

Logistics management for organizational success of downstream industry in oil & gas

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Shamsul. S^{1,*}, Habibah¹

¹ Razak School of Engineering and Advance Technology, Universiti Teknologi Malaysia, Jalan Sultan Yahya Petra, 54100 Kuala Lumpur, Malaysia

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ABSTRACT

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The complexity associated to the large scale and highly-cost of oil and gas industry play key role in determining the best strategy for its logistics supports to stay cost-effective and sustainable in giving back maximum value in return over the humongous investment that has been put. Especially that the oil and gas industry has gone from boom to bust in the past three years, hence the need to re-thinking of their logistics strategy becoming more crucial and pressing. Based on the analysis of the exemplary practices on Royal Dutch Shell and Petroliam Nasional Berhad, this study identifies the main factors that support the long-term organizational success and sustainability of the companies and this represent the other oil and gas downstream companies. The findings from this study are essential in providing knowledge to the other industries regarding the best practices applied by the oil and gas giants for replication.

Keywords:

Logistics management, supply chain, success factor, oil and gas, downstream

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1. Introduction

The growth of outsourcing has led outsourcing strategies to become an increasingly important component of firm success [1]. However, volatility in global economy influences companies' strategic decision including of their logistics and supply chain management as experienced back in 2008. Surely the global economic crisis in 2008 has distorted the trend of logistics development, so that it is necessary for the international logistics industry to respond the tremendous structural change in economic environment [2].

Outsourcing management process (OMP) is an area in logistics and supply chain that has been experiencing advancement because of its ability to shift the performance of the organizations to exceptional level. While basic logistics outsourcing affects cost and delivery directly, advanced logistics outsourcing influences the performances via interaction with OMP [3]. By the use of modern Logistics supply chain theory, the enterprise material supply can be formed as a powerful circle [4].

* Corresponding author.

E-mail address: [Shamsul S \(shamsul1978@gmail.com\)](mailto:Shamsul S (shamsul1978@gmail.com))

We find outsourcing congruence across all five competitive priorities to be positively and significantly related to supply chain performance. We also find the level of supply chain performance in a firm to be positively and significantly associated with the firm's business performance [5].

In relation to the organizational performance and logistics management, this paper studies the application of logistics management emphasizing on the two strategic decision of logistics management; 1) the corporate and logistics management strategy and 2) the strategy in Fourth Party Logistics (4PL) using Royal Dutch Shell (Shell) a Netherland's company and Petroliam Nasional Berhad (PETRONAS) a Malaysian company as case studies.

Exceptional practices in the supply chain and logistics management as shown by the two oil and gas giant, Shell and PETRONAS suggested a strong agreement with the above claim that in order to adapt to the dynamic nature of the supply chain, a particular organization should develop, implement and constantly re-visiting its supply chain and logistics management strategy. This will allow early forecasting and identification of possible impact(s) of imminent changes hence accordingly make changes to the organizational or functional in timely and effectively manner to ensure service levels quality are not reduced.

2. Oil and Gas Logistic Management Practices

It is essential to understand the nature of the oil and gas in general and the downstream business in specific in order to comprehend how logistics support sits in the industry. As shown in Figure 2.1, the value chain in oil and gas is includes the transportation understood as the midstream segment [6].

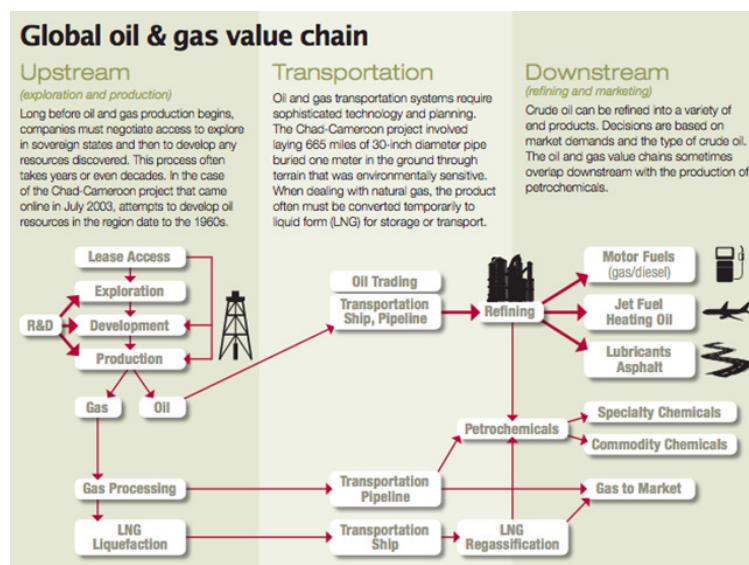


Fig. 1. Global oil and gas value chain

2.1 Shell as One of the Largest Companies in the World

Shell is one of the largest companies in the world. Comprising a global group of energy and petrochemical companies, Shell is active in every area of the oil and gas industry, including exploration and production, downstream manufacturing, and distribution and marketing. Headquartered in the Netherlands, Shell operates in more than 70 countries and territories and employs approximately 92,000 people. In 2013, Shell reported revenues of approximately US\$451

billion [7-8]. The growth and diversity of Shell's upstream business activities created challenges that required a new logistics management solution.

