

Performance increasing researches in the value chain stages within the petroleum industry



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ABSTRACT

The performance increasing in different stages of the value chain represents an important domain of study for both academic researchers and business experts. In the light of globalization, this topic enjoys a major interest from experts in various fields of activity and from the company's management, as well. From the research perspectives, it is desired to analyze the elements that determine and influence the oil companies' performances. For this scope, we have made an analysis of the value chain stages, and we have identified the relevant performance indicators for each working stage. By questioning some key people, managers, and experts situated on different stages of the value chain in a petroleum company, important information and data were obtained regarding their perception of the importance of the chain elements' value. Using a statistical methodology, we intend to obtain a unitary image regarding the importance of the performance in different stages of the value chain within the oil companies.

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1. Introduction

The efficiency of the value chain has become a topic very often addressed not only in the academic environment but also in the modern managerial practice.

As a result of frequent and rapid changes in the business environment, companies are forced not only to react to these but also to anticipate certain modification in the market or in the consumer preferences; respectively there are situations in which the representatives of the companies are actually part of certain working groups-they lobby for the introduction of legislative changes. The oil business is highly influenced by the current legislation, but also by the new market trend, which tries to promote a healthy and safe, in other words, a "green" culture. As Wagner and Bode (2008) mentioned in their empirical examination of supply chain performance, the "modern supply chains seem to be more vulnerable than ever." The value chain related to the oil business model is also well defined, and the performance of this chain could make, in most cases, the difference between the success and

failure of companies. The use of efficiency indicators is undoubtedly necessary, and large corporations and oil companies have developed their own ways of monitoring and controlling the steps of their activity. Based on Richard et al. (2009) considerations, measuring performance "is essential in allowing researchers and managers to evaluate the specific actions of firms and manager, where firms stand vis-à-vis their rivals, and how firms evolve and perform over time" (Govindan et al., 2020; Micheli et al., 2019; Chan et al., 2017).

Depending on the specifics of the business, the management team might have at their disposal certain indicators, or even a set of indicators through which they monitor the performance of the employees, of the equipment, respectively of the company as a whole.

Considering the above, the purpose of this study is to highlight the possibilities of monitoring and improving performance in the oil industry, using specific key performance indicators in this field of activity.

2. Stakeholders and competitive environment analysis

Generally speaking, petroleum companies' organizational structure is designed to include both main and support activities that help the given company to achieve its goals.

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Using a complex set of performance indicators, each type of activity and process is determined, monitored, and attentively measured. The system of performance indicators is adapted to the specifics of each sequence of consecutive activities (production, accounting, human resources, logistics, warehousing, procurement, etc.), respectively to each stage of their business in which the company is involved (extraction, refining, storage, transportation, etc.).

In order to understand the role and importance of the performance indicators used in different stages of the petroleum activity, we have started considering the interests of different groups of stakeholders, these being presented according to Fig. 1.

3. The activities' analysis performed along the value chain stages by the petroleum companies

Analyzing the typology of oil companies, especially those on the domestic market, regardless of the origin of capital, we have noticed that the stages of the value chain have the structure as they are set out in Fig. 2 and Fig. 3.

4. Key performance indicators within the value chain of the petroleum sector

In order to identify the potential sources of value creation and performance increasing among the petroleum operations, the research focused on the

key performance indicators used within the selected oil multinational company.

Any deviations from the proposed initial plan are analyzed and interpreted by the controlling team together with the people in charge and are subject to the company's management decision.

There are situations when it is necessary to take corrective measures in order to recover and fine-tuned the results within the proposed limits. However, there might be cases when, due to external factors, it is necessary to adjust the initial objectives and to redefine the performance indicators implicitly.

Within the analyzed company, the indicators used within different departments, compartments or different individual jobs could be classified in the categories as set out in the below Table 1.

5. Results and discussions

This research paper is based on the Ph.D. dissertation of the authors, which is under development and being an intermediate stage in the completion of research, aims both to highlight the current state of knowledge of performance measurement in the petroleum industry, based on a detailed bibliographic study, and also to identify the current state of usage of performance indicators based on which the oil companies' management could take the best decisions how to measure and evaluate performances along the stages of the value chain.

