

Raising Performance through Supplier Collaboration: Framework for Supplier-Client Service

SATYA SHAH, MAO LING, SYED HASAN
Centre for Global Logistics and Supply Chain Management
University of Bolton
Deane Road, Bolton
UNITED KINGDOM
s.shah@bolton.ac.uk

Abstract: - The research paper examines the Supplier Collaboration in Oil and Gas Industry in Malaysia. Relationship between buyer and supplier are getting more attention in the current supply chain management environment. Suppliers nowadays playing vital roles that they are not just able to supply products or services to their buyer but also play an important part to help buyer to meet buyer's business objective. Through supplier collaboration, both buyer and supplier can take care their own interest without neglecting each other's interest. To understand the research topic better, the paper aims to examine and analyse the concept of supplier collaboration, supply chain management and procurement, oil and gas industry in Malaysia, parties involved in oil and gas industry, and the inter-relationship between supplier collaboration and oil and gas industry. The paper also focusses towards the importance of supplier collaboration, while identifying the key barriers in implementing supplier collaboration and ways to overcome these barriers. The research intends to expand further this research with case study analysis in future work.

Key-Words: - Supplier Collaboration, Supply Chain Management, Oil and Gas Industry, Procurement and Supply

1 Introduction

Collaboration in any given supply chain network consisting of multiple parties including suppliers, manufacturers, distributors, and customers requires detailed understanding of all the business process acquired through all the parties that share each individual experience within the collaboration. Similarly, supply chain strategy examines the key relationship developed between the stakeholders (i.e. parties), its business processes and the key resources that are implemented to create any raw materials into finished end products. It is well known that supply and demand within any given business environment aims to focus heavily towards the relationship of the supply chain parties and to enable collaboration through all the parties within the given business environment.

Suppliers in any given environment aims to contribute towards the growth of the business. Suppliers are not just the providers or suppliers of products and service but are more of strategic partners and the growth function of any business environment. Procurement in oil and gas are split into two categories which are materials and services. Based on researcher's experience in the industry,

services procurement is more complicated compared to materials procurement as it does not come with well-defined specifications or brands. Services in oil and gas are much depending on the suppliers' technology or working method to carry out the works. This paper seeks to examine supply chain's supplier collaboration from qualitative conceptual framework that allows future research from operations research dimension. The evolving importance of supplier collaboration provides a unique proposition for both supply chain and operations management researchers to align their future directions within this area.

2 Background Literature

The literature examined within this study is focused towards the supplier collaboration specific to oil and gas industry within Malaysia. The paper aims to address this through current literature within the oil and gas industry, the relationship between supplier collaboration, both within supply chain management and procurement, the importance of supplier collaboration and the barriers encountered and ways to overcome these barriers in implementing supplier collaboration. The paper followed the research concept map as shown in figure 1.

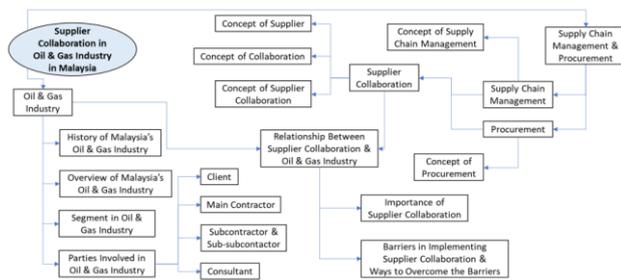


Fig.1: Research Concept Map

2.1 Supplier Collaboration

Supplier is the person or organization that provides product or services to another person or organization where in this research, contractor and subcontractor are considered as suppliers. Suppliers are one of the important elements in oil and gas industry as there is no organization that can provide all type of products and services due to many of them are unit and specific which require specialized suppliers to produce or to perform. Research highlighted that supplier would bring either positive or negative impact to the organization's performance [1]. Hence, it is important to engage the correct suppliers to serve the organisation. To highlighted, that correct suppliers here do not mean the lowest commercial suppliers but the suppliers with the best technical capabilities and reasonable price. Similarly, studies used Kraljic matrix to categories the supplier [2]. Kraljic matrix, also known as the Kraljic model, is an influential strategic tool which is developed by Peter Kraljic and it is used to differentiate the supplier according to each organization's risk and profitability [3]. Risk can be described as the potential or possibilities of something uncontrolled or unexpected loss whereas profitability can be termed as the capabilities or abilities of an organisation to generate a profit.

