

# A Review of Nigerian National Petroleum Corporation (NNPC) Downstream Supply Chain Management

Bankole Razaq<sup>1</sup> & Lawal Aliyu Umar<sup>2</sup>

Department of Business Administration

LIGS University USA

## **Abstract:**

*No manufacturing organization or a commercial company that did not take its supply chain structures and functions seriously will expect any meaningful success in its operations in this modern day business practice. Petroleum producing companies are particularly vulnerable in this respect as their operations are streamlined in stages across the production lines from prospecting through to different complex stages to finishing and consumption. In their research opinion, “Chopra and Meindle (2004) opined that supply chain process follows a string of value chain activities in which case every contributor, be it individual or company - supplying, producing, transporting, stocking, storing and a host of other activities - tends to fulfil customer’s expectation” Bankole (2020). This review is therefore important to refreshing our knowledge and understanding of how this function of NNPC is a valuable process of bringing petroleum products to the doorsteps of their numerous and varied customers and consumers.*

## **Keywords:**

Logistics, NNPC, Petroleum Products, Supply Chain, Value Chain, Warehousing

## **I. INTRODUCTION**

Basically, the process of supply chain entails the concepts of “Push” and “Pull”. It all depends on the time the order is placed. Requisition order made by the customer to the supplier for implementation is always under the pull process while push process entails getting ready of the product in anticipation of order to be placed by the customer. The supplier is able to determine what is needed by the customer as symbolised by the order placement before going into production based on customer’s order by getting instruction (pull) from customer. For the push, the supplier has already made the product available waiting for customer to ask for it. In a nut shell it is a process that discriminates between speculative and reactive supplies. As an example, with Dell computers, the beginning of PC assembly starts from the production stage; this distinguishes the Pull from the Push. Before the PC assembly, activities represent ‘push’ and after the ‘push’ all activities represent the ‘Pull’ process (Chopra and Meindle, 2004).

## **II. LITERATURE REVIEW**

### **2.1 The Conceptual Theory of Supply Chain Management**

Whistleblowing is when a person or group of people draws the attention of the public or the attention of an authority to wrongdoing misconduct, illicit or an unethical activity happening within the private or public organisations.

The concept of whistleblowing gained more and more concern in the 1970s and has since then been drawing more and more attention across several disciplines from business, law, medicine, agriculture etc. In fact, the concept of whistleblowing lies within disclosure and notification of unlawful or unethical act or behaviour such as fraud, forgery, illicit acts or behaviours, misconduct etc. in an private or public organization.

It virtually almost agreed that whistleblowing typically emancipates as a result of failure of organizational ethics norms, values and even accountability and it will be also ideally good for the blower to note that whistleblowing has pros and cons so the he must adhere to some certain steps before blowing the whistle.

## **2.2 Supply Chain Process as a Structure of Value Chain**

According to Chopra and Meindle (2004) supply chain process follows a string of value chain activities in which case every contributor, be it individual or company - supplying, producing, transporting, stocking, storing and a host of other activities - tends to fulfil customer's expectation. In the case of a manufacturer, the process of supply chain begins when a customer or consumer places an order for the product in question. The producer (manufacturer) then undertake to coordinate the roles of product development, marketing and commercial; financial and distribution operations (Chopra and Meindle, 2004). Wal-Mart stores, in its duty to provide satisfaction to its customers, which happen to be the main reason for setting up their distribution roles make the customer as the focus of its supply chain activities. Therefore supply chain for Wal-Mart begins when customer's order for detergent (as an example) is received in a form of retail demand. This they do by replenishing the retail shelves from the warehouse or an outright supply is requested from the manufacturer of detergent (P & G) or its agent. This also will necessarily involve haulage and warehousing logistics to move the product to Wal-Mart stores. While the agent receives supply from the manufacturer, the manufacturer herself got supplies of raw materials from different sources. These may include packaging company, and raw material agents and palm oil extractors.

