

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF SUPPLY CHAIN AND INFORMATION SYSTEMS

SOURCING AND PROCUREMENT: A CASE STUDY OF ECONOMIC, SOCIAL, AND
ENVIRONMENTAL IMPLICATIONS

DALE C. ESHBACH
Spring 2012

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Supply Chain and Information Systems
with honors in Supply Chain and Information Systems

Reviewed and approved* by the following:

Felisa Preciado, Ph.D.
Clinical Assistant Professor of Supply Chain Management
Thesis Supervisor

John Spsychalski, DBA
Professor Emeritus of Supply Chain Management
Honors Adviser

* Signatures are on file in the Schreyer Honors College

Abstract

This thesis examines the importance of sourcing and procurement best practices through an overview of the make-or-buy decision and a case study of the Deepwater Horizon disaster that took place in the Gulf of Mexico in 2010. A review of literature and various industry examples have been used to demonstrate the importance of building sustainability into sourcing and procurement decisions at the beginning of supply chain activities. By increasing upstream visibility and holding partners to consistent standards of sustainability, firms can successfully mitigate risk and improve return on investment. Several different sourcing and procurement examples are highlighted and compared to the main case study that investigates the social, economic, and environmental implications of BP's supply chain management decisions over the past three decades.

Table of Contents

Introduction.....1

Chapter 1 The Make-or-Buy Decision

1.1 The Sourcing Decision.....5

- 1.1.1 Advantages of Insourcing.....5
- 1.1.2 Disadvantages of Insourcing.....9
- 1.1.3 Advantages of Outsourcing.....9
- 1.1.4 Disadvantages of Outsourcing.....11
 - 1.1.1.4 Mitigating the Loss of Control in Outsourcing.....13

1.3 Measuring the Costs of Insourcing and Outsourcing.....14

1.4 Implications of the Outsourcing Decision.....16

- 1.4.1 The Influence of IT on Globalized Sourcing Practices.....16
- 1.4.2 The Financial Impact of Purchasing.....17
- 1.4.3 The Impact of Performance Dimensions and Non-Price Factors.....19

1.5 The Decline of Vertical Integration and Sustainability Implications of Outsourcing.....20

Chapter 2 BP: Economic, Social, and Environmental Implications

2.1 BP and Outsourcing Partners: the Gulf of Mexico Oil Spill.....23

2.2 BP Climbs to the Top: Vertical Integration.....24

2.3 Corporate Leadership.....26

- 2.3.1 Texas City Refinery: Social Implications.....27
- 2.3.2 Thunder Horse Platform: Economic Implications.....28

2.3.3 Alaska’s Prudhoe Bay Pipeline: Environmental Implications.....	29
2.4 Tony Hayward and the Operating Management System.....	31
2.5 The Deepwater Horizon: Managerial Decisions.....	33
2.5.1 Outsourcing of Core-Competencies.....	39
2.5.2 BP: Contracts and Liabilities.....	41
2.5.3 BP: Supplier Evaluation.....	43
Chapter 3 Implications	
3.1 Becoming Sustainable.....	45
3.1.1 Performance Measures.....	45
3.1.2 Holding Partners Accountable.....	47
3.1.3 Supply Chain Visibility.....	49
Conclusion.....	51

Introduction

The terms *procurement*, *purchasing*, and *sourcing* are all used to represent the second of five distinct management processes that make up the Supply-Chain Operations Reference-Model (SCOR). This reference model was originally developed by the global management consulting firm PRTM and adopted by the Supply-Chain Council (SCC) as a diagnostic tool for best practices in supply chain management. The five distinct management processes, as stated by the SCC, include the processes of: plan, source, make, deliver, and return. Organizations of all sizes, strategies, and industries can universally apply supply chain scenarios to the SCOR model. It is a standardized tool that encompasses the furthest upstream and downstream processes of a supply chain network, including reverse logistics and product returns (Blanchard 56).

These five distinct management processes concisely and accurately describe the wide range of activities that span the field of supply chain management, today. However, the term supply chain management is a relatively new term that only dates back to the 1950s. The foundational research of this new field can be accredited to Jay Forrester and his colleagues at the Massachusetts Institute of Technology. In the late 1950's, Forrester and his colleagues began studying what would become known as the "bullwhip effect." Together, they identified that variability in a "supply pipeline" increased as the distance between a supplier and customer increased, hence a figurative bullwhip (Blanchard 7).

Unfortunately, solutions to disseminate the discovery of aggregate variability or "bullwhip" were not available until computing power enhanced and became more accessible in the 1990s. Nonetheless, Forrester's research pioneered a new way of thinking about the holistic organization and would eventually lead to additional research on the benefits of unsiloing the

modern organization. About 30 years after Forrester's discovery of the bullwhip effect, the five distinct management processes of the SCOR model began to merge into one integrated, all-encompassing field: *supply chain management*.

As witnessed by the historical development of the supply chain management field, technology has not only ushered this topic into the limelight, but it has also enabled today's horizontally integrated organization. Organizational activities that fall under the larger field of supply chain management, such as sourcing and procurement, were once referred to as tactical in nature. Today, the best practices in these areas of supply chain management are emphasized as strategic objectives due to their potential to improve profit margins and mitigate risks in an integrated supply chain network.

Through the use of information technology (IT) in procurement and the ability to source from higher quality external suppliers, firms have skillfully been able to own less of the supply chain than ever before. Successful organizations now focus on core competencies and collaborative supplier relationships in order to operate most efficiently and remain flexible to fluctuating customer demands and requests for customization. The shift to a less compartmentalized organization is undoubtedly the result of a more connected, technology driven, globalized economy.

However, great rewards are certainly accompanied with great risks. There are many tradeoffs to consider when deciding between flexibility and control. The make-or-buy decision defines the roles of an organization from a strategic standpoint. This decision dictates whether an organization will produce a product or service internally or source it from an outside supplier.

Recently, this decision to make or buy has garnered higher level attention for reasons other than an organization's bottom line. A focus on sustainable business practices and recent supply

chain disasters have forced organizations to take a deeper look into their upstream suppliers and downstream operations. Organizations and their suppliers must now focus on the social, environmental, and economic implications of their supply chain management decisions. Due to an increase in stakeholder awareness, quality, safety, and environmental concerns, companies are granting more attention to the sourcing and procurement of products and key services. Through the efforts of more comprehensive supplier evaluation and improved visibility in the supply chain, progressive companies and responsible industries are beginning to witness the countless advantages of sustainability.

While industries retain different incentives and standards for sustainable sourcing and procurement, the challenge of standardizing sustainability across all industries is a national and international venture. Qualitative evidence about the benefits of sustainability is simply not enough. This presents challenges because the disasters that are avoided due to sustainable sourcing and procurement practices are rarely noticed. On the other hand, playing the odds in sourcing or procuring products and services can make you a hero as quickly as a villain. This signifies that there must be a proper balance between the environmental, social, and economic interests in all industries.

The question of balance is multi-dimensional, pre-dating the industrial era and capitalism itself. The discoveries of Forrester and the development of the supply chain management field have exemplified that all stakeholder needs can be satisfied through collaboration and visibility throughout the entire supply chain. Partnering with upstream suppliers and incorporating sustainability into sourcing and procurement decisions at the beginning of the supply chain is the first step to answering this timeless conflict of stakeholder interests. Sustainability and collaboration are the future of economically providing quality products and services while

simultaneously answering the social and environmental concerns that have rightfully emerged.

Consequently, the strategic goal for any company and its suppliers should be to interpret the economic, social, and environmental implications of sustainability as the ultimate in understanding stakeholder requirements. Companies can no longer afford to ignore this call to action. Just as the field of supply chain management revolutionized the roles and responsibilities of today's organization, it must now lead the way in implementing sustainability. The expectations are enormous, but so are the benefits to be gained from sustainable practices. In the future, "competitive advantage will be determined in part by [the organization's] ability to seize opportunities and manage risks associated with growing social and environmental performance expectations of customers, shareholders and stakeholders" (Serwinowski and Marshall).

Chapter 1

The Make-or-Buy Decision

1.1 The Sourcing Decision

“Sourcing decisions are high-level, often strategic decisions regarding which products and services will be provided using resources within the firm (known as insourcing) and which will be provided by a firm’s supply chain partners (known as outsourcing)” (Bozarth and Handfield 233). The sourcing decision, also known as the make-or-buy decision, defines the responsibilities of an organization from the top down. The strategic nature of sourcing dictates the processes that the firm’s purchasing department will eventually follow. Although purchasing may be looked at as a more tactical process, it is equally important because this function supplements the organization with the products and services that it cannot internally provide.

1.1.1 Advantages of Insourcing

“For over a century, companies competed on the basis of what they owned. AT&T, with its direct control of the American telephone network; Bethlehem Steel, with its large-scale manufacturing plants; and Exxon with its vast oil reserves, each dominated its respective industry” (Gottfredson, Mark, Rudy Puryear, and Stephen Phillips). Vertical integration, or owning the entire supply chain, represents a traditional business model where large firms utilize size and financial leverage to exert control over the processes of: plan, source, make, deliver, and return in the supply chain. Oil and gas exploration and extraction companies, such as Shell and BP (formerly known as British Petroleum before officially adopting the slogan, “Beyond Petroleum” in 1997), popularized this supply chain strategy through heavily investing in

downstream refineries and distribution networks in the 1970s and 1980s (“Vertical Integration”).

At this time, vertical integration and consolidation in the oil and gas industry was becoming a common trend. However, when Exxon and Mobil merged several years later in 1999, these two companies already owned both upstream and downstream processes of their supply chains. This merger between the two vertically integrated giants was, therefore, motivated by reasons other than the desire for control over supply chain processes. Together, Exxon and Mobil proved that economies of scale are necessary to obtain the financial benefits of insourcing and owning the entire supply chain. It also proved that it is easier for companies of this size to “swallow” each other up when the boundaries of internal efficiency and organizational restructuring are pushed to the limit. Through vertical integration, it was estimated that the merger created \$3.8 billion per year in cost savings and profit improvement items for ExxonMobil Corporation (ExxonMobil 1999 Annual Report).

Furthermore, insourcing becomes advantageous when the processes being performed fall within a company’s core competencies. As Bozarth and Handfield have explained, these are organizational strengths or abilities, developed over a long period that customers find valuable and competitors find difficult or even impossible to copy (233). The desire to protect intellectual property, processes, or trade secrets exemplifies the benefits of maintaining control over supply chain processes.

In other instances, organizational strengths may refer to services that are extremely difficult to outsource for various reasons. Some processes are inherently locked-in, for example the tourism industry is incapable of outsourcing services because relocating geography or culture is virtually impossible. A more relevant example to this discussion is the consulting industry. While computer programming and other non-critical services can be outsourced to an extent, the

knowledge, experience, and creativity provided by a consultant is hard to implement over the phone. This is evident particularly when technology consulting firms employ a limited number of consultants to interact with the assigned client and understand requirements on the front-end. Meanwhile, the firm will contract a large number of low-cost employees in another country to perform the physical labor and build the actual requirements on the back-end. This example proves that there is still a need for personal interaction at the point where services are consumed.