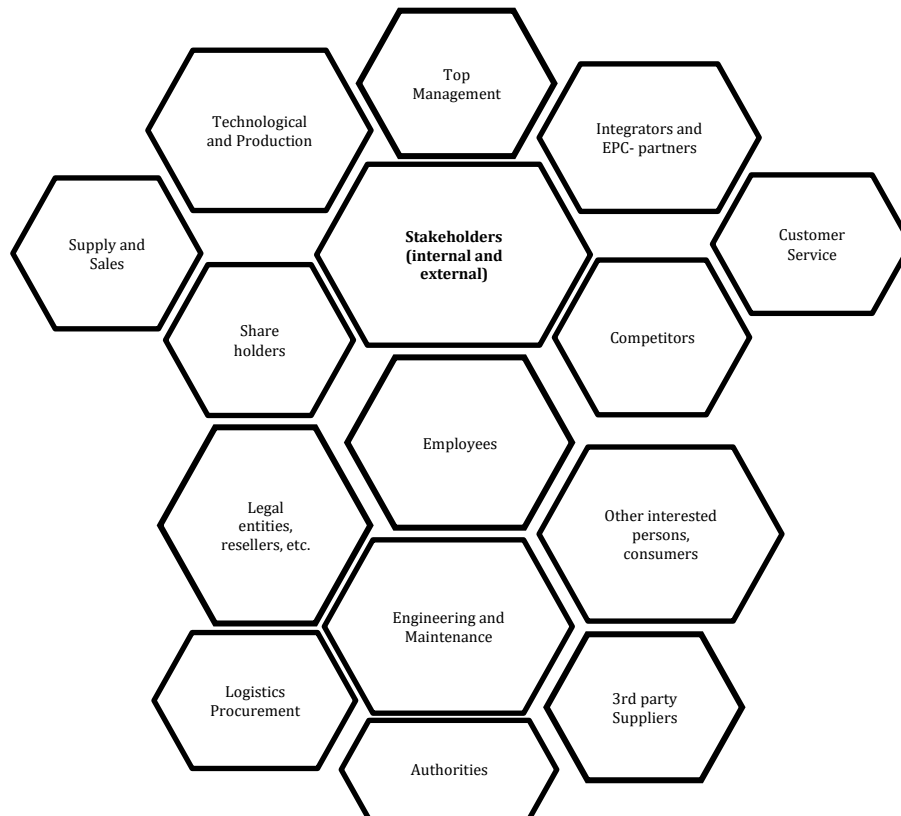


Fig. 1: Internal and external stakeholders

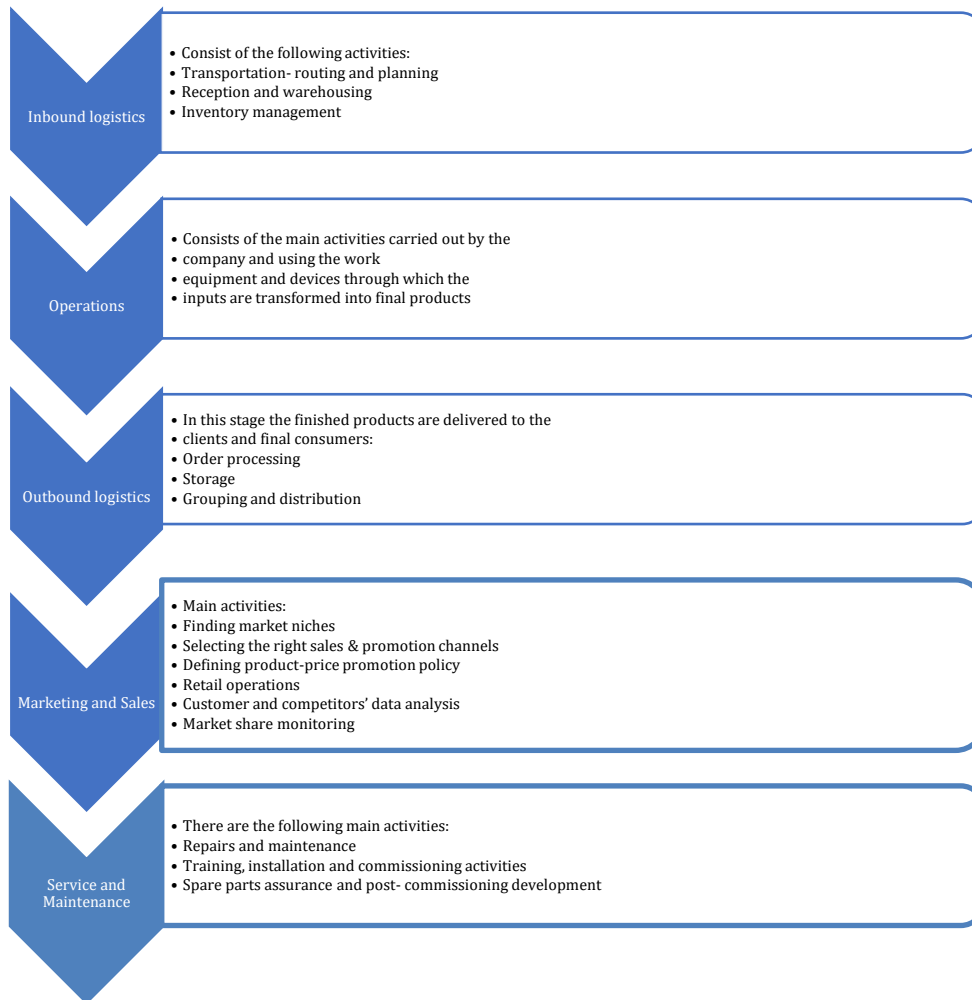


Fig. 2: Core activities

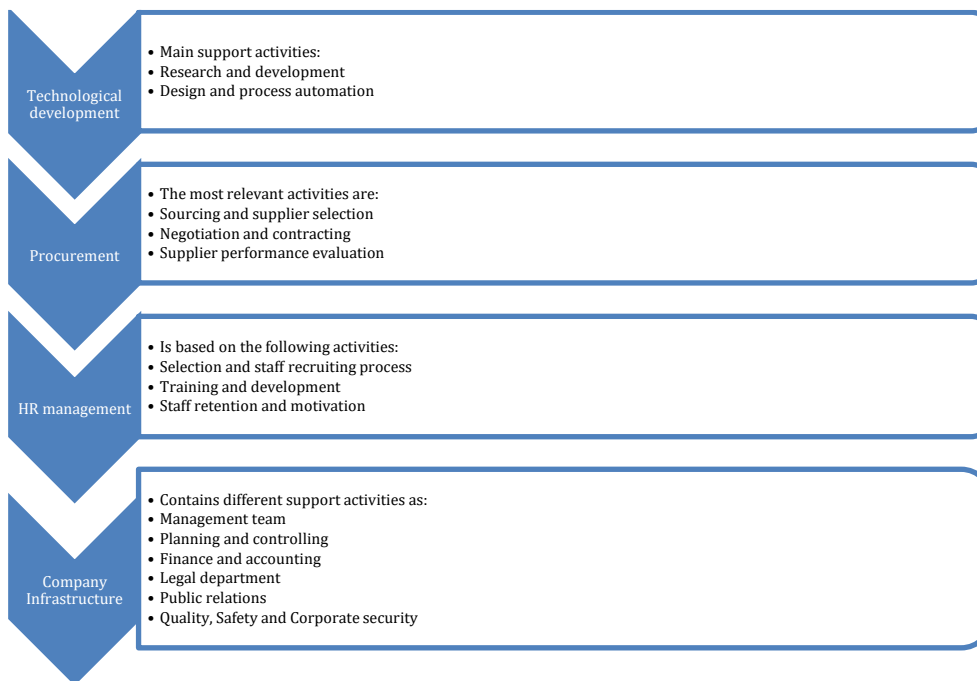


Fig. 3: Support activities

Thus, the academic approach is correlated with practical experience, and the combination of the two components could bring an important added value to the research.

