The Exploration of collaborative supply chain factors in the oil and gas industry

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Abstract

Recent investigation on supply chain collaboration practices in the Oil and Gas industry reveals that there is limited research on supply chain collaboration (SCC). This calls for further exploration of the literature on collaborative supply chain and the factors of SCC in other industries to understand and identify the extent of SCC that exist in the industries. The study explored the systematic literature of two significant databases (Scopus and OnePetrol) to collect related publications on existing collaborative supply chain factors and its extents in almost all sectors. The findings suggest that information sharing, trust, and information technology are three crucial factors of a collaborative supply chain that contributes to performance improvement and effective supply chain system in most organisations. This study suggests that the identified factors have the potentials to enhance the oil and gas industry if implemented to achieve the outlined improvements obtained across other industries.

Keywords: Supply Chain Collaboration, Supply Chain Management, Factors, Oil and Gas Industry

1.0 Introduction

Over the past two decades, globalization has prompted significant breakthroughs in business with organizations gaining more and more competitive advantage. However, these benefits are hindered by some specific factors which affect how organizations plan and achieve their business goals. To understand these factors, an in-depth understanding of the supply chain as well as collaboration becomes vital, especially for the oil and gas industry. The oil and gas industry is an industry that has very active participants in the global market, especially for the downstream sector where products are refined and sold to the final consumers. Perhaps, during these processes including Exploration, extraction, and mining; information sharing, equipment, as well as knowledge-based services provided by participants of which there is no documented procedure of how these participants work together to achieve their aims. This research focuses on the exploration of the factors of collaborative supply chains for the oil and gas industry using a systematic literature review approach.

1.1 Definition of Supply Chain Concepts

According to Oxford (2019), the supply chain is the collection of processes engaged in a product produced and distributed to the end-users. Furthermore, the supply chain is an interconnected and sequentially interlinked value system of product suppliers, manufacturers, distributors, and retailers operating together with the primary purpose of creating product values for the end-users (Peng Wong & Yew Wong, 2008). Wang, Wallace, Shen, and Choi (2015) further noted that the supply chain is the movement of goods and services from the points of initiation to the points of consumption. In this regard, our study prescribed that the "supply chain" is the process of transferring products and services from one location (point of origin) to the destination (end-users). Lack of coordination of products and services during supply chain activities call for supply chain management (SCM) research.

SCM has been described as the process of planning, controlling and monitoring of dependent organizational network which promote various types of product movement from the point of the producer to the location of the final consumer to optimize the productivity through operational efficiencies and achieving potential customer satisfaction (Heckmann, Comes, & Nickel, 2015; Stock & Boyer, 2009). Routroy and Behera (2017) argued that SCM is used to inter-link main business activities and business operations in a consistent and high performance within an organization. Farooque, Zhang, Thürer, Qu, and Huisingh (2019) added that SCM is the management of products, information, and flow of capital as well as collaboration between organizations along with supply chain processes. SCM can also be further described as a cooperative technique for connecting company business operations to acquire a common goal, market opportunity and to incorporate all strategic business activities all over the supply chain (Kotzab & Otto, 2004).

Besides, Kauffmann and Carmi (2019), Collaboration is a procedure where separate individuals or entities act together through informal and formal compromise. Allaoui, Guo, and Sarkis (2019) further defined collaboration as a process where two unrelated companies work together to determine how risks, mutual goals, resources, and information are among the collaborators. Additionally, the collaborators in agreement develop rules, regulations, and framework for their relationship as well as decide ways to behave and agree on issues that brought them together to have maximum efficiency in their mode of operations. Collaboration enables the partners to achieve more significant results and benefits, which an individual entity will not achieve alone. Nevertheless, collaboration is a vital tool that a firm use to solve its challenges on their own to accomplish expected performance metrics, and it enables collaborative team members to support one another and share their experiences proactively.

Conversely, for effective SCM, there is a need for collaboration to exist among SC partners. Supply chain collaboration is the procedure where two or more independent organizations work together alongside the supply chain for optimization of product delivery to the end-users. Furthermore, for corporations that offer services, supply chain collaboration can be referred to as a cooperative strategy where two or more entities (individuals or firms) work together to generate mutual advantages (Simatupang & Sridharan, 2007). supply chain collaboration is the main driver for the adequate performance of organizations that wants to sustain a competitive advantage. The benefits of supply chain collaboration are enormous, and among these benefits is a competitive advantage. However, some authors have outlined that most of the reasons why firms get involved in supply chain collaboration include continuous development, capacity improvement, mutual benefits, and maintenance (Hardy, Phillips, & Lawrence, 2003; Liao, Hu, & Ding, 2017). Other benefits of supply chain collaboration include knowledge sharing/creation, minimize the cost of purchasing, communication, supply chain innovation, increase innovative capability, thereby improving supply chain performance. (Hui, He-Cheng, & Min-Fei, 2015; Liao et al., 2017; K. Singh & Mitchell, 2005). supply chain collaboration and collaborative practices allow information exchange as well as enable the members to have accurate forecasts (Pradabwong, Braziotis, Tannock, & Pawar, 2017).

Furthermore, supply chain collaboration is drive by many factors of which Pradabwong et al. (2017) outlined that Supply chain partners focus on the expansion of profits and mutual benefits through the process of adequate planning and distribution networks. Also, they highlighted that most organizations collaborate with others to combine resources and expand their capability, thus improving organizational performance, unlike when working independently. Perhaps, Liao et al. (2017) suggested that every firm that partakes in the collaboration process should have the same goal which will involve joint activities that will enable such a relationship that exists between the member to last for a more extended period. These factors, among many others, will sustain collaborative practices when effectively applied.