For a rather simple example of a supply chain process, the internet has since reduced the universe into a shrink global business environment. The advent of internet business interaction has evolved a seemingly different form of supply chain management. For example, an IT company like Dell would have a supply chain structure like this: through the internet website of Dell company, customers place their orders, Dell using its plant for computer assemblage; dell places orders to its suppliers who in turn place orders to its suppliers' supplier. The website communicate business information to its computer customers which will include the cost of buying by the customer as per sizes and the existing product quantity, customer then pay for the product using online facility after the acceptance of order. Through the website customer monitor's the delivery movement of the product.

## **2.3 Importance of managing the Supply Chain**

The value of supply chain management to the customer is the difference between what the product is to the customer as gain and the value added by the channel members along the supply chain. This was posited by Chopra and Mendle in their research of 2004. For example if a customer should pay \$1800 as money accrual to the supply chain for acquiring a Dell computer, the difference of the total amount of money paid by all the contributors along the supply chain and the money, \$1800 paid by the final customer to Dell for acquiring the product is the value of the supply chain profitability.

The importance of supply chain management can also be seen when considering the physical distance between the customer and its supplier. The chain shows clearly, the various activities needed to get a product ready by the supplier to the customer. This is glaring when the distance is even significant (Chopra and Meindle, 2004; Walters, 2009)

In his observations, Walters (2009) considers that it is necessary to bridge the gap between the supplier and consumers being widely separated through implementation of carefully planned supply chain measures. Specifically Walters pointed out that the farmers of coffee beans in South America with their consumers located in North America; the existing distance between the producers of natural gas in Siberia and their customers based in Europe; distance barriers existing between the location of coal mining and energy depots be shortened; similarly, gaps between producers of food in the farmlands be reasonably close to consumers in the towns and cities (Walters, 2009). In the same way, the author will like to see the supply gap between NNPC and her customer being mutually close (Walters, 2009).

Unavoidable natural gaps between can only be accommodated through properly planned supply chain measures. For instance, supply of sugar is generally constant throughout the year. Harvesting of sugar cane is however determined by seasonal vagaries. Therefore during surplus harvest excesses are kept in warehouses against subsequent seasons when harvesting could be lower (Walters, 2009).

Walter also added a space gap in the analysis of supplier chain barriers. This he explained by drawing from the analogy presented by Anderson (1954):

“Despite the space gaps in the case of bauxite which is mined in Australia, but used by far away manufacturers; When there is a long time gap (lead time) between when a product is made available and buying period, storage takes an important role here in deferring the life of the product (for example, as whisky is produced in Scotland and stored for at least, three years before it matures). Regarding quantity gap, between the amount of product available from suppliers and the demand for it by customers is seen when publishers print books (for example) in large batches to reduce unit cost of printing, however a customer always buys one copy each. Lastly, he equally discussed the gap caused by information when the availability of some stocks is not known by customers and inversely too, suppliers also do not know about existing potential customers; as an example, due to non-penetration of supply chain in some markets, some countries are oblivion of McDonald restaurants”.

## **2.4 Supply Chain Process and its Logistics Functions**

- A brief explanation of logistics will aid the understanding of how it intertwines with the processes of supply chain in an organisation. Logistic function is the activities involved in the transfer of materials from the primary source of supply through to the end user or consumer. This will include transportation, ware housing, haulage, and all other activities that will aid the smooth movement of production materials from ‘dirt – to – dirt’ (Walters, 2009). Therefore it is an established fact that all producing organisations are involved in logistics practice. So, producers will have to transport raw materials and/ or semi-finished products from primary owner (supplier) for onward delivery to their storage facility for processing and forward movement of their finished products to their agents, distributors, wholesalers and retailers. Agricultural produce are also moved from the rural locations to town centres and other points of processing or consumption. Articles ordered through the websites are delivered to the door steps of owners by delivery services. Manufacturers move their vehicles round the world for delivery to dealer’s sales garages. It is important to realise that all these movements are aided by logistics operations (Walters, 2009).

