



SUPPLY CHAIN MANAGEMENT IN OIL INDUSTRY

Oil and gas are unrecoverable resources. And for this reason business world tries to use these resources in a most effective way. One of the approaches providing effective and efficient solution of this problem is supply chain management.

There are various definitions of the supply chain management. Some of them interpret a supply chain as the optimal flow of raw materials and products from site of production to the site of final use. Others emphasize that supply chain simply comprises all elements in the process that enable the delivery of a product to a customer.

Ganeshan & Harrison define a supply chain as a network of facilities and distribution options. This network performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers.

Today a supply chain performance determines who will win the market competition.

In a large number of industries oil and gas are used as essential sources of energy and raw materials. These products are produced in limited regions of the world, but are demanded all over the world.

The increasing demand for oil and its derivatives has enabled oil companies to reach more customers and increase their market share and profitability.

Oil industry production system is subdivided into 2 subsystems: the upstream and the downstream supply chains.

The upstream supply chain involves the obtaining of crude oil. This is the most important specialty of the oil companies. The downstream supply chain starts at the refinery, where the crude oil is transformed into the consumable products. And that is the specialty of refineries and petrochemical companies. Some of the oil

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companies are involved in the above both processes, others specialize only in the one.

Efficiency and effectiveness of the oil industry management directly influence development and growth of the any sectors of economy. In a competitive economic environment supply chain improvements allow to lower production costs (by smoothing production processes, reducing production volatility, inventory levels and logistics costs).

Presently the worldwide demand for oil reached 85 million barrels per day. It has been projected to increase at a rate of 2 percent per year over the next ten years.

Unpredictable price and demand changes influence and disorder the daily business planning and profitability for even the best-controlled oil and gas companies.

The sudden increase in global demand for oil and its derivatives, the ease of international trade and the inflexibility have made the petroleum industry's supply chain management more complex and more difficult. The petroleum industry is still in the development stage of efficiently managing their supply chains.

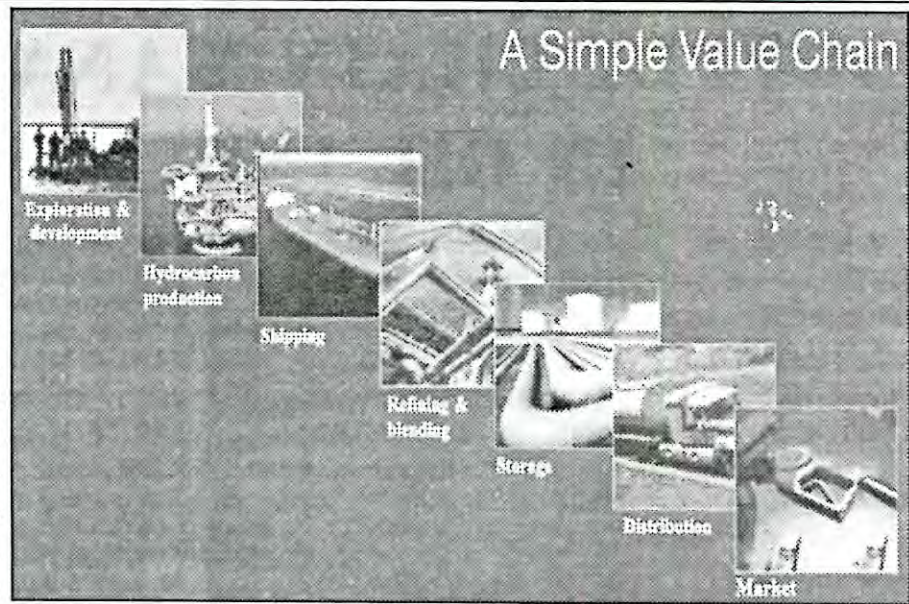
Supply chain management in the petroleum industry contains various challenges, specifically in the logistics area, that are not present in most other industries. These logistical challenges are a major influence on the cost of oil and its derivatives.

Most studies estimate that oil production will reach the highest point sometime between now and 2040. This variety of statements is wide. The reason is that the time of reaching the highest point depends on many uncertain factors.

