



**Developing Procurement Practices Framework in Supply Chain of
Oil & Gas Sector :A Case Study of Gastec Company in Egypt**

Research extracted from a master's thesis

By

Mirna Mohamed Mostafa

Gastec Company

Foreign Purchasing Specialist

mirna.abouelela@icloud.com

Dr. Khaled Abdallah EL Sakty

Arab Academy for Science and

Technology and Maritime Transport

Dean – College of International

Transport and Logistics

Khaled.sakty@aast.edu

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Developing Procurement Practices Framework in Supply Chain of Oil & Gas Sector :A Case Study of Gastec Company in Egypt

Mirna Mohamed Mostafa and Dr. Khaled EL Sakty

Abstract

The main aim of this research is to find out the impact of developing procurement practices on supply chain management. Developing the procurement practices in general will contribute in solving one of the major problems affecting the supply chain procedures nowadays in Egypt, and specifically will allow Oil & Gas companies to manage supply chain risks and achieve operational efficiency.

This research used the analytical method and descriptive method through inductive approach. This research was based on an investigation that aspires to test theory through developing of objectives regarding to impact of procurement on supply chain performance. The study tested the mentioned variables hence modifying the theory in light of the findings. Therefore, the adoption of inductive approach was appropriate for this study. The study used questionnaire as a data collection tool to collect a primary data.

The study found that Gastec was experiencing a number of issues, the most significant of which is that the internal departments are not connected to each other by a unified electronic system, and the business also does not rely on an electronic system to manage its procurement procedures, which is the thesis' main focus.

Key Words: Procurement Practices, Oil and gas, Supply Chain Management

1. Overview of the Study

In the current unpredictable competition of project-based manufacturing environment in oil and gas sector, it is very important for business players (both suppliers and manufacturers) to start recognizing the importance of procurement practices because it is one of the most important stages in a business that always requires attention and continuous evaluation. Procurement facilitates acquisition or purchasing of goods and services. That is why; procurement is closely related to a purchase management (Lenny,2019).

In the area of oil and gas sector-based manufacturing, procurement is the connection process of purchasing and arranging in bound movement of all items, supplies, materials, parts, finished inventory and general support services from the suppliers into manufacturing process or assembly plants or warehouses (Rami,2018).

The Egyptian International Gas Technology (GASTEC), a Company affiliated to the Egyptian Petroleum Sector, established in 1996 as a joint stock company as per the provisions of the Law of Investment no. 230 of year 1989 and its amendments, and Law no. 159 of year 1981 and its executive regulation in accordance with the decree of the Minister of Economy and International Cooperation no. 125 for year 1996. This research will focus on the impact of developing procurement practices on the oil and gas sector (Rami,2018).

2. Research Problem

There are many obstacles that impede the work of the supply chain in the Egyptian oil and gas sector (Gastec company), as the procurement represent the most problems, especially after the current circumstances, which are represented in letter of credits, the NAFEZA system, and inflation. Through this thesis, we will study the impact of procurement management on the performance of the supply chain in the oil and gas company through the following drivers: (Internal operation- Customer relationship management- Supplier relationship management- Information technology- Payment procedures- Shipping procedures).

3. Research Questions

The above research problem can be addressed by the following questions:

RQ1: What is the impact of developing procurement practices on supply chain of oil and gas sector?

RQ1.1: What is the impact of developing procurement practices on internal operations of oil and gas sector?

RQ1.2: What is the impact of developing procurement practices on supplier relationship management of oil and gas sector?

RQ1.3: What is the impact of developing procurement practices on customer relationship management of oil and gas sector?

RQ1.4: What is the impact of developing procurement practices on (IT) information technology and procurement management in SC Process of oil and gas sector?

RQ1.5: What is the impact of developing procurement practices on payment procedures of oil and gas sector?

RQ1.6: What is the impact of developing procurement practices on shipping procedures of oil and gas sector?

4. Research Objectives

The objectives of this research are as follows:

1. To investigate the impact of developing the procurement practices on internal operations of oil and gas sector.
2. To find out the impact of developing the procurement practices on supplier relationship management of oil and gas sector.
3. To determine the impact of developing the procurement practices on customer relationship management of oil and gas sector.
4. To investigate the impact of developing the procurement practices on (IT) information technology and procurement management in SC Process of oil and gas sector.
5. To observe the impact of developing the procurement practices on payment procedures of oil and gas sector.
6. To explore the impact of developing the procurement practices on shipping procedures of oil and gas sector.

5. Research Hypothesis

H0: There is a significant relationship between develop procurement practices and supply chain of oil and gas sector.

H1: There is the significant relationship between develop procurement practices and internal operations of oil and gas sector.

H2: There is the significant relationship between develop procurement practices and supplier relationship management of oil and gas sector.

H3: There is the significant relationship between develop procurement practices and customer relationship management of oil and gas sector.

H4: There is the significant relationship between develop procurement practices and (IT) information technology and procurement management in SC Process of oil and gas sector.

H5: There is the significant relationship between develop procurement practices and payment procedures of oil and gas sector.

H6: There is the significant relationship between develop procurement practices and shipping procedures of oil and gas sector.

6. Research Importance

Developing the procurement practices in general will contribute in solving one of the major problems affecting the supply chain procedures nowadays in Egypt, and specifically will allow Oil & Gas companies to manage supply chain risks and achieve operational efficiency.