Although insourcing presents the ability to maintain tight control of the organization's processes while reaping the benefits associated with economies of scale, vertical integration is not a universal business model. As explained earlier, this business model is most successful in consolidated industries that represent near-monopolistic competition. Not every industry contains the same capital and technology intensive barriers to entry as the oil and gas industry. Therefore, not every industry or business requires the same approach to the make-or-buy decision. Figure 1.1.1 demonstrates the sheer magnitude required to obtain economies of scale through vertical integration. Manufacturing sites, refineries, service stations, and an incredible amount of employees were all factors in Exxon and Mobil's strategic decisions to find the appropriate balance between owning more of the supply chain or divesting in physical assets and partnering with outside product and service providers.



Financial	Financial
<p>Net income of \$8.5 bn Revenues of \$137.2 bn Capital employed was \$52.9 bn Capital and exploration expenditures of \$8.8 bn Return on Average Capital Employed of 16.5%</p>	<p>Net income of \$3.3 bn Revenues of \$65.9 bn Capital employed was \$26.5 bn Capital and exploration expenditures of \$5.3 bn Return on Average Capital Employed of 13.4%</p>
Exploration and Production	Exploration and Production
<p>Worldwide net production of 1.6 million b/d of crude oil and natural gas liquids and 6.3 bn cubic feet of natural gas a day Proven liquid reserves of 6.8 bn barrels; proven natural gas reserves of 42.1 trillion cubic feet Exploration/production activities in 30 countries</p>	<p>Worldwide net production of 0.9 million b/d of crude oil and natural gas liquids and 4.6 bn cubic feet of natural gas a day Proven liquid reserves of 4.1 bn barrels; proven natural gas reserves of 17.0 trillion cubic feet Exploration/production activities in 25 countries</p>
Refining and Marketing	Refining and Marketing
<p>Total petroleum product sales of 5.4 million b/d 33,000 service stations worldwide Refinery throughput of 4.0 million b/d Interests in 31 refineries in 17 countries</p>	<p>Total petroleum product sales of 3.3 million b/d 15,500 service stations worldwide Refinery throughput of 2.1 million b/d Interests in 19 refineries in 12 countries</p>
Chemicals	Chemicals
<p>Sales of 17.3 million metric tons/ year Revenues totaled \$14.0 bn Interests in 56 manufacturing sites in 24 countries</p>	<p>Sales of 4.0 million metric tons/ year Revenues totaled \$3.5 bn Interests in 19 manufacturing sites in 10 countries</p>
Other	Other
<p>80,000 employees worldwide Common shares outstanding (as of 11/27/98) 2,427.7 million. In addition, there are 3.8 million common share equivalents in the form of Convertible Class A Preferred Stock</p>	<p>42,700 employees worldwide Common shares outstanding (as of 11/27/1998) 779.9 million. In addition, there are 16.6 million common share equivalents in the form of Series B ESOP Convertible Preferred Stock.</p>

Figure 1.1.1 Vertical Integration (“Exxon-Mobil, Total-Petrofina Mergers Slated”)

1.1.2 Disadvantages of Insourcing

Insourcing and vertical integration require heavy capital investments in equipment and labor for a company to adequately perform every function of the supply chain. This is a risky maneuver for companies that cannot afford to be locked into a permanent operation for an extended period of time. These capacity commitments decrease a company's flexibility and may hinder their ability to meet customer needs if demand for customization, quantity of demand, or lead time change in the future. The situation becomes more complicated when an organization does not have clear understanding of their core competencies. Devoting capital to insourcing when the same processes can be more efficiently supplied externally restricts a company's ability to invest in other profitable projects. Organizations must carefully consider the strategic advantages and disadvantages of insourcing. When making these decisions, it is often better to strive for excellence in select processes as opposed to aiming for mediocrity in all five distinct management processes of the SCOR model.

1.1.3 Advantages of Outsourcing

With a decline in the vertically integrated business model, organizations are beginning to realize the advantages of partnering with external suppliers for non-core competencies. From a financial perspective, return on investment can be maximized when companies apply capital to areas with the greatest potential for mastery and avoid investments in other non-value added processes. Most importantly, this means that the outsourcing company does not endure the burden of initial capital investments.

The founder of Dell Computers, Michael Dell, put an interesting spin on the question of what to insource or outsource in the 1990s. The Dell model relied on the close integration of

flexible suppliers, allowing the company to perform core competencies while owning as little of the supply chain as possible. Through establishing interdependent relationships and leveraging partners, Dell was able to shift non-value added processes upstream (Fugate and Mentzer). This allowed the company to focus on what it did best, providing customized computers. The Dell model is one of the first examples of virtual supply chain integration. By combining traditional aspects of the vertical business model and characteristics of the virtual organization, outsourcing firms can take advantage of supplier capabilities while sharing the costs and risks of capital investments with partners (“Vertical Integration”).

As illustrated in the Dell model of virtual integration, there are additional advantages that make outsourcing of non-value added processes appealing. In this example, the need for flexibility in daily operations was a critical factor in Dell’s make-or-buy decision. Without flexible suppliers, Dell would have been crippled by the large demand fluctuations it faced in the short-term.

Personnel productivity is another factor to consider when analyzing outsourcing possibilities. Keeping the amount of products and services produced in-house to a manageable quantity allows the organization to better utilize labor. Focusing on core competencies, whether product or service related, allows for the development of a more productive work force (Lynch 135). Companies may also benefit from less training and narrower skill requirements, as the work force becomes more specialized and is able to focus on fewer processes.

Outsourcing may also become practical when companies are looking to circumvent unionization in the work force. In 2011, Boeing took this approach when it added additional production capacity to its 787 Dreamliner project. As a result of union related issues in Boeing’s Puget Sound, Washington plant, the company decided to invest \$750 million in a non-unionized

assembly plant in Charleston, South Carolina. Boeing had already been facing internal issues with procurement and assembly processes of this composite airplane. However, a 58-day strike in 2008 may have influenced the company's decision to seek less complex labor agreements (Greenhouse). Whether or not this strike was the underlying cause for the additional capacity investments remains undisclosed.

As of June 2011, Boeing was currently still fighting the International Association of Machinists and Aerospace Workers union under the stipulation that the company illegally removed potential work from its Washington plant. This example is a clear representation of the possible complications and advantages that can arise through the outsourcing of labor and capacity.

1.1.4 Disadvantages of Outsourcing

Although the inherent nature of outsourcing does increase flexibility in the supply chain, there are numerous complications that can arise. Buyers must carefully analyze suppliers to ensure that quality and performance expectations are realistic and achievable (Bozarth and Handfield 240). Since quality and performance expectations can be overstated, contingency planning becomes necessary. Organizations must devise plans and processes for limiting their exposure to risk in dealing with the added variability external partners bring to their supply chains. Additionally, global sourcing from suppliers has also introduced unforeseen risks and complexities that were irrelevant in an age where products and services were consumed close to the point of production.

Consider Apple's iPod supply chain: A factory in the Philippines is responsible for assembling 1.8-inch disk drives for the Apple iPod. The plant ships 20,000+ disk drives each

day but will only carry about two days of the finished product because of the excessive inventory carrying costs. The plant is located 18 miles from a major volcano and this region is commonly exposed to typhoons and earthquakes. Although Apple has addressed this plant as a key focus in their contingency planning efforts, a natural disaster in the plant could be detrimental. A disruption from this critical supplier could limit Apple's ability to meet production requirements for the iPod in as little as 48 hours. If such a disruption did occur in October, Apple could feel the effects of reduced disk drive supply during the holiday season (Bozarth and Handfield 232).

While Apple's iPod supply chain does represent the inherent dangers of sourcing globally from single suppliers, there are a few remaining considerations, such as loss of control. Outsourcing may not be the best option for a company if its leaders feel that their product or service provides competitive advantage through design or technological innovation. In the aerospace industry, intellectual property rights have a major influence on the decision to outsource or utilize low-cost labor options within the organization. Through an outsourcing strategy, aerospace companies are forced to surrender intellectual property rights and the subsequent share of aftermarket revenues from the repair and overhaul of products and components. Companies such as Honeywell Aerospace often choose to utilize internal labor in other countries to combat this issue of control and maintain the ownership of intellectual property. Enormous aftermarket profit margins provide incentives for utilizing in-house processes (Scott, Bill. Phone interview. 26 March. 2012). However, reverse engineering and the ability to purchase products in a free market make it difficult to keep designs and technology exclusive for long.

Coordination can also play a role in choosing to outsource. Today, many companies are exploiting global purchasing strategies which allow buyers to sit on-site at the outsourced

suppliers' facilities. This process often involves the integration of enterprise resource planning software on an international scale. Coordinating time zones, units of measure, and language barriers are just some of the issues that should be factored into the decision to utilize global sourcing and purchasing strategies.

1.1.4.1 Mitigating the Loss of Control in Outsourcing

As explained earlier, intellectual property, processes, and trade secrets are all reasons to insource as well as recognizable sources of risk when outsourcing. However, certain approaches can be taken to mitigate these risks. For example, Nike's core competencies include the design and marketing of running shoes. In order to take advantage of low-cost labor and still keep these core competencies in-house, Nike only outsources the manufacturing processes within their supply chain (Bozarth and Handfield 233).

Another example of a company protecting what it does best is 7-Eleven. In the early 1990s, 7-Eleven operated under a vertically integrated strategy. "The company operated its own distribution network, delivered its own gasoline, made its own candy and ice. It even owned the cows that produced the milk it sold" (Gottfredson, Puryear, and Phillips). Realizing that 7-Eleven performed few of these processes exceptionally, former CEO, Jim Keyes, let no processes escape his make-or-buy evaluation. Nevertheless, Keyes was skeptical to adopt a one-size-fits-all approach to outsourcing. In contradiction to the popular wave of the decade, Keyes instituted an approach that allowed his company to outsource certain processes while maintaining many of the core competencies that were proprietary to 7-Eleven.

Gasoline was a key component of 7-Eleven's sales; however, the distribution of gasoline was not a specialty. Under this new business model, Keyes decided to outsource the distribution of

gasoline to Citgo but maintain the sales and pricing processes internally. Furthermore, the company's snack foods provider, Frito-Lay, suggested the use of vendor managed inventory (VMI). At the time, Frito-Lay was becoming well-known for their ability to provide warehousing and logistics through the VMI process. VMI enabled Frito-Lay to determine order quantities and shelf placement in the stores that they serviced. However, Keyes believed that 7-Eleven's traditional process of maintaining extensive data on local customers and their purchasing behaviors was a process that his company could perform better than Frito-Lay or competitors in the market. In the end, 7-Eleven was able to compromise with Frito-Lay. The convenience stores maintained their traditional purchasing and merchandising activities while Frito-Lay agreed to provide direct delivery to the stores. By taking advantage of Frito-Lays warehousing and transportation systems, 7-Eleven was able to benefit from strategic sourcing partnerships while maintaining control over proprietary customer information and processes (Gottfredson, Puryear, and Phillips).

