# OUTSOURCING LOGISTICS IN THE OIL AND GAS INDUSTRY

A Senior Scholars Thesis

by

CRISTINA I. HERRERA

Submitted to Honors and Undergraduate Research
Texas A&M University
in partial fulfillment of the requirements for the designation as

UNDERGRADUATE RESEARCH SCHOLAR

May 2012

Major: Industrial Distribution

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Associate Director, Honors and Undergraduate Research: Duncan MacKenzie

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# ABSTRACT

Outsourcing Logistics in the Oil and Gas Industry. (May 2012)

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The supply chain challenges that the Oil and Gas industry faces in material logistics have enlarged in the last few decades owing to an increased hydro-carbon demand. Many reasons justify the challenges, such as exploration activities which have moved to remote locations, not only increasing distances but also escalating logistics costs. The objectives of the study is to discover the logistics needs of oil and gas companies, the motivation, benefits and the requirements of outsourcing logistics. The study aims to identify the material supply chain inefficiencies in the industry and proposes solutions to solve them. In this study, Oil and Gas industry's outsourcing practices in logistics are analyzed along with the trends of the third party logistics companies serving the industry. The participants of this study are from different companies in the Oil and Gas industry dealing with supply chain operations. After surveying industry players, it has been concluded that third party logistics (3PLs) companies have the opportunity to improve the logistics related activities in this industry but they have to meet certain requirements and critical success factors to be successful in this industry.

# ACKNOWLEDGEMENTS

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# CHAPTER I

# INTRODUCTION

In the last few decades, supply chain management has increased its importance, due primarily to the growth of business globalization and the intense competition in every industry. Companies have focused their efforts on making supply chain more efficient to decrease costs, sustain profitability and develop a competitive advantage. Logistics is defined by the Council of Logistics Management as "that part of the supply chain process that plans implements and controls the efficient flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers' requirements" (Council of Logistics Management 1998) For this reason, logistics plays an important role in the attempt of running the supply chain efficiently.

Supply chain management in the Oil and Gas industry is characterized for being very complex and difficult to manage. In addition, the growing demand of hydrocarbons, the globalization of the industry and the discoveries of oil and gas resources in remote locations has made the management of the supply chain even more challenging. The major problems in the oil and gas supply chain deal with logistics. Longer distances

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This thesis follows the style of *Journal of Supply Chain Management.*

between oilfields and refineries have increased lead times and high variability in transportation times. Oil and Gas companies are forced to keep a larger safety stock to prevent a shutdown of operations in case of a disruption in the supply chain. Higher safety and in-transit inventories along with the increase in transportation expenditure have escalated logistics costs.

Some oil and gas companies have recurred to outsource all or part of their logistics activities to a third party. The hypothesis is third party logistics (3PLs) companies have an opportunity to provide their expertise in logistics to integrate and improve the supply chain in this industry. Partnering with a 3PL to manage the logistics activities can help oil and gas companies share some risks as well as reduce expenses by having a more efficient and reliable supply chain.

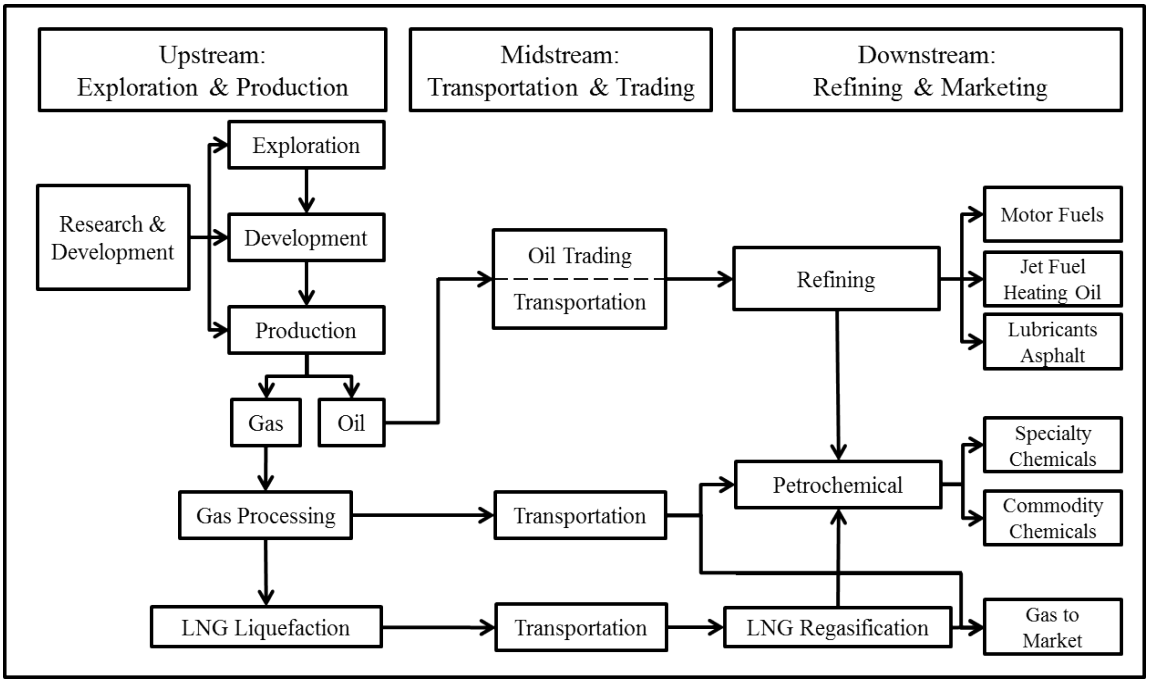
The study aims to identify the logistics challenges that the industry is facing and outline the requirements and motivators for outsourcing logistics to a third party. The organization of the study is as follows. First, the study discusses the structure of the oil and gas industry supply chain, and identifies the different segments and players in the industry. Then, the current trends in the industry will be discussed. After having clearly defined the supply chain and the oil and gas industry outlook, the challenges in supply chain will be analyzed. The outsourcing trends in logistics and its implications for third party logistics companies are then examined. At the end, suggested solutions to improve