Collaboration is one of the important elements in undertaking business to achieve better performance and productivity [4]. Collaboration is where people working together to achieve a common purpose through direct or indirect means within a channel. There are two types of collaboration namely internal collaboration and external collaboration. Internal collaboration is also known as intra-organisation collaboration whereas external collaboration is known as inter-organisation collaboration. Internal collaboration involves the employees within the organisation across different disciplines, external collaboration involves the individuals or parties outside the organisation such as suppliers. Today,

supplier collaboration has become a common practice in supply chain management where buyer starts to concern on the supplier's interest [5]. However, in direct material or service, supplier collaboration is still an overlook element in supply chain where collaboration might only start when the supplier is awarded for the business [6]. This issue has occurred in purchasing behaviours in the past decades. During mid 1960s till late 1970s, supplier is not considered as value-added partner as the buyers only concern on the price [7]. However, beyond 2000s, there is increment in the level of awareness in supplier relationship. Other studies highlighted that information technology is an enabler in supplier relationship management where it helps to integrate the buyer and supplier [8]. One of the examples is supplier portal. Through the supplier portal, exchange of information happens, and subsequently, this will enhance or improve the relationship between buyer and supplier. There are three keys to develop a good supplier collaboration and they are listed as follows:

- Ensure internal collaboration is prior to establishing external collaboration
- Ensure the supplier collaboration designs are meeting the purpose
- Ensure transparency and trust in collaboration

2.2 Global Supply Chain and Procurement Practices

People often confused on the terms of supply chain management and procurement. Some people misunderstood that these two terms are having the same meaning but in fact, they do not. The definition and concept of these two terms will be explained separately in the following sections.

2.1.1 The Concept of Supply Chain Management

Supply chain management is combination of two terms which are supply chain and management. Supply chain is the network of materials, information and services which link suppliers and buyers together [9]. Various parties are involved in supply chain either directly or indirectly. Supply chain is not only involving the manufacturers (supplier of the materials or products) and suppliers, but it also involves other elements such as transporters, warehouses, retailers and the end users of the products or services. In other words, supply chain is the process of converting the raw material to product or service for the end customer [10]. Supply chain management in an easier way to explain is the managing of the supply chain process. It is always regarded that supply chain management enables to expand the value of customer and

increases the competitive edge for any businesses within the market. As such, every companies need to manage their supply chain well. Supply chain management enables companies to operate in lower costs, higher profits, and better operating efficiencies. However, there are challenges and obstacles within the supply chain management and one of it is collaboration with suppliers as identified through various literature studies within this area. One of the earliest studies identified the term “strategic alliance”, a supply chain partnership which is through relationship of two independent parties within the supply chains that aims on achieving specific objectives and mutual benefits in the given environment [11].

2.2.2 The Concept of Procurement

The procurement function in any given supply chain environment ideally involves purchasing and supply management along with the management of all inbound and outbound logistics activities. Manufacturing companies identifies that some of these activities takes most of the time during order processing, order fulfilment and order delivery through different means of transportation. These activities while are time consuming, have a major impact on the effectiveness and responsiveness of the firm [12]. Similarly, the selection of suppliers also has an integral role towards the lead times of the orders placed within the organisation. This in turn impacts the overall cycle time due the processing of the transaction within the procurement processes. Researchers have identified that any strategic sourcing, purchasing and flexibility of the businesses improves the overall performance of the supply chain and thus the procurement practices within the firm [12].