1.3 Measuring the Costs of Insourcing and Outsourcing

While the tradeoffs between control and flexibility remain important considerations in the make-or-buy decision, the complexities associated with measuring the costs of these decisions are equally critical. Total cost analysis, the process by which an organization seeks to identify and quantify all of the major costs associated with various sourcing options, is one tool that allows managers to evaluate the financial tradeoffs of insourcing and outsourcing decisions (Bozarth and Handfield 235). Based on this definition, the process of allocating costs may seem straightforward and simple; however, managers must understand how direct and indirect costs relate to supply chain activities before the allocation process can proceed.

For an outsourcing strategy, indirect costs are mostly captured in the direct purchase price shown on the supplier's invoice. Additional costs are relatively simple to calculate and may include inbound freight and the administrative costs associated with managing the buyer-supplier relationship. However, for managers to truly understand the total cost of insourcing and outsourcing decisions, they must be able to allocate the indirect costs to individual units of production (Bozarth and Handfield 235). Applying these costs becomes more complicated when processes are performed internally and are no longer considered a component of the supplier's invoice.

For insourcing activities, indirect costs cannot be directly tied to the level of operations or supply chain activities. Equipment depreciation, overhead expenses, administration fees, and maintenance costs are just some of the expenditures that must be applied in some way to individual units of production. This allocation process becomes subject to management's judgment and interpretation of rates. Under this approach, managers can apply indirect costs to be absorbed over a specific number of units, depending on how the organization wishes to disperse the total cost of production.

While the actual approaches to total cost analysis may vary between organizations, most managers follow a similar framework in determining which costs are directly and indirectly tied to their supply chain activities. Although total cost analysis introduces variability from human input, this model can be effective in evaluating the financial impact of the make-or-buy decision. Even the most simplistic total cost analysis requires managerial judgment and interpretation. Therefore, it is important to evaluate indirect costs from a holistic perspective and make allocation decisions under the consideration of strategic factors.

1.4 Implications of the Outsourcing Decision

If an organization decides that the benefits of outsourcing outweigh the risks involved, the company must participate in procurement of products and services. According to Bozarth and Handfield, purchasing includes the activities associated with identifying needs, locating and selecting suppliers, negotiating terms, and following up to ensure supplier performance (252). Although purchasing represents an important business function, it can be said that there has been, “a long-standing perception that purchasing plays second (or third) fiddle to the star performers in a company, typically finance, sales, and marketing” (Blanchard 56). However, recent trends have been working in unison to display the positive impacts that best practices in purchasing can have on a company’s bottom line. These trends include:

- The influence of IT on globalized sourcing practices
- The financial impact of purchasing
- The impact of performance dimensions and non-price factors

1.4.1 The influence of IT on Globalized Sourcing Practices

Today, organizations are realizing that in order to compete globally, they must also purchase globally. In 2000, the Center for Advanced Purchasing Studies conducted a research study that concluded upon the most obvious reasons for the increase in global sourcing. Number one on the list was cost reductions. At that time, executives participating in the survey reported an average of 19% reduction in unit purchase price through global sourcing strategies (Atkinson). While this reduction in purchasing price was primarily explained as a result of lower labor costs in foreign countries, IT has undoubtedly enabled companies to take advantage of the opportunities to conduct purchasing more efficiently and globally source products or services for

the best prices.

Vale S.A., a mining company headquartered in Rio de Janeiro, Brazil, is the world's largest producer of iron ore and a prime example of how IT has enabled a company's global procurement team. Vale relies on a centralized database that allows buyers to input category information, such as negotiation notes, managerial reports, and observations. Market intelligence team members also use the database to input market analysis, trends, changes in price indexes, and relevant news in each commodity category. For a company that has operations on five different continents, IT has enabled the procurement department to consolidate global demand and purchasing information. Vale has successfully leveraged its power as a global organization by virtually centralizing procurement activities that were once geographically dispersed among the company's four regional procurement segments (Arnseth 21).

1.4.2 The Financial Impact of Purchasing

From a financial perspective, the importance of procurement has often gone unrecognized. However, when much of the firm's revenue is spent on materials and services, purchasing represents a major opportunity to increase profitability through what is known as the profit leverage effect. This is used to describe how a dollar in cost savings increases pretax profits by one dollar, while a dollar increase in sales only increases pretax profits by the dollar multiplied by the pretax profit margin (Bozarth and Handfield 256).

Tables 1.4.2.1 and 1.4.2.2 illustrate the profit leverage effect by using actual and adjusted sales data from Walmart's 2011 annual report. In table 1.4.2.1, Walmart's pretax profit margin of 24.74% means that every dollar of sales results in about 25 cents in pretax earnings for the

company. If Walmart were able to lower their cost of sales by one dollar, the result would be a direct increase of pretax profit by one dollar. In contrast, Walmart's sales department would have to generate $\$1.00 / 24.74\% = \4.04 in new sales to have the same impact of lowering the cost of sales by one dollar. This simple example justifies the recent attention that has been directed to best practices in procurement. Thus, the profit leverage effect proves that effective management of supplier relationships and purchasing activities enables a company to more significantly impact their bottom line through procurement than any other function within the organization.

Table 1.4.2.1: Profit Leverage Effect (Actual Data / Walmart 2011 Annual Report)

Earnings and Expenses (Fiscal Year Ending 1/31/2011) (all figures in million \$)	
Net sales	\$418,952
Cost of Sales	\$315,287
Pretax earnings	\$103,665
Pretax profit margin:	24.74%

Table 1.4.2.2: Profit Leverage Effect (Represents 5% Reduction in Cost of Sales)

Earnings and Expenses (Fiscal Year Ending 1/31/2011) (all figures in million \$)	
Net sales	\$418,952
New cost of sales	\$299,523
Old pretax earnings	\$103,665
Plus 5% reduction in cost of sales	\$15,764
New pretax earnings	\$119,429
New pretax profit margin:	28.51%

Additionally, procurement plays an important role in improving a firm's return on assets. Similar to the hypothetical example in table 1.4.2.2, a decrease by one dollar in cost of sales also lowers inventory costs by one dollar. Lowering the firm's inventory on-hand, results in a decrease in total assets. This result is favorable, as the firm now has the opportunity to generate a higher return on asset while owning a smaller asset base.

1.4.3 The Impact of Performance Dimensions and Non-Price Factors

Lastly, the impact of performance dimensions and non-price factors has become a growing concern for leveraging the importance of best practices in purchasing. For some organizations, it is nearly impossible to measure the consequences of a product or service that does not conform to quality and performance requirements. From medical devices that are used to keep patients alive to the equipment that is used by soldiers in combat, understanding quality and reliability requirements has become a critical component of purchasing. Few metrics exist to determine the cost of the unexpected. It would be immoral for companies to compromise quality for price. The cost of a stock-out or late delivery is no longer measured monetarily.

With these risks included as part of the organizations' purchasing strategy, non-price factors should always retain a high priority. Non-price factors in purchasing, and the two preceding examples, represent the qualitative and quantitative impacts of procurement decisions. With a better understanding of the importance of sourcing and purchasing, organizations today now recognize these functions as a strategic competitive advantage, not as mere cost reduction targets.

1.5 The Decline of Vertical Integration and Sustainability Implications of Outsourcing

Throughout the entirety of this chapter, attention was directed to the advantages and disadvantages of the make-or-buy decision. Starting with the rise of some of the first legitimate vertically integrated companies in the 1970s, the advantages of economies of scale and control over the supply chain were discussed. Continuing on to the early 1990s, and Michael Dell's creation of the virtually integrated organization, the focus shifted to a technology driven environment. Dell's hybrid strategy embraced flexibility and close collaboration among many different owners of various supply chain functions. Today, the limitations and disadvantages of these two strategies have combined to influence the evolution of an organization's make-or-buy decision.

As recent trends indicate, there has been a significant decline in the vertically integrated business model of the past. Similarly, consumer demands and the ability to source and procure globally have added complexities and risks to the virtually integrated business model that was once revered as a flexible alternative. Companies like Dell once thrived on the ability to customize personal computers in-house. They are now being forced to outsource the core competency of manufacturing in order to efficiently provide mass quantities of consumer notebooks to retail outlets. In more traditional industries, such as oil and gas, BP has begun to outsource the core competency of drilling. This is the result of an increase in specialized, and therefore more efficient, drilling companies. Similarly, ExxonMobil has recently purchased XTO Energy, a natural-gas company that will conduct "unconventional" gas operations in the Marcellus Shale region, as a completely separate entity.

These multi-industry events demonstrate the growing need for companies to utilize outsourcing strategies for reasons of cost efficiency, responsiveness, customization, risk

mitigation, and product and service superiority. However, the game of outsourcing has many tradeoffs. When a company chooses to outsource, whether in consumer packaged goods (CPG) or the oil and gas industry, they must be willing to accept the risks that may not appear to be their direct responsibility. The quality of inputs and actions of upstream suppliers all flow downstream to the final product or service that the outsourcing firm provides to the end user. This means, the environmental, social, and economic implications of outsourced products become the responsibility of everyone who interacts with any part of the five distinct management processes of the SCOR model.

Effectively managing these complex external relationships presents significant opportunities; however, high rewards are often accompanied with high risks. This standing tradeoff between risk and return is especially prevalent in the inherently dangerous oil and gas industry. Unlike many of the simplistic examples presented so far, there are countless situations where a distinct answer to the make-or-buy decision cannot be provided. Integrated companies that offer numerous products or services and operate across international borders must utilize several different sourcing and procurement strategies to effectively find the correct balance between risk and return. However, building sustainability into the beginning of the supply chain, at the point of sourcing and procurement, can automatically put companies on the right track to balancing these tradeoffs.

The concept of sustainability is a popular subject of discussion across multiple agendas today. It is mentioned in boardrooms and news broadcasts daily. Although it is easy to blaviate (speak or write verbosely or windily and in a pompous manner) about the advantages of sustainability, it is hard to implement sustainable processes throughout an organization (Merriam-Webster). With this in mind, it is important to understand the level of distortion that

businesses leaders, politicians, and special interest groups apply to their preferable description of sustainability. The remainder of this thesis addresses sustainability from a holistic perspective with the ultimate goal of identifying the appropriate balance between environmental, social, and economic aspects. Furthermore, chapter two illustrates the complications that can arise when a company neglects to address these aspects of sustainability and chooses to play a high-stakes game of roulette for returns in an industry with a low margin for error. Using BP's Gulf of Mexico oil spill as a case study, a series of negligent decisions are analyzed and used as a framework for confirming the importance of sustainability. Beginning with BP's history and succession of corporate leadership, strikingly obvious incidents call attention to the difficulties of implementing sustainability.