supply chain management in this industry and the benefits of outsourcing logistics will be outlined.

**Supply chain management in the oil and gas industry**

It is essential to inspect the structure of the supply chain in order to comprehend the challenges in the Oil and Gas industry. The supply chain is functionally divided into three different segments: Upstream, Midstream and Downstream. The Upstream segment comprises the exploration and production of oil and gas. The Midstream segment includes the trading and transportation from the wells to the refineries or utilities plants. The Downstream segment consists of refining, marketing and delivery to the end customer (Inkpen and Moffet 2010). Figure 1 shows the flow of the supply chain in the oil and gas industry and its different segments.

**FIGURE 1**
**Oil and Gas Supply Chain Segments**




Adapted from "The Global Oil and Gas Industry 2010" by Inkpen and Moffet

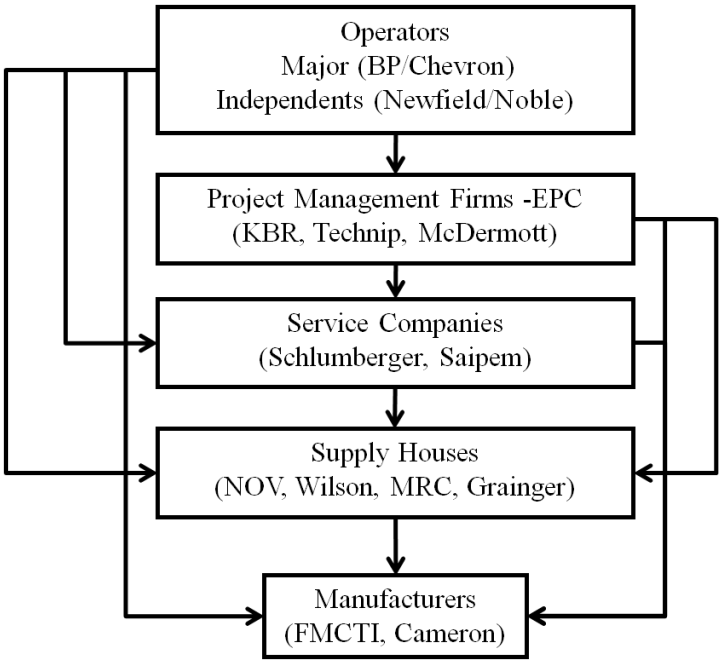
The division of the industry into three different segments (Upstream, Midstream and Downstream) along with the number of different players in this industry result in the complexity of the supply chain. The players include integrated operators, independent oil companies, engineering, procurement and construction (EPC) companies, oilfield service companies, manufacturers and distributors. The following definitions describe the role of each player:

- Integrated operator: Companies that have integrated operations throughout the supply chain and have licenses for the oil and gas, rights to acreage and take direct legal responsibility for exploiting them. For example: BP, Shell, Exxon, and Chevron. (Inkpen and Moffet 2010)

- Independent oil companies: Non-integrated companies that do most of their business in the exploration and production segment of the industry. For example: Anadarko Petroleum and Plains Exploration and Production. (Inkpen and Moffet 2010)
- Engineering, Procurement and Construction (EPC) companies: Offer turnkey solutions to upstream and downstream operators with Engineering, Procurement and Construction projects (EPC). For example: Technip and KBR.
- Oilfield service companies: Companies which contract directly with the operators to arrange and provide services. They take responsibility for dealing with most aspects of field operations. For example: Schlumberger, Baker Hughes, and Halliburton. (Inkpen and Moffet 2010)
- Manufacturers: Companies that manufacture equipment and products used in Oil and Gas industry. For example: FMCTI, Bosch Rexroth, and Cameron.
- Distributors: Suppliers fall into two categories: (1) Those which supply basic items such as nuts, bolts and delivery services. (2) Those which supply highly specialized products and services. They deal directly with contractors and, in many cases, directly with operators. For example: McJunkin Red Man, Wilson.

Since each participant plays a crucial role and supports the others, the material and information flow gets extremely convoluted. Figure 2 shows all the different information and material paths needed for the success of operations in the oil and gas industry.

