

# How Global Supply Chain Management Is Disrupting Local Supply Chain Management Case of Oil and Gas Industry in UAE

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## Abstract

The development of modern business is highly dependent on the factor of globalization, which impacts both economic and social aspects of modern business activity. In the context of globalization, modern businesses must be capable to identify optimal formats of strategic development to satisfy the needs of key stakeholders and preserve strong competitive positions. This study analyzed the role of globalization in the aspect of modification of the supply chain management (SCM) processes in modern organizations operating in the oil & gas (O&G) sector. It was sensible to analyze a research problem about the influence of the global SCM trends on the development of local SCM processes in the oil & gas sector of different countries. For the realization of the study objective, the qualitative research methodology was applied. A researcher initially analyzed the findings of relevant and reliable academic literature sources to identify the existing knowledge in the sphere of the study. Based on an analysis of academic literature, relevant challenges and knowledge gaps were identified. To address the stated gaps of the study, it was important to perform a mixture of interview and case analysis. A semi-structured interview format was applied to collect primary data from the respondents of the study. Representatives of management of different O&G sector companies were attracted to the study. For the aims of case analysis, a set of relevant cases describing the process of local SCM transformation in the target industry was considered. The findings of the study were analyzed using the thematic analysis instrument. The outcomes of the study demonstrated the significant role of global trends for the modernization of local SCM processes in the O&G sector. Specific factors that were found to be vital included digitalization, sustainability, and knowledge management. It was found that the O&G business cannot ignore the requirements of the global trends if it aims to compete in the global market and reach long-term development objectives.

#### **Keywords**

Supply Chain Management, Oil & Gas Sector, Management, Digital Transformation, Knowledge Management, Sustainability

## **1. Introduction**

The development of an effective supply chain management framework is one of the important conditions for the long-term operations of the business. Without the stable format of cooperation with its key external stakeholders, the business is not capable of fulfilling its main goal—generation of sales and profits. In addition, the format of the supply chain management (SCM) model used by the organization could identify the limits for its growth and development. Without control of all processes included in the SCM model, management of the organization would not be capable of identifying narrow points and barriers in the existing structure, which limit growth opportunities.

The problem of effective SCM model development gained relevance under conditions of globalization. The phenomenon of globalization allowed defining two types of supply chain management influencing the operations of any type of organization—local supply chain and global supply chain. Local supply chain management is the set of operations contributing to the implementation of the company's performance objectives in the specific market. At the same time, global supply chain management should contribute to the strengthening of the positions of business in the global market. One of the main problems caused by globalization in terms of SCM is associated with differences between global and local SCM standards. Standards of SCM in the local market can significantly differ from the requirements placed in the global market. Under such conditions, a business is forced to adapt its SCM practices to comply with the needs of the global market. Otherwise, the risk of failure keeps rising.

This paper aimed to consider the effects of global supply chains on the development of local supply chains in the oil & gas sector. The oil & gas sector plays a significant role in the economy of countries that obtain these strategic resources. Such an argument is especially relevant for the UAE. It is important to understand what potential effects on the local supply chains could be brought by global markets, and what means of adoption to this influence can be applied.

## 2. Literature Review

The discussion of the problem of the effects of global markets on local SCM should start from the definition of terms. Vidrova (2020) discussed a supply chain as a network of relationships between economic actors where the value could be generated (p.2). Another definition of the supply chain is described as

an integration of information and resources through a series of value-adding activities (Vidrova, 2020: p. 2). From this perspective, the global SCM models influence the format of relationships among actors in the local supply chains. Hu & Haddud (2017) described one of the dimensions of global effects on the local SCM as an example. According to them, globalization and new communication technology led to the digitalization of SCM and the development of e-commerce business (Hu & Huddud, 2017: p. 2). In this way, digitalization urged all the players in local markets, including the O&G sector, to adapt.