7. Conceptual Framework

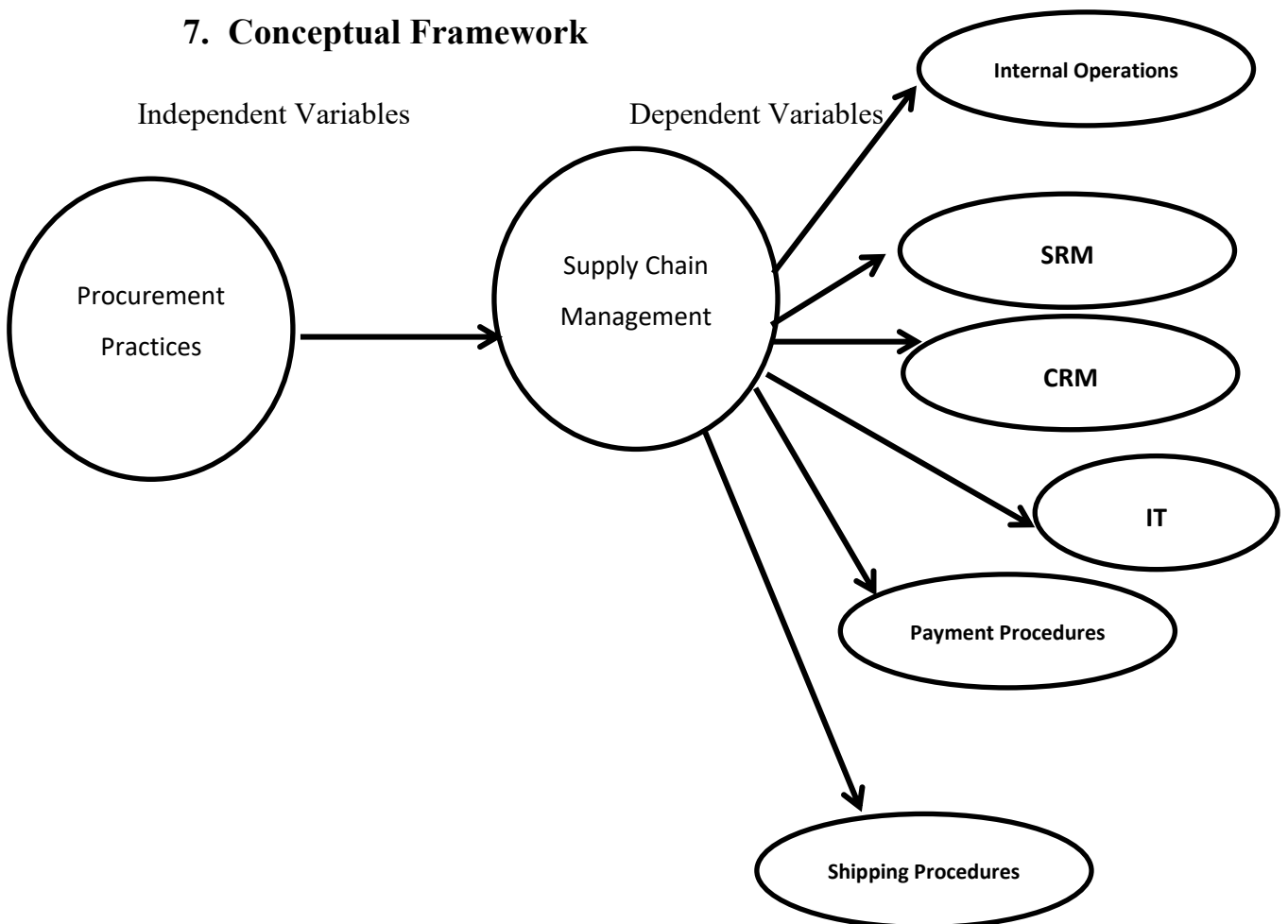


Figure 1.1 Conceptual Frameworks

Source: Prepared by the researcher

8. Literature Review:

8.1. Previous Studies:

8.1.1 Procurement Strategies for the Oil and Gas Industry: Conventional Versus Innovative Approaches (2016) By: Fahd El Assem

The study concentrated on methods for extracting large amounts of oil and gas from abundant and convenient sources. It was common for people to adopt building methods and tools that were now available on the market in their haste to begin oil production. Early business owners paid little attention to long-term procurement strategies since they had a limited amount of financial resources and were more focused on the capital cost of construction and equipment than on operating and maintenance costs.

The operators became concerned as a result, believing that certain contractors had adopted a "sell and forget" strategy, harming the reputation of after-sales support. The potential of plant and equipment failure, which might cause a significant operational stoppage and a loss of production, was also present to the operators. Due to this experience and the 1986 oil and gas price drop, the operators began to consider new cutting-edge procurement strategies that shared risks and profits in addition to cost, time, and quality. The use of procurement lessons from other industries, such as Design and Build/Engineering, Procurement and Construction, Partnering/Alliancing/Joint Ventures, and Performance-Based Contracts, have varying degrees of success.

This research presents a review of current literature on the subject within the industry which will form the basis of further work.

8.1.2. Study on Oil & Gas Laws in Egypt “General Report on the Oil & Gas Sector in Egypt – Technip” (2015) by Lena Hamdi

Egypt has had abundant energy resources, including both conventional fossil fuels and renewable energy, in large part because of the country's enormous underused landmass and year-round sunshine. Egypt has the potential to rank among the top gas producing countries in the world in the near future, in particular, thanks to its advantageous geographic location.

This study will provide a legal analysis on the oil and gas sector in Egypt. This assessment will outline the entities that govern the industry, in addition to the various laws, provisions, and regulations utilized to govern the oil and gas industry.

8.1.3. Renewable Energy Resources in the Egyptian Oil and “Gas Industry: Outlooks and Challenges” (2019) by Sherif M Ismael and Shady H.E Abdel Aleem

Due to their multiple benefits, which include reducing reliance on scarce fossil fuels and protecting the environment by reducing harmful greenhouse gas emissions, as well as their low operating costs, renewable energy resources (RES) have seen a surge in development over the past two decades. RES were once thought of potential alternatives to traditional oil and gas supplies.

International oil and gas businesses are now aware of how critical RES integration is to the oil and gas sector. As a result, RES technologies have been adopted globally in a variety of oil and gas projects, not only for the purposes of electricity generation but also for other cutting-edge process purposes such as steam generation to improve oil recovery (EOR). Egypt's unique geographic location offers exciting opportunities for the production of renewable energy. In numerous applications, including offshore gas platforms, pipeline remote terminal units (RTU), supervisory control and data acquisition (SCADA) systems, and remote wellhead power supply, Egyptian oil and gas corporations have used photovoltaic technologies to produce electricity.