**FIGURE 2**
**Information and Material Flow in Oil and Gas Industry**




**The oil and gas industry**

The energy consumption of the world is expected to grow by more than two-thirds of today by 2030. Fossil fuels will account for more than 90% of energy consumption (Dorian et al., 2005). The predicted amount of the investment needed to meet the world's energy needs through 2030 is about $16 trillion, from which approximately $200 billion per year will be in the oil and gas industry (Dorian et al., 2005). In 2003, ExxonMobil invested about $100 billion in property, plant and equipment; 55% in the upstream segment, 40% in the downstream and chemicals segments, and 5% on discontinued operations (ExxonMobil Financial & Operating Review, 2003). The industry is investing substantial sums because of the oil demand growth, increasing the movement of equipment and materials as well as the need of proper management of these capital

investments (Heath 2005). The expanding trend of global oil product demand is represented in Figure 3 (IEA Oil Market Report 2012)

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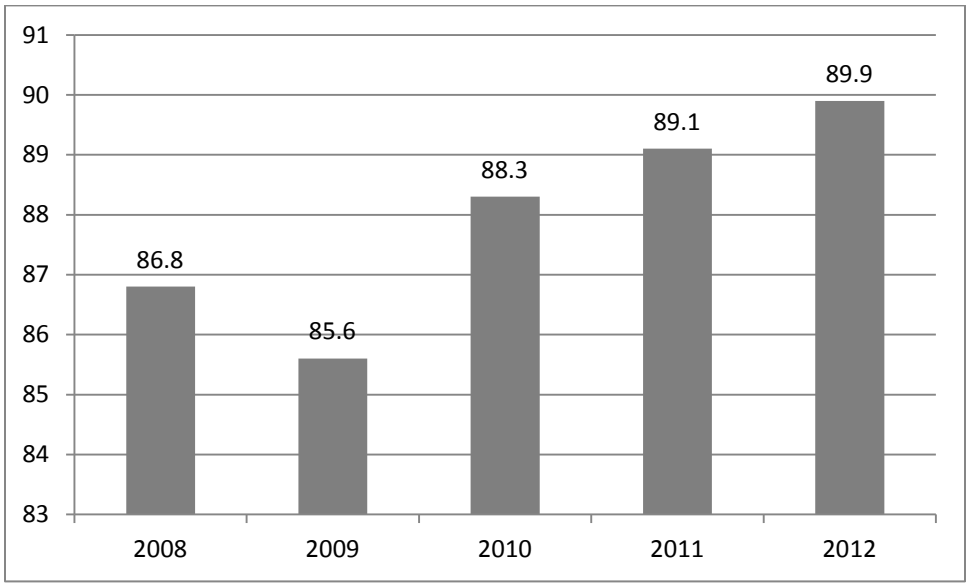
**FIGURE 3**
**Global Oil Product Demand (mb/day)**




The upstream drilling and production segment is expected to grow in the next five years owing mainly to the increasing oil demand and the subsequent recent discoveries of oil and natural gas deposits. This segment is highly fragmented since only a small percentage of the market share is composed of a few major integrated operators and the rest is made up of smaller independent oil companies (Molovi 2011). Though the segment operates on a substantial profit margin, economic cycles force firms to close unprofitable wells. Hence any logistics inefficiency which is overlooked translates into a competitive advantage if discovered and improved upon.

On the other hand, the downstream refining segment is expected to experience marginal annual growth in the United States. Existing capacity will suffice to meet short-term demand. Capital expenditures have been driven to meet stricter environmental regulations rather than expanding capacity. The number of refineries in the U.S has steadily declined from 195 in 1987 to 141 in 2009 mostly due to low profit margins (Inkpen and Moffet 2010). Operating on a smaller profit margin, this segment is in need of continuous technology and process innovation to improve their bottom line (Inkpen and Moffet 2010). Planning of efficient logistics is a key opportunity to minimize costs without affecting product quality and delivery of service (Sear 1993). To counter the cyclical nature and create a better outlook for their shareholders, firms have to discover methods to convert fixed expenses to variable expenses. Table 1 present the future growth in the US of each segment and proves that the downstream refining segment operates in a lower profit margin in comparison to the upstream drilling and exploration activities (IBIS World 2011).

**TABLE 1**

**Oil and Gas Market Outlook (IBIS World 2011)**

| Industry Segment | Revenue | Annual Growth (06-11) | | Profit | Profit Margin (%) |
|---|---|---|---|---|---|
| | | 2006-2011 | 2011-2016 | | |
| Drilling and Exploration (Upstream) | $329.9bn | 3.10% | 5.50% | $158.4bn | 48.00% |
| Refining (Downstream) | $698.9bn | 4.60% | 3.10% | $90.9bn | 13.00% |

# CHAPTER II

# METHODOLOGY

The study includes literature review from academic and industry specific journals, marketing supplements and industry specific interviews. To understand the needs of the various supply chain members several participants were surveyed from different companies in the Oil and Gas industry dealing with supply chain operations. Before the survey was finalized, similar professionals were interviewed by phone and face to face to verify its appropriateness.