From the point of generation of new requirements for SCM by the global market, Suriyantphupha & Bourlakis (2019) argued that modern business had to obtain the long-term strategy of innovative technologies implementation to remain competitive in terms of global SCM. As a result, companies are forced to comply with the demands of the global market in the modification of their local SCM practices. Together with the orientation on new technologies, modern business is forced to become customer- and supplier-oriented; this trend is identified in global markets (Kumar et al., 2018: p. 3; Katsaliaki et al., 2021). Operational efficiency in the organization of the SCM processes at the local level is also a new trend demanded by the global character of markets (Panday & Panday, 2016: p. 5). Due to the simplicity of access to the local market for any international player, even organizations without international access should comply with the demands of the global market if they do not want to lose competition locally.

One of the most important trends that have shifted the nature of local supply chains is the development of the customer-oriented vision of the business strategy. In such a way, every modern business has to prioritize the satisfaction of customer needs as one of the highest priorities of development, which usually define the organization format of the local SCM processes (Stefanelli, 2020). Stefanelli (2020) argued that while in the previous decades SCM had been performed in the way to optimize costs and increase the profitability of the business, global SCM influenced local SCM practices by increasing the focus on the needs of customers. As a result, companies usually enter the global level of operations to find better solutions for local customers.

The final aspect of global markets' effects on the local SCM in the majority of industries included the increased encouragement of sustainability initiatives in business. Hazen et al. (2021) identified the trend for the global transformation of local supply chains in the direction of circular economy model implementation. The main idea of this SCM approach is that the organization should minimize the resource utilization level, together with the waste. All the produced goods should be consumed. Vidrova (2020) argued that local businesses had to comply with the global SCM requirements, mainly to gain access to specific advantages: availability of excellent products, reduced costs, stock amount reduction, improved quality of operations, continuous operations of the supply chain, opportunities for new knowledge acquisition and flexibility (pp. 6-7). Altogether, the influence of global markets on the local SCM models is objective, and companies

rarely avoid such influence and the associated benefits.

## 2.1. Specifics of the O&G Industry

Together with the discussion of the general effects of the global market on local SCM of business, the specifics of the O&G industry should be analyzed. The modern phase of local supply chains development influenced by global markets is characterized mainly by the integration of new IT solutions aimed to optimize existing processes and improve the competitive positioning of business (Lisitsa et al., 2019: p. 5). Specific IT solutions utilized in the sector include software products for the automation of SCM processes (Joshi et al., 2017), decision-making support tools (Rossit et al., 2020), instruments for control, and optimization of SCM costs, for example.

In the O&G industry, the influence of the global market on the local SCM practices is even higher as compared to the majority of other industries since this sector is highly dependent on access to the global market for successful development (Chima, 2007). In case the large O&G organization is not capable of selling its goods globally, it would be difficult for it to get sufficient demand in the local market. An example of the influence of global markets on the O&G sector could be seen in the factor of risk of dependency on a specific market as a consumer of the company's product. For example, Amor & Ghorbel (2018) identified the following sources of risk coming from global markets, "procurement, regulation, infrastructure, and procurement import sources" (p. 149). As a result, companies are forced to comply with the requirements of global markets to remain productive.

The need to integrate innovative technology in local SCM led to the shift in the vision of knowledge management practices in the O&G industry. Saad et al. (2014) highlighted the role of the following practices that had changed the format of knowledge management in the O&G industry, "1) commitment to learning, 2) shared vision, 3) open-mindedness, and 4) intra-organizational knowledge sharing" (p. 47). Together with the shift in knowledge management practices, O&G organizations had changed their format of operations for higher sustainability (Ahmad et al., 2016a; Ahmad, 2016b). Altogether, global SCM forces local SCM for active transformation, and the main directions of change were highlighted in this section.

#### 2.2. Challenges & Knowledge Gaps

The results of the literature review contributed to the definition of the key factors associated with the influence of the global markets on local SCM in the O&G industry. Key variables of the study included technological innovations, change of the knowledge management approaches, development of the sustainable business model, and extremely high levels of local the business's dependency on access to the global market. In the context of the study, it is also important to identify specific challenges and knowledge gaps that had been unaddressed in the past to develop a basis for this study.