2.2.3 Oil and Gas Industry Environment

Malaysia’s first oil well was on Canada Hill in Miri, Sarawak, discovered by Shell in year 1910 and this marked the beginning of Malaysia’s oil and gas industry. The first discovered oil well is known as “Miri No. 1” and it was drilled on 10 August 1910 with an initial production of 83 barrels per day in December and it reached a maximum of 15,000 barrels per day in year 1929 [13]. Today, “Miri No. 1” is also affectionately recognized as “The Grand Old Lady”. Since the discovery of first oil well in Sarawak, the development of Malaysia’s oil and gas industry began to increase rapidly with more and more discovery of oil and gas fields, subsequently, more investment from the foreign oil companies and numerous jobs or employment opportunities were created within the country. In August 1974, the

national company of Malaysia, Petroliaam Nasional Bhd’s (Petronas) was established. The oil price collapse which began since year 2014 has unfavorably affected the oil and gas companies in Malaysia. Many companies were having slashing budgets and re-evaluation on investment decisions to either terminate or defer projects which may not profitable during that challenging market conditions. In year 2019, five years after the 2014 global oil price dip, Malaysia’s oil, and gas industry, the second highest export earner after electrical and electronics [14], is observed to have recovered moderately due to the more stabilizing oil prices.

Client	Client is known as owner for a project, client is someone who pays for the good and services, and categorised in three categories as [15]: <ul style="list-style-type: none"> ▪ <i>Public</i> –two subdivisions as national and local. ▪ <i>Private</i> two subdivisions as industrial and services. ▪ <i>Mixed</i> –subdivisions as public and private enterprise. Client is exposed to many problems as they require to deal with numerous parties and some others unpleasant or unfavourable conflicts [15]. Hence, by having a good supplier, client can reduce and minimise the potential of unanticipated problems or issues that will cause headache to them such as project fall behind schedule.
Main Contractor	In oil and gas industry, sometime one project will have one or more main contractor to serve the client where the client splits the project into several scopes, due to the complexity of the project. Each main contractor has their own strength and capabilities to perform different specialisations such as fabrication, transport and installation, engineering and/or construction. Once main contractor is being awarded for a project, they start planning project execution, including engaging subcontractors to provide certain specific materials or services.
Subcontract or and Sub-subcontract or	Subcontractors are engaged by main contractor as main contractor may not have skills or resources to supply certain products or to perform certain services. This also occurs when subcontractor engages sub-subcontractors. However, for main contractor and subcontractor to further subcontracting out the work scope, it will require approval first.
Consultant	Consultants are usually involved at the initial stage of a project or operation. Consultants will be responsible to analyse and design, subsequently, propose or recommend the best design solution to client with consideration of both technical and commercial parts to meet client’s requirement and budget. Consultants are normally involved at Front End Engineering Design (FEED) stage and in certain project, client will continue to hire them at Engineering, Procurement and Construction (EPC) stage as consultant for them to check or verify the engineering work of main contractor.

Table 1, Parties Involved in Businesses

Generally, oil and gas industry are categorized into three main sectors, which are upstream, midstream, and downstream. The upstream segment is also commonly known as exploration and production, which mainly participating in activities associated to searching for, recovering, and producing crude oil and natural gas deposits. Midstream segment encompasses activities such as processing, storing, shipping, or transporting of the raw crude oil and natural gas production from upstream segment to downstream segment. As the last link in the industry's value chain, the downstream segment is responsible for the refining, marketing and distribution of the petroleum products developed from the raw crude oil and natural gas production obtained from upstream segment. Same as other industries, various parties are involved in oil and gas business or developments. All these parties collaborate and cooperate to ensure a project can be delivered successfully with quality assurance as well as within the established budget and schedule. This involves parties such as client, main contractor, subcontractor, sub-subcontractor and consultant. Here, besides client, the other parties can act as supplier's role. For example, main contractor is supplier to client and subcontractor is supplier to main contractor. All these parties are vital elements to form a team and a great team will deliver a great project.