Chapter 2

BP: Economic, Social, and Environmental

Implications

2.1 BP and Outsourcing Partners: the Gulf of Mexico Oil Spill

The events that unraveled in the BP oil spill resulted in the deaths of 11 rig workers, over 350 lawsuits, and the release of 206 million gallons of oil into the Gulf of Mexico. At least nine separate investigations by government agencies, the National Academy of Engineering, three of the corporations involved, and a special Presidential Spill Commission were conducted after the explosion of the Deepwater Horizon drilling rig. Plaintiffs that include local fishermen, hotel and restaurant owners, and the federal government have all come forward to settle liabilities that could exceed \$50 billion for the resulting impacts of this social and environmental disaster (Elkind 105-132). As of February 2012, Halliburton and Transocean, the two major contractors that BP outsourced work to, were still in legal battles with BP over who should absorb the blunt of the disaster's liability. Recent rulings, however, have weakened BP's efforts to have the two contractors share in the blame and liability of what is expected to be billions of dollars in fines and payments (Fowler).

April 20, 2010, served as a wake-up call to the deep-water drilling industry, its contractors, and the BP managers. All of whom were involved in everything from the strategic decision to outsource labor to the final project that capped the Macondo well after 87 days of leakage. It is important to note that the 32,600 ton deep-sea platform, owned by Transocean and leased by BP, did not sink to the bottom of the Gulf of Mexico as a result of one crucial mistake. For several

decades, BP had chosen to neglect the social and environmental consequences of their supply chain decisions (Fowler).

The federal government accused BP of committing a “series of inter-related failures” (Fowler). These “failures” stemmed from a long history of negligence in corporate leadership, process-safety, and supplier relations. Personal accounts from the event and historical records from past incidents at BP and Transocean prove this to be true. Certain details may never be fully uncovered. However, the warning signs preceding this event are undeniable and give insight to a preventable tragedy with rippling effects and key takeaways for future outsourcing decisions and sustainability considerations.

2.2 BP Climbs to the Top: Vertical Integration

BP has come a long way since it was founded in 1909 as the Anglo-Persian Oil Co. From the early beginnings, the British government was the largest shareholder in BP and the company derived the majority of its oil supply with relative ease from the Middle East. In the early 1980s, Arab countries prevented BP from obtaining oil from these sources and forced the company to look elsewhere. Alaska’s Prudhoe Bay and the North Sea were soon identified as two options with the potential to replace what BP had lost in the Middle East. At the time, these locations were revered as risky territories, not just by BP, but by the standards of other industry leaders as well. Prudhoe Bay and the North Sea would soon become fundamental building blocks for BP’s future of daring success and expansion. BP would test its luck in the Caspian Sea, West Africa, and Latin America. However, the emerging potential for deepwater drilling in the Gulf of Mexico enticed BP more than anything (Elkind 105-132).

High risks for high rewards - the idea of drilling deeper in more dangerous areas was consequently becoming synonymous with the name British Petroleum. Backed by tax incentives, endorsement from the United States Minerals Management Service (MMS) and the acquisition of many offshore leases, the company silenced critics that once dubbed BP a “two-pipeline company” (Elkind 105-132). The source of BP’s supply was no longer in question as long as the company continued to take the risks that its competitors were unwilling to consider. However, the company needed an overhaul. BP quickly needed culture and process changes that would positively impact their bottom line and allow them to compete with industry leaders.

Changes had to start from within the company. For years, BP had been infamous for its bureaucratic culture. Senior employees, called “tray men,” received their tea and biscuits each afternoon on an individual tray and were given new towels and bars of soap every Monday morning. A strict hierarchy of management had become imbedded over the years in a company that was run by “lifers.” As bureaucracy ruled, operating costs soared to the point that BP’s profit per employee was half that of Exxon (Elkind 105-132). The lavished lifestyle enjoyed by many had a ticking clock that would abruptly stop when Edmund John Philip Browne became BP’s chief executive officer in 1995.

Under Browne’s control, BP would expand vertically, merging with Amoco and buying ARCO, Vastar, Burmah Castrol, and Veba. Utilizing local markets and refineries located close to the Gulf of Mexico, BP quickly became the largest producer of oil in the United States (Elkind 105-132). When Browne was finally forced into resignation in 2007, BP had more than doubled its annual revenues and closely followed Exxon and Shell in size. Under Browne, acquisitions propelled BP forward, but it would be a lack of integration among these different cultures that would eventually lead to many problems. Browne’s cavalier approach to becoming number one

through vertical integration was dangerously flawed by design. Record profits were clearly shadowing the warning signs that were aggregating within the melting pot that had become BP. Economic achievement had become the primary measure of success during this era. Little attention was given to the impact that the company's strategic decisions had upon their workers, the environment in which they operated, or the well-being of external stakeholders.

2.3 Corporate Leadership

Starting with Browne's appointment to the CEO position in 1995, two distinct cultures can be observed within BP. Inherently a product of a consolidating industry's nature and increasing competition, the Browne-era of BP lived and died by the bottom line. Browne transformed BP into a cost-cutting machine and took on risks that were unheard of in the time where oil was easily acquired from the Middle East. Accordingly, an immediate decentralization of power became apparent throughout the organization. Managers were granted the ultimate authority over their business units. In return, the CEO held his top 250 managers to aggressive profit and productivity targets by having them each sign annual "performance contracts" (Elkind 105-132).

However, in the midst of the cost-cutting that was taking place during Brown's reign, it would appear that the company was reasonably prepared for catastrophe. Working with Rand Corporation, BP continuously practiced two and three day simulations of potential disasters to prepare for the worst case scenario. For years, Browne had been publicly adamant about BP's personal safety-records. Minimizing slips, falls, and vehicle incidents that resulted in days away from work had become a popular industry practice and the standard at BP.

Under Browne, the company had more personal-safety guidelines than they could justify or measure. BP had strict regulations for carrying a cup of coffee without a lid, not driving while

on a cell phone, and using a handrail when walking down stairs (Elkind 105-132). Obsessive attention to these non-life threatening safety guidelines can now be identified as a major culprit of much larger issues in BP's culture, including the Deepwater Horizon disaster. In an industry with little room for error, process-safety at BP was not paramount to all else. Unfortunately, BP's corporate leadership downplayed the significance of process-safety. By choosing to align profit and production metrics with managers' bonuses, BP's corporate leadership ignored the social impacts of cost-cutting, undoubtedly chartering the company for disaster.

2.3.1 Texas City Refinery: Social Implications

On March 23, 2005, BP's Texas City oil refinery experienced the worst U.S. industrial accident in a decade. The 71 year-old refinery had been neglected of maintenance and safety upgrades since BP had taken it over in their merger with Amoco. The blast that resulted from an ignited vapor cloud killed 15 workers and injured 180. The year before, Texas City had three fatalities for a total of 23 prior to this disaster. According to safety audits and reports, the plant was "in complete decline" and had the potential for a "major site incident" (Elkind 105-132). Upon an investigation required by the U.S. Chemical Safety Board, results identified that BP lacked operating discipline and demonstrated serious complacency in promoting and enforcing process-safety for the protection of company employees. Furthermore, the board identified corporate cost-cutting as a major cause and concluded that Browne's, "decentralized management system and entrepreneurial culture" inspired such deviations from industry safety standards (Elkind 105-132).

Although tragic, these results were certainly preceded by frequent warning signs. Small fires and chemical releases were common occurrences at Texas City and BP had become well aware of the risks it faced in its most troubled refinery. The plant's manager had brought many of these issues to the attention of his superiors just one month before the fatal explosion in 2005. However, the problems were dismissed in the wake of 25% budget cuts that Browne initiated shortly after the company took over operations in Texas City (Elkind 105-132). Following this horrific event, Browne promised to investigate the cause and correct the underlying safety issues that had developed in the midst of his company's recent expansion. The public would soon realize that safety improvements promised by BP's senior leadership would air frequently and without sincerity. Over the next several decades, the company seemingly preferred to pay the price for their non-conformance approach to safety that resulted in various social consequences.

2.3.2 Thunder Horse Platform: Economic Implications

As one could predict, Texas City was not the only disaster to essentially pave the way for BP's final blowout aboard Deepwater Horizon. Just four months after 15 workers were killed at Texas City, a Transocean-owned and BP-leased production platform, the Thunder Horse almost sank to the bottom of the Gulf of Mexico. According to BP, the \$1 billion facility was damaged when Hurricane Dennis swept through the Gulf of Mexico in 2005. However, if the previous examples of BP's negligent culture and failure to address sustainability have demonstrated anything, they point to underlying short-cuts as the root cause of this platform's problems. Holding to this theory, leaks in the manifold system, faulty subsea components, and the flooding of the Thunder Horse's ballast tanks point to non-environmental causes, according to the U.S. MMS ("BP's Thunder Horse Oil Field Goes Online").

Additionally, the U.S. Coast Guard's spokesperson, Adam Wine, stated that there was no physical damage caused by the hurricane ("Rig Regains Composure After Nearly Sinking in Gulf"). Dennis was not a direct cause of what the Coast Guard termed "internal malfunctions" and what Fortune called "shoddy work" by BP. Consequently, analysts estimated that the repairs to the platform would add tens of millions of dollars to the project. The efforts to pump water out of the vessel's flooded hulls required assistance from 70 firms, 15 different ships, and more than 700 workers ("Rig Regains Composure After Nearly Sinking in Gulf"). Once again, the cost-cutting that was being promoted by BP's corporate leadership led to detrimental results. Fortunately, there were neither fatalities nor social implications for BP employees or external stakeholders in this incident. However, the short-cuts that BP took resulted in negative economic consequences for the company and its shareholders.

2.3.3 Alaska's Prudhoe Bay Pipeline: Environmental Implications

Finally, in March 2006, corrosion in BP's Prudhoe Bay pipelines resulted in a 267,000-gallon oil leak. The pipeline that is owned by BP carried oil from America's largest oil field to the Trans-Alaska Pipeline and on to the Port of Valdez. However, production in recent years had been far from the 1.6 million barrels per day record set in the late 1980s. At the time of the spill, Prudhoe Bay's production had been down 75% and BP's attention was shifting towards promising reserves in West Africa and Russia. Although BP pointed to a \$787 million operations and maintenance increase, the investments were not enough to keep environmental critics at bay (Schwartz). In 2006, government officials claimed that BP had nothing left to gain from the Alaskan oil field, insinuating that the recent safety investments were trivial compared to the \$22 billion it posted in profits the year before (BP 2005 Annual Report).

Additionally, Admiral Thomas Barrett of the Department of Transportation questioned why BP did not clean the pipeline on a regular basis given the inherent danger of the Alaskan environment. Aiming to undermine BP's already dwindling environmental reputation, he stated that, "most operators demonstrate a higher standard of care in their operations" (Schwartz). This final statement highlighted BP's lack of compliance to continuously monitoring deterioration and cleaning the pipeline through a process known as pigging. On the west side of Prudhoe Bay, the pipes were last cleaned and tested in 1998, while the field's eastern side had not been pigged since 1991. The Trans-Alaska Pipeline, on the other hand, was pigged every 14 days (Schwartz).