In order to perform the practical research, it was necessary to clarify the following aspects from the perspective of the research purpose, as follows:

- Determining the operations performed by companies within each stage of the value chain
- Identify the main practices for measuring performance in the stages of the value chain in the petroleum industry.
- Identification and highlighting of the performance indicators used
- Ranking of the most frequently used performance indicators.
- Determining the relevance of the indicators considered important in the different stages of the working processes.
- Identify the link and correlations between performance indicators, if any, used in the various stages of the petroleum industry value chain
- Obtaining information on the performance indicators review frequency.
- Determining a global indicator used to measure the performance of the entire petroleum value chain industry.
- Each before mentioned point is part of a hypothesis that is going to be analyzed based on the answers received from the questioned respondents so that the results could be analyzed using the SPSS statistical program within the next research stage.

Table 1: Key performance indicators within the petroleum value chain stages

Indicators
Inbound Logistics
o Transportation-routing and planning
o Reception and warehousing
o Inventory management
Operations
o Production and administrative tasks
Outbound Logistics
o Terminal operations
o Transportation, grouping, and distribution
Marketing and Sales
o Data and market research
Service and Maintenance
o Service and repairs
o Training and testing
Technological Development
o New projects
o Financing value
o Contracts value
Procurement
o Sourcing and supplier selection
o Negotiation and contracting
o Supplier performance evaluation
Human Resources Management
o Selection and staff recruiting process
o Training and development
o Staff retention and motivation
Company Infrastructure
o Management team
o Planning and controlling
o Finance and accounting
o Legal department
o Public relations
o Quality, Safety and Corporate security

Based on the specific literature and the elements presented in the current practice, it was considered essential to investigate the ways of monitoring and measuring performance, as well as the situation of good practices used in the oil industry regarding the usage of performance indicators (Lai et al., 2020; Shahbaz et al., 2018; Alhosani and Zabri, 2018). The

research is based on the activities performed by a multinational company, but the results might be a basis for adapting to similar activities of other companies involved in the petroleum sector or used by companies from another industry. The research methodology was based on a questionnaire, strictly developed for a non-random sampling survey.

During the next stage of the research, the data processing will be done using the SPSS program (Statistical Package for the Social Sciences)-“package of statistical programs applied to the social sciences.”

The research is in the phase of collecting information from the respondents.

The actual analysis will be done using the step-by-step multiple linear regression analysis models, aiming to identify a link between:

- the importance that companies give to performance evaluation and
- the importance is given to the performance evaluation indicators along the petroleum value chain stages.

In order to achieve the established objectives, a questionnaire was used, as a research tool, to obtain relevant data and information for the study.

The questionnaire was designed so that closed questions predominate, most being multichotomy (with several answer options), respectively with scale answers (using a scale of importance in five steps, varying especially between the extremes: very- and not at all). This gives respondents the opportunity to choose from several predetermined answer options. The advantages of using closed type questions, such as the scale ones in the questionnaire, are the following:

- allows a logical construction of the questions
- helps simple and objective coding of answers
- allows relatively easy and fast analysis of the obtained data
- facilitates the preservation of the confidentiality and anonymity of the respondents
- allows measuring the intensity of the opinions expressed.

The questionnaire was prepared to allow to conduct the research on three distinct levels, as follows:

- Level 1: Analysis of indicators used within the operations performed in different stages of the petroleum value chain
- Level 2: Analysis of the main activities, both for the primary and secondary activities
- Level 3: Analysis of a global indicator relevant to the petroleum industry value chain stages.

In order to carry out the research, it was considered the non-random sampling method based on reasoning, which implies, according to those presented by Trif et al. (2010) that the researcher “appeals to his own judgment in choosing the

subjects from which he/she considers that can obtain the correct information.”

To highlight the importance of the interviewed subjects, in Table 2 are indicated their functions and role within the supply chain stages.