## **2.5 Overview of the Oil and Gas Industry Supply Chain**

A brief look at the general oil and gas industry world-over reveals an enormous influence on other businesses. It is hardly possible for the modern world to survive without an even supply of oil and gas (Bhardwaj, online accessed, 21/03/2017). So, this is why certain countries that are naturally endowed with this resource (oil) form part of the richest in the world, especially when this resource is given the proper management attention it deserves. As a result of the important need for this product, which serves as the impetus of world economic growth, since it serves all spheres of human endeavour either as input to the productions of other products or providing a spiral employment for human development? Priority must therefore be given to its effective supply chain development (Bhardwaj, on-line accessed 2017).

The oil and gas industry is basically divided and organized into upstream and downstream as follows:

- i. **The Upstream Division:** This division is in charge of oil production in its crude form. Its main functions are geological surveying, prospecting, exploration and production of crude oil and natural gas. It could carry on its activities both-on-shore and off-shore.
- ii. **The Downstream and Mid-stream Divisions:** In most of the petroleum industries, the mid-stream division activity is normally interwoven with the downstream division activity. This normally includes refining of the crude oil and natural gas into different forms of finish, semi-finished and some form of raw petroleum products. Specifically, the refineries produce diesel oil, kerosene, gasoline, liquefied petroleum gas, antifreeze, fertilizers, synthetic rubber, industrial chemicals and a host of others – some of which serve as raw materials for many other manufactured products.

The downstream division also takes care of different areas of operations such as marketing and sales; transportation and warehousing; and musters the business relationships with its customers. It's in charge of building and maintaining organisation's petro-chemical outfits, refinery plants, logistics for distribution and maintenance of the retail outlets.

## **III. METHODOLOGY**

### **3.1 Research Design**

This research work is specifically designed to study the Review of Nigerian National Petroleum Corporation (NNPC) Downstream Supply Chain Management.

The research design is meant to guide the researcher in the use of the best method of collecting data in the course of the research work. The research design used in this study is the simple survey approach.

### **3.2 METHOD OF DATA COLLECTION**

The researcher tried to exploit all possible avenues for a fairly accurate data to be collected in order to get the best reliable and accurate data in the course of this research study. Concisely, the researcher employed both primary and secondary sources of data collection.

## **IV. DATA ANALYSIS**

### **4.1 General Review of the Downstream Oil and Gas Supply Chains**

According to Amponsah and Opei (2017), lack of prolific academic literature on oil and gas supply chain activities makes a review of its operation rather more challenging, especially the downstream.

Accordingly, Lewin (2013) observed that the importance of the sector as the provider of human most essential need for survival in this age is unquantifiable. For instance, without the production and distribution of this product, it would be hard to see the rapid development of modern day transportation, power generation, development of petro-chemical industries which are very cumbersome (Lewin, 2013). This is the reason why it is very necessary to know much about the supply chain workings of the downstream section of the oil industry operations. It is therefore the central objective of the downstream supply chain to render excellent and satisfying supply chain delivery to the organization's customers in the most cost effective and acceptable manner. Many national oil and gas supply chain have been organized to satisfy this condition while some are still lacking the efficiency to achieve the minimum standard expected. Chima (2007) however opined that due to the good uses to modern available technologies of information procedures, many are able to design functional and effective petroleum products supply chain. Similarly Balasubramanian (2010) also agrees that different forms of supply chain systems are now available to cope with the downstream oil and gas supply chain; from crude handling through to different stages to point of retail distribution and consumption (Balasubramanian, 2010; Amponsah and Opei, 2017).

#### **4.2 Nigerian National Petroleum Corporation (NNPC) Downstream Supply Chain Management**

Petroleum Products Marketing Company (PPMC) is saddled with the downstream supply chain operations of NNPC. Amongst its responsibilities, is to make sure that petroleum products distribution covers the whole country at single uniform prices.