The Prudhoe Bay incident is similar to the previous examples in terms of process failures. For financial reasons, BP refused to stop production on these lines and conduct the industry standard cleaning and testing processes. In doing so, BP's management signified their loyalty to short-term incentives and lack of concern for environmental considerations. Failure to compromise on strict production targets had been a transcending theme from the top of the organization since Browne had become CEO. Taking short-cuts had already led to numerous civil and criminal charges against the oil giant and the subsequent production loss of 200,000 barrels of oil for each day the pipeline was decommissioned (Schwartz). This was not the first consequence of BP's negligent leadership and it would not be the last. The following notes summarize the fines and penalties resulting from the two most socially and environmentally devastating incidents that preceded the Deepwater Horizon disaster:

Texas City Refinery Explosion (O'Rourke 11)

- Pleads guilty to a felony violation of the Clean Air Act: \$50 million fine, 3 years of probation*
- Required to update safety equipment at refinery: estimated \$265 million
- Compensation for workers injured in the explosion and the resolve of more than 1,650 personal injury claims related to the accident: \$1.6 Billion
- 300 separate fines from the U.S. Occupational Safety and Health Administration: \$21.4 million

Alaska's Prudhoe Bay Oil Spill (O'Rourke 11)

- Pleads guilty to a misdemeanor Clean Air Violation: \$12 million fine, 3 years of probation*
 - National Fish and Wildlife Foundation for environmental research: \$4 million
 - Restitutions to the state of Alaska: \$4 million
 - Required to replace 16 miles of pipeline: estimated at more than \$260 million
- * Indicates the largest penalty ever assessed under this law**

2.4 Tony Hayward and the Operating Management System

Despite one fatal incident, an oil spill in Alaska, and additional charges against BP traders for manipulating the propane market, Browne successfully held onto his title until 2007. Fittingly, it would not be his company's lack of process-safety or the environmental and social consequences of his leadership that would lead to his demise. The CEO that made BP famously profitable yet remarkably hated would be forced to resign as the result of lying in court over questionable personal relations with an estranged former lover. The remnants of Browne's personal life were soon splattered across the news, rendering another black eye on BP's public image.

In the wake of these shocking events, the board had unanimously agreed on Brown's successor. Tony Hayward, a product of Browne's old regime, had held positions as the company's CEO of Exploration and Production and Treasurer in the past. The BP veteran who had seven different jobs in 11 years had been hand-picked and groomed by Browne, yet Hayward promised to make safety his number one priority. Hayward's approach to process-safety and devotion to the bottom line was shockingly similar to the former CEO's. Just months after taking over and promising to focus "like a laser" on safety, Hayward proposed a budget cutting plan to close an \$8 billion "profit gap" with Shell (Elkind 105-132).

Like Browne, the new CEO continuously attempted to satisfy the wrong objectives while trying to balance process-safety with strict production and profit targets. Hayward made several attempts towards improving BP's culture, differentiating him slightly from his mentor. He personally chaired BP's risk committee and hired professional safety coaches to teach the proper techniques of evaluating a facility's safety during on-site visits. The CEO established BP's "Operations Academy," under which he sent groups of managers to two-week sessions at MIT to learn about risk and safety. Hayward realized that it could take years to change the organization's culture and its inherent flaws. His strategy for bringing the company back to social and environmental compliance hinged on a plan called the Operating Management System (OMS). The plan sought to integrate safety into every aspect of operations and essentially make each individual employee responsible for safety.

Unlike safety guidelines of the past, OMS identified some aspects of process-safety, detecting small problems as warning signs and avoiding spur of the moment operating changes. Unfortunately, the plan lacked the much needed procedures and standardization for guiding decisions during operations. OMS failed to penetrate deep enough into the flawed processes that

critically hindered BP's operations and exposed the company to the most risk. The plan alerted employees and managers to process-safety issues and the need for change, but it lacked the support to modify BP's long existing metrics that were solely driven by profit and production targets. As a result, BP continued to experience process-related safety problems. There had been three more fatalities in Texas City since the 2005 explosion. According to the Center for Public Integrity, between June 2007 and February 2010, the Occupational Safety and Health Administration (OSHA) proposed a record fine against BP and sited the company for 829 safety violations. The rest of the industry combined for only 33. (Elkind 105-132).

The persistent problems that began during the Browne-era proved that Hayward was not the only CEO to unsuccessfully attempt to change the company's culture without changing its people. Although some critics claim that Hayward's OMS demonstrated the potential for success, the plan was perhaps too late to prevent the unimaginable. By 2010, the company had become more profitable than Shell and the public humility that BP harbored over the past decade had vanished. Investors were marveling over Hayward's economic achievements. Based on BP's personal-safety metrics of measuring days away from work, the company was on course for one of its "safest" and most profitable years ever (Elkind 105-132).

2.5 The Deepwater Horizon: Managerial Decisions

The previous three events and the cavalier culture established by Browne and embraced by Hayward surely had a direct influence on the formidable precession of events that culminated into a perfect storm on April 20, 2010. Presented with this brief summary of events, it is hard to understand why BP's managers and corporate leaders failed to realize the similarities between each occurrence. Likewise, managerial flaws, negligence in process-safety, and cost-cutting

would again become a common theme in BP's most recent disaster that took place in the Gulf of Mexico. This final example can be viewed as an all-encompassing case study of BP's failure to address the social, environmental, and economic implications of sustainability.

BP originally approved spending \$96.2 million over an estimated 78 days on the Macondo well located 50 miles southeast of Venice, Louisiana. Prompted by lofty production goals, the company internally established a more immediate target of about 51 days (Casselman and Gold). Macondo was supposed to be a routine project in which the crew would drill the well and temporarily abandon the site. This common industry practice, known as temporary abandonment, would allow another offshore crew to resume work on the site when a production platform became available. BP and Transocean, the drilling team and owners of the Deepwater Horizon, would soon find out that this was no typical well. On March 8, a drill pipe became wedged in the rock on the ocean floor, forcing the operators to drill in another area. Throughout the spring, BP and Transocean experienced unexpected gas pressure in the well and problems with rock stability on the sea floor. The well required more than \$15 million worth of drilling fluid than BP had originally planned for. By mid-April, BP engineers declared the project a success (Casselman and Gold).

For Deepwater Horizon to successfully complete the project and temporarily abandon the well, one last crucial process had to be performed. BP had outsourced to Halliburton as a contractor, to cement in place the steel pipe that ran from the rig into the well. Although Halliburton had worked with BP on many cementing projects in the past, this task was different. Standard industry practice was to use two pipes, one inside the other, sealed together, with the smaller pipe penetrating the oil reservoir. With this design, if gas tried to get outside of the pipe, it would need to break through the seal between the two pipes and the cement. Utilizing the two-

pipe process would be a more expensive approach; however, the method would apply a second layer of defense if gas or oil were to get outside of the pipe. Unfortunately, BP chose not to use the two-pipe industry standard for the well that became known as “the well from hell.” Instead, BP’s engineers in Houston approved the use of a single long pipe for extraction of oil from the Macondo well. Some petroleum engineers would refer to the well design as unusual or non-traditional. In a letter to the MMS, Royal Dutch Shell PLC stated the company, “generally does not” use a single-pipe process for deepwater extraction. Later, these statements were refuted by BP engineers who claimed that “various factors” are always taken into consideration during the design stages of each individual well (Casselman and Gold).

Additionally, Halliburton had warned that without using an appropriate number of centering devices, the cement would not provide a safe seal, resulting in, “a severe gas flow problem” (Casselman and Gold). The cement contractors had requested 21 centralizers for the steel pipe, but at the time BP had only six on hand. With the additional delays, the project was now 45 days behind schedule and \$58 million over budget (Elkind 105-132). BP managers, who controlled all final decisions aboard Deepwater Horizon, decided to go ahead with the cement job. Halliburton knowingly acknowledged the risk that the cement may not properly seal but still proceeded with BP’s orders. After the incident, Halliburton would claim that the instructions from BP, “were not consistent with industry best practices” but they were, “within acceptable industry standards” (Casselman and Gold).

Furthering their attempts to minimize costly delays, BP managers neglected to verify the quality of the nitrified cement mixture that had failed multiple tests in Halliburton’s own labs. Underestimating the importance of a good cement job, managers then dismissed experts from Schlumberger that were aboard to conduct a planned test of the final sealing. Despite the OMS

approach to safety, “Operations Academy” training at MIT, and a series of preceding incidents, it had become evident that corporate’s strict financial and production targets were driving managerial decisions aboard the Deepwater Horizon. Little attention was granted to the quality or reliability of the processes being performed or materials being used on the well that was supervised and owned by BP.

On the morning of April 20, 2010, it was reported that arguments had broken out between Transocean’s chief mechanic and top BP officials over the procedures that had been followed. Furthermore, there was a disagreement between BP’s top manager and Transocean’s offshore installation manager over the decision to remove drilling mud and replace it with lighter seawater. The use of drilling mud, another common industry practice, allows workers to test for gas leaks by examining the fluid once it has been completely circulated throughout the well. When the process has been performed, the mud is typically replaced with lighter and less environmentally damaging seawater. In this case, BP’s manager decided to make the transition to seawater without performing thorough circulation of the drilling mud. For a well that was 18,360 feet, the test could have taken somewhere around 12 hours, according to people who have run the procedure. However, BP managers stopped circulation as soon as the mud reached the surface the day before. After about 30 minutes, a BP manager supposedly told a Transocean employee that the emergency blowout preventer would shut off the well if such an emergency did occur (Casselmann and Gold).

Before the final explosion occurred on the Deepwater Horizon, there was one final test that could have potentially identified all previous warning signs and possibly stopped the remaining gas-infused mud from rising back up the pipe. This process, known as a negative pressure test, was conducted by a Halliburton employee and was used to identify possible oil and gas seeping

into the well. According to Jimmy Harrell, Transocean's senior drilling officer, there was no mention of the test on BP's daily work plan for April 19. Harrell, however, was not willing to let the six BP employees aboard proceed without performing the all-inclusive test for leaking gas and oil. Despite the fact that there had been numerous warning signs, the decision to go ahead with testing the well only went back on the schedule as a last minute addition. According to the Presidential Spill Commission that investigated the incident, "there [was] no evidence that these changes went through any sort of formal risk assessment or management of change process" (Elkind 105-132). Consequently, the negative pressure test was conducted three different times. Each attempt achieved results that were inconclusive and unable to be interpreted by those aboard the vessel.

