. Take, for example, four well-recognized competitiveness dimensions: of competitive cost, response time, quality, and flexibility. A firm may choose to compete on only one or on a grouping of these dimensions. The dimension (or dimensions) that will be selected will serve as a basis for the dynamics of the value chain.

If a firm chooses to compete on cost reduction, the value chain needs to be planned for it. If it chooses response time to market, then the value chain needs to be planned for speed. Companies may not have the capacities and the resources to compete on several dimensions. However, large firms and leaders in their market may choose to compete on all four dimensions simultaneously. This is actually the case with Schlumberger which built its reputation by competing on several key competitive dimensions in the drilling sector.

b) Culture and People: a fit with the environment

This is perhaps the most important pillar in the foundation of an effective value chain. Especially in countries with high-context cultures (Hall, 1976). In the Middle East, as in some African countries or in Asia, informal relationships are as important as formal relationships. A good knowledge of the local organization culture is an absolute necessity and the firm's organizational culture has to match the local one in some way, or at least be compatible (Hofstede, 1990 ; Hofstede and Bond 1988; House et al. 2004; Schein, 2017). Human relationships should be boundariless, or at least boundaries between one's organization and the environment should be erased or overcome. This is particularly important in Saudi Arabian, with the heavy weight of the kingdom and Saudi culture.

Boundarylessness is a term introduced by Jack Welch, former CEO of General Electric Baker Corporation, in describing an important characteristic of a successful company where the walls between organizational functions, customers, and suppliers are eliminated. Human resource management which is a supporting activity in Porter's generic model is included in Presutti and Mawhinney (2013) value chain through the culture. Overall, the issue becomes one of personnel alignment, "Getting the right people on the bus and the wrong people off the bus, and the right people in the right seats" (Collins, 2001). The fit between the organization culture of the supplier and the organizational

culture of the environment , including the monopsonist is probably an important success factor. . Those that score well on this element should be rewarded accordingly (Kerr, 1975), which completely makes sense in Middle East and for International Oil and gas drilling service companies.

A competitive advantage based on culture and the skills of the people is difficult for competitors to duplicate or imitate.

c) Infrastructure: integrating people, processes and technology

Infrastructure means the basic context of the organization. Within the infrastructure, processes, technology, and facilities are enablers of the value proposition, providing the “**sustenance**” to the people in order to effectively perform the goals and strategies of the business. The integration of people, processes, and technology has become a main focus for improving productivity and service teamwork (Bal and Teo, 2000).

Missing the proper technology and processes to most effectively meet the customer’s value needs can bound the competitiveness of the organization. These aspects must also line up with and support the organization if the greatest value is to be achieved. The proper interoperability and integration of people, processes and technologies is fundamental (Presutti and Mawhinney, 2013). This is a typical example of what Schlumberger is doing and implements in Saudi market, using the latest technology, integrated along with the entire drilling process which makes Schlumberger the favourite service company for Aramco and lead the Saudi monopsonist market in terms of market share. Moreover, “a company’s strategy determines its structure and the common denominator of structure and strategy has been the application of the enterprise’s existing resources to market demands” (Chandler, 1962). Again, this is precisely what GE oil and Gas (Baker) and Schlumberger try to do by reshaping departments to decrease the bureaucratic form to better serve the Client. They also moved the decision makers to the country to facilitate the entire process and ease the human relationships.

In all cases, conversely, Presutti and Mawhinney (2013) also consider that the structure must afford for connexions among functional silos and with the company’s external resources. That is the necessary characteristic for an effective value chain.

Passing across the three pillars of the Contemporary Value Chain are two important and universal beams that directly support the concrete value creating activities

that allows a firm to transform “Customer Need” into “Customer Value.” Those support beams are information management and budgeting and financial support.

Two supporting beams: Information management and Budgeting and financial support

a) Information management

Information management is crucial to provide a firm with the resources to effectively and efficiently manage the value chain. The importance of information management was already underlined by Porter (1985): “Information systems technology is particularly pervasive in the value chain, and since every value activity creates and uses information. (Porter, 1985). It necessitates an interdepartmental cooperation, aligned with the goals and strategies..

Friedman (2007) notes the example of a firm which was rewarding high levels of inventory and hoping for interdepartmental partnership to reduce inventory levels, a classical example of dysfunction mentioned by Kerr (1975): “rewarding A while hoping for B”. One of the functions in the value chain puts its own goals above the goals of the organization.(Ashkenas et al., 1995). There is a problem of information management coupled with a system of reward structure which was not consistent with an effective value chain management strategy. This is why Schlumberger, for example, implemented several software to integrate and reduce inventory level called (i-District).

b) Budgeting and Financial Support

Porter considers accounting and finance as part of the infrastructure in his generic model. As noted earlier infrastructure is defined differently here. Budgeting and finance is not a part of the infrastructure but a dynamic force in the management of an effective and efficient value chain. This is also the case of the information management. These supporting beams must serve the defined goals in order to facilitate the process that should lead to the creation of value for the client, in our case, the monopsonist client, Aramco. This implies that the firm’s accounting professionals work closely with those in other disciplines to facilitate the development and delivery of products and services that meet client needs at a price the customer is willing to pay. This is customary with market-driven opportunistic pricing and target costing. The expected profit margin will occur if target (allowable) costs are met.

This is exactly what Schlumberger is doing by having a financial controller for each segment in general and for Drilling bits, who is part of the value chain from the standard cost of manufacturing the bits in Houston, until the selling price with the required margins, and passing by the logistics and procurements parts.

Management accounting helps the product designers meet target costs by identifying variances from target, thus obliging redesign efforts through the process of “value engineering”. Value engineering is a concept developed in the 1940s by Larry Miles at General Electric Company, and is presently used as well by GE Oil and Gas as by Schlumberger Smith Bits to reduce the standard cost in order to increase the margins without sacrificing the performance and drilling bits product quality. In core, to be effective in supporting value chain activities, management accounting must innovate, that is support a continuous improvement philosophy in spite of the existing constraints. There are no limits to improvement..

From this perspective, management accounting and finance are real drivers of value creation for the client and competitive advantage for the supplier.

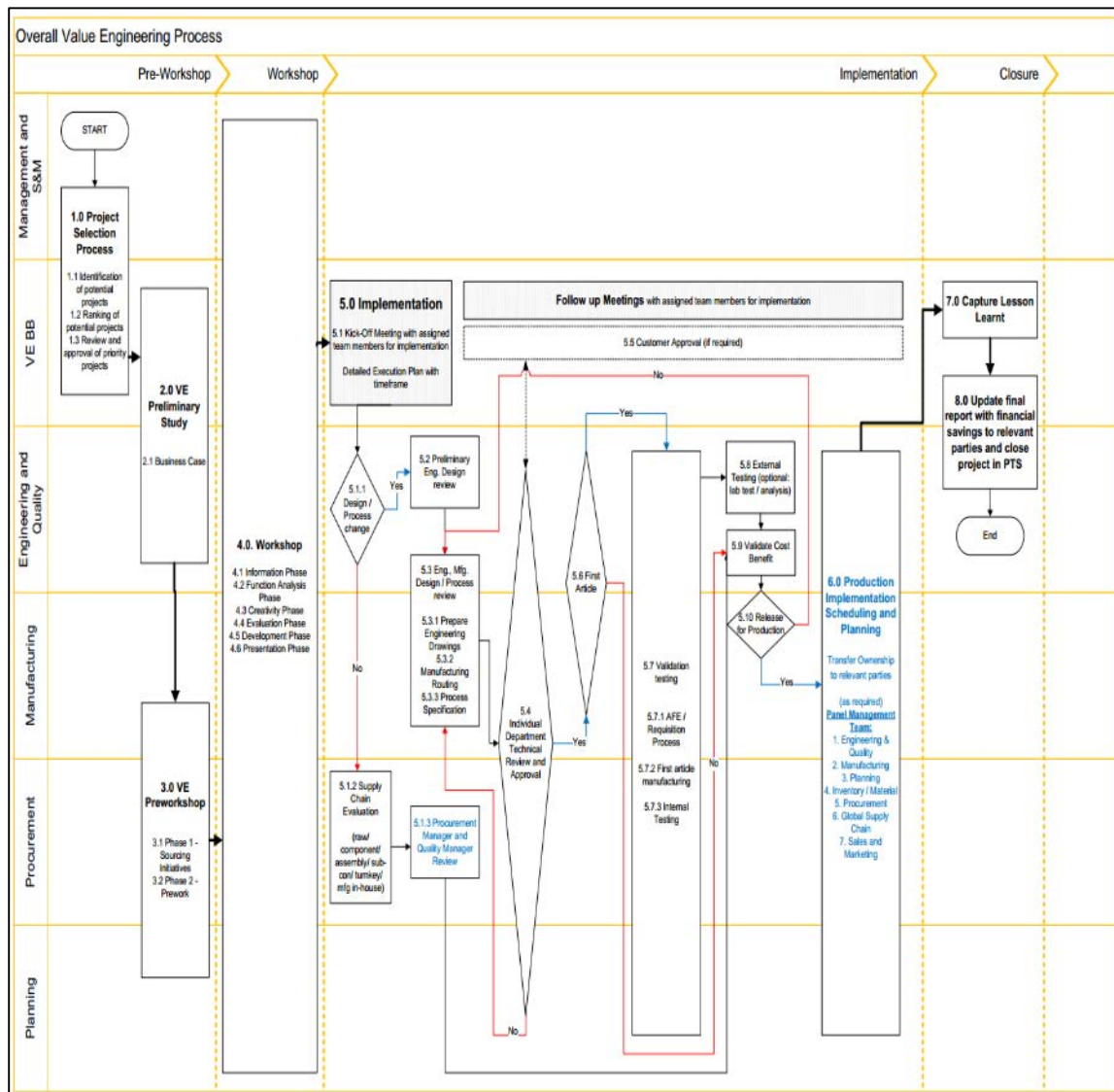


Figure 1. 16 Schlumberger Value Engineering Process

(Source: <http://www.slb.com>, Schlumberger Drilling Bits Hub, 2017)

In Figure 1.16, we present Schlumberger’s Value engineering process. Given Schlumberger’s ability to collect and analyse data today across business channels because of the advances in information management systems, finance can assist us plan our strategic future, manage our operational present, and record our financial past in order to create value..

Another important role of finance in the value chain is that it allows us to measure our financial success in delivering value to the marketplace, with the use of economic value added (EVA) to connect different processes and activities in a company and their impact on the total value created. Key components of EVA are revenues, costs, and assets.)

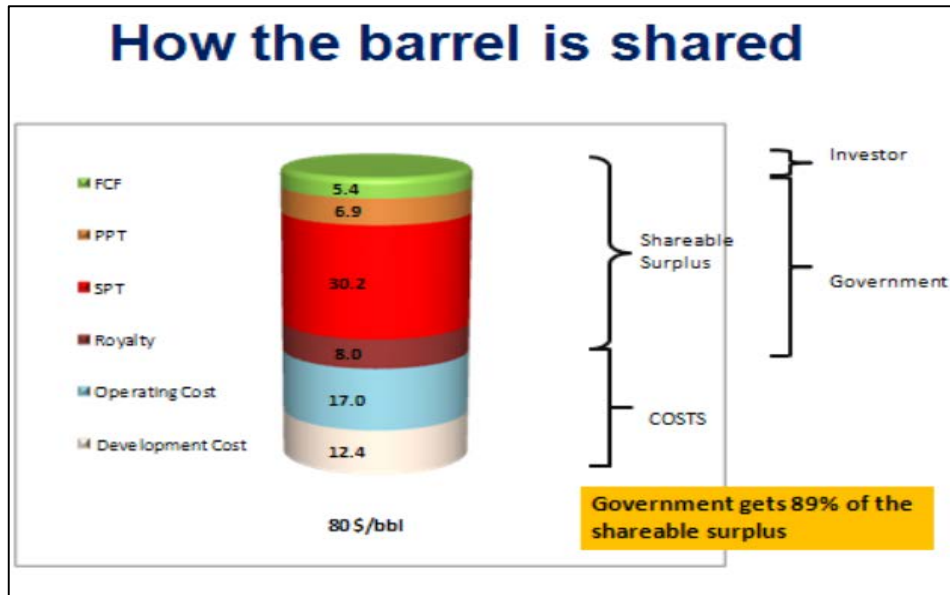


Figure 1. 17 Figure 1.44 Oil Barrel Breakdown
 (Source: <https://theseventhfold.wordpress.com/peak-oil-101/>, 2007)

Product Development:

Product development is the transformative process that converts an idea to a product or service in value for the client. A number of constituents including marketing, engineering, production, supply management and suppliers are associated to this process. Supportive culture and organization with interdepartmental collaboration are necessary to ensure the efficiency of the product development process. For example, that requires close collaboration between engineering and supply management. This prevalent collaboration between all relevant constituents in the value chain results in meeting three important dimensions of competitiveness in industrial purchasing behavior, which should be present in a monopsonist market: cost, quality, and response time to market. Moreover, the objective is to meet all constituent (actors) objectives: for example, marketing and customer acceptance, engineering and performance, supply management, and cost and obtainability of required materials, etc. At Schlumberger, this system is called “Transformation”.

c) Supply Chain Management

As noted earlier, the primary activities in the Porter Value Chain model inbound logistics, operations, outbound logistics, marketing and sales, and customer service are important mechanisms of what is called the supply chain.

Procurement, a support activity in the Porter model, is recognized as an important component of the supply chain on the input end of the Contemporary model and is recognized as supply management in Pressutti and Mawhinney's (2013) value chain. The Porter's inbound logistics component is captured through the supply management and transportation components of their model. The Porter's outbound logistics component is reflected in the supply planning and transportation components of their model.

As Figure 1.18 suggests, the fundamentals of the supply chain represent the "source–make–deliver" sequence required to link suppliers (source) with the internal components of the supply chain (make) ultimately delivering value to a firm's customers (deliver). All suppliers and customers are included in the "source–make–deliver" sequence. For example, Schlumberger Drill Bits manufacturer may purchase dashboard assemblies from an assembly supplier who, in turn, purchases assembly components from its suppliers. The Drill Bits manufacturers make the final Drilling Bits and deliver them to Schlumberger who sells to the final Client. The "source–make–deliver" sequence applies to all companies either upstream (suppliers) or downstream (distributors) of the firm's value network. Any value chain model aspiring to define the workings of the 21st-century value chain must clearly include a different supply chain element.

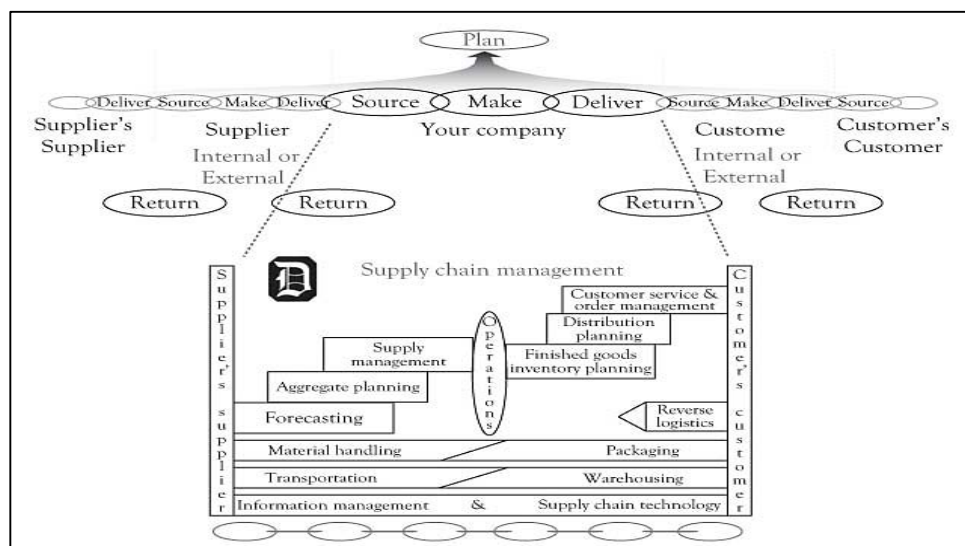


Figure 1. 18 The basic elements of a supply chain (Source: Mawhinney & Presutti, 2009)

An effectively functioning supply chain should deliver a competitive advantage to the firm because competition is no longer simply between companies but between those companies' supply chains.

External Resources

A company's competitiveness depends on the quality of its external resources more than ever before. Increased competition and national ambitions increase the pressure on companies and states. Friedman (2007) considers that flattening the world, by giving a chance to everyone will be beneficial to all. He identifies 10 flatteners that may lead to a flatter world. He mentions outsourcing, offshoring (that is relocating manufacturing facilities or other processes to a foreign country to take advantage of less costly operations but also to respond more rapidly to client demands and assist the country in its quest for welfare), supply chaining, and insourcing. By using such flatteners, companies contribute to level inequalities, and rely on external resources to improve their global competitiveness (Friedman, 2007). Leveraging external resources also means building upstream or downstream partnerships, that is developing vertical linkages according to Porter to win the competitive race. As firms continue to follow outsourcing strategies, the supplier base of the value chain becomes progressively important. Efficiently managed, supplier input at the development process stage can help the buying firm reduce two important dimensions of competitiveness, cost and time by 15 to 20% (The Aberdeen Group, 2001).

New Value Chain and Social Responsibility

As concerns about the environment and ethical practices stand, a firm's success and reputation will also be measured by its capacity to meet these new environmental and social obligations. Porter and Kramer (2011) insist upon the necessity to develop a shared values approach to reconnect company success with social progress.

The triple bottom line refers to the impact of a firm's activities not only on profit but also on society and the environment. Presutti and Mawhinney (2013) urge firms to infuse this triple bottom line concern into all activities in the value chain. This concern must be explicitly recognized by the firm's leadership, invade the corporate culture, be an important element of goals and strategies, and finally manifest itself in product development and actions in the supply chain including the results on the choice of suppliers.

In the operations constituent of the supply chain, in the drilling sector, the issue should be if a product can be manufactured to minimize environmental impact. Here, if

the value chain is being managed effectively, the importance of the internal integration between product development and operations becomes obvious. Regarding suppliers, firms need to pay attention to the importance of social responsibility among the supplier selection criteria. In the contemporary value chain (Presutti and Mawhinney, 2013), social responsibility is not considered a separate component but rather embedded in the very fabric of the value chain itself.

Schlumberger and major international Oil and Gas Services Company are contributing to the Health, Safety, Security, Environment, & Social Responsibility Conferences. With a theme of "Sustaining our Future through Innovation, Collaboration, and Capital Efficiency," this event brings together managers and professionals to share ideas, best practices, innovative solutions to address issues facing the E&P (Exploration and Production) industry.

1.5 Conclusion

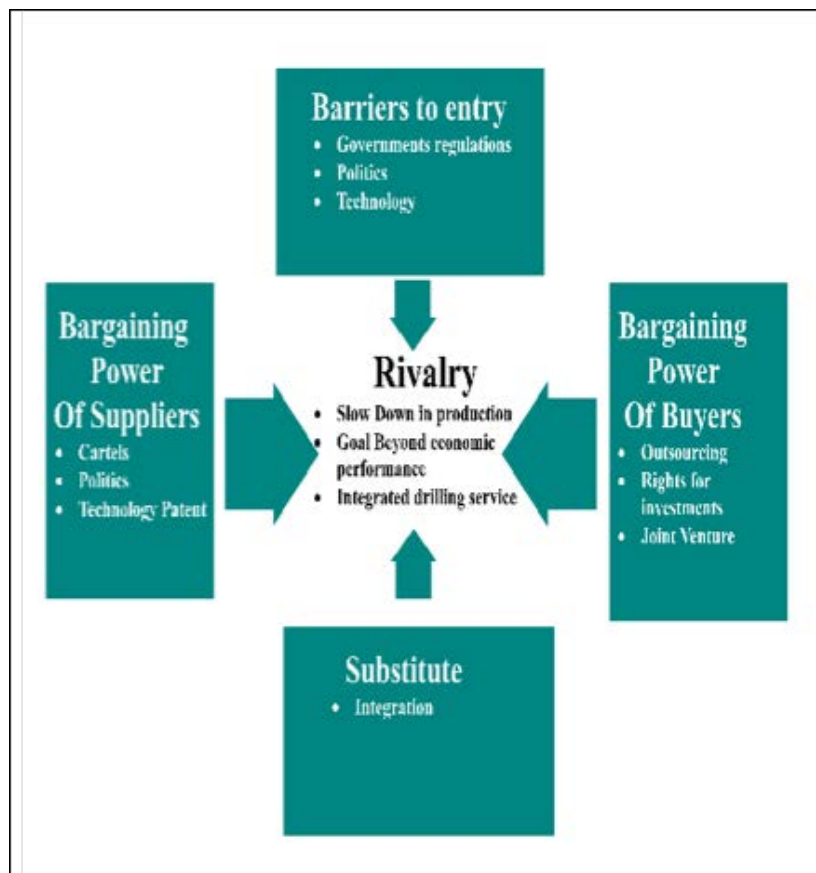
In this chapter, the objective was to answer the first research question that is to help understand the general monopsonist situation and the main characteristics of the monopsonist market under study, with its value chain.

Research question 1. RQ1: What are the sector characteristics and the value chain in a monopsonist market?

The drilling market in Saudi Arabia is the upstream sector of the oil and gas industries. It is a pure monopsonist market with a single buyer, Aramco which is the biggest oil producer and state-owned oil company in the world. Its power is considerable. The suppliers include the 5 most important drilling service providers worldwide and several other oil companies. The rivalry in the market is strong and the objectives and needs of the buyer are evolving under the pressure of the environment and the new impulse and objectives of the royal family, in a world where energy and oil and gas are big economic, political and environmental issues.

This is why the Porter's 5 forces analysis that we applied to the drilling sector made appear a strong importance of issues that are not purely economic but that are related to technology, politics and integrated solutions, in an unstable environment. We will also notice the important weight of dimensions such as joint-ventures for suppliers, or rights for investments. In the same way, facing the huge power of the monopsonists, the suppliers

try to find solutions through cartels, technology patents but also politics and strong historical relationships. Thus, the barriers to entry are strongly linked to government regulations, politics and technology. A substitute to the monopsonist power and to the suppliers/client relationships is the integration alternative. Integrated solutions emerge in these highly competitive monopsonist markets. The rivalry and competition is exercised with respect to economic but also non economic issues.



In the same way, following Friedman (2007), these issues are also of great importance in the value chain with environment considerations. There is a need to choose a global view of the phenomena at work on this monopsonist market to provide the best responses to create value for both the client and the supplier. The supplier must respond to a triple bottom line that is a performance and profit bottom line, a social bottom line and an environment bottom line, with the requirements of the monopsonist which expects global and integrated solutions.

In that way, the contemporary value chain (Presutti and Mawhinney, 2013) sounds to be particularly appropriate to analyze the drilling sector's case of a monopsonist market. This contemporary value chain is consistent with Porter's value chain but captures some key elements of a firm's value chain that the Porter's model does not. This model argues that the effective functioning of the value chain fundamentally depends on a holistic vision of the firm and of its environment, and particularly the quality of a firm's leadership, corporate culture, the quality of its people, and the correspondence between the firm's strategy, the organization and its environment. This is not new in management but it is both a holistic approach and a client centric dynamic approach, which fits particularly well the monopsonist case. The danger in a monopsonist market with a very strong buying power is to technically respond to the strong and sometimes changing demands of the monopsonist client and to lose a longer-term vision with inspiring goals and objectives, which must fit with the client ones.

The primary activities of the Porter model are consolidated into the supply chain module of the Contemporary model allowing the new value chain model to include important elements to understand management of the 21st-century and what is at stake in a monopsonist market. In particular the recognition that a firm, in our case the supplier, cannot create value without association with external resources. The client needs now are the driver of the chain in order to generate client value as the outcome. Then the value chain has stable starting (i.e. client needs) and ending points (i.e. client's value) which are customer-focused or client-focused, which is a critical consideration today in building competitive advantage with a dominant client with very strong purchasing power.

It also identifies what we believe to be essential resources necessary for a successful value chain: people management, budgeting and finances, information management, and external resources (i.e., idea generation, product development, supply chain management). The Contemporary model assumes that these resources are deeply imbedded in the management of the value chain. While elements such as leadership with the goals and the strategy, the culture and the people, the infrastructure were among the supporting activities in the Porter's value chain, they are at the core of the activities and of the whole dynamics that goes from client needs to client value.

Finally, characteristic in the decisions made in the process of managing the Contemporary Value Chain is the universal notion of corporate social responsibility, an

issue that has become fundamentally important in contemporary business. Overall, we show in this chapter, that the Contemporary modern Value Chain is more complete than Porter's value chain and also makes more sense in order to understand value creation for the client (but also the supplier) in a monopsonist market. The critical elements of today's drilling market in the oil and gas industries are the people, the processes, and technology integration as we show with numerous examples in the chapter.

This first chapter help understand the general picture of the monopsonist client sector and the main issues that the supplier has to address. But a thorough analysis of the suppliers must be conducted with the support of the industrial and organizational behaviour literature, based upon the analysis of the "buying center", and of a qualitative analysis conducted in Saudi Arabia. A quantitative analysis carried out over monopsonist and non monopsonist market will finally put our results into perspective.

2

THE BUYING CENTER AND BUYING PROCESS IN THE OIL INDUSTRY IN A MONOPSONIST MARKET



Table B Research questions and Methodology

Research Questions applied to the case of the drilling sector in the oil industry	Methodology	Data collection	Data analysis
RQ1 : What are the sector characteristics and the value chain in a monopsonist market	Literature review Secondary data		Review and analysis of the literature and of secondary data: oil industry and drilling sector documents
RQ2: What are the Buying center and the Buying Behavior (process, roles and influences) in a monopsonist market	Literature review and Primary data	Analysis of internal data and secondary data about the role of the Kingdom	Literature review and analysis of Schlumberger internal documents
	Qualitative analysis	16 semi-structured in depth interviews in Saudi Arabia with managers from suppliers (Schlumberger and competitors) and the supplier (Aramco)	Content analysis of the interviews
RQ3: What are the important attributes in the Buying center and how to gain a competitive advantage	Qualitative analysis	16 semi-structured in depth interviews in Saudi Arabia with managers from suppliers (Schlumberger and competitors) and the supplier (Aramco)	Content analysis of the interviews in the Saudi-Arabian monopsonist market
	Quantitative analyses: Saudi Arabian monopsonist market	77 managers (41 managers from the suppliers : Schlumberger and competitors service providers ; 36 managers from the client: Aramco)	t-tests: comparison of means for dependent samples (comparison between straight rebuy and modified rebuy) for
	Quantitative analyses: monopsonist versus non monopsonist markets	116 managers (85 in a monopsonist market and 31 in non monopsonist markets)	t-tests: comparison of means for independent samples (monopsonist versus non monopsonist)

CHAPTER 2: The Buying center and Buying process in the oil industry in a monopsonist market

Many studies have dealt with industrial buying behavior (Robinson and Faris, 1967; Webster and Wind, 1972a; Sheth, 1976; Webster and Wind, 1996). A synthesis and analysis of these comprehensive industrial buying behavior models as well as of the industrial adoption process (e.g., Ozanne and Churchill, 1971; Choffray and Lilien, 1978) has been conducted by Pras and Tarondeau (1981). In this chapter, we present the main fundamental industrial buying behavior and their characteristics but also some evolutions of these models and, to our knowledge, the only attempt to apply them to the oil industry, by studying the sealing systems industries in Iran. This literature review will help us build our frame of reference to conduct our study regarding research question 2 and 3: “RQ 2: What are the Buying Center and the Buying Behaviour in a monopsonist market (Process, roles and Influences) (Case of the Drilling sector in the Oil industry); “RQ3: What are the important attributes in the buying center and how to gain a competitive advantage in a Monopsonist? (Market case of drilling Sector in the Oil Industry)”. In order to answer these questions we conduct a qualitative research. The methodology that we used and the results are then presented.

2.1 Global models: Buyclasses, Buyphases and Buying center (Robinson, Faris and Wind model and Webster and Wind models)

As reminded by Pras and Tarondeau (1981), there are two main classes of industrial buying behaviour models. The models which emphasize the stages in the decision making process and the buying situations which are met, and which have long been recognized as vital in determining the buying process (Robinson et al., 1967) and the introduced the concept of buying center. This concept with further research about the roles that individuals play in the buying center was further developed and analyzed by Webster and Wind (1972a). The other type of model insists on the interaction and interrelations between the members of the buying center and also puts the emphasis on the psychological aspects buying process (Sheth, 1973; Bon and Pras, 1984).

The popularity of the Robinson, Faris and Wind or RFW model (Robinson et al., 1967) is due to the fact that this model can be easily testable and is decision-making oriented. Their

theory of buyclasses has been called “one of the most useful analytical tools for both academics and practitioners interested in organizational buying behaviour” (Moriarty, 1980, p.23). These researchers see the industrial buying behaviour not as single events but as buying processes with specific buyclasses and buyphases. But this has to be twinned with the buying center and the roles of its members (Webster and Wind, 1972a).

Robinson et al. (1967) identify eight buyphases and three buyclasses in industrial buying behaviour, that is new task, modified rebuy and straight rebuy.

Table 2. 1 Buyphases and buyclasses in the RFW Buygrid model

Buyphases	New task	Modified rebuy	Straight rebuy
Recognition of the organizational problem or need	x		
Determination of the characteristics of the item or the quantity needed	x		
Description of the characteristics of the item or the quantity needed	x	x	
Search for and qualification of the potential sources	x	x	
Evaluation of the proposal and selection of suppliers	x	x	
Selection of a routine order	x	x	x
Performance feedback and evaluation	x	x	x

Source: Robinson et al. (1967)

2.1.1 Buyclasses and buyphases

The buyphases identified by Robinson et al (1967) have been reduced to six phases by Webster and Wind (1972)

- a) Recognition of a need

- b) Determination of the specifications
- c) Search for potential suppliers
- d) Evaluation of proposals
- e) Choice of the supplier
- f) Evaluation of performance

The buyclasses are the new task, the modified rebuy and the straight rebuy. With each one of this situation, the buyer will follow a more or less extensive process with a more or less extensive information search and a more or less extensive search for new suppliers and alternatives.

2.1.1.1 New Task

With a new task, the industrial buyer will follow the whole buying process, from problem recognition to the post-purchase evaluation. It will seek a large variety of information and explore alternative purchasing solutions. It will extend its consideration set to a the maximum of potential suppliers even it may rely on some particularly important attributes in his final choice (Pras and Summers, 1975).

In this situation, an internal or external stimulus, or even an environmental factor may cause the recognition of this new need. The problem is new as well as the task. This situation is relatively rare. In practice, there is a continuum between New task, modified rebuy and Straight rebuy depending on the newness of the problem and of the situation. The new task situation help identify a need which had not been elucidated before. This is why it necessitates a thorough analysis of all potential suppliers and alternatives.

2.1.1.2 Modified Rebuy

The modified rebuy is one of the most common situation in industrial purchasing (Robinson et al. 1967). This situation is different from both the new task and the straight rebuy. This situation occurs when the choice criteria change, when there are new solutions to an existing problem, when there was a reassessment of product specifications. Modified rebuy goes along with innovation, even if the need remains the same. It usually involves fewer participants in the buying process than the new task. Researchers consider that, in this situation, the suppliers which are on an approved supplier list get a chance to maintain their

competitiveness by proposing new offers while suppliers which are not yet on an approved supplier list get a chance to enter the client consideration set of suppliers. Therefore, the information requirements are moderate and the search for new alternatives is limited ((Robinson et al., 1967) (Table XX).

2.1.1.3 *Straight Rebuy*

The straight rebuy situation is one of the most common situation in industrial purchasing (Robinson et al., 1967) since most purchases are made on this direct basis. It involves the rebuy of a product or of established solutions. The buyer Knows the supplier, has much experience with him. A routine purchase process is put in place. The information to reorder most often comes from the inventory control department. This process requires regular quality assessment and may be interrupted if a decrease is found or when an incident occurs. Suppliers usually are on an approved list and the search for information is extremely limited. This routine process requires very little effort in general and no further information requirements (Dholakia and Johnson, 1967. It may happen from time to time, that small changes are asked for or required, but this does not cause important changes in the procurement process and patterns (Robinson et al., 1967).

New task, Modified rebuy and Straight rebuy situations have been characterized by Robinson et al. (1967) according to three characteristics (Table 2.2):

- 1) Newness of the problem,
- 2) Information requirements
- 3) Considerations of new alternatives

Robinson et al (1967) show how these characteristics influence each basic type of buying situation (Table 2.2).

Table 2.2 Distinguishing Characteristics of Buying Situations, Source: Robinson et al., 1967, p. 25

Type of Buying Situation	Newness of the problem	Information requirements	Consideration of New Alternatives
New task	High	Maximum	Important
Modified rebuy	Medium	Moderate	Limited
Straight rebuy	Low	Minimal	None

Other researchers as well found that problem newness and information requirements were strongly related (Anderson et al., 1987).

2.1.2 The Buying Center

There is an extensive agreement that industrial buying involves multiple participants inside and outside the buying organization. The concept of buying center was first originated by Robinson et al. (1967) who defined it as “The individuals who are related directly to the purchasing process, whether users, buying influencers, decision makers, or actual purchasers.” (ibid., p. 101). This group comprise all individuals with a stake in the buying decision process. These individual can belong to the client, the supplier, competitors, but also to the system at large (civil servants, state, end-users, retailers, etc). The buying center concept has been further developed and analysed by Webster and Wind (1972a; 1972b) who specified the roles that the individuals can play. An individual can have several roles (for a detailed analysis, also see Pras and Tarondeau, 1981).

For Webster and Wind (1972a; 1972b; 1996), only a subset of organizational actors are involved in a buying situation, with five determinant roles: users, buyers, influencers, deciders, and gatekeepers. Several individuals may have the same role, e.g. there may be several users or gatekeepers. In the same way, as already said, one individual may play several roles even if he has a determined function in the organization. For example, the same individual may sign the purchase order and be both buyer and gatekeeper. The five roles in the buying center are as follows:

- **Users** : those members of the organization who use the purchased product and services.
- **Buyers**: those with formal responsibility and authority for contracting with suppliers.
- **Influencers**: those who influence the decision process directly or indirectly by providing information and criteria for evaluating alternative buying actions.
- **Deciders**: those with authority to choose among alternative buying actions
- **Gatekeepers**/ those who control the flow of information (and materials) into buying center.” (Webster and Wind, 1996, p. 56)

For Webster and Wind (1996), it is extremely important to understand the roles expectations for the various members in the buying center. But these expectations will be influenced by other factors at the individual, social and organizational levels (Webster and Wind, 1996).

Bonoma (1982) added a sixth role (initiator) to the five roles identified by Webster and Wind (1972a; 1996). “The *initiator* of the purchase process (...) recognizes that some company problem can be solved or avoided by acquiring a product or service.” (Bonoma, 2006, p. 175). This set of roles sounds to be relevant even if other researchers suggested three groups of decision-making units (Moller, 1993): the executors who carry through the processes and are the execution specialists; the degerminators who are the potential users and existing users who also decide what to do.; and the gatekeeper whose role is found to be played by more or less all categories involved.

The roles such as determined by Webster and Wind (1972a; 1972b; 1996) and enriched by Bonoma (1982) are the most commonly used in the literature since their definition is clear. Bonoma gives an example of these six roles for the replacement of a company’s telecommunications system (Table 2.3).

Table 2. 3 Example of a buying center and roles when replacing a company’s telecommunication system

Initiator	Division general manager proposes to replace the company’s telecommunications system
Decider	Vice president of administration selects, with influence from others, the vendor the company will deal with and the system it will buy
Influencers	Corporate telecommunications department and the vice president of data processing have important say about which system and vendor the company will deal with
Purchaser	Corporate purchasing department completes the purchase to specifications by negotiating or bidding
Gatekeeper	Corporate purchasing and corporate telecommunications departments analyze the company’s needs and recommend likely matches with potential vendors
Users	All division employees who use the telecommunications equipment

Source: Bonoma (2006 p. 175)

2.2 Other models and key variables

Robinson et al's (1967) and Webster and Wind's (1972a; 1972b; 1996) have been extensively discussed in the literature on industrial buying behaviour but there are still considered as the reference frameworks. Other models introduced new variables, extended the basic frameworks or analyzed the reliability of the model in various sectoral conditions.

We shall examine some of these issues. First, we shall briefly present some other models and the relevant extensions. Second, we shall discuss the relevance of psychological models and in particular Sheth industrial buying behaviour model (1973) for our study. Third, we shall discuss the selection criteria and evaluation criteria which are taken into account in the literature, mainly in the vendor selection literature. Fourth, we shall consider the environmental factors in the industrial buying behaviour models.

2.2.1 Other models and dimensions: imbalance of power, trust and commitment

Other models referring in particular to the industrial adoption process were developed (Ozanne and Chrchill, 1971; Choffray and Lilien , 1978; Johnston (1981). These researchers, such as Choffray and Lilien put a stronger emphasis on two aspects: the individual responsibilities within the buying center, the potential alternatives regarding the environment constraints (physical, technological, economic and social) and the organizational constraints (technical and financial). For these researchers , the buygrid model overstates the role of newness in the process and neglects important issues such as importance of the acquisition. The acquisition, that is the investment aspect. Ghingold (1986) also found that the buygrid better characterizes some types of purchases than some others. However, the framework is considered useful for the understanding of the buying process (Haas, 1995; Webster and Wind, 1996; Kotler et al., 2013; Thomas, 2014; Kotler and Armstrong, 2017).

Other researchers suggested to focus on other dimensions. An interesting approach is Johnston and Bonoma's one (1981). Based on the social psychological literature on

communications and small groups, they hypothesize that five dimensions of the buying center could be specified and measured:

1. Vertical involvement in the buying center communications. This dimension defers to “the number of levels of the organization's authority hierarchy exerting influence and communicating within the buying center” (Johnston and Bonoma, 1981, p. 146). They defined six levels of authority from ownership to lower level operating management (via top management, policy level management and upper level management).
2. Lateral involvement of different departments and divisions in the buying communications network. This dimension characterizes the number of separate departments, divisions, or firm functional areas involved in the purchase decision.
3. Extensivity, or the total number of individuals involved in the purchase communication network.
4. Connectedness of those involved in the buying communication network. This corresponds to “the degree to which the members of the buying center are linked with each other by direct communications concerning the purchase” (Johnston and Bonoma, 1981, p. 147).
5. Centrality of the purchasing manager in the buying communication network.

This approach is interesting since it shows that there may be priorities in the attributes depending upon the weight, the hierarchical level and the centrality of the member of the buying center. It also introduces the concept of balance of power between buyer and seller.

The level of responsibility of buying center members is a key question. Who has the main responsibility at which stage of the buying process can be a powerful segmentation tool. For example, Thomas (2014) conducted an exploratory study which focused on the use of buying center purchase responsibilities as a basis for industrial market segmentation. They analyses “overlapping” versus “position-dominant” patterns of purchase responsibility.

Other researchers also insisted on the importance of the buyer bargaining power in industrial buying behaviour and procurement strategies (Schoenherr and Mabert, 2011). Ebers and Semrau (2015) have also shown the importance of power imbalance and its effects on specific investments between buyer and supplier, with the moderating role of trust. And they suggest that further research investigates the role of power imbalance and trust in the buyer seller relationship and specific investments. In the same way, Chen et al. (2017) investigate the mediating role of specific assets in the effects of trust and commitment on value creation in asymmetric buyer–seller relationships. Balance of power, trust and commitment and investments are important issues in the literature, The study reveals that, even when there is power imbalance, the relationship value could still be increased once the congruent goals have been achieved by both parties

Incorporating twenty five years of research since the Robinson et al.'s model (1967), Johnston and Lewin (1996) insist upon the fact that research demonstrates that much of the variation in organizational buying behavior appears to be related to the levels of risk . These levels of risk are associated with a given purchase situation. “Interfirm (buyer-seller) relationships and communication networks become increasingly important in higher risk purchase situations. Awarding the contract to a seller whose products and services have a proven interorganizational track record helps reduce the perceived risk associated with an important purchase. “ (Johnston and Lewin, 1996). For Moon and Tikoo (2002), it is important to understand the characteristics of the buying situations in order to assess their impact on the buying processes. These characteristics are the purchase importance for the buyer, the task uncertainty, that is the buyer's perceived lack of information, the extensiveness of the choice set which refers to the breadth of alternatives available, and the perceived buyer power, which is the buyer's perception of the firm's negotiating strength in a particular buying decision situation. They apply this approach to the hospitals with the buyers and users. Task uncertainty and the perceived buyer's power have an effect on the type of approach that the buyer adopts.

These various studies show that the imbalance of power should have an impact upon the buying process and the characteristics taken into account by the buyer.

2.2.2 Psychological issues affecting the industrial buying behaviour and the weight of situational factors

One of the major models in industrial buying behaviour is Sheth's model (1973). In his model, Sheth investigates the various steps in the industrial decision-making process, which includes initiating the decision to buy, gathering of information, evaluating alternative suppliers, and resolving conflict among the parties who must jointly decide.

He focuses on conflict resolution and adopt a psychological perspective in his analysis. But he also systematically examines the power positions of various individuals and roles involved in the industrial buying process. He studies both the power positions of the individuals and the trade-offs among various objectives. In his model, the process of conflict resolution among the parties and of trade-offs among various objectives and their impacts on supplier or product choice is crucial.

Moreover, Sheth says that it is important to realize that not all industrial decisions are the outcomes of a systematic psychological decision-making process. Some decisions may be based on a set of situational factors, which may play a more key role than the conflict resolution and trade-offs processes. In such cases, what is needed is a "checklist of empirical observations of the ad hoc events which vitiate the neat relationship between the theory or the model and a specific buying decision" (Sheth, 1973, p. 56).

For Sheth, there is ample empirical evidence in the literature to suggest that at least some of the industrial buying decisions are determined by ad hoc situational factors (...) such as some economic or political conditions.

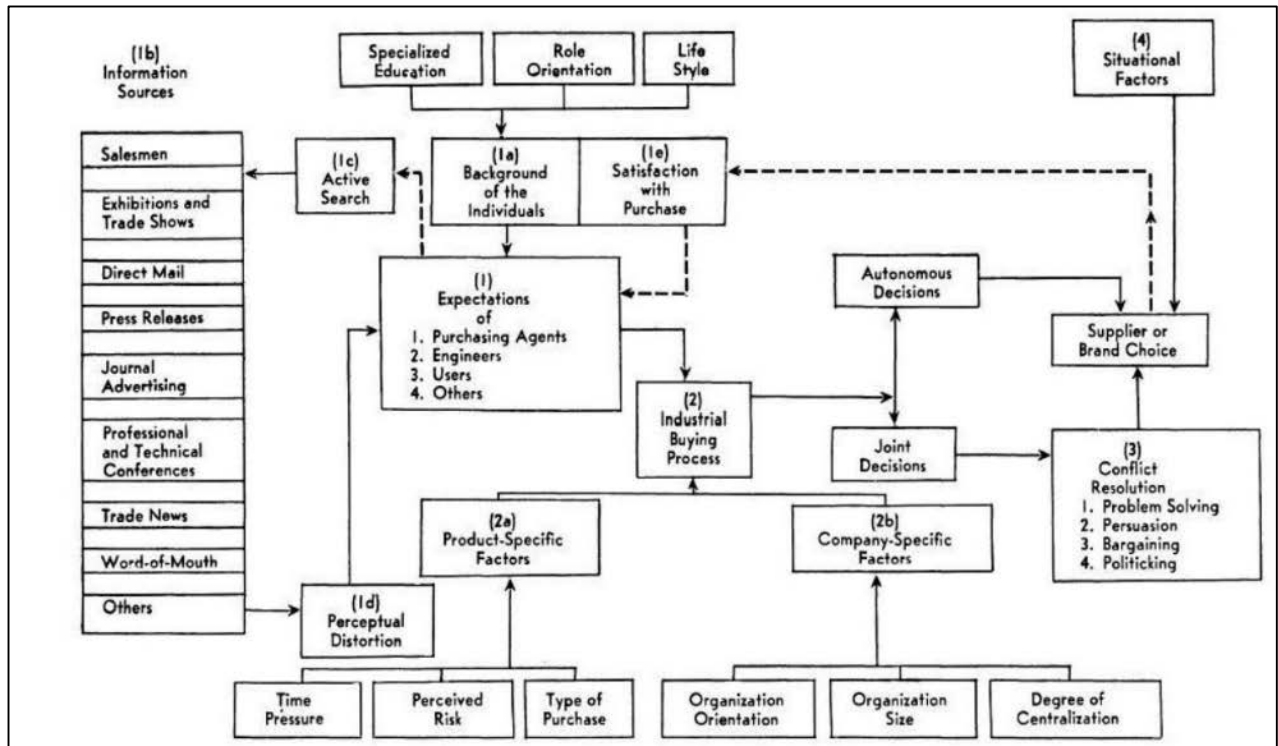


Figure 2. 1 Sheth's model of industrial buying behavior Source : Sheth (1973)

2.2.3 Environmental Factors affecting the Buying Process and the Buying Center

One of the main attempt to classify the factors affecting the buying process and the buying center was made by Webster and Wind (1972b; 1996) who identify four classes of variables influencing the buying process and the buying center, namely: individual, social, organizational and environmental factors. The basic principle of Webster and Wind's model is that organizational buying is a decision-making process carried out by individuals, in interaction with other people in the buying center, within the context of a formal organization, and the influence of environmental factors.

Wind and Thomas (1980) identified two set of factors influencing the buying process and the configuration of the buying center. These are the different buyclasses and the idiosyncratic personal, interpersonal, organizational and environmental conditions. Environmental factors regulate values and standards in buyer-seller collaboration as well as between competitors. They also influence the flow of information entering an organization.

Webster and Wind (1996) went a step further by making the distinction between task and non-task factors. This distinction is based upon previous models which may focus either on the buying task and economic factors such as buying agreements, price, compliance to specifications, or on “no task characteristics such as personal goals and motivations, and relationships between buyer and seller or the political climate (Figure 2.2).

Classification and examples of variables influencing organizational buying decisions

Individual	Desire to obtain lowest prices	Personal values and needs
Social	Meetings to set specifications	Informal, off-the-job interactions
Organizational	Policy regarding local supplier preference	Methods of personnel evaluation
Environmental	Anticipated changes in prices	Political climate in an election year

Figure 2. 2 Variables influencing organizational buying decisions (Source: Webster and Wind, 1996)

The buying decision is influenced by the characteristics at the buying center level, which in turn are influenced by the organization and environmental characteristics. “The formal organization exerts its influence on the buying center through the subsystems of tasks, structure (communication, authority, status, rewards, and work flow), technology, and people. Finally, the entire organization is embedded in a set of environmental influences including economic, technological, physical, political, legal, and cultural forces.” (Webster and Wind, 1996, p. 54).

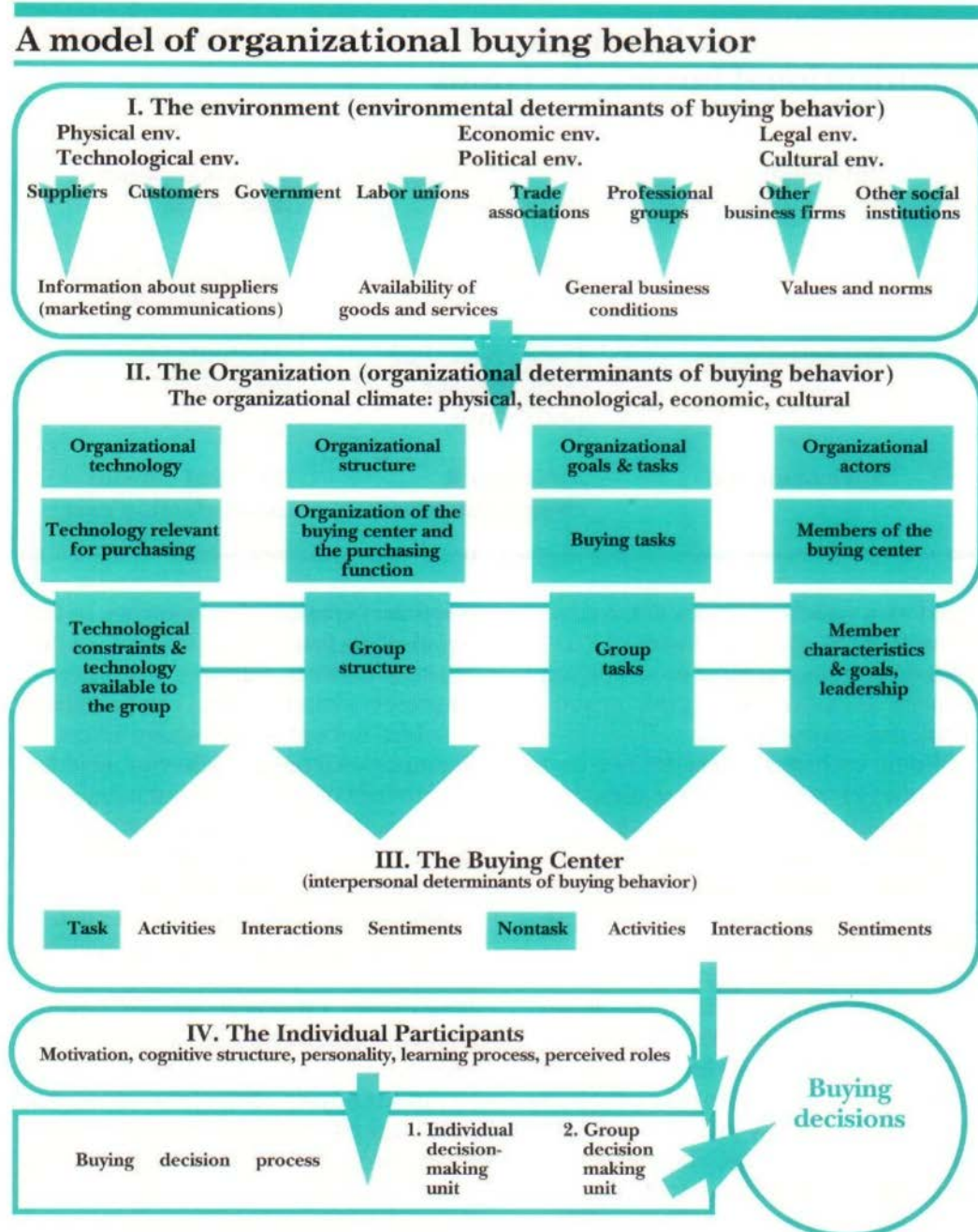


Figure 2. 3 Variables influencing organizational buying decisions: a model of organizational buying behavior
 (Source: Webster and Wind, 1996)

Wind and Thomas (1996; 2010) as well as Sheth (1996) emphasize the importance of globalization, increased competition and rapid changes in the environment which may have a direct impact on the number of buyclasses considered in a specific market. Information technology and cross-functional integration may also require close

relationships between client and suppliers in order to deal with complex issues. Time and responsiveness to buyer demands are also more important in the decision process than decades ago. Moreover, the phases in the buying process may be overlapping and it is important to understand their dynamics in specific market, under specific economic conditions. The “center of gravity” of the phases may move (Wind and Thomas, 1996; 2010).

In particular, Wind and Thomas (2010) emphasize five phenomena:

- The accelerating globalization will increase the likelihood that organizations with innovations and/or cost advantages will partner to form new business models.
- Flattening networks of organizations and increased formation of networks can result in the lock-in or lock-out of some organizations.
- Disrupting value chains can undermine value chain relationships thereby shifting organizational dependencies.
- Intensifying government involvement lead to changing rules that impact when and how organizations can partner.
- Continuously fragmenting customer needs can create market segments and new partnership, disrupting operational scale.

Therefore, in our study, we consider crucial the need to understand the impact of the environment in order to make suitable strategic decisions. Overlooking environmental factors, values and cultural dimensions them can become very risky. The impact of new technology, culture, power relationships should play a significant role in order to acquire a competitive advantage, gain market shares and open the business by satisfying the expectations and requirements of the monopsonist client, with the Middle-eastern culture.

2.3 Specificities of the oil and gas industries and of a monopsonist market: a frame of reference

2.3.1 Supplier selection criteria and specificities of the oil and fast industries

Defining the criteria to select and evaluate a supplier is an important issue in industrial buying behaviour. The list of criteria may vary according to sectoral specificities

Research first focused on vendor selection criteria. One of the first study was Dickson's research (1966) on vendor's selection criteria. This research shows the major importance of operational criteria in the vendor selection process, followed by reputational factors or firms characteristics (Table 2.4)

Since Dickson's seminal paper, there has been radical changes in the purchasing supplier process, according to Weber et al. (1991). These authors reviewed and classified 74 articles related to supplier selection criteria in order to judge their evolution over time. Their results show that the most cited attributes are net price, delivery, quality, production facilities and capacity, geographic location, technical capability, management and organization, reputation and position in the industry, financial position, performance history, repair service (Table 2.5)

This evolution is interesting since it shows the still major impact of price, quality and delivery but at the same time the increasing importance of organizational dimensions and of the overall reputation of the firm.

In 2016, Jaysinpure et al. (2016) in a literature review introduce other criteria such as responsiveness, organizational profile and risk factor, which is in line with the evolution of the environment such as discussed by Wind and Thomas (2010).

Table 2. 4 Vendor's selection criteria from Dickson (1966) to Haysinpure et al. (2016)

Dickson's study (1966)			Jaysinpure et al (2016)	
<i>Criteria</i>	<i>Mean rating</i>	<i>Evaluation</i>	<i>Identification of potentiel vendors</i>	<i>Vendor's evaluation</i>
Quality	3.50	Extreme importance	Overall superiority	
Delivery	3.41		Performance	
Performance history	2.99		Delivery	
Warranties and claims	2.85		Responsiveness	
Production facilities and capacity	2.77	Considerable importance	Reference checks	
Price	2.75		Financial status	
Technical capability	2.54			Cost criteria
Financial position	2.51			Technical capability
Procedural compliance	2.48			Quality assessment
Communication system	2.42			Organizational profile
Reputation and position in industry	2.41			Service levels
Desire for business	2.25	Average importance		Past history
Management and organization	2.21			Risk factor
Operating control	2.21			
Repair service	2.18			
Attitude	2.12			
Impression	2.09			
Others	2.00 or less	Slight importance		

Table 2. 5 An analysis of the evolution of supplier selection criteria over 25 years (1966-1991),

Source: Weber et al. (1991), p. 12.

Dickson's study		Criteria	Number of articles	(%)
Rank	Rating ^a			
6	1	Net price	61	80
2	1	Delivery	44	58
1	1A	Quality	40	53
5	1	Production facilities and capacity	23	30
20	2	Geographic location	16	21
7	1	Technical capability	15	20
13	2	Management and organization	10	13
11	2	Reputation and position in industry	8	11
8	1	Financial position	7	9
3	1	Performance history	7	9
15	2	Repair service	7	9
16	2	Attitude	6	8
18	2	Packaging ability	3	4
14	2	Operational controls	3	4
22	2	Training aids	2	3
9	2	Bidding procedural compliance	2	3
19	2	Labor relations record	2	3
10	2	Communication system	2	3
23	3	Reciprocal arrangements	2	3
17	2	Impression	2	3
12	2	Desire for business	1	1
21	2	Amount of past business	1	1
4	1	Warranties and claims	0	0

^a Ratings: 1A = Extreme importance. 2 = Average importance.
1 = Considerable importance. 3 = Slight importance.

A critical issue is to analyze whether these supplier selection criteria are global and relevant for any sector, or if the oil and gas industry uses specific criteria different from other sectors. Two studies are useful regarding the oil and gas sector (Khodadadi et al., 2006; Luzon and El-Sayegh, 2016) (see Table 2.6).

Table 2. 6 Supplier selection criteria in the oil and gas industries

Khodadadi et al (2006)		Luzon and El-Sayegh (2016)	
<i>Criteria</i>	<i>Level of importance</i>	<i>Technical and commercial aspects</i>	<i>Company related aspects</i>
Quality	Considerable or extreme importance	Quality	
Price		Price	
Delivery		Delivery	
Management and organization		Service	
Performance history	Considerable importance	Warranties and claims	
Warranty and claim policy			Technical capability
Safety			Production facility and capability
Technical capability			Financial position
Spare parts	Average to considerable importance		Performance history
Production facilities and capacity			Geographical location
Financial position			
Operations control			
Repair service			
Amount of past business			
Impression			
Other factors	Slight to average importance		

Source: Synthesis table adapted from Khodadadi et al. (2006) and Luzon and El-Sayegh (2016)

Khodadadi et al (2006) studied the buying behavior of EPC (Engineering, Procurement and Construction) companies in sealing systems industries (e.g. pumps and compressors) in the Iranian petroleum market. Actually, the same criteria emerged as Dickson's ones with an extreme to considerable importance assigned to quality, price, delivery, management and control, and a considerable importance given to performance history, warranty and claim policy, safety and technical capability. It should be noted that criteria such as production

facilities and capacity, financial position and operations control are considered generally as less important. The Iranian market is particular since there is a monopsonist on the client side, but on the supplier side, there are either national companies or a few joint ventures between national Iranian companies and mostly Asian companies. Therefore, the competition is mainly on technical dimensions more than on cultural or environmental aspects.

For Luzon and El-Sayegh (2016), selecting the right material suppliers is of paramount importance to the construction of oil and gas project. They conducted a study to identify the key criteria for selecting suppliers in the United Arab Emirates. They used a Delphi method and an Analytic hierarchy process to select the top 10 criteria's, from an initial list of 23 criteria, that they clustered into two main group, with 5 attributes in each group. The first group comprised technical and commercial aspects and the second group company-related aspects. Without any surprise, the emerging attributes in the technical and commercial group were: quality, price, delivery, service, warranties and claims. In the company-related group, the emerging dimensions were: technical capability, production facilities and capability, financial position, performance history and geographical location. Quality and price are the most important attributes, and technical and commercial attributes were considered more important than company-related attributes. It should be underlined that the UAE oil and gas market is not a monopsonist market.

2.3.2 Buygrid, buying center and a monopsonist market: frame of reference and research questions

2.3.2.1 Industrial buying behavior and specificities of an oil and gas monopsonist

We expect some specificities of the industrial buying behavior in the drilling monopsonist market. First of all, it is difficult to make a distinction between New task and Modified rebuy since the needs are well-known. We will make the distinction between:

- Modified rebuy,
- Straight or repetitive rebuy (approved product)

When suppliers propose a new purchase or modified product, this usually corresponds to an existing need. We therefore prefer to use the Modified rebuy situation than the New task situation. The challenge for the company will be to have its new product or modified product approved by the supplier, that is to be on the approved list.

As for repetitive buying, contrary to many industrial buying situations, the fact of being on an approved list does not necessarily means that the product will be automatically rebought in a monopsonist situation. The strong purchasing power of the monopsonist make the rebuy more uncertain than in a competitive market with multiple buyers and suppliers. The quest for information will is also expected to be higher for the monopsonist.

Table 2. 7 Expected differences of information requirements for Non monopsonist and monopsonist in the oil and gas industries

Type of Buying Situation (Buyclass)	Newness of the problem	Information requirements		Consideration of New Alternatives	
		Non monopsonist	Monopsonist	Non monopsonist	Monopsonist
Modified rebuy	Medium	Moderate	High	Limited	Moderate
Straight rebuy (approved product)	Low	Minimal	Moderate to High	None	Moderate

We also expect the supplier selection criteria to be highly sensitive to the bargaining power or the imbalance of power due to the monopsonist situation. In other words, researchers showed that in terms of industrial buying behavior, trust and confidence and imbalance of power were closely related (Schoenherr and Mabert, 2011; Ebers and Semrau, 2015; Chen et al. , 2017). Webster and Wind (1996) have insisted upon the weight of the economic, social, political, technological environmental factors, in relation with the organization characteristics and capabilities., Wind and Thmaas (2010) have also shown the importance of responsiveness to the client demands, which may become crucial in a monopsonist

context. The specific context of Saudi Arabia with the importance of the Kingdom may also be a factor which exerts a strong impact on the supplier selection criteria.

From the literature on industrial buying behaviour, we can therefore expect the cultural dimensions and organizational dimensions to play a more important role among supplier selection criteria than in non monopsonist markets.

Previous research has not analysed modified rebuy versus straight rebuy in the oil and gas industries and not either in a monopsonist market. We expect Straight rebuy to be more “competitive” than in non monopsonist market because of the power imbalance.

As for the buying center, the roles and industrial buying process should be well defined since the monopsonist controls the information and is expected to be well organized. Therefore, there should be a relatively easy identification of the centrality of the roles along the industrial buying process.

2.3.2.2 Research questions and research framework

Our objective in this chapter is to answer two research questions by using a qualitative analysis.

The research questions are as follows:

Research question 2 (RQ2): “What are the Buying Center and the Buying Behaviour (Process, roles and influences) in a Monopsonist Market?”(the case of the drilling sector in the oil and gas industries)

Research question 3 (RQ3): “What are the important attributes in the, buying center and how to gain a competitive advantage in a Monopsonist? (the case of the drilling sector in the oil and gas industries)

The answers to these research questions will be based on the analysis of the drilling sector in the oil and gas industry in Saudi Arabia with a monopsonist client Aramco. Our expectations rely upon the literature review and are presented in Table 2.8.

The framework of reference is based on the general buygrid and buyphases industrial buying behaviour models, but with specific expectations concerning the monopsonist client such as more importance attached to the attributes for straight rebuy

than it is usually the case in non monopsonist situations, more importance attached to trust, confidence and relationship dimensions than in monopsonist cases, a clear identification of the roles (centrality (see Figure 2.4).

Table 2. 8 Research questions and the monopsonist context

Research Question	Basic concepts	Components	Authors	Drilling sector Monopsonist client
RQ#2 Buying center and buying behaviour in a monopsonist case	Buying Center and Buying process	Buyclasses and Buyphases: New task, Modified rebuy, Straight rebuy	Robinson et al. (1967), Sheth (1973), Webster and Wind (1972a; 1996), Choffray and Lilien (1978), Pras and Tarondeau (1981), Anderson et al. (1987), Bonoma (1982; 2006), (Schoenherr and Mabert (2011) Johnston and Bonoma (1981), Ebers and Semrau (2015), Chen et al. (2017)	Modified rebuy and Straight rebuy (Approved product), but not New task
		Dimensions of the Buying Center: Vertical and lateral involvement, extensivity and centrality		Dimensions of the buying center: centrality and lateral involvement
		Roles in the Buying Center: initiator, decider, influencers, purchaser, gatekeeper and users		Same roles as Bonoma but with internal and external influencers
RQ#3 Important attributes and competitive advantages in a monopsonist case	Supplier Selection criteria and competitive advantages	Selection criteria with a dominance of technical and commercial related dimensions versus company or environment related dimensions	Dickson (1966), Weber et al. (1991), Webster and Wind (1996), Khodadadi et al. (2006), Wind and Thomas (2010), Luzon and El-Sayegh (2016), Jaysinpure et al. (2016),	Selection criteria but with likely heavier weight for Straight rebuy than in the classical models (non monopsonist cases) due to the purchasing power of the monopsonist; globally importance of the environment-related and company-related variables in relation with the monopsonist

Note: the list of authors is not comprehensive

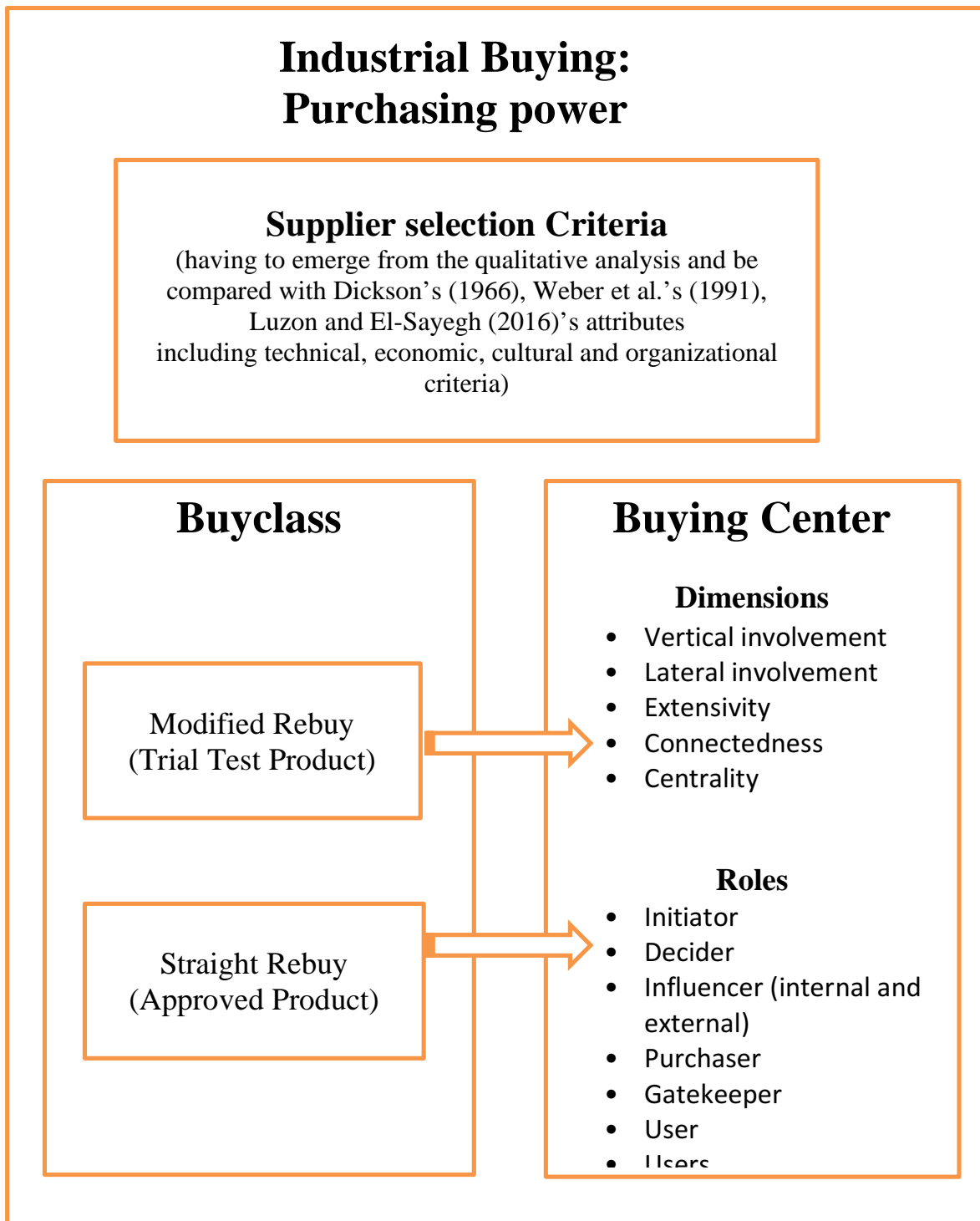


Figure 2. 4 Research framework Emerged Frame of Reference

As for the competitive advantages, they can be acquired on any of the determinant attributes which are used as selection criteria. Therefore, we shall identify the most important

attributes for the different members of the buying center, and the positioning of the various competitors on these attributes.

As an example, we shall illustrate the possible competitive advantages with Schlumberger's case, one of the main service providers in the drilling market. Internal documents about this specific case as well as the qualitative analysis that we conduct will help examine this specific case and make more general propositions about how to gain competitive advantages for a supplier.

More generally, a competitive strategy takes into account the following elements:

1. **Products or services:** The scope of the organization is defined by the products or services it offers and chooses not to offer, by the market (customer or client base) or population it seeks to serve or not to serve, by the competitors it chooses to challenge or avoid, and so forth.
2. **Strategic investment thrust:** Although there are many different investment options and variations that can be considered, the following represent the range of possibilities:
 - *Growth or expansion:* Investing to enlarge or enter a new market
 - *Stability:* Investing only to maintain the existing position in the market
 - *Retrenchment or harvest:* Minimizing or reducing investment to deplete or downsize the organization
 - *Divestiture or liquidation:* Curtailing investment by recovering as much of the asset base as possible by closing down or selling off the business
3. **Functional competence:** Specific methodologies upon which to compete may be based on one or more functional area strategies such as:
 - Product line or services offered
 - Market positioning
 - Pricing
 - Distribution or logistics
 - Manufacturing or service delivery
 - Quality or reliability
 - Technological competence

4. Unique competitive advantage: A strategic skill is something that an organization does extremely well, such as manufacturing, service delivery, quality control, or marketing and promotion, and which has strategic importance to that organization. A strategic asset is a resource, such as recognized name (brand name). Like Smith Bits in Schlumberger for example, or well-satisfied customer or client base, which creates an exceptional advantage over competitors.