The extent of supply chain collaboration is measured using various metrics. Among these metrics, Liao et al. (2017) outlined three dimensions on which supply chain collaboration can be measured, such as incentive alignment, joint decision making, and information sharing. These metrics highlight the level of supply chain collaboration practices performed by organizations involved in the collaboration.

There are many supply chain collaboration practices that differ from one industry to another, of which researchers have explored these diverse industries and organizations involved in supply chain collaborative practices. Among these industries, the retail industry, agriculture, manufacturing, as well as automotive industries, have well advanced collaborative frameworks for practising supply chain collaboration (Zacharia, Nix, & Lusch, 2009). However, there is no existing documented literature for practising supply chain collaboration in the Oil and Gas industry except research on the impact of supply chain management approaches on supply chain performance for the Iraqi Oil and Gas industry (Al-Douri, J.A, 2018). Although this paper identified critical SCM approaches for improving performance in Iraq, the authors did not consider collaboration holistically. Perhaps, we extend the research on supply chain collaboration to the Oil and Gas industry. This paper focusses mainly on the supply chain collaborative practices as well as the factors of supply chain collaboration in the Oil and Gas industry.

The subsequent parts of this literature review are as follows: Part 2 introduces the Oil and Gas Industry. Section 3 details the literature exploration techniques, while Part 4 presents the identified vital factors of supply chain collaboration in the Oil and Gas industry. Part 5 outlines the discussion, and part 6 offers the conclusion.

2.0 The Oil and Gas Industry

The oil and gas industry is one of the booming industries that contribute heavily to the world and national economic growth, and it provides the foundation that enables a nation to improve on its economy. The industry is one of the largest market sectors in the world. The Oil and Gas industry is further segment into three sections: which are upstream (Exploration, drilling, and production), mainstream (transportation, processing, and storage) and downstream (refining, marketing, and Distribution). However, the prior study refers that the cost operations in the oil and gas industry are high, and there is a need for supply chain collaboration to avert these challenges (Amu & Ozuru, 2014). Therefore, the supply chain network in the industry will work more effectively by determining the extent of supply chain collaboration and its factors towards improving supply chain performance in the industry. The factors for effective supply chain collaboration are information technology, information sharing, knowledge sharing/creation, commitments, incentive alignment, Trusts, discussion making, communication, and Resource sharing, etc. However, research conducted by prior researchers indicates that the industry is still lacking a universal solution to the oil and gas supply chain process.

Nonetheless, the absence of supply chain collaboration among the oil and gas stakeholders also lead to a fall in oil prices and lack of market growth in the supply chain. Lack of collaboration between supply chain partners such as the national corporation, global and local expertise have negative impacts on the oil and gas industry. Many organization in the industry requires supply chain collaboration to improve its performance. This research first will focus on the collaborative practices that exist within the upstream, mainstream, and downstream oil and gas industry using a systematic literature review approach.

3.0 Literature Exploration Techniques

The research outlines a comprehensive systematic review of the literature on factors of supply chain collaboration for performance enhancement in the said industry to understand collaborative practices in the industry. Furthermore, this research adopted the methods recommended which involve strategic actions such as; data collection, descriptive analysis, categorization analysis, and finally evaluation and interpretation, suggested by Chen et al. (2017); Krippendorff (1980).

This study focuses solely on supply chain collaboration in the oil and gas sector as its scope mainly because of the high ranking of the industry as well as the fact that there were few published papers on supply chain collaboration in Oil and Gas, making it an exciting area of Exploration. The sector has three segments: first, the upstream comprises of exploration, drilling and production activities. Secondly, the midstream which serves as the middleman between the upstream and downstream provides activities like storage and transportation of crude oil from the upstream to downstream. Lastly, the downstream includes activities like oil refineries, marketing, logistics and end-users, (Amue & Ozuru, 2014). Figure 1 highlight the primary operations of each sector of the oil and gas industry, where supply chain collaboration and supply chain management is applied. For a proper understanding of the critical factors affecting supply chain collaboration in the Oil and Gas industry, the next section of this research introduces a systematic literature review (SLR) as a method used to outline the findings.