One of the main knowledge gaps that could be addressed in this study is related to the discussion of specifics of organizations' adaptation to the needs of global markets in the case of each specific business. It is crucial to discuss the methods and practices applied by specific companies that are leaders in the global O&G industry. Based on the discussion of their experience in the field of innovative development of local SCM processes in response to the needs of the global market, it would be possible to develop recommendations for the future development of the O&G sector SCM methods in general. The findings of such a study could contribute to the definition of separate elements of the innovations development framework that could contribute to the optimization of transformation processes in the O&G industry. The criteria of optimization of resource and time expenses for the transformation of local SCM according to the demands of the global market could be considered as the primary objective of the study.

# 3. Hypothesis

This study aimed to analyze the following research hypothesis:

Global SCM has a considerable influence on the local SCM in the O&G industry.

Under conditions of globalization, the local business becomes highly dependent on fluctuations in the global market. It is important to understand the scale of influence of the global market on the local SCM in the oil & gas (O&G) industry. For this study, the following research question was developed:

How does the global SCM influence the local SCM?

## 4. Research Method

In the context of the identified research problem and question, the qualitative research design was selected. Due to the considerable novelty of the research problem, the application of the quantitative research methods was problematic since it was difficult to determine the values that should be counted and analyzed. As for the qualitative research design, it was considered optimal from the perspective of detailed analysis of the comparatively small sample, which would deliver the most valuable data about the object of the study and have the required best possible coverage at the same time. Two methods of data collection were used: semi-structured interview and case analysis.

For the semi-structured interview format, the researcher developed the interview form (**Appendix 1**), which was flexible by structure and could be adapted to the needs of the specific interview. Reliance on the semi-structured format of the interview allowed the researcher to avoid the fixed scenario and collect the most valuable information from the specific respondent. The total sample for interviews collection included fourteen specialists in the O&G industry, whose everyday work was directly related to SCM. Case analysis was based on the dis-

cussion of four relevant cases of O&G organizations, which were forced to adapt local SCM to the demands of the global market. The four cases cover the biggest main O&G companies in UAE.

The procedure of data gathering during interviews included the invitation of respondents via an email message that included information about the study and the consent form that had to be filled in by the respondents. In the case of the analysis process, the researcher collected and analyzed relevant publications describing each of the selected cases. Due to the need to engage human participants in the interview, ethical considerations of the study included avoidance of collection, storage, or publication of any type of personal data.

For the aims of analysis of interviews and case study data, the instrument of thematic analysis was applied. Transcripts of the interviews and the text of publications describing each target case were analyzed from the point of identification of the key themes highlighted by the authors. Later, the key themes were analyzed and summarized to develop the main findings of the study.

## 5. Data Gathering and Analysis

This section of the thesis presented the outcomes of the data collection and analysis processes performed during the study. For the simplicity of the results' presentation, this section was divided into a discussion of case analysis and interview analysis outcomes. The researcher compared the outcomes of both approaches' application in the development of the final recommendations for future practice.

## 5.1. Case Analysis

The four cases analysis were selected based on four directions and approaches in tackling the O&G SCM specifics and the different roles and responsibilities each case is bearing. The common factors and similarities in managing the supply chain and the local and global interdependencies are taken into consideration to ensure proper coverage of the population.

The first case analyzed in this study demonstrated the effects of global SCM on local SCM in the terms of sustainability practices implementation. Royal Dutch Shell faced a legal scandal in 2021, which included the accusation of the company of operations that led to negative outcomes for the environment. Organizations that stood against Shell in the court included mainly non-governmental organizations (NGOs)—Greenpeace and Friends of the Earth (Leise, 2021). As an outcome of this legal case, Shell was forced to cut its carbon emissions in the local SCM model in Denmark by 45% as compared to 2019 (Leise, 2021). This case demonstrated that the rapid changes in the image of global SCM processes could lead to the active engagement of NGOs and other informal agencies, which would force businesses to transform and comply with global standards. It is a good example of the indirect influence of global SCM principles on the local SCM practices in the specific company.