2.2.4 Relationship Between Supplier Collaboration and Oil and Gas Industry

As highlighted in the paper, Malaysian Oil and Gas sectors are now gradually recovering from the oil price collapse. However, oil and gas companies could not operate like during the high oil price era as cost optimisation or cost efficiency is the main objective of every project or operation in the current market condition. From a business perspective, it is undeniable that every companies no matter client, main contractor or subcontractor, they always aim to get more profits with reasonable investment cost. However, for example, in an extreme case, client may try to pressurize the main contractor to execute a project with a relatively low budget, consequently, the same pressure will be passed or transferred from main contractor to subcontractors. At the end, the one who will be suffered the most is mainly the lower tier subcontractors or suppliers. To avoid such scenario, a good relationship or collaboration between every parties involved in a project should be maintained. Further, supplier collaboration is important for oil and gas industry as the industry is involved with high risk in terms of safety and price. Studies suggested that oil and gas companies need

to collaborate and cooperate with their supplier to create supplier-led solutions which would bring profit to both parties [16].

2.2.5 Importance of Supplier Collaboration

Supplier collaboration of firm is determined by the extent to which they can share information and are involved in planning and problem-solving practices with a common interest to fulfil [17, 18]. Similarly, earlier research studies have identified that supplier partnership and collaboration allow other supply chain partners to learn on best practices, processes and methods [18]. Other areas such as knowledge creation, new product development and operational efficiencies are also achieved through supplier collaboration within supply chains [19]. Within this context, suppliers sharing of information about products and services, the production processes and methods enables manufacturers to develop more practical and resourceful production strategies to enable them produce goods and services on time while improving the inventory controls and delivery performances within the organisation [17]. However, as supplier collaboration aims to facilitate businesses to relate more closely to both internal and external knowledge allowing them to make timely and strategic decisions for the benefit of all the partners within the supply chain.

3 Barriers in Implementing Supplier Collaboration and Ways to Overcome the Barriers

Earlier studies present four barriers which can caused supplier collaboration fail and they are described separately as follows [22]. Although supply chain collaboration between different businesses and partners tends to provide a more competitive advantage, but lack of information sharing and knowledge development, and awareness towards one of the barriers in implementing supplier collaboration is considered as one of the most important barrier for supplier collaboration [23].

3.1 Buyer Resistance to Change

The buyer resistance to change is where there is wall of resistance in the buyer's organisation to resist the change [20]. Supplier collaboration is the business strategy of buyer which require internal effort to change the internal process. However, the changes will cause the buyer's employee to leave from their comfort zone due to change in culture, working method and process. The resistance to change will cause supplier to be not able to work

better or to work closely with buyer. Internal collaboration needs to be strengthened prior reaching out to supplier. Management needs to explain to their employees and ensure that they understand the company business strategies so that everyone is committed to the same objectives. Effective and regular communication is required to make sure everyone in a team is updated or informed on the project progress.

3.2 Lack of Security Guarantee

Security is one of the main concerns for collaboration. Supplier and buyer are reluctant to share all their data closely because from supplier's perspective, certain products or service data are their proprietary data whereas from buyer or client's standpoint, they are worried and afraid that their data such as production and inventory data may leaked to their competitors. To be able to move collaboration further, system security issue need to be resolved to ensure the concerns for all parties are insured. Investment in technology or software is required.

3.3 No Win-win Situation

Each party has their own interest to take care and this can cause collaboration to fail. The key interest of buyer or client is about getting the highest profit they can get which means the lowest investment cost. For example, buyer will tend to ask for the lowest cost from supplier, however, this is not a favorable situation for supplier as in this case, if supplier still want to secure the project or job scope, supplier will need to comply with buyer's request by bearing the cost. Buyer need to understand that supplier is not just "supplier" but also partners to them. Close relationship needs to be taken care by maintaining regular communication and visibility of information to supplier. Also, offering a better payment term and pay on time to supplier will help to show that buyer is a reliable and trustworthy customer to them.

3.4 No Commitment from Supplier

Finally, supplier's commitment is crucial to make sure the success of supplier collaboration. Massive communications and commitments are required during collaboration process in which some supplier may find it troublesome or cumbersome to be practiced. Certain suppliers will even presume that collaboration will fail before initiating it and such thinking will cause them to be more reluctant to cooperate and commit in the process. Communication is the key to build trust with suppliers. Suppliers need to have visibility on the

buyer's plan so that they can support the project in a better and more efficient way. Trainings and supports need to be provided to supplier. Studies found out that there are issues occurred between main contractor and subcontractor in construction industry [21]. The issues are contractual issues, time and cost overrun, project delay, trust issue, lack of quality, lack of communication, contractor's financial problems, changes in material and labour cost, conflict of scheduling and planning, lack of safety, incomplete working drawing, shortage of construction materials, shortage of skilled labors, termination of work, incorrect pricing and act of God factor. The aforementioned factors may also affect the collaboration in oil and gas project as the parties involved are about the same for both construction or oil and gas industry except the scale of the projects [21].