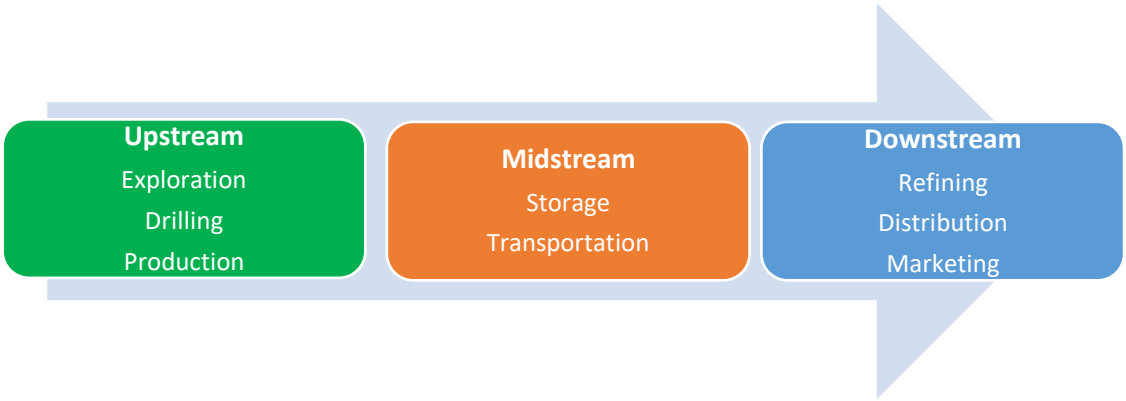

Figure 1 Components of the Oil and Gas Industry

3.1 Data Collection

This study explored the SLR approach to provides a step by step procedure used to obtain the papers used for the review To accomplish the research goals, SLR aims to provide a detailed and comprehensive report of existing evidence applicable to the research topic. The SLR is the purposeful use methods to capture existing relevant data, thoroughly analyze research papers to extract findings through quantitative or qualitative analysis (M. Ralston, Richey, & J. Grawe, 2017; H. Singh, Garg, & Sachdeva, 2018). Besides, it enables the research team to develop a broad or narrow scientific research question and to classify research that is related to the research aims. A study by Duong and Chong (2020) further added that SLR is used to generate robust knowledge concerning research gaps and equally improve practices. Finally, this study evaluates previous research in assessing the level of supply chain collaboration and its factors, current trend, and future direction, which lead to understanding what it is required when considering factors of supply chain collaboration. The subsequent paragraphs outline the search methods, article selection criteria, categorization analysis, and data characteristics.

The research identifies three potential extensive repositories for abstract and high citation databases such as OnePetrol and Scopus database. The study omitted google scholar due to its limited data accuracy and reliability, which raises concerns about its analysis suitability. Keywords used in Table 1, indicated that there are no articles identified in OnePetrol database; therefore, the authors focus on the Scopus database to generate prior studies for this research.

The literature search is group into two main sections which are "exact" keywords which include ("supply chain collaboration" AND Factors), (supply chain collaboration AND Factors AND "Oil and Gas"), and the synonyms of supply chain collaboration. The search with oil and gas exact keywords on Scopus revealed that there is just one published work on supply chain collaboration in the Oil and gas Industry. The literature highlights the need for further research to identify the factors that generally affect supply chain collaboration in the Oil and Gas industry. This study includes articles published from 2008 until January 2020, which was the number of years that the Scopus database covers the search keywords, as shown in Table 1. Nevertheless, the whole filtering criteria outlined in Table 1 for clarity.

3.1.1 Selection Method

The articles included and exempted at the selection level were filtered by reading through the titles, abstracts, keywords, and conclusion. By going through the abstract, the academic materials which covered the area of "factors of supply chain collaboration" and "oil and gas industry" context recorded. This process further reduces the number of identified literature to 57 that are related to the research keywords, while 45 publications excluded for not being relevant to this research. At this stage, this study removes 20 duplicate articles, and further examine the reference of the selected studies. This research captured 16 cross citations of

reference through those chosen articles. This study carried out its investigation with a total number of 73 prior studies and further download the papers and examined them thoroughly, to provide a systematic review for this research.

Table 1 Literature search keywords and criteria

Keywords Search	No. of articles	Criteria	No. of articles
"Supply Chain Collaboration" AND Factors	138	Publication stage (final), document type (article, review), Keywords (supply chain collaboration), Source type (journals), Language (English)	50
		Reading of titles, abstracts, and keywords	40
"Supply Chain Collaboration" AND Factors AND "Oil and Gas"	1		0
"Supply Chain Collaborat*" OR "supply chain partners*" OR "supply chain alliance" OR "supply chain relation*" OR "supply chain coordinat*" AND Factors	708	Publication stage (final), document type (article, review), Keywords (supply chain collaboration), Source type (journals), Language (English)	49
		Reading of titles, abstracts, and keywords	37
"Supply Chain Collaborat*" OR "supply chain partners*" OR "supply chain alliance" OR "supply chain relation*" OR "supply chain coordinat*" AND Factors AND "oil and gas."	2		0
Cross citation articles			16
		Duplicates articles	20
		Reviewed articles	73

The next section highlights the categorization analysis of this research applied.

3.2 Descriptive Analysis

The descriptive analysis presented the opportunity to analyze the research publications in supply chain collaboration over time. These publications were analyzed based on the year of publication in all the journals cited. **Error! Reference source not found.**: presented the papers that are focused on factors of supply chain collaboration in every industry. The identified literature provide evidence of failure in supply chain collaboration and the criticalities towards customer demands. There is a large and diverse competitive environment, aiming to determine the factors for sustaining supply chain collaboration in the oil and gas industry. In this regard, various authors have conducted a series of research to determine the coefficients for improving supply chain collaboration in other sectors. The summary of these results shown in **Error! Reference source not found.** outlines that there is unsustained research output within the field

for the period of 2008 to 2020, with the highest publications produced in 2018, closely followed by 2015.

3.3 Data Evaluation and Analysis

At this stage, the literature that most discussed the factors of supply chain collaboration for more than one decade is evaluated and analyzed. This study characterized the articles gathered from the Scopus database into the following categories; influential supply chain journals, Citation report, countries ranking, types of documents, and publication by year.

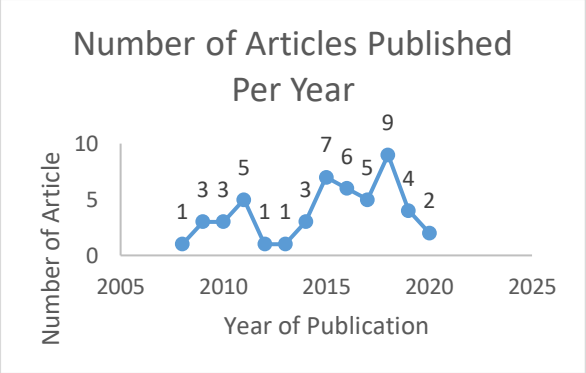

Figure 2 Number of Article Published Between 2008 to 2020

3.3.1 Industry Analysis

The industry analysis of the published articles on supply chain collaboration highlights that there is enormous research focussed on general supply chain practices. Moreover, the logistics industry has the second most significant research while manufacturing, technology, and automotive industries had lesser research on supply chain collaboration, respectively. However, from these results, the oil and gas industry appear amongst the least researched industries with just one article published on supply chain collaboration alongside other smaller sectors that include services, fashion, tourism, beverages, retails among many others. **Error! Reference source not found.** despites the number of publications by industries in the column chart.