According to a Coast Guard interview with a BP employee, the first test strayed from the approved process that was spelled out in the drilling permit issued by the MMS. When the first pressure test indicated that there may be a leak, workers repeated the test for a second time in accordance with the permit's procedures. The results proved identical, increasing pressure and rising fluid indicated that there was a leak somewhere in the well. Donald Vidrine, another BP manager, finally ordered the crew to perform a third and final test. This time, it would be performed on a side channel into the drill pipe called a "kill line." Under the consideration that the kill line and drill pipe were part of a closed system, the crew and BP managers should have expected similar results. The third test, however, produced results that the managers found suitable to overturn the previous two tests of the well. It was later theorized that the kill line was clogged, and these results were also inconclusive.

Additionally, BP's well-site leader supervising these tests, Robert Kaluza, had no prior experience in deepwater drilling. Kaluza's experience was largely in land drilling. According to

Coast Guard notes from an interview shortly after the incident, Mr. Kaluza was on the rig, “to learn about deepwater.” The decision to overturn two tests represents additional short-cuts to finish a project that was 45 days past schedule and costing BP over \$1 million each day to lease the platform and employ the outsourced labor (Casselman and Gold). Furthermore, BP did not have any form of standardized process for conducting the negative pressure test or interpreting the results. Again, this proved that BP lacked process-safety and standardization in procedures that companies such as ExxonMobil had formally defined (Elkind 105-132).

At this point, there were only three things that stood between the rig and an explosive mixture of oil and gas rising up the pipe from the oil reservoir. One was the heavy drilling mud that Transocean employees were ordered to remove shortly after BP managers viewed the positive results from the final test. The second was the faulty blowout preventer near the sea floor. Finally, the plan approved by the MMS required BP to cement a plug inside the well before removing the drilling mud and abandoning the well. However, Transocean workers began removing the mud before setting the plug, leaving few barriers to prevent any gas that had entered the well from rising up to the rig. Shortly after the replacement process began, the remaining mud and sea water mixture started heading back up the pipe. The mud had become infused with gas and was now shooting out of the well’s top and onto the rig’s deck. The flammable substance found a source of ignition and explosions soon followed. The crew tried to activate the emergency blowout preventer clamps but was unsuccessful, as the clamps had never been tested before installation. In fact, there was never any maintenance or inspection of the equipment performed by contractors on the final device, which could have prevented a blowout (Barrett 62).

Some of the crew was able to escape the deadly explosions and fire using the salvageable lifeboats attached to the rig. However, most of the crew members leaped off of the Horizon's 111 foot deck into the ocean to avoid being burned alive. 126 men were aboard the Deepwater Horizon when it exploded. Given the magnitude of this terrible disaster, it is remarkable that only 11 fatalities were recorded (Barrett 56). Nevertheless, these fatalities and the many that took place in prior BP incidents are largely the result of negligent corporate leadership. Cost-cutting, hasty acquisitions and a failure to address the impacts on society and the environment have inevitably become the product of a company that measured success solely in monetary terms. Holding managers' feet to the fire through performance contracts and uncompromising production targets enabled this unethical culture to flow from the top of the organization downwards. Although BP did not silence whistleblowers that called out safety problems and warning signs, the decentralized style of management made it impossible for their voices to be heard. Operational processes were carried out with little concern for anything other than the bottom line and attempts to change this culture were futile. The occasional shouts of warning signs from the operational level were merely heard as dull whispers by managers and the strategic decision makers driving this company in the direction of profitability.

2.5.1 Outsourcing of Core-Competencies

Earlier in this chapter, it was stated that BP defined its reputation through obtaining oil in risky environments by drilling deeper and taking on the risks that their competitors would not consider. The industry of deepwater drilling and the supply chain strategies adopted by today's integrated oil companies have inevitably changed since the Browne-era of vertical integration. Today, oil companies, such as BP and ExxonMobil continue to own the majority of the processes

in their supply chains; however, partnering with highly capable outside suppliers has made it easier and less expensive to outsource processes that were once conducted in-house. The evolution of this vertically integrated business model has forced companies like BP to rethink their core competencies and supply chain strategies. BP now relies on its supply chain to manage and coordinate the work that it once performed itself. From the integrated oil company's perspective, the physical labor and ownership of capital resources no longer constitute core competencies. Outsourcing specific supply chain functions has become a key driver of competitive advantage. Managing these strategic relationships with suppliers and implementing a specific strategy is now a key challenge.

As it becomes easier to reach oil and natural gas reserves, becoming more difficult and expensive to obtain, companies like BP will continue to follow this trend of leasing capital equipment and purchasing services from specialists like Transocean, Ensco, and Noble Drilling Services (Barrett 57). The added complexities and requirements of obtaining these hard-to-reach resources will inevitably create an unprecedented demand for any specialist that can reliably and efficiently provide these services to an integrated oil company.

In this case, BP relied on Transocean to provide the drilling rig and 79 of the 126 employees aboard Deepwater Horizon as contract workers. Through this partnership with Transocean, BP avoided financing the project to build the rig at a cost of \$365 million (Elkind 105-132). BP also utilized several contractors, including Halliburton for cementing services and Schlumberger Ltd. for various well measuring processes. Even though outsourcing of core competencies did not lead to a positive outcome in BP's situation, this strategy of owning less of the supply chain cannot be immediately disregarded. Aside from the opportunity to limit capital investments, this strategy may present the opportunity to share or pool risk with outsourcing partners. Structuring

contracts in a manner that will entitle the outsourcing company and the external provider of products or services to both reap the rewards and share the potential risks is key to this strategy. High risks do come with high rewards; however, all partners in the supply chain must understand this and be willing to share in the outcome of each other's actions.

2.5.2 BP: Contracts and Liabilities

While much of the oil that spilled into the Gulf of Mexico has disappeared thanks to controlled burns, various clean-up efforts, and the warm climate of the gulf coast, the legal battles over liability for this disaster continue to drag on. In February 2012, BP settled with Cameron International Corporation, the maker of the wells blowout preventer; Anadarko Petroleum Corporation, a minority owner of the well; and M.I. Swaco, the provider of the project's heavy drilling mud. All three of the companies agreed to either pay BP or drop charges against BP in exchange for indemnity against most claims. Cameron International paid \$250 million while Anadarko agreed to pay \$4 billion for protection against losses and damages (Fowler). These settlements, in which parties from both sides have willingly admitted faults, are an exception to the bigger picture. BP and the two largest contractors it employed aboard the Deepwater Horizon, Transocean and Halliburton, continue to battle over liabilities and payments that could amount to more than \$50 billion.

Within 12 hours of receiving medical attention after the explosion of the Deepwater Horizon, surviving Transocean employees were transported to a hotel and questioned by lawyers to exonerate their actions. From the beginning, it was evident that Transocean was unwilling to except any liability for the fatal incident that unraveled in the Gulf of Mexico on April 20, 2010. To this day, Transocean has refused to acknowledge committing any process mistakes and has

declined to help BP pay for any of the clean-up. While this strategy of omitting no wrong has come as a surprise to BP and the public, Transocean was aware of their limited liability from day one (Barrett 56).

The contract between BP, Transocean, and Halliburton grants indemnity to the outsourced contractors under extremely broad language. The contract states that BP must indemnify Halliburton and Transocean against all compensatory damages in the occurrence of an undesirable outcome. This legal agreement has been interpreted to mean that the two contractors are not responsible for payments to individuals and business owners affected by the spill unless negligence can be proved (Fowler). The implications of this contract agreement could point to the possibility that BP did not thoroughly understand their exposure to outsourcing risks and the resulting consequences in the Gulf of Mexico. BP was the designer and primary owner of the physical well as opposed to the contracted rig which was merely attached to the well. Likewise, BP structured their agreements so that their managers would have the ultimate authority and ability to make all key decisions. Under these agreements, Transocean and Halliburton expected BP to assume responsibilities for any problems that may occur. This was evident in the fact that Transocean did not set aside additional reserves for liabilities associated with this project. The only financial contingency that Transocean planned for included a \$1 billion insurance coverage policy for the vessel itself. Furthermore, Transocean's CEO reassured investors of the company's financial solvency by attaching the language of the contractual agreement to their second-quarter 2010 earnings report (Barrett 58).

This particular example identifies BP's failure to require upstream partners to share even a fraction of the risk. On the other hand, Transocean was able to take advantage of this opportunity and use the flawed contract as a method for contingency planning. According to a

filing with the Securities and Exchange Commission, as of March 31, 2010, Transocean has paid \$160 million for their role in the disaster (Barrett 60). BP has paid billions in federal fines and was forced to establish a \$20 billion compensation fund for victims affected by the spill in the Gulf of Mexico (Choo).

2.5.3 BP: Supplier Evaluation

In January of 2010, the Presidential Spill Commission stated that all participants involved with the Macondo well shared responsibility for the disaster that took place in the Gulf of Mexico. Their report and accusations called out the systemic safety problems hindering BP as well as the oil and gas industry as a whole. Although the commission placed every integrated oil company and contractor on the same playing field, BP and Transocean continued to battle through their disagreements publicly. BP's lawyers argued that Transocean's mistakes were the primary cause of the explosion, not their own negligence in managerial decision making and overall process-safety. BP claimed that on the evening of the explosion, Transocean employees failed to recognize, "clear and obvious signs of a well control incident." Furthermore, once Transocean understood the catastrophe they used the wrong equipment at the wrong times to control the explosion. BP lawyers also stated that Transocean was responsible for the malfunctioning blowout preventer which occurred due their negligence in maintenance procedures (Barrett 62).

Transocean countered these statements with their own investigation after the disaster. In response, Transocean alleged that BP used a risky well design and revised the initial plan to seal the Macondo well five times in the two week period preceding the blowout. Clearly, both sides have failed to take responsibility for their careless actions. However, this bickering over right

and wrong is simply wisdom after the event. Fines and penalties will eventually be paid out by the parties responsible in a manner the legal system deems appropriate. This is something that BP, Transocean, Halliburton, and every other outsourced contractor no longer have control over. The company that chose to work with each of these external suppliers does, however, have the opportunity to ensure that a situation of this magnitude never happens again. BP must learn from the devastation in the Gulf of Mexico to improve supplier evaluation and visibility of the capabilities and decisions of external partners in the future.

Ultimately, BP was responsible for hiring the contractors who provided the equipment being used and the services performed aboard the Deepwater Horizon drilling rig. Just as BP managers made every decision aboard the vessel, sourcing and procurement teams in Houston and throughout BP's supply chain made the final call to outsource to each of these "qualified" suppliers. This illustrates the importance of building sustainability into sourcing and procurement decisions at the beginning of the supply chain. By ensuring that external suppliers address the economic, social, and environmental implications of their own supply chains, companies like BP will be able to focus on limiting the risks that are within their control. Eliminating non-sustainable suppliers early in the decision making process will streamline the evaluation and selection process, while simultaneously preventing non-sustainable processes from entering the supply chain.