According to Babatunde and Bamiduro (2014) the functions and management of NNPC downstream supply chain is directed by PPMC as follows:

- i. PPMC Role of Distribution: PPMC carries out the distribution network of the NNPC with the assurance that its distribution coverage will cover everywhere in the country at the same retail prices irrespective of distance or mode of carriage. It is in charge of both internal and external sourcing of the products and distributing them to all categories of customers and consumers so that auto mobiles will have constant access whenever they are needed.
- ii. Movement of Crude Oil and Finished Products: PPMC as the NNPC subsidiary in charge of the downstream, moves crude product from National Investment Management Services (NAPIMS) to the nation's refineries through the pipelines, for refining into different forms of products and shipped through 6' -18' diameter pipe into the subsidiaries storage that are linked together with twenty-two loading bays. The total capacity for all the storages put together amounted to 1,422,000 cubic meters. The breakdown of this figure as per products is as follow:

Dual Purpose Kerosene (DPK) = 676400;

Automotive Gas Oil (AGO) = 007,900;

Premium Motor Spirit (PMS) = 266890;

Aviation Kerosene (ATK) = 074,000.

In spite of this supply chain design and its logistics arrangement, smooth and consistent supplies of these products continue to elude consumers. PPMC was to operate lean strategies in its operations in order to secure a smooth movement of its products to the home market and be most competitive at home and abroad. With its competitive advantage in procuring crude oil from the upstream sector of the industry, PPMC moves crude oil supplies to the refineries with refined products to the market place. But

with all these measures NNPC cannot do without refined petroleum products being imported to the distribution system for home consumption to bridge the shortage gap between demand and supply (PPMC, 2015).

- iii. Combining Home Refined with Imported Refined Products: Importation of petroleum product has been in existence from time immemorial. Dated back even before the first refinery was established in 1965 and after, up till date.  
The first refinery in Nigeria was constructed in 1965 by Shell BP. The civil war that erupted after the construction truncated its expansion and was even damaged during the civil war. Unfortunately importations of refined petroleum products continue up till today despite the construction of four nationally owned refineries (PPMC, undated – Accessed 20/04/2016). However since the creation of PPMC in 1988, importation of refined petroleum only reduced but these products continue to be imported to supplement the locally refined ones (PPMC, undated – Accessed 20/04/2016).
- iv. PPMC Supplying Refined Products Across the International Borders: The management of NNPC has its plans underway for the extension of petroleum pipelines to accommodate exportation of refined products to a number of neighbouring countries of West Africa. When fully done, it means NNPC is prepared to rip the West African neighbouring markets of more revenue despite the difficulties entail now, for PPMC to fully supply the local market satisfactorily.
- v. National Distribution Network for Refined Products: The National Distribution Network for Refined Products take the form of pipeline connectivity from the depots and the storage system. Import and export jetties were constructed and connected to the supply depots and main storage grids. NNPC operation is zoned into five territorial divisions with each operational division headed by Area manager who also is placed under the operational instructions of an Operations Executive Director. Each Area Manager superintends over the jetty and depots located within their sphere of coverage (Babatunde and Bamiduro, 2014). Babatunde and Badejo (2014) listed the South West zone depots as follows:
  - MosimiOgun Depot
  - Atlas Cove Jetty and Depot
  - Satellite, (Ejigbo/ Lagos) Depot
  - Ibadan Depot
  - Ore Depot
  - Ilorin Depot

(Babatunde and Bamiduro, 2014) with its distributional depots coverage as follows: “MosimiOgun Depot is designated to serve Ogun State and part of Lagos State; Atlas Cove Jetty and Ejigbo Depot serve Lagos State; Ibadan depot serves Oyo and Osun States; and Ore Depot serves Ondo and Ekiti States” (NNPC – Accessed, 20/04/2016; PPMC, 2015 and Babatunde and Bamiduro, 2014)”

According to NNPC, as at 5th April 2019, “NNPC runs 55 petroleum products distribution depots, all over the country. The depots distribution locations are as follows: Lagos - 23; Port Harcourt - 7; Warri - 11; Calabar - 6; Kaduna - 8 and its intention, according to its GMD, Maikanti Baru (2018) “is to increase the number in orders; to reduce the burden of supply and distribution of products” (Nnodim, 2018).