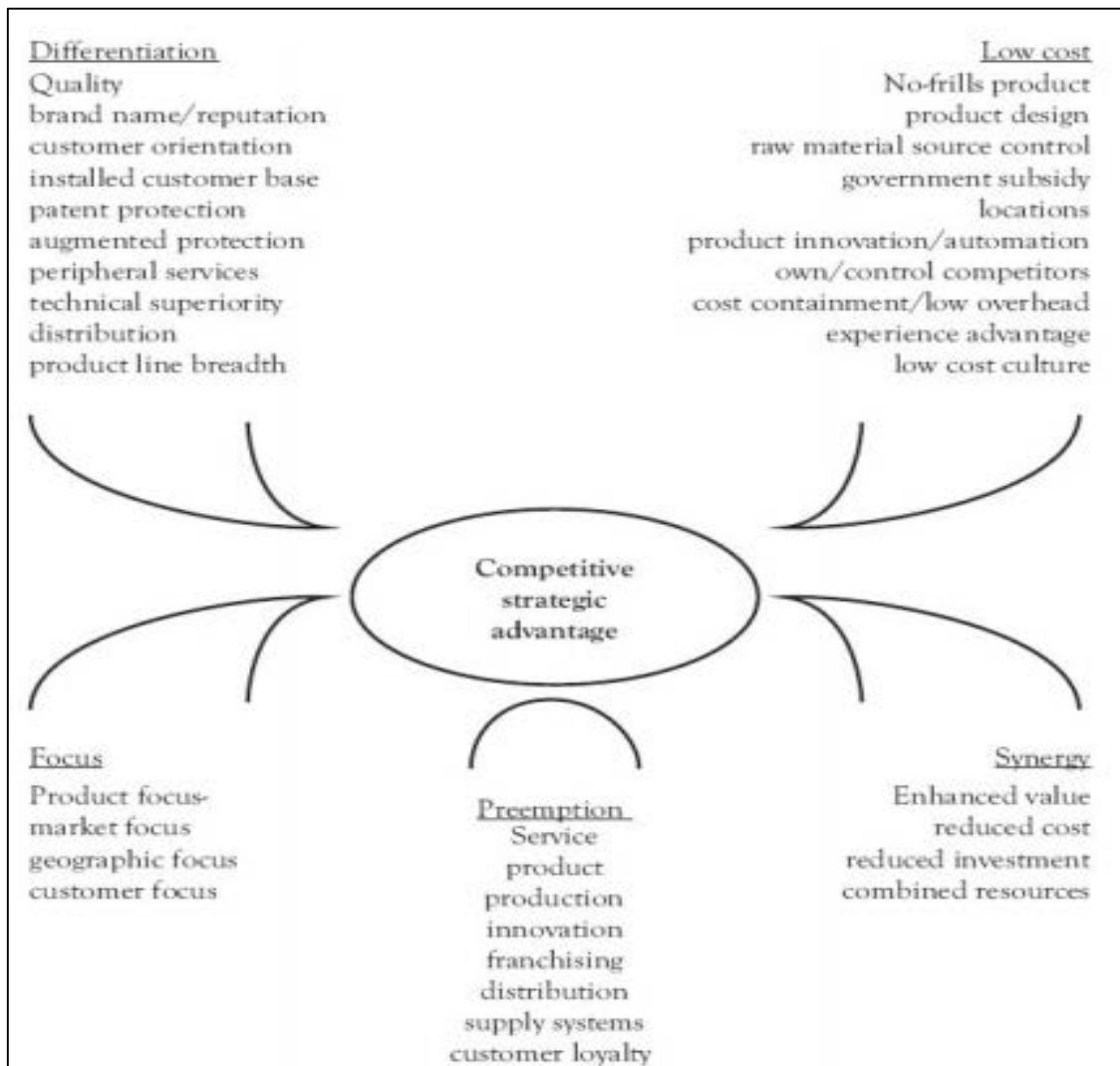


Figure 2.5 Strategies for competitive advantage

(Source: <https://www.slideshare.net/RajivBDeo/strategies-for-competitive-advantage>, 2006)

In this research, we shall mainly focus on the buying center and the results of our qualitative analysis in order to make propositions.

2.4 Qualitative analysis: Research Methodology

2.4.1 A mixed approach

With respect to our research questions, we shall precise our approach, As Sheth (1973; 1998) suggested, industrial buying behaviour does not always fit with expectations, in particular when we examine new buying contexts and new sectors. The organizational purchasing behaviour may be very context-specific. He recommends to have in such cases an exploratory and descriptive approach, based on the facts. This is not far from the strategy as practice approach (Table 2.9).

In such cases, we are in an exploratory approach, which has also to be based on the description of the roles and process at work. Moreover, as we analyses the specific case of Aramco, a monopsonist client with international service providers, a good knowledge of the characteristics of the case is also necessary. It is possible to use more than one research strategy for a research project, depending on the purpose (Saunders, Lewis & Thornhill, 2000).

The exploratory nature of this study fits the monopsonist case, since there is not much knowledge about the situation (Sekaran, 1992). Qualitative analysis sounds suitable for this purpose, with a search for existing information about the case, but also by relying on experts and on interviews (Saunders et al., 2000). We first need to have a good picture of the phenomenon, that is to be in a descriptive perspective, about the roles which are plaid in the buying center, and the description of the buying process.

But description does not exclude collecting information through observation and reporting, or reading others work and summarizing it (Gummesson, 1991) as we have already done about the oil and gas industries. . Such a description does not aim at finding causes to a phenomenon but rather to present this phenomenon within its context, which can be used to present its characteristics (Yin, 1993).

Our research has the objective of gaining understanding of the organizational buying behaviour in a monopsonist context by describing the area of study with respect to what can be reasonably expected in theory, but by being anchored in reality.

In this chapter, the research approach is qualitative, while we try to give some external validity to our study in the next chapter with a quantitative analysis. This thesis will therefore use mixed methods in order to analyse the phenomenon at hand.

Interviews are according to Yin (1994) a good source of evidence when case studies are about human affairs, since these are best interpreted through the eyes of a well-informed respondent. Furthermore, an interview is the most advantageous methodology.

Table 2. 9 Sources of Evidence: Strengths and weaknesses, Source: Adapted by Khodadadi, Naderi and Safari (2006) from Yin, (1994)

Source of Evidence	Objective
<p><i>Secondary – Multiple source documentation;</i></p> <ul style="list-style-type: none"> - Experience with Aramco - Aramco documents - Oil and Gas Web sites - Schlumberger's reports and internal notes - Hub Written SPE reports - Books on the industry - Newspaper clippings and other articles 	<ul style="list-style-type: none"> - Mastering the context of the case in order to understand the issues at hand, the balance of power, the economic, social and organizational context of the case. - Description of the departments and functions within the organizations
<p><i>Primary data - Interviews:</i></p> <ul style="list-style-type: none"> - Observation of the process and researcher experience - Semi-structured in-depth interviews with key informants 	<ul style="list-style-type: none"> - Observation for the identification of key informants - Descriptive research for identifying the characteristics to be taken into account, and interpretative research to assess their importance and the buying decision process

This qualitative approach which relies on the analysis of a case and selected semi-structured in-depth interviews help us attain our research objectives, that is gaining information about a firm or an organization (Saunders et al., 2000). Since documentation

such as articles, books and administrative documents can be very useful as a complement to other sources of evidence (Yin, 1994). The documentations that we have used include newspaper articles. Written documents have been used in combination with other sources of evidence, mainly to gain background information and raise relevant questions.

Interviewing is the technique researchers conducting case studies tend to rely most upon (Yin, 1994; Marshall and Rossman, 1999). This study is no exception and therefore interviewing is the investigation's main source of primary data. The semi-structured in-depth interviews are largely used in medicine with patients to let them express any feeling or symptoms, but with a guidance to make sure not to skip some important issue. This is what we did with the key informants to be certain that all the questions related to the buying center, the selection attributes, the competitiveness would be dealt with. But the respondents had a complete freedom to express any thought that came to their minds, and there was no time constraint in the interviews. The semi-structured in-depth interviews consist of a mix of Yin 's (1994) open-ended and focused interviews. This allowed the interviewer to have a dialogue with the respondents and ask questions that were open-ended but still gives a well-structured information from the interview. At points during the interviews, the discussions ran easily and we did not to stick to the questions in the interview guide, to allow the interviewees to express freely their thoughts. The choice of face-to-face interviews was a necessity at this stage of the research. The main advantage with this kind of interview is that the researcher can adapt questions, clarify doubts, pick up on body language and ensure that the questions are properly understood (Sekaran, 1992).

These interviews were face-to face. The *semi- structured interview* guide was based on the study's emerged frame of reference (Table 2.11). While doing so we were able to focus directly on the case study's topic. This approach avoided the undesirable aspects of more structured questionnaires, which would have led to strong response biases at this stage of the study in a high-context culture (Hall, 1976), that is the Middle East culture, about the biggest Petroleum Company in the world on a sensitive topic.

Table 2. 10 Semi structured in-depth interview (the roles in the buying center were completed once the interview was conducted)

Semi-structured in-depth interview

N: of Candidate: RI

Position Title:

Department:

Date of interview:

Roles of the respondent in the buying process:

Roles in the Buying Center: Modified Rebuy / New Product	Roles in the Buying Center Straight rebuy / repetitive

QUESTIONS:

Why is the Drilling Bits important for Aramco?

What does the Drilling Bits technology bring to the future of Aramco?

How is that product (Drilling Bits) purchased on a regular basis?

What are the buying phases?

What are the expectations from Aramco?.

What are the suppliers and how is their search for suppliers?

On what criteria are the offers and proposals evaluated and selected?

How Schlumberger is evaluated compared to other companies on different criteria?

How do you evaluate performance?

What are the environmental influence in the process (political, legal, etc.)?

Who influences the process on which dimensions?

Table 2. 11 Example of one interview

Example of one interview:**N: of Candidate: R15****Position Title:** *Country Manager***Department:** GE Baker Hughes**Date of interview:** 03/11/2016**Roles of the respondent in the buying process:**

Roles in the Buying Centre Modified Rebuy / New Product	Roles in the Buying Centre Straight rebuy / repetitive
External Influencer	External Influencer

QUESTIONS:**Why is the Drilling Bits important for Aramco?**

As a Country Manager for drilling bits for the world leader company (Baker Hughes), Acquired by GE in 2016 ,Baker Hughes (NYSE: BHI) significantly strengthened its Middle East capabilities with the opening of a new operations center in Dhahran, Saudi Arabia. The 100,000-square-meter facility, which houses laboratories, offices, repair and maintenance operations and a remote collaboration center, is part of Baker Hughes' expansion plans for the Kingdom of Saudi Arabia, a key growth market for the company. The Dhahran facility opening ceremony was attended by Saudi Aramco executives; partners; dignitaries; oil and gas industry stakeholders; and Baker Hughes executives. During the event, Baker Hughes showcased its product and service portfolio, as well as its successful collaborations with Saudi Aramco.

The new facility allows Baker Hughes to better serve its Middle East clients. In addition to repair and maintenance capabilities, the base's BEACON Center allows local teams to remotely manage and monitor operations in the region and to collaborate with clients and Baker Hughes' technology experts located anywhere in the world.

Khaled Nouh, Middle East president for Baker Hughes, said the Dhahran operations base is a testament to Baker Hughes' long-term commitment to the Kingdom of Saudi Arabia. "For the first time, all Baker Hughes product lines are housed in the same facility in Saudi Arabia under one management team, which will drive consistent standards to improve service quality and reliability," noted Nouh.

"Our investments in Saudi Arabia and the rest of the Middle East have positioned us to provide superior operations support in the region. The Dhahran base also underscores our commitment to creating new jobs and empowering the local economy in line with the vision of the Kingdom's leaders."

Baker Hughes will expand its footprint in Saudi Arabia again next year with construction of a multi-million dollar research and technology center in KFUPM Dhahran Techno-Valley. "The Dhahran Technology Center will integrate the competencies of engineers and scientists from the Saudi oil and gas industry, King Fahd University of Petroleum and Minerals and Baker Hughes to develop application-specific technologies for complex reservoirs, including the tight sand plays of Saudi Arabia," explained Nouh.

What does the Drilling Bits technology bring to the future of Aramco?

Baker Hughes is the world leader in this industry over 100 years, Optimize drilling performance with improved durability and ROP for Aramco, The Talon™ platform of PDC bits reliably and consistently perform in virtually any environment while giving Aramco superior directional control, longer run life, improved rates of penetration (ROP), and enhanced durability and drilling efficiency. Innovative Talon bits include the industry's most advanced mechanical and hydraulic designs, uniquely shaped and positioned blades, and application-specific polished diamond cutters. The DART process maximizes drilling efficiency Talon drill bit designs begin with the Baker Hughes DART™ drilling application review process. Cross-functional teams of highly experienced technical personnel work in a collaborative, learning environment to meet the required drilling objectives by combining new and existing technologies that result in innovative designs to deliver exactly the right drill bit for your specific application. Each DART team gathers relevant drilling application data, conducts root cause analyses, identifies the primary performance limiters, and evaluates possible solutions for game-changing improvements in overall performance, while minimizing drilling and completion costs and reducing nonproductive time. Bit designs for every drilling need, The Talon platform of bits consists of the Talon bit, the Talon 3D bit, and the AutoTrak™ Curve system bit:

- Talon high-efficiency PDC bits provide optimal performance in first-bit-under-the-surface, intermediate, vertical, near-vertical drilling, and hard-to-drill and abrasive applications.
- Talon 3D vector-accurate bits extend this outstanding performance to unconventional gas applications, including shale plays, and are ideal for conventional directional drilling. The bit's one-piece steel body with a short bit-to-bend dimension allows greater buildup aggressiveness and longer life.
- Providing extra versatility, Talon bits are fully compatible with the Baker Hughes AutoTrak Curve rotary steerable system. Working together, these two solutions meet the challenges of drilling unconventional plays with exceptional accuracy, reliability, and speed.

Which help Aramco to stay in the hole longer with new StaySharp cutters

All Talon PDC bits include Baker Hughes StaySharp™ premium cutters with sophisticated diamond technology and patented polished faces. The innovative extra-tough design of this propriety technology is exceptionally erosion and chip resistant, which helps the bit stay sharper, maximize run life, and deliver higher ROP, improved run life, and lower cost per foot. The StaySharp cutters also decrease friction, which reduces heat buildup on the cutter face to further minimize wear. Polished cutters also generate smaller cuttings, which aid in overall cutting evacuation.

How is that product (Drilling Bits) purchased on a regular basis?

We are selling our drilling bits to Aramco on consignments basis, which is the repetitive purchases on day-to-day operations, we have an approved Aramco Products List (SMI List), those bits already approved in Aramco system. We need to receive the DRSS request (Drilling request Supply system), if the bit will be utilized we will receive the used notification and the PO (Purchase Order), if the bit will not be utilized it will be return to our warehouse within three months from delivery date free of charge.

What are the buying phases?

Aramco is using two types of buying Phases depends on type of purchases (new purchases and repetitive purchases). The new purchase Need to make a trial test for the New introduced product at zero cost to prove the new product to be added to Aramco approved list. It requires list of proposals and approvals from three Aramco's departments.

The repetitive purchase relate to the operation decision from the drilling engineer from the product already passed Aramco trial test criteria on consignment basis, same as all service companies and suppliers.

What are the expectations from Aramco?

Aramco's expect from us introducing latest technology, especially Baker Hughes Consistently improve drilling performance, minimize cost and risk.

Our Technology general-purpose PDC bit from Baker Hughes consistently optimizes drilling performance and minimizes nonproductive time, days on well, and drilling costs in virtually any drilling environment. Initially developed through the Baker Hughes DART™ drill bit design process, the Genesis bit has proven itself as a reliable performer in cost-effective environments.

Stay in the hole longer

Through continual research and advancements, the latest Genesis bit cutter technology offers improved impact resistance, wear resistance, and aggressiveness to increase performance and drilling economics. The outcome is better durability, prolonged bit life, and longer runs.

Minimize vibrations

The Genesis bit's patented lateral movement mitigator helps reduce bit vibration and increase whirl resistance for improved cutter protection and stability. Added protection on the gauge pad prevents hole spiraling and potential hole problems, allowing the bit to continue drilling a smoother, uniform borehole for more effective completions.

Maximize flow

Hydraulic efficiency is imperative to maximizing cuttings removal. The hydraulic configuration of every Genesis bit design is optimized through a proprietary computational fluid dynamics process that reduces balling tendencies, improves cutter cooling, and limits fluid erosion.

Add efficiency through directional control

To ensure better control in motor and rotary steerable applications Genesis PDC bits include additional directional control features. A new shorter shank decreases makeup length and increases steerability to deliver better buildup rates while the Baker Hughes EZSteer™ directional technology reduces reactive torque fluctuations from increased weight on bit for better directional precision and higher ROP.

Applications

- Hard, abrasive, and interbedded formations
- Conventional and unconventional shale formations
- Highly drillable applications
- Virtually all drilling environments where cost-effective drilling is needed

What are the suppliers and is their search for suppliers?

All big and medium players are in Saudi Market , which is the biggest and high rewarding market universally all the competitions are interesting to increase more market share and bring together their technologies with their best team, Aramco displayed last year after introduction of the new kingdom vision IKTVA for any company will work with Saudi Aramco should have minimum requirements of local suppliers and human resources , and for drilling bits companies specifically they should have a lot Designed to amplify the efforts of our partners and our investments, IKTVA was developed and tested through extensive consultation, both in Kingdom and internationally have manufacturer facility in country within two years' time.

On what criteria are the offers and proposals evaluated and selected?

Generally the criteria nowadays is based on the kingdom vision for local content and human resources percentage IKTVA , Saudi Aramco's In-Kingdom Total Value Add (IKTVA) program has allowed for further impetus with GE Oil and Gas breaking ground on a new Multi-Modal Manufacturing Center at MODON in Dammam.

Abdulaziz A. Al Abdulkarim, Saudi Aramco's vice president of Procurement and Supply Chain Management, and other members of executive management recently joined with GE Oil and Gas management for an official groundbreaking ceremony.

The new phase development builds upon the expansion of GE's Gas Pressure Control manufacturing facility that was inaugurated late last year and comes with a promise of creating 100 jobs during the startup stage, with an 80% rate of Saudization.

When constructed, the new 18,000 m² center will have the capability to manufacture and service the entire range of GE's oil and gas portfolio, including Artificial Lift, Digital Solutions, Downstream Technology Solutions, Turbomachinery Solutions and Subsea Systems.

GE Oil and Gas promises that the new center will bring added "Made in Saudi" capabilities, serving as a manufacturing, assembly, repair, services, and training facility for advanced gas turbines and mechanical drives.

Al Abdulkarim said the IKTVA program, launched by Saudi Aramco last December, is already making a positive impact.

"We are confident that the IKTVA initiative is steadily gaining momentum. As partners such as GE Oil and Gas are demonstrating, IKTVA is a 'win-win' proposition for companies able to build a deep and lasting relationship with the Kingdom by extending the opportunity to localize our materials and services procurement needs, all while supporting the economic growth, job creation and skills development of Saudi Arabia."

GE Oil and Gas president and CEO Lorenzo Simonelli said: "With over 80 years of partnership in the Kingdom, we are committed to strengthening our localized manufacturing service and repair capabilities, and to building our already strong local talent pool. The new center brings cross-functional synergies to our operations in the Kingdom and will serve as a one-stop center for our customers in Saudi and the region."

The new facility will also deliver the services of the recently acquired Alstom Grid business, enabling it to offer a complete portfolio to customers.

Recently, GE Oil and Gas completed the first six high-efficiency gas compression trains manufactured in Saudi Arabia. These will be used in Phase I of Saudi Aramco's Master Gas System expansion project in the Kingdom.

How Schlumberger is evaluated compared to other companies on different criteria?

Baker Hughes (GE) and Schlumberger Smith Bits, and Halliburton are the biggest Player in the Saudi Market, and it is performance bases and recently the factor of IKTVA (IN-KINGDOM TOTAL VALUE ADD) Program which show how the company is investing in Saudi and willing to have a long term investment in Saudi.

What is the importance of the criteria and for whom?

IKTVA, Performance and Cost effective are the main drive for any company to do business in Saudi Arabia generally and Saudi Aramco Specifically. Technically afterword for drilling bits business the keyword will be the BPA (Bit Performance Analyser) is the essential reference and criteria to the drilling bits business market share split between the competitions.

How do you evaluate performance?

In Baker Hughes (GE), we have different software's and entire team are working to follow the operations, and evaluate our performance on daily basis, and gives us a monthly report showing the entire Aramco's drilling activities shows every company performance and based on it we as operation we decide the product development and define our strength, weakness, opportunity and threats, Baker Hughes commercially released its Kymera XTreme (XT) hybrid drill bits. The bits are the combination of PDC and roller cone technology and offer smooth and consistent performance, and we are capitalizing in our patent technology Kymera hybrid bit technology patent to grasp big market share in the upper soft section. Meanwhile Aramco is carrying out on quarterly basis SQ meeting (Service Quality) meeting , gathering all failures and NPT (Non-productive time) for each company as well as any environment or safety issues happened during the last quarter, based on it Aramco decide to increase or decrease the market share for any company based on their results and performances.

What are the environmental influence in the process (political, legal, etc.)?

Fundamentally now the key effects on the entire business process in Saudi is the kingdom vision IKTVA and direction toward the localization of resources have the main impact for the assessment and growing market share and permitting the business to any supplier. So they are ranking the opportunities for local suppliers or international ones which have high percentage of local employee and contents to have business and more market share. Politics derives the market share based on the area you working for, it depends principally on the relations and relatives, other operational influence is splitting the market between most of suppliers and don't depend on single supplier, and it is doable in the upper soft sections, despite the lower and hard part.

Who influences the process on which dimensions?

Saudi Aramco today reaffirmed its steadfast commitment to its In-Kingdom Total Value Add (iktva) localization program by celebrating the accomplishments made by both the company and its suppliers since its launch a year ago. At a ceremony attended by HRH Prince Saud bin Naif bin Abdulaziz, Amir of the Eastern Province, as well as government dignitaries, and business and supplier executives, H.E. Khalid Al Falih, Minister of Energy, Industry, and Mineral Resources and Chairman of Saudi Aramco, said in a keynote speech: "iktva represents a pioneering and model program, among other major programs which the Saudi Arabian government is working on to expand and diversify the economy, localize strategic industrial and economic sectors, and create jobs, in alignment with Saudi

By mixing and matching several methods, triangulation can take place and enhance the quality of a research (Saunders et al., 2000). The objective was to ensure that the data are telling you what you think they are telling you. The triangulation in this study consists of documentation and interviews.

2.4.2 Sample Selection for the semi-structured in-depth interviews and data analysis

When the sources of evidence have been chosen, the next step is to choose an appropriate sample. According to Miles and Huberman (1994), the boundary setting and the frame of reference are important issues when analyzing a specific case. The drilling sector in the oil and gas Industry in Saudi Arabia , with a monopsonist client, Aramco, and international drilling oil and gas services providers companies, constitutes a manageable field of research for the researcher. The geographical proximity and the researcher personal long term experience in the country, with day to day direct relations with the service provider company and with the client were decisive in the choice. The researcher could have access to the necessary secondary data and get in touch with key informants, which was an absolute necessity in order to try answering the research questions.

Secondary data collection, observation, identification of key informants was possible. Sixteen respondents have been selected. They had to belong to the monopsonist client and to the service providers. They also had to represent the various technical and operations functions since the roles in the buying process are closely related to the different types of functions in the various companies. This final selection of the respondents was made after an analysis of the characteristics of the monopsonist case to have a sample representative of the functions and the roles in the buying center.

We used the grounded-theory strategy (Glaser and Strauss, 1967; Strauss and Corbin,, 1990) as described by Langley (1999) to analyze the data. Data were cut into small units and assembled into a system of categories in order to allow internal comparisons. A vertical analysis of each interview was conducted to identify the relevant verbatims with respect to the categories studies; then a horizontal analysis of the body of interviews was carried out in order to strengthen internal validity (Langley, 1999). Furthermore, we relied on long sentences since they help understand the phenomena at hand better than short verbatims (Parmentier and Fisher, 2015).

Table 2. 12 How the qualitative sample was composed: Respondents and their functions in the monopsonist client and in the service providers (suppliers) competitors for Drilling Bits Market in Saudi Arabia

Type of company	Respondents	Functions	Technical	Operations
Client : Aramco	1.	Engineer in Charge	Drilling Technical department	
	2.	Supervisor (head of the department)	Drilling Technical department	
	3.	Senior Drilling Engineer		Drilling and Operations Department
	4.	General supervisor (Head of department)		Drilling and Operations Department
	5.	Supervisor		Drilling and Operations Department
	6.	General supervisor (Head of department)		MAFD (Material and Functions Department)
	7.	Drilling Superintendent		Operations Department
Suppliers	8.	Operations and Sales Manager		Bits and Drilling Tools (Sales Department)
	9.	Sales Engineer		Bits and Drilling Tools (Sales Department)
	10.	Senior Product Engineer	Bits and Drilling Tools (Engineering Department)	
	11.	Demand Planner		Bits and Drilling Tools (Logistics department)
	12.	Sales Manager		Bits and Drilling Tools (Sales Department)
	13.	Designer and Focal point for Aramco	Bits and Drilling Tools (Engineering Department)	
	14.	Account Manager		Drilling Bits (Sales Department)
	15.	Country Manager		Drilling Bits (Sales Department)
	16.	Sales Engineer		Bits and Drilling Tools (Sales Department)

2.4.3 Data collection and analysis, and case study evidence

Before selecting the respondent, collecting the information and then analysing its content, the researcher first investigated the economic, organizational and cultural context of the monopsonist situation. It was necessary to acquire a good knowledge of the actors, of the functions in the organization, and of the structure of the market. This is of great help to clarify, simplify and reduce the data at hand (Yin, 1994; Miles and Huberman, 1994). In the first chapter, we saw Aramco's characteristics with respect to its monopsonist and purchasing power dimension and how a value chain could be built by a supplier with respect to this strong expectations and power of the monopsonist client.

of Saudi Aramco as an example of Monopsonist Client in the biggest Drilling oil and gas market globally. I'll present data related to the supplier selection criteria and dimensions and roles in the buying center in different buyclasses.

The presentation of the case study evidence is organized around the theoretical variables selected in the frame of reference. These theoretical variables are:

- Supplier selection criteria
- Buyclasses, dimensions and roles in the buying center

2.5 Case Saudi Aramco: context and elements of the buying process from secondary data and internal sources

2.5.1 Saudi Aramco Overview

Saudi Aramco, over the past 80 years, has become a world leader in hydrocarbons exploration, production, refining, distribution and marketing.

Officially the Saudi Arabian Oil Company, most popularly known just as Aramco (formerly Arabian-American Oil Company), is a Saudi Arabian national petroleum and natural gas company based in Dhahran. Saudi Aramco's value has been estimated at somewhere between US\$1.25 trillion and US\$10 trillion, making it the world's most valuable company and the world's largest oil and gas company.

Saudi Aramco has both the world's largest proven crude oil reserves, at more than 260 billion barrels (4.1×10^{10} m³), and largest daily oil production. Saudi Aramco owns, operates and develops all energy resources based in Saudi Arabia.

Saudi Aramco's oil and gas production infrastructure leads the industry in scale of production, operational reliability, and technical advances. The headquarters are based in Dhahran, Saudi Arabia, with offices and operations throughout the Saudi Arabian Kingdom, and the company employs more than 65,000 workers worldwide. Its subsidiaries and affiliates are located across the globe in Saudi Arabia, China, Egypt, Japan, India, the Netherlands, the Republic of Korea, Singapore, the United Kingdom and the United States.

Today, they continue to deliver on their core mission of reliably supplying energy to the Kingdom and the world, and continue to progress towards becoming the world's leading integrated energy and chemicals enterprise, a top refiner and a creator of energy technologies.

According to the International Energy Agency's World Energy Outlook 2015, global oil demand alone is expected to rise by about 17 percent compared to the current level, reaching roughly 108 million barrels per day (bpd) in 2040.

Though the current times pose challenges, shifting market conditions are nothing new to the industry. Over the course of time, markets favor agile and diversified companies that operate efficiently and stay true to their core values.

Aramco's goal is to satisfy Saudi Aramco supply chain demand and maximize value creation by creating strategic supplier relationships. The strategic dimension is to identify new local manufacturing opportunities, increase the national supply base, along with expansion of existing local manufacturers' diversity and capability. Saudi Aramco purchases billions in goods and services each year. They partner with local contractors and their suppliers to increase their ability to compete for work and meet their requirements. A detailed presentation of Aramco activities is presented in Appendix A.

The drilling downhole equipment is an important Aramco's activity. Aramco is a monopsonist being the only client for the international service providers of this type of equipment in Saudi Arabia.

2.5.2 Aramco's Supplier Selection Criteria and elements of the buying process

Business principles. Aramco official documents affirm several principles related to business ethics and material supplier guide. Globally, Aramco's goal is to develop mutually beneficial relationships between suppliers/contractors and the client that will allow both parties to attain the highest level of excellence. It is also to work successfully with local and international businesses – from contractors providing the monopsonist client with a service, to suppliers offering their materials. Aramco says in its official documents that it relies and depends on the quality of the relationships it develops with its suppliers/contractors. Saudi Aramco says it needs suppliers/contractors with high quality standards, innovative products and services, competitive prices, and on-time delivery. Saudi Aramco searches for suppliers/contractors that add value to the supply chain and have the ability to scale to meet growth changes within the business.

Therefore, the supplier selection attributes, according to Aramco's official website and documents are: quality, innovation, price, delivery, good relationship, capacity to add value and responsiveness.

Business ethics and supplier guide. The monopsonist client also asks the suppliers to acknowledge and agree to comply with the Code of Conduct (Business ethics) enacted by Aramco. The suppliers must also learn about relational practices, terms and conditions of purchases and apply them.

- *Business ethics:* Saudi Aramco is committed to the highest ethical and legal standards in the conduct of its business. All vendors, manufacturers, contractors and sub-contractors with which Saudi Aramco conducts business shall acknowledge and agree to abide by the policies and principles set forth in the Saudi Aramco Supplier Code of Conduct.

- *Material Supplier Guide:* This guide is for material suppliers (vendors and manufacturers). The terms and conditions of any purchase orders or procurement agreements between Saudi Aramco and suppliers shall supersede any understanding, implied or given here. This guide is provided to help suppliers to:

- Register and manage their online relationship with Saudi Aramco
- Obtain access to Saudi Aramco's supplier systems
- Use Saudi Aramco's systems to conduct supply chain transactions
- Understand supplier performance measures and outcomes

Services providers (contractors) can learn more about contracting services with Saudi Aramco by visiting Saudi Aramco's page [Contacting Services](#).

Being on the list of qualified suppliers. The suppliers that Aramco contract are selected from a list of qualified suppliers (for the relevant product segment). The qualified suppliers are evaluated before each tender and even during the contract. The most important parameters for Aramco in selecting with the equal weight are technically, quality and cost criteria. All other parameters will be evaluated in relation to these three main parameters. Aramco explains that new suppliers are all the international companies and services providers When searching for new suppliers the basic demands from Aramco must be fulfilled, they look at the technical and commercial potential. The suppliers should be introduced by procurement department to the company. Then the engineering department will be responsible for assessment of the potential supplier. After approval of engineering department, for entering to a qualified

suppliers list of Aramco the transaction committee of company should approve the vendor as a qualified vendor.

Logistics department is not responsible for procurement, insurance, transportation, and customs clearance. Both contractors and vendors must be assessed by Engineering department before their selection and then this assessment will be continued during the bid phase and also even after getting the order. In total in Aramco drilling technical department (DTD) has more important role in the vendor selection. All the procedures are also applicable for sub vendors in case of end user request but communication with sub vendors must be done via original vendors.

There is no preferred vendor but in case of a certain license or instruct from end user, then Aramco must act based on the instruction. Meanwhile besides there is no written preferred vendor but the relations with vendors and their past experiences make some kind of unofficial preferred vendors for Aramco, especially the big American players.

Vendors should receive minimum requirement for being approved by drilling technical engineering dept. (DTD) and afterward the procurement dept. could send the inquiries to them. Aramco could buy the goods from vendors even with higher prices that technically are in a better position and lower cost. A group in Aramco is preparing the necessary procedures for vendor selection.

2.6 Research question 2: Buyclasses, Buyphases, Roles and decision process at Aramco, a monopsonist client

RQ2: “What are the Buying Center and the Buying Behaviour (Process, roles and influences) in a Monopsonist Market?” (Case of the drilling Sector in the Oil industry)

2.6.1 Buyclasses: Modified rebuy and Straight rebuy

Purchases in Aramco has two different types: the modified rebuy and the straight rebuy cases. As it was indicated above, to be accepted in the Saudi Arabian market a new product has to pass an Approval test. These new products, which can be real innovations are still drilling bits, and therefore do not accomplish a completely New task. This is why, by convention, we prefer to qualify them of **Modified rebuy** (also called Trial test), even the innovations can be

important. They are New products but not New Task. However, the product will go through all the stages of the buying process.

Once the product has been approved and listed in Aramco approved list, we can speak of **Straight rebuy**. But this does not mean that this will be a Straight process or a Straight road. Actually, the monopsonist client has the power, and there are steps or obstacles facing the approved product before becoming a repetitive purchase

The number of individuals involved in a purchase depends on the buying situation and the type of component. The respondent discloses that, irrespective of the buying situation, there are always a purchasing department responsible for the purchase and a technical department responsible for the technical issues of relevant purchase.

In the following, we present the persons that we have interviewed, with their roles under the Modified rebuy and Straight rebuy situations (Table 2.13) and this at the different stages of the buying process (Table 2.14).

2.6.2 Buying center dimensions

When examining buying centers composition, buying center size, buying center formalization and buying center centralization are useful criteria to understand how decisions are taken. Buying center size or extensivity refers to the number of people actively involved in a purchase situation. For complex decision processes, new purchases or important purchase, the size is larger. Formalization refers to the emphasis placed on the use of formal rules and procedures. Understanding formal rules is important for the seller. Centralization or centrality refers to buying centers where only a few participants hold meaningful influence.

In order to gain a better understanding of these influences, vertical and lateral involvement are also examined. Vertical involvement refers to the number of vertical hierarchical levels involved in the process, and lateral involvement to the number of different departments.

Differences can be expected between Modified rebuy and Straight rebuy, with less probably individuals involved in Straight rebuy situations than in Modified rebuy situations (Lewin and Donthu, 2005). However, drilling products purchases being important in terms of price and technicity, it can be expected that several people or department will be involved in

the process, even for Straight rebuy. It can also be expected that for Straight rebuy, once the main technical choices have been made, the operations and purchase department will play a more important role than for Modified Rebuy (centrality and connectedness), where technical and financial aspects should predominate.

For the supplier, there will always be two vertical levels involved in the process, the manager level and the sales level. In the following, we shall mainly focus on the buyer side.

Modified rebuy

Vertical involvement (3 hierarchical levels or 4 if we include the clerical employees for the buyer)

At Aramco, there are three hierarchical levels involved in the process: top management, policy level operating management, lower level operating management, and four if we include clerical employees:

- Top Management:
 - (a) Manager in MAFD (Material and Functions Department)
 - (b) General Supervisor in Drilling Technical Department.
 - (c) General Supervisor in Drilling Operations Department.
- Policy level operating management
 - (a) Engineering Supervisor in Drilling Technical Department.
 - (b) Drilling Supervisor in Drilling Operations Department.
- Lower level operating management
 - (a) Technical Engineer in Drilling Technical Department.
 - (b) Drilling Engineer in Drilling Operations Department.
 - (c) Drilling Superintendent in Drilling Operations Department.
- Clerical employees (e.g. secretary)

On the supplier side, there are always two hierarchical levels involved in the process : managers and salesman levels.

Lateral involvement (3 departments)

The number of departments on the buying side involved in a modified rebuy situation is three and they are:

- (a) Technical department
- (b) Drilling operations department
- (c) Material and Functions Department

The number of people involved in modified rebuy on the buyer side varies between eight and twelve, which corresponds to previous research (Johnston and Bonoma, 1981; Lewin and Donthu, 2005).

On the seller side, there are three departments involved: sales, engineering and logistics.

Extensivity (12 individuals)

Extensivity is characterized by the total number of individuals involved in the modified buying communication network. For the modified rebuy situation, we can count 12 individuals (maximum number, this number varying from 8 to 12 according to the situations), as follows:

- Three in drilling technical department in Aramco
- Four in drilling operations department in Aramco
- Two in Material and Functions Department in Aramco
- Three in Supplier (Technical, operation and Gate Keeper)

Connectedness

Connectedness corresponds to the degree to which the members of the buying center are linked with each other by direct communications concerning the purchase, vertically on the same department in the buyer and laterally between the client and supplier. The overall process is pretty much formalized. The individual at the center of this overall process with a key role is the Technical Supervisor in the Modified rebuy case.

Centrality (drilling technical department and supervisor)

For the modified rebuy situation, Aramco drilling technical department engineers and supervisors are central in the decision process due to the importance of the technical background and judgment on the new technology. They have to assess if the new offers will benefit Aramco and help the company accelerate drilling time and reduce the cost per foot. The key role with respect to this centralization is played by the Supervisor of the Technical

department at Aramco, in the buying communication network.

Straight rebuy

Vertical involvement (3 to 4, depending whether the clerical employees level is accounted for or not, on the buyer side)

For Straight rebuy, the levels of vertical involvement are the same. Only some function intervene at different levels (the MAFD department at the lower level of operating management while it was at the manager level for the Modified rebuy):

- Top Management:
 - (a) General Supervisor in Drilling Operations Department.
 - (b) General Supervisor in Drilling Technical Department.

- Policy level operating management
 - (a) Drilling Supervisor in Drilling Operations Department.
 - (b) Engineering Supervisor in Drilling Technical Department.

- Lower level operating management
 - (a) Drilling Engineer in Drilling Operations Department.
 - (b) Drilling Superintendent in Drilling Operations Department.
 - (c) Technical Engineer in Drilling Technical Department.
 - (d) MAFD (Material and Functions Department)

- Clerical employees (e.g. secretary) In a straight situation, the hierarchical levels include the same.

On the supplier side, there are always two hierarchical levels involved in the process : managers and salesman levels.

Lateral involvement (3 departments)

The number of departments involved in straight rebuy situation on the buyer side is three, that is identical as in the Modified rebuy case. The department are:

- (a) Drilling operations department

- (b) Technical department
- (c) Material and Functions Department

On the seller side, the departments involved are also the sales department, the engineering department and the logistics department.

Extensivity (maximum 9)

Extensivity is characterized by the total number of individuals involved in the straight buying communication network are 9 and may vary from 5 to . This maximum number is as follows:

- Four in drilling operations department in Aramco
- Two in drilling technical department in Aramco
- One in Material and Functions Department in Aramco
- Three in Supplier (Technical, operation and Gate Keeper)

As expected, the number of individuals involved in the process at Aramco is smaller than for Modified rebuy. This is in conformity with the literature (Johnston and Bonoma, 1981; Lewin and Donthu, 2005).

Connectedness

Connectedness corresponds to the degree to which the members of the buying center are linked with each other by direct communications concerning the purchase, vertically in the same department but also between laterally between the client and supplier. Processes are highly formalized but the connections are on a very regular basis between the client and the supplier, and the operation department is the core of this communication network even if the seller has an important role and needs to be proactive. For Straight rebuy, the initiator is an engineer in the operation drilling department along with sales engineer from the supplier who propose the best suitable drilling bits based on the required application. But the overall information process and the connections between supplier and client, and within the hierarchical levels and different departments are very formalized.

Centrality (Drilling operation department engineers and supervisors)

In the Straight rebuy case, the degree of centralization is also high and the most important role is the Drilling operation department's role at Aramco, in in the buying decision process and communication network. Aramco drilling operation department engineers and

supervisors are central in the decision process for the straight rebuy due to their responsibility in drilling operations in order to select the best suitable drilling bits regarding the drilling application from the Aramco approved list.

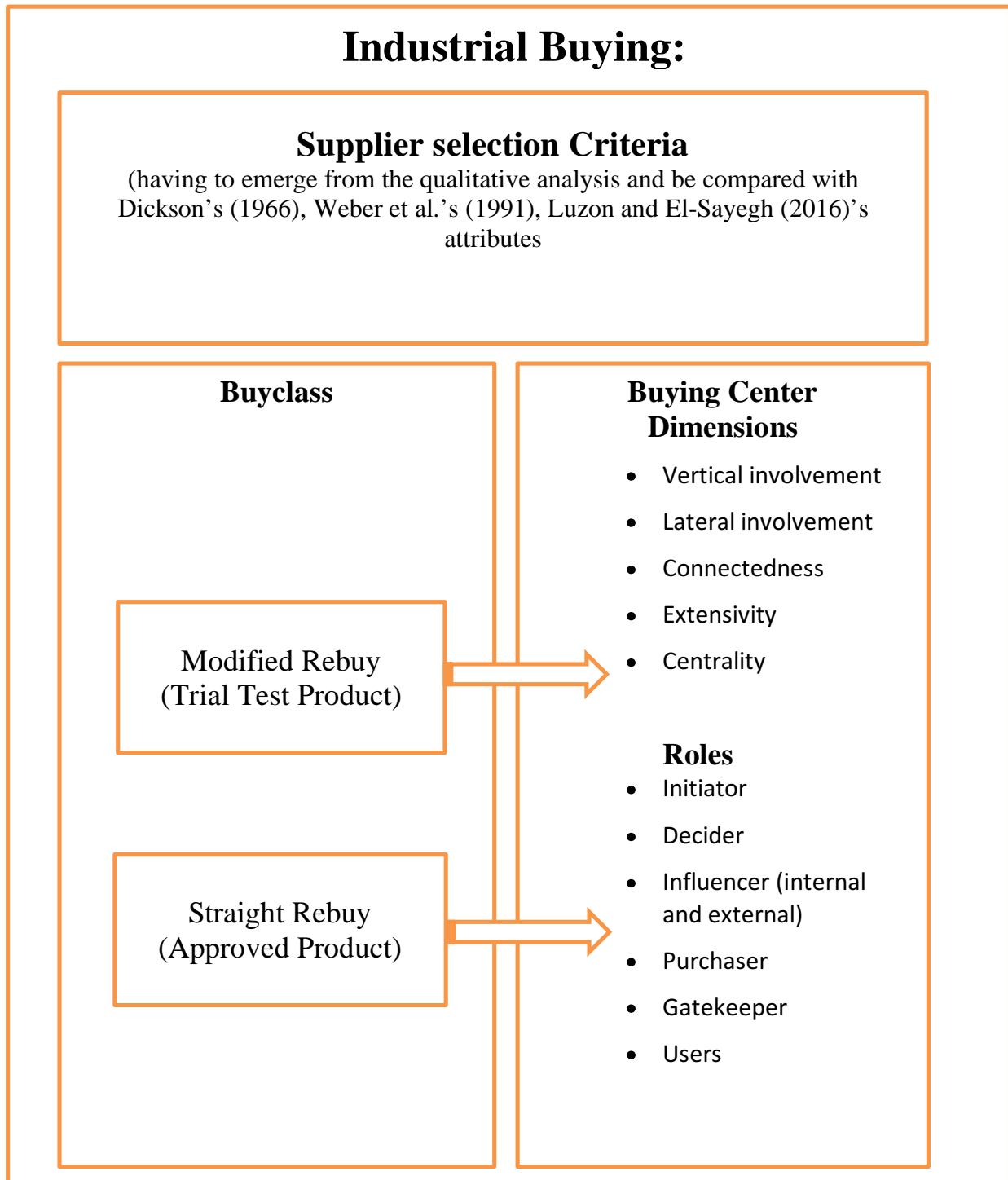


Figure 2. 6 Industrial Buying and buying center dimensions

Table 2. 13 Respondents and their Roles in the Buying Center

	Firms	R(1)	Years in the Firm	Function	Department	Roles for Modified Rebuy / New Product	Roles for Straight rebuy / repetitive
Monopsonist Client	Aramco	1.	8 years	Engineer in Charge	Drilling Technical department	Initiator, Gate Keeper	Internal Influencer, Gate Keeper
		2.	5 years	Supervisor (head of the department)	Drilling Technical department	Decider, Gate Keeper	Internal Influencer, Gate Keeper
		3.	7 years	Senior Drilling Engineer	Drilling and Operations Department	Internal Influencer	User/Initiator
		4.	15 years	General supervisor (Head of department)	Drilling and Operations Department	Internal Influencer	Purchaser and decider
		5.	23 years	Supervisor	Drilling and Operations Department	Internal Influencer	Decider
		6.	30 years	General supervisor (Head of department)	MAFD (Material and Functions Department)	Purchaser	Purchaser
		7.	15 years	Drilling Superintendent	Operations Department	Internal Influencer	User
Suppliers	Schlumberger	8.	9 years	Operations and Sales Manager	Bits and Drilling Tools (Sales Department)	External Influencer	External Influencer
		9.	4 years	Sales Engineer	Bits and Drilling Tools (Sales Department)	Initiator / External Influencer	Initiator / External Influencer
		10.	12 years	Senior Product Engineer	Bits and Drilling Tools (Engineering Department)	External Influencer	External Influencer
		11.	11 years	Demand Planner	Bits and Drilling Tools (Logistics department)	Gate Keeper (Information Flow to the Buyer)	Gate Keeper (Information Flow to the Buyer)
		12.	16 years	Sales Manager	Bits and Drilling Tools (Sales Department)	External Influencer	External Influencer
		13.	6 years	Designer and Focal point for Aramco	Bits and Drilling Tools (Engineering Department)	External Influencer	External Influencer
		Halliburton	14.	8 years	Account Manager	Drilling Bits (Sales Department)	Initiator / External Influencer
	Baker	15.	15 years	Country Manager	Drilling Bits (Sales Department)	External Influencer	External Influencer
	NOV (National Oil Well Varco)	16.	6 years	Sales Engineer	Bits and Drilling Tools (Sales Department)	Initiator / External Influencer	Initiator / External Influencer

Note: The respondents are identified by a number, from R1 to R16

Table 2. 14 Roles at different steps of the buying process

	Initiators	Users	Influencer s	Buyers	Decision makers	Gate keepers
Problem recognition	Aramco R1 (Technical) R3 (Operations) Suppliers R9,R14,R16 (Sales Departments)	Aramco R2 (Technical) Suppliers R10,R13 (Technical)	Aramco R2 (Technical) R5 (Operations)	Aramco R6 (Materials)	Aramco R2 (Technical) R4 (Operations) Suppliers R10,R13 (Technical)	Aramco R1,R2 (Technical) Suppliers R11 (Demand Planner)
Product Specifications	Aramco R1 (Technical) Suppliers R10,R13 (Technical)	Aramco R1 (Technical) R3 (Operations) Suppliers R9,R14,R16 (Sales Departments)	Aramco R2 (Technical) R3 (Operations) Suppliers R9,R14,R16 (Sales Departments)	Aramco R2 (Technical) R3,R4,R5 (Operations)	Aramco R2 (Technical) R3 (Operations) Suppliers R9,R14,R16 (Sales Departments)	Aramco R1,R2 (Technical) Suppliers R11 (Demand Planner)
Search for Potential suppliers	Aramco R1 (Technical)	Aramco R1 (Technical) R3 (Operations) Suppliers R9,R14,R16 (Sales Departments)	Suppliers R8,R12,R15 (Sales Management)	Aramco R6 (Materials)	Aramco R2 (Technical) R6 (Materials)	Aramco R1,R2 (Technical) Suppliers R11 (Demand Planner)
Evaluate propositions	Aramco R1 (Technical) R3 (Operations) Suppliers R10,R13 (Technical)	Aramco R2 (Technical) Suppliers R10,R13 (Technical)	Aramco R2 (Technical) R5 (Operations)	Aramco R6 (Materials)	Aramco R2 (Technical) R4 (Operations)	Aramco R1,R2 (Technical) Suppliers R11 (Demand Planner)
Select product and supplier	Aramco R3 (Operations) Suppliers R9,R14,R16 (Sales Departments)	Aramco R3 (Operations)	Aramco R2 (Technical)	Aramco R6 (Materials)	Aramco R4 (Operations)	Aramco R1,R2 (Technical) Suppliers R11 (Demand Planner)
Evaluate performances	Aramco R1 (Technical) R3 (Operations) Suppliers R10,R13 (Technical)	Aramco R3 (Operations) Suppliers R9,R14,R16 (Sales Departments)	Aramco R2 (Technical)	Aramco R6 (Materials)	Aramco R4 (Operations)	Aramco R1,R2 (Technical) Suppliers R11 (Demand Planner)

2.6.3 The roles and the phases

Decision-making according to the data gathered consists of multiple persons affecting the purchasing decision. Acquiring a product like drilling bits, that investigates business customer satisfaction towards the supplier, is a process affected by many people. As the literature (studied in part 1) suggests it is important to convince the users of the product since they usually initiate and influence the buying process.

In term of job roles and processes, our buying center consist of members belonging to the monopsonist Buyer (Aramco) and the Suppliers (Schlumberger and the international drilling service companies).

All Aramco's respondents who are involved in the buying centers for modified rebuy or straight rebuy would act as users or influencers of the purchasing decision. However, the final decision might be made by one person, such as the Supervisor in the drilling technical department (R2) under the modified rebuy situation and the General Supervisor (R4) in the drilling department under the repetitive rebuy condition. But it seems that the purchasing decision would not be made if some influencers oppose the procurement. This is due to the fact that all of the respondents (even the final decision makers) discuss with each other, often both subordinates and superiors, about the possible purchase. Our results show that approximately five persons affect this type of buying process in Both Straight rebuy (repetitive) and modified rebuy (trial test).

In what follows, we present the members of the buying center and the roles that they play, then we look at the buying process such as it appeared for modified rebuy and straight rebuy.

Initiator:

Typically, the initiator is someone who realizes there is a need of New Drilling bit or even new design based on the application needed, and drilling problem, then suggests purchasing a new product that will fulfill the identified need or problem, from Suppliers Part as example Schlumberger , GE Baker, Halliburton etc. , the Supplier Sales and Product Engineers (R9,R10,R14andR16), in two vertical levels that the engineers will initiate a proposal with the New product specification sheet , or the new design presentation than review it with the vertical managers before presenting to Aramco and get Aramco technical department blessing for the new product in order to proceed with the manufacturer process.

Influencer:

Influencer are the People who influence the buying decision. They often help define specification and also provide information for evaluating alternatives technologies and best drilling bits solutions for Aramco. Technical department engineers in Aramco are the most important influencers (R1 and R2) they are two vertical levels between the Aramco Technical engineer and the Drilling technical department manager to review and influence the proposal presented from the suppliers for the new drilling bits designs or technologies. Based on (BPA) Bit performance Analyser which is a Software that compare the Top five products in similar applications which the New proposed product should Lower the cost per foot by 5% of the average best five products performance or to be 5 % faster in performance from the fastest five products from the same applications. If the bit will pass the trial test criteria it will be free of Charge, but it will be listed under Aramco Approved Name which can be utilized on a repetitive purchases.

Decider:

After getting blessing from Technical department about the new drilling bit design and its suitability for the application, Chain of Approvals for decisions regarding the new product on three vertical levels in Aramco (R3,R4,R5,R7), and R3 Senior drilling engineer approve the proposal and send it to R5 for reviewing it and decide on it then refer it to Aramco Drilling General Supervisor (R4) , head of department for Final Decision before sending it to the Buyer (Material departments) and the supplier Gatekeeper.

Purchaser:

Generally after getting the required Technical and operational approvals, the system will send a notification to the purchaser (Buyer) Material Departments (R6) to request a final quotation from the supplier with Aramco contract terms that if the drilling bits will pass Aramco Technical requirements it will be approved and the bit cost for the first trial run will be Zero Dollar, and if the bit will fail the cost will be one Dollar and the supplier will not have the authority to run this product again in the kingdom. People who have formal authority to select the supplier and arrange the purchase terms. Buyers paly their major role in selecting vendors and negotiating and this is exactly what happened this the declining in oil and gas market two years back and the Purchase become very aggressive with the suppliers.

Gatekeeper:

Classically Gatekeepers are the people who have the power to prevent sellers or information from reaching members of the buying center, in our case the gate keeper is the demand planner for supplier (R11), and On systematic basis the suppliers are providing drilling bits to Aramco on a consignments basis, dealing with Aramco system during the entire Buying center process is the Demand planner. He receiving approved Aramco the DRSS request (Drilling Request Supply System), we can send it directly to the Aramco tool House, and after receiving if the bit will be utilized we will receive the used notification and the PO (Purchase Order) afterward.

Users:

Characteristically those who will use the drilling products .In many cases the users initiate the buying proposal and help define the product requirements, which is in our case in Modified rebuy (R3, R4, R5, R7), after finalizing the paperwork and perform the trial test in the required field, the Users need to follow the parameters applied and drilling practices using the new drilling bits and review the performance based on the proposal agreed with the suppliers and send their recommendations to technical department (R1,R2), to give the final approval on the new drill bits, if it will be successful one they will send to the Materials and Functions department to list this drilling bits to the Aramco approved list and added to B2B list , meanwhile if they trial run for the new drilling bits not succeed , they will send back to the supplier through the gatekeeper (R11), that the bit is not approved and will backload the bit to the Supplier warehouse and will not be able to use similar drilling bit type again in Saudi Aramco.

2.7 Detailed processes: Modified Rebuy versus Straight Rebuy

2.7.1 Drilling Bits Modified rebuy Process

Modified rebuy: it means a new Product (drilling bit) or new technology design need to be approved. This Modified rebuy is called by Aramco Call a Trial test product. It is the door to be opened. If a company wants to join the market by introducing new product / technology, it needs to pass successfully by the following process with all the respondents (see their job roles description). To initiate the process of Modified rebuy as the one of a new drilling bit , the supplier Product Engineer (Respondents R10) shall initiate and prepare a proposal which includes the new product specification sheet showing the difference from the previous drilling

bits . He has to explain the new technology or tweaks for this new product, justify its interest and show the benefits for Aramco. His role consist in influencing Aramco’s interlocutors to initiate a trial test for this unapproved (or not yet approved) new drilling bits in order to be listed in Aramco Approved products. :

“The buying Phases depends on type of purchases (new purchases and repetitive purchases). The new purchase Need to initiate trial test for the New introduced product free of charge to prove the new product to be added to Aramco approved list. It requires chain of proposals and approvals from three Aramco’s departments. “(Respondent R10, technical, supplier).

So based on this, the Technical engineer in the suppliers (International Oil service companies) will initiate a proposal based on the new drilling bits or even a modified drilling bits to be presented to Aramco Technical department. The supplier has to get Aramco’s approval prior starting the manufacturing process and bring the bit in Saudi. Aramco Technical department consists of two vertical levels with the Engineer in charge for example respondent R1) and the Supervisor Engineer of drilling technical department (head of the department), as an example respondent R2. They are reviewing and confirming the proposal for the new product/technology and if it will help Aramco and improve the drilling performance and reduce the Cost per foot in drilling. They will give the acceptance to proceed to manufacture the drilling bit and bring it to Saudi Arabia :

“Drilling Bits business mainly comes from International services providers and we are expecting from them to improve their tools to improve the drilling performance which will help Aramco to Drill Faster with Cost effective , so overall will minimize drilling Cost and accelerate the production of the Oil and gas wells.” (Respondent R1, technical, Client).

After getting the approval from the technical department which reviewed the technical proposal, and getting confirmation that the new product can be brought to Saudi Arabia to be tested with Aramco, the international drilling companies (suppliers) sales representatives (for example respondents R9, R14, R16) and their management (for example respondents R8, R12, R15) start contacting the drilling Engineers and drilling Supervisor and Drilling General Supervisor in the Drilling Operation department at Aramco (for example, respondents R3, R4, R5). This is consistent with a 3 levels of vertical Approval. The main goal is to have the information about the new proposed product/technology pass to the drilling operation

department in order to start the trial test proposal based on it. The trial test proposal will be made on a specific nominated well by Aramco. So the Sales / Account manager from the suppliers will start making the analysis of the offsets wells with Aramco Drilling engineer, based on the nominated well to test the new coming product. All the usual criteria which are taken into account to evaluate the performance such as BPA (Bit Performance Analyzer), CPF (Cost per Foot), ROP (Rate of Penetration) will be used, taking also into account the characteristics of the oil well and the difficulties of the drilling. Based on those criteria the supplier representative and management will decide the new drilling bits price based passing the mentioned two criteria's :

“Initially the companies (service providers) should perform a trial test free of charge to approve the product (drilling bit) based on the size and type and application required, then if it will be approved according to the BPA (Bit performance Analyser) There will turn to consignment basis” (Respondent R2, technical, Client).

“The new purchase Prerequisite to initiate trial test for the new presented product free of charge to prove the new product to be added to Aramco approved list. It requires chain of proposals and approvals from three Aramco's departments, starting from Technical department, then operational departments finally to Material and delivery department, if the new product will pass the trial test criteria it will be added to Aramco approved list” (Respondent R12, Operational, Supplier).

“If you are asking about the evaluation of the trial test proposal for new products , Aramco technical department is the first place to visit , Initially we review the company profile , an recently we added rules after the new Country policy for the Localization of human resources and the percentage of Local ingredients for any new product will be used in Aramco, if the company passed this criteria we will review the technical proposal for the new product that the company wants to trial tested in Aramco , based on (BPA) Bit performance Analyser which is a Software that compare the Top five products in similar applications which the New proposed product should Lower the cost per foot by 5% of the average best five products performance or to be 5 % faster in performance from the fastest five products from the same applications. If the bit will pass the trial test criteria it will be free of Charge, but it will be listed under Aramco Approved Name which can be utilized on a repetitive purchases”.
(Respondent R1, technical, Client).

After all these steps have been made, including the trial test proposal, the supplier will propose a price for this new product that the client will balance with the performance benefit that it can gain (for example in terms of Cost per Foot). The gain for the client which is one of their ultimate goal will be used by the international drilling companies as a strategy to increase their prices, revenue and margin for the new bits and technology :

Aramco's expect from us introducing latest technology, specially Schlumberger smith bits hold the highest market share worldwide and the only company embrace the patents for 3DC cutters technology, Rolling Cutters, StingBlade and AxeBlade, which no one from competition can copy or imitate it, typically we are testing our new product in North America and send it directly to Saudi Arabia to test the do-ability of their applications and formation with the new technology, And Aramco expected that these technology will improve their overall cost per foot meanwhile great opportunity for us to improve our pricing and margins based on it. (Respondent R8, Operational, Supplier).

Then after all the chain of Aramco's operational and technical approval (MAFD), the Material department at Aramco will raise a (RFQ) request for Quotation, to be sent to the supplier demand planner in order to prepare and send the new bit to Aramco warehouse. The next step is that the candidate well is ready to be drilled. When this is the case, Aramco's Foreman will request from Aramco Tool house to send the drilling bit to the Aramco Drilling rig in Order to be ready to drill the section. Then, Aramco Drilling Engineer along with Aramco Superintendent will ask the Supplier technical and operational manager to send a field engineer to the location to follow the drilling section and optimize the drilling parameters. This engineer will follow the road map sent by the supplier account manager to get the best performance out of it. While drilling, both supplier and client are following the drilling closely and send the update each six hours while monitoring and mitigating the parameters. After reaching the casing point and finish drilling the required section as agreed, a post run report (evaluation report) is prepared and sent by the supplier to Aramco Drilling engineer to check and compare the trial test proposal with the actual drilling run. Consequently, Aramco Drilling Engineer will check the evaluation post run report against Aramco Bit Performance Analyser (BPA),

"The BPA (Bit Performance Analyser) is the fundamental reference and criteria to choose the drilling bits, the importance of the proposal and Sales representative from the suppliers is really important to explain the new technology and

recent performance in my field and all other areas.” (Respondent R3, Operational, Client).

If drilling bit passed the trial test criteria, then Aramco drilling engineer will send the evaluation report along with updated BPA for DTD (Drilling Technical department) for final reviewing and approval. If so, the technical department will send it to Aramco Material Departments (MAFD) to list the mentioned bit to B2B system with the mentioned bit , and this bit can be used afterword in the repetitive rebuy after been listed in Aramco SAP system .

As a Material departments there are two groups of purchases, (new purchases and repetitive purchases). The new purchase involves the procurement of new products and need a trial test criteria. The repetitive purchase relate to the procurement of new product that have been already approved and passed Aramco trial test criteria on consignment basis. Aramco always have two kinds of purchases and it is a must to pass by the first type to get approved to be a repetitive one. (Respondent R6, Operational, Client).

If the product drilling bit did not pass the trial test criteria, then the supplier will send a post-run report to Aramco drilling engineer and he will review the drilling performance against the technical trial test proposal. Then he will send it to Aramco’s DTD (Drilling technical department) in order to get the final decisions. Normally this trial test will be consider “Failed”. This type of bit will not be allowed at Aramco. Sometimes, in special circumstances, if the underperformance of the new bit was due to any other criteria than drilling performance (accidental failure, run on junk, etc), technical department can considered it inconclusive. The supplier will be allowed to run the test again with a similar product, under normal conditions. If the second trial test is successful, the product will be listed in B2B SAP system at Aramco , and the supplier can then use it in the repetitive rebuy context (Straight rebuy).

The Process is influenced by the kingdom vision for Saudization, the priority of giving business and highest market share will be for the company which will follow these instructions providing Saudi engineers and have highest content in their products. Schlumberger just got the kingdom award for the highest company hired Saudi personal and meanwhile we are working to setup our Bit facilities in Saudi to start the manufacturing process locally. (Respondent R10, Technical, supplier).

Technically point of view, Aramco evaluate the competency of the companies and their capabilities of the proposed products then the kingdom vision knowing that Schlumberger was presented with an Excellence Award for “Highest in Saudi Workforce” at Saudi Aramco’s In-Kingdom Total Value Add (iktva) Forum, which took place in Dammam, Saudi Arabia in December 2016. For local content and human resources percentage, then on the company profile on drilling application in Saudi, HSE (health, safety and environment data) there will be an Audit from Aramco site to come over the supplier manufacturer facility even outside country to approve it. They also give chances for small players to create competition and challenge the big companies. (Respondent R13, Technical, supplier).

These considerations for Modified rebuy have to placed with a bigger picture context. This is the kingdom influence on choosing and continuing business with Aramco. New requirements were edicted in order to make sure that the suppliers will produce long-term tangible benefits such as quality jobs for a growing Saudi population, innovation and diversification of industry, and increased global competitiveness in Saudi Arabia.

“Create thousands of direct and indirect jobs for Saudis Aramco consider Schlumberger Smith Bits, as a technical oriented company with the most proven patents in the cutters technology with Aramco rely on it especially on the abrasive formation, and after long-term relationship of working together with Aramco in all drilling and production sector they guarantee business and support in the judgment for the new products. (Respondent R13, Technical, supplier).



Figure 2.7 Buying process for the Modified rebuy situation (Drilling sector)

2.7.2 Drilling Bits Straight rebuy Process

Straight rebuy, called as well repetitive rebuy it means an approved Product (drilling bit) already in Aramco's approved list. We start with the roles since there is also the drilling superintendent at the rig site which is involved. Then we present the process.

2.7.2.1 *The roles in the buying center for straight rebuy*

From initiator to utilization:

The initiator in repetitive rebuy is the Sales Engineer (for example, R9, R14, and R16) at the Suppliers. The sales engineer prepares the proposal, based on the application, which he submits to the Aramco drilling engineer, reviewed by the drilling supervisor, and then by the Aramco Drilling Engineer General supervisor as the final approver. The proposal with its approvals arrive to the drilling rig for requesting the bits. The drilling superintendent will approve the request. The supplier which gets the request sends the the bit to the rig on a consignment basis. It may not be utilized. If the product is utilized, Aramco will pay for it. Otherwise, if if not utilized, the product will be return back to the supplier.

Influencer:

Aramco Drilling department has the main influence for the repetitive rebuy. This starts with the Drilling Engineer who receives the proposals from suppliers and validate them through the BPA (Bit Performance Analyser) software which compares the Top five products in similar applications. Then, he gathers the information to pass it to his Drilling supervisor (for example, respondents R3 and R5). And this strongly influences the buying decision at this stage. All the required information and data are already collected to get the final approval of the General drilling engineer supervisor (for example, respondent R4). If they think that it is useful or necessary, the drilling department can also get back to the DTD (Drilling technical department) at Aramco to check its opinion regarding the appropriateness of the mentioned proposed bit and their opinion in the drilling applications related to the drilling bits. In some cases, the Drilling Superintendent at the rig site (for example, respondent R7) gives his opinion and can influence the drilling bits based on his experience with the rig site.

Decider:

After getting the approval from the Drilling engineer supervisor and also the advices from the Technical department about the proposed drilling bit, the official formal approval is given by the General drilling supervisor (for example, respondent R4). In other words, R3 the Senior drilling engineer approves the proposal and sends it to his supervisor (R5) for reviewing it. Then, the Aramco Drilling General Supervisor (R4) , head of department, takes the final decision. A DRSS (Drilling Request Supplier System) asks the supplier to send the requested drilling bits to the location.

Purchaser:

After getting the required approvals from operational department , the drilling Engineer will make the drilling program signed by the drilling Engineer, drilling supervisor and drilling general supervisor approvals. He will send a copy to the Drilling Rig to drill the well, meanwhile the system will send a notification to the supplier to send the drilling bit to the location , this request will reach the Gatekeeper (respondent R11). If the bit is utilized, a systematic Purchase Order within maximum five days with the full bit price.

Gatekeeper

The gatekeeper plays a main role in the straight rebuy, consignment basis (repetitive buyer) (R11). The supplier demand planner receives the DRSS request (Drilling Request Supply System), and is given access by Aramco to Aramco system. Therefore, he is able to track the DRSS request and drilling bits status. He knows if the product is utilized or not, and the supplier can intervene to understand what happens.

Users:

Typically those who will use the drilling bits are those who are working in the drilling department ar Aramco. They are managed by the Drilling Superintendent (respondent R7) who is leading the operations and the drilling foreman on the drilling rig. Meanwhile the entire team in drilling departments is involved in the process, starting from drilling engineers, passing by the Drilling Supervisor, ending by the Drilling General Supervisor (R3, R4, and R5).

2.7.2.2 *Synthesis of the straight rebuy process*

An important point to understand is that there are two different levels of choice:

- the initiation of the process of straight rebuy
- choices of the bits for straight rebuy are made on a daily basis, and not once forever
- if the drilling bit outperforms others, it will be the first choice in repetitive rebuy in the same area for the same type of drilling and wells

All this process relies on procedures but also on personal meetings between the suppliers and Aramco. Normally all the international drilling bits company working with Aramco hold a list of approved drilling bits based on their bits sizes and types related to the drilling application. To initiate the process of Straight rebuy (repetitive rebuy), it started with front line sales (respondents R9, R14 and R16 in the suppliers) with drilling bits proposals. The sale engineer will arrange a meeting with Aramco drilling engineer checking the upcoming well for his drilling rig. He also checks the offsets closest wells drilled already to compare the previous performance and propose the best drilling bits for the upcoming well based on its previous record and performance. Meanwhile Aramco drilling engineer will review the proposals from all bits suppliers and compare it with Aramco (BPA) Bit Performance Analyser, and the process will go on:

“According to my job description, I’m dealing with the repetitive purchases on daily basis. I’m choosing the supplier based on the BPA (Bit performance Analyser) , it will show the best five drilling bits on the field that I’ll start drilling in , and based on Aramco criteria I have the authority to choose anyone from the best five without justification, but the door is open for all other suppliers that have approved drilling bits to show their performance in other fields and submit their proposals , if they convince me that they can break the record in my next well, I can choose it and make justification and explain to my supervisor.” (Respondent R3, Operational, Client).

“We are purchasing drilling bits in Aramco mainly on Consignment basis the drilling engineer will choose the best product based on the BPA (Bit performance Analyzers) ,then will review all suppliers proposals , once he made his drilling

proposal and the drilling bits selection , he is coming to me to review it and for my approval. Typically I'm reviewing the selection criteria and if it is matching Aramco Standard (BPA) and if there is any drilling bits outside the BPA, should have a clear justification to break the field record". (Respondent R5, Operational, Client).

"On regular Basis, the drilling Engineer initiate the drilling program and choose the bits selection based on BPA (Bit Performance Analyser), then he will convince his supervisor then they will bring the program for my final approval, typically I review based on the lowest CPF (Cost Per Foot), then a copy from the Drilling program to be send to drilling foreman on the rig to request the selected drilling bits". (Respondent R4, Operational, Client).