The following tables show the number of participants from each type of company. There were a total of 42 responses. Table 2 represents the number of respondents divided into the supply chain segment in which their company does business. Table 3 denotes the number of respondents classified by the type of company as defined earlier.

**TABLE 2**

**Survey Responses by Supply Chain Segment**

| Supply Chain Segment | Number of Respondents |
|---|---|
| Upstream | 38 |
| Midstream | 20 |
| Downstream | 23 |

**TABLE 3**

**Survey Responses by Type of Company**

| Type of Company | Number of Respondents |
|---|---|
| Integrated Operator | 12 |
| Oilfield Services | 6 |
| Independent Oil Company | 5 |
| EPC | 8 |
| Manufacturer | 7 |
| Distributor | 4 |

The Questionnaire used in the interviews included questions that helped identify the supply chain challenges that oil and gas companies are facing, as well as their logistics needs and their motivators to outsource these services. The structure of the questionnaire is as follows. The first section included questions to classify the respondents by certain criteria, such as industry segment, type of company and size. The second section involved questions to understand the material movement and their current logistics practices. Then, the questions required the respondents to outline the requirements, motivators and discouragements for outsourcing. The fourth section included questions about transportation and warehouse management. Lastly, questions about third party logistics providers (3PL) selection and key performance indicators (KPI) were asked.

There were a varying number of respondents from different customer types which may have skewed the results in favor of the type of companies with a majority of

respondents. For instance, there were only a few responses from the distributors. To capture the most accurate comparisons an average number of responses by types of companies were measured for some questions. In addition, there was some confusion from respondents when choosing the supply chain segment in which their company was involved. Some respondents answered this question regarding to his or her job title instead of their company's business. Additionally, the options were not limited to a single segment of the supply chain. Thus Table 2 shows the responses were from individual firms slanting towards the upstream segment. The study does not compare supply chain characteristics by this classification.

# CHAPTER III

# SUPPLY CHAIN CHALLENGES IN OIL AND GAS INDUSTRY

As mentioned before, the supply chain in the oil and gas industry is very complex and challenging. The oil and gas industry players need supply chain innovation to keep up with the pace of demand for the oil and gas products. The lack of flexibility in the supply chain mainly caused by the production capabilities of suppliers, long transportation lead times and the limitations of modes of transportation makes very difficult to use integrated planning across the supply chain (Hussain et al. 2006). Moreover, a shutdown of operations, either for maintenance or failure, is very costly for two main reasons: production losses and the limited amount of money that companies have to invest in working capital for production equipment. In addition, the interdependence of the industry connects a failure in one end of the supply chain to other areas, with delays and costs. For this reason, there is a need to align and manage the exploration and production functions of an oil company in a more integrated, planned manner (Chima 2007).

## Transportation

The discovery of fields in remote locations, the growing offshore and deep water exploration and globalization of the industry has led to unique supply chain challenges that need to be addressed. The development of operations in these challenging environments has made it more difficult to integrate the supply chain. Consequently, the distance between supply chain partners has increased leading to higher transportation

costs and longer lead times (Hussain et al. 2006). Extensive distances proportionally have increased in-transit inventory and inventory carrying costs since companies have to store a greater amount of safety stock at the final location (Hussain et al. 2006). In addition, they cause high variability of transportation times that can hurt the service level of supplies and safety stock costs for the final customers or worse, shutdown the operations (Hussain et al. 2006). For this reason, 39% of the survey respondents are forced to expedite their shipments 25% or more of the times leading to inefficient transportation management with a larger number of Less Than Truck (LTL) shipping (60%) versus Full Truckload (40%).

**Inventory management**

According to the survey responses, inventory management is the biggest challenge they face with a 36 percent of responses. Inventory management entails “holding inventory to meet customer needs while keeping inventory costs at a reasonable level to produce a profit for the firm” (Mercado 2007). The inventory surplus in the industry is approximately $10 billion which shows the need of best practices in inventory management, redeployment and disposition (Heath 2005). It is estimated that the average book value of surplus inventory of major integrated oil companies was $817 million. The annual cost to carry that surplus inventory is 25% from which 17-18% is the cost of money. Therefore, with a hard cost of 7-8% annually it results in $57 million expense per year (Heath 2005). One of the reasons for this inventory surplus is that oil and gas companies hold higher safety stock of materials and maintenance, repair and operations

(MRO) products because a stock-out will oblige them to shut down operations incurring a significant costs. In addition, firms may not completely trust the delivery reliability of their suppliers. Consequently, inventory and inventory carrying costs are a substantial, poorly controlled expense.