2.2 PETRONAS as a National Oil Company

PETRONAS is Malaysia's national petroleum corporation established in 1974. Since its incorporation PETRONAS has grown to be an integrated international oil and gas company with business interests in more than 30 countries. The PETRONAS Group comprises over 100 subsidiaries and 45 associated companies. The Group is engaged in a wide spectrum of petroleum activities, including upstream exploration and production of oil and gas to downstream oil refining; marketing and distribution of petroleum products; trading; gas processing and liquefaction; gas transmission pipeline network operations; marketing of liquefied natural gas; petrochemical manufacturing and marketing; and shipping [9-10].

For the purpose of this case study, methanol production is selected for Shell business and petrochemical manufacturing is selected for PETRONAS business.

2.3 Key Attributes for Sustainable Competitive Advantage in Logistics Management

To achieve sustainable competitive advantage, your supply chain needs all three of these qualities: agility, adaptability, alignment [11]. The year 2010, is believed to be the year that witness a comeback of the global economy has shown rises of global businesses hence warrant adjustment in logistics and supply chain to accommodate growth in the economy. In recent years, the successful operation of the fourth party logistics (4PL) in practice has gradually demonstrated that it is an effective mode to integrate the complicated resources of a supply chain reasonably, efficiently and flexibly [12].

Shell collaborated with Accenture to achieve a step change in its logistics performance through the design and implementation of a 4PL logistics solution. Shell engaged Accenture to help design a logistics solution that involved the use of a 4PL provider to plan and manage Shell's logistics activities that helps to optimize and manage traditional 3PL (3rd party logistics) execution partners. The single client platform enabled a Shell tailored solution with dedicated focus [8].

Manugistics Group, Inc. (Nasdaq:MANU), a leading global provider of supply chain management and demand chain optimization solutions, has been selected by PETRONAS to power a strategic supply chain initiative across the company's oil business to help improve inventory and capacity visibility, reduce shipping costs, and reduce inventory levels at PETRONAS' depots across Malaysia, while improving on already high customer service levels [10].

3. Results and Discussion

Direct comparison method between Shell and PETRONAS business strategy and performance in the application of logistics management of two strategic decisions in logistics management i.e.; 1) the corporate and logistics management strategy and 2) the strategy in Fourth Party Logistics (4PL) is used for this study. The findings from the review of the companies' logistics management practices and performance are evaluated against the attributes findings as identified from the literature reviews performed in Section 2.0. From the comparison, it can be said that the attributes found in the two companies supported the attributes findings from the literature reviews.

Since the inception of the companies, Shell and PETRONAS have grown significantly from being a main player in their own countries into global oil and gas majors internationally. A longer supply chain

– particularly one that extends into regions with inadequate infrastructure and/or a chronically inefficient regulatory regime – can wreak havoc on oil and gas company's maintenance, repair and operations (MRO) schedules. For example, a delayed delivery of mission-critical equipment for a refinery can heighten safety and environmental risks and diminish relations with customers and regulators [13].

As supply chains are persistently changing and evolving and will affect any logistics organization, Shell and PETRONAS reviewed their logistics strategy from time to time, in order to be on top of its dynamic nature as supply chains and the supply chain priorities change. The reasons are that the market competition is gradually fierce, and the cost of production is also increasing such that it requires the enterprise exploring new competitive methods from the internal and external of organization boundary for different aspects [14-15].

Both Shell and PETRONAS demonstrated clearly the agility, adaptability and alignment attributes in advance logistic management practices in their strategies respectively. As example, Shell plays its role steering Accenture by focusing on building long-term strategic relationships, positioning the international organization to access the 4PL provider's best people, leading innovations and best technology. Accenture at the same time plays its roles aligned with Shell in strategizing for Shell up to designing the suitable approach for the logistics management that meets Shell's operation globally.

3.1 Strategy Decision 1: Corporate and Logistics Management Strategy

Logistics strategy for companies really means that the service level of its logistics management is at its optimum level as mentioned by Martin Murray that when a company creates a logistics strategy it is defining the service levels at which its logistics organization is at its most cost effective [16]. The case study shows that Shell adopted the LMS term to highlight key distinctions from traditional 4PL and to define a solution that was dedicated to Shell and based on a model that allowed Shell to retain close control of the outsource provider [8].

