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Application of SCOR Model in an Oil- producing Company

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Abstract

Supply Chain Operations Reference (SCOR) model is developed and maintained by the Supply Chain Council (SCC). The model is a reference model which can be utilized to map benchmark and improve the supply chain operations. SCOR model provides companies with a basic process modeling tool, an extensive benchmark database by defining a set of supply chain metrics. This paper explains the process and results obtained by applying SCOR model to analyze the supply chain of Iranol Oil Company (IOC). Making numerous interviews with the managers and considering the documents regarding the supply chain processes and comparing the current situation of the supply chain with SCOR best practices, some improvement projects were proposed to improve the supply chain performance. The projects were prioritized using TOPSIS, a well-known multi attribute decision making technique.

Keywords: Supply Chain, SCOR, TOPSIS, Oil.

1. Introduction

IOC is a lubricant making company with two refinery sites in Tehran (in the Central part of Iran) and Abadan (in the south west of Iran) and a container making company in Tehran (This company packages lubricants and makes containers). The refineries are very close to Tehran and Abadan oil refineries. The lubricant is transported to the container making company by particular trucks for packaging. However, the company may also sell bulk lubricant but the strategy is selling the products in containers because of Higher added values. The major raw material of refineries which is lube cut is transported by pipelines from the oil refineries. Figure 1 illustrates a brief geographical representation of the oil and lubricant refineries in Tehran and Abadan. The Container making company is also in Tehran and receives a part of the refineries product.
Standard products which enjoy standard qualities are usually produced make-to-stock and special quality products are usually produced make-to-order. The company’s products are divided into four categories including automobile motor lubricant, industrial lubricant, antifreeze and by-products such as slack wax, furfural extract, base oil and petrolatum. Motor and industrial lubricants are more sold in containers in comparison to antifreeze and by-products. The customers of the company could be industrial factories or automobile owners. The key processes of the company are sales, purchasing and production.
The major suppliers of IOC, except for refineries, are chemical materials suppliers, container suppliers, spare parts suppliers, additive materials suppliers and furfural suppliers. Chemical materials suppliers are petrochemical complexes, mostly located in different locations of the country. The containers suppliers are also inside the country ; however, the company has also a container making complex. The spare parts suppliers are external companies (e.g. Metra from France) or some companies inside Iran. Additive materials suppliers are some European companies (e.g. Euro Gulf from England) which have representatives inside Iran. Furfural suppliers (e.g. Shell) are some companies in China, Europe and Africa. IOC supplies it from their representative inside Iran. As pointed out earlier, oil refineries are located in Tehran and Abadan .

IOC’s products are sold externally or internally. Internal customers include numerous dealers, exclusive representatives and industries. The external customers are international customers who receive the products at the ports. Dealers receive products in the form of bulk or in containers. The dealers could purchase them from the competitors and they can export the products. Exclusive representatives, which are in a closer relationship with the company ,could just purchase products from IOC. Industries include many factories which require lubricant for various applications like maintaining machineries.

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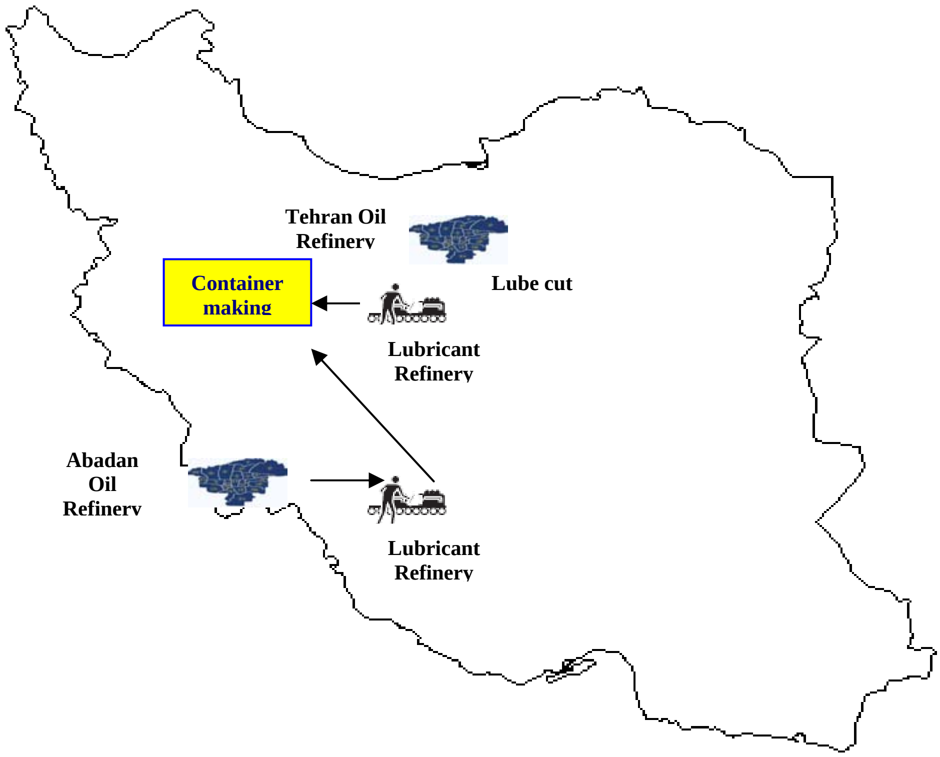

Fig. 1. Geographical representation of IOC supply chain

Figure 2 indicates a schematic diagram of the addressed supply chain.The major goal of this paper is applying SCOR model to this supply chain, analyzing it and proposing some improvement projects based on the analysis.