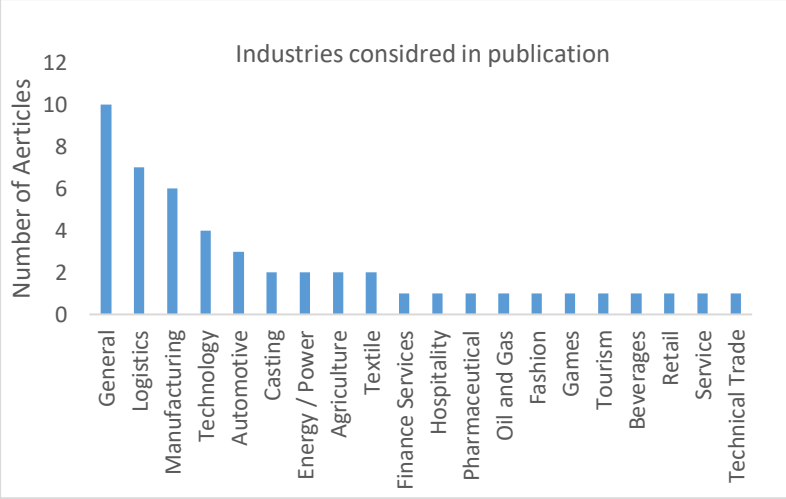

Figure 3 Industry analysis of the published papers

3.3.2 Published Research in Various Journals

The column chart of Figure 5 highlights the journals of supply chain collaboration with the corresponding published articles that outline the factors of supply chain collaboration. From the search and sorting criteria (section 3.1), thirty-four (34) journals identified that contribute to the search, with only one journal having four (4) articles and eight other

journals considered to have a majority of the publications. These include; Int' *l Journal Of Production Economics, Int' l Journal Of Integrated Supply Mgt, Int' l Journal Of Supply Chain Mgt, Journal Of Cleaner Production, Production Planning And Control, Industrial Mgt And Data Systems, Int' l Journal Of Physical Distribution And Logistics Mgt, Int' l Journal Of Production Research, and finally, World Academy Of Science Engineering And Technology.* At the same time, the other journals have just one publication such as *Decision Sciences, International Journal Of Advanced Operations Management, Journal Of Operations Management, Journal Of Supply Chain Management* and many others.