The second case of the local SCM practices transformation influenced by the global trends included the case of the UAE's ADNOC. This case demonstrates the influence of innovative technologies presented by the global markets on the modernization of local SCM processes in the O&G sector. Due to the rapid development of blockchain technology, the management of the ADNOC decided to use this technology in the optimization of the SCM processes and the generation of additional competitive advantages. According to Geronimo (2018), ADNOC aimed to apply blockchain solutions for integrated operations of all companies and stakeholders across the company's value chain. Blockchain reduced time expenses for transactions between companies in the SCM network, increased operational efficiency across the value chain, and boosted the transparency of cooperation (Geronimo, 2018). In this way, integration of the blockchain technology also caused the change of the corporate culture in the local SCM process.

The third case of local SCM processes transformation caused by the effects of the global market was presented by Cameron and Schlumberger—companies that operated in the oil-field service and equipment (OFSE) sector of the O&G industry. This sector is responsible for the extraction of raw materials from natural sources for further processing. To address the problems of high competition and reducing profits in the global markets, two companies decided to form vertical integration (Bresciani & Brinkman, 2016). The format of vertical integration between the companies was named the OneSubsea Alliance. The advantage of this format was that it allowed integrating "SLB's reservoir and well technology with CAM's wellhead and surface technology" (Bresciani & Brinkman, 2016). Annual cost and revenue synergies from the implementation of this project were assessed as equal to \$600 million (Bresciani & Brinkman, 2016). This is an example of how global market conditions forced companies to transform local SCM practices, seeking benefits.

The final case that was analyzed included the development of new revenue models for companies to share financial risks under conditions of uncertainty. The global trends identified rising financial risks for the O&G sector—reduced sales and prices per energy source, the collapse of the previously existing supply chains, and new risks for all stakeholders. To address this problem, companies transformed local SCM models in the way of distribution of costs with partners. General Electric (GE) signed an agreement with the drilling company, Diamond Offshore. This agreement supposed that GE will retain ownership of eight Blow out Preventers, shifting capital expenditures to more financially sustainable partners (Bresciani & Brinkman, 2016). Such an approach to the transformation of partnership in the SCM system guaranteed the preservation of the companies' operations during difficult times. Global problems force companies to seek radical means of the local SCM transformation.

#### 5.2. Interviews Analysis

The fourteen interviews analysis were categorized on four perspectives based the common factors and similarities in managing the supply chain and the local and

global interdependencies.

**Perspective 1** had more than ten years of experience in the O&G sector, operating in the sector of logistics. In his current position, the respondent was responsible for the innovative development of logistics management practices in the organization. He stated that the influence of the changes in the global SCM models on his work was significant. Respondent 1 had been permanently forced to analyze changes in the global market, seeking solutions that would adapt the logistics model of the company to the changes and help the company remain profitable. Digitalization was considered the main factor of influence of global SCM on local SCM practices in the company. To succeed in the digital transformation of business, Respondent 1 also considered it crucial to focus on the improvement of the knowledge management practices in the organization. Despite the high relevance of sustainability transformation for the O&G sector, the respondent did not identify significant changes in the sphere for his company. Other factors of global SCM effect on the local SCM included the need to develop a strategic partnership with external players.

**Perspective 2** identified her previous work experience as equal to twelve years. In her previous work, the respondent was responsible for the development of strategic relationships with the company's partners. To deal with the challenges identified by the global market and SCM conditions, the company heavily relied on the search for means of more productive cooperation with partners and access to clients. The key factor of the global SCM influences the local SCM was associated with the implementation of sustainability initiatives in the company. Respondent was tasked to define companies that could deliver sustainable supplies to the organization and build productive cooperation with them. It was an example of an organization that responded to the market conditions with a sustainability-based approach.