Primary supplier selection criteria	<ul style="list-style-type: none"> • response strategy as a reliable supplier of methanol and offer total supply security
Supply chain inventory	<ul style="list-style-type: none"> • Use buffer stocks, abundant storage capacity in methanol production to ensure speedy supply
Distribution network	<ul style="list-style-type: none"> • European target market segment
Product design characteristics	<ul style="list-style-type: none"> • low setup time, rapid production ramp-up, anchor plants at Wesseling and Germany
Transportation mixed	<ul style="list-style-type: none"> • intermodal routes per truck, train or ferry in any combination
Partnership	<ul style="list-style-type: none"> • only works with experienced and certificated DME transport companies to ensure reliable logistic chain up to production facilities
Logistic arm	<ul style="list-style-type: none"> • Shell Shipping & Maritime is the Group's centre for maritime expertise, providing commercial, ship management and technology services, along with assurance advice to internal and external customers

Fig.2. Shell methanol production logistics strategy

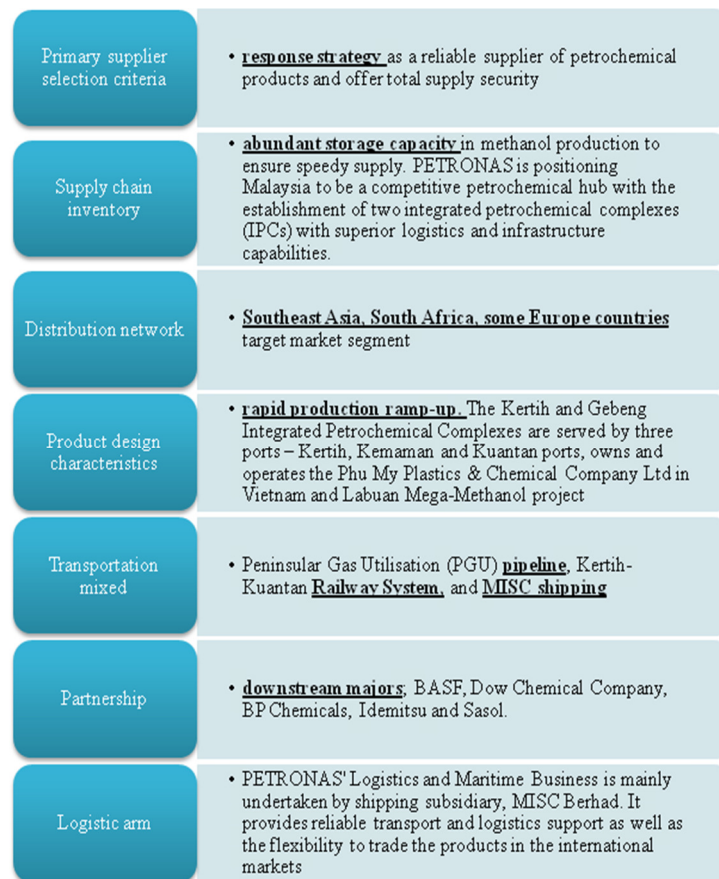


Fig.3. PETRONAS petrochemical manufacturing logistics strategy

While in PETRONAS, the organization’s strategic initiative is focusing on a collaborative, Internet-based state-of-the-art supply chain planning and execution platform as a nerve centre for the complex supply chain, to ensure top operational performance in a complex business environment, including allowing optimized, consensus-built demand forecasts for refined products, by depot. These dynamic forecasts will help PETRONAS to pinpoint accurate expectations for marketplace demand, and then streamline inventory and pipeline capacity requirements accordingly [10].

There are some similarities in terms of the corporate strategy at high level, where both companies strategized for response strategy to market their commodity products. Both companies also have their in house logistics expertise to function as the reliable logistics planner, logistics support and as traders to internal and external customers. Figure 2 and 3 illustrates the differences in strategy between the two companies.

3.2 Strategy Decision 2: Fourth Party Logistics (4PL) Strategy

Both oil and gas majors strategized their future growth by implementing 4PL logistics solutions to further improve the efficiency and advancement in logistics and supply chain according to the business future growth and diversity and boosts the downstream business by positioning its competency in internet-based supply chain system. The practices is well supported by Hingley saying that with an interdisciplinary approach, drawn from supply management, relationship management, and logistics and supply chain management...horizontal collaboration using fourth-party logistics structures as horizontal intermediary conduits, who act independently between retailers and

suppliers to facilitate collaborative and relational activity [17] and Kim finding that company reinforces its competitive advantage from the Red Ocean while it transitions into a Blue Ocean by utilizing advanced information communication technologies [18].

Another key success factor that is found in both Shell and PETRONAS is, both companies have competent and effective internal logistics organizations that are functioning as the lead to provide steer to their 4PL consultants to ensure quality, agility and alignment are met. In particular, company experience is a distinct key competence that managers constantly use in combination with other competences, and thereby has a significant effect on manager competences [19].