Aramco drilling engineer can contact technical department to take their advice if needed but usually in repetitive rebuy there is no influence from Technical department which are not involved on it:

"In Aramco mainly we use the consignment basis, which is once the required product passes the Trial Test criteria and has been listed in Aramco Approved list in the drop down list and turn to repetitive purchased. (Respondent R1, Technical, Client).

(... if approved, there Aramco) will turn to consignment basis, the drilling engineer will raise the request, supervisor will approve then the superintend will approve the request raised by the drilling foreman, once the bit will be used, Aramco will purchase it, if not It will be returned to the supplier. (Respondent R2, Technical, Client).

After getting all required approval from drilling department for the upcoming drilling program with the chosen drilling bits, the operation part will take the action to start ordering the bit by sending a copy from the approved drilling program to the rig. Aramco foreman will raise the DRSS (drilling request Supplier system) which will go to the gatekeeper, that is the demand planner at the supplier in order to prepare and send the bit to Aramco drilling rig:

"On systematic basis we are providing drilling bits to Aramco on a consignments basis, which is the repetitive purchases on daily basis, I'm receiving approved Aramco the DRSS request (Drilling Request Supply System), we can send it directly to the drilling rigs, after receiving if the bit will be utilized we will receive the used notification and the PO (Purchase Order) afterword, if the bit will not be used it

will be return to our warehouse within 90 days from delivery date free of charge.”
(Respondent R11, Demand Planner, Supplier).

“Schlumberger Smith Bits have a contract with Aramco to provide drilling bits on a consignments basis, which is the repetitive purchases on regular operation. We have an approved Aramco Products List (SMI List), those bits already passed Aramco trial test criteria and we can send it straight to the drilling rigs, after receiving the DRSS request (Drilling Request Supply System), if the bit will be utilized we will receive the used notification and the PO (Purchase Order) consequently, if the bit will not be used it will be return to our warehouse within 90 days from delivery date free of charge.” (Respondent R12, Operation, Supplier).

Before starting drilling, the Aramco Drilling foreman will call the supplier sales engineer to have him send a field engineer (Bit Runner) to go to the drilling rig in order to pick up the bits and guide and mitigate the drilling section. The Bit runner (supplier field engineer) also follows the drilling parameters and ensure the best performance through the drilling operation. This will make the best out of the drilling bits achievements this will lead that the mentioned bit will be in the top of BPA bit performance Analyser and and try to be in the top five BPA achievements. If this is the case, the bit will be selected for all other wells in the same area. If the product does not perform in the top five, it will be ruled out. This may happen any time in a straight rebuy process. Usually Aramco is ordering two bits per section main and backup. In case the bit is not used within 90 days , the supplier should backload the bit to its warehouse without charging any cost to Aramco. If the bit is utilized , it will be Aramco’s property and the supplier will get the Purchase Order within five days.

The entire process is influenced mainly by the performance drilling, meanwhile The Process is influenced by the kingdom vision for Saudization, the priority of giving business and highest market share will be for the company which will follow these instructions, and the influence of Localization in sales population with long relationship and direct relations have a great impact on the market distribution among the suppliers and the effect of Saudization and localization in product is not affecting the approved bits business not like the modified rebuy.

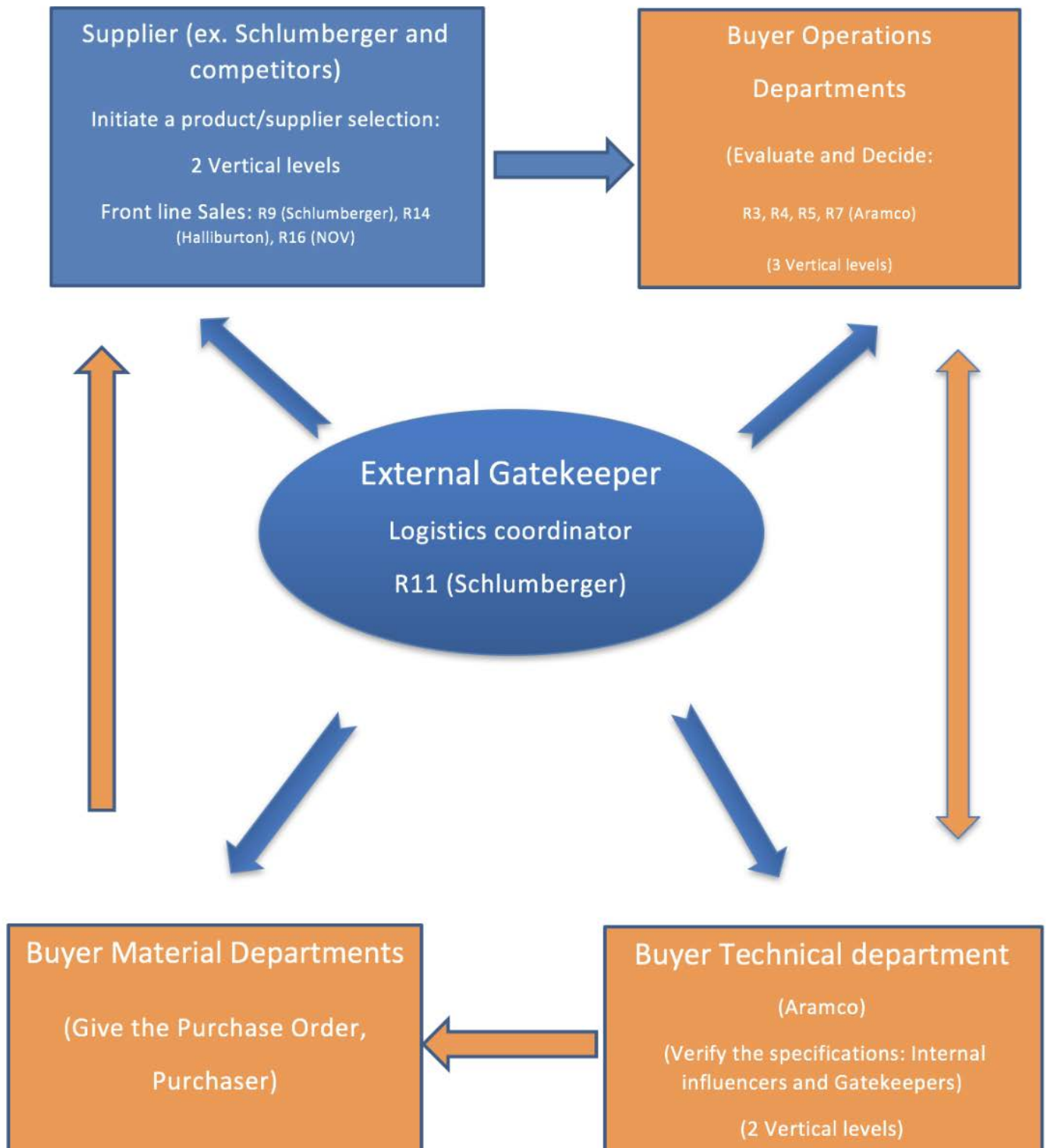
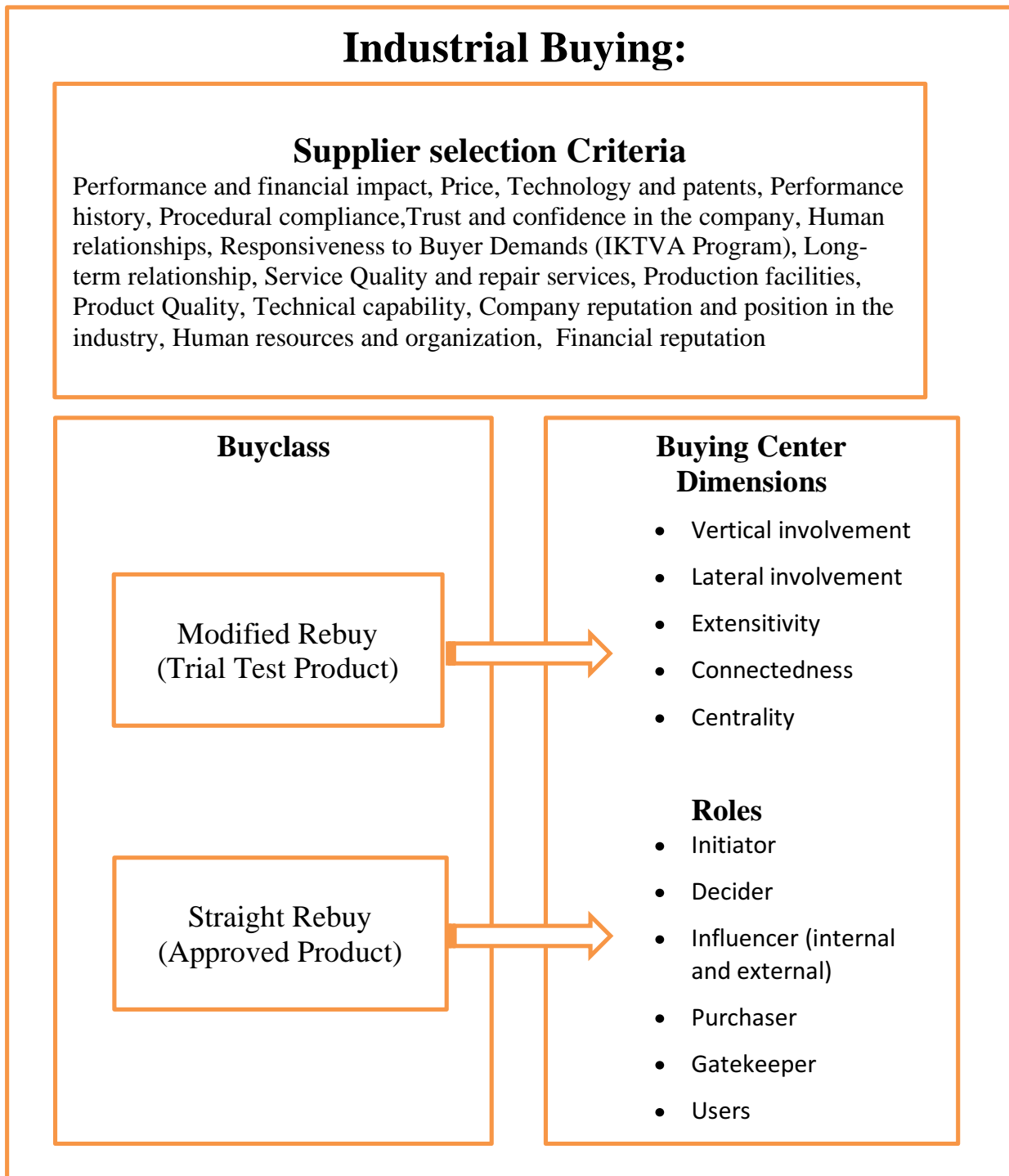


Figure 2.8 Buying process for the Straight rebuy situation (Drilling sector)

2.8 Qualitative analysis. Research Question 3

RQ3: “What are the important attributes in the buying center and how to gain a Competitive advantage in a Monopsonist market?” (Case of drilling Sector in the Oil industry)



Note: the attributes mentioned in this figure are not ranked by degree of importance but their order of presentation reflects groups of level of importance such as found in this research

Figure 2. 9 Research framework and supplier selection criteria for a monopsonist

2.8.1 Output and attributes importance by analyzing the interviews

We conducted the interviews with key persons in the buying center of the biggest oil and gas Monopsonist market globally, the respondents were from Aramco which is the client and the suppliers which are the international drilling service companies as an example of Schlumberger, GE Baker, Halliburton and National Oil well Varco (NOV). In the semi-structured interviews, the questions help discuss the supplier selection criteria such as perceived by the respondents and the possible competitive advantages of the service providers. In order to stimulate the respondent, we asked questions such as: *“On what criteria are the offers and proposals evaluated and selected?”* *“How Schlumberger is evaluated compared to other companies on different criteria?”* *“What is the importance of the criteria and for whom?”* *“How do you evaluate performance?”*.

In order to identify the attributes and assess them an importance level, we proceed as presented in the methodology, that is by using a content analysis with vertical and horizontal classification (Glaser and Strauss, 1967; Strauss and Corbin, 1990; Langley, 1999).

In order to facilitate the classification, the literature review with extensive lists of supplier section attributes for the vendor and in the oil industry in general helped us (Dickson, 1966; Weber et al., 1991; Khodadadi et al., 2006; Jaysinpure et al., 2016; Luzon and El-Sayegh, 2016). The specificities of the monopsonist case and of the evolutions of the organizational purchasing environment (Wind and Thomas, 2010) also helped us. The specificities of the Saudi Arabia monopsonist market clearly appear but the general criteria are as follows (not classified here below by degree of importance):

- Performance and financial impact
- Technology and patents
- Performance history
- Price
- Production
- Product Quality
- Service Quality and repair services
- Procedural compliance

- Technical capability
- Reputation and position in industry
- Trust and confidence in the company
- Human relationships
- Human resources and organization
- Responsiveness to Buyer Demands (IKTVA Program)
- Financial reputation
- Long-term relation

In order to be able to assign an importance level to the attributes, for modified rebuy as for straight rebuy, in order to rank the attributes we counted the number of respondents who mentioned the characteristic, the importance they indicate they assigned to the attribute, the order in which the attributes appeared and the insistence with which they spoke about them. The importance level was not a simple mathematical calculation, since each attribute has subdimensions and the researcher has to weight and interpret all these elements. We are fairly confident about the identification of the attributes and the weight we gave to each one of them, even if it would have been important to cross-check what we did with a second researcher. However, the importance will be assessed later on, not by the researcher but by a larger sample of respondents, in monopsonist and non-monopsonist contexts with a structured questionnaire. And this will be formalized for modified rebuy and straight rebuy situations.

In the following presentation, long verbatims are introduced to illustrate the findings and give a better understanding of the respondents vision, as suggested by Langley (1999). We shall follow the order of the list of attributes presented above. This does not reflect the importance of the attributes and is only presented as such for convenience reasons. When the importance of the attributes will be assessed in the summary tables, the degree of importance that we assign to the different attributes result from the frequency and intensity of citation by the respondents (the complete transcription of the interview is on Appendix C). We were the only rater in this research but the quantitative analysis that we conducted later on give some external validity to our findings.

Performance and financial impact

Starting with the performance and financial impact for Aramco as an attribute for product and supplier selection, Aramco is perceived as usually assigning a high weight to

Performance in order to improve its drilling capabilities and explore for potential oil and gas extraction all over the Saudi kingdom. So the performance will reduce their drilling cost (CPF Cost Per Foot). This is why Aramco introduces a system to control all performance based criteria for supplier product selection. This system is called BPA: Bit Performance Analyser :

“(BPA) Bit performance Analyser which is a Software that compare the Top five products in similar applications which the New proposed product should Lower the cost per foot by 5% of the average best five products performance or to be 5 % faster in performance from the fastest five products from the same applications.” (Respondent R1, Technical, Client).

Aramco relies on this system mainly to choose between the bit suppliers in both modified rebuy, which is the trial test for new introduced product for Aramco , and in straight rebuy or day to day operations to choose between the approved drilling bits. Aramco will choose the supplier which will provide the best performance and help Aramco in two ways : first, drill faster, which leads to put the drilling well into production quickly and start producing oil and gas faster, second make cost per foot savings which will help Aramco to reduce the drilling cost:

“If the bit will pass the trial test criteria it will be free of Charge, but it will be listed under Aramco Approved Name which can be utilized on a repetitive straight rebuy purchases, which is the most important part and the main target for the service provider to start generate revenue and for Aramco to have several option to improve the drilling performance to put the wells faster into production and as well Aramco will have the luxury to choose between different drilling products and create competition between which will help us to save and improve our cost consequently.” (Respondent R2, Technical, Client).

“On my current position I’m reviewing the drilling program submitted from the drilling engineer and reviewed by drilling supervisor, my criteria is the lowest cost per foot generally, more specific in the soft upper section I’m giving the small players highest market share with Lowest bit price, and for the lower hard section, most likely the big players have the best products so I go for the best performer in the field with the lowest CPF.” (Respondent R3, Operation, Client).

Technology and patents

These criteria lead to increase the competition between the suppliers and each one starts to introduce its latest technology and patent to create market differentiator in terms of knowhow and ideas. These technological innovations will make the drilling faster and more economical to Aramco. Big international drilling companies like Schlumberger and GE Baker have the resources and power to propose new ideas and innovative technology and secure patents which helps them lead the market in Saudi Arabia. For example, Schlumberger dominates the lower drilling section, which constitutes a challenge, with more abrasive drilling. By doing so, the company dominates the most lucrative market without real competition from the other international oil and gas service providers. It can charge more than double price compared to competitors. They have a with real market differentiator with the rotating cutters which have been introduced two years ago in 2015. This innovation has represented a step change in drilling through abrasive formation in term of footage drilling and reduce the entire drilling cost:

“Schlumberger is the world biggest service provider worldwide and we have long-term relationship around 80 years, Schlumberger consider for us a technical oriented company and we rely on them to provide the latest technology to improve our overall performance in drilling and optimization in general, but talking about the drilling bits side Smith Bits currently hold the highest market share in terms of selling new bits.” (Respondent R1, technical, Client).

“From a technical point of view Schlumberger consider for me a technical oriented company and own the most and highest number of drilling Patent we consider this while evaluating the new tenders and market share to improve our overall performance in drilling and optimization in general, and they invest in the kingdom in all domains that’s why we treat Schlumberger differently while reviewing the contracts, tenders.” (Respondent R2, technical, Client).

As well as one of the respondent (R8) the drilling superintend in Aramco mentions as well a very important point about Schlumberger as a drilling supplier which is the only company that can provide all the drilling bits sizes approved by Aramco. All other suppliers have most of the drilling sizes but not all except Schlumberger. This was an important factor

in Aramco's decision to give Schlumberger a turnkey drilling project for the entire well and entrust the company for this project:

“Schlumberger Smith Bits, the only supplier who can drill the entire sections, with all drilling bits sizes and types. Schlumberger Smith Bits hold the highest market share, we believe in them on our challenges sections particularly they are providing competitive advantage for the abrasive formation section rather than all other bits suppliers.” (Respondent R7, Operations, Client).

Accordingly Schlumberger and GE Baker Hughes used this competitive advantage and try to secure a decent market share using their technology patent. Smith Bits made a step change in the smaller size section using the rolling cutters, StingBlade and AXEBlade technology which are the latest cutters technology and patent for their drilling bits:

“Aramco's expect from us introducing latest technology, specially Schlumberger smith bits hold the highest market share worldwide and the only company embrace the patents for 3DC cutters technology, Rolling Cutters, StingBlade and AxeBlade, which no one from competition can copy or imitate it, typically we are testing our new product in North America and send it directly to Saudi Arabia to test the do-ability of their applications and formation with the new technology. The newest 3D cutting element from Smith Bits, a Schlumberger company, the Axe ridged diamond element features a unique ridge-shaped geometry that combines the shearing action of a conventional PDC (Poly Crystalline Cutters) cutter with the crushing action of a tungsten carbide insert (TCI). Positioning Axe elements across the bit face results in the AxeBlade ridged diamond element bit. Many previous improvements in PDC bit performance were the results of metallurgy and materials changes. That is, until the StingBlade conical diamond element bit was introduced with its unique cone-shaped cutting element. From the success of StingBlade bits, Smith Bits engineers sought to further improve bit performance by developing a new cutter geometry through extensive internal R&D and field testing. The new ridged design of the Axe element enables more efficient cutting and heat dissipation, while also having better frontal impact resistance which is achieved through a thicker diamond layer, proprietary blend of polycrystalline diamond grain-size distribution, and optimized materials. Increased cutting efficiency for instant ROP improvement. Axe elements employ a unique geometry that cuts rock

in a new way combination of shearing and crushing. This cutting method achieves at least 22% deeper penetration, removing more formation to provide higher instantaneous ROP when using the same WOB and rpm applied to conventional PDC cutters. The diamond table on the element ridge, which is 70% thicker than that of a conventional cutter, gives the Axe element increased frontal impact resistance. For operators, this means that the AxeBlade bit delivers improved durability and dull condition for maximum ROP throughout the run. Field tests of the AxeBlade bit have demonstrated up to 29% improvement in ROP compared with similar bit designs using conventional PDC cutters, resulting in significant rig time and cost savings for Aramco.” (Respondent R10, Technical, Supplier).

The Baker GE country Manager also insists upon the importance of using their patent technology to gain competitive advantage

“In Baker Hughes (GE), we have different software’s and entire team are working to follow the operations, and evaluate our performance on daily basis, and gives us a monthly report showing the entire Aramco’s drilling activities shows every company performance and based on it we as operation we decide the product development and define our strength, weakness, opportunity and threats, Baker Hughes commercially released its Kymera XTreme (XT) hybrid drill bits. The bits are the combination of PDC and roller cone technology and offer smooth and consistent performance, and we are capitalizing in our patent technology Kymera hybrid bit technology patent to grasp big market share in the upper soft section.” (Respondent R15, Operation, Supplier).

Performance history

Aramco is using Performance history to evaluate the suppliers performance on a Quarterly basis. The client reviews its benchmarks and record runs as well as the failures which happened during the last Quarter. Based on these records, the monopsonist distributes the market share accordingly, and increases the business of the supplier companies with better performance and less NPT (non-productive time) , and decrease the share of the others. The monopsonist is therefore omnipotent:

“Every Quarter we evaluate all companies’ performance based on service quality and non-productive times (NPT) for the operations versus the service and

product performance for each supplier by holding a meeting with all suppliers' managers and Aramco's manager to review it on Quarterly basis. For each supplier if the trend is not matching our minimum requirements or lots of service quality issue we will drop the supplier market share.” (Respondent R2, Technical, Client).

“As a Superintendent for six rigs, my main criteria is the reliability of the product which help me to finish as fast as possible, without any NPT (Non-productive time), more precise in the soft upper section I'm open-handed for the small companies, with Lowest bit price, and for the lower hard section, most likely the big companies have the best reliable products so I go for the best performer in the field with the lowest CPF.” (Respondent R7, Operational, Client).

Based on this, Schlumberger and other service provider companies are constantly reviewing their performance and their products drill-ability in order to tweak designs and introduce new products to enhance the performance:

“As a Product Engineer Within the company we have every quarter a strategy meeting, product engineer will gather the entire drilling sections during this quarter and show the performance for all drilling bits to see our strength and weakness to improve our products and introduce new product and modified some existing ones , For Aramco, they are performing on quarterly basis SQ meeting (Service Quality) meeting , gathering all failures and NPT (Non-productive time) for each company as well as any environment or safety issues happened during the last quarter, based on it Aramco decide to increase or decrease the marker share for this company based on the results and performances. (Respondent R10, technical, supplier).

Price or cost reduction driven

Aramco is not really perceived as a Price Oriented company. The entire market is not price driven, but performance / CPF (Cost per foot) driven. If a supplier proposes a lower price but with a less competitive performance, this may impact the cost per foot in the end. When the supplier cost per foot does not run among the top five cost per foot in Aramco's BPA (Bit Performance Analyser) system, it will not be able to get a share of Aramco market. Even if a supplier already has a market share double of the others, the monopsonist will not hesitate to increase it even more if this supplier still overperform other suppliers. This is the case with Schlumberger Smith bits:

“Future of the oil industry generally and Aramco Specifically need new technology to solve drilling issues and finalize every section in one go with faster ROP (Rate of Penetration), and lower CPF (Cost Per Foot) and the most important project is to grasp a technology that will help to reach the deepest formation and drill igneous and volcanic Rocks and really abrasive formation in costly and timely manner.” (Respondent R5, operation, Client).

“The Process is influenced by drilling engineer and drilling supervisor toward splitting the market among all suppliers and don’t let Aramco depend on sole supplier and create competition which will benefit Aramco in ROP (Rate of Penetration) and CPF (Cost per Foot).” (Respondent R9, operation, Supplier).

“Before starting to plan a new well, I send proposal request to all suppliers then I review all proposals from all suppliers and compare it with BPA (Bit Performance Analyser) and I’m trying to give share for all the suppliers specially in the upper soft section and my priority will be price based, but in the Lower section will go for the big companies with the premium product because of the hard and abrasive drilling.” (Respondent R4, operation, Client).

Production facilities

In 2015, while renewing the supplier’s contracts, Aramco added new terms for the next renewal and market distribution based on the Kingdom’s new vision, the IKTVA (In-Kingdom Total Value Add), recently announced. This new vision is an important step in the supplier monopsonist relationships since all companies should comply with these political and economic government requirements. Big companies have already started to invest in Saudi Arabia by manufacturing their own facility to follow Saudi Arabian and Aramco new vision. They move forward and continue to do business in the Kingdom by applying these new IKTVA directions. IKTVA guidelines require the use of a certain percentage of local content and local labor. Aramco will audit its suppliers and analyze the companies’ profile on drilling application in Saudi Arabia, with respect to HSE (health, safety and environment data). The monopsonist will come over the supplier manufacturer facility, and eventually force all suppliers to invest in Saudi and build their own facility in the country, using local human resources and local content. The suppliers will have to manufacture the drilling bits locally in Saudi Arabia. Any supplier which will not follow this rule will not be a part of this market any longer. This is one of the downsides of the monopsonist market, the real issue being the skills of the local labor

and local content. If the employees are not competent in relation to the international drilling company requirements, the situation may become difficult for small companies that cannot afford to invest locally and take human resources and business risks. These changes will not be beneficial to them:

“Honestly as I mention before the kingdom vision and direction toward the localization of resources have the biggest influence for the evaluation and increasing market share and granting the business to any supplier. So we are prioritizing the opportunities for local suppliers or international ones which have high percentage of local employee and contents to have business and more market share. “ (Respondent R1, technical engineer, client)

“Aramco displayed last year the introduction of the new kingdom vision; any company which will work with Saudi Aramco should have minimum requirements of local suppliers and human resources, and for drilling bits companies specifically they should have a local manufacturer facility in country within two years’ time. If not the supplier will not be able to continue working in Saudi market.” (Respondent R8, operation, Supplier).

“The Process is influenced by the kingdom vision for Saudization, the priority of giving business and highest market share will be for the company which will follow these instructions providing Saudi engineers and have highest content in their products. Schlumberger just got the kingdom award for the highest company hired Saudi personal and meanwhile we are working to setup our Bit facilities in Saudi to start the manufacturing process locally.” (Respondent R10, technical, Supplier).

“After eleven years in Saudi Arabia, and following Aramco’s operations I can tell that the Process is influenced by the kingdom vision for the Saudization, the priority of giving business and highest market share will be for the company which will follow these instructions providing Saudi engineers and have highest content in their products.” (Respondent R11, Demand planner, Supplier).

“Fundamentally now the key effects on the entire business process in Saudi is the kingdom vision IKTVA and direction toward the localization of resources have the main impact for the assessment and growing market share and permitting the business to any supplier. So they are ranking the opportunities for local suppliers or international ones which have high percentage of local employees and contents to have business and more market share.” ((Respondent R15, operation, Supplier).

The IKTVA criterion is very important as it conditions future business perspectives in Saudi Arabia. It is in tune with the developments highlighted by many researchers (Wind and Webster, 1996; Wind and Thomas, 2010), be it the weight of the economic, social and political environment, the growing influence of government and the interrelated relationships between suppliers and clients, and in particular suppliers and an oil and gas monopsonist in the Saudi Arabian kingdom, with the important influence of the royal family.

Product quality

There is no doubt about the importance of the product quality. This criterion includes several components: the trust and confidence that can be; the reliability and durability of the proud product quality criterion includes several components, the durability of the product and its reliability. However, while this criterion is unquestionably important, what the client is looking at are the consequences of this product quality that is, the actual service associated with the productive time or with the minimization of the non-productive time. This is the reason why engineers cite product quality has having consequences upon the performance and why the supplier refers to the product quality has helping him finish the drill as fast as possible:

“Schlumberger Revolutionary cutting technology for extended durability . The ONYX 360 rolling PDC cutter substantially increases PDC bit durability by revolving 360°. Positioned in the highest-wear areas of the cutting structure, the revolving cutters use the entire diamond edge to drill the formation. The cutter's rotating action allows the cutter's diamond edge to stay sharper longer, extending ONYX 360 cutter life far beyond that of premium fixed cutters.”; Respondent R13, designer engineer, Supplier))

“The diamond table on the element ridge, which is 70% thicker than that of a conventional cutter, gives the Axe element increased frontal impact resistance. For operators, this means that the AxeBlade bit delivers improved durability and dull condition for maximum ROP throughout the run. Field tests of the AxeBlade bit have demonstrated up to 29% improvement in ROP compared with similar bit designs using conventional PDC cutters, resulting in significant rig time and cost savings for Aramco” (Respondent 10, technical product engineer, supplier)

...It is important to “enhance wellbore quality for smooth casing running Data from the service, integrated with borehole caliper and images from LWD services, is used to evaluate the stability of the borehole throughout the drilling process. Combined with detection of microdoglegs and spiraling from bending-moment data, this

information helps you to drill a smooth wellbore for running casing.” (Respondent R10, technical product engineer, Supplier)

“As a Superintendent for six rigs, my main criteria is the reliability of the product which help me to finish as fast as possible, without any NPT (Non-productive time), more precise in the soft upper section” (Respondent R7, drilling Superintendent, client)

Service quality and repair services

Aramco relies on its important Every Quarter evaluation of the performance of all companies. This evaluation is based upon service quality and non-productive times (NPT) for the operations. The quality of the repair services also leads to NPT reduction. Aramco holds a meeting with all suppliers’ managers and Aramco’s manager to review their performance on a quarterly basis. For each supplier if the trend is not matching Aramco’s minimum requirements or service quality issues, the monopsonist client reduces the supplier market share. Being efficient on service quality and repair services is a virtuous circle. It generates revenue with best IBT globally, which helps the supplier hire experienced candidates in the oil industry labor market, who in turn provide premium products to serve Aramco and keep market share:

“Every Quarter we evaluate all companies’ performance based on service quality and non-productive times (NPT) for the operations versus the service and product performance for each supplier by holding a meeting with all suppliers’ managers and Aramco’s manager to review it on Quarterly basis. For each supplier if the trend is not matching our minimum requirements or lots of service quality issue we will drop the supplier market share.” (Respondent R2, technical, Client).

“Internally we have every quarter a strategy meeting, gathering the entire drilling sections during this quarter and show the performance for all drilling bits to see our strength and weakness to improve our products and introduce new product and modified some existing ones , externally Aramco is performing on quarterly basis SQ meeting (Service Quality) meeting , gathering all failures and NPT (Non-productive time) for each company as well as any environment or safety issues happened during the last quarter, based on it Aramco decide to increase or decrease the market share for this company based on the results and performances. “ (Respondent R8, sales and operations, Supplier)

For Service Quality and repair services the monopsonist has the power and can set any rules for the suppliers. Those who will not follow will be kicked out of the market with no other option. One of the respondents shares his personal experience in Gabon, a non monopsonist oil and gas market, compared with NOV (National Oilwell Varco) supplier's experience which was brutally kicked out of the market for 10 months:

“Actually in terms of influence I want to share a particular experience comparing the impact and influence differences between Non-Monopsonist and Monopsonist Market. Whereas working in Gabon, which is a typical non-monopsonist market with 11 different clients working in Gabon, which give a vast diversity for the clients and suppliers to offer different products diversity and prices. At that time Schlumberger failed to renew two contracts with two clients with led to lost contracts with two clients. Meantime Schlumberger was able to continue working and leading the market in Gabon. And this is a big benefit to work in a non-monopsonist market that you can maintain your revenue and business if even you lost couple of clients. On the other hand and as an example of extreme Monopsonist market in Middle east, Aramco is the only Client in Saudi Arabia , a dispute occurred with (NOV), National Oilwell Varco that Aramco requested from NOV some more details regarding approved products that Aramco have thought that NOV was not following the specifications of using those bits, an instant decision from Aramco to stop NOV till further notice for more examination lead to ten Months NOV were completely out of the biggest market globally, due to the monopsonist environment, no other solution or revenue generating only Aramco.” (Respondent R9, operation, Supplier).

Procedural compliance

Procedural compliance is another criterion which is said to show a clear difference between monopsonist and non monopsonist markets. In a non-monopsonist market you will have numerous procedural compliances based on each client contract and requirements, but in the monopsonist market the procedural compliance is only based on the client requirements. Again, the company which does not follow them gets out of the business:

“Generally speaking, drilling bits will improve Aramco drilling and production in Oil and gas, NOV is there to provide the solutions that Aramco need downhole. We're one of the world's largest independent supplier for drilling and intervention operations. With supply and service centers around the globe, we can provide a complete suite of

tools and support where you need it, when you need it. We take pride in delivering superior performance and reliability. For more than 170 years, we've designed, manufactured, and delivered exceptional tools and equipment. No one else offers the full range of drilling and intervention solutions like NOV. In Saudi Arabia, we have more than 150 service centers staffed with highly qualified drilling solutions engineers and experienced technicians. The purchase or rental of our equipment includes tool and engineering support specifically tailored to your job requirements, and we can assist Aramco with difficult drilling and extreme well conditions. Working with Aramco to choose the right components for the formation and your operation, we can help you increase ROP, improve safety, and decrease non-productive time.” (Respondent R16, operation, Supplier).

Technical capabilities

The technical capabilities of the suppliers is one of the important attributes that the client relies on, expecting help, technical and personal support and advice from them in its drilling operations all around Saudi Kingdom. Suppliers are asked to be cost effective and performance efficient in assisting Aramco to explore reserves and to extract oil and gas. Aramco wants its suppliers to bring him the highest technology and the best available competencies. In return, Aramco will secure the supplier market share, with fast payment:

“Schlumberger is the world biggest service provider worldwide and we have long-term relationship around 80 years, Schlumberger is considered by us a technical oriented company and rely on them to provide the latest technology to improve our overall performance in drilling and optimization in general, but talking about the drilling bits side Smith Bits currently hold the highest market share in terms of selling new bits” (Respondent R1, technical, Client).

“Suppliers are most of the international companies in the drilling bits industry, typically we are open for any new supplier that will help Aramco to improve its KPI and accelerate the drilling and reduce the cost and cost per foot.” (Respondent R4, technical, Client).

“Schlumberger smith bits hold the highest market share worldwide which lead that Aramco’s expect from us introducing latest technology, Specially the 3DC cutters technology, Rolling Cutters, StingBlade and AxeBlade, which no one from competition has it”. (Respondent R9, operation, Supplier).

Reputation and position in the industry

In terms of Reputation and position in industry for the supplier and how it affects Aramco's decisions practically, Aramco appreciate American companies. This is due to long-term economic and political relationships between the kingdom and the US government. Aramco often prioritizes American companies. It also appreciates their technology. Since Aramco is considered to be the biggest client Owner oil company worldwide; it likes to deal with the biggest international oil companies globally as well. This is why all the big suppliers are present in the Saudi market, and the highest market shares typically will go to the American companies.:

“Schlumberger Smith Bits can optimize any bit to fit Aramco’s specific drilling needs. Our IDEAS integrated drill bit design platform enables us to develop industry-leading bits that continually push the boundaries of performance and reliability for every application. Technology to drill holes and to excavate tunnels and openings in rock is vital for the economic, environmental, and scientific well-being for Aramco. Drilling is a key technology in several applications of strategic or social importance, including energy and mineral production in Aramco, environmental defense, and substructure development. Through this period, U.S. technology has conquered the worldwide drilling industry and much of the dig and communication industries. In the committee’s view, this U.S. dominance is likely to erode without continued technological advances, that’s why Saudi Aramco rely on the top American drilling bits companies, Although incremental improvements in the component processes in the present state of the art can continue to make drilling more productive, it is the rudimentary deduction of this committee that ground-breaking advances are within reach through the overview and intensive expansion of smart drilling systems especially for the world biggest oil and gas producers (Aramco”). (Respondent R12, operation, Supplier).

Trust and confidence in the supplier

Trust and confidence in the company, Aramco build their trust and confidence based on two direction first will be on their Middle East culture that trust and build confidence over long-term relationship and human relationship, secondly the success together, and I heard lot of similar statement from Aramco employee like (don’t change the wining team), it is well documented that successful organizations that outperform in

their marketplace have highly engaged workforces. These employees outperform because they are aligned to the strategic priorities of the organization. They outperform because they are enabled by the leaders in their organization. They outperform because they are set up to make a meaningful contribution. A work environment that inspires trust and confidence in senior leaders will set the foundation for a culture of elevated engagement that will propel your employees to outperform:

“Aramco deals with all suppliers worldwide and the door is open for suppliers that can provide any new solutions or technology to accelerate the drilling. Typically we rely on the biggest international suppliers worldwide that we build our trust and confidence after years of working together and understanding Saudi Application, meanwhile we are open for any new supplier want to prove themselves in the most challenging application. (Respondent R2, technical, Client).”

“Schlumberger Smith Bits, have all products in the entire sections, and hold the highest market share, we trust on smith bits on our challenges sections specially they are providing competitive advantage for the abrasive formation. (Respondent R4, operation, Client).”

Human relationships

Human relationships in Saudi Culture typically have high weight in terms of managing the business , that’s why most of suppliers keen to hire the candidates prioritizing whom having relationships with Aramco drilling engineer , it will facilitate the communication and securing the market share , middle east culture rely on human relationships and prefer to work and deal with someone they knew which will result into trust, the international drilling companies tend to hire local with good Aramco relationship with other expat preferably have same relation , precisely the sales population (Customer engagement coordinator), which will lead and drive the business between the suppliers part with Aramco:

“On my day to day work with Aramco Drilling Engineers and drilling supervisors, they are trying to split the market share among all the suppliers, they tried to give the small companies the soft and easy sections, and give the big companies the hardest and challenging sections, to create competition and challenge the big companies, and Aramco drilling engineer tend to deal with the sales they knew long

back and from their troops , it will ease the proposal review and having meeting to discuss it and secure the market share for its company.” (Respondent R9, operation, supplier).

“Politics derives the market share based on the area you working for, it depends principally on the relations and relatives, other operational influence is splitting the market between most of suppliers and don’t depend on single supplier, and it is doable in the upper soft sections, despite the lower and hard part.” (Respondent R15, operation, Supplier).

Human resources and organization

Human resources and organization is playing big role in sustaining the business with Aramco in all levels, starting with the big positions in Aramco, are really VIP stuff and like to be treated specially, and all international service providers are aware about this and they make regular visits from headquarter coming directly from Houston to meet them quit often, on the lower level management they are working together closely and support Aramco on different level on day to day operation which Aramco appreciate this and Schlumberger specifically with the other international drilling suppliers are using latest technology to serve Aramco on their operations daily:

“Generally speaking, drilling bits will improve Aramco drilling and production in Oil and gas, NOV is there to provide the solutions that Aramco need downhole. We're one of the world's largest independent supplier for drilling and intervention operations. With supply and service centers around the globe, we can provide a complete suite of tools and support where you need it, when you need it. We take pride in delivering superior performance and reliability. For more than 170 years, we've designed, manufactured, and delivered exceptional tools and equipment. No one else offers the full range of drilling and intervention solutions like NOV. In Saudi Arabia, we have more than 150 service centers staffed with highly qualified drilling solutions engineers and experienced technicians. The purchase or rental of our equipment includes tool and engineering support specifically tailored to your job requirements, and we can assist Aramco with difficult drilling and extreme well conditions.

Working with Aramco to choose the right components for the formation and your operation, we can help you increase ROP, improve safety, and decrease non-productive time.

FuseTek™ Hybrid Drill Bits from NOV Downhole have bridged the gap between PDC and Diamond Impregnated drill bit applications. When PDC bits are not durable enough, and Impreg bits are not fast enough, FuseTek bits step up and excel. Impregnated diamond material on the blade tops combines with industry-leading PDC cutter technology to make FuseTek the bit of choice in challenging lithologies. (Respondent R16, operation, supplier).

Responsiveness to buyer's demands

This attribute is linked to various buyer demands. For example, one of the most important buyer demand is related to the IKTVA program and the responsiveness to Aramco's as well as the kingdom expectations became crucial. In this matter, the criteria becomes Responsiveness to Buyer Demands (IKTVA Program). In December 2015, Aramco forces the suppliers to double the percentage of Localisation locally-produced energy-related goods and services to 70% by 2021. (IKTVA) In Kingdom Total Value Add. A bedrock of Saudi Aramco's Strategy is to create value in every aspect of their business, maximizing long-term economic growth and diversification. Through the In Kingdom Total Value Add (IKTVA) program, they are taking action to drive additional domestic value creation to support a rapidly changing economic environment and foster future prosperity. By working with the international drilling suppliers, Aramco will capture value that produces long-term tangible benefits – quality jobs for a growing Saudi population, innovation and diversification of industry, and increased global competitiveness.

As well as driving domestic value creation, IKTVA prioritizes consistency and transparency to create a level playing field for more various suppliers Aramco is engaged with. The responsiveness to the new demands is supposed to open the competition between suppliers and to give a new chance to all suppliers including the smaller ones. The main difficulty for the smaller players is their capacity to invest in these new challenges. Actually, IKTVA was developed and tested through extensive consultation, both in Kingdom and internationally, and was accompanied by agreements signed between Aramco and international companies in 2017 and the creation of joint ventures, in particular with American companies (see Appendix A3). These joint ventures are examples of quick responses to buyer demand. It is no surprise that the companies that responded most quickly to the kingdom's new demands are those with long-term

relationships with Aramco and strong historical ties to the country such as American companies.

“Technically, Aramco evaluate the competency of the companies and their capabilities of the proposed products then the kingdom vision knowing that Schlumberger was presented with an Excellence Award for “Highest in Saudi Workforce” at Saudi Aramco’s In-Kingdom Total Value Add (iktva) Forum, which took place in Dammam, Saudi Arabia in December 2016. For local content and human resources percentage, then on the company profile on drilling application in Saudi, HSE (health, safety and environment data) there will be an Audit from Aramco site to come over the supplier manufacturer facility even outside country to approve it. They also give chances for small players to create competition and challenge the big companies.” (Respondent R13, technical, supplier).

“As I told you about (IKTVA) In-Kingdom Total Value Add, The award was accepted by Chairman and Chief Executive Officer of Schlumberger Paal Kibsgaard, at a ceremony attended by Minister of Energy, Industry, and Mineral Resources and Chairman of Saudi Aramco Khalid Al Falih, HRH Prince Saud bin Naif bin Abdulaziz, Saudi Aramco President and CEO Amin H. Nasser and Saudi Aramco Vice President of Procurement and Supply Chain Management Abdulaziz A. Al-AbdulKarim.

The two-day iktva Forum commemorated the one-year anniversary of Saudi Aramco launching its localization initiative. The event provided an opportunity for two-way dialog between Saudi Aramco and key strategic suppliers. Saudi Aramco shared its vision for the future of the energy sector in the Kingdom and an update on major projects and initiatives that support iktva, such as local manufacturing, training and development, and attracting increased investment to the Kingdom.

The event included the first annual iktva Excellence Awards which were presented in recognition of the most significant commitment, investment, and progress in localization.” (Respondent R13, technical, supplier).

Financial reputation

Financial reputation does not really represent an essential key differentiator in Aramco’s business model concerning the supplier. However, after the new kingdom vision as explained in the previous point, it may be a barrier for entrance for the small suppliers that cannot invest and build their own manufacturer facility in Saudi Arabia.

Several factors make new suppliers important. First, there may exist new suppliers that are superior in performance in some way to Aramco's existing suppliers. For example, a new supplier may have developed a new production technology or patent which allows it to significantly reduce its production costs relative to predominant production technology or processes. Or, a new supplier may have a structural cost advantage over existing suppliers, for example, due to low labor costs or favorable import/export regulations in its home country. Second, existing suppliers may go out of business, or their costs may be increasing. Third, Aramco may need additional suppliers simply to drive competition, reduce supply disruption risks, or meet other business objectives such as supplier diversity. Therefore, technology and patent is expected to be more important attributes than financial reputation. In recognition of these reasons, Aramco may be obliged by company policy to locate a minimum number of viable, potential suppliers for every product or service procured:

“We are expecting new technology as we used to get from the biggest supplier usually drilling bits business is really dynamic and any supplier will get a reliable product will drill fast and reduce cost will gain the market share. “

“Suppliers are most of the international companies in the drilling bits industry, typically we are open for any new supplier will Aramco to improve our KPI and accelerate the drilling and reduce the cost and cost per foot.” (Respondent R4, operation, client).

Long-term buyer-supplier relationships

Schlumberger , GE Baker and Halliburton all have more than 80 years of long term relationships with Aramco, which are characterized also by trustful and confident relationships. Long-term supplier relationships with the buyer, especially in the Middle East culture in a pure monopsonist market have lots of profits and benefits, from business services and office supplies, to utilities and logistics. Almost no modern business can do without a range of indirect products and services across a variety of categories. For Aramco, establishing strong, mutually beneficial long-term relationships with strategic supplier relationship management is a critical step in improving performance across the supply chain, generating greater cost efficiency and enabling the drilling business to grow and develop.

With this in mind, six key benefits of long term supplier relationships and effective supplier relationship management are often identified: 1) reduced costs since the supplier-

client partner incur less re-tendering or re-negotiating costs; 2) increased efficiency and communication since the longer a supplier provides drilling product to Aramco, the better its understanding of Aramco's needs and processes is, which results into an improvement of the service and efficiency with respect to the client expectations; 3) pricing volatility mitigation through possible open book policies and negotiated margins which could be an output of long term relations or even joint ventures as a result of the IKTVA approach; 4) supply chain consolidation with areas of consolidation across products and services along the value chain as for instance in the case of service quality and repair services, with the potential creation of new products and services and of economies of scales and cost savings; 5) outsourcing of non-critical activities, with trust and confidence, which could allow Aramco to harness specific industry or product expertise; 6) continual improvement process between the monopsonist client and the supplier. This is particularly important when the buyer has a strong purchasing power as in the case of the Aramco's monopsonist. The verbatims which are presented below, illustrate some of these mutual advantages which results from these long-term relationships:

“Actually Schlumberger is the world biggest service provider worldwide and we have long-term relationship around 80 years, and the amount of business and product that we are dealing together is massive , for drilling bits part , Schlumberger is providing the highest number of products in all section with all hole sizes that Aramco is drilling, and lately we had a deep investigation for all drilling bit companies lead to ban couple of bits provider and we can't do the same for Schlumberger because the operational departments inform us that they can't afford to stop using it and it will lead to stop and delay couple of Aramco's projects , it means that our relations ship and business oriented lead to treat Schlumberger differently and priorities there products.”
(Respondent R4, operation, client).

“Such additional R&D (research and development) should focus on a long-term commitment with Aramco is needed to accomplish the objectives of the program. The program should be structured with shared research objectives to Aramco's Operation.”(Respondent R11, demand planner, Supplier)

“The new phase development builds upon the expansion of GE's Gas Pressure Control manufacturing facility that was inaugurated late last year and comes with a promise of creating 100 jobs during the startup stage, with an 80% rate of Saudization. When constructed, the new 18,000 m2 center will have the capability to manufacture and service the entire range of GE's oil and gas portfolio, including Artificial Lift,

Digital Solutions, Downstream Technology Solutions, Turbomachinery Solutions and Subsea Systems.

GE Oil and Gas promises that the new center will bring added “Made in Saudi” capabilities, serving as a manufacturing, assembly, repair, services, and training facility for advanced gas turbines and mechanical drives.

Al Abdulkarim said the IKTVA program, launched by Saudi Aramco last December, is already making a positive impact.

“We are confident that the IKTVA initiative is steadily gaining momentum. As partners such as GE Oil and Gas are demonstrating, IKTVA is a ‘win-win’ proposition for companies able to build a deep and lasting relationship with the Kingdom by extending the opportunity to localize our materials and services procurement needs, all while supporting the economic growth, job creation and skills development of Saudi Arabia.”

GE Oil and Gas president and CEO Lorenzo Simonelli said: “With over 80 years of partnership in the Kingdom, we are committed to strengthening our localized manufacturing service and repair capabilities, and to building our already strong local talent pool. The new center brings cross-functional synergies to our operations in the Kingdom and will serve as a one-stop center for our customers in Saudi and the region.”

The new facility will also deliver the services of the recently acquired Alstom Grid business, enabling it to offer a complete portfolio to customers.

Recently, GE Oil and Gas completed the first six high-efficiency gas compression trains manufactured in Saudi Arabia. These will be used in Phase I of Saudi Aramco’s Master Gas System expansion project in the Kingdom.” (Respondent R15, operation, supplier).

2.8.2 Conclusions on Repetitive and Modified rebuy attributes

From the interviews, it appears that the modified rebuy situation necessitates for the companies which are in competition to make competitive offers on the most important attributes. But if every competitor is good and performs well on the most important attributes, it is necessary to be better than others even on less important attributes, in order to gain a competitive advantage in the market. In a monopsonist market, the power of the client will be very strong.

For both modified rebuy and straight rebuy, one of the most important attribute is the responsiveness to the demands of the monopsonist client (Aramco), based on Saudi Arabian vision which is the IKTVA (In Kingdom Total Value Add) localization to keep the suppliers business running: *“The importance of the required criteria is not an optional and any supplier will not meet the required criteria will not have any business with Aramco, it is a country vision for localization 70% by 2020 and any side-track of it will not be acceptable, we already gave all suppliers a deadline by end of 2018 to follow and apply all the new criteria.” (Respondent R1, technical, Client).*

2.8.2.1 Most important attributes for modified rebuy

For modified rebuy, it is particularly important to have an excellent performance on the criteria that the State, that is the Kingdom, has put forward that is the IKTVA program but also human relationships. If a company satisfies the State’s criteria, this will open the market. Of course, the performance and financial aspects, technology patents, procedural compliance, will also play a great role.

Among all criteria there may be some differences that appeared in the interviews. Aramco intends to get the best of new technologies from all suppliers through introducing trial test (modified rebuy) to increase Aramco’s performance: *“Aramco’s Expectation is that the Drilling Bits provider will continue trial testing new technologies and compete together to lower the cost per foot and accelerate the drilling time.”(Respondent R1, technical, Client).*

Still regarding modified rebuy, one of the most the important attribute is the BPA (Aramco Bit Performance Analyzer) to fulfill Aramco requirements: *“For any new product, it will be used by Aramco, if the company passed this criteria we will review the technical proposal for the new product that the company wants to trial tested in Aramco, based on (BPA) Bit performance Analyser” (Respondent R1, technical, Client).*

Technology and patent along with procedural compliance are among the important attributes in the modified rebuy purchase , because modified rebuy is considered as an opening market and product for the supplier; and long term relation with Aramco will help the supplier know the required procedural compliances to make the trial test procedures approved within Aramco system :*“Typically we are not favoring any supplier over the other by brand, meanwhile we are expecting all companies to provide the latest and best technology and patent to trial tested with us. But naturally the long-term relations with the biggest drilling company*

globally have a preferences over the new comers in term of knowing the Saudi drilling applications and Aramco procedures compliance for the trial test.” (Respondent R2, technical, Client).

2.8.2.2 Most important attributes for straight rebuy

For straight rebuy, that is approved product, the most important thing for the suppliers, is to maintain an excellent performance on a quarterly basis (performance history) that is to have an excellent performance history on all the attributes which may count for the client and increase market share for the supplier accordingly: *“We evaluate all companies’ performance on quarterly basis, based on service quality and non-productive times for the operations versus the service and product performance” (Respondent R1, technical, Client).*

Straight rebuy is considered as generating revenue for the supplier and as performance driven for the client. Therefore, there are important attributes for the supplier and for the monopsonist client. The products have already been approved but the purchase decision for the straight rebuy belongs to the client. The importance of improved performance and reduced cost per foot (CPF), along with the performance history are the main attributes which drive the decision to choose the supplier to drill the bit:

“The repetitive process is influenced by the drilling bits Performance, (BPA) Bit Performance Analyser and the supplier technical sales representative with the drilling engineer and toward the Lower (CPF) Cost per foot and increase the (ROP) Rate of Penetration.” (Respondent R5, Operation, Client).

And because of the repetitive straight rebuy type of business, there is a daily contact between supplier representative and Aramco drilling engineer / supervisors which lead to strong relationships. This will affect the market share and distribution, based on these long-term strong relationships: *“According to my job description, I’m dealing with the repetitive purchases on daily basis with all the suppliers”. (Respondent R3, Operation, Client).*

2.8.2.3 Differences in attribute importance between modified rebuy and straight rebuy

From the interviews analysis, some attributes appear to be more important for Modified rebuy than for Straight rebuy and vice-versa.

IKTVA (In Kingdom Total Value Add), localization and facilities to keep the supplier's business running, repair services and service quality (number of failures; non-productive time), and procedural compliance are particularly *important for modified rebuy* in order to get approved products.

Cost per foot (CPF), drilling cost, performance history on a quarterly basis, long-term relationships sound *extremely important in the case of straight rebuy*. But they are also very important for modified rebuy.

Actually, *several criteria are important in both cases*: CPF (Cost per foot), cost effectiveness (minimize drilling cost), regular technological innovation with technology and patents, performance history, bit performance (BPA, CPF), service quality and repair services, long term investment and relationships, trust and confidence, responsiveness to buyer demand (IKTVA program), even if the degree may vary according to the purchasing situation.

Other attributes reveal to be less important: drill faster (ROP: rate of penetration), drill longer (footage), price, durability of the product, reliability and rerun ability of the product, operating control, company profile, management and organization, desire for business, localization of content, transfer of technology, overall financial reputation.

It is interesting to ascertain that the qualitative analysis did not put forward the organization and general reputation components with respect to the importance of the attributes in the selection process for (the monopsonist). The most important attributes are more based upon the performance and the direct relations than on the organizational aspects.

Table 2. 15 Differences in attribute importance between modified rebuy and straight rebuy (qualitative analysis)

General criteria	More detailed attributes	Modified rebuy	Repeated buying	Overall importance of the Criterion
<i>Performance And financial impact</i>	Improved Performance Cost per foot	*****	****	****
	Drills faster (ROP) Rate Of Penetration	*	*	*
	Drills Longer (Footage)	**	**	**
	Low cost or cost effectiveness (minimize drilling cost)	*****	***	*****
<i>Technology and patents</i>	Regular technological innovations (ROP, Durability)	***	****	****
<i>Performance history</i>	SQ (Service Quality) Performance on a quarterly basis	****	*****	*****
<i>Price</i>	Price	***	***	***
	Bit performance (with analysis BPA CPF)	****	*****	*****
<i>Production</i>	Local Production facilities and capacity	****	**	***
<i>Product quality</i>	Trust confidence in the tool	***	***	***
	Durability of the product	**	**	**
	Reliability and rerunability of the product	**	**	**
<i>Service quality and repair services</i>	Service quality and repair services (number of failures ; non productive time)	*****	***	****
	Specifications to fulfill (repair facility)	*****	**	***
<i>Procedural compliance</i>	Trial Test (Approved Product)	****	**	***
	Availability in country (Technical capabilities)	*****	***	*****
	Operating control	***	***	***
<i>Company reputation and position in the industry</i>	Company profile	***	***	***
<i>Trust and confidence in the company</i>	Long term investement	****	*****	*****
<i>Human relationships</i>	Politics and relations	*****	*****	*****
	Management and organization	**	**	**

<i>Human resources and organization</i>	Desire for business	*	**	**
<i>Responsiveness to buyer demands (IKTV A program)</i>	Localization of human resources	*****	****	*****
	Localization of content	**	*	**
	Transfer of technology	*	*	*
	IKTVA (In-Kingdom Total Value Add) program	*****	****	*****
<i>Financial reputation</i>	Overall financial reputation	**	**	**
<i>Long-term relationships</i>	History of relationships	*****	*****	*****

Note: ***Extremely importance, **** High Importance, ***Moderate Importance, **Low importance, *No importance**

2.8.3 Overall Supplier Evaluation and Choice Criteria for the Buyer: understanding the practical issues and implications behind the attributes

Normally the client is asking for the best and highest performance, but he also wants to pay less and to receive wonders. In our case, most clients involved in the buying center agreed on the importance of some attributes but differed from others, based upon their job role in the buying center and the type of rebuy whether modified (trial test) or straight rebuy, which is the repetitive approved rebuy.

Performance and financial aspect. Initially most buying center members settled and agreed that Performance and financial aspect, that is, Improving drilling Performance and reducing the Cost per foot (CPF) constitutes a high importance attribute in the product selection process. Bit performance analyzer is also an extremely important criterion for the modified rebuy situation in order to have the new drilling product approved by the client and added to Aramco approved list: “(BPA) Bit performance Analyser which is a Software that compare the Top five products in similar applications which the New proposed product should Lower the cost per foot by 5% of the average best five products performance or to be 5 % faster in performance from the fastest five products from the same applications. If the bit will pass the trial test criteria it will be free of Charge, but it will be listed under Aramco Approved Name which can be utilized on a repetitive purchases.” (Respondent R1, technical, Client).

Cost per foot and Rate of penetration. For repetitive/straight rebuy, the main objective of any Aramco drilling engineer is to reduce Aramco drilling cost, and the main attribute is reducing the Cost per foot in drilling which will lead Aramco to drill the well with improved cost. reduction: “Aramco’s drilling engineer expect continuous improvement in drilling and provide new designs in drillings bits to drill faster and reduce the cost per foot and improve the KPI for the drilling well.” (Respondent R3, Operation, Client). At the same time, drilling faster and longer is not a really important attribute because the drilling speed and the length of time it is possible to drill is not necessarily to the cost per foot, depending upon additional costs such as the necessary drilling fluids or the actual depth of the drill.: “typically I review based on the lowest CPF (Cost Per Foot), and the best performance for the recent wells and the bit will give me the higher ROP (Rate of Penetration) , after my approval the request go to the vendor to provide the bit.” (Respondent R7, Operation, Client).

Technology and patent. Technology and patent is considered one of the important attribute in product selection for the client, especially in the *repeated rebuy situation*, because it will help the drilling department to achieve its goals and finish the required drilling wells target per year. The patent makes the selection easy for the client as the monopsonist considers that the supplier has a competitive advantage with respect to its performance which gives a step change in drilling, especially in challenging applications. The big players among suppliers have patents which help them secure the highest markets share and over price the drilling product: “Schlumberger Smith Bits hold the uppermost market share, we have trust and confidence on them on our most challenges abrasive sections particularly they are providing competitive advantage for the abrasive formation section rather than all other bits suppliers using the Onyx-360 rolling cutters which is patent for Schlumberger.” (Respondent R7, Operation, Client).

Performance history. Concerning the performance history, it is one of the extremely important attributes in product selection due to the confidence in the product based on its previous history and record on the same field and application, and this is the main target for any drilling bits company to achieve for sure in the repetitive rebuy. In the meantime, the supplier consider performance history as a very important attribute for the modified rebuy because the sales and technical engineer from the supplier side will show the history of similar product in drilling similar formation trying to convince the technical department and Aramco drilling Engineer to create a trial test for it .

Product price and Bit performance analyzer (BPA). Regarding the product price, any client will pay attention to product price and wants to reduce it and choose the cheapest option. But for Aramco and for the suppliers, the price attribute in product selection is considered to be of moderate importance due to the importance of BPA (Bit performance Analyser) which target is the CPF (Cost per foot). A reduced price is wanted but, in Aramco's mindset, the key issue is the drilling cost; that is why Aramco fixes the CPF criterion as a main attribute for the modified and repetitive rebuy: "Before starting to plan a new well, I send proposal request to all suppliers then I review all proposals from all suppliers and compare it with BPA (Bit Performance Analyser) and I'm trying to give share for all the suppliers specially in the upper soft section and my priority will be price based, but in the Lower section will go for the big companies with the premium product because of the hard and abrasive drilling." (Respondent R4, operation, Client). As shown, due to the extreme importance of BPA (Bit performance analyzer) for modified rebuy, no product will be approved until it passes the BPA criterion, and no Aramco drilling engineer will select an approved bit unless it will show on Aramco Boa among the top best five CPF/ROP/Footage: "based on (BPA) Bit performance Analyser which is a Software that compare the Top five products in similar applications which the New proposed product should Lower the cost per foot by 5% of the average best five products performance or to be 5 % faster in performance from the fastest five products from the same applications. If the bit will pass the trial test criteria it will be free of Charge, but it will be listed under Aramco Approved Name which can be utilized on a repetitive purchases. (Respondent R1, Technical, Client).

Production facility. For the local production facility, as of today, the importance will be for the modified rebuy because Aramco technical department will ask about the Production facility and the Quality control and the Quality checks for the facility and product. This might affect the trial test for a new product, but it is less important for the repetitive rebuy.

Product quality, and trust and confidence in the tool. The importance of the Product Quality as attribute is not really significant. What will count for the monopsonist will be the trust and confidence he will have in the tool that he tried before and which did good performance. This is the performance that the client expects from the use of the product which counts and not the quality of the product by itself. So the confidence in the tool increases and may affect the client's product selection on the next well. Despite the durability and rerun

ability of the product, the purchase will be case by case, depending on the application and type of well that the client will be drilling specially for the repetitive rebuy.

Service quality and repair services. Service Quality and repair service is considered a highly important attribute for the modified rebuy, as after the recent Kingdom vision for localization, Aramco is pushing all supplier to have a repair facility in Saudi so they increase the localization in raw material and in personal as well. This is an extremely important attribute for any new comer (Supplier). A new comer who wants to open business with Saudi Aramco, should have a repair facility in Saudi. *“In Dhahran, Saudi Arabia. The 100,000-square-meter facility, which houses laboratories, offices, repair and maintenance operations and a remote collaboration center, is part of Baker Hughes' expansion plans for the Kingdom of Saudi Arabia, a key growth market for the company.” (Respondent R15, Operations, Supplier).*

Procedural compliance. Regarding the procedural compliance, it is a moderate importance overall, with high importance for the modified rebuy due to the supplier need to comply with Aramco Procedures. To approve the new trial test bits, but it is far less relevant for straight rebuy..

Company reputation and position in the market. Generally speaking, the monopsonist Aramco prefers to have the best companies with the latest technology in the market , but regarding the drilling sector, the supplier reputation in the market will have a moderate influence as an attribute for drilling bits selection.

Trust and confidence and human relationships. Nevertheless for trust and confidence and human relationship, this attribute plays a big role with an extreme importance in the product selection due to the Middle East culture that relies on the trust on people. High context cultures such as in Saudi Arabia tend to put more value and emphasis on building trust and personal relationships (Hall, 1976). Trustful relationships play a significant role in the client decision in both repetitive and modified rebuy.

Human resources and organization. Human resources and organization along with the desire of business appear to be low importance attributes in the drilling bits selection at the level of buying center. This is probably due to the fact that type of organization neither affects the performance nor the cost per foot.

Responsiveness to the client. Responsiveness to the client (IKTVA program: In-Kingdom Total Value Add) is considered by the interviewees to be an extremely important attribute for any supplier which would like to continue working with Saudi Aramco. Aramco adopts the Saudi Kingdom Vision for localization product and personal. Therefore, most suppliers (and probably all) should comply with the IKTVA in order to continue working in both modified and repetitive rebuy:” *Technically point of view, Aramco evaluate the competency of the companies and their capabilities of the proposed products then the kingdom vision” (Respondent R13, technical, Supplier).*

Financial reputation and long-term relationships. The Financial reputation for the supplier seems to have a relatively low importance among the product selection attributes although long-term relationships have an extreme importance for product selection due to the Saudi culture. “*After long-term relationship of working together with Aramco in all drilling and production sector they guarantee business and support in the judgment for the new products.*” (Respondent R10, technical, supplier). Again, this is perfectly in line with the values identified by Hofstede (1990), Hofstede and Bond (1988), House et al. (2004), or Schein (2017), and other researchers regarding values and culture in the Middle East.

2.8.4 Evaluation and Choice Criteria for the Buyer with Respect to the Roles in the Buying Center – Qualitative analysis

The roles in the buying center are: initiator, influencer, decider, purchaser and gatekeeper. These roles are exercised in different contexts. The importance of the different attributes according to the roles of the members of the buying center is presented in Table 2.16.

For the *performance and financial impact*, most individuals in the buying center, whatever their role, associate a high importance to this criterion for product selection, with the goal of reducing the cost per foot: “*Future of the oil industry generally and Aramco Specifically need new technology to solve drilling issues and finalize every section in one go with faster ROP (Rate of Penetration), and lower CPF (Cost Per Foot) and the most important project is to grasp a technology that will help to reach the deepest formation and drill igneous and volcanic Rocks and really abrasive formation in costly and timely manner” (Respondent R5, Operation, Client, in echo to other respondents as well).*

Meanwhile for the *technology and patent attribute*, it can be noticed from the interviews that the *influencer and the decider* consider it as a high important attribute for the product

selection. Other participants in the buying center give less weight to this attribute, which makes sense. The influencer and the decider are the technical and operations managers from the client and they favor new technology and patent from the suppliers to improve performance.:"
From technical point of view Schlumberger consider for me a technical oriented company and own the most and highest number of drilling Patent we consider this while evaluating the new tenders and market share to improve our overall performance in drilling and optimization in general, and they invest in the kingdom in all domains that's why we treat Schlumberger differently while reviewing the contracts, tenders." (Respondent R2, technical, Client).

Similarly, for *performance history*, almost all the role participants in the buying center (from the initiator to the decider) attach an extreme importance to the history of the product in order to select it (or have it selected) again, since performance history helps to build and make the overall performance of the product. The individuals whose roles are the closest to the field attach the greatest importance to this dimension, that is *the initiator, the influencer and the decider*. If the product does not pass the requirements on a quarterly basis, it may not be selected any longer. Both technical and operations managers are sensitive to this criterion, at the monopsonist client company and consequently at the supplier company. They are the technical and operational managers from the supplier along with the client. The purchaser and the gatekeeper, who are further away from the field, marked less interest in this attribute because they do not realize the potential negative consequences of choosing a bit with no history record.

As for *price*, *the purchaser* had the highest rating because he is price-oriented and he intends to save Aramco's money. The other roles are more involved in the operations and give higher weight to the cost per foot rather than to price only, as explained before.

All buying center participants, whatever their job role, rated the *BPA (Bit performance analyzer) attribute as extremely important*. For modified rebuy, no product will be approved until it passes the BPA criterion. And no Aramco drilling Engineer will select an approved bit unless it will rank on Aramco Boa in the top five CPF/ROP/Footage: "*based on (BPA) Bit performance Analyser which is a Software that compare the Top five products in similar applications which the New proposed product should Lower the cost per foot by 5% of the average best five products performance or to be 5 % faster in performance from the fastest five products from the same applications. If the bit will pass the trial test criteria it will be free of Charge, but it will be listed under Aramco Approved Name which can be utilized on a repetitive*

purchases. (Respondent R1, Technical, Client). When the client is a monopsonist, one can easily understand the critical importance of this criterion.

Regarding the *Local Production facilities and capacity*, the interviews reveal that *the purchaser* is the only participant who gave an extreme importance to this attribute. For the other participants, the importance was considered low. The Kingdom vision is to push the supplier to invest locally in Saudi. The purchaser is very sensitive to this vision while the other participants for the other participant are more focused on drilling and achieving their current drilling target than on the Kingdom vision on 2021. Actually, in a monopsonist context, this criterion becomes strategic. It may have consequences at the operational and technical levels but this decision may not be dealt with at the technical and operations levels but this type of decision is dealt with at the strategic level (see Wind and Thomas, 2010).

For *product quality*, the initiator, influencer and decider gave more importance to this attribute than the purchaser and gatekeeper because it is more related to technical and operational decision. The purchaser along with the gatekeeper are more keen (or at least less reluctant) about procedures and paperwork.

As for the *Service Quality and repair services*, the buying center members who belong to the monopsonist client, Aramco, add more weight on it and consider it to be an important attribute in the product selection process. Therefore, *the influencer, the decider and the purchaser* at Aramco give more importance to this selection attribute than the initiator and gatekeeper at the service providers do.

Concerning the *procedural compliance* no significant difference between most job roles has been noticed. They *all give similar weight* to this attribute. It is the same for *company reputation*, with all participant having the same importance rating, from what we could evaluate from the interviews.

Trust and confidence in the company along with *Human relationship* are said to be *important by everyone, whatever his role*. Each participant in the buying center from the client and supplier sides consider both attributes as extremely important. They perfectly match perfectly the Middle East culture and the way of running business in such monopsonist environment. On the opposite we found that *Human resources and organization* along with *desire of business* have less importance among the product selection attributes. This rating is shared by all participants. The human factor along with relationships is perceived as more important than the organizational factor. The environment is also perceived as very important in terms of culture. Mastering the Human factor and local culture with *long-term relationships*

constitute a key success factor in Saudi Arabia. If any supplier would like to have a higher market share, it would have to learn and gain experience on how to develop and maintain excellent long-term relationships with a Middle East partner which is a monopsonist client. This will facilitate the business, and this is exactly what most suppliers are doing. Investing in people now is a good way to secure one's business and market share.