3 Proposed Research Framework

The conceptual framework shown in figure 2 is developed to address some of the research questions derived through this study and as identified within the literature.

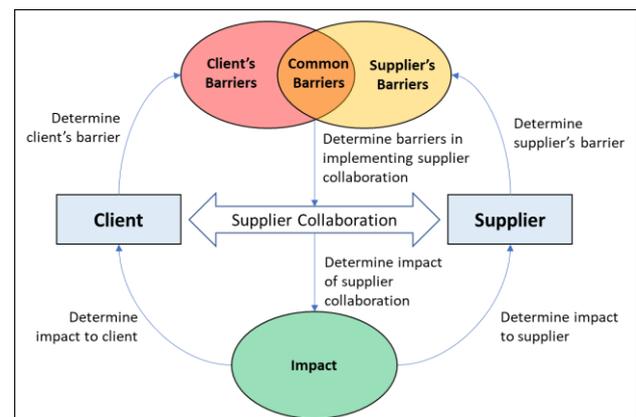


Fig 2 Research Conceptual Framework

This paper presents the initial plans for the proposed research framework intended to be adopted in future research studies. The paper provides an overarching view of the research framework and the key research questions that are identified through part of the literature studies presented within this paper.

- How supplier collaboration impacts the procurement of Malaysia's Oil & Gas Industry?
- What is the exposure of supplier collaboration concept in Malaysia's Oil and Gas Industry?
- What are the key challenges and opportunity in increasing the supplier collaboration in Malaysia's Oil & Gas industry?

4 Conclusion

This paper examined the review on the supplier collaboration and oil and gas industry. Supplier collaboration is believed to be able to help both buyer and suppliers gain advantages throughout the process. Awareness of importance and advantages of supplier collaboration is increasing but there are barriers or challenges in implementing it in each organisation. The level of supplier collaboration in Malaysia's oil and gas industry is unknown yet as there is less research on this industry. The research extends the scope on further understanding and research development to the extent on the importance of supplier collaboration is relevant within Oil and Gas sector. The research is targeted to study the supplier collaboration in oil and gas industry in Malaysia. However, there are still certain undiscovered areas which can be further studied. As future work recommendation, some areas as:

- Similar studies with larger population size expanded to South East Asia or even Asia Pacific region.
- Qualitative methods be used in view to have a deeper understanding on the problems by studying opinions and thoughts from interviewers.
- Focused study group such as client only to have a clearer understanding on the issues.

The study presented within this paper aims to provide valuable direction through the identification of research gaps for any future studies and investigations towards supplier collaboration within oil and gas industries, especially due to the limitation on "collaboration" and "supplier collaboration" literature, specific to oil and gas industries, and any specific methods or practices that have been adopted to address it.

References:

- [1] Amindoust, A., Ahmed, S. and Saghafinia, A., Supplier selection and performance evaluation of telecommunication company. *American Journal of Engineering and Applied Sciences*, 5(1), 2012
- [2] Botes, A., Niemann, W. and Kotzé, T., "Buyer-supplier collaboration and supply chain resilience: A case study in the petrochemical industry". *South African Journal of Industrial Engineering*, 28(4), 2017, pp.183-199.
- [3] Kraljic, P., Purchasing must become supply management. *Harvard Business Review*, 61(5), 1983, pp.109-117.
- [4] Collymore, R.S., *The Eight Principles of Doing Business with Collaboration in the Earth*. Author House, 2015
- [5] Boyce, W.S., Mano, H. and Kent, J.L., The influence of collaboration in procurement relationships. [Online] Available at: <https://arxiv.org/ftp/arxiv/papers/1701/1701.02647.pdf> [Accessed 17 Oct. 2020], 2016
- [6] Payne, J. and Dorn, W.R. *Managing Indirect Spend: Enhancing Profitability Through Strategic Sourcing*, 557. John Wiley & Sons, 2011, pp 252-253
- [7] Lysons, K. and Farrington, B. *Purchasing and Supply Chain Management*. Pearson Education Limited, England, 2012, pp 11-12
- [8] Verweij, H. and Peek, L., 2013. Supplier Relationship Management: How key suppliers drive your company's competitive advantage. Netherlands: Pricewaterhousecoopers. [online] Available at: <https://www.pwc.nl/nl/assets/documents/pwc-supplier-relationship-management.pdf> [Accessed 10 Oct. 2020].
- [9] Chen, I.J. and Paulraj, A. Towards a theory of supply chain management: the constructs and measurements. *Journal of operations management*, 22(2), 2004, pp.119-150.
- [10] Felea, M. and Albăstroi, I. Defining the concept of supply chain management and its relevance to Romanian academics and practitioners. *Amfiteatru Economic Journal*, 15(33), 2013, pp.74-88.
- [11] Maloni, M.J. and Benton, W.C. Supply chain partnerships: opportunities for operations research. *European journal of operational research*, 101(3), 1997, pp.419-429.
- [12] Bag, S., Wood, L.C., Mangla, S.K. and Luthra, S. Procurement 4.0 and its implications on business process performance in a circular economy. *Resources, Conservation and Recycling*, 152, 2020, p.104502.
- [13] Quoquad, F., Md Husin, M., Mohammad, J. and Hassan, A. *A Handbook of Malaysian Cases: Contemporary Issues in Marketing & Management*. Singapore: Partridge Publishing Singapore, ISBN: 978-482881349, 2016
- [14] Bernama.com., Oil & gas remains govt focus area. [online] Available at: <http://bernama.com/en/news.php?id=1693239> [Accessed 20 Nov 2020], 2020.
- [15] Boyd, D. and Chinyio, E. *Understanding the construction client*. John Wiley & Sons, 2008
- [16] Barbosa, F., Hart, J., Santoni, G. and Seitz, T., Reimagining supply-chain collaboration in a low-oil-price environment. [online] McKinsey

- & Company. Available at: <https://www.mckinsey.com/industries/oil-and-gas/our-insights/reimagining-supply-chain-collaboration-in-a-low-oil-price-environment> [Accessed 17 Oct. 2020], 2019
- [17] Ho, H.D. and Lu, R. Performance implications of marketing exploitation and exploration: Moderating role of supplier collaboration. *Journal of Business Research*, 68(5), 2015, pp.1026-1034.
- [18] Cheung, M.S., Myers, M.B. and Mentzer, J.T. Does relationship learning lead to relationship value? A cross-national supply chain investigation. *Journal of operations management*, 28(6), 2010, pp.472-487.
- [19] Cao, M. and Zhang, Q. Supply chain collaboration: Impact on collaborative advantage and firm performance. *Journal of operations management*, 29(3), 2011, pp.163-180.
- [20] Webb, J., 2015. Why Supplier Collaboration Projects Keep Hitting the Wall. [online] Forbes.com. Available at: <https://www.forbes.com/sites/jwebb/2015/11/23/why-supplier-collaboration-projects-keep-hitting-the-wall/#3dc7f9483501> [Accessed 16 Oct. 2020].
- [21] Lagiman, S. *Improvement of relationship between main contractor and subcontractor for successful construction project implementation* (Doctoral dissertation, Universiti Tun Hussein Onn Malaysia), 2017
- [22] Sumner, W. Overcoming Barriers to Supplier Collaboration. [online] Orafaq.com. Available at: <http://www.orafaq.com/papers/WP-OvercomingBarrierstoSupplierCollaboration.pdf> [Accessed 18 Oct. 2020], 2005
- [23] Ramesh, A., Banwet, D.K. and Shankar, R. "Modeling the barriers of supply chain collaboration", *Journal of Modelling in Management*, 5(2), 2010, pp. 176-193