Chapter 3

Implementing Sustainability

3.1 Becoming Sustainable

It is easy for one to observe and analyze the managerial mistakes and negligent practices that resulted in the Deepwater Horizon disaster in the Gulf of Mexico. Warning signs accumulated as the company failed to address the environmental, social, and economic aspects of sustainability within their business processes. BP failed to evaluate the capabilities of outsourcing partners and the additional risks that were imposed upon their own supply chain. Combining these major omissions with a faulty contract, BP exposed itself to many avoidable risks. As stated in chapter two, eliminating suppliers that do not conform to sustainability is a critical first step towards reducing the risk that materializes when processes are no longer performed in-house. However, it would be difficult for BP to hold suppliers and extended members of their supply chain accountable for negligence when the company itself does not conform to sustainability. If BP intends to be sustainable in the future, the company must address the flaws in its own culture and processes.

3.1.1 Performance Measures

Single, or standalone, business entities are almost nonexistent today. The evolving business model of integrated oil companies proves that organizations belong to a network of entities along different stages of the supply chain. Therefore, performance measures such as profitability, production, and days away from work become inadequate measures of the interactive processes between supply chain members. Beginning in the Browne-era, BP deceptively measured

performance from a qualitative perspective. Qualitative metrics for personal-safety and days away from work directly corresponded to the quantitative production and performance measurements that were ultimately valued. This strict focus on the bottom line proved ineffective, in terms of social and environmental impact. Therefore, realigning BP's metrics to effectively address both quantitative and qualitative indicators of sustainability is necessary (Saadany, El, and M.Y. Jaber).

According to a recent publication from the Management Research Review, effective qualitative measures for sustainability could include: management involvement, public perception of the company, accidents or spills, lawsuits, quality awards, purchasing environmentally friendly materials, employee training, ranking in environmental performance, process innovation, and interaction with suppliers. These qualitative metrics allow the social and environmental implications of sustainability to be effectively measured. Additionally, qualitative measures still enable BP to quantify performance and production by traditional metrics. Economic performance measures must be considered relative to the social and environmental implications when making sourcing and procurement decisions. When possible, it may also be helpful to illustrate the importance of quantifying market share gain or loss and recovery costs related to disasters that have resulted from neglecting the non-economic implications of sustainability. This is a complex process, as it is difficult to place a dollar value on a negative outcome that has not yet occurred. However, quantifying the economic impact of the Gulf of Mexico oil spill and other BP incidents should provide the needed leverage to investigate this theory of applying a cost to an environmental and social disaster (Saadany, El, and M.Y. Jaber).

3.1.2 Holding Partners Accountable

Implementing metrics that effectively satisfy the three aspects of sustainability is the first step to ensure that BP is consistently evaluating the implications and tradeoffs of their supply chain decisions. Once the aspects of sustainability are fully taken into consideration, BP can begin to hold suppliers accountable to the same standards. Similar to the way that John Browne held his managers' feet to the fire through performance contracts and uncompromising production targets, BP must take a zero tolerance approach to supplier non-conformance.

Fortunately, there are many examples that BP and other companies in the oil and gas industry can look to for advice in sustainable supplier management. IKEA is a privately held home products company that designs and sells ready-to-assemble furniture. Management established The IKEA Way on Purchasing Home Furnishing Products (IWAY) code of conduct in 2000. IWAY defines what suppliers can expect from IKEA and specifies what IKEA requires from its suppliers. This strict code of conduct covers working conditions, the prevention of child labor, responsible forestry management, and other environmental concerns ("About IKEA"). For IKEA, this code of conduct is embraced within daily culture and consistently enforced by the company's top executives. In the company's latest sustainability report, IKEA said that it expects some existing suppliers to not be compliant with the September 2012 goal to achieve 100 percent compliance in sustainability. The company has 1,026 home furnishing suppliers in 53 countries. Between 90 and 94 percent of suppliers in American and Europe are IWAY approved. However, only 11 percent of Chinese suppliers have been able to meet IKEA's strict standards on environmental, safety, and social and working conditions (Snell).

Last year, IKEA terminated relationships with 19 suppliers, eight for failing to comply with IWAY and 11 for other non-compliance issues. In 2010, the retailer refused to continue

purchasing from 27 suppliers. In total, the company conducted 993 audits in 2011, 711 of these were unannounced. While this certainly presents a zero tolerance approach to enforcing supplier performance, IKEA realizes that some requirements are not immediately realistic for certain suppliers. For instance, IKEA mandates that all suppliers meet a 40 hour work week. However, most suppliers in China are unable to make these changes as quickly as IKEA would like. As a result, IKEA is working with its non-complaint suppliers and has allowed a 60 hour work week, as a step towards meeting the code's requirements (Snell).

Aside from IKEA's initiatives to promote sustainability, companies such as Walmart have also been active in promoting this effort. In 2009, Walmart decided to conduct a sustainability survey on some of their biggest suppliers (Damian). Procter and Gamble (P&G) was on the receiving end of this survey that aimed to collect data on greenhouse gas emissions, water use, and raw materials as well as subjective information such as "ethical production" and "social compliance" (Blanchard 2006). Recognizing the value of this information, P&G's Global Purchases organization decided to issue their own mandatory sustainability scorecards to their supply chain (Damian). P&G's evaluation efforts required suppliers to provide much of the same information as they provided to Walmart. These examples signify the importance of enforcing a zero tolerance approach to non-conformance and holding suppliers accountable for their actions. While the oil and gas industry inherently possesses fewer suppliers of products and services and the potential for greater risks, there is much to learn from looking at other industry approaches to building sustainability into the supply chain at the point of sourcing and procurement.

3.1.3 Supply Chain Visibility

As the previous examples have demonstrated, multiple industries are striving to satisfy the environmental, social, and economic aspects of sustainability in the organization. However, to make sure that specific codes of conduct and supplier requirements are being followed, there must be a greater amount of visibility throughout the supply chain than ever before. According to David B. Yoffie, a professor at the Harvard Business School, “major companies have constant communications and deep knowledge of primary suppliers. It’s the secondary layers of suppliers—things that are smaller, barely noticed—where the greater risk is” (Lohr). This statement was demonstrated by the rippling effects that a shortage of bolts and screws had on Boeing’s 787 Dreamliner program. While Boeing focused heavily on first tier suppliers of critical items, the company underestimated the importance of a consistent and reliable supply from their second and third tier partners (Greising, Johnson).

IBM also acknowledged the importance of visibility in a study titled “The Smarter Supply Chain of the Future.” This survey of executives concluded that visibility has emerged as the largest challenge in today’s global supply chains (IBM Global Chief Supply Chain Officer Study). IBM’s findings and Boeing’s failure to look deeper into the supply chain highlight the difficulties and expenses required to obtain upstream visibility when procurement networks become more complex and supply lines grow longer. Leveraging the right technologies and structuring the appropriate relationships to obtain this visibility has numerous implications on all five distinct management processes of the SCOR model. In sourcing and procurement, there are tradeoffs in obtaining visibility. The additional costs of increasing visibility and the time required to monitor suppliers’ actions throughout several tiers must be weighed against the potential of reducing inferior products and services in the supply chain or possibly preventing a

major environmental, social, or economic disaster.

Although visibility seems to be heavily sought after in many industries, especial CPG, the oil and gas industry has not yet caught on. In this profitable industry with such a small margin of error, additional investments for increased visibility in the supply chain may be a step in the right direction. However, the oil and gas industry does present challenges that are not present in many other industries. According to Susan Rice, even though certain companies may want change “there may not be any real incentive for the supplier to adopt a more sustainable approach.” This is unfortunate, as both the buyer and supplier could benefit from providing more detailed information regarding their products and services. Increasing visibility in the oil and gas supply chain would undoubtedly reduce the risk associated with the buyer-supplier relationship when outsourcing. As integrated oil companies learn from other industry success stories and apply the lessons thus learned, progressive companies who implement visibility and sustainable practices will benefit from a first mover’s advantage.

Conclusion

Building sustainability into the supply chain, at the point of sourcing and procurement decisions, is key to mitigating the risk outside of an organization's control and ensuring that external suppliers meet the same standards as the outsourcing company. By analyzing the make-or-buy decisions of different companies in several industries the process of deciding when to produce in-house or partner with external suppliers has become a strategic initiative. Today, there seems to be an evolution among business models in their outsourcing and insourcing strategies. Some organizations are leaning more towards flexibility and responsiveness by utilizing the Dell model of virtual integration. Other firms have realized that this strategy may be too volatile as global supply chain networks have exacerbated risks in the last several decades. Many of these organizations once operated under a vertical integration strategy. However, many of these companies, especially in the oil and gas industry, are now choosing to utilize a business model that falls somewhere between virtual and vertical integration. For companies like BP, owning the supply chain is still important. However, certain functions are inherently being taken over by specialists that can provide these products and services more efficiently.

As the capabilities of specialists have improved, outsourcing of core competencies has become a common practice. As BP exemplified, today's supply chains are now beginning to play the roles of coordinators and managers as opposed to actual product or service providers. Under this new approach, the five distinct management process of plan, source, make, deliver, and return each represent new tradeoffs. However, the timeless question of balance still remains. Managing risk for the greatest level of return while simultaneously satisfying environmental, social, and economic aspects of sustainability remains an organization's ultimate challenge. While certain industries have standardized this process and led the way in implementing

sustainability, others are still in the preliminary stages. The examples given throughout this thesis prove that sustainability is obtainable through establishing a sustainable culture and set of processes, holding external suppliers to a set of established standards, and evaluating upstream actions through increased supply chain visibility. Satisfying all aspects of sustainability in the sourcing and procurement process is the most effective method of managing risk and meeting the expectations of all stakeholders.

Works Cited

"About IKEA." IWAY, Our Code of Conduct. Web. 5 Mar. 2012.

<http://www.ikea.com/ms/en_US/about_ikea/our_responsibility/iway/index.html>.

Arnseth, Lisa. "Mining for New Opportunities." *Inside Supply Management* 23 (2012): 18-21.

Print.

Atkinson, William. "The Big Trends in Sourcing and Procurement." *Supply Chain Management*

Review May 2008. Print.

Barrett, Paul M. "Success Is Never Having to Say You're Sorry." *Bloomberg BusinessWeek*

(2011): 54-62. Print.

Blanchard, David. *Supply Chain Management: Best Practices*. 2nd ed. Hoboken, NJ: John Wiley

& Sons, 2010. Print.

"Blovaite." Merriam-Webster. Web. 8 Apr. 2012. <<http://www.merriam->

[webster.com/dictionary/bloviate](http://www.merriam-webster.com/dictionary/bloviate)>.

"Bill Scott" Honeywell Aerospace Director of Global Transitions." Telephone interview. 26 Mar.

2012.

Bozarth, Cecil C., and Robert B. Handfield. "Apple's iPod Supply Chain Risk." Introduction.

Introduction to Operations and Supply Chain Management. Upper Saddle River, NJ:

Pearson Prentice Hall, 2006. 232. Print.