As expected for the attributes related to the *Kingdom vision and IKTVA* (In-Kingdom Total Value Add) program for localisation, the interviews show that the roles in the buying center from the supplier side (and in particular *the purchaser and the decider*) add higher importance to this attribute for the product selection.

Regarding the *Financial reputation*, most participants affect a relatively low importance to this attribute for the product selection process, despite the buyer viewpoint. For the *purchaser*, the company which holds a better financial reputation will invest more in the country and will provide the highest and latest technology to Aramco. This is a long term view to which other participants in the buying center seem to be less sensitive. For the other participants, this criterion does not really affect the product selection, at least on a short-term basis.

And for the last criterion, which is the *Long-term relationships*, as already said, it match exactly the Saudi market culture. Relationships are of *extreme importance* in order to run business. We could say that, as in a means-end chain model, this criterion is a higher level attribute since it gives a positive tonality to the business overall. This feeling is shared by *all members of the buying center*, on the client side as on the supplier side.

Table 2. 16 The importance of the different attributes according to the roles of the members of the buying center

General criteria	More detailed attributes	Initiator	Influencer	Decider	Purchaser	Gatekeeper	Importance of the Criterion
Performance and financial impact	Improved performance Cost per foot	****	***	****	***	***	****
	Drill Faster (ROP) Rate of Penetration	*	**	**	*	*	*
	Drill Longer (Footage)	*	**	**	*	*	**
	Low cost or cost effectiveness (minimize drilling cost) CPF	*****	*****	*****	*****	*****	*****
Technology and patents	Regular technological innovations (ROP, Footage)	****	*****	*****	***	***	****
Performance history	SQ (Service Quality) performance on a quarterly basis	*****	*****	*****	****	***	*****
Price	Price	**	***	***	****	***	***
	Bit performance (with analysis BPA)	*****	*****	*****	*****	*****	*****
Production	Local Production facilities and capacity	*	**	*	*****	*	***
Product quality	Trust confidence in the product	****	***	****	****	**	***
	Durability of the product	***	***	***	*	*	**
	Reliability and rerunability of the product	***	***	***	*	*	**
Service quality and repair services	Service quality and repair services (number of failure; non productive times) NPT	***	*****	*****	*****	***	****
	Specifications to fulfill (repair facility)	*	***	*	****	***	***
Procedural compliance	Trial Test (to have approved product)	***	****	*****	***	***	***
	Availability in country (Technical Capabilities)	***	*****	*****	*****	***	*****
	Operating control	***	***	***	****	****	***
Company reputation and position in the industry	Company profile	***	**	***	***	**	***
Trust and confidence in the company	Long Term Investement	*****	*****	*****	*****	*****	*****
Human relationships	Politics and relation	*****	*****	*****	*****	*****	*****
Human resources and organization	Management and organization	***	***	***	**	***	**
	Desire for business	**	**	**	*	*	**
Responsiveness to buyer demands (IKTVA program)	Localization of human resources	*	*****	*****	*****	***	*****
	Localization of content	***	*****	**	*****	***	**
	Transfer of technology	**	*	**	*	*	*
	IKTVA (In-Kingdom Total Value Add) program	*	***	*****	*****	*****	*****
Financial reputation	Overall financial reputation	*	*	*	*****	**	**
Long-term relationships	History of relationships	*****	*****	*****	*****	*****	*****

Note: ***** Extreme importance, ****High importance, ***Moderate importance, ** Low importance, * No importance

2.8.5 Competitive advantage of Schlumberger versus its competitors on the important criteria – Qualitative analysis

In order to analyze competitive advantages for a company, it is necessary to examine two points:

- the positioning and competitive advantage/disadvantage of this company versus other companies on each supplier selection attribute
- the importance of each attribute

The determinacy of an attribute in the selection process is the importance of the attribute weighted by its capacity to differentiate between alternatives (Pras and Tarondeau, 1981). When an attribute is important and the competitors are well differentiated on this attribute (good and bad positioning), this attribute is said to “determine” the selection of the supplier by the buyer. If an attribute is important but with all the competitors perceived as equally good or bad on this attribute, the supplier choice is difficult on this attribute. But when a competitor comes to surpass the others on this dimension, this helps the client decide in its favor, if this attribute is important. Importance of the attribute and differentiation of the competitors on the various attributes are two key points in the decision process.

In a monopsonist case, it will be absolutely necessary to pass the minimum required levels of performance on all the relevant attributes and to perform extremely well on the key attributes to be among the top five competitors on these dimensions, such as revealed by the previous analysis. Usually, a supplier can segment its market and respond better to the demand of a specific client than to another one. This possibility is not open in the monopsonist case.

As there is no other sales alternatives than satisfying Aramco, a thorough examination of the competitive advantages of the company under study is necessary. We shall take the example of Schlumberger. Therefore, in this research, we shall examine the supplier selection dimensions, their importance, and Schlumberger evaluation versus competitors evaluation. The evaluation level was derived from the semi-structured in-depth interviews as presented above, which were sometimes completed and validated by internal company's documents to precise the performance of the competitors on each supplier selection attribute.

The importance levels and the positioning are presented in Table 2.17. We decomposed the importance according to the situations: Modified rebuy and Straight rebuy?

2.8.5.1 *Schlumberger's excellence on several dimensions: a clear competitive advantage*

An excellent performance may be determinant in the supplier choice by the monopsonist when the attribute is extremely important and when Schlumberger is better than its competitors on this dimension see Table 2.17). This is the case for six of them:

- The cost per foot and the improvement of the improvement tools which reflect the performance and the financial dimension
- Procedural compliance on which Schlumberger is better than competitors
- Technical capabilities
- Localization of human resources
- IKTVA program
- Long-term relationships with the client

The main point is to keep these competitive advantages, and try to make it difficult for competitors to compete on these attributes. Among these attributes, cost per foot and procedural compliance are basic attributes. In other words, a company must pass these requirements if it wants to be accepted on the market. The excellent positioning of Schlumberger on these dimensions is an asset for securing its market share. But the other dimensions (localization of human resources, the excellence on the IKTVA program, and the long-term relationships with the client) are of considerable importance for gaining a strong and sustainable competitive advantage for the future. With an excellent positioning on these attributes, Schlumberger does not only rely on commercial or technical attributes but opens the market for the future, in line with the kingdom objective to make international foreign investments benefit the whole kingdom and improve its citizens welfare. In 2016, Schlumberger won the Golden Award for Responsiveness to buyer demands (IKTVA program) from Aramco CEO. Schlumberger appears as a pioneer of the drilling sector on this new competitive attribute. The company should pursue its efforts on these dimensions and continue to push its competitive advantage. The excellent long-term relationships between this supplier and the monopsonist facilitates the rapid implementation of a cooperative strategy and of a “good citizenship” approach. There is a mutual respect and trust: *“The importance of the localization comes from the country vision*

not the company, and Schlumberger shows a great respect and leadership toward the kingdom vision, and this points is really important and required criteria for any company wants to continue working with Aramco, prioritization for the Local company and the international companies that will comply with the kingdom vision.” (Respondent R2, Technical, Client)

2.8.5.2 Potential dangers associated with competitive disadvantages

A danger lurks Schlumberger if the company lacks coherence. In order to be consistent with the IKTVA approach, Schlumberger should also be competitive on complementary attributes such as the local production facilities and capacity, and the localization of content. On these two dimensions, Schlumberger has a competitive disadvantage and is actually poor on the last criterion: localization of content. These dimensions are integrated in the “responsiveness to the client demands” dimension and the company should hasten the pace and accelerates its efforts on these aspects. on these dimensions. Even if localization of content is not a major attribute at the time being in the decision process, it will become more and more important in the future with the Saudization of the sector. Some competitors have started working on this dimension for quite a while and it is time to react not to lag behind in the future. All the attributes that are related to this Saudization of the business environment will become increasingly important, with the strong influence of the royal family which irrigates the orientations and the strategic objectives of Aramco.

In the same way, Schlumberger is less competitive than competitors on the dimension: specifications to fulfil, which is an important attribute in the Modified rebuy situation. Schlumberger

Therefore, the priority in terms of efforts should be put on:

- Local production facilities and capacity
- Localization of content
- Specifications to fulfil

2.8.5.3 Securing and sustaining other competitive advantages

For the other dimensions on which Schlumberger is excellently positioned, Schlumberger is better positioned than its competitors on 5 of them, but these dimensions are less important than the first six ones:

- Trust confidence in the product
- Durability of the product
- Company profile
- Management and organization
- Drill deeper

These attributes are said to be less prioritized than other attributes because they are not examined per se, even if they have an impact on the performance level of the monopsonist. Aramco knows the quality or durability of the product, its drilling performance, and it has confidence in it. Schlumberger has the best product quality on the market, which allows it to practice premium prices. This is one of the reasons why price is not a very important attribute in the drilling sector. It must be said that Schlumberger has an edge over all other drilling suppliers by introducing the ONYX-360 in the 5 7/8” section to drill in the deep abrasive formation, which gives Aramco a step change in drilling deeper and faster than competitors with cost effectiveness. For Aramco, the final criterion with this respect will be cost effectiveness, even if the cause of this superior cost effectiveness is to be found among the above quality criteria, which inspire confidence to the client. These competitive advantages must therefore be maintained and even increase by insisting upon them.

Schlumberger and competitors are pretty close in terms of excellence on two dimensions:

- Technology and patents
- Performance history

For example, Schlumberger introduced three new patents in terms of cutter technology and is considered to lead the market but GE Baker introduced a new technology in big holes size and leads the bit design. Trust in a drilling company is often associated with its excellence in technology and the patents it holds.

Performance history is a crucial attribute and all drilling companies make strong efforts to be excellent on this attribute in order to stay in the market and gain market share. There are no competitive advantages between Schlumberger and its main competitors over this dimension. They are excellent.

As for transfer of technology, desire for business, overall financial reputation, Schlumberger and its main competitors are excellent and there is no real competitive advantage between them on these dimensions. These attributes, are not considered determinant in the choice or even very important. But no one knows how the drilling sector will evolve in the future, the environment factors becoming more and more important, in particular in a monopsonist market.

2.8.5.4 Dimensions to be improved

Schlumberger is as good as competitors, or competitors as good as Schlumberger on five dimensions. All are considered Very good but none are considered Excellent. as said to be Excellent. This means that a competitive space is open and the first company to enter it will gain a competitive advantage. These dimensions are:

- Bit performance analyzer
- Human relationships
- Service quality and repair services
- Trust confidence in the company

The importance of these four dimensions must be emphasized. The first drilling company that achieves excellence on one or more of these dimensions can gain a competitive advantage and we can add Operating control, whose importance is average.

As for the price, which is one of the major criteria in other research on "supplier selection criteria", we have seen that its role is not important here. On the other hand, smaller companies that drill less in depth, in the top soft surface section, will be price competitive. Large companies often focus on harder-to-reach wells, with more difficult drilling jobs, which cost more but also where margins are the strongest.

2.8.5.5 A holistic view on the overall

On the overall, it is possible for a supplier to create value and generate competitive advantages in a monopsonist market. Instead of adopting a benefit segmentation approach based upon the expectations of the various industrial clients, it is possible to segment the market with respect to the types of purchase situations (modified rebuy or straight rebuy), the type of

products, the type of tasks. But it is certain that with a monopsonist client, the purchasing power of this client is very strong, which creates unbalanced power relationships.

However, a competitive advantage can be gained by offering the monopsonist client a greater value than the competitors, such as in Schlumberger's case, by providing quality services or other benefits that justify a higher price. The strongest competitive advantage is a strategy that cannot be imitated by other companies. This is why in a monopsonist market, a strong competitive advantage will largely depend on the uniqueness of the offer to respond to complex demands of the client such as IKTVA program requests. It will also depend on ability to consistently accompany and assist the monopsonist client in its drilling but also in its social and economic activities. This is perfectly in line with Presutti and Mawhinney's (2013) contemporary value chain upon which we relied in the first chapter. The competitive advantage of the suppliers will be largely related to their capabilities, but also to their technological, economic and political power, which will lead to a more balanced relationship with a partnership perspective. The quality of this relationship (long term relationships, human relations) will play a key role. Finally, one must be both analytical (see Table 2.17) but also have a global vision of the monopsonist client's requests because many criteria of choice are interrelated.

Table 2. 17 Competitive advantage/disadvantage of Schlumberger versus its competitors in a monopsonist market

General criteria	More detailed attributes	Attribute importance		Schlumberger evaluation	Competitor evaluation	Competitive advantage
		Modified rebuy	Straight rebuy			
<i>Performance And financial impact</i>	Improve tools and performance	*****	****	Excellent	Very Good	+
	Drill faster	*	*	Excellent	Excellent	=
	Drill deeper	**	**	Excellent	Very Good	+
	Low cost (Cost per foot drilling cost) CPF	*****	***	Excellent	Very Good	+
<i>Technology and patents</i>	Regular technological innovations (ROP / CPF)	***	****	Excellent	Excellent	=
<i>Performance history</i>	SQ Service quality performance on a quarterly basis	****	*****	Excellent	Excellent	=
<i>Price</i>	Price	***	***	Good	Very Good	-
	Bit performance Analyser (BPA)	****	*****	Very Good	Very Good	=
<i>Production</i>	Local production facilities and capacity	****	**	Good	Excellent	--
<i>Product quality</i>	Trust confidence in the product	***	***	Excellent	Very Good	+
	Durability of the product	**	**	Excellent	Very Good	+
	Reliability and rerunability	**	**	Very Good	Very Good	=

<i>Service quality and repair services</i>	Service quality and repair services (number of failure; non productive times)	*****	***	Very Good	Very Good	=
	Specifications to fulfill (trial test, approved list): Yes or No)	*****	**	Good	Very Good	-
<i>Procedural compliance</i>	Procedural compliance	****	**	Excellent	Very Good	+
<i>Technical capabilities</i>	Technical capabilities	*****	***	Excellent	Very Good	+
	Operating control	***	***	Very Good	Very Good	=
<i>Company reputation and position in the industry</i>	Company profile	***	***	Excellent	Very Good	+
<i>Trust and confidence in the company</i>	Trust confidence in the company	****	*****	Very Good	Very Good	=
<i>Human relationships</i>	Human relationships	*****	*****	Very Good	Very Good	=
<i>Human resources and organization</i>	Management and organization	**	**	Excellent	Very Good	+
	Desire for business	*	**	Excellent	Excellent	=
<i>Responsiveness to buyer demands (IKTVA program)</i>	Localization of human resources	*****	****	Excellent	Good	++
	Localization of content	**	*	Not Good	Very Good	--
	Transfer of technology	*	*	Excellent	Excellent	=
	IKTVA (In-Kingdom Total Value Add) program	*****	****	Excellent	Good	++
<i>Financial reputation</i>	Overall financial reputation	**	**	Excellent	Excellent	=
<i>Long-term relationships</i>	History of relationships	*****	*****	Excellent	Very Good	+

- (1) Schlumberger is excellent on safety and good on spare parts; the competitors are excellent on good on safety and excellent on spare parts

2.9 Synthesis and conclusion

This chapter aimed at finding responses to research questions 2 and 3.

Research question 2 refers to RQ 2: “What are the Buying Center and the Buying Behaviour (Process, roles and Influences) in a monopsonist market? (Case of drilling Sector in the Oil Industry)”. Differences were expected between Modified rebuy and Straight rebuy, with probably fewer individuals involved in Straight rebuy situations than in Modified rebuy situations (Lewin and Donthu, 2005). This is actually the case since a maximum of 12 individuals were involved in the Modified rebuy situation and a maximum of 9 individuals participated into the purchase process, on the buyer side. But the technicity being high for drilling products, several hierarchical levels (vertical involvement) from several departments (lateral involvement) still have to be implied in the process. Their number is actually the same in both situations. Technicity may then count more than buyer power with this respect. Drilling products purchases being important in terms of price and technicity, it was expected that

several people or department will be involved in the process, even for Straight rebuy. It can also be expected for Straight rebuy, once the main technical choices have been made, that the operations and purchase department will play a more important role than for Modified Rebuy (centrality and connectedness), where technical and financial aspects should predominate. The qualitative analysis shows that the characteristics of a buying center in a monopsonist market corresponds to what we expected from the literature, due to the strong power of the monopsonist. In a monopsonist market, the process is highly formalized and implies more members of the buying center than in a non monopsonist market. The comparison between Modified rebuy and Straight rebuy is particularly interesting. The results from the qualitative analysis show that Straight rebuy (or repetitive buying) still implies lots of members of the buying center while in non monopsonist markets, repetitive rebuy usually imply fewer persons. Straight rebuy is less “repetitive” in monopsonist markets than in non monopsonist markets. This is a logical consequence of the huge buyer power of the client which may unilaterally and immediately suspend or stop the relationship with the supplier when the expected requirements are considered not fulfilled.

Research Question 3 refers to the development of competitive advantages by a supplier through the creation of value for the client by answering the monopsonist client needs: “RQ3: What are the important attributes in the buying center and how to gain a competitive advantage in a monopsonist market? (Market case of drilling Sector in the Oil Industry)” When we analyze the strategy of a supplier with the example of Schlumberger, the strategic moves can be summarized in Table 2.18. It appears that this company has important competitive advantages from a technical standpoint (performance and financial aspects, cost per foot, procedural compliance, technical capabilities) but also with respect to non economic dimensions such as the IKTVA program, the localization of human resources and long-term relationships. This company can also put the emphasis on quality dimensions such as its products qualities (durability, etc) which probably are not very important attributes at the time being. Schlumberger could try to enhance such attributes to have them become basic attributes, that is attributes which are necessary not to be rejected by the cliente (Llosa, 1997). In terms of performance history, technology and patents, Schlumberger is excellent but its main competitors are also excellent, even if their “excellence” is on different innovative products. Each competitor has its own innovative specificity, corresponding to some specific segments and use. The danger relies more on local production facilities and capacity, and specifications to fulfill. While it is possible to react relatively quickly to specifications to fulfill, it takes more

time to decide to produce locally and invest into local production facilities for international firms. This also raises the question of product quality control, when a company employs local workforce, and of the type of product that you are going to produce locally, the market of these products (local or international).

Table 2. 18 Schlumberger competitive positioning and strategic moves

Schlumberger performance	Positions with respect to competitors	Importance of the supplier selection attributes		
		High importance	Moderate importance	Low importance
Excellent performance	<i>Better than competitors</i>	Main competitive advantage <ul style="list-style-type: none"> • Performance and financial aspects (improve tools ; cost per foot) • Procedural compliance • Technical capabilities • Localization of human resources • IKTVA program • Long-term relationships 	Potential opportunities <ul style="list-style-type: none"> • Company profile • Trust and confidence in the product 	Maintain <ul style="list-style-type: none"> • Management and organization • Drill deeper • Durability of the product
	<i>Equal to competitors</i>	Maintain constant effort <ul style="list-style-type: none"> • Performance history • Technology and patents 		<ul style="list-style-type: none"> • Transfer of technology • Overall financial reputation • Desire for business • Drill faster
Very good performance	<i>Equal to competitors</i>	Improvements to be made <ul style="list-style-type: none"> • Bit performance analyzer • Human relationships • Service quality and repair services • Trust confidence in the company 	<ul style="list-style-type: none"> • Operating control 	
Good	<i>Less good than competitors</i>	Main risk incurred <ul style="list-style-type: none"> • Local production facilities and capacity • Specifications to fulfill 	<ul style="list-style-type: none"> • Price 	
Not good	<i>Less good than competitors</i>			Potential danger <ul style="list-style-type: none"> • Localization of content

As we previously said, these results from the qualitative analysis are consistent with what we found in chapter 1 with Porter's five forces analysis of the sector and the new

contemporary value chain (Presutti and Mawhinney, 2013). The necessity to take into account client needs in order to increase client value, the importance of performance and profit but also of culture, long-term relationships, and strong partnership ties with the client are key success factors. This sounds particularly important in a monopsonist market where the buyer has a strong power. In a monopsonist market, it also appears that modified rebuy and straight rebuy are subject to extremely formalized process from the buyer part, with strong requirements which may be subject to changes, sometimes sudden. Constant relationships and extremely good information process also are of major importance. This is also at the core also of the contemporary value chain and of its dynamic process (from client needs to client value). These formal but also informal regular relationships go a step further with the IKTVA program and the requirement of suppliers contributions to the economic and social welfare of the country (Friedman, 2007). This trend is likely to lead to joint ventures in the future. It may also raise the questions of partnership between suppliers, as it was suggested in chapter 1.

3

Quantitative Analysis:
Monopsonist versus non
monopsonist and Discussion



Table A - Research questions and organization of the thesis

Research Questions, applied to the case of the drilling sector in the oil industry	Chapters and sections	Methodology
<p>RQ1 : What are the sector characteristics and the value chain in a monopsonist market</p>	<p>Chapter 1: Monopsonist market and value chain in the oil industry</p> <p>Section 1. Monopsonist market and the drilling sector</p> <p>Section 2. Monopsonist market and Porter’s five forces analysis</p> <p>Section 3. Monopsonist market and the value chain in the drilling sector</p>	<p>Literature review</p> <p>Secondary data</p>
<p>RQ2: What are the Buying center and the Buying Behavior (process, roles and influences) in a monopsonist market</p>	<p>Chapter 2: The Buying center and Buying process in the oil industry in a monopsonist market</p> <p>Section 1. Buying center, Buying process and specificities of the oil industry</p> <p>Section 2. Qualitative methodology</p> <p>Section 3. Analysis of the buying center and buying behavior in Saudi Arabia</p>	<p>Literature review</p> <p>Primary data</p> <p>Qualitative analysis</p>
<p>RQ3: What are the important attributes in the Buying center and how to gain a competitive advantage</p>	<p>Chapter 2 (continued)</p> <p>Section 4. Identification of the important attributes in the buying center and how to gain a competitive advantage</p>	<p>Qualitative analysis</p>
	<p>Chapter 3 Important attributes in the Buying center of a monopsonist market</p> <p>Section 1. Quantitative methodology</p> <p>Section 2. Analysis in a monopsonist market</p> <p>Section 3. Comparison between monopsonist and non monopsonist markets</p> <p>Section 4. Other explanatory variables of differences</p>	<p>Quantitative analysis</p>

Table B Research questions and Methodology

Research Questions applied to the case of the drilling sector in the oil industry	Methodology	Data collection	Data analysis
RQ1 : What are the sector characteristics and the value chain in a monopsonist market	Literature review Secondary data		Review and analysis of the literature and of secondary data: oil industry and drilling sector documents
RQ2: What are the Buying center and the Buying Behavior (process, roles and influences) in a monopsonist market	Literature review and Primary data	Analysis of internal data and secondary data about the role of the Kingdom	Literature review and analysis of Schlumberger internal documents
	Qualitative analysis	16 semi-structured in depth interviews in Saudi Arabia with managers from suppliers (Schlumberger and competitors) and the supplier (Aramco)	Content analysis of the interviews
RQ3: What are the important attributes in the Buying center and how to gain a competitive advantage	Qualitative analysis	16 semi-structured in depth interviews in Saudi Arabia with managers from suppliers (Schlumberger and competitors) and the supplier (Aramco)	Content analysis of the interviews in the Saudi-Arabian monopsonist market
	Quantitative analyses: Saudi Arabian monopsonist market	77 managers (41 managers from the suppliers : Schlumberger and competitors service providers ; 36 managers from the client: Aramco)	t-tests: comparison of means for dependent samples (comparison between straight rebuy and modified rebuy) for
	Quantitative analyses: monopsonist versus non monopsonist markets	116 managers (85 in a monopsonist market and 31 in non monopsonist markets)	t-tests: comparison of means for independent samples (monopsonist versus non monopsonist)

CHAPTER 3: Quantitative Analysis – Monopsonist versus non monopsonist markets and discussion

This chapter has two objectives:

(1) To give external validity to the results from the qualitative analysis in the Saudi Arabia monopsonist market

(2) To compare results between monopsonist and non monopsonist markets. For this, we administered a structured questionnaire to 116 respondents in monopsonist and non monopsonist oil markets.

3.1 Methodology

To make these comparisons, we had to elaborate and administer a questionnaire which reflected the different criteria taken into account in the buying process.

3.1.1 Questionnaire

Therefore, a questionnaire was elaborated to reflect the criteria identified in the qualitative analysis and the potential impact of these criteria on product and supplier selection the buying process. This had to be done for the two types of rebuy: straight rebuy and modified rebuy. Both for straight rebuy (repetitive) and modified rebuy (trial test), we built the questionnaire that we based on the results of the qualitative analysis. The questionnaire was pretested with five respondents in order to check the questions: easiness to understand, length of the questionnaire (it appeared that the questionnaire had to be administered in less than 10 min, which sound maximum length of time that the respondents would spend on it). We also checked that the respondents had the capacity to answer the questions without any hesitation with respect to their competencies and experience.

We also checked for the number of points on the scales. We first tried a seven point's scale questionnaire in order to propose a large number of possibilities to the respondents if they wanted some refinement in their responses. But it took more time for the respondents and they express more difficulties in responding than with less points on the scales. After these pre-tests we end it up with five point scales as follow:

Example: Impact of performance on Product selection

1-Not all important

2-Not So important

3-Somewhat important

4-Very important

5- Extremely important

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Moreover, in order to check for the respective importance of the criteria, we also introduced specific questions about the respective importance of the criteria, for example by asking the respondents for the five most important criteria or the five least important criteria. These was useful to complete the information directly obtained for each criteria.

Example of question measuring the respective importance of criteria:

24. From the List of Criteria below would you please indicate the **Five most important** criteria on the **Approved Product** (Straight rebuy) in Product selection

- Performance and financial impact (CPF/M)
- Technology Patent
- Performance history (SQ)
- Price
- Client Performance Analyser
- Production Facility and capacity
- Product Quality
- Service Quality and repair services (NPT)
- Specification to fulfill
- Specification sheet (Spec. Sheet)
- Procedural compliance
- Technical capabilities
- Operating Control
- Company reputation and Position in the industry
- Trust and confidence in the company
- Human relationships (Connections)
- Human resources and organization
- Responsiveness to Buyer Demand (Localisation) program
- Financial reputation
- Long term relationships

The questionnaire was administered by Survey Monkey. The final questionnaire is presented in Appendix D.

The respondents were invited to participate to a market research in order to avoid the thinking that it could be an internal study of a competitor. The introduction of the questionnaire was:

“Market Research: Product Testing Template

Selection criteria for drilling products

We thank you for having accepted our invitation to complete this questionnaire. It should not take more than 10 minutes to fill it in. The criteria which are mentioned in the questionnaire refer to product (e.g. performance, quality, etc.) or service (e.g. procedural compliance) characteristics of the drilling service suppliers as well as their organizational or general characteristics (e.g., reputation, trust, human relationships) and the importance of these characteristics on product selection by the buyer, from your point of view. With respect to your position and experience, how important do you think are the following criteria in drilling product selection for Trial test Product (Modified rebuy) and/or Approved Product (Straight rebuy)”

The questionnaire had 31 Questions, the last questions that is 29 to 31 were used for identification purposes:

* 29. What is your job role?

- Operations
- Technical

* 30. Which type of company are you working for?

- Client
- Service Provider

* 31. Please indicate at which location (Region of the World) you work?

- NAM (North America)
- SAM (South America)
- Europe
- Africa
- MEA (Middle East)
- Asia
- Russia
- North Africa

When collecting data, we added a Question 32 to characterize the questionnaire as belonging to a monopsonist or non monopsonist market since we knew which type it was from the country identification.

3.1.2 Respondents and samples

Respondents in the monopsonist market

The qualitative analysis was conducted over 16 respondents, with 7 respondents from Aramco, 9 respondents from the suppliers, 4 technical respondents and 12 operation respondents see Table 3.1 below).

In the quantitative analysis, we need to have a larger number of technical respondents if we want a balanced sample between the relevant categories.

Table 3. 1 How the qualitative sample was composed: Respondents and their Roles in the buying Centre for Drilling Bits Market in Saudi Arabia

Type of company	Respondents	Functions	Technical	Operations
Client : Aramco	1.	Engineer in Charge	Drilling Technical department	
	2.	Supervisor (head of the department)	Drilling Technical department	
	3.	Senior Drilling Engineer		Drilling and Operations Department
	4.	General supervisor (Head of department)		Drilling and Operations Department
	5.	Supervisor		Drilling and Operations Department
	6.	General supervisor (Head of department)		MAFD (Material and Functions Department)
	7.	Drilling Superintendent		Operations Department
Suppliers	8.	Operations and Sales Manager		Bits and Drilling Tools (Sales Department)
	9	Sales Engineer		Bits and Drilling Tools (Sales Department)
	10	Senior Product Engineer	Bits and Drilling Tools (Engineering Department)	
	11.	Demand Planner		Bits and Drilling Tools (Logistics department)
	12.	Sales Manager		Bits and Drilling Tools (Sales Department)
	13.	Designer and Focal point for Aramco	Bits and Drilling Tools (Engineering Department)	
	14.	Account Manager		Drilling Bits (Sales Department)
	15.	Country Manager		Drilling Bits (Sales Department)
	16.	Sales Engineer		Bits and Drilling Tools (Sales Department)

To study the external validity of what we found in the qualitative analysis, we needed a larger sample with around 30 respondents for each relevant category which was conceptually relevant in the analysis: suppliers versus clients technical versus operations respondents. These numbers were necessary to run test of comparison of means in terms of importance of the various criteria.

We used personal contacts in Saudi Arabia, within Schlumberger, competitors and at Aramco to build a first list of 20 respondents (the respondents in the qualitative analysis were not used again in the quantitative analysis. To complete the list of respondents, we used a snowball approach. The final sample comprised 77 respondents.

Thus we carried out the quantitative analysis over 77 respondents in the Saudi Arabia monopsonist market. The respondents in the sample were as follow (Table 3.2).

Table 3. 2 Repartition of the 77 respondents (suppliers versus client) in the monopsonist market

	Technical	Operations	Total
Suppliers (Service Provider)	23	26	49
Aramco (Client)	13	15	28
Total	36	41	77

With 49 respondents from the suppliers (international drilling service provider companies) and 28 from Client (Aramco), the repartition between technical and operations was such that all the subtotal were equivalent or close to 30 and satisfied the necessary number of respondents in the cells to run t-tests: 36 for the technical and 41 for the operations respondents; 49 for the service providers and 28 for the client. We are is in line with the qualitative analysis by having clients and suppliers respondents as well as operations and technical respondents. Moreover, we increase the external validity with a more balanced number of technical versus operation respondents than in the qualitative analysis.

Respondents in monopsonist versus non monopsonist markets

Oil and gas markets vary according to their monopsonist characteristics. For example, Saudi Arabia and Algeria are monopsonist, with only one client in each case (Aramco in Saudi Arabia and Sonatrach in Algeria. But many other markets are non monopsonist: for example, Gabon, Venezuela, and Indonesia. We look for respondents in these countries since Schlumberger is present. Therefore, it was possible for us to find respondents from Schlumberger, from competitors, and from clients as well.

We ended up with 84 service providers' respondents and 30 non monopsonist client respondents. We used the same method as in Saudi Arabia (direct contacts plus a complementary list by using a snowball approach).

Table 3. 3 Type of markets based on geographical area

Geographical Area	Countries	Type of Market	Number of Buyers per Country
Middle East (MEA)	Saudi Arabia	Monopsonist	1 Client
North Africa	Algeria	Monopsonist	1 Client
South America (SAM)	Venezuela	Oligopolist	2 to 3 Clients
Africa	Gabon	Non-Monopsonist	11 clients
Eastern Europe	Russia	Non-Monopsonist	Numerous
Asia	Indonesia	Non-Monopsonist	Numerous
North America (NAM)	Canada	Non-Monopsonist	Numerous

The final sample is composed of respondents from Middle East (Saudi Arabia: 77) and (Algeria: 2) for monopsonists, Latin America for oligopolist (Venezuela: 6) and from Africa (Gabon: 17), Eastern Europe (Russia: 2), North America (Canada: 2) and Asia (Indonesia: 10) for non monopsonist. The repartition between suppliers and clients respondents on the one hand, and between technical and operations respondents on the other hand is presented in Table 3.4 and Table 3.5

Table 3. 4 Monopsonist versus non monopsonist markets.

Repartition of respondents between suppliers and clients

	Suppliers	Clients	Total
Monopsonist	50	35	85
Non-monopsonist	10	21	31
total	60	56	116

Note: the monopsonist group comprises 79 pure monopsonist and 6 oligopolist (there are only 2 to 3 clients in the country)

Table 3. 5 Monopsonist versus non monopsonist markets.

Repartition of respondents between technical and operation respondents

	Technical	Operations	Total
Monopsonist	41	44	85
Non-monopsonist	9	22	31
Total	50	66	116

We needed to have 30 respondents (or around 30 respondents) in each subtotal group and to have enough service providers versus clients, and technical versus operation respondents in order to compare monopsonist and non monopsonist markets, with some representativeness with respect to these two dimensions. We asked to our Schlumberger correspondents to look for respondents who satisfied these characteristics, that is who represented these diverse types. This was actually the case. The idea was not to have the same number of clients in each cell.

We shall also mention that before arriving at this final list, we had to throw away 17 questionnaires and collect them again because of a bias. We discovered that client in non monopsonist markets always gave extremely positive responses with almost no variance in their responses. Further investigation let us find out that they wanted to please the interviewer. We had to do a second data collection over other 17 non monopsonist respondents and to insist upon the fact that they should answer what they really thought, and take their time to give thorough response. This new data collection showed the same variance in the responses as the other respondents in the study.

3.1.3 Analysis and Tests

We used t- tests for paired comparison of means for the monopsonist market in order to compare the responses for straight rebuy and modify rebuy ($n = 77$). We needed to check if what we observed in the quantitative analysis matched what we found in the qualitative analysis and therefore our expectation. In the same way, we had to use some t-tests for independent samples to analyze the statistical significance of the differences between technical ($n_1 = 36$) and operation ($n_2 = 41$) respondents and between service providers ($n_1 = 49$) and client respondents ($n_1 = 28$).

As for the comparison of the criteria which are used by the buying center in the selection process of a supplier, between the monopsonist and the non monopsonist markets, we run t=tests for independent samples (monopsonist $n_1 = 85$; non monopsonist $n_2 = 31$) in order to assess the significance of the differences.

This quantitative chapter with the t=tests is an integral component of our mixed methodology which includes review of the literature, secondary data collection (e.g.,

documents from the industry and from the company), primary data collection with qualitative analysis with experts and representative respondents.

3.2 Overall Supplier Evaluation and Choice Criteria for the Monopsonist Client

Comparison between the expectations based on the qualitative analysis and the quantitative results in monopsonist market in both Modified and straight rebuy.

Qualitative methods might be used to explore a phenomenon, try to understand complex relations between variables or sometimes understand the meaning of the conclusions produced by quantitative methods. By using quantitative methods, it is possible to give precise and testable expression to qualitative ideas. This combination of quantitative and qualitative data gathering is often referred to as mixed-methods research.

3.2.1 Expectations from the qualitative analysis

From the qualitative analysis, we expect some variables to be more important than others in a monopsonist market. For example, the most important variables should be some performance attributes such as cost per foot (CPF), cost effectiveness and bit performance analyzer (BPA), performance history, “regular performance” innovation with technology and patents, service and product quality with repair services; But also, we also expect attributes such as human and long term relationship, *trust and confidence, responsiveness to buyer demand (IKTVA program) to be important.*

Criteria expected to be more important from the qualitative analysis.

Moreover we expect straight rebuy and modify rebuy not to have the same importance in the buying process. In the quantitative analysis, the perceived importance assigned to the criteria was different between the straight rebuy and the modified rebuy conditions for 8 criteria and 14 attributes

Criteria expected to be more important for repeated rebuy (straight rebuy, from the qualitative analysis). The criteria were more important for repetitive rebuy than for Straight rebuy for “improve performance cost per foot (CPF), technology and patents, performance

history, bit performance, trust and confidence in the company and long term relationships (Supplier).

Criteria expected to be more important for modified rebuy. Modified rebuy was expected to have greater importance than repetitive rebuy for the following attributes: Cost effectiveness, local production facility, service quality and repair “NPT nonproductive time, Specification to fulfil”, procedural compliance”. Trust and confidence, responsiveness to buyer demand, localization of human resource and localization of content IKTV (In Kingdom total value add program. Trust and confidence and long-term relationships are important to both of them (straight and modified rebuy).

In the following, we will start by indicating which criteria were listed as the five most important, without providing statistical tests but only frequencies. Then we shall analyze the results from the quantitative analysis at two levels:

- The differences between modified and straight rebuy, criterion by criterion, with a particular attention when differences were expected
- When the respondents were asked to rank them.

3.2.2 Most important criteria in straight rebuy and modified rebuy situations

These first results are only indicative, without statistical test to give an indication of the criteria which emerged when the respondents were asked to rank them.

Question Q 24 and Q 26 referred to Approved rebuy (Straight rebuy) and modified rebuy. Results have to be compared with qualitative research propositions. Performance and financial impact is as expected a very important criteria, as performance history, price, client performance analyzer, human relationship (Table 3.6) However, we did not expect product quality to be that high and we expected trust and confidence as well as responsiveness (localization of human resources) to rank higher. But we need to go to the details of the attributes, beyond the general criteria to have a more complete understanding of what is more

important. We also need to compare straight and modified rebuy in terms of the statistical significance of the differences of the impact of the criteria on the selection decision.

On the overall, results were as expected, with further investigation on two attributes.

Table 3. 6 Most important attributes for straight rebuy and modified rebuy

Q 24. Most important criteria From the List of Criteria below would you please indicate the Five most important criteria on the Approved Product (Straight rebuy) in Product selection

Table 3. 6

ANSWER CHOICES	RESPONSES	
Performance and financial impact (CPF/M) (1)	83.53%	71
Performance history (SQ) (3)	74.12%	63
Price (4)	56.47%	48
Client Performance Analyser (5)	54.12%	46
Human relationships (Connections) (16)	40.00%	34
Product Quality (7)	40.00%	34

Q 26. From the List of Criteria below would you please indicate the Five Most important criteria on the Trial Test Product (Modified rebuy) in Product selection

Table 3. 7

ANSWER CHOICES	RESPONSES	
Performance and financial impact (CPF/M) (1)	72.94%	62
Client Performance Analyser (5)	50.59%	43
Price (4)	47.06%	40
Technology Patent (2)	43.53%	37
Product Quality (7)	42.35%	36
Human relationships (Connections) (16)	35.29%	30
Technical capabilities (12)	30.59%	26

However, when we look at the means for modified rebuy and straight rebuy on a five-point scale, we can observe that the highest mean values for the attributes correspond to: improved performance cost and financial impact, technology and patents, performance history, BPA (client performance analyzer), product quality, service quality and repair services (NPT), specifications to fulfill, technical compliance, trust and confidence on the

company, long term relationships. Some attributes also rank high but more for modified rebuy than for straight rebuy (procedure compliance and responsiveness to buyer localization IKTVA) (see Table 3.8).

Modified rebuy			Repeated buying		
Rank	Attribute	Mean rating	Rank	Attribute	Mean rating
1	Specifications to fulfill	4.32	1	Performance history (SQ)	4.25
2	Technical capabilities	4.25	2	Long-term relationships	4.12
3	Service quality and repair services NPT	4.22	3	Trust and confidence in the company	4.05
4	BPA (Client performance analyser)	4.17	4	Improved Performance Cost and financial impact	4.04
5	Product quality	4.12	5	BPA (Client performance analyser)	3.99
6	Procedural compliance	4.09	6	Product quality	3.97
6	Trust and confidence in the company	4.09	7	Technology and patents	3.92
6	Long-term relationships	4.09	8	Human relationships	3.92
9	Responsiveness to buyer localisation (IKTWA)	4.00	9	Technical capabilities	3.91
9	Improved Performance Cost and financial impact	4.00	10	Service quality and repair services NPT	3.90
11	Human relationships	3.99	11	Specifications to fulfill	3.84
12	Performance history (SQ)	3.92	12	Company reputation and position in the industry	3.78
13	Company reputation and position in the industry	3.88	13	Procedural compliance	3.74
14	Operating control	3.84	14	Price	3.69
15	Technology and patents	3.83	15	Responsiveness to buyer localisation	3.69
16	Production (local production facility and capacity)	3.74	16	Operating control	3.66
17	Price	3.57	17	Production (local production facility and capacity)	3.43
18	Financial reputation	3.47	18	Financial reputation	3.25
19	Human resources and organization	3.27	19	Human resources and organization	3.17

Table 3. Ranking of attribute importance for Modified rebuy and Straight rebuy in Saudi Arabia (monopsonist, n = 77)

3.2.3 Analysis of the differences in attribute importance between straight and modified rebuy

The results show that the impact of the various criteria on the product selection, when they were significantly different were almost always greater for Modified rebuy than for Straight rebuy except for performance history. In particular, we find significantly greater importance for service quality and repair services (NPT), specifications to fulfill, procedural compliance, technical capability for modified rebuy in order to have the product approved. In the same way IKTVA is also significantly more important for modified rebuy than for straight rebuy. As for local production facilities and capacity they are significantly greater at $p = .09$ (that is $p < .05$ for a one-tailed test, which gives an indication of the tendency, which is as expected).

For the modified rebuy, a company is in direct competition with other companies and has to outperform them on as many attributes as possible and in particular on the most important attributes.

For performance history, this is in conformity with our general expectations since the straight rebuy means that the product has already been approved, and there is no much competition. It is important to maintain an excellent performance. This is why our performance history on a quarterly basis has to be excellent for Straight rebuy.

**Table 3. 8 Differences in attribute importance between straight and modified rebuy in Saudi Arabia
(monopsonist, n = 77)**

Performance	Modified rebuy M1	Repeated buying M2	t- Value	p- value (two-tailed test)
Improved Performance Cost and financial impact	4	4.04	-.26	.78
Technology and patents	3.83	3.92	-0.60	.54
Performance history (SQ)	3.92	4.25	-2.36	.01
Price	3.57	3.69	-0.74	.45
BPA (Client performance analyser)	4.17	3.99	1.24	.21
Production (local production facility and capacity)	3.74	3.43	1.66	.09
Product quality	4.12	3.97	0.98	.32
Service quality and repair services NPT	4.22	3.9	1.92	.05
Specifications to fulfill	4.32	3.84	3.55	.00
Procedural compliance	4.09	3.74	2.61	.00
Technical capabilities	4.25	3.91	2.84	.00
Operating control	3.84	3.66	1.26	.20
Company reputation and position in the industry	3.88	3.78	0.70	.48
Trust and confidence in the company	4.09	4.05	0.28	.77
Human relationships	3.99	3.92	0.39	.69
Human resources and organization	3.27	3.17	0.58	.55
Responsiveness to buyer Localisation (IKTWA)	4	3.69	1.93	.05
Financial reputation	3.47	3.25	1.17	.24
Long-term relationships	4.09	4.12	-0.23	.81

Table 3. 9 Expectations based on the qualitative analysis, and significant differences between the importance of supplier selection attributes between modified rebuy and Straight (repeated) rebuy in Saudi Arabia (monopsonist, n = 77)

Criterion	Monopsonist case: importance of supplier selection attributes			
	Qualitative analysis			Quantitative analysis: differences between Modified and straight rebuy
	Modified rebuy	Straight buying	Overall criterion importance	<i>P value (two-tailed test)</i>
<i>Improved Performance Cost per foot</i>	****	****	****	n.s. at p < .05
<i>Technology and patents</i>	***	****	****	n.s.at p < .05
<i>Performance history (SQ)</i>	****	*****	*****	M1 < M2 at p < .01
<i>Price</i>	***	***	***	n.s. at p < .05
<i>BPA (Bit performance)</i>	****	*****	*****	n.s. at p < .05
<i>Production</i>	****	**	***	M1 > M2 at p < .05 (for a one-tailed test)
<i>Product quality</i>	***	***	***	n.s. at p < .05
<i>Service quality and repair services NPT</i>	*****	***	****	M1 > M2 at p < .05
<i>Specifications to fulfill (repair facility)</i>	*****	**	***	M1 > M2 at p < .05
<i>Procedural compliance</i>	****	**	***	M1 > M2 at p < .05
<i>Technical capabilities</i>	*****	***	*****	M1 > M2 at p < .05
<i>Operating control</i>	***	***	***	n.s. at p < .05
<i>Company reputation and position in the industry</i>	***	***	***	n.s. at p < .05
<i>Trust and confidence in the company</i>	****	*****	*****	n.s. at p < .05
<i>Human relationships</i>	*****	*****	*****	n.s. at p < .05
<i>Human resources and organization</i>	**	**	**	n.s. at p < .05
<i>Responsiveness to buyer Localisation</i>	*****	****	*****	M1 > M2 at p < .01
<i>Financial reputation</i>	**	**	**	n.s. at p < .05
<i>Long-term relationships</i>	*****	*****	*****	n.s. at p < .05

Note: *****Extreme importance, **** High Importance, ***Moderate importance, **Low importance, *No importance

3.2.4 Analysis of the differences in attribute importance between straight and modified rebuy for technical versus operations managers

In terms of methodology, even if technical managers have given more weight to some attributes, regarding their activities, we expect them to be good analysts of the monopsonist expectations. The technical managers and operations managers belonged to both the suppliers and the client. Therefore, we expect that the quantitative analysis will show that both types of managers will converge in the importance they give to the selection attributes of the monopsonist client.

Table 3. 10 Differences in attribute's importance for *Modified rebuy* between Operations and Technical managers in Saudi Arabia (monopsonist, n = 77)

Attributes	Operations M1 N1 = 41 Mean	Technical M2 n1 = 36 Mean	t-Value	p value (two- tailed test)
Improved Performance Cost and financial impact	3.99	3.87	0.53	.59
Technology and patents	3.75	4.03	-1.24	.21
Performance history (SQ)	3.95	3.89	0.26	.79
Price	3.68	3.44	.93	.35
BPA (Client performance analyser)	4.07	4.28	-1.01	.32
Production Facility	4.06	3.46	2.27	.02
Product quality	4.17	4.06	0.60	.54
Service quality and repair services NPT	4.24	4.19	0.23	.81
Specifications to fulfil	4.30	4.47	-1.17	.24
Procedural compliance	4.15	4.03	.70	.48
Technical capabilities	4.17	4.33	-1.07	.28
Operating control	3.76	3.92	-.83	.40
Company reputation and position in the industry	3.93	3.83	.46	.64
Trust and confidence in the company	4.10	4.08	.10	.91

Human relationships	4.00	3.97	.13	.89
Human resources and organization	3.27	3.28	-.04	.96
Responsiveness to buyer Localisation	3.88	4.14	-1.12	.26
Financial reputation	3.50	3.44	.24	.80
Long-term relationships	4.02	4.17	-.97	.33

This is the case since the differences between the importance they give for modified rebuy and for straight rebuy are not significantly different with two exceptions. These exceptions were the higher score that operations managers attached to Production facility in the case of Modified rebuy, and the higher score that the technical managers attached to the BPA (Client performance analyzer) for straight rebuy, that is approved products. These differences do not constitute a surprise since to invest in the country with Production facility and capacities is a must when a company wants to enter the drilling market, and this is an operations decision. As for the Bit performance analyzer, this is the main tool for the client (that is the technical manager) to select a supplier in the straight rebuy situation, as already discussed.

Table 3. 11 Differences in attribute's importance for *Straight rebuy* between Operations and technical managers Suppliers and client in Saudi Arabia (monopsonist, n = 77)

Attributes	Operations M1 n1 = 41 Mean	Technical M2 n2 = 36 Mean	t-Value	p value (two-tailed test)
Improved Performance Cost and financial impact	3.93	4.17	-1.32	.18
Technology and patents	3.98	3.86	.72	.47
Performance history (SQ)	4.15	4.36	-1.38	.17
Price	3.67	3.69	0.45	.91
BPA (Client performance analyser)	3.76	4.25	-2.50	.01
Production Facility	3.41	3.44	-.12	.90
Product quality	4.02	3.92	0.43	.66
Service quality and repair services NPT	3.98	3.81	.63	.52
Specifications to fulfil	3.88	3.81	.31	.75
Procedural compliance	3.88	3.58	1.44	.17
Technical capabilities	3.88	3.94	-.31	.75
Operating control	3.66	3.67	-.05	.96

Company reputation and position in the industry	3.80	3.25	.46	.80
Trust and confidence in the company	4.02	4.08	-.30	.75
Human relationships	3.83	4.03	-.85	.40
Human resources and organization	3.20	3.14	.23	.81
Responsiveness to buyer Localisation (IKTVA)	3.59	3.78	-.85	.39
Financial reputation	3.22	3.28	-.20	.83
Long-term relationships	3.98	4.28	-1.86	.07

3.2.5 Analysis of the differences in attribute importance between straight and modified rebuy for the monopsonist client versus the service providers (suppliers)

The expectations concerning the potential differences in attribute importance such as viewed by the suppliers (service providers) and the monopsonist client are different in nature. The monopsonist client undergoes the influence of the Kingdom strategy on the oil and investment issue. This is likely to have some consequences in terms of attribute importance for monopsonist managers. A clear example of some divergence between the client and service provider mindsets (Table 3.13) is the case of the technology and patent attribute. Technology and patent is considered as more important for product selection in the modified rebuy situation by the supplier than by the buyer while the monopsonist (Aramco) consider Responsiveness to buyer and Local production facilities, which are in the In Kingdom Total Value Add (IKTVA) program, more important and creating additional domestic value to support a rapidly changing economic environment in order to fasten future prosperity. Aramco, in line with the Kingdom priorities, tries to capture value that produces long-term tangible benefits with quality jobs in the context of a rapidly increasing Saudi population. The monopsonist Aramco puts a competitive pressure on the various suppliers in terms of their capability and involvement in collaborating with the monopsonist and Saudi partners in order to enhance innovation, the diversification of the industry, and increase Saudi economy and welfare and its future global competitiveness. As we said, with the IKTVA vision, any company which will work

with Saudi Aramco should fulfil minimum requirements of local suppliers and human resources. This is fully the case for service providers companies in the drilling industries. Moreover, , and for drilling bits companies specifically they should have a lot Designed to amplify the efforts of our partners and our investments, especially in modified rebuy which is the trial test procedures and because of Aramco is a Pure Monopsonist Client it follow strictly the Kingdom vision.

Table 3. 12 Differences in attribute's importance for *Modified rebuy* between Suppliers and the Client (the Monopsonist: Aramco, n = 77))

Performance	Monopsonist Client (Aramco) M1 n1 = 28	Service provider (Suppliers) M2 n2 = 49	t-Value	p value (two-tailed test)
Improved Performance Cost and financial impact	3.46	4.31	-3.26	.00
Technology and patents	3.36	4.10	-2.98	.00
Performance history (SQ)	3.89	3.94	-.21	.82
Price	3.25	3.76	-1.84	.07
BPA (Client performance analyser)	4.29	4.10	.85	.40
Production Facility	4.18	3.49	2.54	.01
Product quality	3.75	4.33	-3.07	.00
Service quality and repair services NPT	4.18	4.24	-.30	.76
Specifications to fulfill	4.43	4.27	1.31	.03
Procedural compliance	4.18	4.04	.73	.47
Technical capabilities	4.32	4.20	.75	.35
Operating control	3.68	3.94	-1.21	.23
Company reputation and position in the industry	3.64	4.02	-1.79	.08
Trust and confidence in the company	3.93	4.18	-1.26	.21
Human relationships	4.29	3.82	2.33	.02
Human resources and organization	3.29	3.27	0.07	.93
Responsiveness to buyer Localisation	4.54	3.69	3.88	.00
Financial reputation	3.11	3.67	-2.05	.05
Long-term relationships	4.21	4.02	1.24	.22

Table 3. 13 Differences in attribute's importance for *Straight rebuy* between suppliers and the Client (the monopsonist: Aramco, n = 77)

Performance	Monopsonist Client (Aramco) M1 n1 = 28	Service provider (Suppliers) M2 n2 = 49	t-Value	p value (two-tailed test)
Improved Performance Cost and financial impact	4.04	4.04	.00	1.00
Technology and patents	3.96	3.90	.29	.76
Performance history (SQ)	4.36	4.18	1,20	.23
Price	3.75	3.65	0.51	.61
BPA (Client performance analyser)	4.32	3.80	2.42	.02
Production Facility	3.25	3.53	-1.07	.28
Product quality	3.50	4.24	-2.83	.00
Service quality and repair services NPT	3.21	4.29	-3.75	.00
Specifications to fulfil	3.57	4.00	-1.79	.08
Procedural compliance	3.50	3.88	-1.59	.12
Technical capabilities	3.71	4.02	-1.57	.13
Operating control	3.29	3.88	-2.31	.03
Company reputation and position in the industry	3.71	3.82	-.53	.59
Trust and confidence in the company	4.29	3.92	1.95	.055
Human relationships	4.46	3.61	4.01	.00
Human resources and organization	2.96	3.29	-1.17	.25
Responsiveness to buyer Localisation (IKTVA)	4.00	3.50	2.27	.03
Financial reputation	2.82	3.49	-2.04	.05
Long-term relationships	4.43	3.94	2.94	.00

When we examine the Straight rebuy case, the monopsonist client gives more important to the tool that it uses to constantly assess the drilling product performance, even if this product is on the approved list: BPA (Client performance analyser) and again to human

relationships IKTVA program that is Responsiveness to buyer and local production, as well as long-term relationships.

These findings are quite important since it appears the the service providers in some way underestimate the shift in criteria importance during these past years, due to the Kingdom new policy. Technical issues have always been of major importance but the monopsonist changed its mindset and the clients have to take it into account in order to remain competitive. As we saw it in chapter 2, Schlumberger has understood the importance of this change and has successfully responded to it, but not completely.

3.3 Difference between Monopsonist VS non-Monopsonist

As for the analysis of monopsonist vs non-monopsonist, the objective is to understand which criteria should be different from a conceptual point of view in terms of importance, and which ones are actually different between these two typers of markets in the quantitative analysis. We have to analyze if our results in the quantitate analysis are consistent with “how and where” we can expect value to be created in the buying center in the drilling sector of the oil industry. The buying power is stronger in a monopsonist market than in a nonmonopsonist one. Chapter 2 shows that in the Saudi Arabia monopsonist market, there is a strong emphasis on the supplier absolute necessity to have its product approved by the client. But once the product has been approved, the power of the client is still very strong, the repeated purchase being completely dependent of the good will of the client. Therefore, we are expecting differences between monopsonist and non-monopsonist depending upon the purchasing situation: modified rebuy or straight.

3.3.1 Modified rebuy versus Straigth rebuy

For Modified rebuy, the supplier proposes new offers so that the monopsonist does not have more means of comparison between the suppliers than the non monopsonist has. Consequently we expect most criteria to be more important for monopsonists than for non-monopsonists for Straight rebuy, and not to be significantly different between monopsonist and non monopsonist for Modified rebuy. As for Straigth rebuy, in a monopsonist market, even when the product has been approved by the client, it does not mean that the supplier can easily do repeated sales or that the client will regularly repeat its purchases. A supplier may even not sell it at all if he is not highly competitive. The buyer has all the bargaining

power; The monopsonist buyer knows all the suppliers and has a historical database. It has an excellent follow-up of suppliers performance, with relevant data. In a non monopsonist market, on the overall, clients are less well informed because they do not have an extremely detailed information about each supplier product and enough data points of drilling. Outstanding information systems, huge database and strong tools for controlling suppliers detailed performance on a longitudinal basis are important characteristics of the monopsonist client in the drilling industries.

3.3.2 Criterion by criterion analysis

Modified rebuy. For modified rebuy, we expected the importance of the attributes to be the same in monopsonist and non monopsonist markets. For almost all the attributes, the difference of importance between the two markets is non-significant, which is consistent with our expectations.

They differ for only three attributes under the modified rebuy condition, being stronger in monopsonist markets : Client performer analysis (BPA), production facility, and specifications to fulfill. This is interesting since it shows that these three attributes always are more important for monopsonist, whatever the buying situation (it is also the case for repeated purchase also called straight rebuy). This can be easily understood for production facility since the bargaining power of the client compels the supplier to invest in the country and install its production facilities, whatever the type of purchasing situation As for BPA and specification to fulfill, these attributes were already important for modified rebuy, and being a monopsonist implies that it is even more important to make efforts to have one's product approved.

They also differ on two other attributes but with a *higher importance for non monopsonist than for monopsonist*. This is the case for operating control and financial reputation. In a non monopsonist market, the client is expecting from the "rich" supplier to invest and make a trial test for the new product, which cannot be done by a less financially secure company. Therefore, the financial reputation is important. As for operating control, only the big suppliers can have excellent operating control, and the non monopsonist client expect the supplier to do so since he does not have the capacity to do it by himself.

Table 3. 15 Differences in attribute's importance for *Modified rebuy* between Monopsonist and Non-Monopsonist Market

Performance	Monopsonist M1 n1 = 85	Non- Monopsonist M2 N2 = 31	t-Value	<i>p</i> value (two-tailed test)
Improved Performance Cost and financial impact	3.99	3.87	0.53	.59
Technology and patents	3.75	4.03	-1.24	.21
Performance history (SQ)	3.87	3.68	0.86	.38
Price	3.66	3.77	-0.47	.63
BPA (Client performance analyser)	4.13	3.48	3.05	.00
Production Facility	3.56	2.74	2.77	.00
Product quality	4.08	4.03	0.27	.78
Service quality and repair services NPT	4.09	4	0.43	.66
Specifications to fulfill	4.35	4	2.12	.03
Procedural compliance	4.14	4.35	-1.27	.22
Technical capabilities	4.18	3.94	1.36	.17
Operating control	3.66	4.16	-2.21	.02
Company reputation and position in the industry	3.76	3.42	1.50	.13
Trust and confidence in the company	4.06	3.87	.91	.36
Human relationships	3.98	3.74	1.09	.27
Human resources and organization	3.24	3.16	0.31	.75
Responsiveness to buyer Localisation	3.88	3.58	1.26	.20
Financial reputation	3.40	3.97	-2.25	.02
Long-term relationships	4.01	4.26	-1.30	.19

All these elements are developed in Appendix E2, with the distribution of the responses to the questionnaire, graphically and statistically. We present them in Figures 3.1, 3.2, 3.3. for Operating control and Financial reputation.

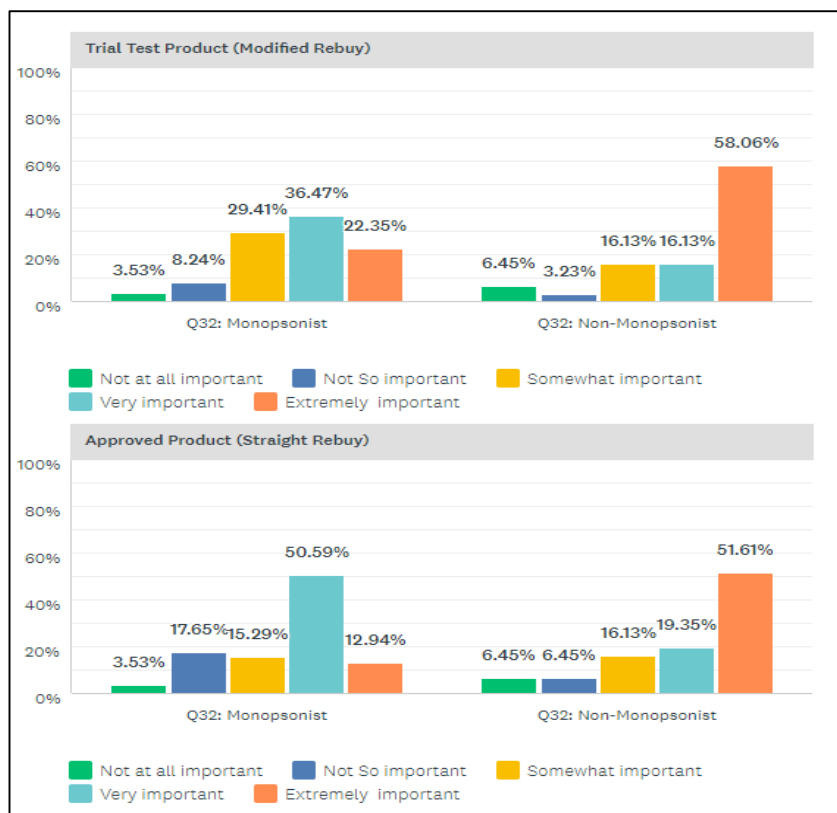


Figure 3.1 Higher importance for non monopsonist than for monopsonist for modified rebuy : Operating control

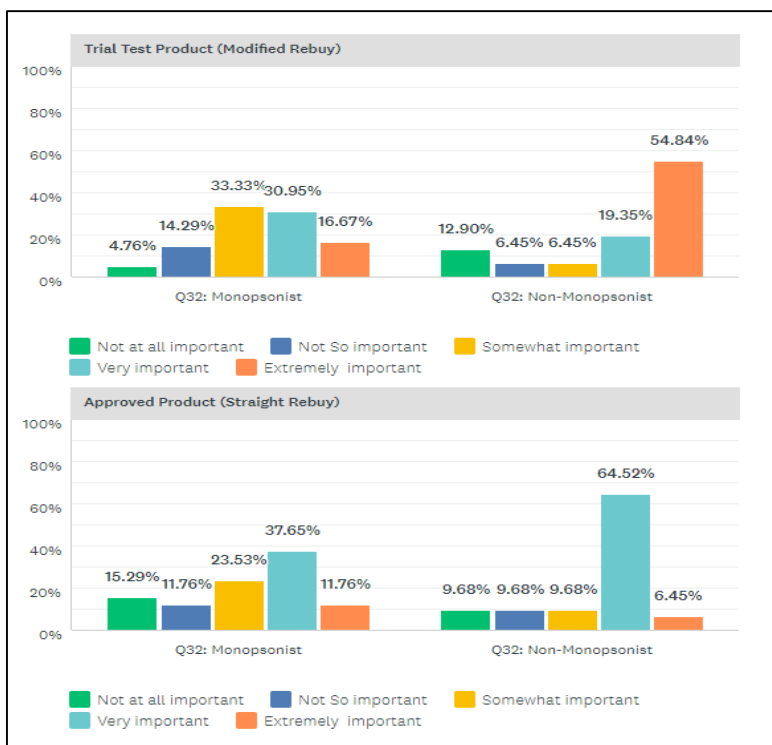


Figure 3. 2 Higher importance for non monopsonist than for monopsonist for : Financial reputation

Straight rebuy. Based on the conceptual development along with the qualitative analysis, we are expecting in particular for the straight rebuy, the attributes to be more important in the product selection process of the monopsonist as long as they directly relate to performance and cost on the one hand, and on maintaining excellent long-term and human relationships between the supplier and the client on the other hand.

We thus expect for the straight rebuy, the following attributes to be more important for monopsonist than for non monopsonist:

- Attributes related to performance, cost and control: improved performance, performance history, BPA (client performance analyzer), specification to fulfill, IKTVA
- Attributes related to long-term relationships and human relationships: human relationships, trust and confidence, long-term relationships.

Thus has been actually the case with very few exceptions:

- Production facility was also significantly higher in the monopsonist case, because the client pushes the supplier to produce and manufacture in the country; it has a stronger bargaining power to make the supplier install production facilities and settings in the country than when there are several clients; actually it is the same logics as the logics of control
- Company reputation and position in the industry was also higher in the monopsonist case, which makes sense since it may be related to long-term relationships and overall reputation, which is important in monopsonist markets
- Operating control is higher for non monopsonist under the straight rebuy case since the client does not control everything in a non-monopsonist market and expect the supplier to have a good performance on this dimension. They only expect the supplier to fully respect the procedure (procedural compliance).

Table 3. 16 Differences in attribute's importance for *Straight rebuy* between Monopsonist and Non-Monopsonist Market

Performance	Monopsonist M1 n1 = 85	Non- Monopsonist M2 n2 = 31	t- Value	p value (two-tailed test)
Improved Performance Cost and financial impact	4.01	3.55	2.72	.00
Technology and patents	3.87	3.52	1.82	.07
Performance history (SQ)	4.24	3.84	2.35	.02
Price	3.78	3.71	0.36	.71
BPA (Client performance analyser)	3.99	3.52	2.41	.01
Production Facility	3.26	2.61	2.30	.02
Product quality	3.98	3.81	0.82	.40
Service quality and repair services NPT	3.92	3.52	1.69	.09
Specifications to fulfill	3.82	3.10	3.54	.00
Procedural compliance	3.72	4.23	-2.57	.01
Technical capabilities	3.89	3.71	1.03	.30
Operating control	3.52	4.03	-2.22	.02
Company reputation and position in the industry	3.71	3.23	2.38	.01
Trust and confidence in the company	4.02	3.32	3.70	.00
Human relationships	3.95	3.23	3.33	.00
Human resources and organization	3.15	2.9	1.02	.30
Responsiveness to buyer Localisation (IKTVA)	3.54	3.06	2.15	.03
Financial reputation	3.19	3.48	-1.16	.24
Long-term relationships	4.13	3.65	2.90	.00

On the overall, the results of the quantitative analysis are pretty much in line with what we found with respect to Porter's five forces and the value chain on the one hand, and straight rebuy and modified rebuy expectations from chapter 2. Table 3.17 presents a comparison of the results from the qualitative and quantitative analysis, which shows their consistency.

3.4 Discussion and conclusion: explanatory roles of the monopsonist nature, of culture and of ownership

This chapter shows that a monopsonist firm is more demanding on most selection criteria in case of Straight rebuy except for operating control and procedural compliance. In these cases, the non monopsonist oil and gas companies are more restrictive than non monopsonist firms. For Modified rebuy, there are no significant differences between monopsonist and non monopsonist cases except for BPA (Bit performance analyser), production facilities, specification to fulfil where the monopsonist is more demanding; and operating control and financial reputation where the non monopsonist is more demanding.

Our findings from the qualitative analysis and quantitative analysis are pretty consistent (Table 3.17).

Table 3. 17 Supplier selection criteria importance: qualitative versus quantitative analysis

Attributes	Qualitative analysis: Monopsonist Attribute importance		Quantitative analysis M1 = monopsonist (mean) M2 = non monopsonist (mean)			
	Modified Rebuy	Straight Rebuy	Modified Rebuy		Straight Rebuy	
			Mean	p	Mean	p
<i>Improved Performance Cost per foot</i>	****	****	M1=3.99 M2=3.87	.59	M1 =4.01 M2=3.55	.00
<i>Technology and patents</i>	***	****	M1 =3.75 M2=4.03	.21	M1 =3.87 M2=3.52	.07
<i>Performance history (SQ)</i>	***	*****	M1 =3.87 M2=3.68	.38	M1 =4.24 M2=3.84	.02
<i>Price</i>	***	***	M1 =3.66 M2=3.77	.03	M1 =3.78 M2=3.71	.71
<i>BPA</i>	****	*****	M1 =4.13 M2=3.48	.00	M1 =3.99 M2=3.52	.01
<i>Production facility</i>	****	**	M1 =3.56 M2=2.74	.00	M1 =3.26 M2=2.61	.02
<i>Product quality</i>	***	***	M1 =4.08 M2=4.03	.78	M1 =3.98 M2=3.81	.40
<i>Service quality and repair services NPT</i>	****	***	M1 =4.09 M2=4.00	.88	M1 =3.92 M2=3.52	.09
<i>Specifications to fulfill (repair facility)</i>	*****	**	M1 =4.35 M2=4.00	.03	M1 =3.82 M2=3.10	.00

<i>Procedural compliance</i>	****	**	M1 =4.14 M2=4.35	.22	M1 =3.72 M2=4.23	.01
<i>Technical capabilities</i>	*****	***	M1 =4.18 M2=3.94	.17	M1 =3.89 M2=3.71	.30
<i>Operating control</i>	***	***	M1 =3.66 M2=4.16	.02	M1 =3.52 M2=4.03	.02
<i>Company reputation and position in the industry</i>	***	***	M1 =3.76 M2=3.42	.13	M1 =3.71 M2=3.23	.01
<i>Trust and confidence in the company</i>	****	*****	M1 =4.06 M2=3.87	.36	M1 =4.02 M2=3.32	.00
<i>Human relationships</i>	*****	*****	M1 =3.98 M2=3.74	.27	M1 =3.95 M2=3.23	.00
<i>Human resources and organization</i>	**	**	M1 =3.24 M2=3.16	.75	M1 =3.15 M2=2.90	.30
<i>Responsiveness to buyer localisation</i>	*****	****	M1 =3.88 M2=3.58	.20	M1 =3.54 M2=3.06	.03
<i>Financial reputation</i>	**	**	M1 =3.40 M2=3.97	.02	M1 =3.19 M2=3.48	.34
<i>Long-term relationships</i>	*****	*****	M1 =4.01 M2=4.26	.19	M1 =4.13 M2=3.65	.00

Note: *****Extreme importance, **** High Importance, ***Moderate Importance, **Low importance, *No importance; p is the significance level of the difference between the means for attribute importance between modified rebuy and straight rebuy; the mean values are measured on a 5-points scale.