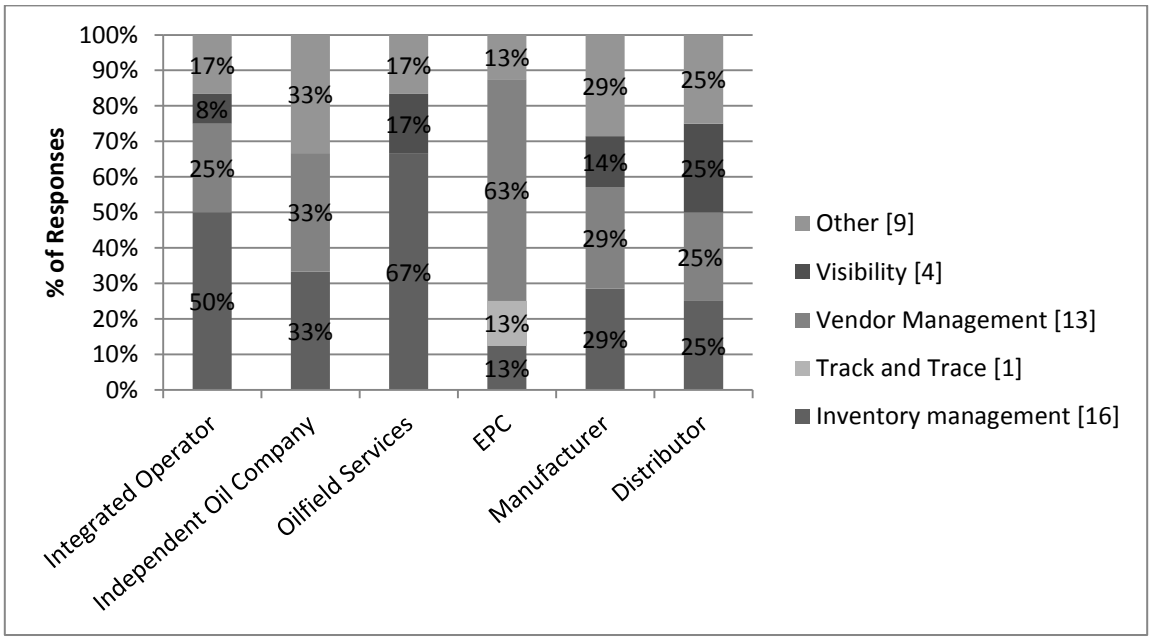
**Traceability and visibility**

The globalization of the industry increased the need for accurate tracking, traceability and visibility. The rigid environment and product features make it difficult to implement track and trace technology like RFID (Radio Frequency Identification) on every shipment or product. The information technology (IT) system should be able to provide inventory visibility within the supply chain since it is necessary to maintain high up time of rigs and refineries.

Visibility plays a critical role especially as safety and compliance has become a priority for the industry. Supply chain visibility helps companies develop a competitive advantage by identifying the best segments, distribution channels and value chain configurations (Supply Chain Council 2005). Oil and Gas companies handle a great deal of hazardous products and critical parts/equipment, and the user increasingly needs to document the origin and the flow. The difficulty in inventory visibility contributes to low inventory turns and redundant inventories present with different supply chain members. In several instances, the firms are unaware of the inventory or its location

especially for spares as usage is infrequent. Figure 4 present the major supply chain challenges by the different types of oil and gas companies face.

**FIGURE 4**
**Supply Chain Challenges in the Oil and Gas Industry**




**Supply chain reliability**

Supply chain reliability is of outmost concern to the industry. The associated costs with a supply chain disruption as well as safety distresses and lack of visibility have increased the importance of reliability. Criticality associated in the oil and gas industry resupply is very high. The failure of a company and its partners to perform its tasks successfully often ends with expensive shutdowns if not worse. A reliable supply chain can avoid detrimental situation in case of a failure or incident, they have the ability to act fast and save money. The increased number of reliability requirements in the industry has made

it very difficult for a firm to do it all. A third party can provide their expertise in supply chain management and increase supply chain reliability by decreasing the risk of failures.

# CHAPTER IV

# OUTSOURCING LOGISTICS IN THE OIL AND GAS INDUSTRY

In an effort of lowering costs and becoming more efficient, companies have relied on third parties and have outsourced non-core activities and processes (Aas et al. 2008). Many companies have relied on third party logistics providers (3PLs) to handle their logistics activities in a more efficient manner (Aas et al. 2008).

Outsourcing is not a new concept in the oil and gas industry. Oil and Gas companies have outsourced non-core but critical activities since the industry's origins (Heath 2005). Sharp-Hughes Tool Co, Halliburton, and Schlumberger are just a few examples of companies that were born thanks to the industry's continuous outsourcing practices striving innovation (Heath 2005). Some of the reasons why Oil and Gas companies outsource include the shortage or unwillingness to spend internal resources on these non-core activities. These companies also recognize that the service could be provided by third parties with a knowledge on best practices and that can leverage the costs of providing those services (Heath 2005).

## Outsourcing benefits

Outsourcing logistics can benefit the companies by reducing and controlling costs, releasing up investment dollars and providing additional resources and functions. Moreover, third parties can help companies gain control over a difficult function and

concentrate on their core business (Heath 2005). Other benefits include flexible infrastructure, access to new channels and risk management.