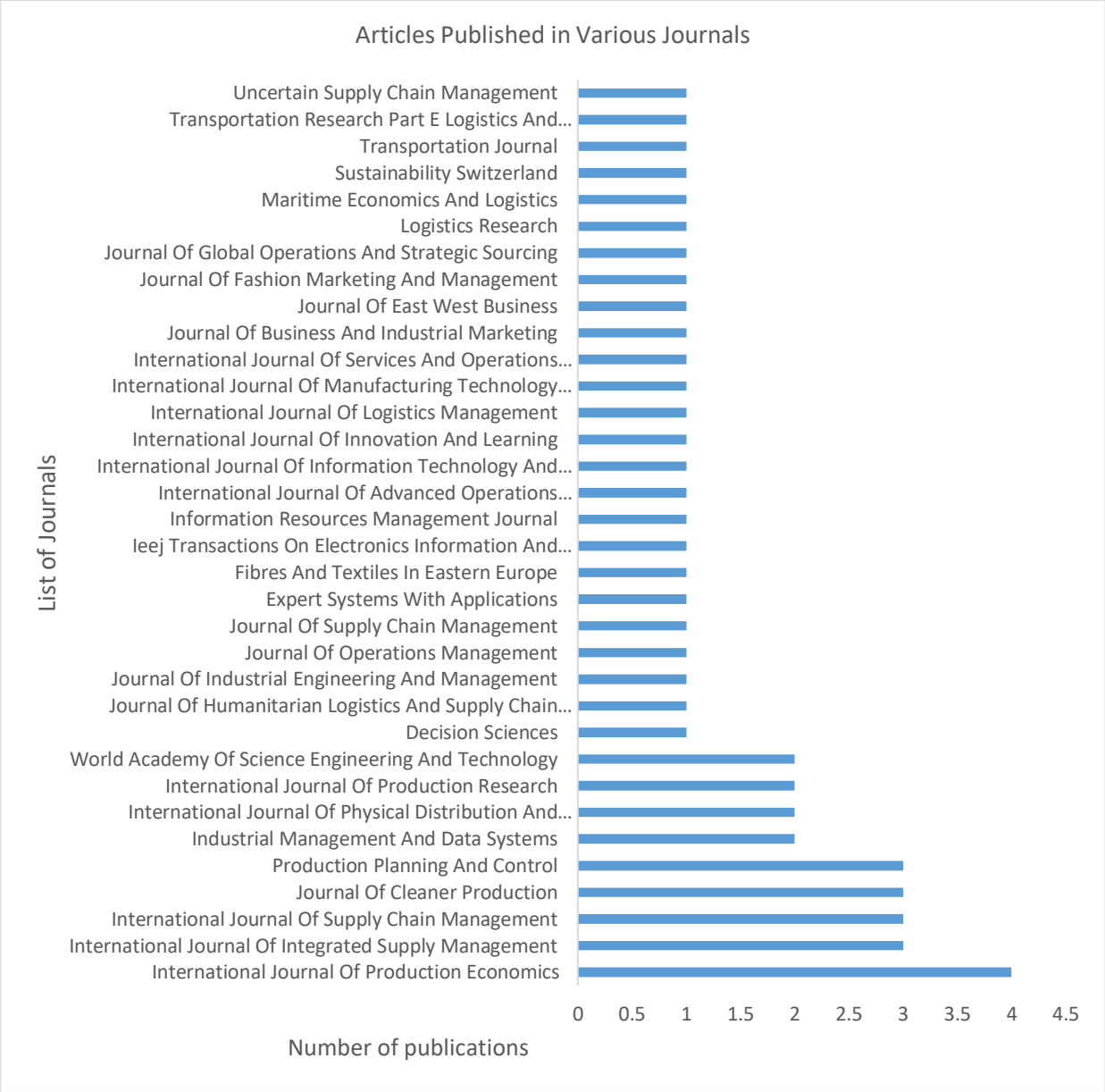

Figure 4 Journals Characteristic

3.3.3 Citation Reports

The chart in **Error! Reference source not found.** summarises that is an increasing trend in the statistics of the citations per year, which is a sign that more scholars are investigating the factors of supply chain collaboration across all industries. The evidence in the trend plots shows that there is sustained growth in the field per year from 2008 to date. Figure 6 shown in the citation trend analysis.

3.3.4 Document Type

Figure 7 presents the document analysis of this paper, which depicts that the types of documents used for the study of this research highlight that there are just 6% of literature review articles with the remaining 94% being research articles. These articles used to understand the current state of research and practices while other documents and academic materials such as white papers, company magazines and public online sources not considered reliable because authorities and experts in the field do not review them.

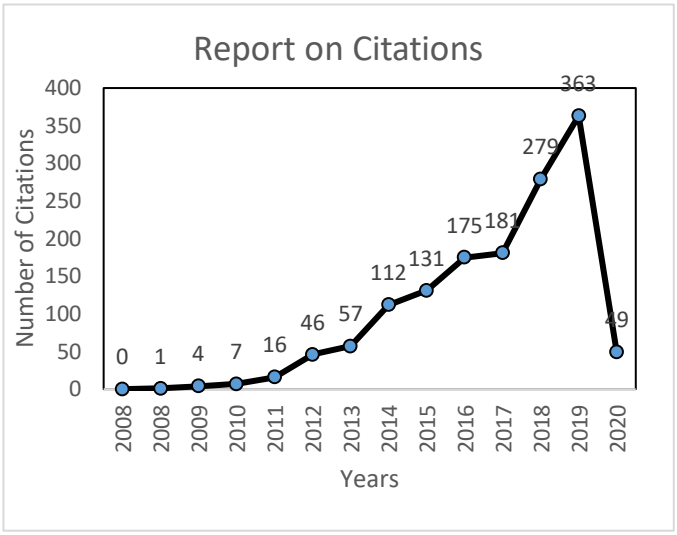

Figure 5 Citation Summary On Yearly Publication

Figure 6 Document Type Characteristics

3.3.5 Countries Characteristics

This research on factors of supply chain collaboration in the Oil and Gas industry reveals that there are twenty-eight (28) countries that have contributed to research for supply chain collaboration. Figure 8 shows a column chart of these countries' analysis with there level of publications, such as the United States producing the most significant portion of factors of supply chain collaboration literature, with eleven (11) papers. The United Kingdom and Finland are the second set of countries that has six (6) publications, followed by China and others.

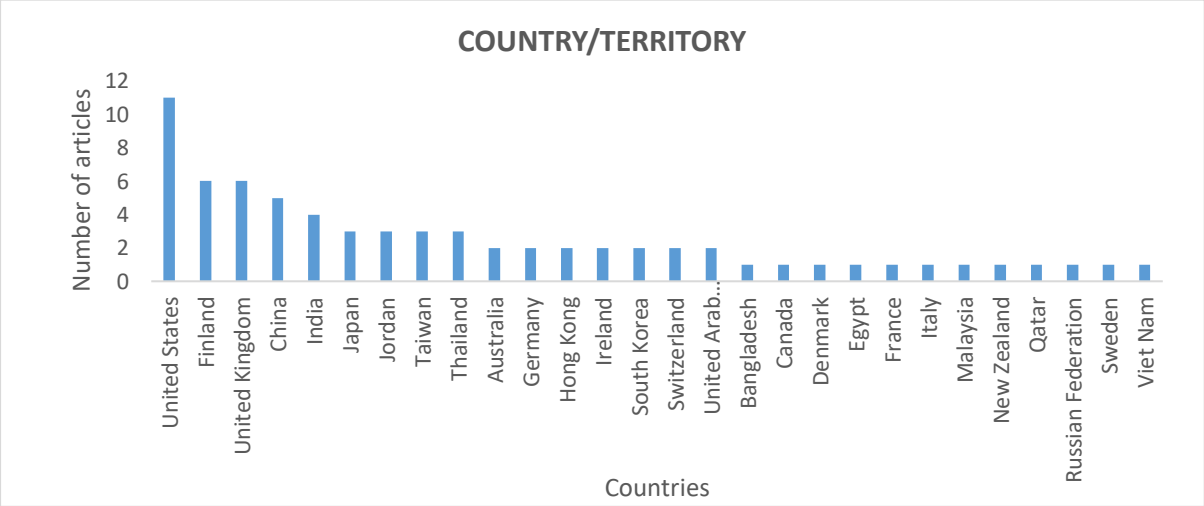

Figure 7: List of studies carried out in different countries

4.0 Factors of Supply Chain Collaboration in Oil and Gas

The review of supply chain collaboration strategies as outlined in a recent study by Nimmy, Chilkapure, and Pillai (2019) were the authors who describe that the future of any business depends on supply- customer relationships which can only be achieved when organizations collaborate. Because of this, we review supply chain collaboration techniques from the literature regarding the outlined guidelines for different collaboration approaches found in the literature (Derrouiche, Neubert, & Bouras, 2008). These guidelines supported the analysis presented in the paper as presented as follows.