In this paper, renewable energy outlooks and challenges in the Egyptian oil and gas sector are investigated. Practical case studies are presented from several Egyptian oil and gas companies.

8.1.4. Local content and procurement requirements in oil and gas contracts: regional trends in the Middle East and North Africa, (2017) by Olawuyi, D

Decided to maximize the picks up of outside coordinate speculation (FDI), indeed more so in a moo oil cost world, numerous resource-rich nations have progressively planned laws and approaches that require remote administrators to lock in innate companies within the acquirement of products and administrations, offer particular work for nationals; and utilize neighborhood crude materials. Other competing powers at play in setting up those hones incorporate the investors' want to guarantee opportunity to get on the premise of fetched, accessibility and quality, and the shared crave for a straightforward and proficient handle.

Whereas neighborhood substance prerequisites may indicate the parcel of add up to uses that must be comprised of locally sourced merchandise and administrations, obtainment methods are as often as possible not well set up. This could (and has) driven to a misalignment between governments and financial specialists on the prerequisites of those methods. This misalignment can show itself in fabric ways, coming about in noteworthy hazard to the financial specialist. This need of clarity and coming about misalignment in understanding and desires can lead to diversion in speculator- government communications, disturbance in petroleum operations, and possibly expensive formal debate determination with destructive impacts on the allure of the venture and the have government to the worldwide venture communities.

The objective of this research is to analyze how local content and procurement requirements have evolved in the MENA region, based on a survey of 20 countries- Qatar, Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Saudi Arabia, Syria, Tunisia, United Arab Emirates, and Yemen-and a review of the literature and evidence on local content and procurement provisions in petroleum agreements. The research will provide comparative analysis and regional survey of local content and procurement requirements in MENA countries, in order to determine prevailing market preferences, trends, best practices, risks and dispute mitigation strategies.

8.1.5. Developing a framework to achieve resilience in oil and gas supply chain during logistics disruptions: an empirical study (2022) by Amr Ekram

The oil and gas segment has more deterrents, vulnerabilities, stuns, and dangers than any other industry, especially within the coordinations administration region. Supply disruption is one of the foremost troublesome issues, so it is basic to get it what outside security dangers may disturb the stream of oil and gas. As of late, the time interim between these stuns and disturbance is astoundingly near. Given this condition, the oil and gas industry would enormously advantage from the application of viable approaches to distinguish and characterize the key coordinations components that lead to supply chain disturbances, permitting for the improvement of more effective hazard relief measures and flexible hones within the future.

This research thoroughly investigates the prospective logistics disruptions that may occur in OGSC, identifies their elements, and develops a framework for the Egyptian context of all logistics disruptions and verify their applicability in the Egyptian context. The research also suggests the best resilience practices to mitigate the logistics disruptions. This research will create a basis for researcher in the future to develop mathematical models and apply the proposed framework in order to aid decision makers in the sector to enhance how the oil and gas industry deals with potential logistics disruption.

The research provides a theoretical framework by conducting a critical review to the theories that are related to the resilience in supply chain, prospective logistics disruptions, and the machineries to manage, control and mitigate them. Then, a conceptual framework is verified and validated by conducting an empirical study through interviews and questionnaires with managers and executives in oil and gas sector around the world, followed by conducting interviews to confirm the outcome data and develop an applied framework

that proposes a road map for oil and gas supply chains to be resilient against potential logistics disruptions.

The research revealed that achieving a high level of flexibility, redundancy, visibility, and collaboration in Egyptian oil and gas supply chain will significantly increase the level of resilience in the sector and consequently help in mitigating probable logistics disruptions. The research contributes to the academia by providing a theoretical framework with the possible logistics disruptions that could occur in oil and gas sector, in addition to providing a conceptual framework for the most common logistics disruptions in the Egyptian oil and gas supply chain.

The research contributed practically to the industry by providing the industry with the most common logistics disruptions in the Egyptian oil and gas supply chain, in addition to identifying the best resilience practices that are feasible and effective in the Egyptian context towards mitigating logistics disruptions. Furthermore, it provides a roadmap for the Egyptian practitioners and executives in oil and gas sector that enhances resilience in the future.

8.1.6. Research Gap:

Through the previous studies, which we mentioned in the previous part, it became clear to us that the studies in the Arabic language that talk about the procurement and supply chain in the oil and gas sector were limited in number, in addition to that most of the studies dealt with parts related to regulations and laws, while others turned to environmental sustainability.

In addition to the lack of Arab studies that dealt with procurement as an independent variable and supply chain as a dependent variable in the oil industry and transportation in Egypt.

With regard to the current research, we may address each of the purchases as an independent variable and supply chain as a dependent variable, and we will add many drivers, which are represented in (Internal operations - Customer relationship management- Supplier relationship management- Information technology- Payment procedures- Shipping procedures), All of this will add importance to the oil and gas sector in Egypt in general.

The current study has also been applied to Gastec Company in Egypt to reach the biggest problems it faces in each of the procurement management and supply chain management.

8.2. Theoretical Framework:

8.2.1. Procurement: Review of Literature

Procurement is the process of finding and agreeing to terms, and acquiring goods, services, or works from an external source, often via a tendering or competitive bidding process (Brevis, 2014).

Procurement generally involves making buying decisions under conditions of scarcity. If sound data is available, it is good practice to make use of economic analysis methods such as cost-benefit analysis or cost-utility analysis.

Procurement is used to ensure the buyer receives goods, services, or works at the best possible price when aspects such as quality, quantity, time, and location are compared. Corporations and public bodies often define processes intended to promote fair and open competition for their business while minimizing risks such as exposure to fraud and collusion (Lee, J. 2016).