In this section, we try to understand whether these differences are due to:

- monopsonist versus non monopsonist characteristics (as discussed above)
- cultural dimensions (see Hofstede, 1983)
- socio-economic characteristics (such as defined in country risk assessment and ratings)

The differences between monopsonist and non monopsonist market, that we have observed, make sense with respect to our expectations and the imbalance of power in monopsonist markets. But some of these differences may be due to cultural differences or specific social and economic characteristics of the market.

In order to investigate these issues, we shall focus on three major oil and gas producers and markets: Gabon (non monopsonist, ranked 37 worldwide and 5th largest oil producer in Sub-Saharan Africa), Saudi Arabia (monopsonist, ranked 1st worldwide), and Indonesia (non monopsonist, ranked 22nd worldwide and 3rd largest oil producer in Asia). All the conclusions that we draw in this section are exploratory since we have only a few respondents for the non monopsonist markets (Gabon: 10 respondents;

Indonesia: 10 respondents) while we have far more respondents in Saudi Arabia. However, our findings are indicative of tendencies.

All these three countries belong to high-context cultures (Hall, 1976) but may differ on some dimension. This uniform cultural basis is important to emphasize since the differences that we observe should not be due to cultural differences. The other explanatory factor could be the differences in terms of economic and social conditions.

3.4.1 Three high-context culture countries (Gabon, Saudi Arabia and Indonesia) and Hofstede cultural dimensions

In high-context cultures, the informal communication is of major importance. This is more the way words are said than the words themselves which count. African, Arabic, Indonesian cultures belong to high-context cultures while North European, North American cultures, for example, are low-context cultures. High-context cultures are more collectivist, rely on tradition and is more holistic in terms of communication. Low-context cultures require explicit language, expression and communication.

If we analyse cultural dimensions between countries and cooperation, high-context cultures should be relatively close to one another with respect to dimensions such as power distance, collectivism.

In the following, we analyze the six Hofstede's cultural dimensions and their differences between Gabon, Saudi Arabia and Indonesia, and the potential impact that they may have on the importance of the selection criteria. Hofstede conducted a comprehensive study of how values in the workplace are influenced by culture. For Hofstede (1983), culture is "the collective programming of the mind distinguishing the members of one group or category of people from others".

Hofstede values consist of six dimensions: power distance (index PDI), individualism versus collectivism (IDV), masculinity versus femininity (MAS), uncertainty avoidance index (UAI), long term orientation versus short term orientation (LTO), indulgence versus restraint (IND). These 6 values that Hofstede calls the 6-D model distinguish working groups and countries preferences rather than individuals preferences. Countries under study score on these dimensions, and these dimensions may evolve over time.

- *Power distance (PDI)* refers to the degree of acceptance of a hierarchical order. In countries with high power distance, employees feel at ease in organizations with hierarchical structures. In countries with low power distance, employees strive to equalize as much as possible the distribution of power and the perceived distance between hierarchical levels is lower. In such countries, we find more transversal types of structures.

- *Individualism (IDV)* refers to people who show preferences for loosely-knit social framework. In individualistic societies, people take care of themselves and their immediate family rather than taking care of their ingroup. This is the “I” rather than the “We”. For example, Western societies are more individualistic than Eastern societies. In companies, the objectives are set at the individual level in one case and for the team level or the group level in the other case. The transmission of information will be faster and more natural in the second case

- *Masculinity (MAS)* refers to achievement, material reward, assertiveness, competitiveness, and femininity to cooperation, modesty, protection of the weak, quality of life and personal life achievement, that is “working in order to live” and not working to be the best as one of one’s main objective. In terms of work, Hofstede relates masculinity to “tough versus tender “ cultures, which has an impact on working hours. In the business context Masculinity versus Femininity is also related to as “tough versus tender” cultures, to cultures with few holidays, with less social protection, versus culture which takes more care of their workers and their people at large.

- *Uncertainty Avoidance (UAI)* refers to the degree to which a society tries to control the future. In societies with high uncertainty avoidance, people feel uncomfortable with uncertainty and ambiguity and usually take less risk than in societies with low uncertainty avoidance. Entrepreneurship, innovation are particularly developed in countries with low uncertainty avoidance like the United States.

- *Long term orientation (LTO)*, versus short term orientation, refers to the attitude toward societal changes. A society with long term orientation is opened to evolutions and encourages changes which prepare the future while short-term

orientation stick to traditions and norms. In a long term orientation society, people show an ability to adapt traditions easily to changed conditions. In the business context, a company with long term orientation is pragmatic and a company with short-term orientation is more normative.

- *Indulgence* (IND) refers the search for free gratifications, where people look for pleasures in life. They try to enjoy life and have fun rather than imposing strong self-restraint and strict social norms. In a society with low indulgence (or strong restraint), people try to control their desires and impulses.

These dimensions will be different according to countries.

Hostede and his research teams have studied Middle East (with Saudi Arabia) as well as Indonesia. They did not study Gabon and did not publish data from this country but from other West African countries, and also Angola, which is pretty close in terms of culture. For Gabon, we rely on another study that collected data, following Hostede research approach, in order to develop index for some African countries (Melessen, 2017). As Melessen did not collect data about Indulgence in Gabon, we took the average of the Indulgence indices in other West African countries analyzed by Hofstede. The score is fairly homogeneous and relatively high (around 80).

Power distance: Indonesia, Saudi Arabia and Gabon

From Hofstede studies (1983 to now, see Hofstede website), *Indonesia* scores high (78) on *power distance*. In Indonesian organizations, hierarchy is strong and power is centralized. Employees expect to be told what to do and managers count on their strict obedience. *Saudi Arabia* scores even higher (95) on power distance, which means that people fully accept a hierarchical order, in society and in the organizations, in which everybody has a place and which needs no further justification. In West African countries, Hofstede found relatively large power distance (80), which is also high in *Gabon* (see Melessen comparisons, 2017) with an index (80) similar to the Indonesian score (74)

Individualism versus collectivism : Indonesia, Saudi Arabia and Gabon

Indonesia is a *collectivist society* (very low score of individualism: 14). People conform to the in-groups to which they belong. Indonesians take care of their parents and give them support in their old age. In Individualist societies, the focus is on the nuclear family only. In Saudi Arabia, the score of 25 is also very low score and characterize a collectivistic society. Again, there is a long-term commitment to the in-group, family, the extended family as well as extended relationships. Loyalty in long-term relationships is important. The management of groups and personal relationships are important. Hofstede results show that African countries relate to collectivist societies. Gabon can also be characterized by a low score of individualism (20), according to Melessen (2017)

Masculinity versus femininity: Indonesia, Saudi Arabia and Gabon

Indonesia scores low on masculinity (46). North European countries (Sweden, Danmark, Norway) are said to be feminine countries and therefore very low in masculinity. In Asia, Indonesia is less masculine than some other Asian countries like Japan, China and India. This is not material gains that bring motivation. *Saudi Arabia* scores higher than Indonesia on masculinity (60). People live more “in order to work” in Saudi Arabia and managers are expected to be more assertive with more emphasis on competition and performance than in Indonesia. As for Gabon, the score is low on masculinity (35).

Uncertainty avoidance: Indonesia, Saudi Arabia and Gabon

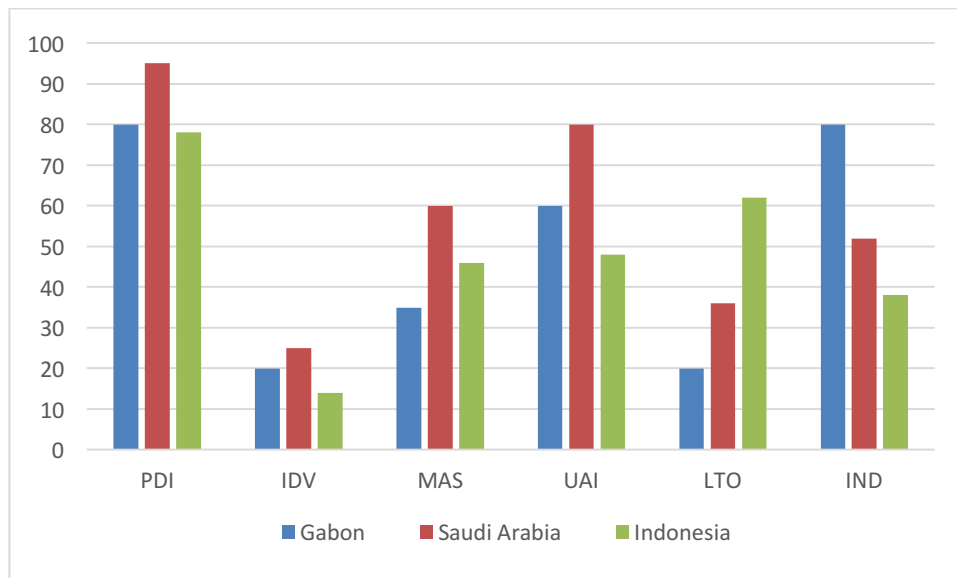
Indonesia has a low preference for *uncertainty avoidance* and scores 48 on this dimension. Even in ambiguous or uncertain situations, Indonesians will not show their embarrassment outwardly; they separate internal self from external self. This also means that in their work, they will try to maintain relationship harmony. They will never emphasize direct communication as a way to resolve conflict, but will prefer a third party intervention, in order to resolve the conflict. Uncertainty avoidance refers also to the propensity to avoid risks, and therefore not to innovate. *Saudi Arabia* scores high (80) on this dimension. People avoid uncertainly. They apply rigid codes, there may be some resistance to innovation and security is a very important issue. In organizations, the tendency for planning may be strong. Gabon

shows a moderate score of uncertainty avoidance (60). The higher score in Saudi Arabia signifies that they may rely more on rigid codes than in Gabon and Indonesia.

Long-term orientation: Indonesia, Saudi Arabia and Gabon

Indonesia has a high score of 62 on *long term orientation*. This means that it has a pragmatic culture. This indicates that they are adjust to situations, contexts and time. They have a pragmatic orientation. They easily adapt traditions to changed conditions.

In *Saudi Arabia*, the long-term orientation score is low (36), which means that the culture is more normative than pragmatic, with a great respect for traditions, and a relatively small propensity to save for the future. In this context, the IKTVA program and the political and economic evolutions represent quite a change with a new model for the future which is emerging. The lowest score is in *Gabon* with 20. This means that they have more difficulties to adjust to new situations.



Note: PDI (Power Distance index); IDV (Individualism Index); MAS (Masculinity index); UAI (Uncertainty Avoidance Index); LTO (Long Term Orientation Index); IND (Indulgence Index)

Figure 3.3 Hofstede's cultural dimensions in Gabon, Saudi Arabia and Indonesia

Indulgence: Indonesia, Saudi Arabia and Gabon

In *Indonesia*, the score is low on indulgence (38). Indonesians have a culture of restraint. Indonesians do not put much emphasis on the gratification of their desires and they strictly conform to social norms and exercised self-restraint. In *Saudi Arabia*, the score is intermediate (52) does not point to a clear orientation towards indulgence or restraint on this dimension. In *Gabon* (the score here is an average of other West Afroican countries), the score is high (80).

Globally, this means that people avoid a bit more uncertainty and are a bit more masculine in Saudi Arabia than in Indonesia and Gabon. They indulge less than in Gabon and rely more on social norms. There are no differences between these high-context cultures on Power distance and Individualism. Saudi Arabia is less long-term oriented (that is more normative and less pragmatic) than Indonesia. This makes sense with the higher importance of Specifications to fulfill in Saudi Arabia but does not explain the greater importance of Bit Performance Analyzer and Production facilities (and their localization) than in Gabon and Indonesia. And the monopsonist explanation still stands. Moreover, this doesnot explain why Operation control and Financial reputation are more important in the non monopsonist markets.

Therefore, we also analyze, the differences in specific economic conditions and the socio-economic risk also called country risk.

3.4.2 Country risk (Gabon, Saudi Arabia, Indonesia), social and economic specificities and selection criteria

In order to go further and understand if the differences that we found are only due to monopsonist and non monopsonist specificities or to other economic conditions, we investigate the specificities of the Indonesian, Saudi Arabian and Gabonese markets, globally and with respect to the oil sector. The analysis below is really exploratory in terms of findings since we had 17 respondents from Gabon, 10 from Indonesia and 77 from Saudi Arabia. They are aimed to provide tendencies rather than demonstrate reliable results or differences. No statistical test was used in this section.

Gabon social and economic specificities and selection criteria

While there is only one client in Saudi Arabia which is a purely monopsonist market, there are 11 clients in Gabon with internationally oil companies and a government-owned company, the Gabon Oil Company created in 2011 and which formed partnerships with oil and gas multinationals such as Perenco and Petronas, but its CEO was accused of personal and excessive expenditures in 2015. Corruption and repeated workers strikes constitute one of the weaknesses of this market. Corruption is still rampant in Gabon particularly in the extractive industries as the oil sector. Law enforcement against corruption is moderate and bribery is a widespread practice. In Gabon, the country risk assessment by Coface is “C” and the Business climate “C”.

Our analysis shows that two of the most important attributes of product selection for Gabon are *Operating Control* and *Financial reputation*. Complementary investigations and interviews show that this is directly related to the corruption in Gabon. Because of corruption, it is very difficult to have the drilling products enter the country in a timely manner. There is always a high degree of uncertainty of the clients and they want to take as little risk as possible. That is why it is extremely important to have a supplier with a high degree of operating control. The client needs to make sure that the drilling bit is in the country. If not, the client will not proceed to the deal with the supplier. The supplier *Financial reputation* is an extreme important attribute for the non-monopsonist market in Gabon, since it indicates that the supplier can invest and clear all the obstacles while doing business in such a difficult environment.

When we examine the Straight rebuy case, the monopsonist client gives more important to the tool that it uses to constantly assess the drilling product performance, even if this product is on the approved list: BPA (Client performance analyser) and again to human relationships IKTVA program that is Responsiveness to buyer and local production, as well as long-term relationships.

These findings are quite important since it appears the the service providers in some way underestimate the shift in criteria importance during these past years, due to the Kingdom new policy. Technical issues have always been of major importance but the monopsonist changed its mindset and the clients have to take it into account in order to remain competitive. As we saw it in chapter 2, Schlumberger has understood the importance of this change and has successfully responded to it, but not completely.

Q14

C

Impact of Operating Control on Product selection

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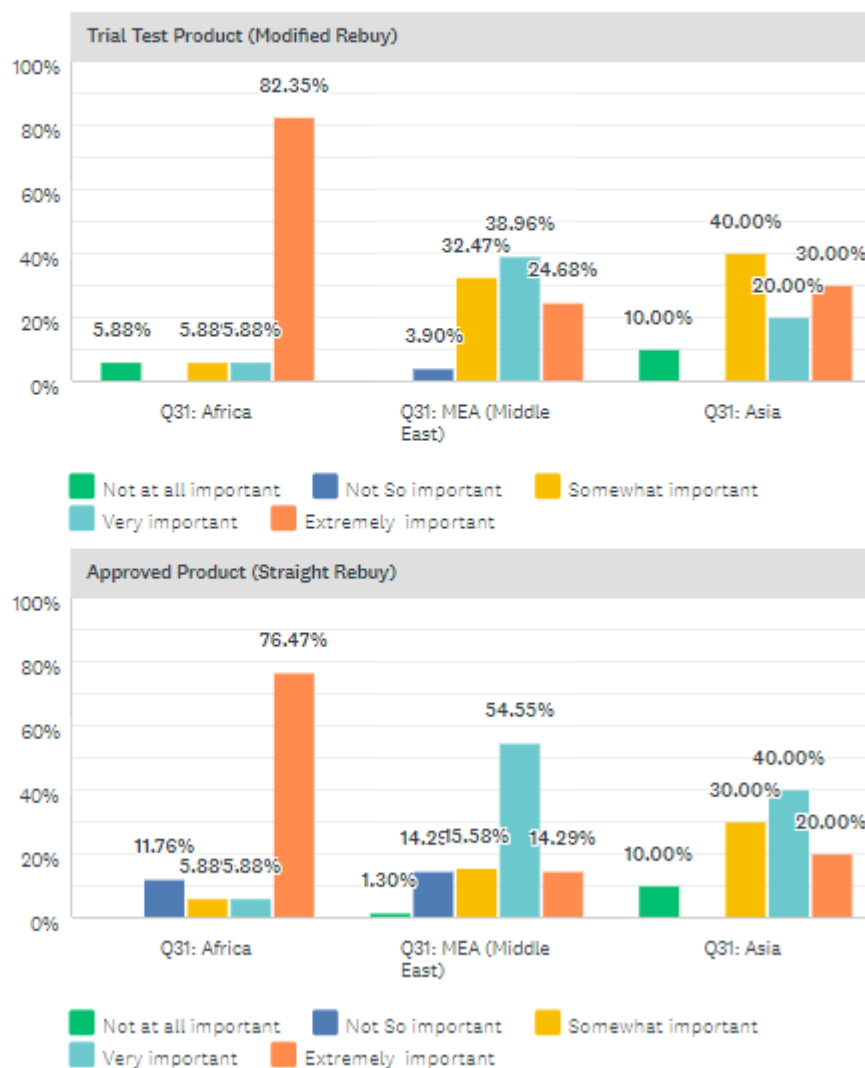


Figure 3.4 Importance of Operating control in Gabon versus Saudi Arabia and Indonesia

Q22

Impact of Financial reputation on the Product selection

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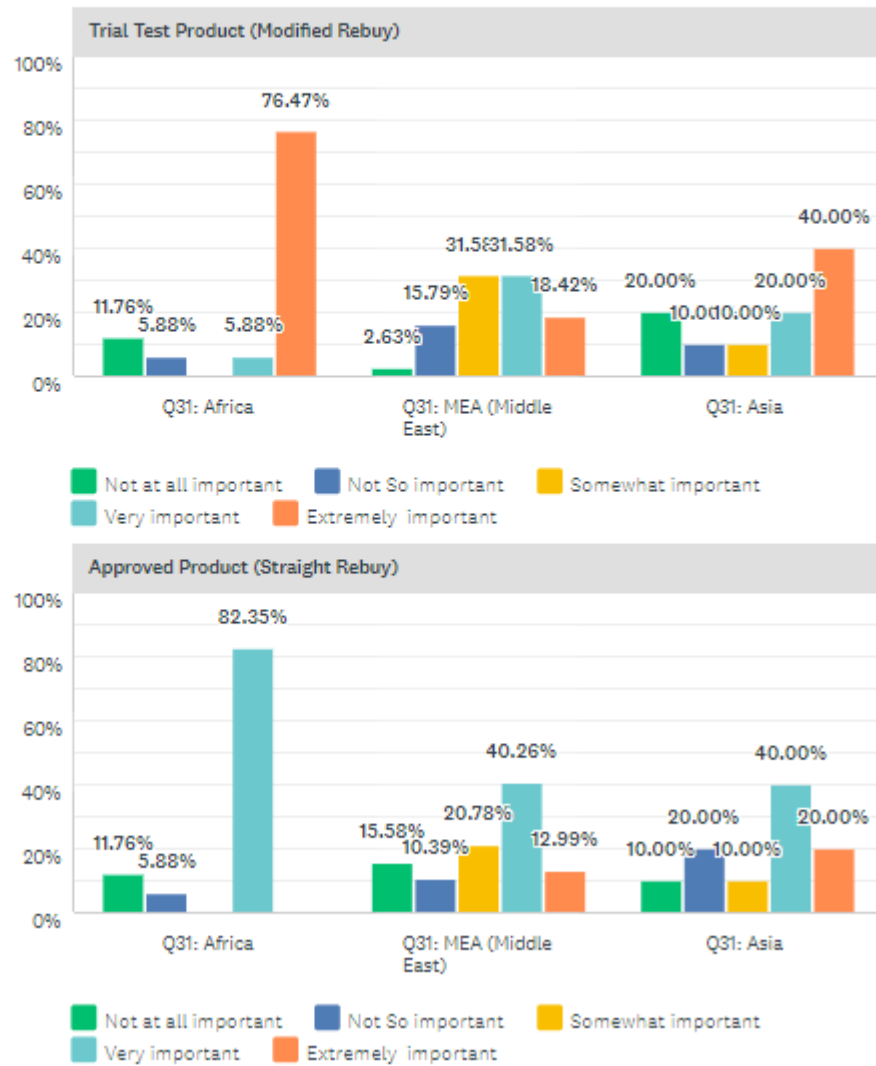


Figure 3.5 Importance of Financial reputation in Gabon versus Saudi Arabia and Indonesia

Indonesia social and economic specificities and selection criteria

It should be noted that in Indonesia, where there is a higher level of corruption than in Saudi Arabia, and where there are less control over the suppliers, characteristics such as Operation control and Financial reputation are also more important than in Saudi Arabia. Regarding the second non-monopsonist example represented by Indonesia, there are twenty to thirty clients, the number varying, national oil companies (NOCs) such as Pertamina

which represents 16% of the market, international oil companies (IOCs) and government-sponsored oil companies (GVs). Globally, the weight of the national oil companies and government-sponsored oil companies is more important than in Gabon. Moreover, the Indonesian oil market for the drilling products is a *price oriented market* (Modified rebuy: score of 4.00 for Indonesia versus 3.53 for Gabon and 3.57 for Saudi Arabia; Straight rebuy: 4.00 for Indonesia versus 3.67 for Saudi Arabia and 3.53 for Gabon).

Impact of Price on Product selection

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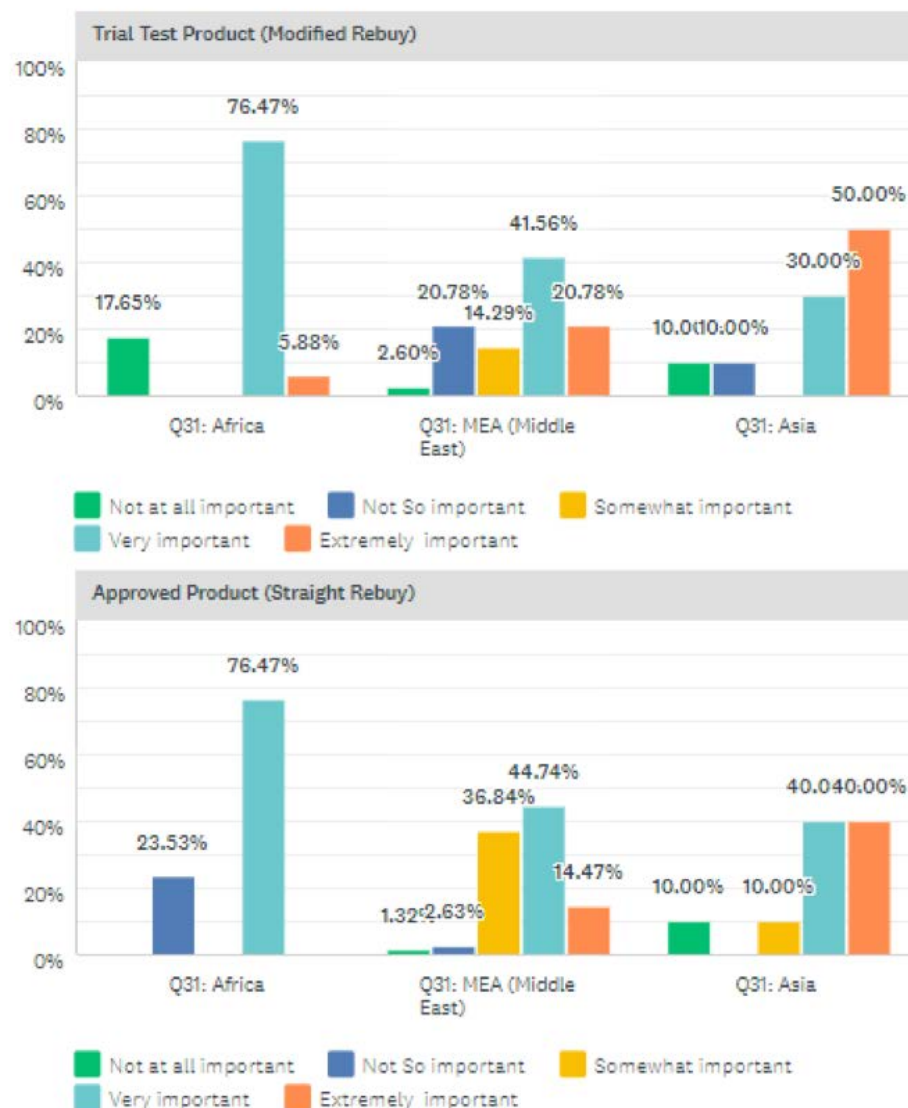


Figure 3.6 Importance of Price in Indonesia versus Saudi Arabia and Gabon: Impact of Price on product selection

As observed above, Indonesian people have a lower Indulgence index (38) than Saudi people (52) or Gabonese (80). Researchers have shown that self-restraint (that is the opposite of indulgence) and frugality are positively related to price consciousness and value consciousness (Lastovicka et al, 1999; Shoham and Brencic, 2004).

The influence of the NOCs which are the National oil companies is also important. These companies are influenced by the Government and, for them, localization and the responsiveness of to the client demands are extreme important. This is why, it is almost as important as for Saudi Arabia in the case of Straight rebuy (Indonesia: 3.60, Saudi Arabia: 3.68, Gabon: 2.82) while it is less important for Modified rebuy, with the strong power of the unique government company, Aramco in Saudi Arabia (Indonesia: 3.50, Saudi Arabia: 4.00, Gabon: 3.65).

Impact of responsiveness to buyer demands (Localisation) on the Product selection

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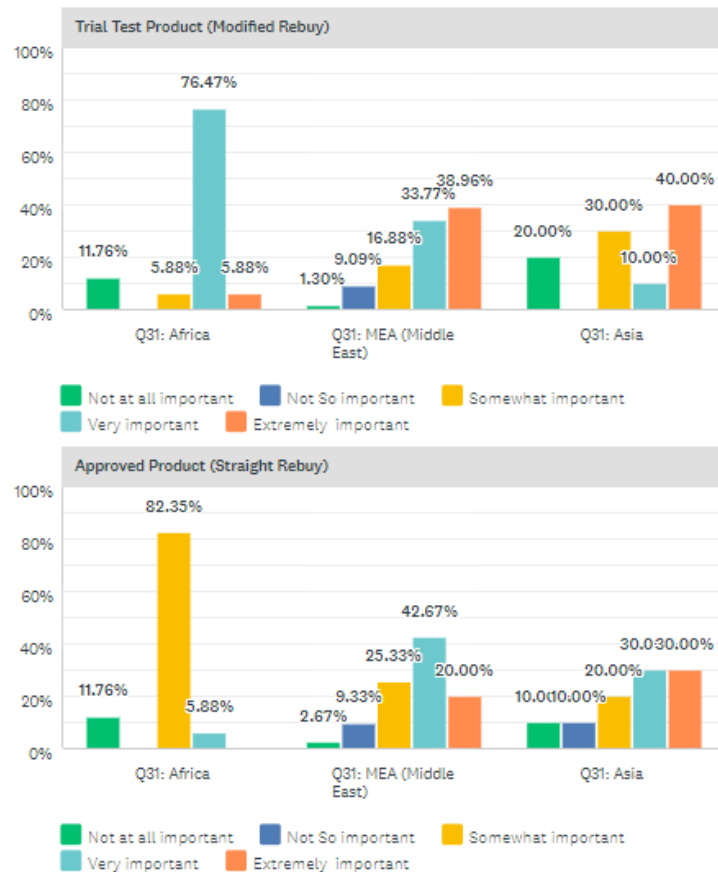


Figure 3.7 Importance of Responsiveness (localization) in Indonesia versus Saudi Arabia and Gabon

As for the other attributes, the Indonesian culture sounds closer to the Saudi Arabian culture than the Gabonese culture (scores of the Hostede's dimensions). The shared muslim culture (88% of the population is muslim in Indonesia) and the business behavior related to this culture is also closer between Saudi Arabia and Indonesia than with Gabon.

Consequently, due to the weight of NOCs and GVs in Indonesia and to a partially shared culture, and while the differences between monopsonist and non monopsonist markets are still observed between Saudi Arabia and Indonesia, these differences are less strong than between Saudi Arabia and Gabon. There is an effect of the cultural dimensions, but the effect of the monopsonist versus non monopsonist conditions still remain.

3.4.2 Conclusion

The objective of this chapter was firstly to examine the external validity of the qualitative findings, about the importance of the attributes in product selection (Aramco's monopsonist case), by comparing the results of the qualitative analysis with those of a quantitative analysis. The second objective was to compare the importance of these attributes between monopsonist and non monopsonist markets. Finally, we discussed whether other variables such as cultural dimensions or other economic characteristics could exert a moderating effect on the results. Therefore, we administered a structured questionnaire to 116 respondents: 85 respondents from monopsonist markets (77 respondents from Saudi Arabia with the Aramco monopsonist case, 2 from Algeria and 6 from a oligopolist market: Venezuela) and 31 from non monopsonist markets (17 from Gabon, 10 from Indonesia and 2 from Russia, and 2 from Canada).

The quantitative analysis was conducted via a structured questionnaire with 5-point scales and with t-tests were used for mean comparisons.

First objective: external validity

For the Saudi Arabian market, that is the monopsonist market analyzed in this research, the results demonstrate a strong convergence between the qualitative and

quantitative analysis by comparing the importance of the attributes in the Modified rebuy (trial test) case and the Straight (Repetitive rebuy or Approved product) case. In the quantitative analysis as in the quantitative analysis, the importance of the selection criteria is greater for the Modified rebuy than for the Straight rebuy (when they significantly differ), except for Performance history. In this latter case, this is normal and was expected since the performance history (with data collected on a quarterly basis) help assess the product performance in a repetitive buying context. The selection criteria that appeared as necessary to have the product approved (Modified rebuy) in the qualitative analysis remain significantly more important in the modified rebuy situation than in the straight rebuy situation: : service quality and repair services (NPT), specifications to fulfill, procedural compliance, technical capability for modified rebuy in order to have the product approved, but also IKTVA. For the modified rebuy, a company has to outperform its competitors on the greatest number of attributes.

Moreover, both technical respondents and operation respondents answered the questionnaire and their importance scores of the selection attributes are not significantly different, either for Modified rebuy or for Straight rebuy. There is one exception for Modified rebuy (higher score for the operations respondents for Production facilities) and one exception for Straight rebuy (higher score for the technical respondents for BPA: bit performance analyzer which is their main tool to assess performance). These results completely make sense.

We also compared responses from the client respondents with responses from the suppliers respondents. As expected, the client respondents gave more importance to the Kingdom strategy-related attributes (IKTVA program) and items such as responsiveness and local production facilities. On the other way, the suppliers respondents think that Patent and technology are more important. The Kingdom vision directly affects the vision of the monopsonist government-owned company, Aramco. The suppliers respondents have to quickly take this evolution into account when they have not done it already.

Second objective: comparison of the selection attributes between monopsonist and non monopsonist markets

The buyer power is stronger in a monopsonist market than in a nonmonopsonist one and the supplier absolutely needs to have its product approved by the client. In a monopsonist market, the power of the client remains very strong even once the product is approved. Therefore, we expected most selection criteria to be more important for monopsonists than for non-monopsonists for Straight rebuy, and not to be significantly different between monopsonist and non monopsonist for Modified rebuy. One of the main strength of the monopsonist client is its excellent historical database about all suppliers since the monopsonist centralize everything. For *Modified rebuy*, as expected, the differences of importance between the two markets (monopsonist and non monopsonist) are non-significant, except for only three attributes which are always higher for monopsonist under the modified rebuy condition but also the straight condition: Client performer analysis (BPA), production facility, and specifications to fulfill. Actually, production facility are high since the client compels the supplier to invest in the country and install its production facilities. As for Specifications to fulfill and BPA (Bit performance analyzer), they are the first and fourth most important attributes (Table 3.8) in a monopsonist market for Modified rebuy. This is no surprise that more efforts are made on these two dimensions in order to have one's product approved in a monopsonist market. It should be noted that two dimensions are more important for non monopsonist than monoipsonist in the Modified rebuy case: Operating control and Financial reputation. This deserved further discussion. For *Straight rebuy*, the attributes were expected to be more important in the product selection process of the monopsonist when they are associated with performance and cost and with maintaining excellent long-term and human relationships between the supplier and the client. Results fully support these expectations . It also appeared that company reputation and position and Tproduction facility are also higher in the monopsonist case, since it mpay be related to long term relationships and overall reputation, as well as investment in the country.

Greater importance in the non monopsonist case: Operation control and Financial reputation

As discussed earlier, the importance of the attributes does not seem affected by the Hofstede's cultural dimensions in the countries, with our example of three monopsonist and non monopsonist markets in high-context cultures for the oil parket (Saudi Arabia, monopsonist; Gabon, non monopsonist; and Indonesia, non monopsonist). The small number

of respondents in each one of the non-monopsonist markets does not allow us to run statistical tests. However, our findings show that the high importance of Operation control and Financial reputation can be explained by the need to have reliable and financially no-risk suppliers, which are in control of the situation, can provide the drilling products and bring them in the producing country, whatever the economic or social barriers, such as political and economic uncertainty or corruption.

Conclusion

We first present the main findings, corresponding to the three research questions. We then indicate what are the main contributions of this doctoral dissertation from a conceptual point of view and for managers. Finally, we shall discuss the difficulties that we met, the limits of this work and the areas for future research.

Objectives, research questions and main findings

The objective of this thesis is to help a company gain a competitive advantage in a monopsonist market. Therefore we first study the value creation for the monopsonist in the market and the way the suppliers may respond to the client needs to create client value (research question 1, RQ1). We then analyze the buyphases, the buying center, the buying situations and the buying process and their specificities in a monopsonist market (research question, RQ2). This leads us to identify the selection criteria of the suppliers for the monopsonist, and their importance with respect to the buying situations. From this analysis and from the positioning of the suppliers on these dimensions, strategic moves can be proposed to gain competitive advantages (research question 3, RQ3). Research questions 2 and 3 relied on a mixed methodology but mainly on a qualitative analysis with key respondents at Aramco (the monopsonist) and at the suppliers. Finally, we carried out a quantitative analysis over 116 respondents in monopsonist and nonmonopsonist markets to give some external validity to our qualitative findings and to compare the selection criteria between monopsonist and non monopsonist markets.

We summarize below the main findings with respect to the three research questions.

RQ 1: What are the sector characteristics and the value chain in a monopsonist market (Case of the drilling Sector in the Oil Industry) ?

The first chapter analyzed the characteristics of a monopsonist sector, the drilling activity in the upstream sector of the oil and gas industries in Saudi Arabia. The rivalry in the market is strong with the huge buying power of the unique client, Aramco, a government-owned company whose objectives are evolving under the pressure of the

environment and the new sustainable impulse and objectives of the royal family. A vast program of economic transformations has been undertaken in the Kingdom, which should lead to more diversification in the activities, limit the Kingdom dependency on oil, and enhance employment and consumption.

The issues, when we apply Porter's five forces analysis, are not only related to economic aspects but also to technology, politics, and integrated solutions within a sustainable approach and a holistic vision of the Kingdom development. In monopsonist markets, the suppliers try to find solutions through cartels, technology patents but also politics and strong historical relationships in order to respond to new environmental pressures. Their capacity to respond to these new challenges, which go beyond technical issues is a key success factor in these changing markets, with a unique client. When we analyze the value chain of the drilling sector, it clearly appears that the contemporary value chain (Presutti and Mawhinney, 2013) makes more sense than the traditional Porter's value chain (see Figure 1.15). These issues are also of great importance in the contemporary value chain with environment considerations (Friedman, 2007); suppliers must respond to economic (performance, profit), social and environmental demands.

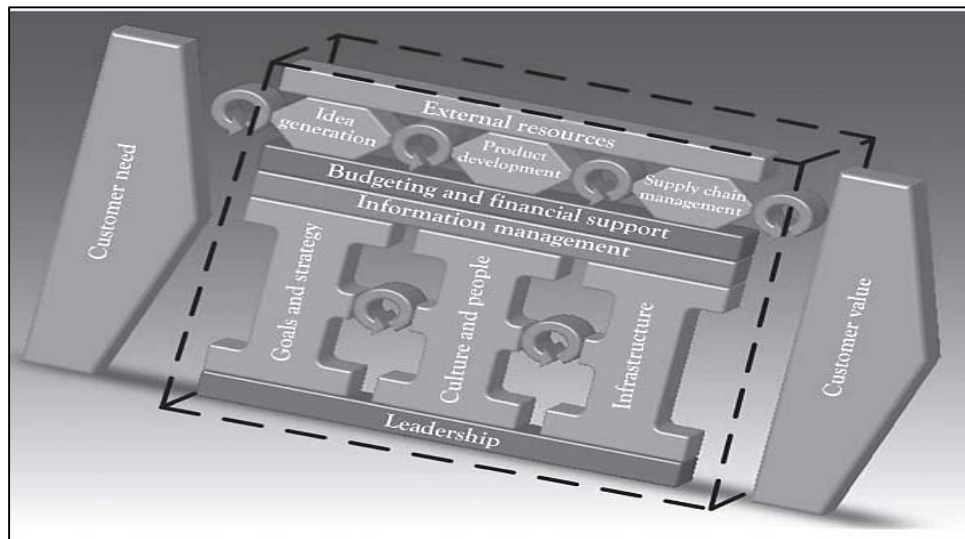


Figure 1.19 The Contemporary Value Chain or Presutti and Mawhinney's model

(Source: Presutti and Mawhinney, 2013)

As we said in the conclusion of chapter 1, Presutti and Mawhinney's (2013) contemporary value chain argues that the effective functioning of the value chain fundamentally depends on a holistic vision of the firm and of its environment; In particular, the quality of a firm's leadership, corporate culture, the quality of its people, and the alignment between the firm's strategy, the organization and its environment. These dynamic process, which goes from Customer needs to Customer value, is clearly Client centric and perfectly corresponds to the way suppliers try to respond to the monopsonist demands in the drilling sector in Saudi Arabia. This contemporary value chain also puts the emphasis on leadership, goals and strategy, but also on culture and people, and infrastructure. They were supporting activities in Porter's traditional value chain but are core elements of the contemporary value chain. Examples in the drilling sector show again that these activities are an important aspect of value creation for the client in a monopsonist market. The contemporary value chain also refers to corporate social responsibility as a universal notion, important in contemporary business. This resonates well with the current evolutions in the Saudi Kingdom. Globally, the key issues of today's drilling market in the oil and gas industries are of course the performance, but also the people, the processes, the technology integration and the will to accompany the client in its evolution and new demands.

RQ 2: What are the Buying Center and the Buying Behaviour (Process, roles and Influences) in a monopsonist market? (Case of drilling Sector in the Oil Industry)

In our research, we showed the specificities of the buying situations, where the differences between New task, Modified purchase and Repetitive purchase are not easy to make. In the drilling sector, there are rarely completely New tasks since the technical needs are often the same: to drill faster and deeper at the lowest cost per foot. The products which are proposed correspond more to Modified rebuy than to New task,. However, the whole purchasing process has to be accomplished to have the product approved by the monopsonist, with the role of the initiator to propose the new modified product. This is why we analyze two buying situations in this research: Modified rebuy (also called Trial test product) and Straight rebuy (also called Approved product or Repetitive rebuy)

In the drilling monopsonist market, in the Modified rebuy situation, the new product

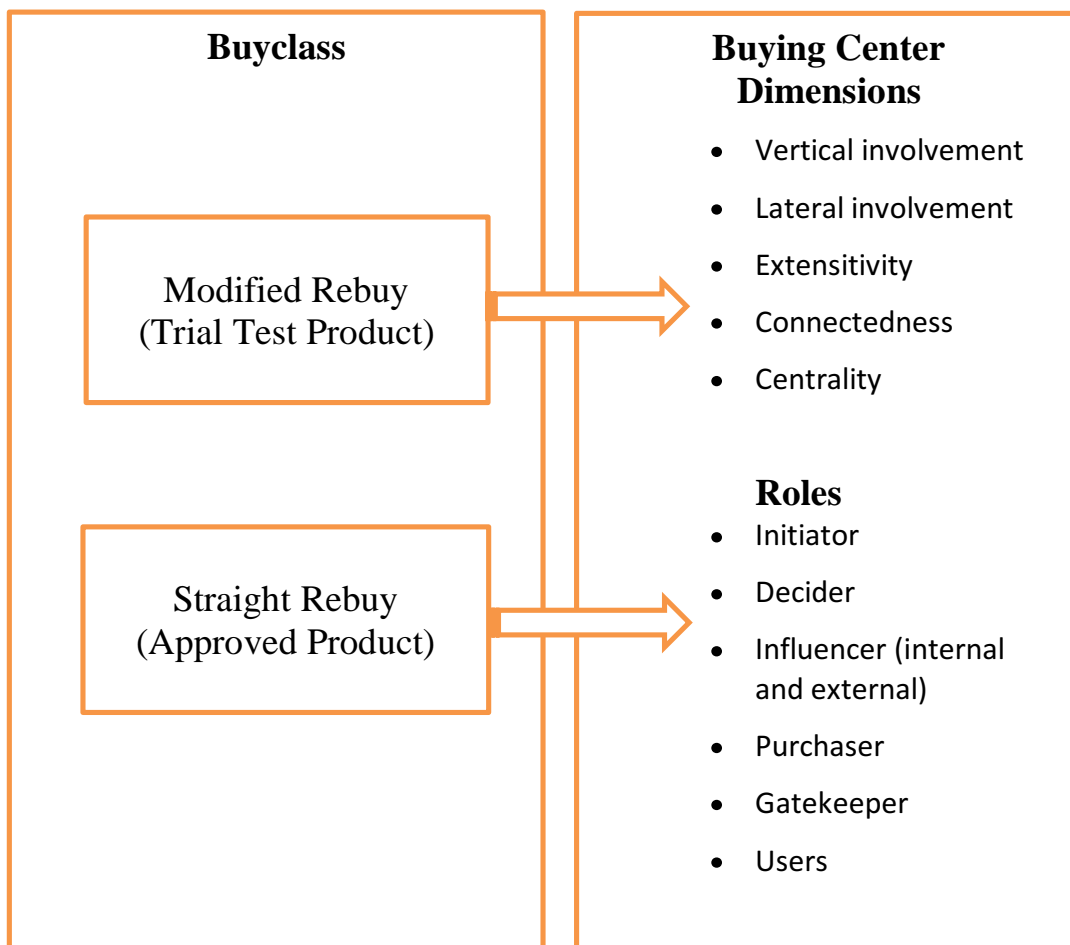
has to “be approved”. This is the reason why Modified rebuy is also called “Trial test product”. The observance of strict rules and processes determined by the monopsonist is necessary to have the product approved and be present on the approved list. Without this approval, there is no chance to enter the market for this product. In a monopsonist market with strong rules, there are more hierarchical levels (vertical involvement) and lateral involvement in the buying center than for non monopsonist markets in general. The process is complex for Modified rebuy. For Straight rebuy, the process is a bit less complex than for Modified rebuy but more complex than in non monopsonist situations. Actually, the repetitive buying is less automatic in the monopsonist market than in the non monopsonist one. And a larger number of individuals are implied in the process compared to situations with less powerful buyers (Figure 2.9), as expected (Lewin and Donthu, 2005). A maximum of 12 individuals were involved in the Modified rebuy situation and a maximum of 9 individuals (extensivity) participated into the purchase process, on the buyer side, which is high for repetitive buying.

The roles are clearly identified in the Modified rebuy situation and the Straight rebuy situations, with the key influence of the technical department of the buyer in the Modified rebuy situation and the key influence of the operation department in the Straight situation (Figures 2.7 and 2.8). The main technical choices have to be made for the Modified rebuy situations (centrality). Once the main technical choices have been made, the operations and purchase departments will take the lead in the Straight rebuy purchase process, as expected. The processes and the figures are extensively explained in chapter 2.

Industrial Buying:

Supplier selection Criteria

Performance and financial impact, Price, Technology and patents, Performance history, Procedural compliance, Trust and confidence in the company, Human relationships, Responsiveness to Buyer Demands (IKTVA Program), Long-term relationship, Service Quality and repair services, Production facilities, Product Quality, Technical capability, Company reputation and position in the industry, Human resources and organization, Financial reputation



Note: the attributes mentioned in this figure are not ranked by degree of importance but their order of presentation reflects groups of level of importance such as found in this research

Figure 2. 9 Research framework and supplier selection criteria for a monopsonist

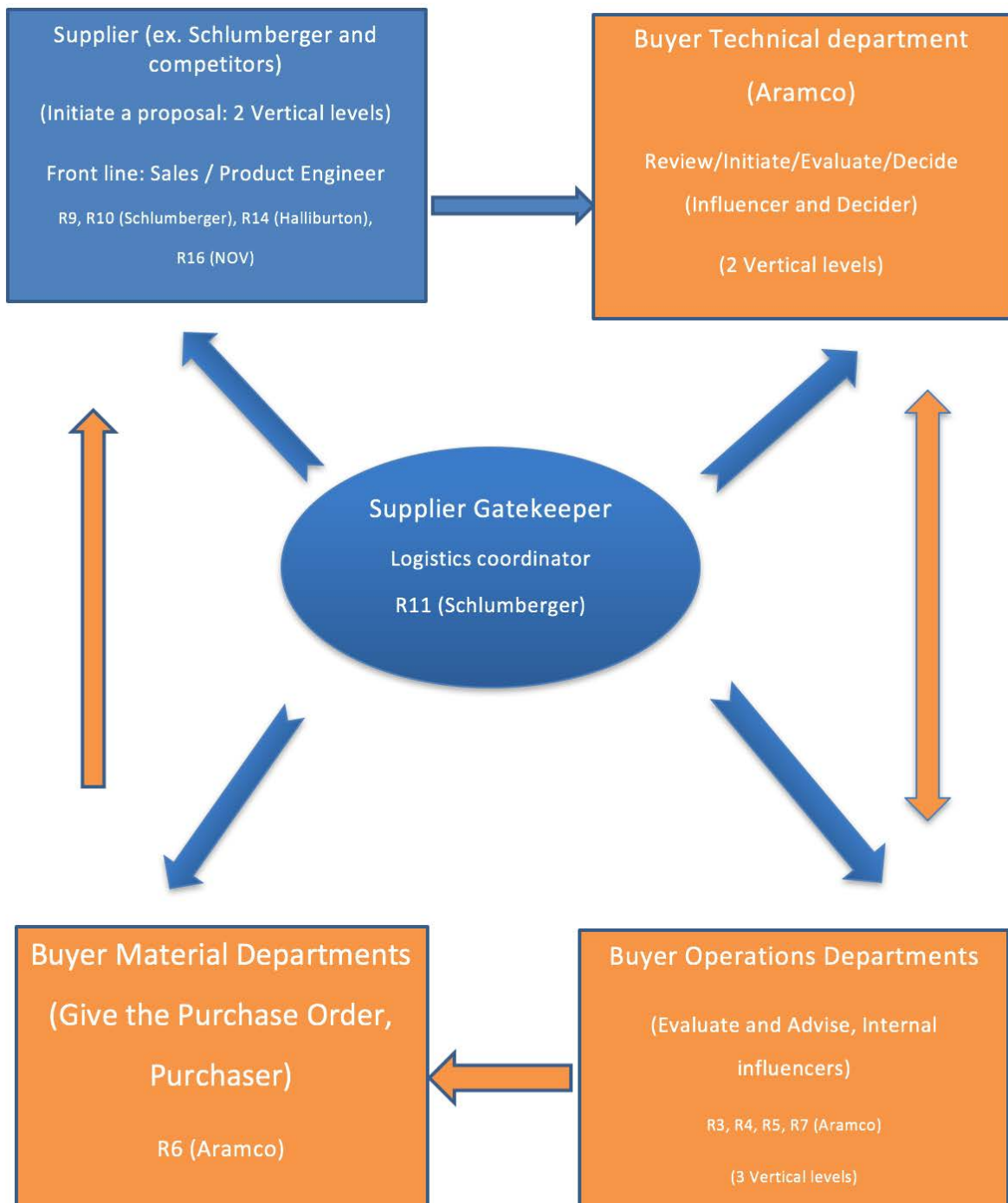


Figure 2.7 Buying process for the Modified rebuy situation (Drilling sector)

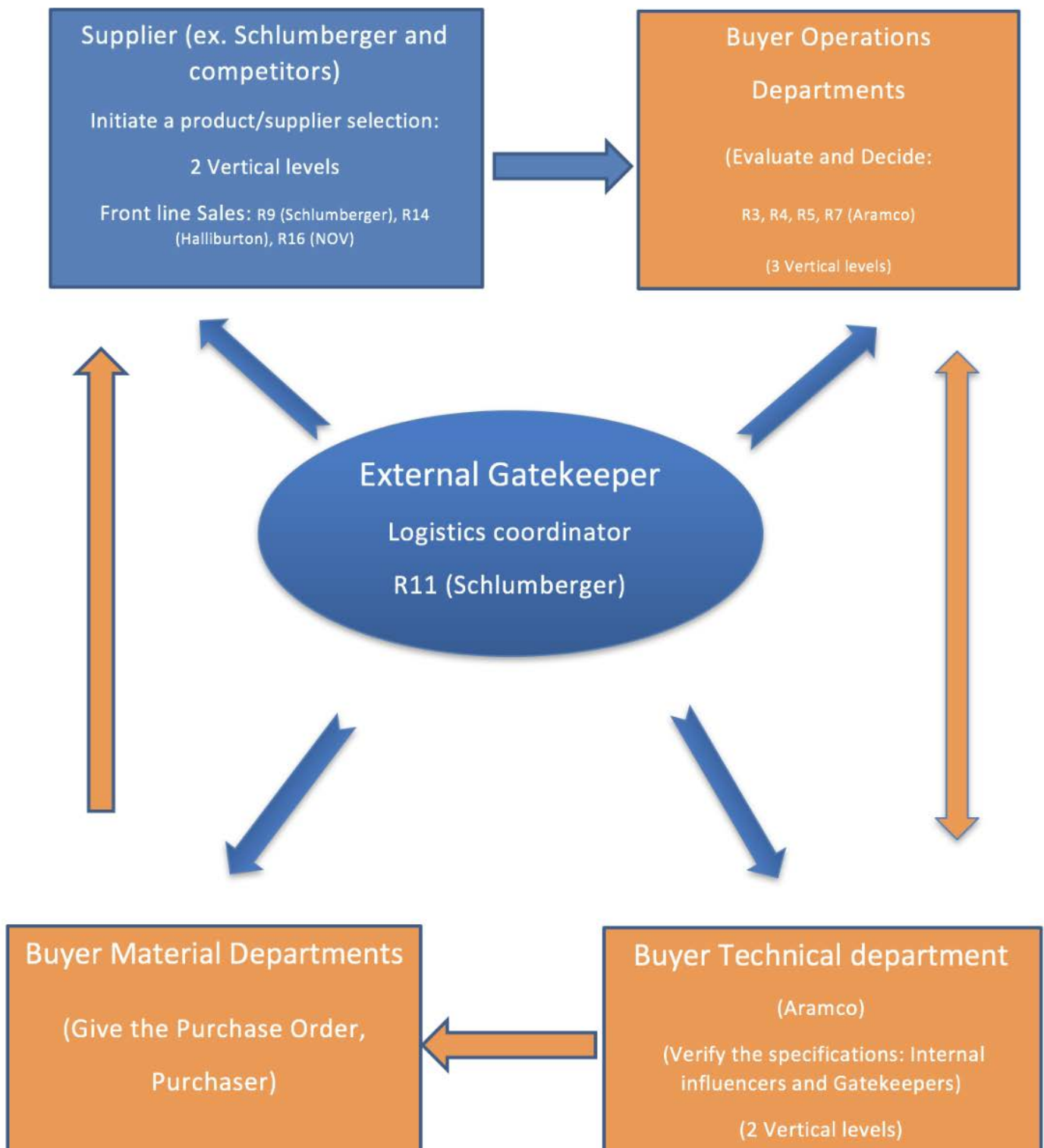


Figure 2.9 Buying process for the Straight rebuy situation (Drilling sector)

RQ3: What are the important attributes in the buying center and how to gain a competitive advantage in a monopsonist market? (Market case of drilling Sector in the Oil Industry).

The qualitative analysis was carried out over 17 respondents. It had the objective of decomposing the buying process, identifying the actors in the buying center and their roles in a monopsonist market. It should be underlined that the role of the King and the Prince is important in the system throughout the IKTVA program and the new Kingdom policy. Their role has been taken into account but it was not conceivable to request an audience with the King, the Prince or their relatives. However, the impact of these main actors have been taken into account via the selection attributes that relate to the IKTVA program.

The identification of the attributes and their importance were assessed via the qualitative analysis. Their respective importance was evaluated for the Modified rebuy and the Straight rebuy situations. The main attributes, as we expected from the analysis of the sector and that of the value chain, correspond to performance dimensions, human relations and long term relationships, and capacity to respond to the new demands of the Kingdom. Performance comprises technical performance itself and cost per foot, performance history and BPA (Bit Performance Analysis), but also service quality, repair services and specifications to fulfill. Human relations and long-term relationships are important. Responsiveness to the new demands of Aramco and of the Kingdom includes responsiveness to buyer's demands with localization of human resources and the In-Kingdom total value add program. We could add trust and confidence, with long term investment, to the responsiveness dimension since they demonstrate the supplier involvement in the country future.

A particularly interesting point is the fact that the environmental issues, the long term relationships and the capacity to give positive solutions to the IKTVA program are almost as important in the Straight rebuy (or Approved product) case as in the Modified rebuy case. These findings are very specific of a monopsonist market, where the buyer can unilaterally and suddenly stop the relationship, even in a repetitive purchasing context. This can even happen when the supplier company becomes undesirable for a reason that is not directly related to the product. Moreover, it should be mentioned that the technical dimensions remain very important and in particular the cost per foot and the BPA along with other dimensions (Table 2.15).

Table 2. 195 Differences in attribute importance between modified rebuy and straight rebuy (qualitative analysis)

General criteria	More detailed attributes	Modified rebuy	Repeated buying	Overall importance of the Criterion
<i>Performance And financial impact</i>	Improved Performance Cost per foot	*****	****	****
	Drills faster (ROP) Rate Of Penetration	*	*	*
	Drills Longer (Footage)	**	**	**
	Low cost or cost effectiveness (minimize drilling cost)	*****	***	*****
<i>Technology and patents</i>	Regular technological innovations (ROP, Durability)	***	****	****
<i>Performance history</i>	SQ (Service Quality) Performance on a quarterly basis	****	*****	*****
<i>Price</i>	Price	***	***	***
	Bit performance (with analysis BPA CPF)	****	*****	*****
<i>Production</i>	Local Production facilities and capacity	****	**	***
<i>Product quality</i>	Trust confidence in the tool	***	***	***
	Durability of the product	**	**	**
	Reliability and rerunability of the product	**	**	**
<i>Service quality and repair services</i>	Service quality and repair services (number of failures ; non productive time)	*****	***	****
	Specifications to fulfill (repair facility)	*****	**	***
<i>Procedural compliance</i>	Trial Test (Approved Product)	****	**	***
	Availability in country (Technical capabilities)	*****	***	*****
	Operating control	***	***	***
<i>Company reputation and position in the industry</i>	Company profile	***	***	***

<i>Trust and confidence in the company</i>	Long term investement	****	*****	*****
<i>Human relationships</i>	Politics and relations	*****	*****	*****
<i>Human resources and organization</i>	Management and organization	**	**	**
	Desire for business	*	**	**
<i>Responsiveness to buyer demands (IKTVAprogram)</i>	Localization of human resources	*****	****	*****
	Localization of content	**	*	**
	Transfer of technology	*	*	*
	IKTVA (In-Kingdom Total Value Add) program	*****	****	*****
<i>Financial reputation</i>	Overall financial reputation	**	**	**
<i>Long-term relationships</i>	History of relationships	*****	*****	*****

Note: ***Extremely importance, **** High Importance, ***Moderate Importance, **Low importance, *No importance**

As for the strategic moves for a supplier, everything depends upon its positioning on the attributes. It is therefore necessary to assess the importance of the attributes, the performance of the supplier with respect to its competitors, the dimensions on which the company has a competitive advantage, the ones on which there is a potential danger if the competitors improve their performance. In our research, the supplier that we chose for the analysis was Schlumberger. As shown in Table 2.18 and said in chapter 2, it appears that this company has important competitive advantages from a technical standpoint (performance and financial aspects, cost per foot, procedural compliance, technical capabilities) but also with respect to non economic dimensions such as the IKTVA program, the localization of human resources and long-term relationships. But on some other highly important attributes such as performance history, technology and patents, all main competitors including Schlumberger are excellent, although they have their own specificities and focus on different segments of the market as for technology and patents. On some other very important dimensions, Schlumberger incurs the risk of being outperformed. This could be the case with production facilities and capacity, and specifications to fulfill. In such cases, the speed of reaction and adaptation is crucial. This speed depends upon the capacity to quickly take strategic decisions and the type of resources that the company is ready to invest locally.

In this conclusive chapter, we shall not develop the external validity issue with the quantitative analysis. Let us say that the quantitative analysis with 77 respondents in Saudi Arabia shows that the results obtained from the qualitative analysis hold with the quantitative analysis. This is globally true with respect to the importance of the attributes, but also with respect to the Modified rebuy/Straight rebuy comparison. Details are presented in chapter 3.

Table 2. 18 Schlumberger competitive positioning and strategic moves

Schlumberger performance	Positions with respect to competitors	Importance of the supplier selection attributes		
		High importance	Moderate importance	Low importance
Excellent performance	<i>Better than competitors</i>	Main competitive advantage <ul style="list-style-type: none"> • Performance and financial aspects (improve tools ; cost per foot) • Procedural compliance • Technical capabilities • Localization of human resources • IKTVA program • Long-term relationships 	Potential opportunities <ul style="list-style-type: none"> • Company profile • Trust and confidence in the product 	Maintain <ul style="list-style-type: none"> • Management and organization • Drill deeper • Durability of the product
	<i>Equal to competitors</i>	Maintain constant effort <ul style="list-style-type: none"> • Performance history • Technology and patents 		<ul style="list-style-type: none"> • Transfer of technology • Overall financial reputation • Desire for business • Drill faster
Very good performance	<i>Equal to competitors</i>	Improvements to be made <ul style="list-style-type: none"> • Bit performance analyzer • Human relationships • Service quality and repair services • Trust confidence in the company 	<ul style="list-style-type: none"> • Operating control 	
Good	<i>Less good than competitors</i>	Main risk incurred <ul style="list-style-type: none"> • Local production facilities and capacity • Specifications to fulfill 	<ul style="list-style-type: none"> • Price 	
Not good	<i>Less good than competitors</i>			Potential danger <ul style="list-style-type: none"> • Localization of content

Main contributions, limits and future research areas

Main contributions and implications

The above presentation of the main results also indicates the main contributions from a conceptual and managerial point of view. Some of them can be further developed below.

Conceptual contributions

In order to understand how to gain a competitive advantage in a monopsonist industrial market, we used a mixed methodology, adapted to our research questions. The first chapter, starting from the definition of monopsony in economics and the description of the drilling sector in the oil and gas industry, has used very classical methods to analyze the sector, with Porter's five forces and Porter's value chain. We relied on research articles but also on internal data from oil and gas companies, documents and reports. This led us to ascertain that Porter's value chain was poorly adapted to the drilling sector context and that it was more interesting, in terms of face validity of what happens in the market, to use the contemporary value chain (Presutti and Mawhinney, 2013). This relatively descriptive approach in the first chapter helped us understand the sector and the phenomena at work: the relationships of suppliers with the monopsonist in the industry.

Once the framework of the sector was set up, the specificities of the buying center and of the buying process in a monopsonist market could be analyzed. This has not been previously done to our knowledge. Some evolutions in the analysis of the buying center have been emphasized by Webster and Wind (1996) and Wind and Thomas (2010) with the importance of globalization, increased competition and rapid changes in the environment, which may have a direct impact on the number of buyclasses considered in a specific market. Other evolutions of the selection criteria have been analyzed but our expectations were directly related to the changing demands of the monopsonist. The qualitative analysis showed this was true with the new demands of Aramco, caused by royal preoccupations for the future of the kingdom. We also expected differences of information requirements for non monopsonist and monopsonists (See Table 2.7). The analysis of the buygrid, that of the involvement and of the importance of the attributes, and the findings about the number and types of attributes considered by the monopsonist support these expectations.

Table 2. 7 Expected differences of information requirements for Non monopsonist and monopsonist in the oil and gas industries

Type of Buying Situation (Buyclass)	Newness of the problem	Information requirements		Consideration of New Alternatives	
		Non monopsonist	Monopsonist	Non monopsonist	Monopsonist
Modified rebuy	Medium	Moderate	High	Limited	Moderate
Straight rebuy (approved product)	Low	Minimal	Moderate to High	None	Moderate

One of the main contribution is certainly about the Straight rebuy situation. We show that for Modified rebuy, the differences between the importance of the selection criteria for monopsonist versus non monopsonist markets are not statistically significant. On the contrary, in the Straight rebuy situation, these differences are almost always significant. The results are consistent between the qualitative analysis and the quantitative analysis and with our expectations.

Finally, when the importance of attributes is higher in non monopsonist markets than in monopsonist markets (Operation control and Financial reputation), we also show that this can be explained by economic and social conditions which accentuate these differences as in Gabon, with a high level of corruption and uncertain business conditions in the market. Finally in chapter 3, we have tried to understand the role of the monopsonist versus non monopsonist markets compared to the role of cultural dimensions and other social and economic factors in explaining differences in selection criteria.

Managerial contributions

This dissertation is an executive doctoral dissertation, and therefore applied to a business situation. The objective is not to develop new theories but to apply already

well-known concepts to new situations and propose useful strategies for companies in these new situations. That is what we have done by proposing a way to gain a competitive advantage for a competitor like Schlumberger.

But the managerial contribution is larger than strategic moves proposal. We provide insights into the buyclasses, the buying center, the roles of its members and the detailed process which is followed. A supplier can clearly understand this buying process and develop a strategy to fulfill the needs of the monopsonist but also of the participants in the buying process from the client side. Moreover, and we think that this is may be the most important, this work show evidence that very important attributes are not only technical but also human, and the responsiveness and the “good citizen” policy are extremely important in a monopsonist context.

Previous studies on selection criteria in general (Dickson, 1966; Jaysinpure et al, 2016), but also in the oil industry (Khodadadi, 2006; Luzon and El-Sayegh, 2016) had not shown these types of findings previously. This has important implications for companies and in particular suppliers.

Limits and areas for future research

Among the difficulties that we met, we must mention the data collection. This research deals with sensitive issues for the respondents, whether they belong to the monopsonist Aramco or to suppliers. We are a Schlumberger’s manager and respondents needed to have trust and confidence to participate in the study. To collect reliable information through the semi-structured in-depth interviews or through the questionnaire, it was necessary not to introduce bias (reluctance to answer or on the opposite social desirability; and to avoid confidential questions). Developing trustful relations with the respondents has been one of the issues of the data collection. Once we had a set of reliable respondents from the client and the suppliers, we used a snowball approach to extend it.

To attain more than 30 respondents for the non monopsonist case was difficult, and the 77 respondents for the Saudi Arabia monopsonist case was not easy either since respondents had to be representative of the suppliers and the client, but also of the technical departments and the operation departments for both company types.

Due to this difficulty, we were able to collect data from 31 non monopsonist respondents but it would have been better to make our comparisons with an identical number of respondents in non monopsonist markets as those of the monopsonist market. A future research should try to get a larger data base, in spite of the difficulties, in particular for respondents of non monopsonist markets. A larger number of respondents, also in countries with government-owned companies and government-sponsored companies such as in Indonesia would be useful in order to differentiate the weight of the monopsonist condition of the market from the weight of the government-owned companies. In Saudi Arabia, Aramco is both a monopsonist and a state-owned company.

A larger study could try to assess the respective weight of the monopsonist market, the ownership of the monopsonist company and the cultural values of the country. We attempted to analyze this question in an exploratory reflection in chapter 3: discussion and conclusion.

Finally, the study of the buying center in a monopsonist market should be conducted with other product categories. We think that our findings should hold in terms of responsiveness to the monopsonist client demands. But these demands may be various and not necessarily related to sustainability and local production and employment as in the Saudi Arabia case. However, it is likely that the monopsonist client will ask the suppliers to accompany them, constantly and efficiently, in their quest for new solutions to their problems.

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Appendix A: Aramco characteristics

A1: Scopes of Activity of Aramco

They are as following, especially in Oil, Gas & Petrochemical project: Local manufacturing opportunities

- Pipes and structural steel: \$12.0 billion – (35% localization)
- Columns, vessels, exchangers and valves: \$6.0 billion – (25% localization)
- Compressors, pumps and turbines: \$4.0 billion – (15% localization)
- Instruments, electrical and transmitters: \$5.0 billion – (30% localization)
- Chemicals, drilling fluids and inhibitors: \$5.0 billion – (45% localization)
- Drilling and producing equipment: \$6.0 billion – (20% localization)
- Health, safety, security and fire equipment: \$3.0 billion – (20% localization)
- Construction and general supplies: \$2.0 billion – (25% localization)

In total, there are 24 commodity groups in a broad array of buying needs with requirements that can vary greatly depending on location, operation and/or business.

Pipes and steel structure

- Welded line pipe
- Seamless pipe
- Structural steel

Static equipment

- Heat transfer equipment
- Valves & pipe fittings
- Vessels & columns

Machinery equipment

- Turbines
- Pumps & compressors
- Power transmission

Instrumentation, Electrical and IT

- Instrumentation & transmitters
- Electrical equipment
- IT

Chemicals

- Process chemicals
- Drilling fluids inhibitors

Drilling (Our Main Focus)

- Down-hole equipment
- Wellhead

Health, Safety and environment

- Environmental
- Medical
- Labs
- Safety and security equipment

Construction & General Supply

- Building materials
- Community & office supplies
- Industrial supplies
- Air conditioning

Key facts and figures

Production and reserves

- Crude oil and condensate reserves (billions of barrels): 261.1
- Gas reserves (associated and no associated) (trillions of standard cubic feet): 297.6
- Crude oil production (annual/billions of barrels): 3.7; (daily/millions of barrels): 10.2
- Crude oil exports (millions of barrels): 2,603
- Delivered sales gas (millions of standard cubic feet per day): 7,979; delivered ethane: 794

- NGL from hydrocarbon gases (millions of barrels): 474.4
- Raw gas processed (billions of standard cubic feet per day): 11.6
- Refined products production (millions of barrels): 641
- Refined products exports (millions of barrels): 232

Exports by region

- **Northwest Europe:** Crude oil 6.4%; Refined products 9.4%
- **Far East:** Crude oil 65.0%; Refined products 34.5%; NGL 26.7%*
- **Mediterranean:** Crude oil 6.4%; Refined products 6.8%; NGL 4.3%*
- **U.S.:** Crude oil 16.6%
- **Other regions:** Crude oil 5.6%; Refined products 49.3%; NGL 69.0%*

* All NGL (natural gas liquids) figures include sales on behalf of SAMREF and SASREF

Refining and chemicals

Refining capacity (millions of bpd): 1.0 wholly owned domestic; 1.9 domestic joint ventures; 2.5 international joint ventures; 5.4 worldwide; 3.1 Saudi Aramco share of worldwide refining capacity

Chemicals production capacity (kilotons per annum): 17,650 total capacity; 6,630 in-Kingdom; 11,020 out-of-Kingdom; 7,016 Saudi Aramco share*

* Saudi Aramco's share of capacity is based on the percentage allocation of the capacity volumes based on the ownership structure in the respective entities. Saudi Aramco's share of Sadara is not included.