These factors will help discover how quickly the oil remaining in the ground is used, how much of that oil can be produced given technological, cost, and environmental challenges. The addition to the challenges there may be potentially unfavorable political and investment conditions in some countries where oil is located: global demand for oil will be influenced by global economic growth, and will be affected by government policies on the environment and climate change and customer choices about conservation.

Maintainable oil supply has become highly unpredictable. It was caused by recent political unrest in the Middle East. Middle East is the largest oil producing region. Companies are made to continue higher safety stocks and search for alternative sources of supplies. Along the chain, such as long lead-times, manufacturing capacity and transportation are hard factors to change. Oil, gas, and petrochemicals require specific types of transportation such as pipelines, vessels or tankers, and railroads. These products are produced in specific and limited regions of the world. But they are demanded all over the world as an essential source of energy and raw material. The supply-chain path from crude oil to the customer is extremely complex. The connections between raw crude and customer must be managed over long times - usually many weeks. Political stability, OPEC rulings, terrorism, or expecting an unusually hot summer - all affect the price significantly.

Transportation of these products from the source points to the final customers' location requires several weeks. From economic standpoint it is very important to decrease production and transportation costs within the global production and global market network. In addition, technolog-



ical processes used in oil and its derivatives production have different nature and specific characteristics. They also have influence on the cost.

Opening new production sites or distribution centers closer to the spread customers is one way to reduce the lead time and transportation costs. However, getting of such facilities in the oil and petrochemical industries is typically very costly. It often results in higher inventory and operating costs. These factors are pushing oil and petrochemicals companies to either absorb the increase in costs or pass the costs on to customers who are already facing increasing prices.

Companies recognize that improved supply chain efficiencies represent an extremely large area for cost savings, especially in the logistics area. They are estimated to be an average between 10 and 20 percent of incomes. The petroleum industry and the operational challenges are very important in our daily life. But the topic had received very little attention in operations and supply chain management literature.

The oil and petrochemical industries are global in nature. As a result, these raw materials and products are transferred between separate locations. The long distance between supply chain partners and slow types of transportation cause not only high transportation costs and in-transit inventory, but



also high inventory carrying costs in terms of safety stocks at the final customer location. The great distances between supply chain partners present a high variability of transportation times. This variability can hurt suppliers in terms of service levels and final customers in terms of safety stock costs. The transportation process is carried out either by ships, railways, pipelines, or railroads. In many instances, a shipment has to operate many transportation types before reaching the final customer's location. Such limitations on transportation types cause long lead times from the shipping point to the final customers' location compared to other industries. For this reason, considering the amount of inflexibility involved, meeting the broadening perspective of oil demand and its derivatives while maintaining high service-levels and efficiency is a major challenge in the petroleum industry.

In the petroleum industry efficient and cost effective supply chain practices represent important factors for maintaining continuous supplies of crude oil, the reduction of transportation times, and lowering of production and distribution costs.

Due to the inflexibility involved in the petroleum industry's supply chain network, logistics represent a great challenge. However, it is only one of several challenging factors. Integrated process management, information systems and information sharing, organizational restructuring, and cultural reorientation are equally important.

Even with the inflexibility and complexity involved in the industry's supply chain, there is a lot of room for improvement and cost reduction, specifically in its logistics area.

In summary, with the oil and gas demand increasing, risk, regulation, and supply unpredictability increases. Supply of oil and its products to consumers, including all major industries, is the critical subject, therefore the sector must continue with timely demand fulfillment by overcoming the difficulties. Excellent experience is one of the necessary prerequisites for achieving this timely demand fulfillment. To

have better operational standards, the industry needs to work cooperatively, but should keep in view the social responsibility of providing oil products to consumers, and not only focusing on maximizing benefit for any organization.

Azerbaijan is an oil country. In 1847 first oil produced in Baku-Bayil-Bibiheybet and in 1872 Nobel brothers established first oil company in Baku. In 1900, 10 million ton of oil was produced in Azerbaijan. This was 95% of oil output in Russia and 50% of world output. And today oil and gas are the most important and huge resources of Azerbaijan. Azerbaijan economy is mainly based on this oil and gas production and marketing. Therefore Supply Chain Management is very important for Azerbaijan, as well as oil companies like SOCAR (State Oil Company of the Azerbaijan Republic) and other oil and gas companies.

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