Almost all purchasing decisions include factors such as delivery and handling, marginal benefit, and price fluctuations (McManus, 2002).

Procurement Process

Procurement begins with the planning decision to make the purchase and this will involve in the first place, deciding whether there is a need for the particular goods or services, ensuring that the purchaser has the powers to undertake the transaction, obtaining any relevant approvals within the organization hierarchy and arranging the necessary funding. It critical for a thorough procurement planning as firms are always facing budget constraints that cannot satisfy all capital acquisition needs (Gianakis, 2001).

Procurement process can be divided into four different activities, or phases: planning, formalization, implementation, and evaluation. Procurement planning calls for early involvement of the purchasing office so that options and alternatives can be explored with the requesting user. Issues such as purchase estimates, product specifications, make or buy decisions, and outsourcing opportunities may very well be on the agenda. The process begins with procurement planning and ends with it after being formalized, implemented and evaluated (Drabkin, 2003).

Indeed, a mistake in procurement planning has far reaching implications on each and every other function of an organization and finally impact negatively on the overall performance of the firm (Ray, S. K.,2016).

8.2.2. Definition of Supply Chain Management

Supply chain management can be defined as the management of the flow of goods and services from the point of origin to the point of consumption. Transportation and storage of raw materials used in research, production, and fully furnished objects are also included (Trowbridge, M, 2015).

The primary purpose of supply chain management is to keep track of and connect the production, distribution, and shipment of goods and services. This can be done by companies who have a tight grip on internal stocks, production, distribution, internal productions, and sales (Ray, S. K.,2016)..

Supply chain management essentially combines supply and demand management. This employs a variety of ways and strategies to observe the entire chain and perform effectively at each and every phase. Each unit in the process should strive to reduce costs and assist organisations in improving their long-term performance while also adding value to their stakeholders and customers.

By eliminating superfluous costs, transfers, and handling, this technique will also lower pricing.

Different supply chain management concepts have been proposed by academics in the literature.

"Managing a network of relationships within a company and between interdependent organisations and business units consisting of material suppliers, purchasing, manufacturing facilities, logistics, marketing, and related systems that facilitate the forward and reverse flow of materials, services, finances, and information from the original manufacturer to the final," according to Stock and Boyer (2009).

Long-term goals, according to Williams (2006), include increasing supply chain partners' efficiency and effectiveness, increasing market share and income, and increasing customer satisfaction. SC's short-term goals include increased efficiency and decreased cycle time and inventory (Wisner & Tan, 2000).

SCM has the potential to deliver higher returns, lower operating costs and improve services (Ram, 2015). The great success of businesses such as Wal-Mart, Procter & Gamble, and Hewlett-Packard shows the strength of the advantages that SCM can gain from making successful use of this. Small

companies, along with large enterprises, should use these essential ideas in their corporate strategy, benefiting from their enterprise's early stages (David et al., 2013). In short, by making effective use of the supply chain practices, it is possible to create a balance between supply and demand.

"A supply chain," according to Chopra and Meindl (2007, p.3), "consists of all parties involved, directly or indirectly, in delivering a consumer request." The supply chain encompasses all functions involved in receiving and fulfilling a customer request inside each firm, such as a manufacturer. New product creation, marketing, operations, distribution, financing, and customer support are only a few of these functions."

According to Chen and Paulraj (2004), a typical supply chain is a network of materials, information, and services processing links with supply, transformation, and demand characteristics, as shown in Figure no.2.1:

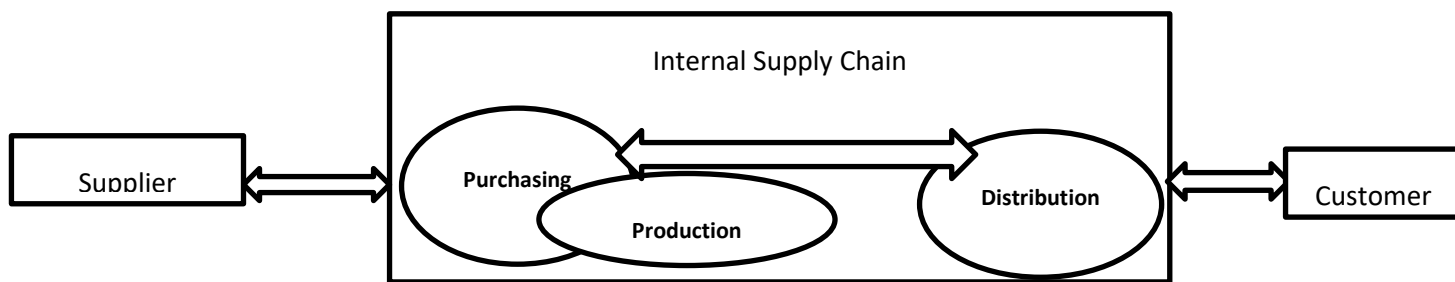


Figure no.2.1: An illustration of a company's supply chain

Source: Chen and Paulraj, 2004

Procurement, production, and distribution are the three conventional steps of the supply chain. Each of these steps could be made up of multiple facilities located all over the world (Ray, S. K.,2016). In the automotive business, for example, assembly plants are located in different nations than component suppliers, and distribution is global.

A supply chain, according to Mentzer et al. (2001, p. 4), is "a collection of three or more entities (organisations or individuals) actively participating in the upstream and downstream flows of products, services, funds, and/or information from a source to a customer." There are three levels of supply chain complexity, according to Mentzer et al. (2001): "direct supply chain," "extended supply chain," and "ultimate supply chain" (Figure no.2.3).

A central organisation, its suppliers, and its customers make up the direct supply chain (Figure no.3.3). In addition, the extended supply chain comprises the immediate supplier's suppliers and the immediate customer's customers (Figure no.2.3). All companies participating in all flows of products, services, funds, and information from ultimate suppliers to ultimate customers are included in the ultimate supply chain (Figure no. 3.3). In addition, functional intermediaries such as market research organisations, finance, and logistics service providers are included in the ultimate supply chain.