Economic impact

- Value of material procurement spending awarded to local manufacturers: \$2.1 billion
- Value of contract procurement awarded to local market: \$26 billion
- Percentage of material procurement spending awarded to local manufacturers: 37%
- Percentage of contract procurement awarded to local market: 80%

People

- 65,266 total workforce of which 54,666 are Saudis and 10,600 expatriates
- 3,774 apprentice graduates joining the company; 383 College Degree Program for Non-Employees (CDPNE) joining the company

Saudi development programs (participants enrolled at year-end 2015)

- 704 in regular development programs
- 1,407 in CDPNE
- 2,000 in college degree programs
- 7,818 in the apprentice program

Operations

- Offices: Dhahran, Saudi Arabia (Head office); London, UK, The Hague, Netherlands, New Delhi, India and Milan, Italy (AOC); Houston and Washington, USA, (ASC), New York, USA (Saudi Petroleum International, Inc.); Beijing, Xiamen and Shanghai, China, Tokyo, Japan, Seoul, Republic of Korea, Singapore (Aramco Asia).
- Joint and Equity Ventures: Fujian Refining and Petrochemical Company Ltd (FREP) and Sinopec SenMei Petroleum Company Ltd (SSPC) - Fujian, China; Motiva Enterprises LLC - Houston, USA; The Arab Petroleum Pipeline Co. (SUMED) - Alexandria, Egypt; S-OIL - Seoul, Republic of Korea; Showa Shell - Tokyo, Japan.
- R&D centers: Beijing, China; Boston, Detroit, Houston, all USA; Dhahran (R&DC, EXPEC ARC), Thuwal (KAUST), both Saudi Arabia; Paris, France.
- Technology offices: Aberdeen, UK; Daejeon, Republic of Korea (KAIST); Delft, The Netherlands
- Bulk plants: Abha, Dhahran, Duba, Al-Hasa, Al-Jawf, Jazan, Jiddah, Najran, Qatif, Qassim, Rabigh, Riyadh, Safaniya, Al-Sulayyil, Tabuk, Turaif, Yanbu'
- Domestic refineries: Jiddah, Ras Tanura, Riyadh, Yanbu'
- Domestic joint venture refineries: Petro Rabigh, SAMREF, SASREF, SATORP, YASREF
- International joint venture refineries: Fujian Refining and Petrochemical Company Ltd (FREP), Motiva, Showa Shell, S-OIL
- Terminals: Duba, Jazan, Jiddah, Ju'aymah, Ras Tanura, Rabigh, Yanbu'

A2: Part of Aramco’s spending in drilling materials

Historical Material Spend

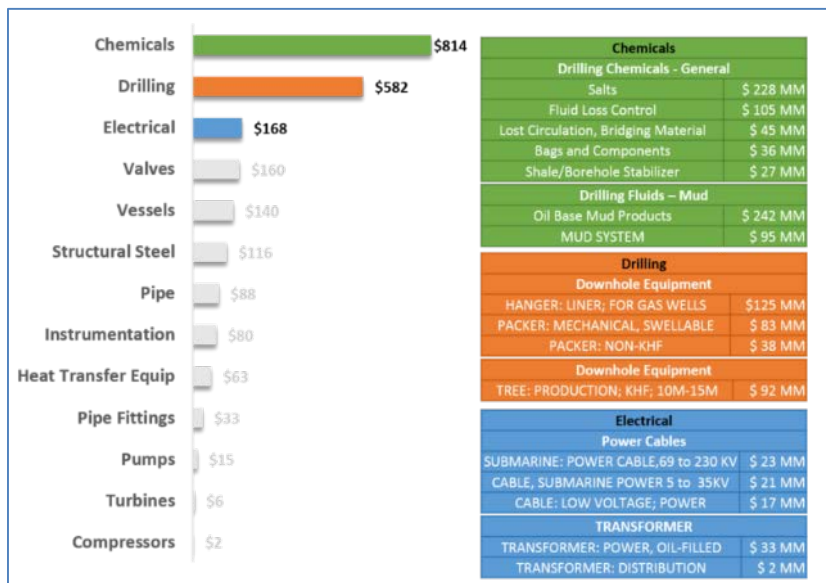


Figure A. 1 Material Spend with Out-of-Kingdom & In-Kingdom
(Sources: 1-2 IK Manufacturers)

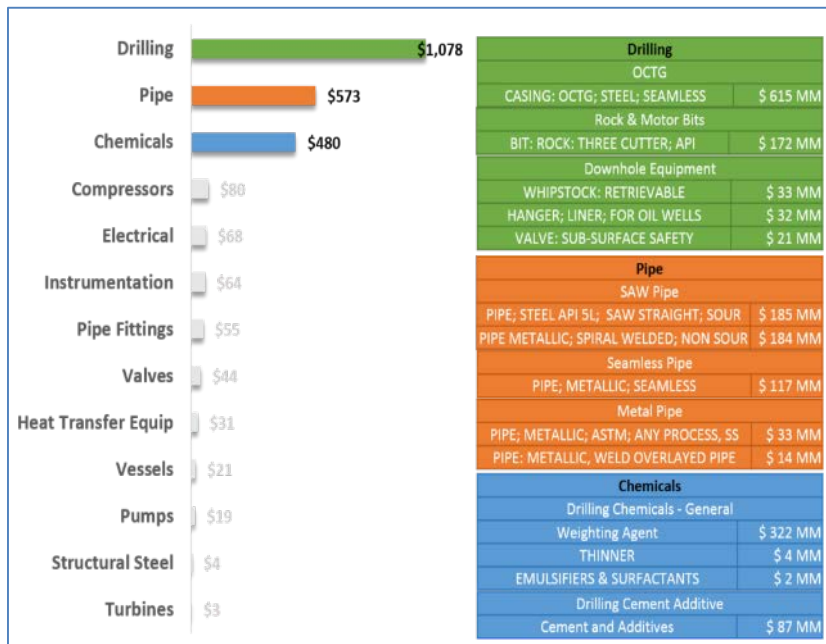


Figure A. 2 10-Years Demand Forecast (materials & Services)
(Sources: 1-2 IK Manufacturers)

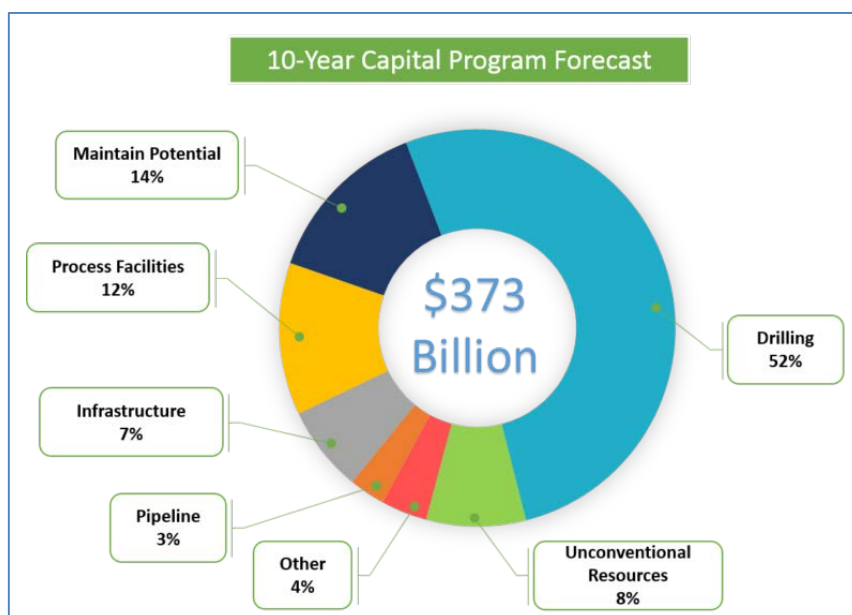


Figure A. 3 10-Years Capital Program Forecast
(Sources: 1-2 IK Manufacturers)

A3: Agreements between Aramco and American companies

While the first visit of Trump to Saudi Arabia, Saudi Aramco today signed agreements with major U.S. companies which will pave way for the company to enhance its business synergy with the U.S. as well as attracting investments from its U.S. counterparts to the Kingdom. The agreements were signed in Riyadh in the presence of The Custodian of The Two Holy Mosques King Salman Bin Abdulaziz Al Saud and U.S. President Donald Trump. President Trump's visit to Saudi Arabia also includes a business summit attended by Saudi and U.S. chief executives, to further cement the strong historic relations between the Kingdom and the U.S.

The agreements were signed by Saudi Aramco President and CEO Amin H. Nasser and his U.S. counterpart. "The agreements signed today by Saudi Aramco with major American companies underscore the purposeful collaboration between Saudi Arabia and the United States in areas of strategic importance linking Saudi Vision 2030 and America's own economic depth and strength," he said.

The agreement which are estimated to be around \$50 billion highlights the magnitude of strategic growth and diversification underway at Saudi Aramco, including strengthening the company's standing as the world's leading energy and chemicals company and focus on local capacity building of its technical expertise and workforce.

Among the agreements signed or updated are:

JV with Jacobs Engineering – New joint ventures to provide program and construction management services; to elevate project execution and job creation throughout Saudi Arabia and across the region

Agreement with Jacobs Engineering Group Inc. (NYSE:JEC) to form a Saudi Arabia-based joint venture company that provides professional program and construction management (PMCM) services for building and infrastructure projects in the Kingdom. The parties also agreed to form a joint venture to provide PMCM services in the Middle East and North Africa. The agreement will create 3000 jobs.

JV with National Oilwell Varco (NOV) – NOV and Saudi Aramco Announce Joint Venture to Provide High-Specification Drilling Rigs and Advanced Drilling Equipment

An (MoU) Memorandum of Understanding with Saudi Aramco to form a joint venture in the Kingdom of Saudi Arabia. Through its state-of-the-art manufacturing and fabrication facilities in the Kingdom and NOV's market-leading drilling technologies, the joint venture will provide high-specification land rigs, rig and drilling equipment and offer certain aftermarket services. Additionally, the

companies announced their proposed joint venture will establish an education center to train Saudi technicians in the maintenance and operation of the sophisticated drilling technology that the venture will bring to the Kingdom. It is expected to create 1,000 jobs.

Broader Oil & Gas Investment Feasibility Study MOU with GE – value adding to existing portfolio with a long-time partner

An (MoU) Memorandum of Understanding which will examine the feasibility of new business development across the energy value chain including enablers covering the Oil & Gas upstream, midstream and downstream eco-system including manufacturing and services,. It is expected to create 2,000 jobs.

(MoU) Memorandum of Understanding with GE – to undertake a digital transformation of Saudi Aramco’s operations, Within the oil and gas sector, Saudi Aramco and GE have signed an MoU to undertake a digital transformation of Saudi Aramco’s operations with a goal of generating US \$4 billion in annual productivity improvements. To enable the transformation, GE will provide a private Predix Industrial IoT cloud, GE’s pioneering APM and industry-specific applications, and staff a Digital Transformation Office (DTO) with local industrial engineers, process experts, and technologists. The DTO is expected to generate 250 high-tech Saudi jobs and stimulate local economic demand for an additional 500 Digital Industrial careers. To support the growth of a broader Predix economy, GE will work within the Saudi Vision 2030 to develop a STEM educational curriculum for high schools and universities to develop Saudi Digital Industrial talent to meet future demand for developers and data scientists. The collaboration is a strong example of Saudi Aramco’s industry leadership and commitment to Saudi Vision 2030 to develop high-tech and knowledge worker careers that add significant value to the local economy.

(MoU) Memorandum of Understanding with Schlumberger to deliver a series of projects related to localizing oil field goods and services. The MOU will create 2,600 jobs, as well as support suppliers with significant funding.

(MoU) Memorandum of Understanding with Halliburton to deliver a series of projects related to localizing oil field goods and services. The MOU will create over 750 jobs, as well as support services with significant worth.

(MoU) Memorandum of Understanding with Weatherford to deliver a series of projects related to localizing oil field goods and services. The (MoU) Memorandum of Understanding will create over 900 jobs, as well as support suppliers with significant funding.

(MoU) Memorandum of Understanding with Baker Hughes deliver a series of projects related to localizing oil field goods and services. The (MoU) Memorandum of Understanding will create 600 jobs, as well as support suppliers with significant funding.

(Source: saudiamco.com)

Appendix B: Some history of the drilling sector

From the old days of the drilling industry to the 21th century.

1. Drilling Industry Overview

Upstream drilling is one of the most significant industries that has an amusing and captivating history is the oil and gas industry. This history extends thousands of years and has played a significant role in structuring this business.

A. Old Days drilling



Figure B. 1 First Discovered oil well by the Chinese

(Source: <https://aoghs.org/technology/oil-well-drilling-technology/>)

Underground oil was first explored and discovered by the Chinese who during the 13th century, In 1650, the first European profitable oil well was discovered in Romania, about 200 years later, The 1850's observed the birth of the first oil company in the world, the Pennsylvania Rock Oil Company. (Antill & Arnott, 2000).

The first major oil company, the Standard Oil Company, was established in 1870 by John Rockefeller, which proceeded to dominate the next decades (1870-1895) despite fierce competition. (Library of Congress 2010).

B. 20th century drilling (1859 to 1995)



**Figure B. 2 A Howard Hughes Sr. 1909 drill bit patent will
"Create the cornerstone of Hughes Tool Company."**

(Source: <https://aoghs.org/technology/oil-well-drilling-technology/>)

Oil well drilling technology has progressed from the ancient spring pole to percussion cable-tools to the modern rotary rigs that can drill miles into the earth.

In 1895, growth in worldwide oil demand was counterbalance by a consistent increase in supply; mostly from United States as it exported 44% of its crude oil production. (Antill & Arnott, 2000).

During 1909, Standard Oil was distributed into 34 separate businesses due to the representation of antitrust laws (Library of Congress 2010).

In 1933, an association of Standard Oil named California Arabian Standard Oil Company was created and obtained the concession to explore Saudi Arabia for oil, and after five years of extensive exploration, commercial oil was finally discovered in Saudi Arabia. (Datamonitor 2009), and this is the creation of Saudi Aramco.

This era of the oil and gas business history ended in 1950 with the United States as the main player accounting for more than half the world's production (Library of Congress 2010).

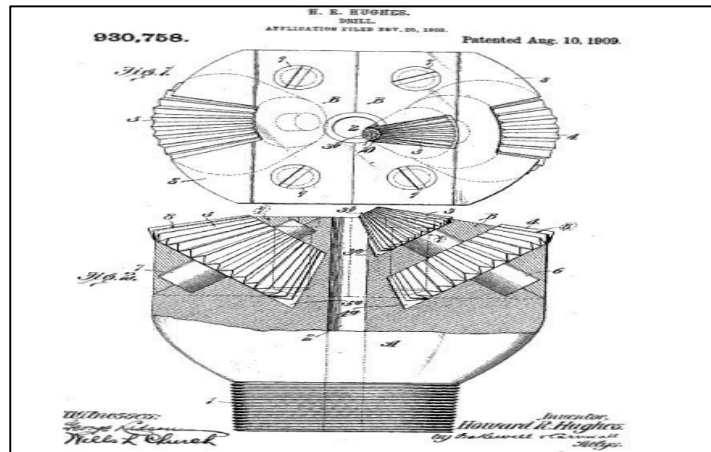
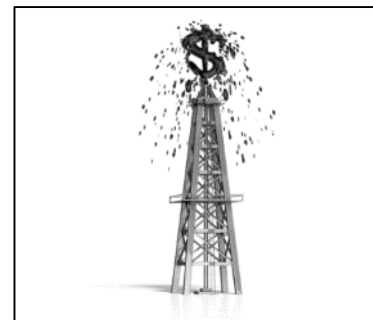


Figure B. 3 Howard Hughes Sr. of Houston, Texas, receives a patent in 1909 for a drill that “relates to boring drills, and particularly to roller drills such as are used for drilling holes in earth and rock.” (Source: <https://aoghs.org/technology/oil-well-drilling-technology/>)

These photos show the early Drill Bits which was using to drill the oil and gas wells in the old days created and invented by Howard Hughes the very end of the drill which is capable of cutting through rock. This was the startup of Baker Hughes Company in Which lead the drilling bits industry for 100 years. Drilling bits can come in many different sizes and shapes and can be made of various materials including diamond and carbide steel. Drill bits are specialized for drilling diverse types of rock formations.

C. 21st century (Globalization)

As market globalization began to arise, more competitors appeared across Europe, especially France (Schlumberger), Russia and Asia, such as Total, Royal Dutch, Shell and Anglo-Persian (British Petroleum). (Library of Congress 2010) Huge discoveries of oil around the world, particularly in the Middle East, led to a decreasing U.S. dominance of the oil industry as Middle Eastern production reached 5.2 million barrels of oil a day (about 24% of the world's total production) by 1960. (Aott, 20).



The Figure shows different Modern offshore drilling petroleum platforms include (left to right): 1 and 2 are conventional fixed platforms; 3 is a compliant tower; 4 and 5 are vertically moored tension leg and mini-tension leg platforms; 6 is a spar platform; 7 and 8 are semi-submersibles; 9 is a floating production, storage, and offloading facility; 10) sub-sea completion and tie-back to host facility. Source: National Oceanic and Atmospheric Administration.

Concentrating on drilling bits companies which is the main domain of this thesis which include the major of international oil service company and their importance comes from that you can't drill any well without a drilling bit.



Figure B. 4 Modern offshore petroleum platforms

(Source: <http://www.scienceinthenews.org.uk/contents/?article=59>, 2009)

The photo below shows a selection of the newest technology of drilling bits in capable to drill different application



Figure B. 5 Selection of Newest technology of Drilling Bits

(Source: Schlumberger Drilling Bits Hub 2017)

1- Big Players in Oil industry (Client)

In the early 19th century, the oil and gas manufacturing was dominated as explained earlier by what was known as “the seven sisters”. These were:

- 1- Standard Oil of New Jersey (Esso) then (Exxon)
- 2- Standard Oil of New York (Mobil)
- 3- Standard Oil of California (Chevron)
- 4- Royal Dutch Shell, Texaco
- 5- Gulf
- 6- British Petroleum (BP).

Although, enormous discoveries of oil and gas fields in Saudi Arabia, Kuwait and Abu Dhabi led to the creation of conglomerates. (Library of Congress 2010). According to Energy Intelligence (2010), the major

10 oil companies in the world today are as shown in the below table : as we can see that Aramco which is the biggest oil and gas company globally and we will focus our study on it as a an example of Pure monopsonist is 100% owned by the state (Government) as follows:

Table B. 1 The major 10 oil companies in the world today

Rank	Company Name	Country	State Ownership %
1	Saudi Aramco	Saudi Arabia	100
2	National Iranian Oil Company	Iran	100
3	Exxon Mobil	US	N/A
4	Petroleos De Venezuela	Venezuela	100
5	China National Petroleum Corporation	China	100
6	British Petroleum	UK	N/A
7	Royal Dutch Shell	UK/Netherlands	N/A
8	ConocoPhillips	US	N/A
9	Chevron	US	N/A
10	TOTAL	France	N/A

The drilling sector is one of the main stakes of the upstream oil and gas sector. That’s why I’ll show and explain the Top five drilling bits market vendors (Supplier) in oil and gas business Therefore, the investment outlook for the sector is dependent upon the overall state of the entire oil and gas value chain. See below the global drilling bits market in oil and gas currently and expectation growth and values; (Spear 2016)

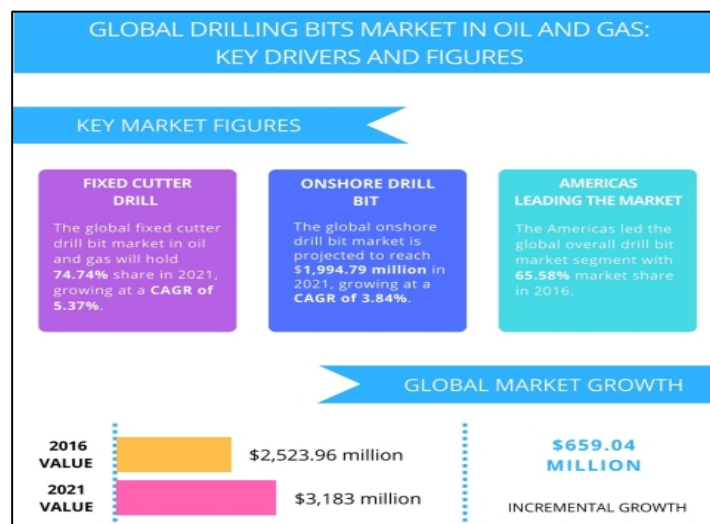


Figure B. 6 Global Drilling Bits Market in Oil and Gas

(Source: <http://www.businesswire.com/news/home/20170201005556/en/Top-5-Vendors-Global-Atopic-Dermatitis-Drugs>, February 01, 2017)

“The global drilling equipment market is focused with big companies holding larger market share. The market leaders elaborate in the drilling equipment market implement numerous plans to create a competitive advantage over the other players in the market,” says Thanikachalam Chandrasekaran, a lead oil and gas research analyst from Technavio.

Furthermore, the regional manager and headquarters of those companies are involved in strong research and development to develop and invent innovative and creative drilling products and new technologies to provide to changing market dynamics. Especially the big companies such Schlumberger and GE Baker Hughes are investing big amount of money to adopt these strategies, companies can create a great partner base as well as numerous clients. As for the suppliers, that is the service providers, they are presented in Chapter 1 of the thesis.

Appendix C: interviews with the respondents

Below the content of the interviews are presented with the 17 respondents, identified from R1 to R17:

1. **N. of Candidate: R1**

Position Title: *Engineer in Charge*

Department: *Aramco Drilling Technical department*

Date of interview: 27/12/2016

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified Rebuy / New Products	Roles in the Buying Centre Straight rebuy / repetitive
Initiator, Gate Keeper	Internal Influencer, Gate Keeper

QUESTIONS:

Why is the Drilling Bits important for Aramco?

Actually in drilling environments the drilling bits is the Key of the entire drilling process and we rely on it big time to achieve our target of drilling in Oil and gas wells, currently we have 210 operating Drilling Rigs in Saudi.

What does the Drilling Bits technology bring to the future of Aramco?

Drilling Bits business mainly comes from International services providers and we are expecting from them to improve their tools to improve the drilling performance which will help Aramco to Drill Faster with Cost effective , so overall will minimize drilling Cost and accelerate the production of the Oil and gas wells.

How is that product (Drilling Bits) purchased on a regular basis?

In Aramco Mainly we use the consignment basis, which is once the required product passes the Trial Test criteria and has been listed in Aramco Approved list in the drop down list and turn to repetitive purchased.

What are the buying phases?

We will assume that Aramco has two groups of purchases, (new purchases and repetitive purchases). The new purchase involves the procurement of new products and need a trial test criteria. The repetitive purchase relate to the procurement of new product that have been already approved and passed Aramco trial test criteria on consignment basis. Aramco always have two kinds of purchases and it is a must to pass by the first type to get approved to be a repetitive one.

What are the expectations from Aramco?

Aramco's Expectation is that the Drilling Bits provider will continue trial testing new technologies and compete together to lower the cost per foot and accelerate the drilling time.

What are the suppliers and is their search for suppliers?

Aramco deals with most of biggest suppliers worldwide and not searching for suppliers meanwhile the door is open for any supplier meet Aramco's trial test criteria and pass it.

On what criteria are the offers and proposals evaluated and selected?

If you are asking about the evaluation of the trial test proposal for new products , Aramco technical department is the first place to visit , Initially we review the company profile , an recently we added rules after the new Country policy for the Localization of human resources and the percentage of Local ingredients for any new product will be used in Aramco, if the company passed this criteria we will review the technical proposal for the new product that the company wants to trial tested in Aramco , based on (BPA) Bit performance Analyser which is a Software that compare the Top five products in similar applications which the New proposed product should Lower the cost per foot by 5% of the average best five products performance or to be 5 % faster in performance from the fastest five products from the same applications. If the bit will pass the trial test criteria it will be free

of Charge, but it will be listed under Aramco Approved Name which can be utilized on repetitive purchases.

How Schlumberger is evaluated compared to other companies on different criteria?

Schlumberger is the world biggest service provider worldwide and we have long-term relationship around 80 years, Schlumberger consider for us a technical oriented company and rely on them to provide the latest technology to improve our overall performance in drilling and optimization in general , but talking about the drilling bits side Smith Bits currently hold the highest market share in terms of selling new bits , but it might be affected because the direct two big competitors (Baker & Halliburton) already started their local facilities in Saudi with Full manufactured process , and it considered for us an advantage over Schlumberger which started last year to have an assembly facility and in two years’ time should be in full manufacturing capacity with 70% Local components.

What is the importance of the criteria and for whom?

The importance of the required criteria is not an optional and any supplier will not meet the required criteria will not have any business with Aramco, it is a country vision for localization 70% by 2020 and any side-track of it will not be acceptable, we already gave all suppliers a deadline by end of 2018 to follow and apply all the new criteria.

How do you evaluate performance?

We evaluate all companies’ performance on quarterly basis, based on service quality and non-productive times for the operations versus the service and product performance for each supplier by handling a meeting with all suppliers’ managers and Aramco’s manager to review it on Quarterly basis. For each supplier if the trend is not matching our minimum requirements or lots of service quality issue we will drop the supplier market share.

What are the environmental influence in the process (political, legal, etc.)?

Honestly as I mention before the kingdom vision and direction toward the localization of resources have the biggest influence for the evaluation and increasing market share and granting the business to any supplier. So we are prioritizing the opportunities for local suppliers or international ones which have high percentage of local employee and contents to have business and more market share.

Who influences the process on which dimensions?

The upper management got this directions despite they need to keep the big international suppliers to maintain the newest technology and the expat community to guide and pass their experience to the local generation.

2. N: of Candidate: R2

Position Title: *Engineering Supervisor (head of the department)*

Department: *Aramco Drilling Technical department*

Date of interview: 15/01/2017

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified Rebuy / New Products	Roles in the Buying Centre Straight rebuy / repetitive
Decider, Gate Keeper	Internal Influencer, Gate Keeper

QUESTIONS:

Why is the Drilling Bits important for Aramco?

Aramco Target is to continue drilling even during last two years after the crisis of Oil price we didn’t stop or reduce the drilling rigs, meanwhile the drilling bits very important for Aramco in two main concern, initially reduce the drilling time and put the well faster on production, and improve the cost per foot for the entire drilling wells.

What does the Drilling Bits technology bring to the future of Aramco?

As mentioned based on the importance of drilling bits for Aramco we are dealing with all big International services companies and Aramco is a reference Premium Market globally and we are confident that they will provide us the latest to improve overall the drilling performance which will help Aramco to Drill Faster with Cost effective, so overall will minimize drilling Cost and accelerate the production of the Oil and gas wells, and overcome all our current drilling issues all over the kingdom.

How is that product (Drilling Bits) purchased on a regular basis?

Initially the companies (service providers) should perform a trial test free of charge to approve the product (drilling bit) based on the size and type and application required, then if it will be approved according to the BPA (Bit performance Analyser) There will turn to consignment basis, the drilling engineer will raise the request, supervisor will approve then the superintendent will approve the request raised by the drilling foreman, once the bit will be used, Aramco will purchase it, if not it will be returned to the supplier.

What are the buying phases?

The buying Phases depends on type of purchases (new purchases and repetitive purchases). The new purchase Need to initiate trial test for the product free of charge to prove the new product to add it to Aramco approved list. The repetitive purchase relate to the operation decision from the drilling engineer from the product already passed Aramco trial test criteria on consignment basis.

What are the expectations from Aramco?

Aramco's limitations is the sky for the new technologies and for me as a supervisor in drilling technical department I'm always open for the latest technology and as a reference market for middle east and we are giving premium for our suppliers and we are expecting from them to provide and use the latest technology that will help Aramco to drill faster and reduce the cost per foot and improve the KPI for the drilling well.

What are the suppliers and is their search for suppliers?

Aramco deals with all suppliers worldwide and the door is open for suppliers that can provide any new solutions or technology to accelerate the drilling. Typically we rely on the biggest international suppliers worldwide that we build our trust and confidence after years of working together and understanding Saudi Application, meanwhile we are open for any new supplier want to prove themselves in the most challenging application.

On what criteria are the offers and proposals evaluated and selected?

At the start the company should come and meet us in drilling technical department, show us the new product and technology, and the company should meet the minimum requirements of the Localization in human resources and the percentage of Local ingredients in their products, if so we will review its history in the kingdom if not worldwide, then

if the company passed this criteria we will review the technical proposal for the new product that the company wants to trial tested in Aramco, the drilling engineer will provide (BPA) Bit performance Analyser which is a Software that compare the Top five products in similar applications which the New proposed product should Lower the cost per foot by 5% of the average best five products performance or to be 5% faster in performance from the fastest five products from the same applications. If the bit will pass the trial test criteria it will be free of Charge, but it will be listed under Aramco Approved Name which can be utilized on a repetitive straight rebuy purchases, which is the most important part and the main target for the service provider to start generate revenue and for Aramco to have several option to improve the drilling performance to put the wells faster into production and as well Aramco will have the luxury to choose between different drilling products and create competition between which will help us to save and improve our cost consequently. Typically we are not favoring any supplier over the other by brand, meanwhile we are expecting all companies provide the latest and best technology and patent to trial tested with us. But naturally the long-term relations with the biggest drilling company globally have a preferences over the new comers in term of knowing the Saudi drilling applications and Aramco procedures compliance for the trial test.

How Schlumberger is evaluated compared to other companies on different criteria?

Just wants to inform you that Schlumberger just won the kingdom award for having the highest percentage of Localization over all other companies in Saudi Arabia, Schlumberger is the world biggest service provider worldwide and we have long-term relationship around 80 years,

From technical point of view Schlumberger consider for me a technical oriented company and own the most and highest number of drilling Patent we consider this while evaluating the new tenders and market share to improve our overall performance in drilling and optimization in general, and they invest in the kingdom in all domains that's why we treat Schlumberger differently while reviewing the contracts, tenders.

What is the importance of the criteria and for whom?

The importance of the Localization comes from the country vision not the company, and Schlumberger shows a great respect and leadership toward the kingdom vision, and this points is really important and required criteria for any company wants to continue working with Aramco,

prioritization for the Local company and the international companies that will comply with the kingdom vision.

How do you evaluate performance?

Every Quarter we evaluate all companies' performance based on service quality and non-productive times (NPT) for the operations versus the service and product performance for each supplier by holding a meeting with all suppliers' managers and Aramco's manager to review it on Quarterly basis. For each supplier if the trend is not matching our minimum requirements or lots of service quality issue we will drop the supplier market share.

What are the environmental influence in the process (political, legal, etc.)?

Saudi Aramco's value has been estimated at anywhere between US\$1.25 trillion and US\$10 trillion making it the world's most valuable company.

Politically driven from the King and Deputy Crown Prince of Saudi Arabia and the vision and direction toward the localization of resources have the biggest influence for the evaluation and increasing market share and granting the business to any supplier. So we are prioritizing the opportunities for local suppliers or international ones which have high percentage of local employee and contents to have business and more market share.

Who influences the process on which dimensions?

the King and Deputy Crown Prince of Saudi Arabia , Oil Minister and CEO of Aramco with The upper management got this directions despite they need to keep the big international suppliers to maintain the newest technology and the expat community to guide and pass their experience to the local generation.

3. *N: of Candidate: R3*

Position Title: *Senior Drilling Engineer*

Department: *Aramco Gas Drilling Department*

Date of interview: 15/12/2016

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified Rebuy / New Products	Roles in the Buying Centre Straight rebuy / repetitive
Internal Influencer	User/Initiator

QUESTIONS:

Why is the Drilling Bits important for Aramco?

From my point of View as a senior drilling Engineer with vast experience in many countries and currently six years in Aramco, drilling bits is the arrow head of the entire drilling process, and it is extremely important to

Chose the correct drilling bits for the application to improve the KPI in the entire drilling well.

What does the Drilling Bits technology bring to the future of Aramco?

As a drilling engineer, drilling bits is the key of reducing the cost of the entire well and accelerate the well plan, especially the remaining and remedial process reach the limit for improvement, despite the drilling bits business is really dynamic one.

How is that product (Drilling Bits) purchased on a regular basis?

According to my job description, I'm dealing with the repetitive purchases on daily basis with all the suppliers , I'm choosing the supplier based on the BPA (Bit performance Analyzers) , it will show the best five drilling bits on the field that I'll start drilling in , and based on Aramco criteria I have the authority to choose anyone from the best five without justification, but the door is open for all other suppliers that have approved drilling bits to show their performance in other fields and submit their proposals , specially some of the suppliers have long term relationship and great knowledge about our drilling application, if they convince me that they can break the record in my next well, I can choose it and make justification and explain to my supervisor. For the new purchases it comes first from Technical department and I'll help the supplier to initiate the trial test proposal.

What are the buying phases?

The buying Phases on my case repetitive purchases, I'll choose the drilling bits based on (BPA) Bit Performance Analyser, then will get my supervisor approval and the General supervisor as a final approval, the Drilling foreman will raise the request and the drilling Superintendent will

approve the request then it will go to the supplier to send the bit to the rig on a consignment basis, if it will be utilize Aramco will buy it if not it will be return back to the supplier.

What are the expectations from Aramco?

Aramco's drilling engineer expect continuous improvement in drilling and provide new designs in drillings bits to drill faster and reduce the cost per foot and improve the KPI for the drilling well.

What are the suppliers and is their search for suppliers?

Discussing the drilling bits business, I'm dealing with all the approved suppliers with different types and sizes of products, I'm not searching for suppliers but any new company will have any approved bit, will pass by me and introduce their product to initiate a repetitive product selling.

On what criteria are the offers and proposals evaluated and selected?

Before starting to plan a new well, I send proposal request to all suppliers then I review all proposals from all suppliers and compare it with BPA (Bit Performance Analyser) and I'm trying to give share for all the suppliers specially in the upper soft section and my priority will be price based, but in the Lower section will go for the big companies with the premium product because of the hard and abrasive drilling.

How Schlumberger is evaluated compared to other companies on different criteria?

Schlumberger Smith Bits, have great product and specially in the lower sections which they hold the premium and market competitive in drilling hard and abrasive formations, that's why I primacies Schlumberger and hold the highest market share in my wells , specially I'm receiving best customer service before and after drilling.

What is the importance of the criteria and for whom?

The BPA (Bit Performance Analyser) is the fundamental reference and criteria to choose the drilling bits, the importance of the proposal and Sales representative from the suppliers is really important to explain the new technology and recent performance in my field and all other areas.

How do you evaluate performance?

After finishing the section, I'm making the comparison between the section and the BPA, if the bit achieved or break the record, I'll choose it in the next well, if the drilling bits didn't achieve at least the average performance from the BPA will not be chosen in the next wells.

What are the environmental influence in the process (political, legal, etc.)?

In my pay grade no such political influence rather than split the market between most of suppliers and don't depend on single supplier, and it is doable in the upper soft sections, despite the lower and hard part.

Who influences the process on which dimensions?

The Process influenced by my direct supervisor and General Supervisor toward distribution of the market among all suppliers and toward lower cost.

4. N: of Candidate: R4

Position Title: *General Supervisor*

Department: *Aramco Gas drilling department*

Date of interview: 18/12/2016

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified	Roles in the Buying Centre Straight rebuy / repetitive
Rebuy / New Products	
Internal Influencer	Purchaser and decider

QUESTIONS:

Why is the Drilling Bits important for Aramco?

As a General supervisor for drilling division and after 25 years of working in drilling department, drilling bits business improved big time over years and we rely big time on the improvement and dynamic of the drilling bits products to improve the entire KPIs in drilling time and reduce the cost per foot drilling operation is the only part that we can improve and reduce drilling time because the other parts of operations reach the limit of improvements.

What does the Drilling Bits technology bring to the future of Aramco?

Our plan to reduce the drilling time, to increase the production, New Technology in drilling bits business is the key for Aramco to improve the entire drilling process and reduce the cost of drilling and accelerate the drilling time to increase our margin and helps Aramco to add more wells in production in timely manner.

How is that product (Drilling Bits) purchased on a regular basis?

On regular Basis, the drilling Engineer initiate the drilling program and choose the bits selection based on BPA (Bit Performance Analyser), then he will convince his supervisor then they will bring the program for my final approval, typically I review based on the lowest CPF (Cost Per Foot), then a copy from the Drilling program to be send to drilling foreman on the rig to request the selected drilling bits.

What are the buying phases?

The repetitive purchases buying Phases, as I mentioned is started from the drilling engineer, reviewed by the drilling supervisor then for me as a final approval before sending to the drilling rig for requesting the bits, then the drilling Superintendent will approve the request then it will go to the supplier to send the bit to the rig on a consignment basis, if it will be utilize Aramco will buy it if not it will be return back to the supplier.

What are the expectations from Aramco?

We are expecting new technology as we used to get from the biggest supplier usually drilling bits business is really dynamic and any supplier will get a reliable product will drill fast and reduce cost will gain the market share.

What are the suppliers and is their search for suppliers?

Suppliers are most of the international companies in the drilling bits industry, typically we are open for any new supplier will Aramco to improve our KPI and accelerate the drilling and reduce the cost and cost per foot.

On what criteria are the offers and proposals evaluated and selected?

On my current position I'm reviewing the drilling program submitted from the drilling engineer and reviewed by drilling supervisor, my criteria is the lowest cost per foot generally, more specific in the soft upper section I'm giving the small players highest market share with Lowest bit price, and for the lower hard section, most likely the big players have the best products so I go for the best performer in the field with the lowest CPF.

How Schlumberger is evaluated compared to other companies on different criteria?

Schlumberger Smith Bits, have all products in the entire sections, and currently lead the market share, we trust smith bits on our challenges sections specially they are providing competitive advantage for the abrasive formation using the rotating cutters which made step difference drilling longer footage and highest rate of penetration drilling the most challenging applications.

What is the importance of the criteria and for whom?

The importance of the criteria is based on BPA (Bit Performance Analyser) is the fundamental reference and criteria to choose the drilling bits, and for the Audit as well to prevent any deviation need to be justified with evidence from previous performance in different to defend choosing a bit without BPA, the drilling engineer should have supporting documents.

How do you evaluate performance?

I'm following all drillings bits performance after each well, and inform the drilling engineer to provide me the performance of all drilling bits against the BPA, normally any bits will have a good performance will keep using it for the next wells and any bit will not perform or fail to achieve the target will not be used in the upcoming wells.

What are the environmental influence in the process (political, legal, etc.)?

Naturally we try to split the market between most of suppliers and create competition and don't depend on single supplier, and as a company vision to push toward the localization, but in drilling operation it's all about performance.

Who influences the process on which dimensions?

The Process is influenced by the performance and price, in drilling bits business no one can influence if the performance and the price is far from Aramco BPA.

5. *N: of Candidate: R5*

Position Title: *Drilling Engineer Supervisor*

Department: *Aramco Gas Drilling Department*

Date of interview: 18/12/2016

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified Rebuy / New Products	Roles in the Buying Centre Straight rebuy / repetitive
Internal Influencer	Decider

QUESTIONS:

Why is the Drilling Bits important for Aramco?

As a supervisor drilling engineer in Aramco , managing seven drilling rigs, I can tell that the drilling bits is really important variable in the drilling equation to improve the Key Performance indicator and improve entire drilling planning time for the well and save drilling cost meanwhile help us to put the wells early on production.

What does the Drilling Bits technology bring to the future of Aramco?

Future of the oil industry generally and Aramco Specifically need new technology to solve drilling issues and finalize every section in one go with faster ROP (Rate of Penetration), and lower CPF (Cost Per Foot) and the most important project is to grasp a technology that will help to reach the deepest formation and drill igneous and volcanic Rocks and really abrasive formation in costly and timely manner.

How is that product (Drilling Bits) purchased on a regular basis?

We are purchasing drilling bits in Aramco mainly on Consignment basis the drilling engineer will choose the best product based on the BPA (Bit performance Analyzers) ,then will review all suppliers proposals , once he made his drilling proposal and the drilling bits selection , he is coming to me to review it and for my approval. Typically I'm reviewing the selection criteria and if it is matching Aramco Standard (BPA) and if there is any drilling bits outside the BPA, should have a clear justification to break the field record.

What are the buying phases?

The buying Phases as per my job description is repetitive purchases, I'll choose the drilling bits based on (BPA) Bit Performance Analyser, then will get my supervisor approval and the General supervisor as a final approval, the Drilling foreman will raise the request and the drilling Superintendent will approve the request then it will go to the supplier to send the bit to the rig on a consignment basis, if it will be utilize Aramco will buy it if not it will be return back to the supplier.

What are the expectations from Aramco?

Aramco's drilling engineer expect continuous improvement in drilling and provide new designs in drillings bits to drill faster and reduce the cost per foot and improve the KPI for the drilling well.

What are the suppliers and is their search for suppliers?

Discussing the drilling bits business, I'm dealing with all the approved suppliers with different types and sizes of products, I'm not searching for suppliers but any new company will have any approved bit, will pass by me and introduce their product to initiate a repetitive.

On what criteria are the offers and proposals evaluated and selected?

Before starting to plan a new well, I send proposal request to all suppliers then I review all proposals from all suppliers and compare it with BPA (Bit Performance Analyser) and I'm trying to give share for all the suppliers specially in the upper soft section and my priority will be price based, but in the Lower section will go for the big companies with the premium product because of the hard and abrasive drilling.

How Schlumberger is evaluated compared to other companies on different criteria?

I used to drill with Schlumberger Smith Bits since long time, not only in Saudi and I believe in their products and customer service, we depend on their representative on technical support not only on drilling bits, also for the BHA (Bottom Hole Assembly) to help us in the entire drilling process, and we are giving them the toughest section because we believe in their product and service.

What is the importance of the criteria and for whom?

Aramco set clear instructions and criteria to use The BPA (Bit Performance Analyser) as reference and criteria to choose the drilling bits, the importance of the proposal and Sales representative from the suppliers is really important to explain the new technology and recent performance in my field and all other areas, then I'll review it with Drilling Engineer.

How do you evaluate performance?

I'm giving instructions for the drilling engineers to give a post run reports for each well to check the performance and review it with me afterward and we decide based on it to use the same drilling bits or stop others, then the market share for it is performance based.

What are the environmental influence in the process (political, legal, etc.)?

For me the main influence is the performance and cost effective, and distribute the market to create competition.

Who influences the process on which dimensions?

The repetitive process is influenced by the drilling bits Performance, (BPA) Bit Performance Analyser and the technical sales representative with the drilling engineer and toward the Lower (CPF) Cost per foot and increase the (ROP) Rate of Penetration.

6. N: of Candidate: R6

Position Title: *General Supervisor*

Department: *MAFD (Material and Functions Department)*

Date of interview: *16/01/2017*

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified Rebuy / New Products	Roles in the Buying Centre Straight rebuy / repetitive
Purchaser	Purchaser

QUESTIONS:**Why is the Drilling Bits important for Aramco?**

I'm not a technical person, I just head of the Material department for all products that Aramco need to use for the entire activity, Aramco is using a lot of drilling bits from the top big suppliers worldwide, and I noticed that there is no Local supplier for drilling bits.

What does the Drilling Bits technology bring to the future of Aramco?

From my prospective we are expecting the newest technology Drilling Bits business mainly comes from International services providers and we are expecting from them to improve their tools to improve the drilling performance which will help Aramco to Drill Faster with Cost effective , so overall will minimize drilling Cost and accelerate the production of the Oil and gas wells.

How is that product (Drilling Bits) purchased on a regular basis?

On regular basis, In Aramco Mainly we use the consignment basis, which is once the required product passes the Trial Test criteria and has been listed in Aramco Approved list in the drop down list and turn to repetitive purchased.

What are the buying phases?

As a Material departments there are two groups of purchases, (new purchases and repetitive purchases). The new purchase involves the procurement of new products and need a trial test criteria. The repetitive purchase relate to the procurement of new product that have been already approved and passed Aramco trial test criteria on consignment basis. Aramco always have two kinds of purchases and it is a must to pass by the first type to get approved to be a repetitive one.

What are the expectations from Aramco?

Aramco's Expectation is that the Drilling Bits provider will continue trial testing new technologies and compete together to lower the cost per foot and accelerate the drilling time.

What are the suppliers and is their search for suppliers?

As Material department we are always searching for new suppliers, mainly local ones and till today we didn't have any single local supplier for drilling bits business which lead to force the big international suppliers to have a minimum requirements from local content and human resources as well.

On what criteria are the offers and proposals evaluated and selected?

In MAFD we are the end of buying phase , we are receiving the feedback from technical and operational departments, in case of new product trial test , once the bit is approved from technical and operational department we enroll this product in Aramco drop down approved list , first product will be free of charge , in the repetitive purchase , we are following that the flow of ordering is as per Aramco requirement and the DRSS (Drilling record system) is initiated by the drilling foreman, then approved by the drilling superintend it will go to the supplier then it will accepted by the vendor then will send the drilling bit to the drilling rig, once the bit will reach the location Aramco drilling foreman

will received the bit on the system , once the bit will be used and appear on the drilling morning report , an automatic PO (Purchase Order), will go to the supplier with one week of the bit usage. Any miss order of the mentioned road will end it up of non-payment for the drilling bits and will lead to a manager request with further investigation and explanation prior proceeding with payments.

How Schlumberger is evaluated compared to other companies on different criteria?

Actually Schlumberger is the world biggest service provider worldwide and we have long-term relationship around 80 years, and the amount of business and product that we are dealing together is massive , for drilling bits part , Schlumberger is providing the highest number of products in all section with all hole sizes that Aramco is drilling, and lately we had a deep investigation for all drilling bit companies lead to ban couple of bits provider and we can't do the same for Schlumberger because the operational departments inform us that they can't afford to stop using it and it will lead to stop and delay couple of Aramco's projects , it means that our relations ship and business oriented lead to treat Schlumberger differently and priorities there products.

What is the importance of the criteria and for whom?

The importance of the required criteria is based on the amount of business and operations decision to prevent any delay and stoppage of Aramco's projects, we have similar criteria for the direct competition like Halliburton and baker, but knowing that Schlumberger hold the highest market share value over all other vendors which lead us for a special treatment from Aramco's higher level.

How do you evaluate performance?

In MAFD our evaluation is based on following the DRS (Drilling Record System) and amount of issues to follow this system, once any company will have such issue and deviation from it, it will get delay in DSO and payment and will lead to stop and reduce using their product till we will overcome this issue.

What are the environmental influence in the process (political, legal, etc.)?

Fairly as I reference previously the kingdom vision and track toward the localization of resources have the main effect for the assessment and increasing market share and admitting the business to any supplier. So we are arranging the opportunities for local suppliers or international ones which have high percentage of local employee and contents to have business and more market share.

Who influences the process on which dimensions?

The upper organization got this directions from the king and government despite they need to keep the big international suppliers to maintain the latest technology and the expat community to guide and pass their experience to the local generation.

7. N: of Candidate: R7

Position Title: *Senior Drilling Superintendent*

Department: *Aramco Gas and workover drilling department*

Date of interview: *30/11/2016*

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified	Roles in the Buying Centre Straight rebuy / repetitive
Rebuy / New Products	
Internal Influencer	User

QUESTIONS:

Why is the Drilling Bits important for Aramco?

From Operational point of View and after 30 years of experience in drilling with Aramco I can tell that, drilling bits business is very important and considered as a key success factor in Aramco's drilling operations we depend on the technology , improvement and dynamic of the drilling bits products to improve the entire KPIs(Key Performance Indicators) in drilling time and reduce the cost per foot drilling operation is the only part that we can improve and reduce drilling time because the other parts of operations reach the border of developments.

What does the Drilling Bits technology bring to the future of Aramco?

I believe that the drilling bits technology can reduce the drilling time affectedly, which will lead to Aramco to finish the drilling wells faster and increase the oil and gas production, New Technology in drilling bits business is the key for Aramco to develop the whole drilling progression and decrease the cost of drilling and speed up the drilling time to increase our boundaries.

How is that product (Drilling Bits) purchased on a regular basis?

For the repetitive purchase On regular Basis, the drilling Engineer initiate the drilling program and choose the bits selection based on BPA (Bit Performance Analyser), then he will convince his supervisor then they will bring the program for final approval by the general supervisor, once the final drilling program arrived to the drilling foreman on the rig site , he will raise a request through (DRSS) drilling records system then this request will come to me for final approval, typically I review based on the lowest CPF (Cost Per Foot), and the best performance for the recent wells and the bit will give me the higher ROP (Rate of Penetration) , after my approval the request go to the vendor to provide the bit.

What are the buying phases?

The buying Phases depends on type of purchases (new purchases and repetitive purchases). The new purchase Need to initiate trial test for the product free of charge to prove the new product to add it to Aramco approved list. Typically it will be introduction of new technology and /or new sizes which help us to improve our price scheme for the same bit size with market competitive and /or open a new market by new introduce market. The repetitive purchase relate to the operation decision from the drilling engineer from the product already passed Aramco trial test criteria on consignment basis.

The repetitive purchases buying Phases, as I mentioned is started from the drilling engineer, reviewed by the drilling supervisor then for me as a final approval before sending to the drilling rig for requesting the bits, then the drilling Superintendent will approve the request then it will go to the supplier to send the bit to the rig on a consignment basis, if it will be utilize Aramco will buy it if not it will be return back to the supplier.

What are the expectations from Aramco?

We are expecting new technology as we used to get from the biggest supplier usually drilling bits business is really dynamic and any supplier will get a reliable product will drill fast and reduce cost will gain the market share.

What are the suppliers and is their search for suppliers?

Suppliers are best of the international establishments in the drilling bits industry, naturally we are open for any new supplier will help Aramco to improve our KPI (Key Performance Indicator) and accelerate the drilling and reduce the cost and cost per foot.

On what criteria are the offers and proposals evaluated and selected?

As a Superintendent for six rigs, my main criteria is the reliability of the product which help me to finish as fast as possible, without any NPT (Non-productive time), more precise in the soft upper section I'm open-handed for the small companies, with Lowest bit price, and for the lower hard section, most likely the big companies have the best reliable products so I go for the best performer in the field with the lowest CPF.

How Schlumberger is evaluated compared to other companies on different criteria?

Schlumberger "Smith Bits", the sole supplier who can drill the entire well all requested sections sizes which allow us to rely on Schlumberger in the turn key project to drill the entire well from top section to bottom, with all drilling bits sizes and types. Schlumberger Smith Bits hold the uppermost market share, we have trust and confidence on them on our most challenges abrasive sections particularly they are providing competitive advantage for the abrasive formation section rather than all other bits suppliers using the Onyx-360 rolling cutters which is patent for Schlumberger.

What is the importance of the criteria and for whom?

From Operational point of view, The importance of the criteria is based on BPA (Bit Performance Analyser) is the essential reference and standards to choose the drilling bits, and for the Audit as well to prevent any deviation need to be justified with evidence from previous performance in different to defend choosing a bit without BPA.

How do you evaluate performance?

I'm following on daily basis my six rigs, all drillings bits performance and inform the drilling engineer to provide me the performance of all drilling bits against the BPA, normally any bits will have a good performance will keep using it for the next wells and any bit will not perform or fail to achieve the target will not be used in the upcoming wells.

What are the environmental influence in the process (political, legal, etc.)?

On the operational level the only influence is the performance and the support getting from the technical support, we give the priority for the Local technical support, personally I give instruction to all the service provider to send only Saudi engineers to my rigs.

Who influences the process on which dimensions?

The Process is influenced by the kingdom vision for the localization, the priority of giving business and highest market share will be for the company which will follow these instructions providing Saudi engineers and have highest content in their products.

8. N: of Candidate: R8

Position Title: *Sales and Operations Manager*

Department: *Schlumberger Drilling Bits and downhole tools*

Date of interview: *03/11/2016*

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified	Roles in the Buying Centre Straight rebuy / repetitive
Rebuy / New Products	
External Influencer	External Influencer

QUESTIONS:

Why is the Drilling Bits important for Aramco?

As a Sales Location Manager for drilling bits for the world leader company (Schlumberger Smith bits), and after six years' experience with Aramco, knowing its applications and buying center, Drilling bits is the most important element in the drilling equation, and it will help Aramco

To improve the KPI (Key Performance Indicator) in the entire drilling well. Choose the best drill bits for your application from the broadest portfolio in the oil and gas industry. Using the most advanced design technology, Smith Bits can optimize any bit to fit Aramco's specific drilling needs. Our IDEAS integrated drill bit design platform enables us to develop industry-leading bits that continually push the boundaries of performance and reliability for every application.

What does the Drilling Bits technology bring to the future of Aramco?

Technology to drill holes and to excavate tunnels and openings in rock is vital for the economic, environmental, and scientific well-being of the United States. Drilling is a key technology in several applications of strategic or societal importance, including energy and mineral production in Aramco, environmental protection, and infrastructure development. During this century, U.S. technology has dominated the worldwide drilling industry and much of the excavation and comminution industries. In the committee's view, this U.S. dominance is likely to erode without continued technological advances.

Although incremental improvements in the component processes in the present state of the art can continue to make drilling more productive, it is the basic conclusion of this committee that revolutionary advances are within reach through the introduction and concerted development of smart drilling systems especially for the world biggest oil and gas producers (Aramco). A smart drilling system is one that is capable of sensing and adapting to conditions around and ahead of the drill bit to reach desired targets. This system may be guided from the surface, or it may be self-guided, utilizing a remote guidance system that modifies the trajectory of the drill when the parameters measured by the sensing system deviate from expectations.

The smart drilling system does not currently exist, but it is presaged by recent dramatic advancements in directional drilling and measurement-while-drilling technologies. Rapid innovation in microelectronics and other fields of computer science and miniaturization technology holds the prospect for greater improvements—even revolutionary breakthroughs—in these systems.

The development of smart drilling systems has the potential to revolutionize drilling. Research in this area will have a significant impact

As a drilling engineer, drilling bits is the key of reducing the cost of the entire well and accelerate the well plan, especially the remaining and remedial process reach the limit for improvement, despite the drilling bits business is really dynamic one.

How is that product (Drilling Bits) purchased on a regular basis?

We have a contract with Aramco to provide drilling bits on a consignments basis, which is the repetitive purchases on daily basis,

We have an approved Aramco Products List (SMI List), those bits already passed Aramco trial test criteria and we can send it directly to the drilling rigs, after receiving the DRSS request (Drilling request Supply system), if the bit will be utilized we will receive the used notification and

the PO (Purchase Order) afterward, if the bit will not be used it will be return to our warehouse within 90 days from delivery date free of charge.

What are the buying phases?

The buying Phases depends on type of purchases (new purchases and repetitive purchases). The new purchase Need to initiate trial test for the New introduced product free of charge to prove the new product to be added to Aramco approved list. It requires chain of proposals and approvals from three Aramco's departments.

The repetitive purchase relate to the operation decision from the drilling engineer from the product already passed Aramco trial test criteria on consignment basis.

What are the expectations from Aramco?

Aramco's expect from us introducing latest technology, specially Schlumberger smith bits hold the highest market share worldwide and the only company embrace the patents for 3DC cutters technology, Rolling Cutters, StingBlade and AxeBlade, which no one from competition can copy or imitate it, typically we are testing our new product in North America and send it directly to Saudi Arabia to test the do-ability of their applications and formation with the new technology, And Aramco expected that these technology will improve their overall cost per foot meanwhile great opportunity for us to improve our pricing and margins based on it.

What are the suppliers and is their search for suppliers?

In Saudi Arabian Market, and due to it is the most premium market globally, all the competitions are challenging to gain more market share and introduced their technologies with their best team, Aramco displayed last year after introduction of the new kingdom vision for any company will work with Saudi Aramco should have minimum requirements of local suppliers and human resources , and for drilling bits companies specifically they should have a local manufacturer facility in country within two years' time. If not the supplier will not be able to continue working in Saudi market.

On what criteria are the offers and proposals evaluated and selected?

Generally the criteria nowadays is based on the kingdom vision for local content and human resources percentage, then on the company profile on drilling application in Saudi , HSE (health , safety and environment data) there will be an Audit from Aramco site to come over the supplier manufacturer facility even outside country to approve it. They also give chances for small players to create competition and challenge the big companies.

How Schlumberger is evaluated compared to other companies on different criteria?

Schlumberger Smith Bits, hold the highest market share worldwide with the most proven patents in the cutters technology with Aramco rely on it specially on the abrasive formation, and celebrating 80 years of working together with Aramco in all drilling and production sector.

What is the importance of the criteria and for whom?

The importance of the BPA (Bit Performance Analyser) is the essential reference and criteria to choose the drilling bits, the importance of the proposal and Sales representative from all suppliers is really important to explain the new technology and recent performance in different fields.

How do you evaluate performance?

Internally we have every quarter a strategy meeting, gathering the entire drilling sections during this quarter and show the performance for all drilling bits to see our strength and weakness to improve our products and introduce new product and modified some existing ones , externally Aramco is performing on quarterly basis SQ meeting (Service Quality) meeting , gathering all failures and NPT (Non-productive time) for each company as well as any environment or safety issues happened during the last quarter, based on it Aramco decide to increase or decrease the market share for this company based on the results and performances.

What are the environmental influence in the process (political, legal, etc.)?

Generally the main influences is the kingdom vision and direction toward the localization of resources have the biggest influence for the evaluation and increasing market share and granting the business to any supplier. So they are prioritizing the opportunities for local suppliers or international ones which have high percentage of local employee and contents to have business and more market share. Politics derives the market share based on the area you working for, it depends primarily on the relations and relatives, other operational influence is splitting the market between most of suppliers and don't depend on single supplier, and it is doable in the upper soft sections, despite the lower and hard part.

Who influences the process on which dimensions?

The Process is influenced by the kingdom vision for the localization, the priority of giving business and highest market share will be for the company which will follow these instructions providing Saudi engineers and have highest content in their products.

Actually in terms of influence i want to share particular comparing the impact and influence difference between Non-Monopsonist and Monopsonist Market. Whereas working in Gabon is a typical non-monopsonist market which there is 11 different clients working in Gabon, which give a vast diversity for the clients and suppliers to offer different products diversity and prices, at that time Schlumberger failed to renew two contracts with two clients with lead to lost contracts with two clients, meantime Schlumberger were able to continue working and leading the market in Gabon. And this is a big benefit to work in a non-monopsonist market that you can maintain your revenue and business if even you lost couple of clients. On the other hand and as an example of extreme Monopsonist market in Middle east, Aramco is the only Client in Saudi Arabia , a dispute occurred with (NOV), National Oilwell Varco that Aramco requested from NOV some more details regarding approved products that Aramco have thought that NOV is not following the specifications of the using those bits, an instant decision from Aramco to stop NOV till further notice for more examination lead to ten Months NOV were completely out of the biggest market globally, due to the monopsonist environment, no other solution or revenue generating only Aramco.

9. N: of Candidate: R9

Position Title: *Sales Engineer*

Department: *Schlumberger Drilling Bits and downhole tools*

Date of interview: *15/11/2016*

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified Rebuy / New Products	Roles in the Buying Centre Straight rebuy / repetitive
Initiator / External Influencer	Initiator / External Influencer

QUESTIONS:

Why is the Drilling Bits important for Aramco?

As a Sales engineer for drilling bits for the world leader company (Schlumberger Smith bits), and after three years' experience with Aramco, knowing its applications and buying center, Drilling bits is the most important element in the drilling equation , The advancement of drilling technology will also help the human race with discovering more about our fascinating planet. Adventurous plans to drill further into the earth's crust were announced recently, lower a drill bit that will bore through 1.5km of solid rock. This news is ground breaking and if the project concludes with positive results, further expeditions will take place; being the first time in history where humans have acquired physical mantle data.

In order to meet demand, further investment will be needed to ensure future discoveries in further regions afield. Oil & Gas in Saudi's Activity focusing on Industry Investment saw £14.8 billion of capital invested and a total of 126 development wells drilled. Yet, it's crucial that we do not neglect existing operations as this is where many companies within the sector can go wrong. Aramco stated earlier this year that it plans to continue injecting investment into existing operations led by its joint venture with couple of Companies Despite current market conditions, Major Drilling announced that it has remained stable over this year and successfully made necessary quality enhancements to productivity. "Our customers continue to focus their work almost exclusively on mine sites, which means they have a much greater focus on production related drilling, such as percussive and underground drilling, which has lower margins. We are continuing to adapt to the current market conditions by investing in and growing our percussive operation.

What does the Drilling Bits technology bring to the future of Aramco?

Drilling Bits Technology although the principal thrust for Aramco of the proposed R&D program should be on smart systems, the program should also facilitate incremental improvements in all consequential aspects of present drilling technology. This should result in more immediate attainment of greater efficiencies and cost savings, and will lend needed justification to continued long-term support for the program of smart system development. Such additional R&D should focus on the following problems:

- Drilling technology, with a focus on the physics of rock removal to reduce energy requirements for drilling;
- Improved cutter materials and bearings;
- Improved bits for drilling in heterogeneous materials;
- Development of environmentally benign drilling fluids; and
- Development of durable, compact, high-power downhole motors for directional and extended reach drilling.

This R&D program should be a combined effort between Schlumberger and Aramco effort. Both of us should benefit; resources and guidance for the program should be shared, where appropriate. This program should have the following characteristics:

- Integration of industry
- Support should serve primarily as a catalyst, with industry providing both technological and financial support. The percentage of R&D support from Schlumberger and industry could be project specific.
- Finally, a long-term commitment with Aramco is needed to accomplish the objectives of the program.

The program should be structured with shared research objectives. Support of projects should be based on a peer-review process and assessment of how the results would contribute to overall program goals.

How is that product (Drilling Bits) purchased on a regular basis?

On regular basis we are providing drilling bits to Aramco on a consignments basis, which is the repetitive purchases on daily basis,

We have an approved Aramco Products List (SMI List), those bits already passed Aramco trial test criteria and we can send it directly to the drilling rigs, after receiving the DRSS request (Drilling Request Supply System), if the bit will be utilized we will receive the used notification and the PO (Purchase Order) afterward, if the bit will not be used it will be return to our warehouse within 90 days from delivery date free of charge.

What are the buying phases?

The buying Phases depends on type of purchases (new purchases and repetitive purchases). The new purchase Need to initiate trial test for the New introduced product free of charge to prove the new product to be added to Aramco approved list. It requires chain of proposals and approvals from three Aramco's departments.

I'm working on daily basis with the repetitive purchase relate to the operation decision from the drilling engineer from the product already passed Aramco trial test criteria on consignment basis.

What are the expectations from Aramco?

Schlumberger smith bits hold the highest market share worldwide which lead that Aramco's expect from us introducing latest technology, Specially the 3DC cutters technology, Rolling Cutters, StingBlade and AxeBlade, which no one from competition has it.

What are the suppliers and is their search for suppliers?

All suppliers are In Saudi Arabian Market, and due to it is the most premium market globally, all the competitions are challenging to gain more market share and introduced their technologies with their best team,

And yes Aramco always searching for new suppliers to provide more competitive products and technology.

On what criteria are the offers and proposals evaluated and selected?

On my day to day work with Aramco Drilling Engineers and drilling supervisors, they are trying to split the market share among all the suppliers, they tried to give the small companies the soft and easy sections, and give the big companies the hardest and challenging sections, to create competition and challenge the big companies, and Aramco drilling engineer tend to deal with the sales they knew long back and from their troops , it will ease the proposal review and having meeting to discuss it and secure the market share for its company.

How Schlumberger is evaluated compared to other companies on different criteria?

Normally Schlumberger Smith Bits, get its share on every well , but they always consider us on the lower hardest section, as sales I'm trying to push for the maximum market share, and get the upper soft section to increase our part, it is tough to convince Aramco drilling engineer and compete with small players specially in terms of pricing.

What is the importance of the criteria and for whom?

The importance of the BPA (Bit Performance Analyser) is the essential reference and criteria to choose the drilling bits, the importance of the proposal and Sales representative from all suppliers

is really important to explain the new technology and recent performance in different fields and push to get the highest market share in each well proposed to get the overall market share increase.

How do you evaluate performance?

As a sales engineer in Schlumberger (Smith Bits) we are evaluating Internally we have every quarter a strategy meeting, gathering the entire drilling sections during this quarter and show the performance for all drilling bits to see our strength and weakness to improve our products and introduce new product and modified some existing ones, and I'm doing after each section a post run report for Aramco drilling engineer to show our performance to get more business based on it.

What are the environmental influence in the process (political, legal, etc.)?

On my Daily work I can feel the Politics derives the market share based on the relations and relatives between some sales representative and Aramco drilling engineer, other operational influence is splitting the market between most of suppliers and don't depend on single supplier, and it is possible in the upper soft sections, despite the lower and hard part.

Who influences the process on which dimensions?

The Process is influenced by drilling engineer and drilling supervisor toward splitting the market among all suppliers and don't let Aramco depend on sole supplier and create competition which will benefit Aramco in ROP (Rate of Penetration) and CPF (Cost per Foot).

10. N: of Candidate: R10

Position Title: *Senior Product Engineer*

Department: *Schlumberger Drilling Bits and downhole tools*

Date of interview: *29/12/2016*

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified Rebuy / New Products	Roles in the Buying Centre Straight rebuy / repetitive
External Influencer	External Influencer

QUESTIONS:

Why is the Drilling Bits important for Aramco?

As a Senior Product Engineer for drilling bits for the world leader company (Schlumberger Smith bits), and after four years' experience with Aramco, knowing its applications, Drilling bits is the most important element in the drilling equation, and it will help Aramco to improve the KPI (Key Performance Indicator) in the entire drilling well. Choose the best drill bits for your application from the biggest portfolio in the oil and gas industry. Using the most advanced design technology, Smith Bits can optimize any bit to fit Aramco's specific drilling needs. Our IDEAS integrated drill bit design platform enables us to grow industry-leading bits that continually push the boundaries of performance and consistency for every application.

What does the Drilling Bits technology bring to the future of Aramco?

Aramco is expecting newest and highest Technology to drill holes Downhole BHA (Bottom Hole Assembly) monitoring and drilling performance improvement, Manage downhole conditions and BHA dynamics with the drilling intelligence service. The service incorporates a rig site display of integrated downhole and surface data provides actionable information to mitigate risk and increase efficiency. This data is simultaneously interpreted by remote experts, who collaborate with the drilling team to improve performance.

- Mitigate risk while drilling shoe to shoe

Using a downhole drilling mechanics and dynamics measurement sub, the service identifies the type and severity of BHA motions and calculates continuous borehole friction factors. With this information, the drilling team can

- Reduce drill string failures
- Extend the life of cutting structures
- Detect sticking pipe tendencies.
- Improve ROP by safely maximizing drilling parameters

The Drilling bits service provides information for the rig site team to identify the optimal drilling parameters to improve ROP. Simultaneously, the remote experts focus on the interpretation

of longer-term trends, identifying performance limiters and anticipating risks. They also share opportunities for process improvement.

- Enhance wellbore quality for smooth casing running

Data from the service, integrated with borehole caliper and images from LWD services, is used to evaluate the stability of the borehole throughout the drilling process. Combined with detection of microdoglegs and spiraling from bending-moment data, this information helps you to drill a smooth wellbore for running casing.

How is that product (Drilling Bits) purchased on a regular basis?

We are providing Aramco drilling bits on a consignments basis, which is the repetitive purchases. We have an approved Aramco Products List, those bits already passed Aramco trial test criteria and we can send it directly to the drilling rigs, after receiving the DRSS request (Drilling Request Supply System), if the bit will be utilized we will receive the used notification and the PO (Purchase Order) afterward, if the bit will not be used it will be return to our warehouse within 90 days from delivery date free of charge.

What are the buying phases?

The buying Phases depends on type of purchases (new purchases and repetitive purchases). The new purchase Need to initiate trial test for the New introduced product free of charge to prove the new product to be added to Aramco approved list. It requires chain of proposals and approvals from three Aramco's departments.

The repetitive purchase relate to the operation decision from the drilling engineer from the product already passed Aramco trial test criteria on consignment basis.

What are the expectations from Aramco?

Aramco's expect from us introducing latest technology, specially Schlumberger smith bits hold the highest market share worldwide and the only company embrace the patents for 3DC cutters technology, Rolling Cutters, StingBlade and AxeBlade, which no one from competition can copy or imitate it, typically we are testing our new product in North America and send it directly to Saudi Arabia to test the do-ability of their applications and formation with the new technology.

The newest 3D cutting element from Smith Bits, a Schlumberger company, the Axe ridged diamond element features a unique ridge-shaped geometry that combines the shearing action of a conventional PDC (Poly Crystalline Cutters) cutter with the crushing action of a tungsten carbide insert (TCI). Positioning Axe elements across the bit face results in the AxeBlade ridged diamond element bit. Many previous improvements in PDC bit performance were the results of metallurgy and materials changes. That is, until the StingBlade conical diamond element bit was introduced with its unique cone-shaped cutting element. From the success of StingBlade bits, Smith Bits engineers sought to further improve bit performance by developing a new cutter geometry through extensive internal R&D and field testing. The new ridged design of the Axe element enables more efficient cutting and heat dissipation, while also having better frontal impact resistance which is achieved through a thicker diamond layer, proprietary blend of polycrystalline diamond grain-size distribution, and optimized materials. Increased cutting efficiency for instant ROP improvement. Axe elements employ a unique geometry that cuts rock in a new way combination of shearing and crushing. This cutting method achieves at least 22% deeper penetration, removing more formation to provide higher instantaneous ROP when using the same WOB and rpm applied to conventional PDC cutters. The diamond table on the element ridge, which is 70% thicker than that of a conventional cutter, gives the Axe element increased frontal impact resistance. For operators, this means that the AxeBlade bit delivers improved durability and dull condition for maximum ROP throughout the run.