**Perspective 3** had nine nine years of previous experience in the O&G sector. His performance was associated with the quality control of suppliers' performance, which allowed the company to avoid supplier risks and the associated losses. According to the respondent, his work depended on the influence of global SCM models, which delivered new instructions for quality control standards in the industry. Respondent had to optimize quality control practices in the organization to comply with the global standards and offer productive innovations. Digitalization was considered a key factor of the global SCM influence on the local SCM processes in the organization. Other factors highlighted by the respondent included the influence of the global rating systems that estimated the quality of the SCM processes organization in a specific company. A respondent argued that specific decisions were made in his work solely to meet the expectations of global customers and partners of the company.

**Perspective 4** had more than fifteen years of experience in the O&G sector. Her role in the current organization was associated with the distribution of products among the target customer organizations. Respondent had to manage the customer base of the organization analyzing changes in the customers' expectations and preferences. She highlighted the fact that the rising need to comply with customer expectations was one of the key effects of global markets on the local SCM practices in her organization. Businesses had to seek means of transformation to comply with the expectations of customers. Two main factors of transformation highlighted by the respondent included digitalization of business processes and sustainable transformation of a company. These changes correlated with the current expectations of customers and provided significant benefits for business.

## 6. Recommendations

The findings of the study demonstrated that:

- The global SCM transformation principles played a significant role in the transformation of the local SCM processes and practices performed by the local organizations.
- Local SCM has an increasing need for the definition of the problems and the potential solutions to adapt to the demands of the global market.
- Local SCM has an increasing need for definition of the problems and the potential solutions with minimal costs and risks of failure.
- Local SCM must focus on the dimensions of disruptive technologies and digital transformation like:
- o digitalization of business
- o knowledge management practices
- o Sustainability
- o strategic partnership relationships
- o Instrumental tools based on disruptive technologies
- Success is reached mainly through productive cooperation with partners.
- Integrated transformation that covers strategy, capabilities and processes of different departments and specialists is a must, partial transformation would not enable the business to adapt to the conditions of the global market.

# 7. Conclusion

The findings of the study demonstrated the significant role played by the global SCM principles on the transformation of the local SCM processes in the O&G sector. Companies in this industry are more dependent on free access to global markets as compared to the majority of other industries. As a result, they are forced to watch changes in the global markets and adapt to them accordingly. The findings of the literature review revealed the following factors of the global SCM influence: digitalization of business, knowledge management practices change; sustainable transformation of business. Other factors identified based on the case and interview analysis included a strategic partnership with other businesses, vertical integration, and distribution of costs. Based on these practices, modern O&G companies should develop specific solutions that would allow them

to remain competitive under global conditions.

## **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.

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## **Appendix**

## **Appendix 1: Interview Questions**

Question 1: Please describe your overall experience of working in the O&G sector. For how many years have you worked in this sector, what positions have you held in your professional career?

Question 2: In what way had your work experience related to the sphere of SCM?

Question 3: Please, characterize the level of influence of global markets and SCM practices on the change of SCM methods used by your organization in the local markets. Did you face the need to seriously change the format of work to comply with global trends and demands?

Question 4: Do you consider it obligatory for your business to change the local SCM practices according to the requirements of the global market to remain competitive? Did you experience higher pressure of environment in your company as a result of ignorance of global SCM trends?

Question 5: What role had the digital transformation played in the development of the local SCM practices in your organization? Please, characterize the process of digital transformation in your company.

Question 6: Did you experience a change in the knowledge management practices in your organization in recent years? If so, do you consider such changes an outcome of the organization's desire to comply with the requirements of the global market?

Question 7: Please, characterize the role of sustainability practices in the transformation of the SCM process in your company. Had your organization passed the way of sustainable transformation during the last years? If so, had the desire to comply with global trends played a role in such a decision?

Question 8: What other factors of influence of global SCM practices on local SCM processes in your organization could you mention? In which ways were you forced to transform local SCM processes to comply with global trends and requirements?