In order to stem the tide of scarcity of gasoline and other essential petroleum products, and also to provide unhindered access to obtaining the product NNPC created a retail outfit known as Mega Stations. The design of NNPC supply chain can therefore not to be complete without revealing the fact behind the establishment and operations of the Mega Stations.

### 4.3 The Retail Division of NNPC Supply Chain

NNPC states that the birth of its retail outlet was as a result of renewed intentions to better serve its local consumers profitably with unadulterated products and to run the station services orderly and diligently. Its mission is to establish a clear lead at the downstream retail level of the oil and gas industry in Nigeria with customer satisfaction at the top of its establishment's agenda.

There are about 500 retail stations run by NNPC Retail Division scattered all over the country. Some of these are Mega Stations which are directly owned by the corporation while others are affiliated stations under the corporation (NNPC Retail Limited, 2019).

Their product lines include: "Premium Motor Spirit (PMS) traditionally called, gasoline or petrol; Automotive Gas Oil, commonly known as Diesel; Liquefied Petroleum Gas known as Cooking Gas; and Dual Purpose Kerosene. Its own brands of lubricants are already underway with an eye on non-oil products to expand their revenue base (Bankole, 2020).

As part of the product shortages control measures, and also to reduce cases of artificial supply distractions occasioned by unscrupulous "black marketers" and smugglers, NNPC sets-up the NNPC Retail Company Ltd. in 2001. This is similar to "Tracking of Bulk Road Vehicles" (BVR) introduced into the oil and gas supply chain of the Ghana's petroleum industry (Amponsah and Opei, 2017), or the UK system of checking easy flow of gasoline supply against disruption (DBEIS, 2017). It is equally intended that setting up the retail stations would project NNPC as completely an integrated petroleum establishment.

As a result of these objectives being pursued by NNPC, this brought about the commissioning of this laudable project of mega stations with the first one started in August 2002 in Lagos and later followed by Abuja Mega Station in December, 2002.

To assume a fully established business outlook, NNPC incorporated its retail division on 22nd June 2009 while other stations followed suit in phases as analysed below:

**Table 1:** NNPC National Retail Mega Stations in Commissioning Phases

PHASE	YEAR	NUMBER
Phase 1	2002	2
Phase 2	2003	2
Phase 3	2004	7
Phase 4	2007 - 2008	12
Phase 5	2008 - 2014	18
Phase 6	2015 - 2016	4
Phase 7	2017	2

**Source:** Bankole (2020) as adapted From NNPC Retail Ltd Web Site. Retrieved 12/11/2019, NNPC Retail Limited 2019.

As a result of this expansion, each state of the Federal Republic of Nigeria is able to enjoy at least one mega station of NNPC creation, including the capital of the federal republic, Abuja. Many other private stations were also affiliated and this makes the company's share of the retail market trade to rise speedily from seven percent in 2009 to it thirteen percent enjoyed at present in 2019.

This achievement was equally guided by its strategically formulated mission acronym - SCRIPT - as enshrined below:

“S;-Safety,

C-Customer-Focus

R-Respect-for-individual

I-Integrity-Transparency-Accountability.

P-Professional-Excellence

T-Teamwork

S- Staff Excellence and Growth”

Source: 2019 © All Rights Reserved by [NNPC Retail Limited - As Adapted](#)

## V. CONCLUSION

The Nigerian oil and gas economy evolves through the process of field surveying, exploring, developing, refinery processing, shipment, and marketing of the oil and gas industry products by NNPC which in other acronyms is referred to as the (NOC) National Oil Company and the International Oil Companies (IOC). The biggest volumes of the output of these processes are gasoline and fuel oil. Many chemical and pharmaceutical productions derive their raw materials from the outputs of crude oil refined products and by-products. Amongst other manufactured products that depend on oil and natural gas productions are, fertilizers, pesticides, plastics and solvents to mentioned but just a few of them.

The inestimable values of all these products (primary and secondary oil productions) make the sustainable understanding of the supply chain arrangement of not only the petroleum products industry very important but also all other manufacturing activities that involve ‘dirt to dirt’ concepts of supply chain a ‘must’ to be reviewed.

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