Field tests of the AxeBlade bit have demonstrated up to 29% improvement in ROP compared with similar bit designs using conventional PDC cutters, resulting in significant rig time and cost savings for Aramco.

What are the suppliers and is their search for suppliers?

The most finest market worldwide is the Saudi Arabian Market, and due to it all the competitions are challenging to gain more market share and introduced their technologies with their best team, Aramco displayed last year after introduction of the new kingdom vision for any company will work with Saudi Aramco should have minimum requirements of local suppliers and human resources , and for drilling bits companies specifically they should have a local manufacturer facility in country within two years' time. If not the supplier will not be able to continue working in Saudi market.

On what criteria are the offers and proposals evaluated and selected?

Technically point of view, Aramco evaluate the competency of the companies and their capabilities of the proposed products then the kingdom vision for local content and human resources

percentage, then on the company profile on drilling application in Saudi, HSE (health, safety and environment data) there will be an Audit from Aramco site to come over the supplier manufacturer facility even outside country to approve it. They also give chances for small players to create competition and challenge the big companies.

How Schlumberger is evaluated compared to other companies on different criteria?

Aramco consider Schlumberger Smith Bits, as a technical oriented company with the most proven patents in the cutters technology with Aramco rely on it especially on the abrasive formation, and after long-term relationship of working together with Aramco in all drilling and production sector they guarantee business and support in the judgment for the new products.

What is the importance of the criteria and for whom?

The BPA (Bit Performance Analyser) is the important guidance criteria to choose the drilling bits, as well as the importance of the proposal and Sales representative from all suppliers is really important to explain the new technology and recent performance in different fields.

How do you evaluate performance?

As a Product Engineer Within the company we have every quarter a strategy meeting, product engineer will gather the entire drilling sections during this quarter and show the performance for all drilling bits to see our strength and weakness to improve our products and introduce new product and modified some existing ones , For Aramco, they are performing on quarterly basis SQ meeting (Service Quality) meeting , gathering all failures and NPT (Non-productive time) for each company as well as any environment or safety issues happened during the last quarter, based on it Aramco decide to increase or decrease the marker share for this company based on the results and performances.

What are the environmental influence in the process (political, legal, etc.)?

From Technical Point of view, the main influences is the technical capabilities Maximize drilling performance in any application with the industry's widest range of bit types, PDC (Poly Diamond Crystalline) and Roller Cones. Our broad portfolio of high-quality bits ensures premium performance to meet Aramco's drilling demands, Deliver maximum results in any application with cutting-edge technology that enables our bits to break performance records all over the world. Use advanced simulations to engineer the optimal drilling assembly for any application including drill bit designs that account for each element of the BHA. Which favorite Schlumberger to get the highest market share based on it.

Who influences the process on which dimensions?

The Process is influenced by the kingdom vision for Saudization, the priority of giving business and highest market share will be for the company which will follow these instructions providing Saudi engineers and have highest content in their products. Schlumberger just got the kingdom award for the highest company hired Saudi personnel and meanwhile we are working to setup our Bit facilities in Saudi to start the manufacturing process locally.

11. N: of Candidate: R11

Position Title: Demand Planner

Department: Schlumberger Drilling Bits and downhole tools

Date of interview: 23/11/2016

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified Rebuy / New Products	Roles in the Buying Centre Straight rebuy / repetitive
Gate Keeper (Information Flow to the Buyer)	Gate Keeper (Information Flow to the Buyer)

QUESTIONS:

Why is the Drilling Bits important for Aramco?

As Senior Demand Planner, serving Aramco and bring the bits to Aramco for 11 years, Aramco depend on our bits for their drilling operations, and year on year the requested bits in terms of units increase. The decision for Aramco to continue drilling despite the oil crisis advancement of drilling technology will also help them with their plans with discovering more oil and gas wells.

Adventurous plans to drill further were announced recently, this news is ground contravention and if the project concludes with positive results, further expeditions will take place.

In order to encounter demand, additional investment will be needed to ensure future discoveries in further Saudi Arabian regions afield. Oil & Gas in Saudi's Activity focusing on Industry Investment. Yet, it's vital that we do not disregard existing operations. Aramco stated earlier this year that it plans to continue injecting investment into existing operations led by its joint venture with couple of Companies Despite current market conditions, Major Drilling proclaimed that it has continued steady over this year and positively made essential quality improvements to efficiency. "Our clientele remain to emphasis their work almost solely on excavation locations, which means they have a much larger attention on production related drilling, such as percussive and underground drilling, which has lower margins. We are continuing to adjust to the current market circumstances by investing in and growing our percussive operation.

What does the Drilling Bits technology bring to the future of Aramco?

Drilling Bits Technology though the main push for Aramco of the planned R&D (research and development) program should be on smart systems on drilling bits, the platform should also simplify incremental developments in all important features of present drilling technology. This should consequence in more instant accomplishment of greater competences and cost savings, and will give wanted explanation to sustained long-term support for the drilling program of drilling bits smart system development. Such additional R&D (research and development) should focus on a long-term commitment with Aramco is needed to accomplish the objectives of the program. The program should be structured with shared research objectives to Aramco's Operation.

How is that product (Drilling Bits) purchased on a regular basis?

On systematic basis we are providing drilling bits to Aramco on a consignments basis, which is the repetitive purchases on daily basis,

I'm receiving approved Aramco the DRSS request (Drilling Request Supply System), we can send it directly to the drilling rigs, after receiving if the bit will be utilized we will receive the used notification and the PO (Purchase Order) afterward, if the bit will not be used it will be return to our warehouse within 90 days from delivery date free of charge.

What are the buying phases?

The buying Phases depends on type of purchases (new purchases and repetitive purchases). The new purchase Need to initiate trial test for the New introduced product free of charge to prove the new product to be added to Aramco approved list. It requires chain of proposals and approvals from three Aramco's departments.

I'm working on daily basis with the repetitive purchase and accept the Bit requests from Aramco and send the bits to Aramco's drilling rigs.

What are the expectations from Aramco?

Aramco Expect from Schlumberger smith bits the least failures and we hold the highest market share with Aramco drilling bits business and our newest technologies and the availability of all the drilling bits in country upon requests.

What are the suppliers and is their search for suppliers?

All providers are In Saudi Arabian Market, and due to it is the most finest market worldwide, all the competitions are interesting to increase more market share and introduced their technologies with their best line-up,

And affirmative Aramco continuously searching for new providers to provide more inexpensive products and know-how.

On what criteria are the offers and proposals evaluated and selected?

I'm not involved in the proposals and evaluations, I'm involved only in receiving Aramco's requests and delivering the drilling bits to the location, receiving the received notification, and if the drilling bits will be utilize I'll receive a used notification from Aramco, if not I'll receive a 90 days not use notification from Aramco's rig to return the drilling bits from Aramco's drilling rig to our warehouse, as per our contract.

How Schlumberger is evaluated compared to other companies on different criteria?

Again, as my part in the buying center I'm not intricate in the evaluation part, Normally Schlumberger Smith Bits, get its share on every well, but they always consider us on the lower hardest section which is smaller sizes bits, as demand planner I'm trying to push for all receiving requests from Aramco to be on location in time.

What is the importance of the criteria and for whom?

The most important criteria to get the drilling bits is the BPA (Bit Performance Analyser) is the necessary reference and criteria to choose the drilling bits.

How do you evaluate performance?

Once more, as a demand planner I'm not a part of evaluation, but I can tell based on my experience that we are getting more requests than ever and year on year the requests are more and I noticed that Aramco is requesting a lot of smaller sizes bit than the other bigger one.

What are the environmental influence in the process (political, legal, etc.)?

On my Quotidian work I can feel the Politics derives the market share based on the relationships between some sales representative and Aramco drilling engineer, legal wise we are following our contract with Aramco and following the consignment basis rules.

Who influences the process on which dimensions?

After eleven years in Saudi Arabia, and following Aramco's operations I can tell that the Process is influenced by the kingdom vision for the Saudization, the priority of giving business and highest market share will be for the company which will follow these instructions providing Saudi engineers and have highest content in their products.

12. N: of Candidate: R12

Position Title: Sales Manager

Department: Schlumberger Drilling Bits and downhole tools

Date of interview: 02/02/2017

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified	Roles in the Buying Centre Straight rebuy / repetitive
Rebuy / New Products	
External Influencer	External Influencer

QUESTIONS:**Why is the Drilling Bits important for Aramco?**

As a Sales Manager for bits and drilling tools for (Schlumberger Smith bits), and after three years' experience with Aramco, knowing its applications and buying center, Drilling bits is one of the essential constituent in the drilling equation, and it will help Aramco to improve the KPI (Key Performance Indicator) of the entire drilling well. Select the top drill bits for your application from the widest portfolio in the oil and gas industry, using the most advanced design technology.

What does the Drilling Bits technology bring to the future of Aramco?

Schlumberger Smith Bits can optimize any bit to fit Aramco's specific drilling needs. Our IDEAS integrated drill bit design platform enables us to develop industry-leading bits that continually push the boundaries of performance and reliability for every application. Technology to drill holes and to excavate tunnels and openings in rock is vital for the economic, environmental, and scientific well-being for Aramco. Drilling is a key technology in several applications of strategic or social importance, including energy and mineral production in Aramco, environmental defense, and substructure development. Through this period, U.S. technology has conquered the worldwide drilling industry and much of the dig and communication industries. In the committee's view, this U.S. dominance is likely to erode without continued technological advances, that's why Saudi Aramco rely on the top American drilling bits companies, Although incremental improvements in the component processes in the present state of the art can continue to make drilling more productive, it is the rudimentary deduction of this committee that ground-breaking advances are within reach through the overview and intensive expansion of smart drilling systems especially for the world biggest oil and gas producers (Aramco). A smart drilling system is one that is capable of detecting and adjusting to circumstances around and ahead of the drill bit to reach anticipated targets. This system may be directed from the surface, or it may be self-guided, utilizing a remote leadership system that adapts the route of the drill when the limits measured by the detecting system deviate from opportunities.

The smart drilling system does not presently exist, but it is foretold by recent dramatic advancements in directional drilling and measurement-while-drilling technologies. Quick invention in microelectronics and other fields of computer science and reduction technology holds the prospect for greater developments level radical advances in these systems.

The development of smart drilling systems has the potential to develop drilling for Aramco. Research in this area will have a significant impact

As a drilling engineer, drilling bits is the key of reducing the cost of the entire well and accelerate the well plan, especially the remaining and corrective process reach the limit for improvement, despite the drilling bits business is really active one.

How is that product (Drilling Bits) purchased on a regular basis?

Schlumberger Smith Bits have a contract with Aramco to provide drilling bits on a consignments basis, which is the repetitive purchases on regular operation. We have an approved Aramco Products List (SMI List), those bits already passed Aramco trial test criteria and we can send it straight to the drilling rigs, after receiving the DRSS request (Drilling Request Supply System), if the bit will be utilized we will receive the used notification and the PO (Purchase Order) consequently, if the bit will not be used it will be return to our warehouse within 90 days from delivery date free of charge.

What are the buying phases?

Drilling Bits buying Phases depends on type of purchases (new purchases and repetitive purchases). The new purchase Prerequisite to initiate trial test for the new presented product free of charge to prove the new product to be added to Aramco approved list. It requires chain of proposals and approvals from three Aramco's departments, starting from Technical department, then operational departments finally to Material and delivery department, if the new product will pass the trial test criteria it will be added to Aramco approved list, for the repetitive purchase relate to the operation decision from the drilling engineer for the products already passed Aramco trial test criteria on consignment basis.

What are the expectations from Aramco?

Aramco's expect from Schlumberger as a world leader in oil and gas service company to introduce latest technology, specially Schlumberger smith bits hold the highest market share worldwide and the only company embrace the copyrights for 3DC cutters technology, Rolling Cutters, StingBlade and AxeBlade, which no one from competition can duplicate or reproduce it, typically we are testing our new product in North America and send it directly to Saudi Arabia to test the effect of the cutters new technology on Saudi formation in different applications.

What are the suppliers and is their search for suppliers?

All oil and gas service companies are in Saudi Arabian Market, due to it is the highest lucrative market globally, and it is the reference market for the eastern globe and specifically Middle East. all the competitions are challenging to gain more market share and introduced their technologies, Aramco displayed last year after introduction of the new kingdom vision for any company will work with Saudi Aramco should have least of requirements of local suppliers and human resources, and for drilling bits companies specifically they should have a local manufacturer facility in country within two years' time. If not the supplier will not be able to continue working in Saudi market.

On what criteria are the offers and proposals evaluated and selected?

Currently the fundamental criteria is based on the kingdom vision announced early 2016 toward local contents and human resources percentage for any company working in Saudi Arabia, so the evaluation of any company profile on drilling application in Saudi, HSE (health, safety and environment data), there will be an Audit from Aramco site to come over the supplier manufacturer facility even outside country to accept it. They also give chances for small players to create competition and challenge the big companies.

How Schlumberger is evaluated compared to other companies on different criteria?

Schlumberger Smith Bits, is leading the market in terms of technology, competitive advantage worldwide with the most proven patents in the cutters technology with Aramco depend on it specially on the abrasive most challenging formation, and celebrating 80 years of working together with Aramco in all drilling and production sector. That's why while tendering it will be favorite and prioritize.

What is the importance of the criteria and for whom?

In terms of tendering Schlumberger already have the highest prioritization specially in technical tender, and will turn to financial one which is somehow accept it to be higher than the competition due to the amount of investment that Schlumberger spent in agreement with Aramco to guarantee business, for drilling bits business The importance of the BPA (Bit Performance Analyser) is the essential reference and criteria to choose the drilling bits.

How do you evaluate performance?

Inside Schlumberger, we have every quarter a strategy meeting, congregation the entire drilling sections drilled during this quarter and show the performance for all drilling bits to see our strength and weakness to improve our products and introduce new product and modified some existing

ones, the attendee of this meeting are all technical sales engineers, Product engineers with the regional technical and designing team to give their supports.

Externally Aramco is performing on quarterly basis SQ meeting (Service Quality) meeting , gathering all failures and NPT (Non-productive time) for each company as well as any environment or safety issues happened during the last quarter, based on it Aramco decide to increase or decrease the market share for this company based on the results and performances.

What are the environmental influence in the process (political, legal, etc.)?

Currently and after the recent kingdom vision and direction toward the localization of resources have the biggest influence for the evaluation and increasing market share and granting the business to any supplier. So they are prioritizing the opportunities for local suppliers or international ones which have high percentage of local employee and contents to have business and more market share. Politics derives the market share based on the area you working for, it depends principally on the relations and relatives, other operational influence is splitting the market between most of suppliers and don't depend on single supplier, and it is doable in the upper soft sections, despite the lower and abrasive challenging formation.

Who influences the process on which dimensions?

The Process is influenced by the kingdom, government, minister of oil then the CEO Toward vision for the localization, the priority of giving business and highest market share will be for the company which will follow these instructions providing Saudi engineers and have highest content in their products.

13. **N: of Candidate: R13**

Position Title: Senior Designer Engineer

(Focal point for Aramco Technical Department)

Department: Schlumberger Drilling Bits and downhole tools

Date of interview: 11/01/2017

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified Rebuy / New Products	Roles in the Buying Centre Straight rebuy / repetitive
External Influencer	External Influencer

QUESTIONS:

Why is the Drilling Bits important for Aramco?

As a Senior designer Engineer for drilling bits, I'm the first in-house designer to work outside USA, and this decision was taken because of Aramco's requirement to have a dedicated designer engineer to design special product to match the exact application and Saudi formation, this show how the drilling bits business is really important for Aramco to save drilling cost, and accelerate the entire drilling operation and put the wells faster on production.

What does the Drilling Bits technology bring to the future of Aramco?

Drilling Bits business in the most dynamic industry in terms of technology, innovation and creativity to enhance the drilling process, and each new technology will help any company to create an competitive advantage and gain market share and will help the Client which is Aramco in our case to reduce its CPF (Cost Per Foot) in drilling and quicken drilling well time and produce oil and gas faster, improve the entire KPI (Key Performance Indicator). And allow Aramco to start exploring areas and reach depths and target, the current technology can't get to these locations and area, which will give the chance for Aramco for further expansion and exploration new fields and formation for oil and gas reservoir.

How is that product (Drilling Bits) purchased on a regular basis?

We are providing Aramco drilling bits on a consignments basis, which is the repetitive purchases. We have an approved Aramco Products List, those bits already passed Aramco trial test criteria and we can send it directly to the drilling rigs, after receiving the DRSS request (Drilling Request Supply System), if the bit will be utilized we will receive the used notification and the PO (Purchase Order) afterward, if the bit will not be used it will be return to our warehouse within three months from delivery date free of charge.

What are the buying phases?

The buying Phases determined by the type of purchases (new purchases and repetitive purchases). The new purchase Need to initiate trial test for the New introduced product free of charge to prove the new product to be added to Aramco approved list. It requires sequence of proposals and approvals from three Aramco's departments.

The repetitive purchase relate to the operation decision from the drilling engineer from the product already passed Aramco trial test criteria on consignment basis.

What are the expectations from Aramco?

Schlumberger Revolutionary cutting technology for extended durability

The ONYX 360 rolling PDC cutter substantially increases PDC bit durability by revolving 360°. Positioned in the highest-wear areas of the cutting structure, the revolving cutters use the entire diamond edge to drill the formation. The cutter's rotating action allows the cutter's diamond edge to stay sharper longer, extending ONYX 360 cutter life far beyond that of premium fixed cutters. Aramco's expect from Schlumberger smith bits introducing latest technology, specially Schlumberger smith bits hold the highest market share worldwide and the only company embrace the patents for 3DC cutters technology, Rolling Cutters, StingBlade and AxeBlade, which no one from competition can copy or imitate it, typically we are testing our new product in North America and send it directly to Saudi Arabia to test the do-ability of their applications and formation with the new technology. To produce a rolling cutter capable of being integrated into a PDC bit's cutting structure, Smith Bits R&D engineers developed a specialized integrated housing that is brazed into the bit blade. This design encloses and secures the cutter while allowing it to rotate.

Using the IDEAS integrated design platform, engineers can determine the rolling cutter's optimal orientation in the blade relative to its contact with the formation. This precise positioning, coupled with the bit's drilling force, drives efficient rotation of the cutter. And because the entire diamond edge of the cutter is used, wear is reduced for more sustained rates of penetration.

What are the suppliers and is their search for suppliers?

The most finest market worldwide is the Saudi Arabian Market, and due to it all the competitions are challenging to gain more market share and introduced their technologies with their best team, Aramco displayed last year after introduction of the new kingdom vision for any company will work with Saudi Aramco should have minimum requirements of local suppliers and human resources, and for drilling bits companies specifically they should have a local manufacturer facility in country within two years' time. If not the supplier will not be able to continue working in Saudi market.

On what criteria are the offers and proposals evaluated and selected?

Technically point of view, Aramco evaluate the competency of the companies and their capabilities of the proposed products then the kingdom vision knowing that Schlumberger was presented with an Excellence Award for "Highest in Saudi Workforce" at Saudi Aramco's **In-Kingdom Total Value Add (iktva)** Forum, which took place in Dammam, Saudi Arabia in December 2016. For local content and human resources percentage, then on the company profile on drilling application in Saudi, HSE (health, safety and environment data) there will be an Audit from Aramco site to come over the supplier manufacturer facility even outside country to approve it. They also give chances for small players to create competition and challenge the big companies.

How Schlumberger is evaluated compared to other companies on different criteria?

As I told you about (IKTVA) In-Kingdom Total Value Add, The award was accepted by Chairman and Chief Executive Officer of Schlumberger Paal Kibsgaard, at a ceremony attended by Minister of Energy, Industry, and Mineral Resources and Chairman of Saudi Aramco Khalid Al Falih, HRH Prince Saud bin Naif bin Abdulaziz, Saudi Aramco President and CEO Amin H. Nasser and Saudi Aramco Vice President of Procurement and Supply Chain Management Abdulaziz A. Al-AbdulKarim.

The two-day iktva Forum commemorated the one-year anniversary of Saudi Aramco launching its localization initiative. The event provided an opportunity for two-way dialog between Saudi Aramco and key strategic suppliers. Saudi Aramco shared its vision for the future of the energy sector in the Kingdom and an update on major projects and initiatives that support iktva, such as local manufacturing, training and development, and attracting increased investment to the Kingdom.

The event included the first annual iktva Excellence Awards which were presented in recognition of the most significant commitment, investment, and progress in localization.

In his keynote address, Saudi Aramco President and CEO Amin H. Nasser said that while the current low oil price environment has posed challenges for the oil and gas industry, particularly for service providers and suppliers, a long term perspective is required and will ensure iktva succeeds. "Iktva can be part of the building blocks for a thriving and competitive world class Saudi energy sector

as Saudi Aramco champions massive investments that will create new industries, which will need completely new localized supply chains,” he said.

Saudi Aramco launched its iktva program in December 2015, identifying and engaging in local value creation efforts in partnership with its supplier network. The program drives towards three critical objectives:

- Double the percentage of locally-produced energy-related goods and services to 70% by 2021
- Exporting 30% of the total domestic energy goods and services produced in the Kingdom by 2020

Create thousands of direct and indirect jobs for Saudis Aramco consider Schlumberger Smith Bits, as a technical oriented company with the most proven patents in the cutters technology with Aramco rely on it especially on the abrasive formation, and after long-term relationship of working together with Aramco in all drilling and production sector they guarantee business and support in the judgment for the new products.

What is the importance of the criteria and for whom?

The Criteria is Kingdom Vision and it will affect any company work in Saudi Arabia, for Drilling bits having a local manufacturer will be a key success factor and from operations point of view is The BPA (Bit Performance Analyser) is the important guidance criteria to choose the drilling bits, as well as the importance of the proposal and Sales.

How do you evaluate performance?

As a designer, I’m evaluating the product performance which is the drilling bits to see if we will need to have a new design. or even modify the current design to improve the performance , I’m getting the drilling data from the Product Engineers Within the company every quarter a strategy meeting, product engineers will gather the entire drilling sections during this quarter and show the performance for all drilling bits to see our strength and weakness to improve our products and introduce new products and modified some existing ones , For Aramco, they are performing on quarterly basis SQ meeting (Service Quality) meeting , gathering all failures and NPT (Non-productive time) for each company as well as any environment or safety issues happened during the last quarter, based on it Aramco decide to increase or decrease the market share for this company based on the results and performances.

What are the environmental influence in the process (political, legal, etc.)?

As a designer and focal point for Schlumberger Smith bits for Aramco I can tell that there is several factors , to cut it short initially is IKTVA as I mention before, then the performance and cost effective.

Who influences the process on which dimensions?

Generally The Process is influenced by the kingdom visualization for Localization, and the technical department are applying the process based on these measurements.

14. N: of Candidate: R14

Position Title: *Account Manager*

Department: *Halliburton Drilling Bits*

Date of interview: *06/10/2016*

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified	Roles in the Buying Centre Straight rebuy / repetitive
Rebuy / New Products	
Initiator / External Influencer	Initiator / External Influencer

QUESTIONS:

Why is the Drilling Bits important for Aramco?

As an account manager in a leading drill bit solution provider, Halliburton, One of the biggest challenges facing the oil and gas industry maintaining wellbore stability and monitoring drilling non-productive time Saudi Arabia Section “Drilling Ahead of the Bit” is an upstream initiative for advanced drilling solutions such as drilling uncertainties and geo-hazard real-time predication and mitigation.

Aramco brought together more than 100 drilling experts, upstream service providers, technology vendors and research institutes to discuss ways to improve the prediction and reading of well environments while drilling. Omar Al-Husaini, general manager of Saudi Aramco's Drilling and Workover (D&WO) Department, spoke about current drilling challenges. Previously, drilling wells were vertical and simpler, but in 1994 horizontal sections came into play in Saudi Aramco and introduced new challenges. "Drilling Ahead of the Bit' is now more important because of the complexity of our wells, the thin layers of reservoir and extended-reach and deep-water wells," Al-Husaini said.

The phrase, "Drilling Ahead of the Bit," refers to the ability of downhole tools to read ahead of the bit — to accurately drill into the reservoir and avoid problematic zones. "It is like an autopilot," he said.

When the horizontal sections were introduced, the focus was on landing better horizontal wells. "There have not been many enhancements in technology over the years," said Al-Husaini. "At present, as we are lacking in the hardware, the focus must be on the well data, and integrating all of the data collected is essential for simulation and prediction."

"We need to achieve optimization of real-time drilling monitoring; we need to make the best use of our data," he said. "There is an absence of the right downhole tools, and we are relying on intelligence."

Experts agreed that the increasingly complex drilling environment requires developing and deploying advanced technological solutions. When this is achieved, drilling engineers will be able to deliver a larger amount of wells more safely, quickly and with huge cost savings.

What does the Drilling Bits technology bring to the future of Aramco?

Advance the evolution of fixed cutter bit technology, introducing innovations that have produced a "step-change" in application-specific PDC bit design.

Incorporating the most advanced PDC cutter technology available, Halliburton's Fixed Cutter bits are designed with the "accumulated knowledge" of a proven design platform that incorporates state-of-the-art force management and drilling dynamics optimization technology.

This highly engineered design platform combines sophisticated modelling and analytical capabilities with a "tool box of options" for unmatched design capabilities, producing bits engineered to meet specific challenges:

- Steerable applications
- Hard rock formations
- Deep unconventional wells
- Turbine drilling

Because each application presents unique challenges to performance, the process of Design at the Customer Interface (DatCISM) process positions experienced design personnel side-by-side with the customer, and equips them with the most sophisticated drilling analysis software available, enabling application-specific design solutions to optimize detailed aspects of drill bit design.

We've learned a lot so far about how petroleum forms and how it's found. Once a well site has been selected, the drilling and exploration crews haul all of the necessary supplies and equipment to the drilling site to begin the complicated, and sometimes dangerous, task of retrieving oil. The challenges in oil production start with the locations where petroleum is found, which is often in hard-to-reach locations. In Saudi Arabia, a great deal of petroleum is found beneath harsh, remote desert (temperatures at Shaybah field, deep in the Rub'al-Khali, can reach as high as 55 °C (131 °F) in the summer months). All the supplies and equipment necessary for developing these fields must be most petroleum reservoirs are hundreds or even thousands of meters underground. That means the drill bits have to go through layer after layer of soil, rock, salt and whatever other obstacles are in the way. The drill bits heat up tremendously from the friction of grinding through the rock (think about what would happen if you rubbed a piece of metal against a rock really quickly). To cool the bits down, the drilling crew pours a mixture of chemicals called "mud" down the drillstring. In addition to cooling the bit, the mud also sweeps away the bits of rock and debris that can clog the drill. The design of a drilling rig will also differ depending on whether it will be used on land (onshore) or in a body of water (offshore).

How is that product (Drilling Bits) purchased on a regular basis?

Aramco is purchasing drilling bits from all suppliers , On regular basis using the consignments basis, which is the repetitive purchases, this purchase occur only for products approved and listed in Aramco approved Products List (SMI List), those bits already passed Aramco trial test criteria and Aramco can request it directly. After receiving the DRSS request (Drilling Request Supply System), if the bit will be utilized we will receive the used notification and the PO (Purchase Order) afterword, if the bit will not be used it will be return to our warehouse at no cost.

What are the buying phases?

Aramco buying Phases hang on two types of purchases (new purchases and repetitive purchases). The new purchase Need to create a trial test for the New introduced product free of charge to prove the new product to be added to Aramco approved list. It requires set of proposals and approvals from three Aramco's departments.

I'm occupied on day-to-day with the repetitive buying relate to the operation decision from the drilling engineer from the product already passed Aramco trial test criteria on consignment basis.

What are the expectations from Aramco?

As a leading drill bit solution provider, Halliburton continues to advance the evolution of fixed cutter bit technology, introducing innovations that have produced a "step-change" in application-specific PDC bit design.

Matrix- and steel-body bits are the "next generation" of PDC bits, with each design truly optimized to deliver a new level of performance in its given application.

Customized through a process that combines specific application experience with our best application science, GeoTech fixed cutter bits incorporate the very latest, most advanced bit technologies: improved matrix/binder materials, leading edge PDC cutter technology, and advanced CFD hydraulics optimization.

But more than that, GeoTech designs combine those innovative technology features through application-specific engineering for bits that help yield optimum performance in your given application.

At the heart of GeoTech innovation, the process of Design at the Customer Interface (DatCISM) draws from a comprehensive solution "tool box" that comprises our best and latest understanding of the science in the bit including:

- Our rock-interaction analysis tool for predicting load and motion of a drill bit for multiple scenarios including rock chipping, bent motor, whirl, and more.
- Depth of cut control (DOCC) optimally positions cutting-structure elements to smooth torque fluctuations, while a two-step cutter layout position improves performance when primary cutters wear or when drilling parameters change.
- PDC-cutter technology significantly increases the amount of rock removed with less wear for higher average ROP and up to four times the footage of previous products.
- Improved hydraulics simulation leads to optimum hydraulic design, directing flow with little recirculation and eliminating stagnant zones to optimize bit cleaning and minimize erosion.
- Advanced materials include new matrix/binder materials, which increase durability and erosion resistance, enabling innovative steel-blade geometries and aggressive matrix body design.

With new, more sophisticated modeling capabilities than ever before, DatCI allows us to determine during the design phase, if modifications will lead to actual performance improvement in a given application. That means GeoTech bits can be "virtually" verified and tested for optimum performance under specific operating conditions before ever being built.

As a result, each GeoTech bit can be truly optimized to deliver a new level of performance in even the most challenging application: yours.

What are the suppliers and is their search for suppliers?

All Big companies and suppliers are In Saudi Arabian Market, and due to it is the most Lucrative market internationally, all the competitions are challenging to gain more market share and introduced their finest technologies with their best crew, Aramco always searching for new providers to deliver more viable products and technology and know-how.

On what criteria are the offers and proposals evaluated and selected?

On 2015 Kingdom of Saudi Arabia announce (IKTVA) **IN-KINGDOM TOTAL VALUE ADD**, A bedrock of strategy at Saudi Aramco is to create value in every aspect of their business, maximizing long-term economic growth and diversification.

Through the In Kingdom Total Value Add (IKTVA) program, Aramco is taking action to drive additional domestic value creation to support a rapidly changing economic environment and foster future prosperity.

Working with our suppliers, we will capture value that produces long-term tangible benefits quality jobs for growing Saudi population, innovation and diversification of industry, and increased global competitiveness.

As well as driving domestic value creation, IKTVA prioritizes consistency and transparency to create a level playing field for more than 1000 suppliers we are engaged with across our local and international network.

Designed to amplify the efforts of their partners and their investments, IKTVA was developed and tested through extensive consultation, both in Kingdom and internationally...

How Schlumberger is evaluated compared to other companies on different criteria?

Schlumberger Smith Bits, is the world leader in terms of market share and new technology, and Aramco rely on them and the other big company like Halliburton and Baker on performance basis, whoever will deliver faster rate of penetration and Lower cost per foot will get the highest market share, I need to mention that Baker Hughes which is GE acquired them lately and my company Halliburton have complete facility in Saudi, and we are fully manufacturing drilling bits in country. Despite Schlumberger have only one an assembly facility.

What is the importance of the criteria and for whom?

The importance of the Criteria of Having a local manufacturer will give an advantage for GE and Halliburton in term of matching the new kingdom vision toward localization, and both companies will get extra privilege and prioritization because they invest more in Saudi. despite the BPA (Bit Performance Analyser) is the essential reference and criteria to choose the drilling bits, the importance of the proposal and Sales representative from all suppliers is really important to explain the new technology and recent performance in different fields and push to get the highest market share in each well proposed to get the overall market share increase.

How do you evaluate performance?

As an account manager Halliburton security drilling bits we are evaluating Internally we have monthly review with the headquarter in Houston and twice a year in depth evaluation collecting the entire drilling sections during the first half and display the performance for all drilling bits for all the companies to see our strength and weakness to progress our products and introduce new product and improve some existing ones,

What are the environmental influence in the process (political, legal, etc.)?

I believe IKTVA as I mention has the biggest influence now for the companies which follow the instructions, and based On my Daily work as a front line with Aramco, I can feel the Politics derives the market share based on the relations and relatives between sales representative and Aramco drilling engineer, other operational influence is splitting the market between most of suppliers and don't depend on single supplier.

Who influences the process on which dimensions?

In drilling bits business, the process is influenced by drilling engineers and drilling supervisors toward splitting the market among all suppliers and don't let Aramco depend on sole supplier and create competition which will benefit Aramco in ROP (Rate of Penetration) and CPF (Cost per Foot).

15. N: of Candidate: R15

Position Title: *Country Manager*

Department: Baker Hughes

Date of interview: 03/11/2016

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified	Roles in the Buying Centre Straight rebuy / repetitive
Rebuy / New Products	
External Influencer	External Influencer

QUESTIONS:

Why is the Drilling Bits important for Aramco?

As a Country Manager for drilling bits for the world leader company (Baker Hughes), Acquired by GE in 2016 ,Baker Hughes (NYSE: BHI) significantly strengthened its Middle East capabilities with the opening of a new operations center in Dhahran, Saudi Arabia. The 100,000-square-meter facility, which houses laboratories, offices, repair and maintenance operations and a remote collaboration center, is part of Baker Hughes' expansion plans for the Kingdom of Saudi Arabia, a key growth market for the company. The Dhahran facility opening ceremony was attended by Saudi Aramco executives; partners; dignitaries; oil and gas industry stakeholders; and Baker

Hughes executives. During the event, Baker Hughes showcased its product and service portfolio, as well as its successful collaborations with Saudi Aramco.

The new facility allows Baker Hughes to better serve its Middle East clients. In addition to repair and maintenance capabilities, the base's BEACON Center allows local teams to remotely manage and monitor operations in the region and to collaborate with clients and Baker Hughes' technology experts located anywhere in the world.

Khaled Nouh, Middle East president for Baker Hughes, said the Dhahran operations base is a testament to Baker Hughes' long-term commitment to the Kingdom of Saudi Arabia. "For the first time, all Baker Hughes product lines are housed in the same facility in Saudi Arabia under one management team, which will drive consistent standards to improve service quality and reliability," noted Nouh.

"Our investments in Saudi Arabia and the rest of the Middle East have positioned us to provide superior operations support in the region. The Dhahran base also underscores our commitment to creating new jobs and empowering the local economy in line with the vision of the Kingdom's leaders."

Baker Hughes will expand its footprint in Saudi Arabia again next year with construction of a multi-million dollar research and technology center in KFUPM Dhahran Techno-Valley. "The Dhahran Technology Center will integrate the competencies of engineers and scientists from the Saudi oil and gas industry, King Fahd University of Petroleum and Minerals and Baker Hughes to develop application-specific technologies for complex reservoirs, including the tight sand plays of Saudi Arabia," explained Nouh.

What does the Drilling Bits technology bring to the future of Aramco?

Baker Hughes is the world leader in this industry over 100 years, Optimize drilling performance with improved durability and ROP for Aramco, The Talon™ platform of PDC bits reliably and consistently perform in virtually any environment while giving Aramco superior directional control, longer run life, improved rates of penetration (ROP), and enhanced durability and drilling efficiency. Innovative Talon bits include the industry's most advanced mechanical and hydraulic designs, uniquely shaped and positioned blades, and application-specific polished diamond cutters. The DART process maximizes drilling efficiency Talon drill bit designs begin with the Baker Hughes DART™ drilling application review process. Cross-functional teams of highly experienced technical personnel work in a collaborative, learning environment to meet the required drilling objectives by combining new and existing technologies that result in innovative designs to deliver exactly the right drill bit for your specific application. Each DART team gathers relevant drilling application data, conducts root cause analyses, identifies the primary performance limiters, and evaluates possible solutions for game-changing improvements in overall performance, while minimizing drilling and completion costs and reducing nonproductive time. Bit designs for every drilling need, The Talon platform of bits consists of the Talon bit, the Talon 3D bit, and the AutoTrak™ Curve system bit:

- Talon high-efficiency PDC bits provide optimal performance in first-bit-under-the-surface, intermediate, vertical, near-vertical drilling, and hard-to-drill and abrasive applications.
- Talon 3D vector-accurate bits extend this outstanding performance to unconventional gas applications, including shale plays, and are ideal for conventional directional drilling. The bit's one-piece steel body with a short bit-to-bend dimension allows greater buildup aggressiveness and longer life.
- Providing extra versatility, Talon bits are fully compatible with the Baker Hughes AutoTrak Curve rotary steerable system. Working together, these two solutions meet the challenges of drilling unconventional plays with exceptional accuracy, reliability, and speed.

Which help Aramco to stay in the hole longer with new StaySharp cutters

All Talon PDC bits include Baker Hughes StaySharp™ premium cutters with sophisticated diamond technology and patented polished faces. The innovative extra-tough design of this propriety technology is exceptionally erosion and chip resistant, which helps the bit stay sharper, maximize run life, and deliver higher ROP, improved run life, and lower cost per foot. The StaySharp cutters also decrease friction, which reduces heat buildup on the cutter face to further minimize wear. Polished cutters also generate smaller cuttings, which aid in overall cutting evacuation.

How is that product (Drilling Bits) purchased on a regular basis?

We are selling our drilling bits to Aramco on consignments basis, which is the repetitive purchases on day-to-day operations, we have an approved Aramco Products List (SMI List), those bits

already approved in Aramco system. We need to receive the DRSS request (Drilling request Supply system), if the bit will be utilized we will receive the used notification and the PO (Purchase Order), if the bit will not be utilized it will be return to our warehouse within three months from delivery date free of charge.

What are the buying phases?

Aramco is using two types of buying Phases depends on type of purchases (new purchases and repetitive purchases). The new purchase Need to make a trial test for the New introduced product at zero cost to prove the new product to be added to Aramco approved list. It requires list of proposals and approvals from three Aramco's departments.

The repetitive purchase relate to the operation decision from the drilling engineer from the product already passed Aramco trial test criteria on consignment basis, same as all service companies and suppliers.

What are the expectations from Aramco?

Aramco's expect from us introducing latest technology, especially Baker Hughes Consistently improve drilling performance, minimize cost and risk.

Our Technology general-purpose PDC bit from Baker Hughes consistently optimizes drilling performance and minimizes nonproductive time, days on well, and drilling costs in virtually any drilling environment. Initially developed through the Baker Hughes DART™ drill bit design process, the Genesis bit has proven itself as a reliable performer in cost-effective environments.

Stay in the hole longer

Through continual research and advancements, the latest Genesis bit cutter technology offers improved impact resistance, wear resistance, and aggressiveness to increase performance and drilling economics. The outcome is better durability, prolonged bit life, and longer runs.

Minimize vibrations

The Genesis bit's patented lateral movement mitigator helps reduce bit vibration and increase whirl resistance for improved cutter protection and stability. Added protection on the gauge pad prevents hole spiraling and potential hole problems, allowing the bit to continue drilling a smoother, uniform borehole for more effective completions.

Maximize flow

Hydraulic efficiency is imperative to maximizing cuttings removal. The hydraulic configuration of every Genesis bit design is optimized through a proprietary computational fluid dynamics process that reduces balling tendencies, improves cutter cooling, and limits fluid erosion.

Add efficiency through directional control

To ensure better control in motor and rotary steerable applications Genesis PDC bits include additional directional control features. A new shorter shank decreases makeup length and increases steerability to deliver better buildup rates while the Baker Hughes EZSteer™ directional technology reduces reactive torque fluctuations from increased weight on bit for better directional precision and higher ROP.

Applications

- Hard, abrasive, and interbedded formations
- Conventional and unconventional shale formations
- Highly drillable applications
- Virtually all drilling environments where cost-effective drilling is needed

What are the suppliers and is their search for suppliers?

All big and medium players are in Saudi Market , which is the biggest and high rewarding market universally all the competitions are interesting to increase more market share and bring together their technologies with their best team, Aramco displayed last year after introduction of the new kingdom vision IKTVA for any company will work with Saudi Aramco should have minimum requirements of local suppliers and human resources , and for drilling bits companies specifically they should have a lot Designed to amplify the efforts of our partners and our investments, IKTVA was developed and tested through extensive consultation, both in Kingdom and internationally have manufacturer facility in country within two years' time.

On what criteria are the offers and proposals evaluated and selected?

Generally the criteria nowadays is based on the kingdom vision for local content and human resources percentage IKTVA , Saudi Aramco's In-Kingdom Total Value Add (IKTVA) program has allowed for further impetus with GE Oil and Gas breaking ground on a new Multi-Modal Manufacturing Center at MODON in Dammam.

Abdulaziz A. Al Abdulkarim, Saudi Aramco's vice president of Procurement and Supply Chain Management, and other members of executive management recently joined with GE Oil and Gas management for an official groundbreaking ceremony.

The new phase development builds upon the expansion of GE's Gas Pressure Control manufacturing facility that was inaugurated late last year and comes with a promise of creating 100 jobs during the startup stage, with an 80% rate of Saudization.

When constructed, the new 18,000 m² center will have the capability to manufacture and service the entire range of GE's oil and gas portfolio, including Artificial Lift, Digital Solutions, Downstream Technology Solutions, Turbomachinery Solutions and Subsea Systems.

GE Oil and Gas promises that the new center will bring added "Made in Saudi" capabilities, serving as a manufacturing, assembly, repair, services, and training facility for advanced gas turbines and mechanical drives.

Al Abdulkarim said the IKTVA program, launched by Saudi Aramco last December, is already making a positive impact.

"We are confident that the IKTVA initiative is steadily gaining momentum. As partners such as GE Oil and Gas are demonstrating, IKTVA is a 'win-win' proposition for companies able to build a deep and lasting relationship with the Kingdom by extending the opportunity to localize our materials and services procurement needs, all while supporting the economic growth, job creation and skills development of Saudi Arabia."

GE Oil and Gas president and CEO Lorenzo Simonelli said: "With over 80 years of partnership in the Kingdom, we are committed to strengthening our localized manufacturing service and repair capabilities, and to building our already strong local talent pool. The new center brings cross-functional synergies to our operations in the Kingdom and will serve as a one-stop center for our customers in Saudi and the region."

The new facility will also deliver the services of the recently acquired Alstom Grid business, enabling it to offer a complete portfolio to customers.

Recently, GE Oil and Gas completed the first six high-efficiency gas compression trains manufactured in Saudi Arabia. These will be used in Phase I of Saudi Aramco's Master Gas System expansion project in the Kingdom.

How Schlumberger is evaluated compared to other companies on different criteria?

Baker Hughes (GE) and Schlumberger Smith Bits, and Halliburton are the biggest Player in the Saudi Market, and it is performance bases and recently the factor of IKTVA (IN-KINGDOM TOTAL VALUE ADD) Program which show how the company is investing in Saudi and willing to have a long term investment in Saudi.

What is the importance of the criteria and for whom?

IKTVA, Performance and Cost effective are the main drive for any company to do business in Saudi Arabia generally and Saudi Aramco Specifically. Technically afterword for drilling bits business the keyword will be the BPA (Bit Performance Analyser) is the essential reference and criteria to the drilling bits business market share split between the competitions.

How do you evaluate performance?

In Baker Hughes (GE), we have different software's and entire team are working to follow the operations, and evaluate our performance on daily basis, and gives us a monthly report showing the entire Aramco's drilling activities shows every company performance and based on it we as operation we decide the product development and define our strength, weakness, opportunity and threats, Baker Hughes commercially released its Kymera XTreme (XT) hybrid drill bits. The bits are the combination of PDC and roller cone technology and offer smooth and consistent performance, and we are capitalizing in our patent technology Kymera hybrid bit technology patent to grasp big market share in the upper soft section. Meanwhile Aramco is carrying out on quarterly basis SQ meeting (Service Quality) meeting , gathering all failures and NPT (Non-productive time) for each company as well as any environment or safety issues happened during the last quarter, based on it Aramco decide to increase or decrease the market share for any company based on their results and performances.

What are the environmental influence in the process (political, legal, etc.)?

Fundamentally now the key effects on the entire business process in Saudi is the kingdom vision IKTVA and direction toward the localization of resources have the main impact for the assessment and growing market share and permitting the business to any supplier. So they are ranking the opportunities for local suppliers or international ones which have high percentage of local employee and contents to have business and more market share. Politics derives the market share based on the area you working for, it depends

principally on the relations and relatives, other operational influence is splitting the market between most of suppliers and don't depend on single supplier, and it is doable in the upper soft sections, despite the lower and hard part.

Who influences the process on which dimensions?

Saudi Aramco today reaffirmed its steadfast commitment to its In-Kingdom Total Value Add (iktva) localization program by celebrating the accomplishments made by both the company and its suppliers since its launch a year ago. At a ceremony attended by HRH Prince Saud bin Naif bin Abdulaziz, Amir of the Eastern Province, as well as government dignitaries, and business and supplier executives, H.E. Khalid Al Falih, Minister of Energy, Industry, and Mineral Resources and Chairman of Saudi Aramco, said in a keynote speech: "iktva represents a pioneering and model program, among other major programs which the Saudi Arabian government is working on to expand and diversify the economy, localize strategic industrial and economic sectors, and create jobs, in alignment with Saudi Vision 2030."

16. N: of Candidate: R16

Position Title: *Account Manager*

Department: *NOV (National Oil*

Date of interview: *06/10/2016*

Roles of the respondent in the buying process:

Roles in the Buying Centre Modified	Roles in the Buying Centre Straight rebuy / repetitive
Rebuy / New Products	
Initiator / External Influencer	Initiator / External Influencer

QUESTIONS:

Why is the Drilling Bits important for Aramco?

As a senior account manager in NOV (National Oil well Varco) in a leading drill bit solution provider, drilling bits is a key technology in several applications of strategic or societal importance, including

- exploration for and extraction of oil, gas, geothermal, and mineral resources;
- environmental monitoring and remediation;
- underground excavation and infrastructure development; and
- Scientific studies of the Earth's subsurface.

Drilling is the primary tool for extracting petroleum from rocks in the subsurface. Improvements in drilling technology that lower drilling costs and increase the rate of success in finding and extracting petroleum will have a direct benefit to the United States in terms of higher energy reserves, stable energy costs, and improved economic competitiveness in the drilling and service industries, which are increasingly global in character. Drilling is also the primary tool for extracting geothermal energy (hot water and steam) from the subsurface for heat and electricity production. At present, geothermal energy is more expensive than fossil fuel energy, owing in part to the high cost of drilling. The reduction in drilling costs through the introduction of improved technologies will allow more of this clean, domestic energy source to be utilized.

Drilling is becoming an increasingly important tool for environmental protection and remediation. Drilling is a relatively noninvasive method for investigating and removing chemical and radioactive wastes from the subsurface, and for placing barriers in the subsurface to halt the spread of contamination. Improvements in drilling technology will improve the efficiency of waste extraction and thereby lower the cost of cleanup efforts. This reflects the increasingly complex and elusive nature of potential reservoirs, as well as limitations of current methods for locating hydrocarbon deposits. The proportion of wells drilled and the total drilled footage outside North America should increase as additional areas around the world are explored and developed. Complex geological conditions and difficult geographic circumstances in many of these areas will require the capability to remotely sense conditions in the subsurface and to drill holes in different orientations.

What does the Drilling Bits technology bring to the future of Aramco?

Generally speaking, drilling bits will improve Aramco drilling and production in Oil and gas, NOV is there to provide the solutions that Aramco need downhole. We're one of the world's largest independent supplier for drilling and intervention operations. With supply and service centers around the globe, we can provide a complete suite of tools and support where you need it, when you need it. We take pride in delivering superior performance and reliability. For more than 170 years, we've designed, manufactured, and delivered exceptional tools and equipment. No one else offers the full range of drilling

and intervention solutions like NOV. In Saudi Arabia, we have more than 150 service centers staffed with highly qualified drilling solutions engineers and experienced technicians. The purchase or rental of our equipment includes tool and engineering support specifically tailored to your job requirements, and we can assist Aramco with difficult drilling and extreme well conditions.

Working with Aramco to choose the right components for the formation and your operation, we can help you increase ROP, improve safety, and decrease non-productive time.

FuseTek™ Hybrid Drill Bits from NOV Downhole have bridged the gap between PDC and Diamond Impregnated drill bit applications. When PDC bits are not durable enough, and Impreg bits are not fast enough, FuseTek bits step up and excel. Impregnated diamond material on the blade tops combines with industry-leading PDC cutter technology to make FuseTek the bit of choice in challenging lithologies.

FuseTek Applications

- PDC drillable formations requiring impreg for hardest sections
- Directional Wells
- Deep Water Wells
- Vertical Wells

Features/Benefits

- Features

- Optimized placement of diamond/PDC
- Blade tops reinforced with diamond impregnated material
- Optimized diamond exposure
- ReedHycalog Premium PDC and Impreg technology
- Built-in insurance of cutting structure redundancy

- Benefits

- Durability without sacrificing ROP
- Increased impact resistance for high vibration environments
- Peace of mind for unpredictable conglomerates/stringers
- Fewer bit trips to reach TD, resulting in reduced Cost per Foot
- NPT reduction through longer intervals drilled in interbedded

How is that product (Drilling Bits) purchased on a regular basis?

Aramco is purchasing drilling bits from all Bits providers , On regular basis using the consignments basis, which is the repetitive purchases, this purchase occur only for products approved and listed in Aramco approved Products List (SMI List), those bits already passed Aramco trial test criteria and Aramco can request it directly. After receiving the DRSS request (Drilling Request Supply System), if the bit will be utilized we will receive the used notification and the PO (Purchase Order) afterword, if the bit will not be used it will be return to our warehouse at no cost.

What are the buying phases?

Aramco buying Phases hang on two types of purchases (new purchases and repetitive purchases). The new purchase Need to create a trial test for the New introduced product free of charge to prove the new product to be added to Aramco approved list. It requires set of proposals and approvals from three Aramco's departments.

I'm occupied on day-to-day with the repetitive buying relate to the operation decision from the drilling engineer from the product already passed Aramco trial test criteria on consignment basis.

What are the expectations from Aramco?

As one of the big players in the oil service industry and to prove our commitment and intention to Saudi Arabia vision, National Oilwell Varco (NOV) will open a new facility in Dammam, Saudi Arabia, the first manufacturing location for NOV in the Kingdom.

The new center will open on 13th of October at the 2nd Industrial City on the eastern coast. In addition to manufacturing, the facility features service and maintenance bays, office space, and a training center, measures a total of more than 365,000 square feet.

The event will showcase NOV technologies and capabilities in Saudi Arabia. "This new manufacturing facility is part of our continuing effort to grow our services in Saudi Arabia," said Kosay El-Rayes, president, NOV Wellbore Technologies, Drilling and Intervention.

"This shows our commitment to the Saudi Arabia market and Middle East region and allows us to have sustained growth by investing in local talents. This will make us more responsive to customer needs," El-Rayes added.

What are the suppliers and is their search for suppliers?

Because of Saudi is a premium market All Big companies and suppliers are In Saudi Arabian Market, and due to it is the most Lucrative market internationally, all the competitions are challenging to gain more market share and introduced their finest technologies with their best crew, Aramco always searching for new providers to deliver more viable products and technology and know-how.

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Designed to amplify the efforts of their partners and their investments, IKTVA was developed and tested through extensive consultation, both in Kingdom and internationally...

How Schlumberger is evaluated compared to other companies on different criteria?

As NOV representative, and dealing with Aramco contract and daily operations, Schlumberger Smith Bits, hold the highest market share in Saudi market and Aramco rely on them for the lower section for their new technology 5 7/8" Rolling cutters technology. Meanwhile in general the top four companies Schlumberger, GE, Halliburton and NOV and treated equally on any evaluation and it's all about performance base.

What is the importance of the criteria and for whom?

Localization and following IKTVA program, are the main criteria to catch the big pie of the business, in drilling bits business GE & Halliburton lead all other companies to have a full manufacturing facilities in Saudi, which lead to have a privilege in repair contract and will start a rental model, NOV we manufactured a facility on 2016, as well we are manufacturing drilling bits in Saudi. Schlumberger Smith Bits is behind in this matter, just got an assembly facility in Saudi and still manufacturing bits in Houston.

How do you evaluate performance?

In NOV we are evaluating the performance on monthly basis, and all drilling bits companies are doing the market share analysis and the market leader is Schlumberger, then Halliburton, GE then NOV.

Meanwhile Aramco on a quarterly basis is performing service quality meeting with all service provider to evaluate the performance and the non-productive time, which is based on it Aramco will decide the splitting of the market.

What are the environmental influence in the process (political, legal, etc.)?

I believe IKTVA as I mention has the biggest influence now for the companies which follow the instructions, and based On my Daily work as a front line with Aramco, I can feel the Politics derives the market share based on the relations and relatives between sales representative and Aramco drilling engineer, other operational influence is splitting the market between most of suppliers and don't depend on single supplier.

Who influences the process on which dimensions?

Saudi Aramco reaffirmed its commitment to help drive sustainable economic growth and diversification across the Kingdom through the promotion of its In-Kingdom Total Value Add (IKTVA) program during the 4th Saudi U.S. Business Opportunities Forum taking place March 22.

Speaking at a plenary session on the first day of the Forum, Saudi Aramco's Vice President of Procurement and Supply Chain Management, Abdulaziz Abdulkarim said: "Two critical objectives guide our new IKTVA localization program: First, we will double the percentage of locally-produced energy-related goods and services to 70 percent by 2021, And second, our local energy goods and services industry will export 30 percent of its output over the same period."

He continued, "IKTVA is a win-win proposition for companies able to build a deep and lasting relationship with the Kingdom by setting-up shop here and investing in training and workforce development, to help capture their share of Saudi Aramco's future spend on materials and services." IKTVA, launched in December 2015, is the Company's commitment to local content development that is now required across its domestic and international supply chains and is helping drive investment, economic growth and diversification, job creation and work force development within the Kingdom. The Saudi U.S.

Business Opportunities Forum is a high-level gathering of senior officials and business leaders from Saudi Arabia and the United States. This three-day forum will explore opportunities for greater economic collaboration between the two nations as well as provide an unparalleled business networking environment.

Appendix D: Survey Questionnaire

Market Research - Product Testing Template

Selection criteria for drilling products

We thank you for having accepted our invitation to complete this questionnaire. It should not take more than **10 minutes** to fill it in. The criteria which are mentioned in the questionnaire refer to product (e.g. performance, quality, etc.) or service (e.g. procedural compliance) characteristics of the drilling service suppliers as well as their organizational or general characteristics (e.g., reputation, trust, human relationships) and the importance of these characteristics on product selection by the buyer, from your point of view. With respect to your position and experience, how important do you think are the following criteria in drilling product selection for Trial test Product (Modified rebuy) and/or Approved Product (Straight rebuy)

* 1. Impact of performance on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 2. In terms of performance, which criterion has the greatest impact on Product selection

	Drill Faster (ROP)	Drill Deeper (Footage)	Low Cost (CPF)	Equal Importance
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 3. Impact of technology and patent on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 4. Impact of Performance history (SQ) on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 5. Impact of Price on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 6. Impact of Client Performance Analyser on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 7. Impact of Production Facilities and Capacity on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 8. Impact of Product Quality on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 9. In terms of Product Quality, which criterion has the **Least** impact on product selection

	Product Quality Confidence	Durability of the Product	Product Safety	Spare Parts Availability	All Criteria are important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 10. Impact of Having NPT (Non Productive time) on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 11. Impact of Fulfilling the specifications (Spec. Sheets) on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 12. Impact of Procedural compliance on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 13. Impact of Technical capabilities on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 14. Impact of Operating Control on Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 15. Impact of Company Profile (Company reputation) on the Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 16. Impact of trust and confidence in the Company on the Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 17. Impact of Human relationships on the Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 18. Impact of Human resources and organization on the Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 19. In terms of Human resources and organization , which criterion has the greatest impact on product selection

	Management and Organization	Desire for Business (Investment)	Equal Importance
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 20. Impact of responsiveness to buyer demands (Localisation) on the Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- * 21. In terms of responsiveness to buyer demands (Localisation), which criterion has the **Least** impact on product selection

	Localisation of Human resources (Hiring Locals)	Localisation of content	Transfer of technology	All Criteria have the same importance
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- * 22. Impact of Financial reputation on the Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- * 23. Impact of Long-term relationships on the Product selection

	Not at all important	Not So important	Somewhat important	Very important	Extremely important
Trial Test Product (Modified Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approved Product (Straight Rebuy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 24. From the List of Criteria below would you please indicate the **Five most important** criteria on the **Approved Product** (Straight rebuy) in Product selection

- Performance and financial impact (CPF/M)
- Technology Patent
- Performance history (SQ)
- Price
- Client Performance Analyser
- Production Facility and capacity
- Product Quality
- Service Quality and repair services (NPT)
- Specification to fulfill
- Specification sheet (Spec. Sheet)
- Procedural compliance
- Technical capabilities
- Operating Control
- Company reputation and Position in the industry
- Trust and confidence in the company
- Human relationships (Connections)
- Human resources and organization
- Responsiveness to Buyer Demand (Localisation) program
- Financial reputation
- Long term relationships

* 25. From the List of Criteria below would you please indicate the **Five Least important** criteria on the **Approved Product** (Straight rebuy) in Product selection

- Performance and financial impact (CPF/M)
- Technology Patent
- Performance history (SQ)
- Price
- Client Performance Analyser
- Production Facility and capacity
- Product Quality
- Service Quality and repair services (NPT)
- Specification to fulfill
- Specification sheet (Spec. Sheet)
- Procedural compliance
- Technical capabilities
- Operating Control
- Company reputation and Position in the industry
- Trust and confidence in the company
- Human relationships (Connections)
- Human resources and organization
- Responsiveness to Buyer Demand (Localisation) program
- Financial reputation
- Long term relationships

* 26. From the List of Criteria below would you please indicate the **Five Most important** criteria on the **Trial Test Product** (Modified rebuy) in Product selection

- Performance and financial impact (CPF/M)
- Technology Patent
- Performance history (SQ)
- Price
- Client Performance Analyser
- Production Facility and capacity
- Product Quality
- Service Quality and repair services (NPT)
- Specification to fulfill
- Specification sheet (Spec. Sheet)
- Procedural compliance
- Technical capabilities
- Operating Control
- Company reputation and Position in the industry
- Trust and confidence in the company
- Human relationships (Connections)
- Human resources and organization
- Responsiveness to Buyer Demand (Localisation) program
- Financial reputation
- Long term relationships

* 27. From the List of Criteria below would you please indicate the **Five Least important** criteria on the **Trial Test Product** (Modified rebuy) in Product selection

- Performance and financial impact (CPF/M)
- Technology Patent
- Performance history (SQ)
- Price
- Client Performance Analyser
- Production Facility and capacity
- Product Quality
- Service Quality and repair services (NPT)
- Specification to fulfill
- Specification sheet (Spec. Sheet)
- Procedural compliance
- Technical capabilities
- Operating Control
- Company reputation and Position in the industry
- Trust and confidence in the company
- Human relationships (Connections)
- Human resources and organization
- Responsiveness to Buyer Demand (Localisation) program
- Financial reputation
- Long Term relationships

* 28. In your own words, what are the things that you would most like to improve in the Drilling Product Buying Process?

* 29. What is your job role?

- Operations
- Technical

* 30. Which type of company are you working for?

- Client
- Service Provider

* 31. Please indicate at which location (Region of the World) you work?