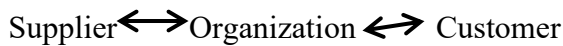


Figure 2.2 Direct Supply Chain

Source: Mentzer et al., 2001

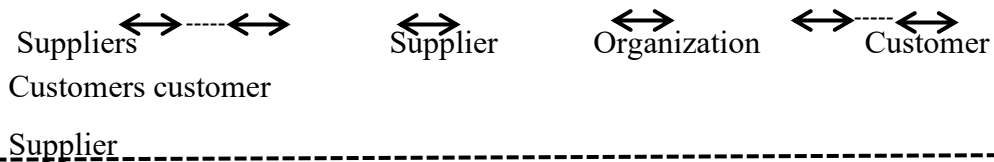


Figure 2.3 Extended Supply Chain

Source: Mentzer et al., 2001

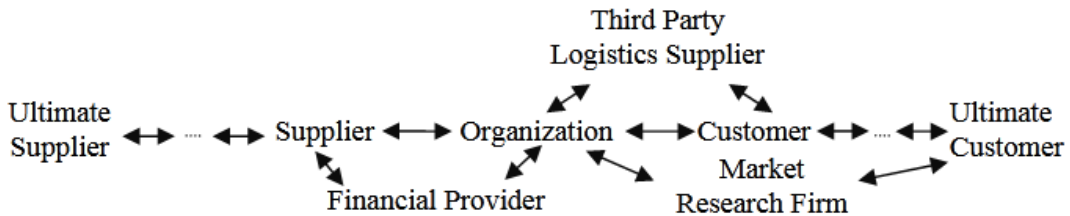


Figure 2.4 Ultimate Supply Chain

Source: Mentzer et al., 2001

The supply chain can vary in complexity depending on the number of participants and the variety of business processes, but there is always a core structure. This organization can control the complete supply chain or not, and even if it does not, the supply chain as an economic phenomenon still exists (Mentzer et al., 2001).

8.2.3. Supply Chain Performance:

As stated in the introduction, the costs of implementing and maintaining supply chain performance assessment systems outweigh the advantages. This is especially true for small businesses that may lack the money, time, or information needed to conduct the studies needed to optimize supply chain activities (Shepherd and Günter, 2006).

The literature review is on supply chain metrics and measurements in order to have a full grasp of supply chain metrics and measurement systems. They're mentioned in relation to the supply chain activities/processes of plan, source, make/assemble, and delivery/customer service (Gunasekaran et al., 2001).

8.2.3.1. Internal Operation:

Internal Operations means use of the Programs by your employees or those of your subsidiaries or parent company and for the performance of consulting or research for third parties who engage you as an employee or independent contractor (Trowbridge, M. 2015).

Internal Operations is consisted of managing whatever the company does to add value. For example, a manufacturer does “Production”, along with managing inventory of raw materials and finished goods, human resources, etc. Distribution Management deals with managing the customers and the relationships with them.

8.2.3.2. Supplier Relationship Management:

Managing relationships with vendors who provide a manufacturer with goods, materials, and/or services is known as supplier relationship management (SRM). It requires assessing each of those interactions and working out how to strategize to increase their performance in regard to a manufacturing organization.

This is accomplished by evaluating each vendor that provides goods or services to a manufacturer and deciding which one is most crucial to the company in terms of continuity and performance. Managers are able to build stronger working relationships with the suppliers they work with thanks to these evaluations (Trowbridge, M. 2015).

SRM is used by professionals involved in managing supply chains. They are the ones who are in frequent communication with vendors due to managing

procurement, project management and operations. That's why SMR is often referred to as supply chain management. It is also close to what's commonly called vendor management and procurement processes.

There are, however, differences between supply relationship management and these other related fields. Costs and service agreements between vendors and organizations are the aim of vendor management. The purchases themselves are the goal of procurement, in that it deals with the ordering, contracting, invoicing and paying off those procurements (David et al., 2013).

8.2.3.3 Customer Relationship Management:

Customer relationship management (CRM) is the combination of practices, strategies and technologies that companies use to manage and analyze customer interactions and data throughout the customer lifecycle. The goal is to improve customer service relationships and assist in customer retention and drive sales growth. CRM systems compile customer data across different channels, or points of contact, between the customer and the company, which could include the company's website, telephone, live chat, direct mail, marketing materials and social networks. CRM systems can also give customer-facing staff members detailed information on customers' personal information, purchase history, buying preferences and concerns (Trowbridge, M. 2015).

8.2.3.4. Information Technology:

Information technology (IT) is a broad professional category covering functions including building communications networks, safeguarding data and information, and troubleshooting computer problems.

Technology involvement in business world is inevitable. All activities within and between organizations engage some type of technology. However, high technology does not equal with high profitability (Porter, 1985). He argues that technological change is crucial merely when it has an effect on competitive advantage. Therefore value chain is the fundamental means to understand how technology can support a company in competitive advantage.

Supply chain is not only about physical flows, but also information flows. Information sharing among firms along supply chain plays a vital role in supply chain management. Information use is a secret to coordination activities and success is based on the smart use of information. In other words, information means nothing unless handling of information leads to proper

decisions. That is why information technology significantly strengthens effective supply chain. Putzger (2017) contends that successful performers focus on supply chain management and use information technology as the key criterion of choosing third party providers for both transportation and information management. Moreover, Nix (cited in Spiegel, 2007: S44) emphasizes the importance of technology by pointing out “Technology will help you do two things-transact faster and more accurately, and make better decisions”. It should be noted that information means nothing unless it helps to execute better decision.

8.2.3.5. Payment Procedures:

Payment Procedures are the practices set from time to time by the Chief Investment Officer for receiving payments from one or more of the Portfolios in which a Participant maintains an account.