The significant factors of supply chain collaboration identified from the literature includes information sharing, trust, information technology, commitment, decision synchronization, incentive alignment, management, Government and technical support, communication, supply chain performance, cost, environmental, financial, supply chain processes, promotion, power balancing, goal congruence, knowledge and skill sharing, and supply chain partnership. These factors are enormous, and they contribute to the success of supply chain collaboration when adequately managed. **Error! Reference source not found.** presents a pictorial view of these main contributing factors.

However, since these factors are enormous, the three critical factors outlined by the majority of the authors, which include information sharing, trust, and information technology form the core discussions presented in the review.

4.1 Information Sharing

Information sharing (IS) is an element of supply chain collaboration (Pradabwong, Braziotis, Pawar, & Tannock, 2015), described as the process of exchanging vital information among the members or firms that are into supply chain collaboration to carry out effective operations. It is a crucial factor and enabler of collaboration (Duong & Chong, 2020; Ma, Wang, & Chan, 2020) and a vital element that enhances upstream firms to identify customer needs, inventory levels, production plans, and many others. It aids decision-makers to effectively plan and control supply chain operations (Rota, Pugliese, Hashem, & Zanasi, 2018). It is among the three critical dimensions of collaboration outlined by Monios and Bergqvist (2015); Nguyen, Lei, Vu, and Le (2019) which includes decision synchronization and incentive alignment as the other dimensions of collaboration. IS is the most critical factor that has a significant effect on supply chain decisions (Han & Dong, 2015) and well as the success of collaborative endeavours (Nguyen et al., 2019; Prasanna & Haavisto, 2018). As organizations move towards higher collaboration, relational behaviour such as information sharing, trust, communication, mutual respect become significant factors. The research results have outlined that collaboration involves a substantial degree of IS to achieve success. These findings have established with validation from directors and senior managers that IS contributes to set the basic rules for collaboration to exist (Braziotis & Tannock, 2011). Although, Panaihfar, Heavey, and Byrne (2015) suggested that information sharing and cooperation are distinct in collaborative planning forecasting and replenishment (CPFR) studies, which contradicts the propositions of SC research that IS is a factor for collaboration. However, there is no support for this claim found in the study.

The benefits of information sharing include contributing to competitive advantage by reducing the cost of the supply chain by decreasing costs of reworks as well as minimizing errors thereby reducing delays in schedules (Kim & Nguyen, 2018). It addresses product flow issues on time (Rota et al., 2018). Also, it helps in the creation of new service and product lines in organizations as well as reduction of risks in business dues to uncertainties mostly in technology, demand, and supply(Prasanna & Haavisto, 2018). IS also simplifies complex decision-making scenarios in an organization (Monios & Bergqvist, 2015) and also plays a vital role in achieving radical innovations within organizations in collaboration (Nguyen et al., 2019). Information sharing also provides transparency of information among the members through information technology (Ramanathan & Gunasekaran, 2014) as well as enhancing the overall profitability and customer satisfaction (Haque & Islam, 2018).

The impact of IS on operational performance has investigated and the results highlight that IS has a significant effect on the success of supply chain performance members and it is vital for sustaining effective operations (Irani, Kamal, Sharif, & Love, 2017; Nimmy et al., 2019).