Table 2: List of interviewees by positions

The value chain stages	List of interviewed persons coded by functions
Inbound Logistics	S01-Terminal Manager
	S02-Transportation Officer
	S03-Supply Chain Manager
Operations	S04-Product Storage Manager
	S05-Terminal Operations Manager
	S06-Tactical Team Leader
	S07-Transportation Manager
Outbound Logistics	S08-Trade Compliance Manager
	S09-Dispatcher
	S10-Marketing and Communication Manager
Marketing and Sales	S11-Public Communication Coordinator
	S12-Marketing and PR Coordinator
	S13-Service Administration Manager
	S14-Engineering Manager
Service and Maintenance	S15-Maintenance Manager
	S16-Hardware Engineering Manager
Technology Development	S17-Manager IT Service Delivery
	S18-IT Specialist
Procurement	S19-Project Procurement Manager
	S20-Senior Strategic Sourcing Specialist
	S21-Project Procurement Lead
Human Resources Management	S22-HR Manager
	S23-HR Operations Manager
	S24-Employee Relations Partner
	S25-Accounting Manager
Company Infrastructure	S26-Finance and Accountant Manager
	S27- HSE and SD Expert

6. Conclusion and future work

The scope of this research is to investigate the sequence of consecutive activities within the petroleum value chain stages and to analyze the potential main contributors to the performance increasing along the petroleum industries’ value chain stages. In order to perform the research, we have decided to use a combined method to collect information.

The first method aims to contact the subjects by email, accompanied by an argumentation message, which shows the importance of the research, as well as the opportunity of the contribution they could have to the research's successful finalization.

The second method will consist of face-to-face interview sessions, which will be held with the selected leaders, experts or specialists, directly involved in certain operations along the stages of the value chain within the petroleum sector.

Due to the non-random nature of the sampling used, the results obtained cannot be extrapolated, being representative only at the level of the investigated company, but the methodology used can be adapted for any other company, noting that certain activities or operations can be found or not in their activity portfolio.

Respectively, certain specific operations may have different weights and importance, depending on several specific characteristics of that company.

The statistical analysis of the research results was intended to be dedicated to the presentation of the links between the stages, activities, respectively between the existing operations within the oil companies, from the perspective of the value chain, as follows:

- the links and the importance level is given to all of the 9 major value chain stages;
- the existing correlations between the major activities within the different stages of the value chain;
- the existing relations and connections between the operations carried out in each of the value chain stages, based on the before mentioned performance indicators.

Fig. 4 shows Connections between the level of importance in the case of the petroleum value chain stages, operations, and activities.

The interactions between the sources of value creation in the petroleum industry, which will be analyzed in more detail during the next research stage, are very complex and dependent on the specific context.

A clear and valid solution, an operational model to successful performance, increasing in the petroleum industry would be thus difficult to obtain. However, this material will be expanded, and the final part of the work will be focused on the research's results, trying to define correlations and links based on the data provided by the respondents, which will guide us to define a mathematical model to analyze the increasing performances in the petroleum value chain stages.

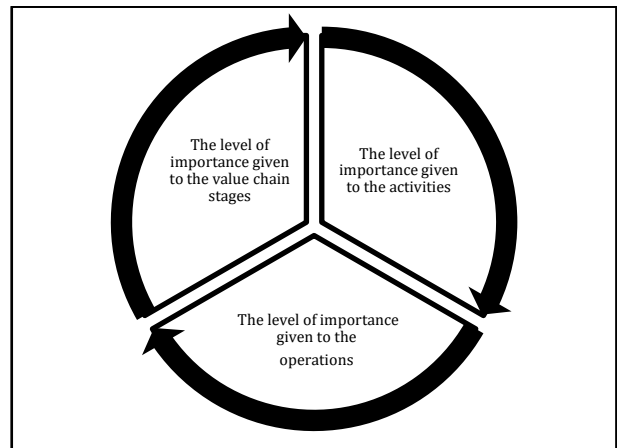


Fig. 4: Connections between the level of importance in case of the petroleum value chain stages, operations and activities

Therefore, the experiences provided by the interviewed/questioned experts and staff in different management roles among the specific oil company will provide valuable insight into that company’s operational model and will allow us to obtain on overview how the key performance indicators are used in daily activities.

And the ultimate goal of this research is to support us in developing a kind of good practice

model used by the oil companies to increase their performance in the value chain stages. Compliance with ethical standards.

Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

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