- NAM (North America)
- SAM (South America)
- Europe
- Africa
- MEA (Middle East)
- Asia
- Russia
- North Africa

32. Market type

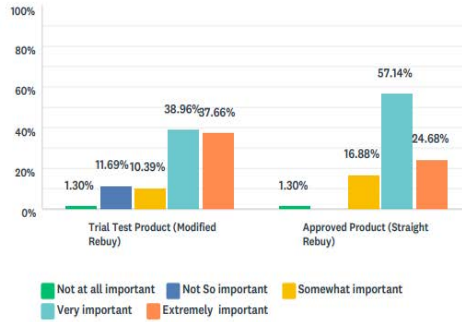
- Monopsonist
- Non-Monopsonist

Appendix E: Results and graphs

E1: Results of Attribute importance between straight and modified rebuy in a Monopsonist Market

Q1 Impact of performance on Product selection

Answered: 77 Skipped: 0

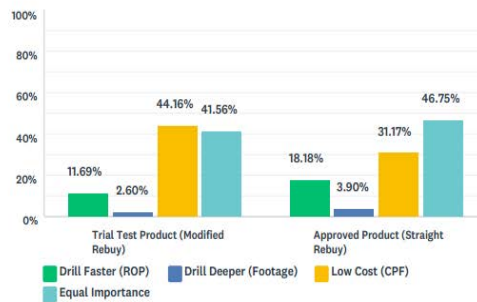


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	1.30% 1	11.69% 9	10.39% 8	38.96% 30	37.66% 29	77	4.00
Approved Product (Straight Rebuy)	1.30% 1	0.00% 0	16.88% 13	57.14% 44	24.68% 19	77	4.04

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	5.00	4.00	4.00	1.03
Approved Product (Straight Rebuy)		1.00	5.00	4.00	4.04	0.73

Q2 In terms of performance, which criterion has the greatest impact on Product selection

Answered: 77 Skipped: 0

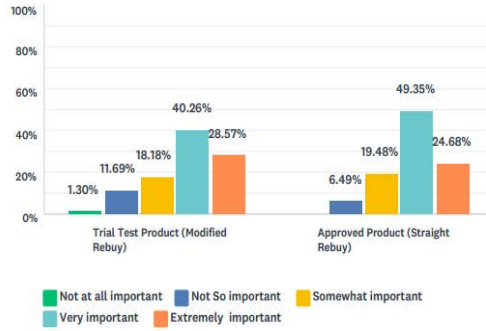


	DRILL FASTER (ROP) (1)	DRILL DEEPER (FOOTAGE) (2)	LOW COST (CPF) (3)	EQUAL IMPORTANCE (4)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	11.69% 9	2.60% 2	44.16% 34	41.56% 32	77	3.16
Approved Product (Straight Rebuy)	18.18% 14	3.90% 3	31.17% 24	46.75% 36	77	3.06

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	4.00	3.00	3.16	0.94
Approved Product (Straight Rebuy)		1.00	4.00	3.00	3.06	1.11

Q3 Impact of technology and patent on Product selection

Answered: 77 Skipped: 0

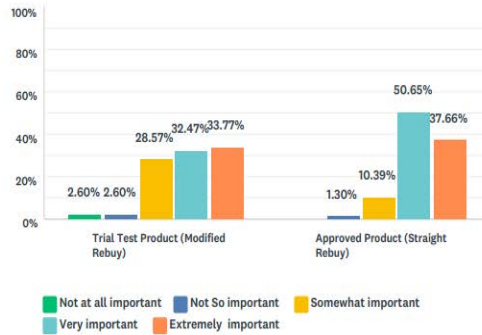


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	1.30% 1	11.69% 9	18.18% 14	40.26% 31	28.57% 22	77	3.83
Approved Product (Straight Rebuy)	0.00% 0	6.49% 5	19.48% 15	49.35% 38	24.68% 19	77	3.92

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	5.00	4.00	3.83	1.01
Approved Product (Straight Rebuy)		2.00	5.00	4.00	3.92	0.83

Q4 Impact of Performance history (SQ) on Product selection

Answered: 77 Skipped: 0

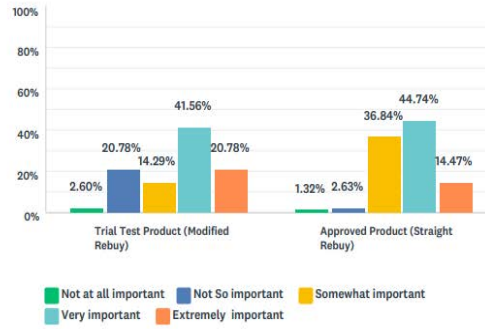


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	2.60% 2	2.60% 2	28.57% 22	32.47% 25	33.77% 26	77	3.92
Approved Product (Straight Rebuy)	0.00% 0	1.30% 1	10.39% 8	50.65% 39	37.66% 29	77	4.25

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	5.00	4.00	3.92	0.98
Approved Product (Straight Rebuy)		2.00	5.00	4.00	4.25	0.69

Q5 Impact of Price on Product selection

Answered: 77 Skipped: 0

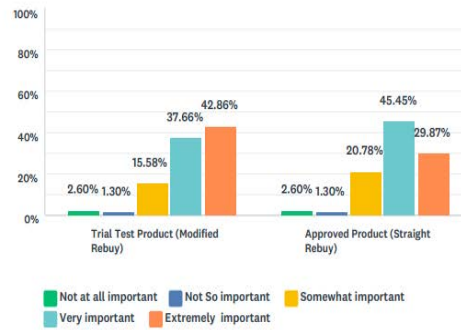


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	2.60% 2	20.78% 16	14.29% 11	41.56% 32	20.78% 16	77	3.57
Approved Product (Straight Rebuy)	1.32% 1	2.63% 2	36.84% 28	44.74% 34	14.47% 11	76	3.68

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)	1.00	5.00	4.00	3.57		1.11
Approved Product (Straight Rebuy)	1.00	5.00	4.00	3.68		0.80

Q6 Impact of Client Performance Analyser on Product selection

Answered: 77 Skipped: 0

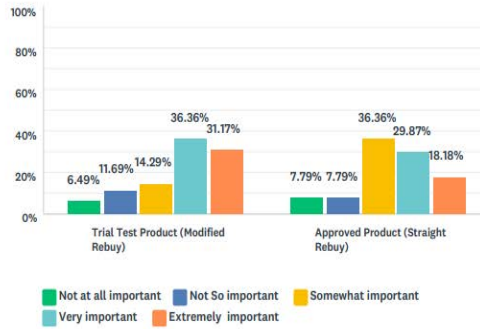


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	2.60% 2	1.30% 1	15.58% 12	37.66% 29	42.86% 33	77	4.17
Approved Product (Straight Rebuy)	2.60% 2	1.30% 1	20.78% 16	45.45% 35	29.87% 23	77	3.99

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)	1.00	5.00	4.00	4.17		0.92
Approved Product (Straight Rebuy)	1.00	5.00	4.00	3.99		0.89

Q7 Impact of Production Facilities and Capacity on Product selection

Answered: 77 Skipped: 0

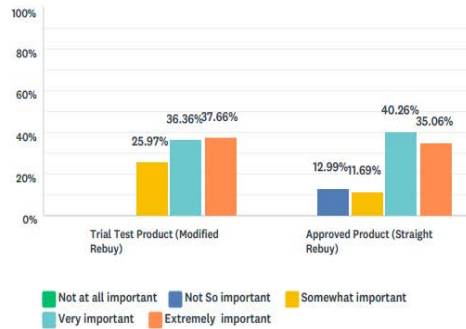


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	6.49% 5	11.69% 9	14.29% 11	36.36% 28	31.17% 24	77	3.74
Approved Product (Straight Rebuy)	7.79% 6	7.79% 6	36.36% 28	29.87% 23	18.18% 14	77	3.43

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	5.00	4.00	3.74	1.20
Approved Product (Straight Rebuy)		1.00	5.00	3.00	3.43	1.11

Q8 Impact of Product Quality on Product selection

Answered: 77 Skipped: 0

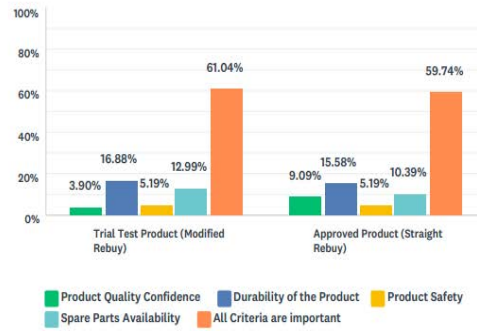


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	0.00% 0	0.00% 0	25.97% 20	36.36% 28	37.66% 29	77	4.12
Approved Product (Straight Rebuy)	0.00% 0	12.99% 10	11.69% 9	40.26% 31	35.06% 27	77	3.97

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		3.00	5.00	4.00	4.12	0.79
Approved Product (Straight Rebuy)		2.00	5.00	4.00	3.97	0.99

Q9 In terms of Product Quality, which criterion has the Least impact on product selection

Answered: 77 Skipped: 0

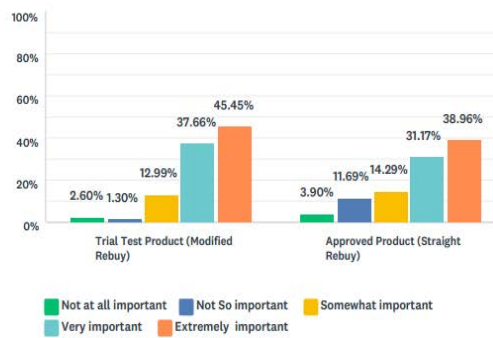


	PRODUCT QUALITY CONFIDENCE (1)	DURABILITY OF THE PRODUCT (2)	PRODUCT SAFETY (3)	SPARE PARTS AVAILABILITY (4)	ALL CRITERIA ARE IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	3.90%	16.88%	5.19%	12.99%	61.04%	47	4.10
Approved Product (Straight Rebuy)	9.09%	15.58%	5.19%	10.39%	59.74%	46	3.96

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	5.00	5.00	4.10	1.30
Approved Product (Straight Rebuy)		1.00	5.00	5.00	3.96	1.45

Q10 Impact of Having NPT (Non Productive time) on Product selection

Answered: 77 Skipped: 0

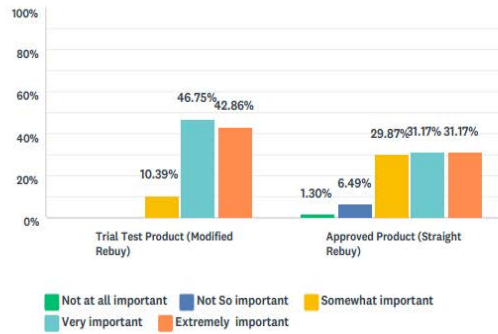


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	2.60%	1.30%	12.99%	37.66%	45.45%	77	4.22
Approved Product (Straight Rebuy)	3.90%	11.69%	14.29%	31.17%	38.96%	77	3.90

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	5.00	4.00	4.22	0.91
Approved Product (Straight Rebuy)		1.00	5.00	4.00	3.90	1.16

Q11 Impact of Fulfilling the specifications (Spec. Sheets) on Product selection

Answered: 77 Skipped: 0

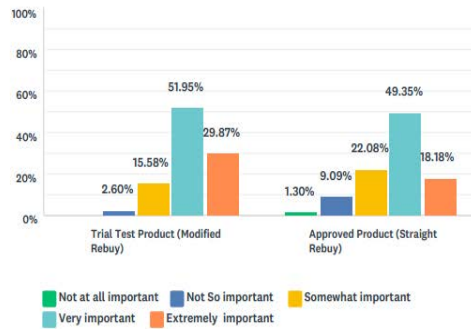


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	0.00% 0	0.00% 0	10.39% 8	46.75% 36	42.86% 33	77	4.32
Approved Product (Straight Rebuy)	1.30% 1	6.49% 5	29.87% 23	31.17% 24	31.17% 24	77	3.84

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		3.00	5.00	4.00	4.32	0.65
Approved Product (Straight Rebuy)		1.00	5.00	4.00	3.84	0.98

Q12 Impact of Procedural compliance on Product selection

Answered: 77 Skipped: 0

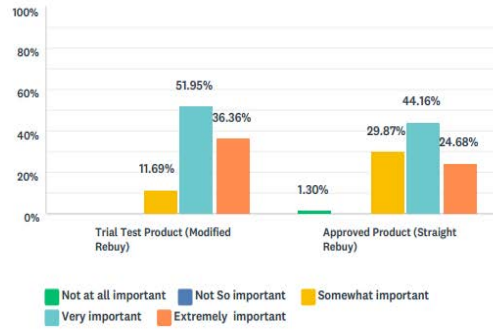


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	0.00% 0	2.60% 2	15.58% 12	51.95% 40	29.87% 23	77	4.09
Approved Product (Straight Rebuy)	1.30% 1	9.09% 7	22.08% 17	49.35% 38	18.18% 14	77	3.74

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		2.00	5.00	4.00	4.09	0.74
Approved Product (Straight Rebuy)		1.00	5.00	4.00	3.74	0.90

Q13 Impact of Technical capabilities on Product selection

Answered: 77 Skipped: 0

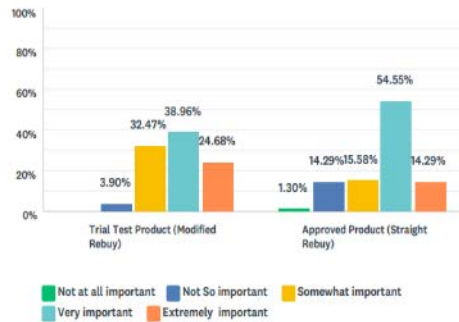


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	0.00% 0	0.00% 0	11.69% 9	51.95% 40	36.36% 28	77	4.25
Approved Product (Straight Rebuy)	1.30% 1	0.00% 0	29.87% 23	44.16% 34	24.68% 19	77	3.91

BASIC STATISTICS							
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Trial Test Product (Modified Rebuy)		3.00	5.00	4.00	4.25		0.65
Approved Product (Straight Rebuy)		1.00	5.00	4.00	3.91		0.81

Q14 Impact of Operating Control on Product selection

Answered: 77 Skipped: 0

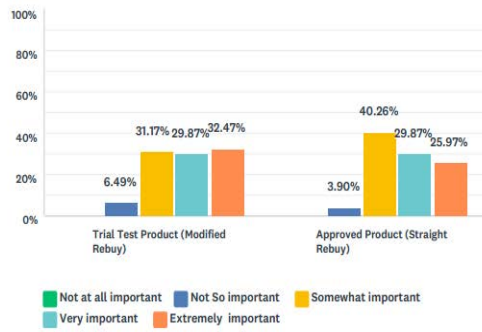


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	0.00% 0	3.90% 3	32.47% 25	38.96% 30	24.68% 19	77	3.84
Approved Product (Straight Rebuy)	1.30% 1	14.29% 11	15.58% 12	54.55% 42	14.29% 11	77	3.66

BASIC STATISTICS							
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Trial Test Product (Modified Rebuy)		2.00	5.00	4.00	3.84		0.84
Approved Product (Straight Rebuy)		1.00	5.00	4.00	3.66		0.93

Q15 Impact of Company Profile (Company reputation) on the Product selection

Answered: 77 Skipped: 0

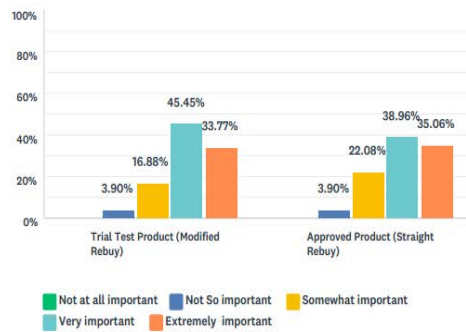


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	0.00% 0	6.49% 5	31.17% 24	29.87% 23	32.47% 25	77	3.88
Approved Product (Straight Rebuy)	0.00% 0	3.90% 3	40.26% 31	29.87% 23	25.97% 20	77	3.78

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		2.00	5.00	4.00	3.88	
Approved Product (Straight Rebuy)		2.00	5.00	4.00	3.78	

Q16 Impact of trust and confidence in the Company on the Product selection

Answered: 77 Skipped: 0

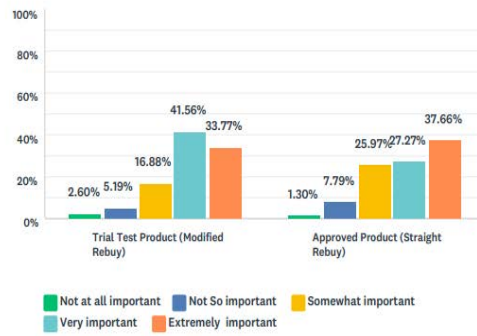


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	0.00% 0	3.90% 3	16.88% 13	45.45% 35	33.77% 26	77	4.09
Approved Product (Straight Rebuy)	0.00% 0	3.90% 3	22.08% 17	38.96% 30	35.06% 27	77	4.05

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		2.00	5.00	4.00	4.09	
Approved Product (Straight Rebuy)		2.00	5.00	4.00	4.05	

Q17 Impact of Human relationships on the Product selection

Answered: 77 Skipped: 0

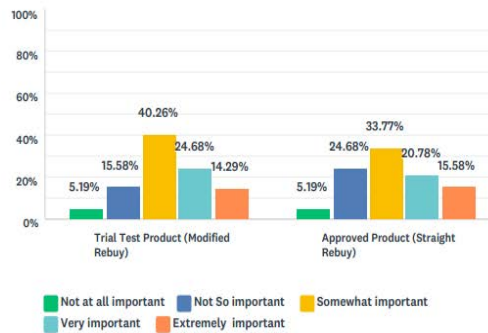


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	2.60% 2	5.19% 4	16.88% 13	41.56% 32	33.77% 26	77	3.99
Approved Product (Straight Rebuy)	1.30% 1	7.79% 6	25.97% 20	27.27% 21	37.66% 29	77	3.92

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	5.00	4.00	3.99	0.97
Approved Product (Straight Rebuy)		1.00	5.00	4.00	3.92	1.03

Q18 Impact of Human resources and organization on the Product selection

Answered: 77 Skipped: 0

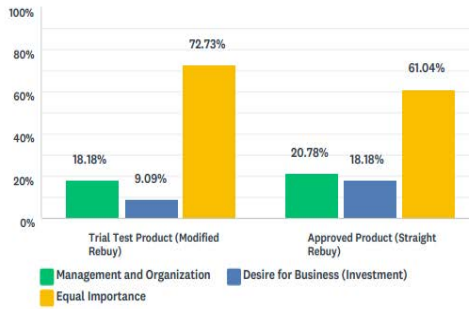


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	5.19% 4	15.58% 12	40.26% 31	24.68% 19	14.29% 11	77	3.27
Approved Product (Straight Rebuy)	5.19% 4	24.68% 19	33.77% 26	20.78% 16	15.58% 12	77	3.17

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	5.00	3.00	3.27	1.05
Approved Product (Straight Rebuy)		1.00	5.00	3.00	3.17	1.12

Q19 In terms of Human resources and organization , which criterion has the greatest impact on product selection

Answered: 77 Skipped: 0

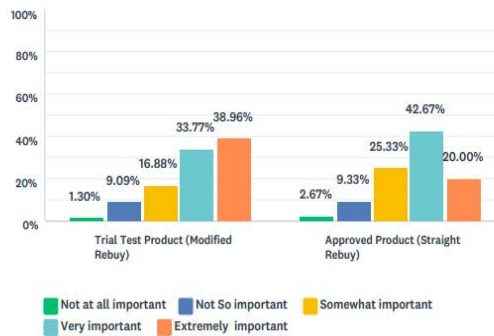


	MANAGEMENT AND ORGANIZATION (1)	DESIRE FOR BUSINESS (INVESTMENT) (2)	EQUAL IMPORTANCE (3)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	18.18% 14	9.09% 7	72.73% 56	77	2.55
Approved Product (Straight Rebuy)	20.78% 16	18.18% 14	61.04% 47	77	2.40

BASIC STATISTICS					
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION
Trial Test Product (Modified Rebuy)	1.00	3.00	3.00	2.55	0.78
Approved Product (Straight Rebuy)	1.00	3.00	3.00	2.40	0.81

Q20 Impact of responsiveness to buyer demands (Localisation) on the Product selection

Answered: 77 Skipped: 0

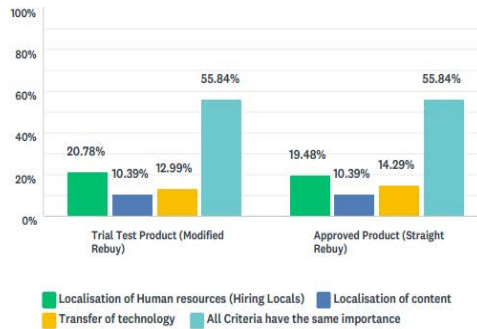


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	1.30% 1	9.09% 7	16.88% 13	33.77% 26	38.96% 30	77	4.00
Approved Product (Straight Rebuy)	2.67% 2	9.33% 7	25.33% 19	42.67% 32	20.00% 15	75	3.68

BASIC STATISTICS					
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION
Trial Test Product (Modified Rebuy)	1.00	5.00	4.00	4.00	1.02
Approved Product (Straight Rebuy)	1.00	5.00	4.00	3.68	0.98

Q21 In terms of responsiveness to buyer demands (Localisation), which criterion has the Least impact on product selection

Answered: 77 Skipped: 0

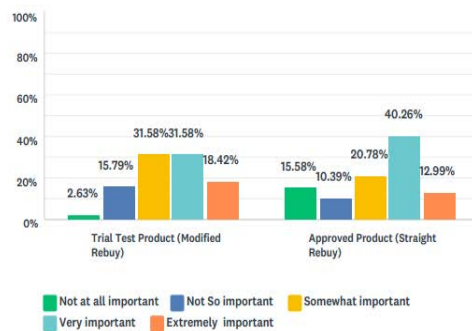


	LOCALISATION OF HUMAN RESOURCES (HIRING LOCALS) (1)	LOCALISATION OF CONTENT (2)	TRANSFER OF TECHNOLOGY (3)	ALL CRITERIA HAVE THE SAME IMPORTANCE (4)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	20.78% 16	10.39% 8	12.99% 10	55.84% 43	77	3.04
Approved Product (Straight Rebuy)	19.48% 15	10.39% 8	14.29% 11	55.84% 43	77	3.06

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	4.00	4.00	3.04	1.22

Q22 Impact of Financial reputation on the Product selection

Answered: 77 Skipped: 0

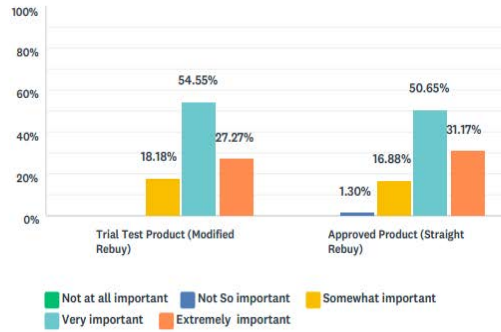


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	2.63% 2	15.79% 12	31.58% 24	31.58% 24	18.42% 14	76	3.47
Approved Product (Straight Rebuy)	15.58% 12	10.39% 8	20.78% 16	40.26% 31	12.99% 10	77	3.25

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		1.00	5.00	3.50	3.47	1.04
Approved Product (Straight Rebuy)		1.00	5.00	4.00	3.25	1.26

Q23 Impact of Long-term relationships on the Product selection

Answered: 77 Skipped: 0

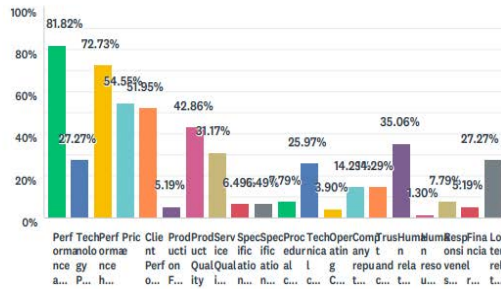


	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Trial Test Product (Modified Rebuy)	0.00% 0	0.00% 0	18.18% 14	54.55% 42	27.27% 21	77	4.09
Approved Product (Straight Rebuy)	0.00% 0	1.30% 1	16.88% 13	50.65% 39	31.17% 24	77	4.12

BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Trial Test Product (Modified Rebuy)		3.00	5.00	4.00	4.09	0.67
Approved Product (Straight Rebuy)		2.00	5.00	4.00	4.12	0.72

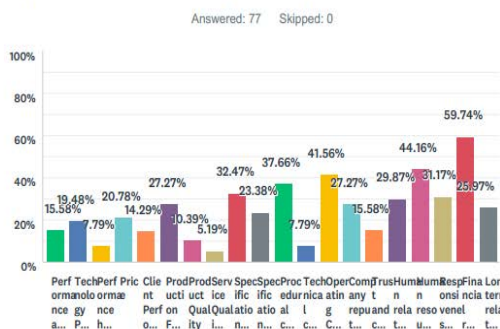
Q24 From the List of Criteria below would you please indicate the Five most important criteria on the Approved Product (Straight rebuy) in Product selection

Answered: 77 Skipped: 0



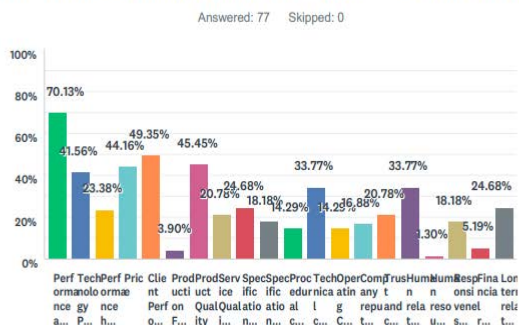
ANSWER CHOICES	RESPONSES
Performance and financial impact (CPF/M) (1)	81.82% 63
Technology Patent (2)	27.27% 21
Performance history (SQ) (3)	72.73% 56
Price (4)	54.55% 42
Client Performance Analyser (5)	51.95% 40
Production Facility and capacity (6)	5.19% 4
Product Quality (7)	42.86% 33
Service Quality and repair services (NPT) (8)	31.17% 24
Specification to fulfill (9)	6.49% 5

Q25 From the List of Criteria below would you please indicate the Five Least important criteria on the Approved Product (Straight rebuy) in Product selection



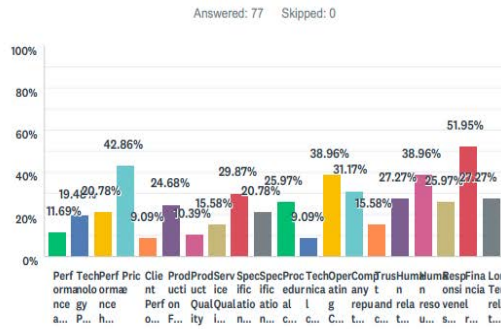
ANSWER CHOICES	RESPONSES
Performance and financial impact (CPF/M) (1)	15.58% 12
Technology Patent (2)	19.48% 15
Performance history (SQ) (3)	7.79% 6
Price (4)	20.78% 16
Client Performance Analyser (5)	14.29% 11
Production Facility and capacity (6)	27.27% 21
Product Quality (7)	10.39% 8
Service Quality and repair services (NPT) (8)	5.19% 4
Specification to fulfill (9)	32.47% 25

Q26 From the List of Criteria below would you please indicate the Five Most important criteria on the Trial Test Product (Modified rebuy) in Product selection



ANSWER CHOICES	RESPONSES
Performance and financial impact (CPF/M) (1)	70.13% 54
Technology Patent (2)	41.56% 32
Performance history (SQ) (3)	23.38% 18
Price (4)	44.16% 34
Client Performance Analyser (5)	49.35% 38
Production Facility and capacity (6)	3.90% 3
Product Quality (7)	45.45% 35
Service Quality and repair services (NPT) (8)	20.78% 16
Specification to fulfill (9)	24.68% 19

Q27 From the List of Criteria below would you please indicate the Five Least important criteria on the Trial Test Product (Modified rebuy) in Product selection



ANSWER CHOICES	RESPONSES
Performance and financial impact (CPFF/M) (1)	11.69% 9
Technology Patent (2)	19.48% 15
Performance history (SQ) (3)	20.78% 16
Price (4)	42.86% 33
Client Performance Analyser (5)	9.09% 7
Production Facility and capacity (6)	24.68% 19
Product Quality (7)	10.39% 8
Service Quality and repair services (NPT) (8)	15.58% 12
Specification to fulfill (9)	29.87% 23

Q29 What is your job role?



ANSWER CHOICES	RESPONSES
Operations (1)	53.25% 41
Technical (2)	46.75% 36
TOTAL	77

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.47	0.50

Q30 Which type of company are you working for?

Answered: 77 Skipped: 0

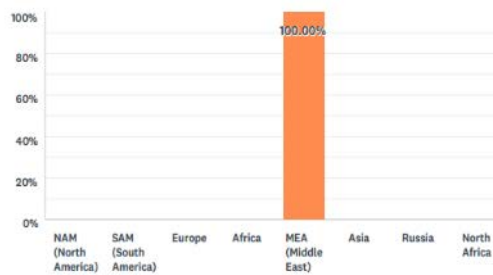


ANSWER CHOICES		RESPONSES	
Client (1)		36.36%	28
Service Provider (2)		63.64%	49
TOTAL			77

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.64	0.48

Q31 Please indicate at which location (Region of the World) you work?

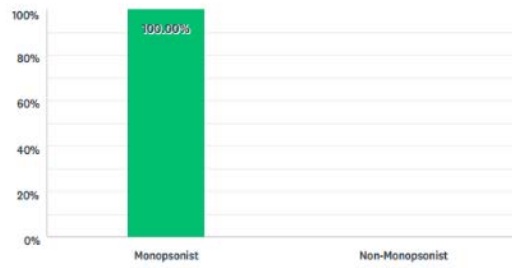
Answered: 77 Skipped: 0



ANSWER CHOICES		RESPONSES	
NAM (North America) (1)		0.00%	0
SAM (South America) (2)		0.00%	0
Europe (3)		0.00%	0
Africa (4)		0.00%	0
MEA (Middle East) (5)		100.00%	77
Asia (6)		0.00%	0
Russia (7)		0.00%	0
North Africa (8)		0.00%	0
TOTAL			77

Q32 Market type

Answered: 77 Skipped: 0

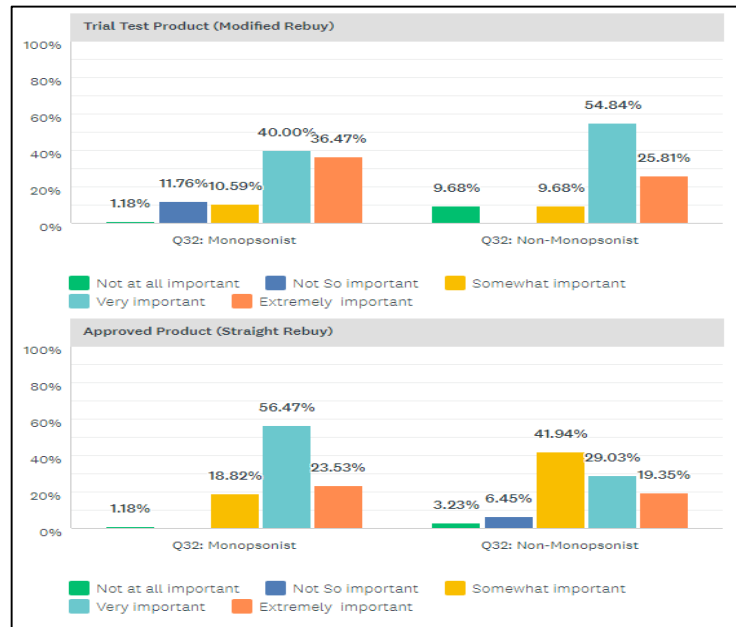


ANSWER CHOICES	RESPONSES	
Monopsonist (1)	100.00%	77
Non-Monopsonist (2)	0.00%	0
TOTAL		77

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	1.00	1.00	1.00	0.00

E2: Results and graphs for the monopsonist (n1 = 85) versus non monopsonist markets (n2 = 31)

Q-1 Impact of Performance on Product selection

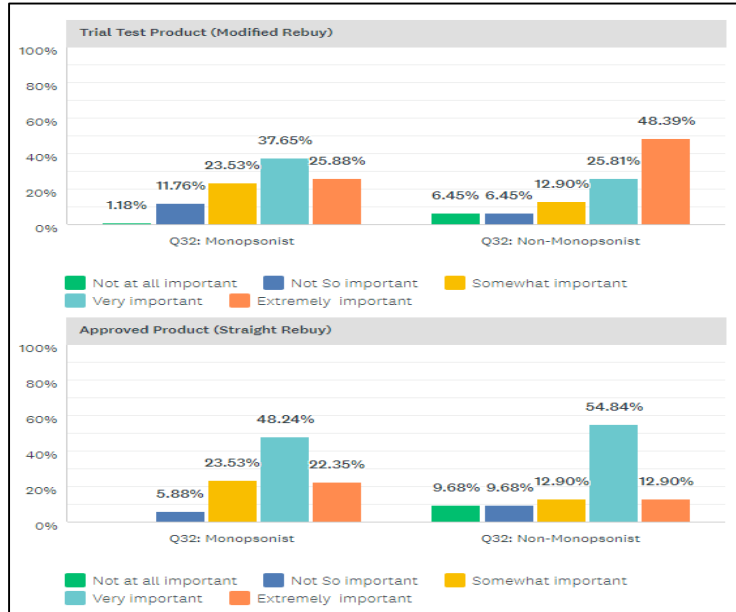


Trial Test Product (Modified Rebuy)								
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE	
Q32: Monopsonist (A)	1.18% 1 B	11.76% 10 B	10.59% 9	40.00% 34	36.47% 31	73.28% 85	3.99	
Q32: Non-Monopsonist (B)	9.68% 3 A	0.00% 0 A	9.68% 3	54.84% 17	25.81% 8	26.72% 31	3.87	
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION			
Q32: Monopsonist (A)	1.00	5.00	4.00	3.99	1.02			
Q32: Non-Monopsonist (B)	1.00	5.00	4.00	3.87	1.10			
Approved Product (Straight Rebuy)								
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE	
Q32: Monopsonist (A)	1.18% 1	0.00% 0 B	18.82% 16 B	56.47% 48 B	23.53% 20	73.28% 85	4.01	
Q32: Non-Monopsonist (B)	3.23% 1	6.45% 2 A	41.94% 13 A	29.03% 9 A	19.35% 6	26.72% 31	3.55	
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION			
Q32: Monopsonist (A)	1.00	5.00	4.00	4.01	0.73			
Q32: Non-Monopsonist (B)	1.00	5.00	3.00	3.55	0.98			

Q-2 IN terms of performance, which criterion has the greatest impact on Product selection

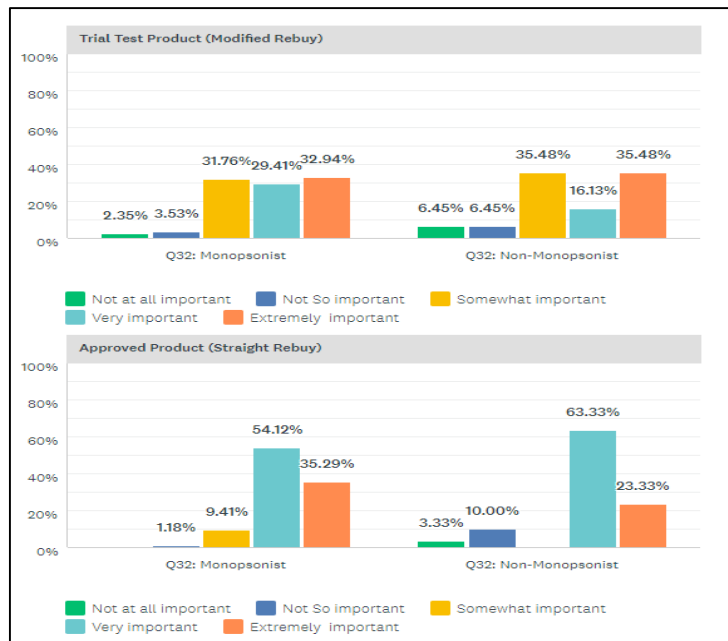
(Not Applicable)

Q-3 Impact of technology and Patent on Product selection



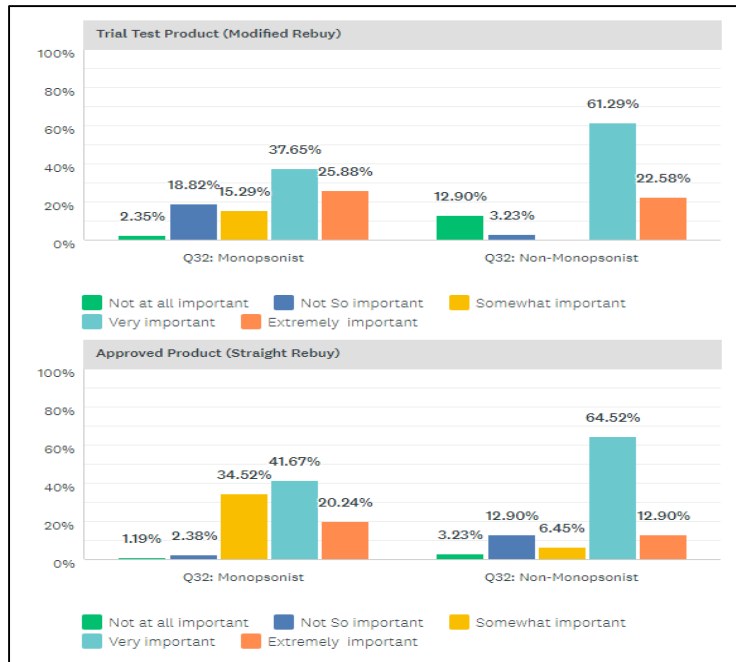
Trial Test Product (Modified Rebuy)									
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE		
Q32: Monopsonist (A)	1.18% 1	11.76% 10	23.53% 20	37.65% 32	25.88% 22 B	73.28% 85	3.75		
Q32: Non-Monopsonist (B)	6.45% 2	6.45% 2	12.90% 4	25.81% 8	48.39% 15 A	26.72% 31	4.03		
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION				
Q32: Monopsonist (A)		1.00	5.00	4.00	3.75	1.00			
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	4.03	1.20			
Approved Product (Straight Rebuy)									
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE		
Q32: Monopsonist (A)	0.00% 0 B	5.88% 5	23.53% 20	48.24% 41	22.35% 19	73.28% 85	3.87		
Q32: Non-Monopsonist (B)	9.68% 3 A	9.68% 3	12.90% 4	54.84% 17	12.90% 4	26.72% 31	3.52		
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION				
Q32: Monopsonist (A)		2.00	5.00	4.00	3.87	0.82			
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	3.52	1.13			

Q-4 Impact of Performance history in the product selection



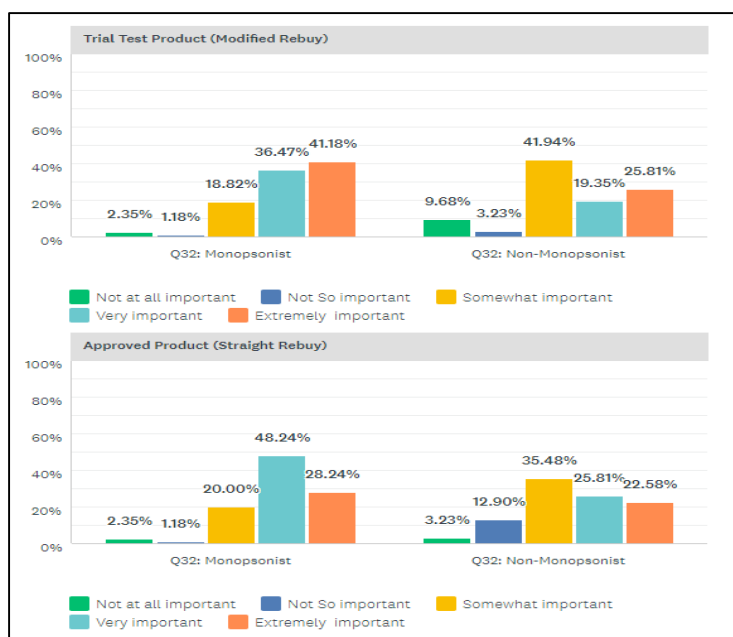
Trial Test Product (Modified Rebuy)								
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE	
Q32: Monopsonist (A)	2.35% 2	3.53% 3	31.76% 27	29.41% 25	32.94% 28	73.28% 85	3.87	
Q32: Non-Monopsonist (B)	6.45% 2	6.45% 2	35.48% 11	16.13% 5	35.48% 11	26.72% 31	3.68	
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION			
Q32: Monopsonist (A)	1.00	5.00	4.00	3.87	0.99			
Q32: Non-Monopsonist (B)	1.00	5.00	4.00	3.68	1.20			
Approved Product (Straight Rebuy)								
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE	
Q32: Monopsonist (A)	0.00% 0	1.18% 1 B	9.41% 8	54.12% 46	35.29% 30	73.28% 85	4.24	
Q32: Non-Monopsonist (B)	3.33% 1	10.00% 3 A	0.00% 0	63.33% 19	23.33% 7	25.86% 30	3.93	
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION			
Q32: Monopsonist (A)	2.00	5.00	4.00	4.24	0.66			
Q32: Non-Monopsonist (B)	1.00	5.00	4.00	3.93	0.96			

Q-5 the impact of Price on Product selection



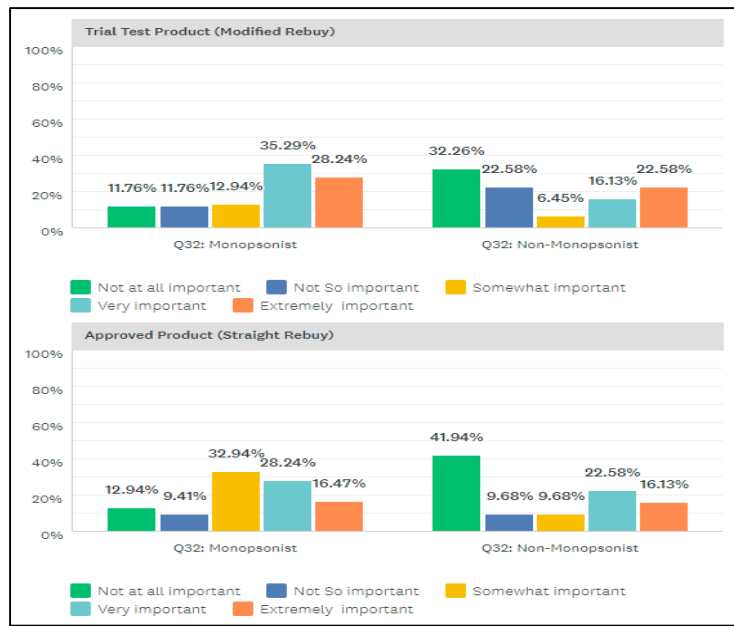
Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	2.35% 2 B	18.82% 16 B	15.29% 13 B	37.65% 32 B	25.88% 22	73.28% 85	3.66
Q32: Non-Monopsonist (B)	12.90% 4 A	3.23% 1 A	0.00% 0 A	61.29% 19 A	22.58% 7	26.72% 31	3.77
BASIC STATISTICS							
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	3.66	1.12	
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	3.77	1.21	
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	1.19% 1	2.38% 2 B	34.52% 29 B	41.67% 35 B	20.24% 17	72.41% 84	3.77
Q32: Non-Monopsonist (B)	3.23% 1	12.90% 4 A	6.45% 2 A	64.52% 20 A	12.90% 4	26.72% 31	3.71
BASIC STATISTICS							
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	3.77	0.84	
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	3.71	0.96	

Q-6 the impact of Client Performance Analyser on product selection



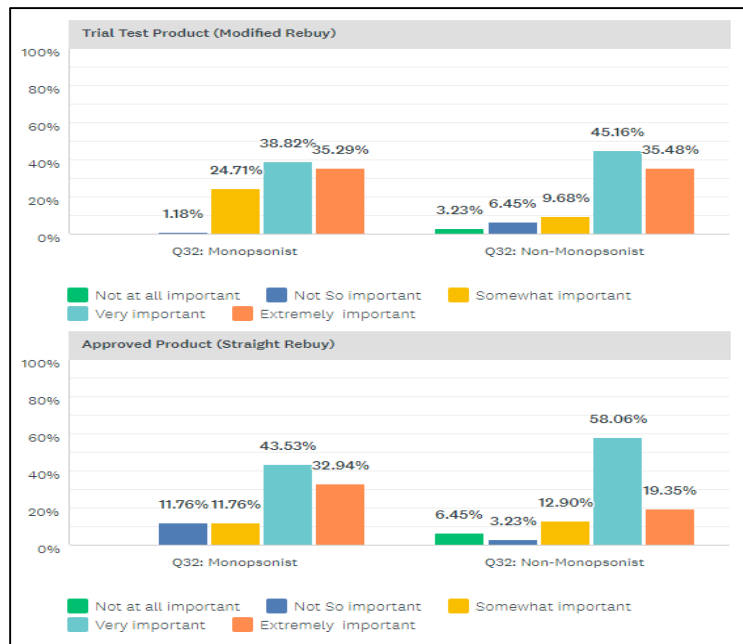
Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	2.35% 2	1.18% 1	18.82% 16 B	36.47% 31	41.18% 35	73.28% 85	4.13
Q32: Non-Monopsonist (B)	9.68% 3	3.23% 1	41.94% 13 A	19.35% 6	25.81% 8	26.72% 31	3.48
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	4.13	0.92	
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	3.48	1.19	
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	2.35% 2	1.18% 1 B	20.00% 17	48.24% 41 B	28.24% 24	73.28% 85	3.99
Q32: Non-Monopsonist (B)	3.23% 1	12.90% 4 A	35.48% 11	25.81% 8 A	22.58% 7	26.72% 31	3.52
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	3.99	0.86	
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	3.52	1.07	

Q-7 Impact of Production Facility and capacity on Product selection



Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	11.76% 10 B	11.76% 10	12.94% 11	35.29% 30 B	28.24% 24	73.28% 85	3.56
Q32: Non-Monopsonist (B)	32.26% 10 A	22.58% 7	6.45% 2	16.13% 5 A	22.58% 7	26.72% 31	2.74
BASIC STATISTICS							
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	3.56	1.32	
Q32: Non-Monopsonist (B)		1.00	5.00	2.00	2.74	1.59	
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	12.94% 11 B	9.41% 8	32.94% 28 B	28.24% 24	16.47% 14	73.28% 85	3.26
Q32: Non-Monopsonist (B)	41.94% 13 A	9.68% 3	9.68% 3 A	22.58% 7	16.13% 5	26.72% 31	2.61
BASIC STATISTICS							
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	3.00	3.26	1.22	
Q32: Non-Monopsonist (B)		1.00	5.00	2.00	2.61	1.58	

Q-8 Impact of Product Quality on Product Selection

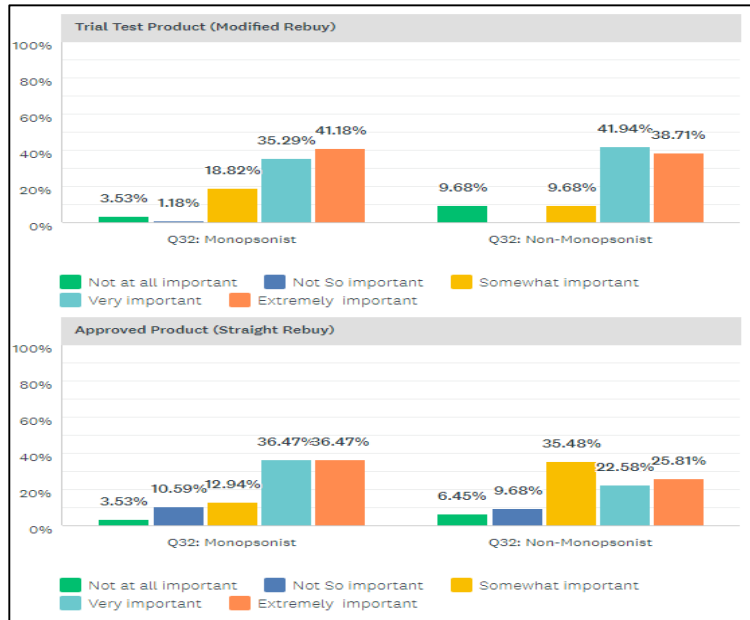


Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	0.00% 0	1.18% 1	24.71% 21	38.82% 33	35.29% 30	73.28% 85	4.08
Q32: Non-Monopsonist (B)	3.23% 1	6.45% 2	9.68% 3	45.16% 14	35.48% 11	26.72% 31	4.03
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		2.00	5.00	4.00	4.08	0.80	
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	4.03	1.00	
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	0.00% 0 B	11.76% 10	11.76% 10	43.53% 37	32.94% 28	73.28% 85	3.98
Q32: Non-Monopsonist (B)	6.45% 2 A	3.23% 1	12.90% 4	58.06% 18	19.35% 6	26.72% 31	3.81
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		2.00	5.00	4.00	3.98	0.96	
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	3.81	1.00	

Q-9 In terms of Product Quality, which criterion has the least impact on product selection

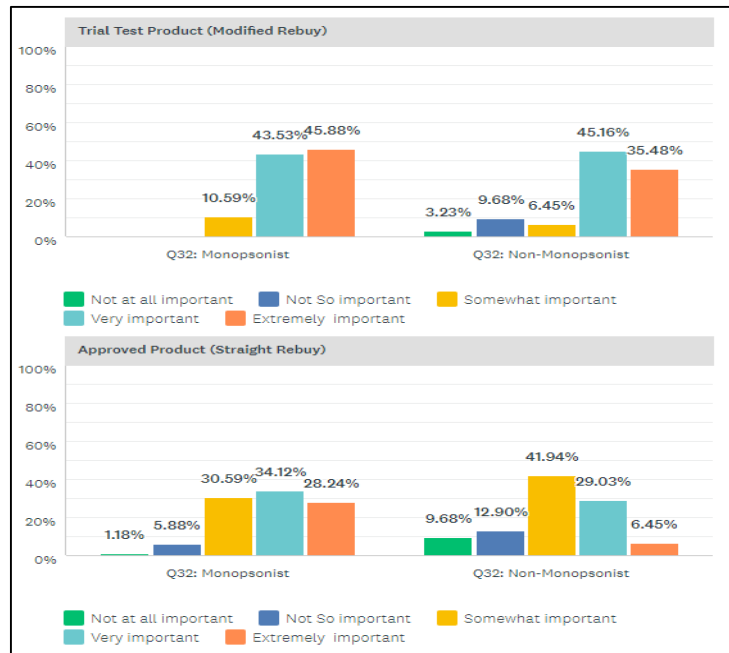
(Not Applicable)

Q-10 the impact of having NPT (Non Productive time)



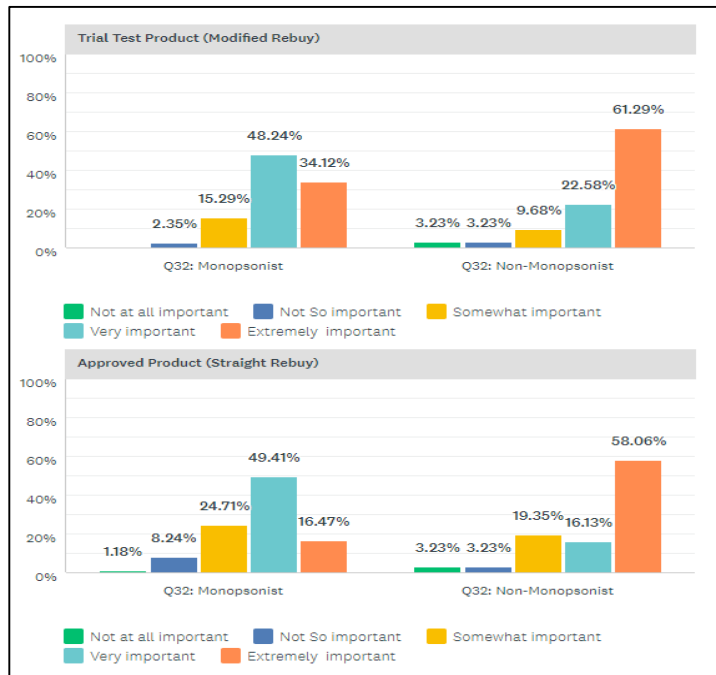
Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	3.53% 3	1.18% 1	18.82% 16	35.29% 30	41.18% 35	73.28% 85	4.09
Q32: Non-Monopsonist (B)	9.68% 3	0.00% 0	9.68% 3	41.94% 13	38.71% 12	26.72% 31	4.00
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	4.09	0.98	
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	4.00	1.16	
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	3.53% 3	10.59% 9	12.94% 11 B	36.47% 31	36.47% 31	73.28% 85	3.92
Q32: Non-Monopsonist (B)	6.45% 2	9.68% 3	35.48% 11 A	22.58% 7	25.81% 8	26.72% 31	3.52
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	3.92	1.11	
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	3.52	1.16	

Q-11 Impact of Fulfilling the specifications sheet on the product selection



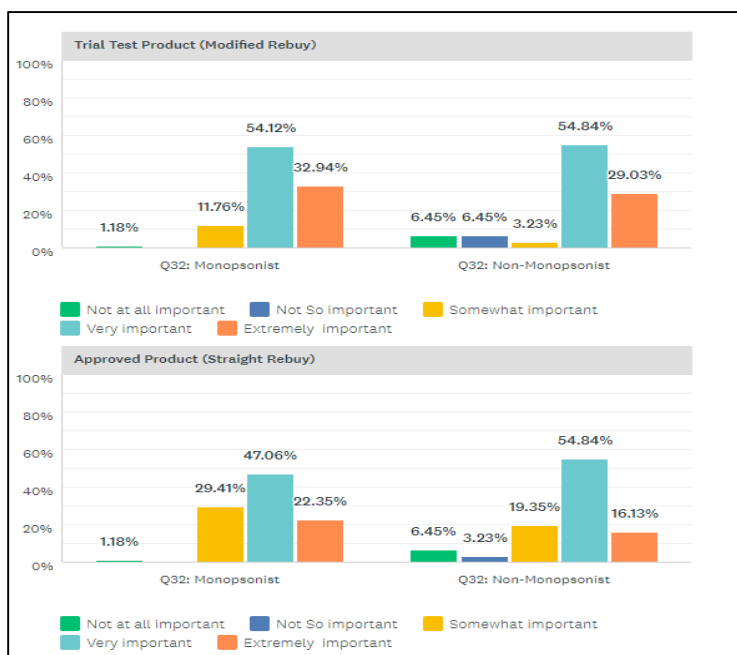
Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	0.00% 0	0.00% 0 B	10.59% 9	43.53% 37	45.88% 39	73.28% 85	4.35
Q32: Non-Monopsonist (B)	3.23% 1	9.68% 3 A	6.45% 2	45.16% 14	35.48% 11	26.72% 31	4.00
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		3.00	5.00	4.00	4.35	0.66	
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	4.00	1.05	
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	1.18% 1 B	5.88% 5	30.59% 26	34.12% 29	28.24% 24 B	73.28% 85	3.82
Q32: Non-Monopsonist (B)	9.68% 3 A	12.90% 4	41.94% 13	29.03% 9	6.45% 2 A	26.72% 31	3.10
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	3.82	0.95	
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	3.10	1.03	

Q-12 Impact of Procedure compliance on the product selection



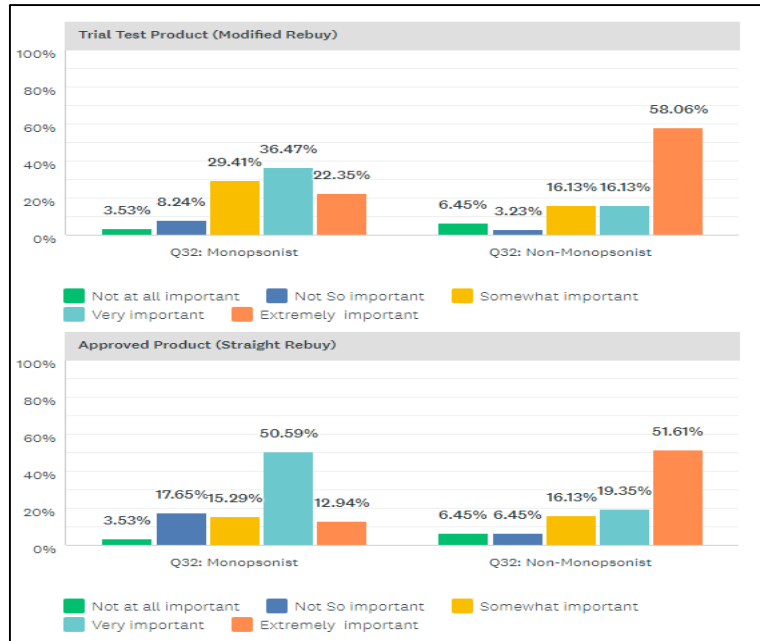
Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	0.00% 0	2.35% 2	15.29% 13	48.24% 41 B	34.12% 29 B	73.28% 85	4.14
Q32: Non-Monopsonist (B)	3.23% 1	3.23% 1	9.68% 3	22.58% 7 A	61.29% 19 A	26.72% 31	4.35
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		2.00	5.00	4.00	4.14	0.75	
Q32: Non-Monopsonist (B)		1.00	5.00	5.00	4.35	1.00	
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	1.18% 1	8.24% 7	24.71% 21	49.41% 42 B	16.47% 14 B	73.28% 85	3.72
Q32: Non-Monopsonist (B)	3.23% 1	3.23% 1	19.35% 6	16.13% 5 A	58.06% 18 A	26.72% 31	4.23
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	3.72	0.88	
Q32: Non-Monopsonist (B)		1.00	5.00	5.00	4.23	1.07	

Q-13 Impact of Technical capabilities on Product selection



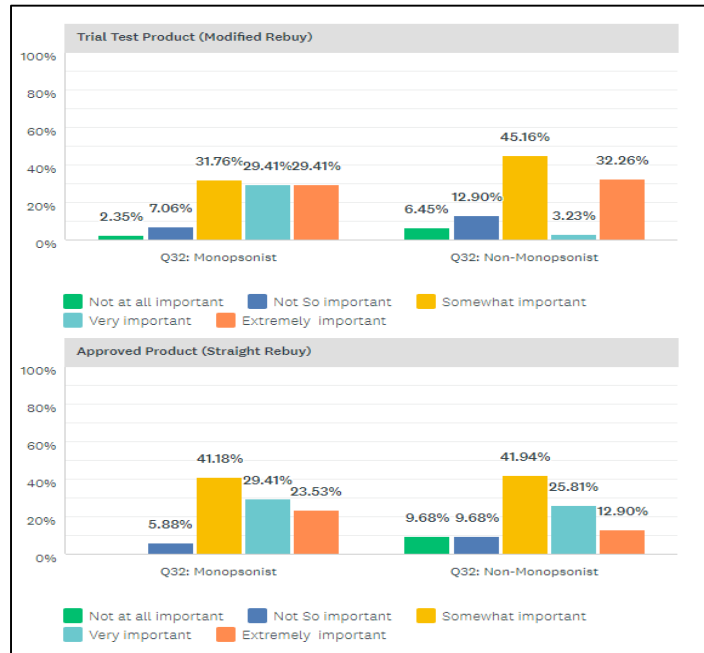
Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	1.18% 1	0.00% 0 B	11.76% 10	54.12% 46	32.94% 28	73.28% 85	4.18
Q32: Non-Monopsonist (B)	6.45% 2	6.45% 2 A	3.23% 1	54.84% 17	29.03% 9	26.72% 31	3.94
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)	1.00	5.00	4.00	4.18	0.72		
Q32: Non-Monopsonist (B)	1.00	5.00	4.00	3.94	1.08		
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	1.18% 1	0.00% 0	29.41% 25	47.06% 40	22.35% 19	73.28% 85	3.89
Q32: Non-Monopsonist (B)	6.45% 2	3.23% 1	19.35% 6	54.84% 17	16.13% 5	26.72% 31	3.71
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)	1.00	5.00	4.00	3.89	0.78		
Q32: Non-Monopsonist (B)	1.00	5.00	4.00	3.71	0.99		

Q-14 Impact of Operation Control



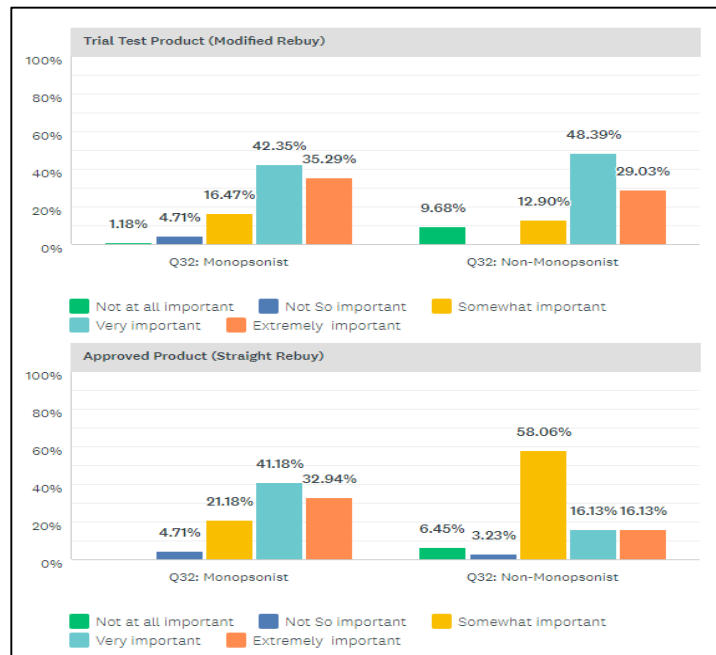
Trial Test Product (Modified Rebuy)								
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE	
Q32: Monopsonist (A)	3.53% 3	8.24% 7	29.41% 25	36.47% 31 B	22.35% 19 B	73.28% 85	3.66	
Q32: Non-Monopsonist (B)	6.45% 2	3.23% 1	16.13% 5	16.13% 5 A	58.06% 18 A	26.72% 31	4.16	
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION			
Q32: Monopsonist (A)	1.00	5.00	4.00	3.66	1.02			
Q32: Non-Monopsonist (B)	1.00	5.00	5.00	4.16	1.19			
Approved Product (Straight Rebuy)								
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE	
Q32: Monopsonist (A)	3.53% 3	17.65% 15	15.29% 13	50.59% 43 B	12.94% 11 B	73.28% 85	3.52	
Q32: Non-Monopsonist (B)	6.45% 2	6.45% 2	16.13% 5	19.35% 6 A	51.61% 16 A	26.72% 31	4.03	
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION			
Q32: Monopsonist (A)	1.00	5.00	4.00	3.52	1.04			
Q32: Non-Monopsonist (B)	1.00	5.00	5.00	4.03	1.23			

Q-15 Impact of company profile on product selection



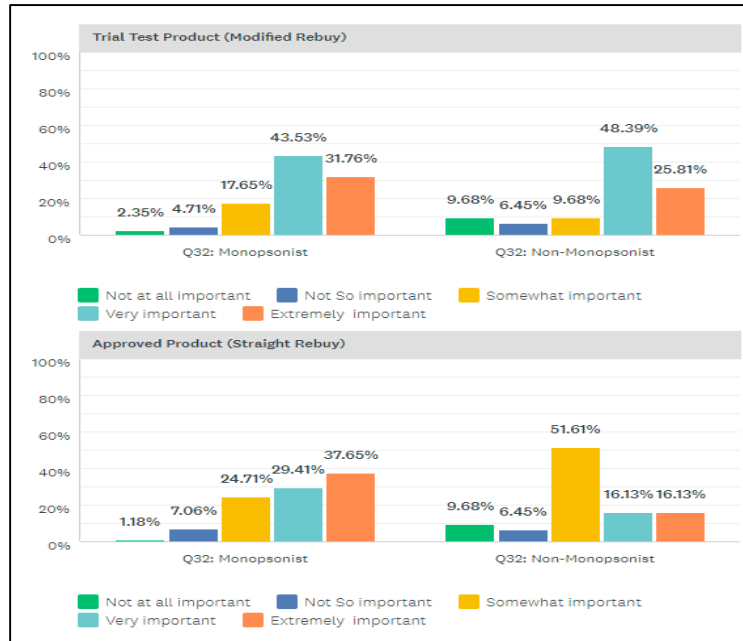
Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	2.35% 2	7.06% 6	31.76% 27	29.41% 25 B	29.41% 25	73.28% 85	3.76
Q32: Non-Monopsonist (B)	6.45% 2	12.90% 4	45.16% 14	3.23% 1 A	32.26% 10	26.72% 31	3.42
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	3.76	1.02	
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	3.42	1.24	
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	0.00% 0 B	5.88% 5	41.18% 35	29.41% 25	23.53% 20	73.28% 85	3.71
Q32: Non-Monopsonist (B)	9.68% 3 A	9.68% 3	41.94% 13	25.81% 8	12.90% 4	26.72% 31	3.23
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		2.00	5.00	4.00	3.71	0.89	
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	3.23	1.10	

Q-16 Impact of trust and confidence in the Company on the Product selection



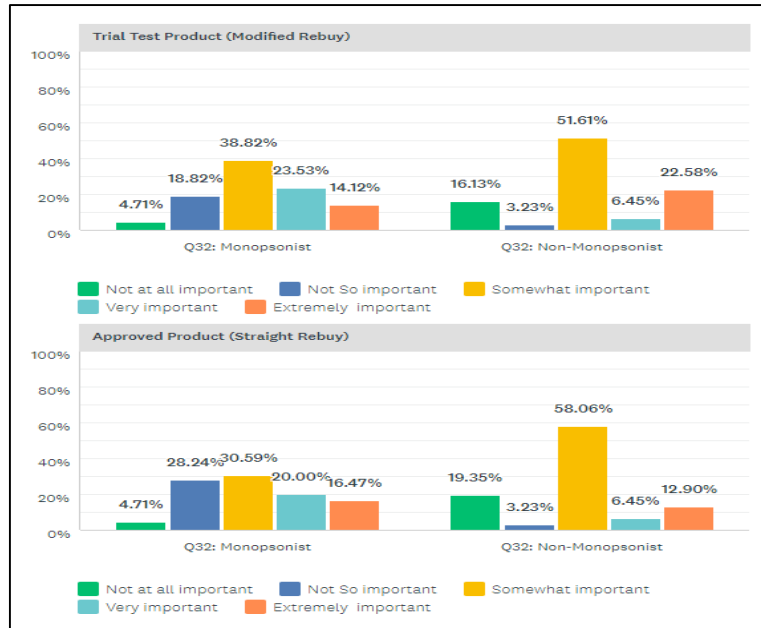
Trial Test Product (Modified Rebuy)									
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE		
Q32: Monopsonist (A)	1.18% 1 B	4.71% 4	16.47% 14	42.35% 36	35.29% 30	73.28% 85	4.06		
Q32: Non-Monopsonist (B)	9.68% 3 A	0.00% 0	12.90% 4	48.39% 15	29.03% 9	26.72% 31	3.87		
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION				
Q32: Monopsonist (A)		1.00	5.00	4.00	4.06	0.90			
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	3.87	1.13			
Approved Product (Straight Rebuy)									
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE		
Q32: Monopsonist (A)	0.00% 0 B	4.71% 4	21.18% 18 B	41.18% 35 B	32.94% 28	73.28% 85	4.02		
Q32: Non-Monopsonist (B)	6.45% 2 A	3.23% 1	58.06% 18 A	16.13% 5 A	16.13% 5	26.72% 31	3.32		
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION				
Q32: Monopsonist (A)		2.00	5.00	4.00	4.02	0.85			
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	3.32	1.00			

Q-17 Impact of Human relationships on the Product selection



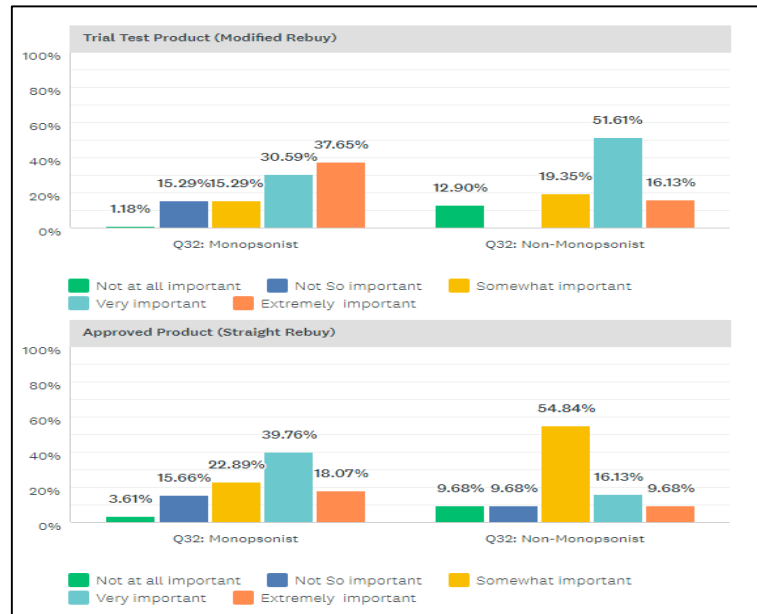
Trial Test Product (Modified Rebuy)									
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE		
Q32: Monopsonist (A)	2.35% 2	4.71% 4	17.65% 15	43.53% 37	31.76% 27	73.28% 85	3.98		
Q32: Non-Monopsonist (B)	9.68% 3	6.45% 2	9.68% 3	48.39% 15	25.81% 8	26.72% 31	3.74		
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION				
Q32: Monopsonist (A)		1.00	5.00	4.00	3.98	0.95			
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	3.74	1.19			
Approved Product (Straight Rebuy)									
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE		
Q32: Monopsonist (A)	1.18% 1 B	7.06% 6	24.71% 21 B	29.41% 25	37.65% 32 B	73.28% 85	3.95		
Q32: Non-Monopsonist (B)	9.68% 3 A	6.45% 2	51.61% 16 A	16.13% 5	16.13% 5 A	26.72% 31	3.23		
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION				
Q32: Monopsonist (A)		1.00	5.00	4.00	3.95	1.00			
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	3.23	1.10			

Q-18 Impact of Human resources and organization on the Product selection



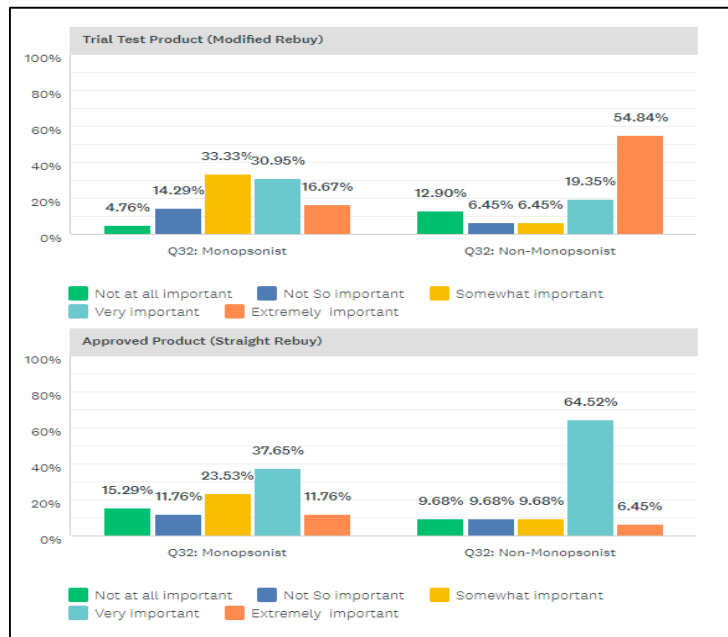
Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	4.71% 4 B	18.82% 16 B	38.82% 33	23.53% 20 B	14.12% 12	73.28% 85	3.24
Q32: Non-Monopsonist (B)	16.13% 5 A	3.23% 1 A	51.61% 16	6.45% 2 A	22.58% 7	26.72% 31	3.16
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	3.00	3.24	1.06	
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	3.16	1.27	
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	4.71% 4 B	28.24% 24 B	30.59% 26 B	20.00% 17	16.47% 14	73.28% 85	3.15
Q32: Non-Monopsonist (B)	19.35% 6 A	3.23% 1 A	58.06% 18 A	6.45% 2	12.90% 4	26.72% 31	2.90
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	3.00	3.15	1.14	
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	2.90	1.17	

Q-20 Impact of responsiveness to buyer demands (Localization) on the Product selection



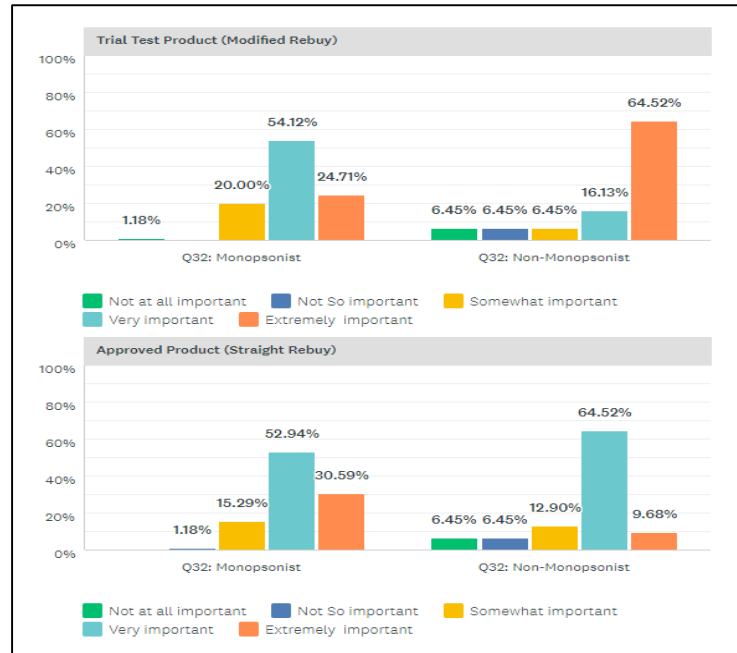
Trial Test Product (Modified Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	1.18% 1 B	15.29% 13 B	15.29% 13	30.59% 26 B	37.65% 32 B	73.28% 85	3.88
Q32: Non-Monopsonist (B)	12.90% 4 A	0.00% 0 A	19.35% 6	51.61% 16 A	16.13% 5 A	26.72% 31	3.58
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	3.88	1.11	
Q32: Non-Monopsonist (B)		1.00	5.00	4.00	3.58	1.16	
Approved Product (Straight Rebuy)							
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE
Q32: Monopsonist (A)	3.61% 3	15.66% 13	22.89% 19 B	39.76% 33 B	18.07% 15	71.55% 83	3.53
Q32: Non-Monopsonist (B)	9.68% 3	9.68% 3	54.84% 17 A	16.13% 5 A	9.68% 3	26.72% 31	3.06
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION		
Q32: Monopsonist (A)		1.00	5.00	4.00	3.53	1.07	
Q32: Non-Monopsonist (B)		1.00	5.00	3.00	3.06	1.01	

Q-22 Impact of Financial reputation on the Product selection



Trial Test Product (Modified Rebuy)								
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE	
Q32: Monopsonist (A)	4.76% 4	14.29% 12	33.33% 28 B	30.95% 26	16.67% 14 B	72.41% 84	3.40	
Q32: Non-Monopsonist (B)	12.90% 4	6.45% 2	6.45% 2 A	19.35% 6	54.84% 17 A	26.72% 31	3.97	
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION			
Q32: Monopsonist (A)	1.00	5.00	3.00	3.40	1.07			
Q32: Non-Monopsonist (B)	1.00	5.00	5.00	3.97	1.43			
Approved Product (Straight Rebuy)								
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE	
Q32: Monopsonist (A)	15.29% 13	11.76% 10	23.53% 20	37.65% 32 B	11.76% 10	73.28% 85	3.19	
Q32: Non-Monopsonist (B)	9.68% 3	9.68% 3	9.68% 3	64.52% 20 A	6.45% 2	26.72% 31	3.48	
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION			
Q32: Monopsonist (A)	1.00	5.00	3.00	3.19	1.24			
Q32: Non-Monopsonist (B)	1.00	5.00	4.00	3.48	1.07			

Q-23 Impact of Long-term relationships on the Product selection



Trial Test Product (Modified Rebuy)								
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE	
Q32: Monopsonist (A)	1.18% 1	0.00% 0 B	20.00% 17	54.12% 46 B	24.71% 21 B	73.28% 85	4.01	
Q32: Non-Monopsonist (B)	6.45% 2	6.45% 2 A	6.45% 2	16.13% 5 A	64.52% 20 A	26.72% 31	4.26	
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION			
Q32: Monopsonist (A)	1.00	5.00	4.00	4.01	0.74			
Q32: Non-Monopsonist (B)	1.00	5.00	5.00	4.26	1.22			
Approved Product (Straight Rebuy)								
	NOT AT ALL IMPORTANT (1)	NOT SO IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	VERY IMPORTANT (4)	EXTREMELY IMPORTANT (5)	TOTAL	WEIGHTED AVERAGE	
Q32: Monopsonist (A)	0.00% 0 B	1.18% 1	15.29% 13	52.94% 45	30.59% 26 B	73.28% 85	4.13	
Q32: Non-Monopsonist (B)	6.45% 2 A	6.45% 2	12.90% 4	64.52% 20	9.68% 3 A	26.72% 31	3.65	
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION			
Q32: Monopsonist (A)	2.00	5.00	4.00	4.13	0.70			
Q32: Non-Monopsonist (B)	1.00	5.00	4.00	3.65	0.97			