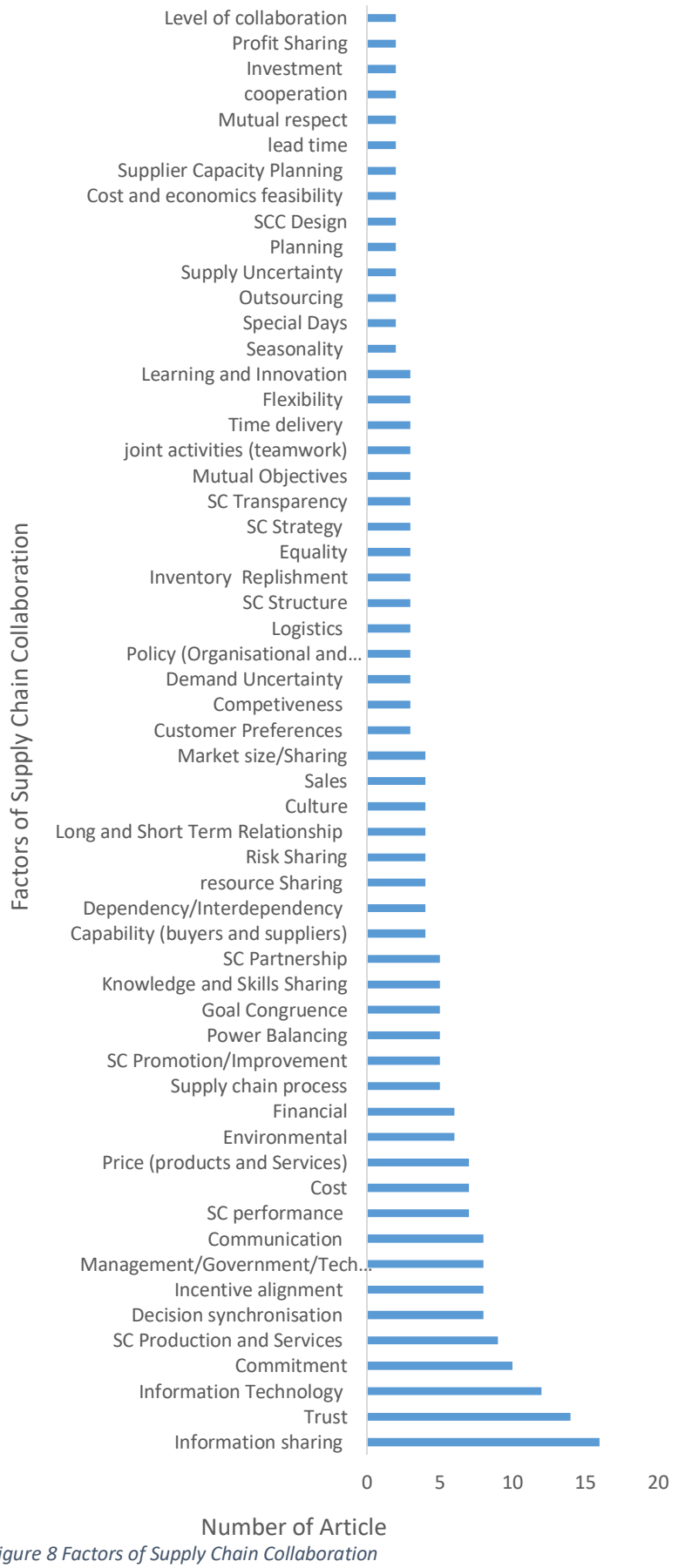

Figure 8 Factors of Supply Chain Collaboration

The significant limitations of IS have identified as the cost of technology implementation as well as a lack of trust by participating in SC organizations (Nimmy et al., 2019). These factors of supply chain collaboration play a crucial role to provide adequate supply chain management in the industry as well as improving performance. Others suggested hindrances to attaining success in information sharing include security, quality of data, misuse of data, and improper relationships. These could be managed by effectively deploying some of the emerging technologies which have excellent security features, data integrity, and adequate and documented information sharing guidelines.

4.2 Trust

Trust is the second most significant factor that affects supply chain collaboration, which Figure 9 shows the article analysis. It is a situation where a collaborating member is willingly relying on another partner to exchange resources, skill, or technology for better and improved performance of supply chain processes. It is the belief about other people's behaviour in the transactions process and collaboration (Sahay, 2003). Furthermore, It enables collaborating members to share and achieve common goals together and also to control any existing relationships between SC partners (Irani et al., 2017).

The literature identified trust as the main factor for a successful supply chain collaboration (Duong & Chong, 2020; Han & Dong, 2015; Kim & Nguyen, 2018; Ma et al., 2020; Moon, Lee, & Lai, 2017; Panahifar, Byrne, &

Heavey, 2015; Sahay, 2003). Trust is used to examine the level of supply chain collaboration that exists among the SC members (Petersen, Ragatz, & Monczka, 2005; Zacharia et al., 2009) and to develop confidence towards reliability and integrity of exchange between members of SC. It also means that SC partners can depend on the information shared with other SC partners whom they trusted (Panahifar et al., 2015).

Furthermore, Irani suggested that useful knowledge sharing in supply chain partnerships relies on the level of trust among members of the supply chain. It is an essential resource used to established sustainable cooperative partnerships in integrated firms that involve the development and maintenance of a product during its lifespan. For instance, trust exists when manufacturers perceive that the suppliers will collaborate with them with fairness and honesty in their mode of operations to meet up with customer demands. Nonetheless, it has a positive effect on the following supply chain collaboration factors: forecast, inventory management, mutual goals, and information sharing (Han & Dong, 2015; Petersen et al., 2005). Trust develops joint dependence and the sense of unity that binds the SC members, form the basis of promoting commitment, improve economic value and building dedicated SC relationships between partners(Braziotis & Tannock, 2011).

The performance of SC members determines this factor and the level of trustworthiness during their collaboration. It is one of the significant enablers of the supply chain collaboration in the (Braziotis & Tannock, 2011; Ma et al., 2020; Prasanna & Haavisto, 2018). It determines the level of supply chain collaboration, which could affect the SC cost, quality, and time effectiveness. Also, the literature added that trust is one of the driving factors of supply chain collaboration, especially in manufacturing industries (H. Singh et al., 2018). The objectives supply chain collaboration and it's relationships (either close or long time relationships) focus on the level of trust among the SC partners (Kim & Nguyen, 2018; Moon et al., 2017). Irani et al. (2017) argued that SC collaborative projects are primarily trust-based among SC members, and it is a crucial factor for successful green supply chain collaboration (Grsupply chain collaboration). In the study by Prasanna and Haavisto (2018) considered trust to be one of the four collaborative elements that will improve collaboration behaviour in the supply chain industry. The Openness and honesty of each SC actors to each other helps in building trust, which will lead to greater reliability towards supply chain relationships. Excellent communication enables trust to be more realistic in the supply chain process (Prasanna & Haavisto, 2018). Researchers have suggested that the existence of trust between the customer and suppliers contributes to the improvement of the performance quality of the customer enterprises (Hudnurkar, Rathod, & Jakhar, 2016).