8.2.3.6. Shipping Procedures:

It is the physical movement of goods from one point to another, such as the moving merchandise from the warehouse to the customer. The shipping process follows the manufacturing and the packing of goods and is controlled and overseen by a shipping or logistics company.

8.2.4. Types of Oil and Gas Industry:

The oil and gas industry is broken down into three main segments: upstream, midstream and downstream.

8.2.4.1 Upstream

Upstream businesses consist of companies involved in the exploration and production of oil and gas. These are the firms that search the world for reservoirs of the raw materials and then drill to extract that material. These companies are often known as "E&P" for "exploration and production" (Frittelli et al., 2014).

8.2.4.2. Midstream

Midstream businesses are those that are focused on transportation. They are the ones responsible for moving the extracted raw materials to refineries to process the oil and gas. Midstream companies are characterized by shipping, trucking, pipelines, and storing of the raw materials. The midstream segment is also marked by high regulation, particularly on pipeline transmission, and low capital risk. The segment is also naturally dependent on the success of upstream firms (Frittelli et al., 2014).

8.2.4.3. Downstream

Downstream businesses are the refineries. These are the companies responsible for removing impurities and converting the oil and gas to products for the general public, such as gasoline, jet fuel, heating oil, and asphalt (Frittelli et al., 2014).

9. Research Methodology

A research philosophy is a belief about the way in which data about a phenomenon should be gathered, analyzed and used. The term epistemology (what is known to be true) as opposed to doxology (what is believed to be true) encompasses the various philosophies of research approach. The purpose of science, then, is the process of transforming things believed into things known: doxa to episteme. Two major research philosophies have been identified in the Western tradition of science, namely positivist (sometimes called scientific) and interpretivist (also known as anti-positivist) (Galliers, 1991).

this research will use Inductive approach, also known in inductive reasoning, starts with the observations and theories are proposed towards the end of the research process as a result of observations, Patterns, resemblances and regularities in experience (premises) are observed in order to reach conclusions (or to generate theory).

This thesis used qualitative method to gain an understanding of underlying reasons, opinions, and motivations. It provides insights into the problem or helps to develop ideas for potential quantitative research.

The research embarked on descriptive research. Zikmund, et al (2003) defines a descriptive study as the type of research that describes characteristics of objects, people, groups, organizations, or environments and tries to “paint a picture” of a given situation. The study aspired at describing the developing procurement practices framework in oil & gas sector.

In this thesis the most suitable strategy that can be used is the case study; the reason why case study strategy was applied in this research because it is a design which helps the researcher doing a study on one or more people, also can be used for doing a study on a real-life case which is the case in that research.

A (single) case study was used in this thesis because the case here is typical and it gives us a chance to observe and analyze a phenomenon that is not considered by many here in Egypt.

Data collection process collected from 15-9-2022 to 1-11-2022. The researcher also conducts informal interviews as a Gastec employee.

This thesis also uses secondary data. Data used for a thesis that were originally collected for some other purpose (Zikmund et al., 2003.). Secondary sources included articles, books, journals, Newspapers, academic surveys and the Internet (Saunders et al., 2009). The researcher gathered information through literature review; from other literature authored by other writers which are relevant to the top of study this included journals, and books.

10. Gastec Case Study Analysis

According to the provisions of the Law of Investment No. 230 of 1989 and its amendments, and Law No. 159 of 1981 and its executive regulation, the Egyptian International Gas Technology (GASTEC), a company affiliated with the Egyptian Petroleum Sector, was established as a joint stock company in 1996 in accordance with the decree of the Minister of Economy and International Cooperation No. 125 for the year 1996.

Since more than 25 years ago, GASTEC has led the way in Egypt and the Middle East in the adoption of CNG as an alternative fuel for automobiles. The Company owns the largest network of filling stations in Egypt, as well as a sizable base of compressors with various capacities and a number of stations that are still under development. Additionally, it owns CNG car conversion facilities that operate at various capacities. include specialist CNG Cylinder Testing Facilities. It is noteworthy that the Company holds the highest market share among NGV companies in Egypt.

12.1. Analysis and Discussion:

Through the applied study in the fourth chapter, it is found the following:

According to hypothesis 1

H1: There is the significant relationship between develop procurement practices and internal operations of oil and gas sector.

Gastec was suffering from many problems, the most important of which is that the internal departments are not linked to each other by a unified electronic system, and that the company also does not rely on an electronic system in managing its procurement procedures, which is the core subject of the thesis.

According to hypothesis 2

H2: There is the significant relationship between develop procurement practices and supplier relationship management of oil and gas sector.

It was found that the company has a strong and long-term relationship with its suppliers, despite the small number of suppliers, which is something that the company must improve and working on obtaining a larger number of suppliers to rely on.

It was found that Gastec involves suppliers in most of the company's tenders and projects, but ignores their evaluation.

According to hypothesis 3

H3: There is the significant relationship between develop procurement practices and customer relationship management of oil and gas sector.

It has become clear to us that Gastec has a special department for customer's services and seeks to provide the best services and products to them, in addition to that it tries to solve their problems in a quick manner, but it lacks a way to measure the extent of customer satisfaction and loyalty.

According to hypothesis 4

H4: There is the significant relationship between develop procurement practices and (IT) information technology and procurement management in SC Process of oil and gas sector.

Gastec does not have EDI system, nor does have an ERP system. As research mentioned earlier, there is no electronic procurement system. Gastec relies on its traditional regulations and laws, which puts it at a low level due to the technological developments, especially after globalization. It was also found that Gastec relies on barcoding systems to facilitate the in and out material operations.

According to hypothesis 5

H5: There is the significant relationship between develop procurement practices and payment procedures of oil and gas sector.

As for the previous hypothesis, which are considered one of the most important objectives of this thesis, research found that Gastec pays to suppliers their dues on time as a governmental company and adheres to the regulations and laws, but Gastec faces a problem, which is change of

exchange rates, which causes many problems, and Gastec relies on providing many methods of payment, which it makes its customers satisfied, and the last problem here is the high price of shipping and customs clearance.