Bozarth, Cecil C., and Robert B. Handfield. "Purchasing." *Introduction to Operations and*

Supply Chain Management. Upper Saddle River, NJ: Pearson Prentice Hall, 2006. 251-

70. Print.

- Bozarth, Cecil C., and Robert B. Handfield. "Sourcing Decisions." *Introduction to Operations and Supply Chain Management*. Upper Saddle River, NJ: Pearson Prentice Hall, 2006. 231-50. Print.
- "BP 2005 Annual Report." *Mergent Online*. Web. 3 Mar. 2012.
<<http://www.mergentonline.com.ezaccess.libraries.psu.edu/documents.php?compnumber=1147>>.
- "BP's Thunder Horse Oil Field Goes Online." *BP's Thunder Horse Oil Field Goes Online*. Web. 17 Mar. 2012. <<http://www.petroleumnews.com/pntruncate/224091963.shtml>>.
- Burton, Niul. "Creating Supply Advantage For Oil And Gas Companies With Strategic Procurement." *Oil and Gas Journal* (1999). Print.
- Casselman, Ben, and Russell Gold. "BP Decisions Set Stage for Disaster." *The Wall Street Journal* (2010). *WSJ.com*. 27 May 2012. Web. 3 Jan. 2012.
- Choo, Kristen. "The Go-To Mediator." *ABA Journal* 96.8 (2010): 18. Print.
- Choo, Kristen. "The Price of Oil." *ABA Journal* 96.8 (2010): 20-24. Print.
- Damian, Joseph. "Score Two for Sustainability." *ABI/INFORM Archive*. ProQuest, Nov. 2010. Web. 23 Feb. 2012.
- Elkind, Peter. "An Accident Waiting To Happen." *Fortune* 7 Feb. 2011: 105-32. Print.
- "ExxonMobil 1999 Annual Report." *Mergent Online*. Web. 2 Feb. 2012.
<<http://www.mergentonline.com.ezaccess.libraries.psu.edu/documents.php?compnumber=2907>>.
- "Exxon-Mobil, Total-Petrofina Mergers Slated." *Oil and Gas Journal* (1998): 37. *LexisNexis Academic*. Web. 22 Jan. 2012.

- Ferreira, John, and Len Prokopets. "Does Offshoring Still Make Sense?" *Supply Chain Management Review* (2009). Jan.-Feb. 2009. Web. Feb. 2012. <www.scmr.com>.
- Fowler, Tom. "BP- Plaintiff Talks Focus on Oil Spill Fund." *Wall Street Journal* (2012). Print.
- Fowler, Tom. "U.S. Readies Onslaught Against BP." *The Wall Street Journal* [New York, N.Y.] 24 Feb. 2012: 2. Web.
- Fugate, Brian S., and John T. Mentzer. "Dell's Supply Chain DNA." *Supply Chain Management Review* (2004). Print.
- Greising, David, and Julie Johnson. "Behind Boeing's 787 Delays: Problems at One of the Smallest Suppliers in Dreamliner Program Causing Effect." *McClatchy - Tribune Business News* [Washington] 8 Dec. 2007. Print.
- Gottfredson, Mark, Rudy Puryear, and Stephen Phillips. "Strategic Sourcing From Periphery to the Core." *Harvard Business Review* (2005). Print.
- Greenhouse, Steven. "Boeing Labor Battle Is Poised to Go Before Judge." *The New York Times* [New York, N.Y.] 14 June 2011: B1. Print.
- Handfield, Robert B., Larry C. Giunipero, and James L. Patterson. "Supplier Evaluation and Selection." *Purchasing & Supply Chain Management*. By Robert M. Monczka. 4th ed. Mason: South-Western Cengage Learning, 2009. 233-68. Print.
- IBM Global Chief Supply Chain Officer Study. *The Smarter Supply Chain of the Future*. Rep. 2009. Print.
- Lee, Hau L., V. Padmanabhan, and Seungjin Whang. "The Bullwhip Effect in Supply Chains." *Sloan Management Review* (1997): 93-102. Print.
- Lee, Yong-Gyo, and Xavier Garza-Gomez. *Total Quality Management & Business Excellence*. Thesis. University of Houston-Victoria, 2012. London: Routledge, 2012. Print.

Lohr, Steve. "Stress Test for the Global Supply Chain." *The New York Times* [New York] 19 Mar. 2011. Print.

Lynch, Clifford F. "Why Outsource?" *Supply Chain Management Review*: 44-51. Print.

Muir, James, Rick Reidinger, and Yoke Mun Chan. "Capturing Sustainability Issues in the Oil and Gas Industry." *Society of Petroleum Engineers* (2002). Print.

O'Rourke, Morgan. "Beyond Petroleum - Not Beyond Fines." *Risk Management* 55.11 (2008): 11. Jan. 2008. Web. 9 Mar. 2012.

"Procter & Gamble." PG.com Sustainability Overview: Sustainability Goals, Scorecard. Web. 01 Apr. 2012. <http://www.pg.com/en_US/sustainability/overview.shtml>.

Rice, Susan. "Fair Trade: Not Just for Chocolate!" *Institute of Chemical Engineers. Business Source Premier*. Web. 2 Jan. 2012.

"Rig Regains Composure After Nearly Sinking in Gulf." *Engineering News Record* 25 June 2005: 13. *Business Source Premier*. Web. 8 Mar. 2012.

Saadany, El, and M.Y. Jaber. "Environmental Performance Measures for Supply Chains." *Management Research Review* 34.11 (2011): 1202-221. Print.

Snell, Paul. "Ikea Prepares to Drop Non-compliant Suppliers." *Purchasing and Supply News, Law, Analysis and Resources*. Chartered Institute of Purchasing & Supply, 25 Feb. 2012. Web. 12 Mar. 2012. <<http://www.supplymanagement.com/news/2012/ikea-prepares-to-drop-non-compliant-suppliers/>>.

Schwartz, Nelson D. "Can BP Bounce Back?" *Fortune* 16 Oct. 2006: 90-99. Print.

Serwinowski, Mark A., and Jessica Marshall. "The ROI of Social Responsibility: Driving Sustainability in the Oil and Gas Sector." *Society of Petroleum Engineers* (2004). Print.

Spray, Gregory. "The Art of Procurement Mastery." *Supply Chain Management Review* (2009): 36-43. *Scmr.com*. Web. 1 Jan. 2012.

Stern, Stepfan. "A Slippery Business." *Purchasing and Supply Blog*. 22 June 2010. Web. 17 Mar. 2012. <<http://blog.supplymanagement.com/2010/06/a-slippery-business/>>.

Stern, Stepfan. "No Excuse for Supply Chain Slip-up." *Supply Chain Management*. 25 May 2010. Web. 3 Feb. 2012. <<http://blog.supplymanagement.com/2010/05/no-excuses-for-supply-chain-slip-up/>>.

"Vertical Integration." *The Economist* (2009). 30 Mar. 2009. Web. 1 Mar. 2012. <<http://www.economist.com/node/13396061>>.

"Walmart 2011 Annual Report." *Mergent Online*. Web. 14 Feb. 2012. <<http://www.mergentonline.com.ezaccess.libraries.psu.edu/documents.php?compnumber=8865>>.

"What Is SCOR? | Supply Chain Council." *Supply Chain Council*. Web. 19 Mar. 2012. <<http://supply-chain.org/scor>>.

Academic Vita of Dale C. Eshbach

dce5032@psu.edu
(717) 314-8053
316 West Beaver Ave. Apt. 703 State College, PA 16801

EDUCATION:

The Pennsylvania State University, Schreyer Honors College
Class of 2012 University Park, PA
Smeal College of Business, Bachelor of Science in Supply Chain and Information Systems
Minor: Information Systems Management

THESIS TITLE: SOURCING AND PROCUREMENT: A CASE STUDY OF ECONOMIC, SOCIAL, AND ENVIRONMENTAL IMPLICATIONS

HONORS ADVISOR: Dr. John Spsychalski

THESIS SUPERVISOR: Dr. Felisa Preciado

HONORS:

- The Traffic Club of Pittsburgh Scholarship
- Beta Gamma Sigma Honor Society
- APICS Mid-Atlantic Case Competition Champion
- The Denver Foundation Priest Scholarship
- Boeing Company Charitable Trust Scholarship
- National Defense Transportation Association Scholarship
- American Collegiate Hockey Association, Division I: Most Improved Athlete
- (ACHA) Division I: Academic - All American (Freshman and Sophomore awards)
- Jim and Mim Herr, National Federation of Independent Business Award

PROFESSIONAL EXPERIENCE:

Honeywell Aerospace
Materials Planner Intern

Phoenix, AZ
May 2011 – August 2011

- Managed a \$2M scrapping process of unserviceable material, reconciled consumption errors, and published standardized work instructions to facilitate future process accuracy and training
- Developed and presented a tool to reduce planned order backlogs by 40% using an Excel Visual Basic macro
- Analyzed and eliminated 600+ WIP staging locations to prepare the production floor for an annual inventory audit
- Planned front-end analytical inspection capacity and expedited shipments for airplane-on-ground stock-outs
- Utilized SAP and Servigistics software to monitor WIP inventory at vendors, investigate lead times, create planned orders, and release service orders to be repaired or overhauled through outside processing or in-house remanufacturing
- Assumed ownership of production control scorecard database, taught planners and new materials manager basic functions while acting as the main focal point to outsourced designers

W.W. Grainger, Inc.
Management, Customer Service, and Sales Intern

Harrisburg, PA
May 2010 – August 2010

- Designed and implemented a four month strategy to revamp the Harrisburg branch showroom during months of peak sales and decreased labor resources
- Improved customer service through a series of 5S and continuous improvement projects that tactically relocated order staging and reduced round trip order picking time by 10 seconds for each in-store pick up
- Requisitioned stock from multiple internal distribution centers to correct incomplete backorders and consolidate deliveries to local warehouses based on most efficient routings and shortest transit times
- Administered warehouse management skills by auditing inbound deliveries for accuracy and analyzing SAP multiple locations reports to improve order picking accuracy and augment Grainger's reliability to customers

Ed's Buggy Rides Gift Shop
Entrepreneur

Strasburg, PA
June 2003 – August 2010

- Forecasted seasonal demand accurately by monitoring 3 years of daily and monthly sales trends with Excel spreadsheets
- Managed relationships with 3 wholesale suppliers to acquire inventory; partnered with sales representatives to receive credit for damaged products and purchase items in the most economically efficient lot sizes
- Trained and coached two seasonal employees to operate cash register, merchandise product displays, and grow overall sales

LEADERSHIP/ACTIVITIES:

- Vice President – SAP Student Interest Group
- 96th Annual Conference Participant – Institute of Supply Management
- Active Member – Council of Supply Chain Management Professionals
- Underclassman Forward - Penn State Berks, Division I Ice Hockey Team
 - Actively participated as an integral team leader during freshmen and sophomore seasons
 - Competed in Columbus, Ohio for the first Penn State Berks Division I National Tournament appearance
 - Volunteered at Nolde Forest, PA State Park and Greater Berks Food Bank as bi-annual service project