**Outsourcing logistics outlook**

The results of the 2010 15th Annual 3PL study performed by Capgemini Consulting firm suggested that the total logistics expenditure which includes transportation, distributions, warehousing and value-added services is an average 11% of the sales revenues of companies (Langley and Capgemini 2010). An average of 42% of the total logistics expense is outsourced worldwide, while in North America is 35% (Langley and Capgemini 2010). From the average total logistics expenditure outsourced, 41% accounts for transportation and 39% for warehouse operations (Langley and Capgemini 2010). To approximate future outsourcing outlook in the oil and gas industry, these results were adapted to estimate the oil and gas industry's 3PL market outlook. Table 4 shows these results. It is important to point out that calculations utilize the average percentages across industries.

**TABLE 4**

**US Future Outsourcing Outlook in the Oil and Gas Industry**

| Industry Segment | Drilling and Exploration | Refining |
|---|---|---|
| **Revenue** | $329.9bn | $698.9bn |
| **Average Total Logistic Expenditure (ATLE) (11% of Revenue*)** | $36.29bn | $76.88bn |
| **Average Total Logistics Expenditure Outsourced (ATLEO) (35% of ATLE*)** | $12.70bn | $26.91bn |
| **Average Transportation Expenditure Outsourced (41% of ATLEO*)** | $5.21bn | $11.03bn |
| **Average Warehouse Expenditure Outsourced (39% of ATLEO*)** | $4.95bn | $10.49bn |

**Logistic activities most likely outsourced by oil and gas industry**

The survey included questions to understand the outsourcing practices of oil and gas industry and their requirements for outsourcing. Oil and gas companies were asked to identify the logistics aspects that are most likely to be outsourced. Transportation is the top aspect that oil and gas industries are most likely to outsource, followed by warehouse management, yard and dock management, and track and trace. These findings are reinforced by the 2010 Annual 3PL study results. Outsourcing transportation is heavily favored by several companies as they perceive it is the core competency of the 3PL's. Liability with transporting hazardous chemicals deters firms in the oil and gas to take the task themselves. For this reason, third party logistics companies find it easier to enter the industry by providing transportation for oil and gas companies. Third party logistics companies can act as a fleet provider, a broker or a transportation analyst. Figure 5 and Table 5 show the supply chain functions most likely to be outsourced by total responses and the type of company respectively. Aspects of functions by company type are ranked based on the number of responses.

**FIGURE 5**
**Aspects of Logistics Most Likely to be Outsourced**

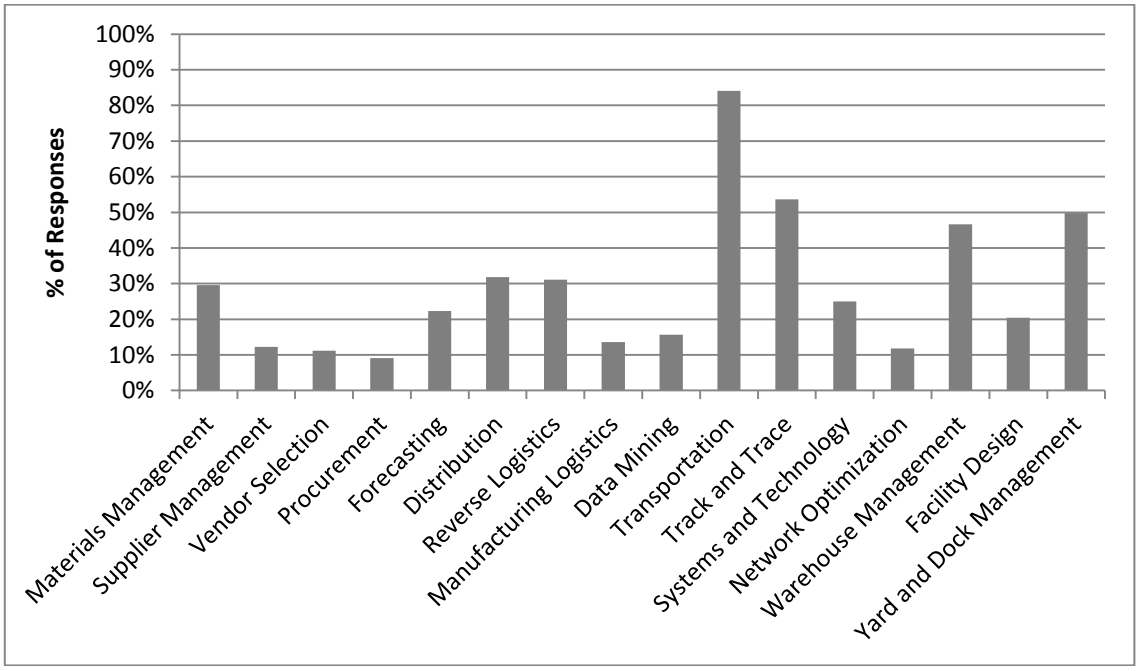



**TABLE 5**
**Aspects of Logistics Most Likely to be Outsourced by Company Type**

| Integrated Operator | Independent Oil Company | Oilfield Services | EPC | Manufacturer |
|---|---|---|---|---|
| Materials Management (66.7%) | Transportation (50.0%) | Transportation (66.7%) | Transportation (62.5%) | Transportation (85.71%) |
| Transportation (66.7%) | Warehouse Management (33.3%) | Warehouse Management (50.0%) | Warehouse Management (37.5%) | Warehouse Management (42.86%) |
| Warehouse Management (66.7%) | Distribution (33.3%) | Track and Trace (50.0%) | Materials Management (25%) | Distribution (42.86%) |
| Distribution (58.3%) | Materials Management (16.67%) | Distribution (33.3%) | Systems and Technology (12.5%) | Systems and Technology (28.57%) |
| Facility Design (41.67%) | Track and Trace (16.67%) | Materials Management (33.3%) | Procurement (12.5%) | Track and Trace (28.57%) |