According to Duong and Chong (2020), a high level of trust leads to a more robust collaborative partnership and improves SC performance. The research carried out by Monios and Bergqvist (2015) highlights that adequate information sharing increases the level of trust, thereby enhancing successful collaboration. The study of Panahifar et al. (2015) identifies trust as a crucial enabler for the implementation of CPFR and allow both parties to jointly solve a common problem that will deliver more exceptional results. Han and Dong (2015) further justify that trust influences decision making in supply chain system as well as indicating that the retailers and suppliers value trust differently. However, trust is quoted as the key factor for reliable transmission of information in electronic data interchange, and trust has effects on CPFR applications.

A research conducted by Singh discussed that the lack of trust between members of the supply chain is a critical barrier to supply chain collaboration and it restricts members of the supply chain from sharing valuable information among them (Irani et al., 2017; Kim & Nguyen, 2018; Prasanna & Haavisto, 2018). Prasanna and Haavisto (2018) indicate that mistrust among the supply chain collaboration actors leads to inefficiencies in SC response while Moon et al. (2017) noted that agility in SC is affected by lack of trust and contributes to the failure of supply chain collaboration. Furthermore, the literature suggested that lack of trust hinders the implementation of CPFR and also increases the cost of transactions. This study further outlined that it is not always possible to have a high degree of trust at the early stages of CPFR implementation, which implies that trust is earned during collaboration and continues to improve business with SC partners successful progress through the SC process.

4.3 Information Technology

Information technologies (IT) refers to the use of computers to store, transmit, receive as well as manipulation of data. It is the third most crucial factor of supply chain collaboration, and it plays a significant role both in supply chain collaboration and business process management (BPM) (Chang, Chang, & Wu, 2011; Kim & Nguyen, 2018; Ma et al., 2020; Pradabwong et al., 2017). As shown from the analysis in Figure 9, information technology ranks as a top factor for successful supply chain collaboration to eliminate barriers in relationships between partners. It is vital for a competitive advantage in the SCM (Chang et al., 2011) as well as supply chain collaboration. Information technology serves as a tool within an organizational supply chain partners to provide effective and efficient in the supply chain network of the industry. However, the research suggested that information technology among supply chain members enables them to improve their collaborative activities as well as improving organizational performance.

Pradabwong et al. (2017) opined that information technology is a means of developing customer values which will lead to customer satisfaction as well as enable suppliers to create a link with their clients. Besides, IT can improve business processes and supply chain collaboration within and outside the organization. For instance, members of the supply chain use information technology to incorporate vital information like details of planning, service delivery, and operational activities within the organization. Furthermore, it is essential for SC partners to monitor and manage the flow of products at every stage of the supply chain process and to improve other SC activities like product quality, coordination, transparency, cost reduction and competitive advantages. It has noticed that IT is used in an organization to share valuable and reliable formation among SC partners to achieve more excellent performance and to respond quickly to the market variations. Duong and Chong (2020) stated IT promotes transparency and visibility during the supply chain process and also the base of collaboration. Duong discusses enterprise resource planning (ERP) as one of the IT enablers in humanitarian SC. Furthermore, Ma et al. outlined that IT enhances trustworthiness faced by the financial institutions during its supply chain processes and Irani et al. (2017) suggesting that IT enables SC partners to have transparent, integrated, quality, reliable and real-time information flow in their mode of operations

A source of a firm's competitive advantage is its ability to use IT to reduce inventory management and improve its response in delivery and time management. Moreover, most business transactions are carried out online with suffocated technology. In this regard, IT allows the partners to be more efficient, responsive, and flexible towards meeting the requirement of the changing market. The limitation of IT in the SC process is mostly to reduce the product quality and other activities of the suppliers which leads to inappropriate performance output, with Ma et al. (2020) alluding that the absence of IT creates a negative impact on the collaborative performance

5.0 Discussion

Collaboration occurs when information sharing, trust, information technology, and some level of commitment are present between supply chain partners, most importantly for the Oil and Gas industry. Each of these factors motivates and drive supply chain collaboration as well as influencing the supply chain environments. The close relationship that exists between the SC partners with time and according to the clients (Schoenherr et al., 2008). However, the underlying meaning of the word 'collaboration' and the different interpretations is that organizations and firms cannot compete individually. Hence, they explore the establishment of relationships with other members of the supply chain to achieve the competitive advantage needed in the areas of partnership.

The literature review shows that information sharing is the main factor affecting supply chain collaboration both in Oil and Gas sector and in other industries like agricultural, automobile, maritime, retail, manufacturer, and production industries. Recent literature on supply chain management states that information sharing contributes majorly to the success of most collaboration endeavours (Al-Douri, 2018; Kim & Nguyen, 2018; Prasanna & Haavisto, 2018).

The other key factors affecting supply chain collaboration in the oil and gas industry include trust and information technology. However, Figure 8 depicts other elements of supply chain collaboration

From the literature, it is evident that there are few pieces of research works on supply chain collaboration in the services, fashion, tourism, beverages, retails, oil and gas, games as well as energy and the agricultural industries. These key areas are core areas for future research to understand the underlying trends in these industries for successful collaboration.

6.0 Conclusion

This research aims to investigate the factors of supply chain collaboration in the oil and gas industry and to achieve this; the study explores a systematic literature search of factors of supply chain collaboration in the above sector. Although the has literature examined the related publication on supply chain collaboration extensively, there is no specific focus on the oil and gas industry. Therefore, this study has identified three major factors that influence supply chain collaboration in the oil and gas industry to include information sharing, trust, and information technology. Finally, the research further identified the benefits and impact of these factors on the success of supply chain collaboration as well as their corresponding limitations. From the above research process, this research identifies that there are no existing academic articles that investigate factors of supply chain collaboration in the oil and gas industry. In the future, we will extend the scope of this research by collecting data for industrial practitioners to analyze the real impact of these supply chain collaboration factors on performance.

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