The global logistics management solutions enable PETRONAS in particular to create and execute an optimized shipping plan across a complex multi-modal environment of trucks, vessels and pipelines. Exception management, real-time reporting and strategic decision-support tools will help PETRONAS evaluate multiple "what-if" scenarios, adjust forecasts, and update production and distribution plans as changes occur in the marketplace, helping proactively resolve unforeseen delays and other challenges [10].

From the review, both companies benefited good results from the collaborations with their 4PL experts as summarized in Figure 4.

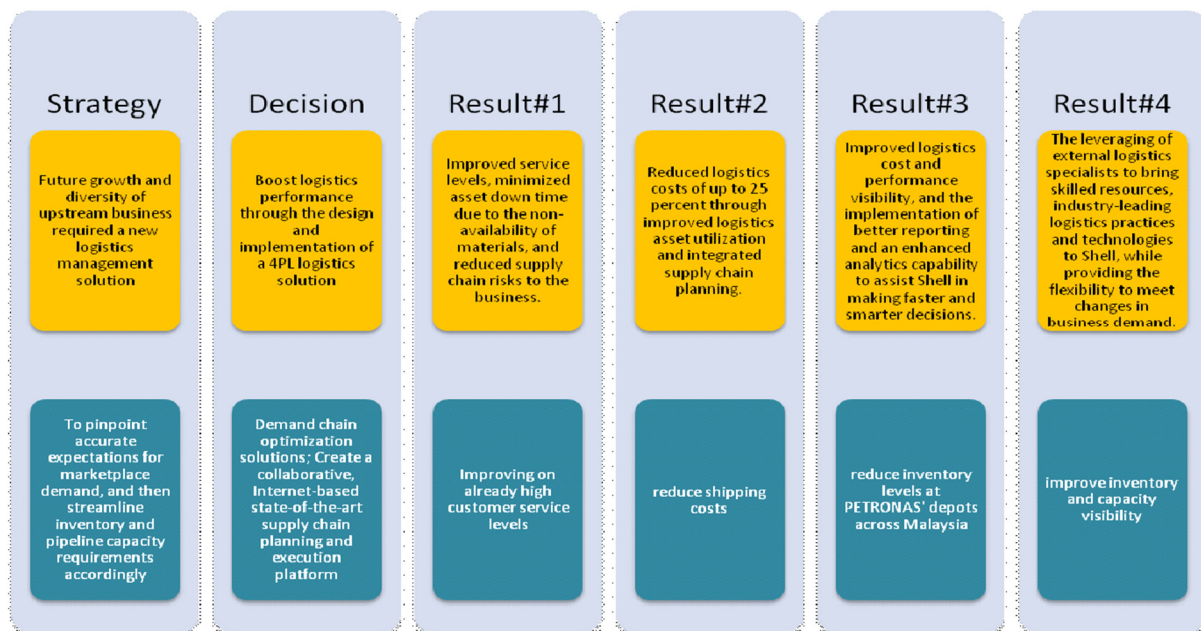


Fig. 4. Comparison between Shell and PETRONAS strategy in 4PL implementation

4. Conclusion

This paper presents a focused review on the application of logistics management emphasizing on the two strategic decision of logistics management; 1) the corporate and logistics management strategy and 2) the strategy in Fourth Party Logistics (4PL). The key success factor that supports Shell's and PETRONAS' excellent performance can be described in a few points below:

- i. The case studies on Shell and PETRONAS learned that the cruciality of an organization in paying attention to the dynamic of the logistics supports and be aligned to the business and market growth is real. Both Shell and PETRONAS are very mindful in ensuring the

- dynamic and flexibility of their logistics organizations to support the business activities and also to chart and secure footprint for their future growth.
- ii. The strategic decision of the companies in applying collaboration using fourth-party logistics structures demonstrated that this is one of the key accomplishments of the companies while they consistently reinforce the competitive advantage of the organization.
 - iii. On top of having a broad mix of transportation, reliable and effective response strategy, broad and reliable transportation mixed to meet international market segment, the use of “buffer storage” or “abundant stock capacity” of methanol production for respective case of Shell and PETRONAS is proven to be the right strategic decision to support its supply chain to meet speedy recovery objective.
 - iv. Continuously revisiting their logistics and supply chain strategy from time to time is essential to ensure the adopted strategies stay relevant.
 - v. Having competent of in-house experts in logistics and supply chain is vital in order to allow the company to have a meaningful collaboration with their preferred 4PL consultants. This element has been the underlying principle of both companies.

It is therefore highly recommended for other business sectors from other industries to replicate the attributes as practiced by Shell and PETRONAS regardless the size of the business.

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