**Outsourcing logistics motivators**

In order to understand why companies in the oil and gas industry consider outsourcing logistics, the survey asked the companies to identify the main motivators to outsource. The results showed cost reduction as the top motivator. This probably is due to the concerns companies have in improving the bottom line and the small profit margin they operate in, principally the downstream segment. The second largest motivator identified was compliance. Since safety concerns have increased recently, companies are looking for partners willing to share some risks and bring their expertise to the table. The third motivator is flexibility. As mentioned before, the supply chain in this industry is highly inflexible. In order to make the supply chain more efficient, firms are seeking 3PL's that can provide them with flexibility to operate in this fluid environment. Logistics not being a core competency is the fourth motivator to outsource. It allows companies to focus entirely in their core activities without wasting resources in non-core activities. The last ranked motivator was operation efficiency. Table 6 compares the motivation for outsourcing across different industries (Bhatnagar et al. 1999) with the motivation for the oil and gas industry only (Survey). When you compare these two scenarios, the oil and gas industry brings to the table compliance as one the most important motivators for outsourcing.

**TABLE 6**

**Motivators for Outsourcing: Across Industries vs. Oil and Gas**

| Motivators for Outsourcing | | |
|---|---|---|
| **Ranking** | **Across Industries*** | **Oil and Gas Industry** |
| **1** | Cost Savings | Cost Reduction |
| **2** | Customer Satisfaction | Compliance |
| **3** | Flexibility in operations | Flexibility |
| **4** | Productivity improvement | Not a core competency |
| **5** | Focus on core business | Operation efficiency |

## Outsourcing logistics requirements

Subsequently, companies were asked to list the requirements they consider when selecting a third party for logistic activities. Safety is the top requirement for a 3PL to do business in the oil and gas industry. This is mainly due to the high criticality of products that are involved in the process and the recent incidents such as gulf oil spill (Mouawad 2010). Safety requirements include having an impeccable safety record and strict safety regulations. The second requirement is experience. The industry strongly believes it requires experienced partners that understand the logistics, the complexity of the logistics and other attributes that effect such decisions. The third requirement is service. In other words, a 3PL should have outstanding service offerings and levels since responsiveness can be crucial in times of crisis. The fourth requirement companies consider when outsourcing logistics is cost. Cost reduction being the top motivator reinforces the requirement of competitive costs for outsourcing logistics. Though cost is an important driver to outsource, it is not necessarily a reason to select the 3PL form. Financial Stability is the next requirement concerning a 3PL since the sourcing cost

associated with the process of outsourcing is high and much is invested with the firm. The last two requirements are brand and culture.

**Outsourcing logistics critical success factors**

The participants of the study also classified the critical success factors to outsource warehousing operations and transportation in the oil and gas industry. Table 7 lists some examples of critical success factors for warehousing and transportation ranked as high, very high, and critical. Critical is the most important factor to consider.

**TABLE 7**

**Critical Success Factors in Outsourcing Logistics in the Oil and Gas Industry**

<table>
<tr><th colspan="3">Warehousing</th></tr>
<tr><th>High</th><th>Very High</th><th>Critical</th></tr>
<tr><td>Customer Transition Plan</td><td>Number of in-house or contracted drayage carriers</td><td>Performance Metrics</td></tr>
<tr><td>Management of container yard (IT system, physical yard checks)</td><td rowspan="2">EDI Transmission</td><td>IT System (SAP)</td></tr>
<tr><td>Warehouse Network Structure</td><td>Sq. footage available in a region</td></tr>
<tr><td rowspan="2">OSHA Recordable Rate</td><td rowspan="2">Involvement in bankruptcy or reorganization proceedings</td><td>Number of shipments in FEUs</td></tr>
<tr><td>Container storage capacity in FEUs</td></tr>
</table>

Table 7 continued.

| Transportation | | |
|---|---|---|
| **High** | **Very High** | **Critical** |
| Company History | Oil and Gas Specific Services | Locations |
| Warehouse | Freight Forwarding | Industries Served (Oil and Gas vertical) |
| Value-Added Services | | |
| Customs Clearance | Web-based IT Services | Core Competencies |
| EDI Capability | Company Strategy & Structure | |
| Transportation | Financial Statements | Modes of Transportation Supported |
| | KPIs | |

**The discouragements of outsourcing logistics**

On the other hand, the discouragements that oil and gas companies face toward outsourcing were also identified by the survey respondents. The number one discouragement for outsourcing logistics is losing control. Most of the oil and gas companies do not want to give the control of the materials and their movement, mainly because of the liability associated with safety concerns. In order to overcome this obstacle, third party logistics companies should look into building strong relationships based on trust and experience. The second and third discouragements are that companies do not see a visible cost reduction and operation efficiency improvement. Therefore, companies do not see the reason to go through the process of outsourcing and prefer to do things in-house. Discouragement number four is the criticality of the products that oil and gas companies handle and the risks associated with it. Companies fear that they will need to increase their efforts to control the handling of these products which translates to additional costs. The fifth reason why companies do not want to outsource is because

they believe their Customer Service Level will be damaged with an extra party involved in the process. The sixth discouragement is that companies believe logistics is part of their core competency. The last discouragement is the fear of failure, losing money in an unsuccessful supply chain.