According to hypothesis 6

H6: There is the significant relationship between develop procurement practices and shipping procedures of oil and gas sector.

With regard to the last hypothesis of the thesis, which contains shipping and procurement procedures, as it is a governmental company, it requires many complex procedures and is characterized by stagnation. There are also problems related to the reorder procedures by Gastec, which causes delays in the goods and affects inventory stock operations.

Customs clearance procedures for imported materials are also considered one of the problems that cause delays. Paper transactions and documentation cycle, as research mentioned earlier, are stagnant, especially with regard to shipments and require a long time for receiving the original shipping documents from suppliers, which impedes the release of goods from ports and may cause many demurrage and storage fees on incoming shipments.

With regard to the CargoX system, it was found that some of the suppliers are able to deal through the CargoX and others are unable, as is also the case in the NAFEZA system that was recently implemented by the Egyptian government. Many workers are not trained enough to deal through the NAFEZA system in addition to suppliers, which negatively affects the purchase and supply procedures, as well as the letter of credits payment method, which was also applied recently by the central bank of Egypt, as it is one of the most obstacles, due to the lack of foreign currency, especially in light of the current circumstances, and finally the problems related to the ACID number, as it usually delay, and issuance at a time that suits Gastec, which impedes the operations.

13. Conclusion

In the area of oil and gas sector-based manufacturing, procurement is the connection process of purchasing and arranging in bound movement of all items, supplies, materials, parts, finished inventory and general support services from the suppliers into manufacturing process or assembly plants or warehouses (Rami,2018). The Egyptian International Gas Technology (GASTEC), a Company affiliated to the Egyptian Petroleum Sector,

established in 1996 as a joint stock company as per the provisions of the Law of Investment no. 230 of year 1989 and its amendments, and Law no. 159 of year 1981 and its executive regulation in accordance with the decree of the Minister of Economy and International Cooperation no. 125 for year 1996.

In terms of internal operations, Gastec was experiencing a number of issues, the most significant of which is that the internal departments are not connected to one another by a unified electronic system, and the business also does not rely on an electronic system to manage its procurement procedures, which is the thesis' main focus.

In terms of the management of supplier relationships within the company, it was discovered that despite the small number of suppliers, the company has a strong and lasting relationship with them. As a result, the company must improve this relationship and work to increase the number of suppliers it can rely on.

The majority of the company's projects and tenders found that Gastec involves suppliers, but ignores evaluation.

In terms of customer relationship management, it is evident to us that Gastec has a separate department for customer services and strives to offer the best services and products to them. In addition, it tries to quickly resolve any issues they may have, but it is lacking a method to gauge the degree of customer satisfaction and loyalty.

Research have discovered that Gastec does not have an EDI system or an ERP system in terms of information technology. There is no electronic procurement system, as research already said. Due to technological advancements, particularly after globalization, Gastec is at a low level because it relies on its traditional laws and regulations. Additionally, it was discovered that Gastec uses barcoding.

Regarding payment procedures, which are one of the thesis's primary goals, research discovered that Gastec, a government-owned company, pays suppliers on time and abides by the law. However, Gastec encounters a problem with exchange rate fluctuations, which creates a number of issues. As a result, Gastec relies on offering a variety of payment options to satisfy its customers. The last issue is the high cost of shipping an order.

As a governmental corporation, it necessitates numerous complicated procedures and is characterized by immobility with relation to the thesis's final axis, which includes shipping and procurement operations. There are other issues with Gastec's reordering processes, which slow down the delivery of the goods and have an impact on inventory stock operations.

Another issue that contributes to delays is the customs clearance processes for imported materials. As thesis previously mentioned, paper transactions and documentation cycles are sluggish, particularly when it comes to shipments. It takes a while for suppliers to provide the original shipping documents, which delays the release of goods from ports and may result in a lot of demurrage and storage fees on incoming shipments.

With regard to the CargoX system, it was found that some of the suppliers are able to deal through the CargoX and others are unable, as is also the case in the NAFEZA system that was recently implemented by the Egyptian government. Many workers are not trained enough to deal through the NAFEZA system in addition to suppliers, which negatively affects the purchase and supply procedures, as well as the letter of credits payment method, which was also applied recently by the central bank of Egypt, as it is one of the most obstacles, due to the lack of foreign currency, especially in light of the current circumstances, and finally the problems related to the ACID number, as it usually delay, and issuance at a time that suits Gastec, which impedes the operations.

14. Recommendations:

14.1. Internal operations

1. Gastec should take care of technological systems, such as EDI, and link internal departments to each other to keep pace with current developments.
2. Dispensing all the unnecessary work as a kind of waste and adopting the concept of sustainability in all of the company's operations.

14.2. Supplier relationship management

1. Reliance on an electronic system in the management of supplier relations in Gastec.

2. Gastec must rely on a larger number of suppliers, in cooperation with the procurement Department, as it attracts new suppliers and chooses the most suitable and best of them.
3. Reliance on the contracting system in dealing with suppliers to ensure price stability for the longest possible period.

14.3. Customer relationship management

1. Training employees in the customer service department on modern electronic systems in order to keep pace with the surrounding conditions.
2. Using modern and electronic systems to assess the satisfaction and loyalty of Gastec customers and conducting a periodic survey of customers in order to find out the weaknesses of the company and try to improve it.

14.4. (IT) information technology

1. Implementing an electronic procurement system and conduct a training program for all the employees in the procurement department in order to be able to work with.
2. Relying on inventory management systems such as ERP in order to avoid inventory shortages and paying attention to the re-order point.
3. Relying on an electronic system regarding the issuance of purchase orders and related approvals, as it reduces the time for that and eliminates unnecessary steps.

14.5. Payment procedures

1. Reducing paper transactions related to financial payment matters and trying to implement them through an electronic system.

14.6. Shipping procedures

1. Training both employees and clients on the CargoX system to avoid delays in issuing documents.
2. Training all employees on the NAFEZA system to prevent work disruption.