# CHAPTER V

# SOLUTIONS

From the study, we can suggest possible solutions to help the supply chain and the logistics activities in the oil and gas industry to be more efficient. Oil and Gas companies should put a major emphasis on sourcing, in an effort to eliminate excess of inventory. Third party logistics companies could provide them with their knowledge in inventory management and warehouse management to control inventory costs. Also, the ability to guarantee supply chain reliability could become a requirement as the industry comes under increasing pressure to eliminate risk of failure. Another suggested solution is to have a single central warehouse for all oil companies to use in a consortium close to the gulf. This would be a unique solution for a third party to coordinate all material movements to a central distribution point for further transport to either offshore projects or to onshore construction yards. In addition, it could reduce inventory holding costs and lead times. The inefficiency in transportation management is evident in the oil and gas industry. Third party logistics companies could consolidate transportation in order to decrease the less than truckloads shipments and give them a potential advantage of lower transportation costs.

# CHAPTER VI

# CONCLUSION

The complexity of the supply chain in the oil and gas industry due to current business trends such as globalization has intensified the focus on logistics to minimize cost and risks. The associated costs with logistics are huge. These costs can be controlled better with the help of a third party logistics company who can provide their expertise to oil and gas companies. Currently, the supply chain in the oil and gas industry has a vast area of improvement. This is a big opportunity for 3PLs to gain more business in this industry by developing or improving their services to meet the unique requirements of oil and gas companies.

This study provides oil and gas companies as well as third party logistics companies an understanding of the current outsourcing practices in this industry. In addition, it provides a good overview of what the needs of oil and gas companies are, which helps third party logistics companies improve their offerings. Third party logistics companies need to be aware of the subtle differences in the oil and gas industry to effectively address their needs.

Future research on the topic might include the increase of survey responses and the performance of more rigorous statistical processes. For instance, calculate the reliability and factor analysis of the data to prove the hypothesis. Other approaches include

building and testing models based on theoretical suggestions, reinforcing case studies of performance improvements and discussing successes and failures of third party logistics in the industry.

# REFERENCES


Aas, B., A. Buvik and D. Cakic. "Outsourcing of Logistics Activities in a Complex Supply Chain: A Case Study from the Norwegian Oil and Gas Industry," *International Journal of Procurement Management,* (1:3), 2008, pp. 280-296.

Bhatnagar, R., A.S. Sohal, and R. Millen. "Third party logistics services: a Singapore perspective," *International Journal of Physical Distribution and Logistics Management,* (29:9), 1999, pp. 569-587.

Chima, C.M. "Supply-Chain Management Issues in the Oil and Gas Industry," *Journal of Business & Economics Research,* (5:6), 2007, pp. 27-36.

Council of Logistics Management, "CSCMP Supply Chain Management Definitions," http://cscmp.org/aboutcscmp/definitions.asp, 1998.

Dorian, J.P., H.T. Franssen, and D.R. Simbeck. "Global Challenges in Energy," *Energy Policy,* (34), 2006, pp. 1984-1991.

ExxonMobil. "Financial and Operating Review," Report, Irving, TX, 2003.

Heath, J.B. "Outsourcing and Asset Disposition: A Proven Model in the Oil and Gas Industry," *Offshore Technology Conference,* 2005.

Hussain, R., T. Assavapokee and B. Khumawala. "Supply Chain Management in the Petroleum Industry: Challenges and Opportunities," *International Journal of Global Logistics & Supply Chain Management,* (1:2), 2006, pp. 90-97.

Inkpen, A. and M. Moffett. *The Global Oil and Gas Industry – 2010,* Thunderbird School of Global Management, 2010.

International Energy Agency (IEA). "Quarterly Oil Product Demand." Oil Market Report. 2012.

Langley, J. and Capgemini. *2010 Third-Party Logistics Annual Study,* 2010.

Mercado, E.C. *Hands-On Inventory Management,* Auerbach Publications, Boca Raton, FL, 2007, p. 1.

Molovi, J. "Industry Report 21111: Oil Drilling & Gas Extraction in the US." Report, IBISWorld, 2011.

Mouawad, Jad. “For BP, a History of Spills and Safety Lapses,” *New York Times*, May 8, 2010.

Sear, T.N. (1993) “Logistics Planning in the Downstream Oil Industry,” *The Journal of the Operational Research Society*, (44:1), pp. 9-17.

Supply Chain Council, Inc., “Performance Metrics for Supply Chain Visibility,” Report, Washington DC, 2005.

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