In addition to the above six drivers there are other recommendations regarding the Egyptian governmental procedures that must be taken into consideration in order to facilitate the process of oil and gas sector generally and Gastec specially

1. The Egyptian government should conduct training courses for all employees of the customs authority on the modern systems that have been applied.
2. The Egyptian government must provide training courses for the petroleum sector and provide them with the necessary facilities regarding the modern systems that have been applied.
3. The Egyptian government, in cooperation with the Central Bank, must provide the necessary currency to ensure the continuation of work without interruption (the letter of credit system).
4. Government support for raw materials for production and private use in order to prevent disruption of work.
5. Determine strict laws and regulations regarding the customs authority in order to prevent illegal practices and facilitate customs procedures.

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Appendix

Questionnaire Template

Dear Responded,

This study aims to assess your thoughts regarding the procurement and supply chain in Gastec Company. We shall be grateful if could voluntarily participate in this survey be responding to ff. statements.

Thank you

Section A

Name:

Gender: Male Female

E-mail:

Managerial Level: Top Management Middle Management Executive
Management

Experience: Less than one year from 1 to 3 years from 3 years to 7
Years

From 7 years to 10 years above 10 years.

Section B

Table research instrument

please note the figures on the tables below represent the following 1-Strongly Disagree, 2- Disagree, 3- Neutral, 4- Agree, 5- Strongly Agree, you may tick or circle them as you wish.

Thank you

Internal Operations					
The existence of a unified electronic system that links all the company's internal departments together	1	2	3	4	5
The extent of transparency, clarity and flexibility between the company's departments	1	2	3	4	5
Availability of an electronic procurement management system	1	2	3	4	5
Is the system used in re-ordering (Minimum-Maximum) periodically and continuously updated	1	2	3	4	5
Are the regulations and procedures of the company flexible due to the conditions of the external environment	1	2	3	4	5
SRM Supplier Relationship Management					
Gastec have longer-term relationship with suppliers	1	2	3	4	5
Gastec depends on Supplier involvement.	1	2	3	4	5
Gastec cares about Supplier feedback on their performance	1	2	3	4	5
The availability of a large number of suppliers dealing with Gastec	1	2	3	4	5
Supplier commitment to fixed price	1	2	3	4	5
CRM Customer Relationship Management					
Gastec have a customer relationship management system	1	2	3	4	5
Gastec depends on customer's involvement.	1	2	3	4	5
Does Gastec provide satisfactory maintenance times for its customers	1	2	3	4	5
The company provides all the required products and services to its customers on time	1	2	3	4	5
Does the company measure the satisfaction of its customers on a regular basis?	1	2	3	4	5
IT Information technology and procurement management in SC Process					

Gastec EDI to communicate between departments	1	2	3	4	5
Gastec have enterprise resource planning system “ERP”	1	2	3	4	5
Gastec used information technology employed at customer base.	1	2	3	4	5
Gastec have effective and transparency information flow throughout supply chain	1	2	3	4	5
Gastec used bar coding and scanner in logistics systems	1	2	3	4	5
Payment Procedures					
Gastec is obligated to pay the value of the goods to the suppliers on the specified dates	1	2	3	4	5
Does Gastec commit to a specific price to its customers or does it change prices constantly	1	2	3	4	5
There are multiple payment methods	1	2	3	4	5
Customs clearance and shipping price is reasonable	1	2	3	4	5
Shipping Procedures					
Is the time period for issuing the purchase order appropriate	1	2	3	4	5
The supply lead time is proportional to the company's stock	1	2	3	4	5
Favorable customs clearance time	1	2	3	4	5
Is the time to receive shipping documents from the supplier before the shipment arrives appropriate	1	2	3	4	5
The suppliers able to deal with CargoX	1	2	3	4	5
Is the company able to deal through the Nafeza program	1	2	3	4	5
The impact of the letter of credit on the supply chain of the company	1	2	3	4	5
Does the period of issuance of the Acid Number for the shipment affect the shipping process	1	2	3	4	5
Is the foreign currency needed for shipments available	1	2	3	4	5

تطوير إطار ممارسات الشراء في سلسلة التوريد لقطاع النفط والغاز

دراسة حالة لشركة فارتك في مصر

أ.ميرنا محمد مصطفى؛ د. خالد جابر عبد الله السقطي

المخلص:

الهدف الرئيسي من هذا البحث هو معرفة تأثير تطوير ممارسات الشراء على إدارة سلسلة التوريد. سيساهم تطوير ممارسات الشراء بشكل عام في حل إحدى المشكلات الرئيسية التي تؤثر على إجراءات سلسلة التوريد في الوقت الحاضر في مصر، وسيسمح على وجه التحديد لشركات النفط والغاز بإدارة مخاطر سلسلة التوريد وتحقيق الكفاءة التشغيلية. استخدم هذا البحث المنهج التحليلي والمنهج الوصفي من خلال المنهج الاستقرائي. استند هذا البحث إلى تحقيق يطمح إلى اختبار النظرية من خلال تطوير الأهداف المتعلقة بتأثير الشراء على أداء سلسلة التوريد. اختبرت الدراسة المتغيرات المذكورة ومن ثم تعديل النظرية في ضوء النتائج. لذلك، كان اعتماد النهج الاستقرائي مناسباً لهذه الدراسة. استخدمت الدراسة الاستبيان كأداة لجمع البيانات الأولية. ووجدت الدراسة أن شركة غازتك كانت تواجه عددًا من القضايا، من أهمها أن الإدارات الداخلية غير مرتبطة ببعضها البعض بنظام إلكتروني موحد، كما أن العمل لا يعتمد على نظام إلكتروني لإدارة إجراءات الشراء الخاصة به، وهو المحور الرئيسي للبحث.

الكلمات المفتاحية:

ممارسات الشراء، النفط والغاز، إدارة سلاسل التوريد.