The rest of the paper is structured as follows: Section 2 gives a review of SCOR model and a brief literature review. In Section 3, Level-2 processes of IOC is presented and in Section 4, the analysis of Level-3 processes based on SCOR best practices is discussed. Section 5 provides the improvement projects and the prioritization. Conclusions and suggestions for further research are cited in Section 6.

2. A Review of SCOR Model and a Brief Literature Review

2.1. SCOR Processes

SCOR-model is the product of the Supply-Chain Council (SCC), an independent, not-for-profit, global corporation with membership open to all companies and organizations interested in applying and advancing the state-of-the-art in supply-chain management systems and practices.

The SCOR-model was confirmed by the supply chain management Council's consensus . While much of the underlying content of the model has been used by practitioners for many years, the SCOR-model provides a unique framework which links business processes, metrics, best practices and technology features into a unified structure to support communication among supply chain partners and to improve the effectiveness of supply chain management and related supply chain improvement activities.

SCOR is composed of three process levels which are level-1, level-2 and level-3 processes.Level-1 processes are known as "SCOR processes" and are defined for each element such as a producer or wholesaler in the supply chain. They are classified into five processes which are illustrated in Figure 3. A short definition of Level-1 processes is given below:

1- Plan (P): Processes that balance aggregate demand and supply to develop a course of action which best meets sourcing, production and delivery requirements.
2- Source (S): Processes that procure goods and services to meet planned or actual demand
3- Make (M): Processes that transform product into a finished state to meet planned or actual demand
4- Deliver (D): Processes that provide finished goods and services to meet planned or actual demand, typically including order management, transportation management and distribution management

5- Return (R): Processes associated with returning or receiving returned products for any reason. These processes extend into post-delivery customer support.

Level-2 processes are known as “SCOR process type” and are classified into three processes including Planning, Execution and Enable Processes. A short definition of Level-2 processes is given here:

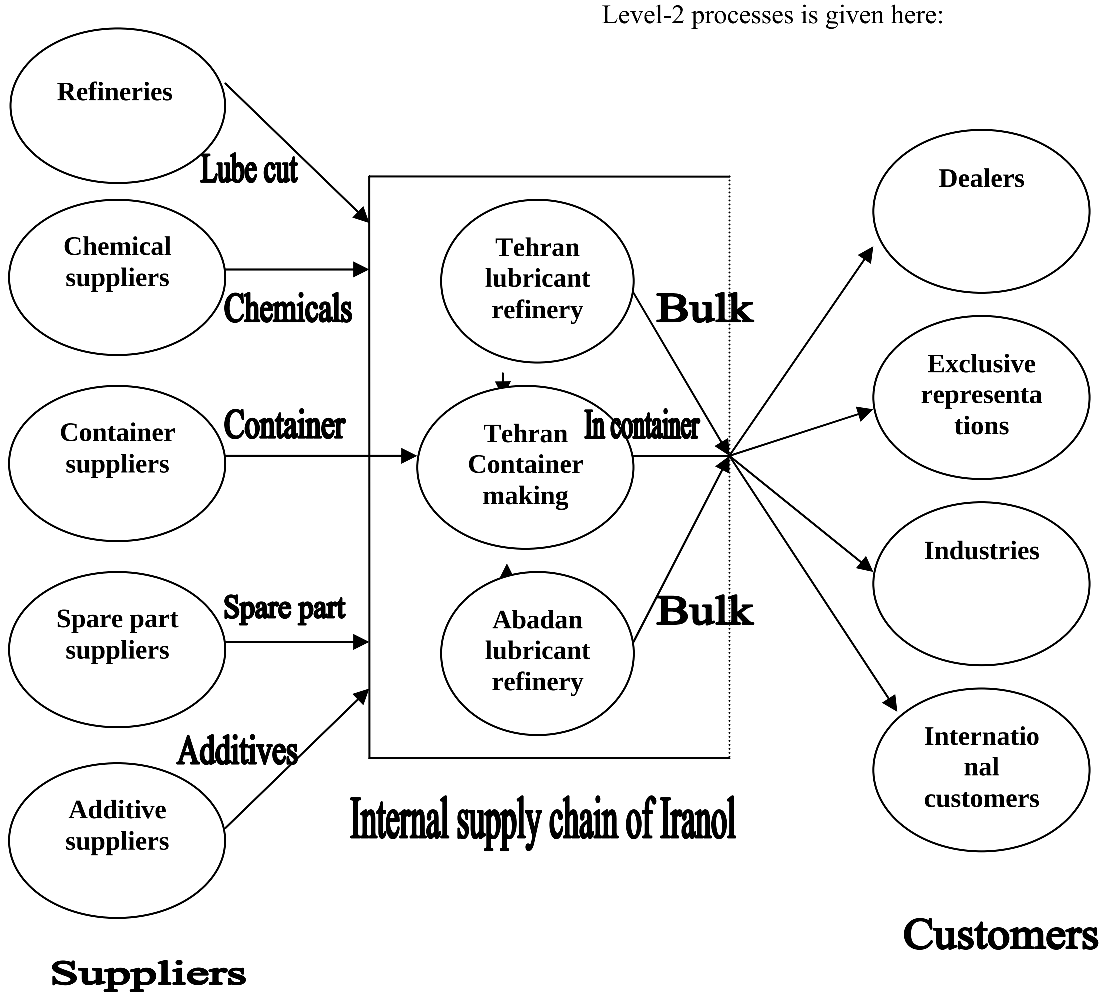

Fig. 2. A schematic diagram of IOC’s supply chain from suppliers to customers

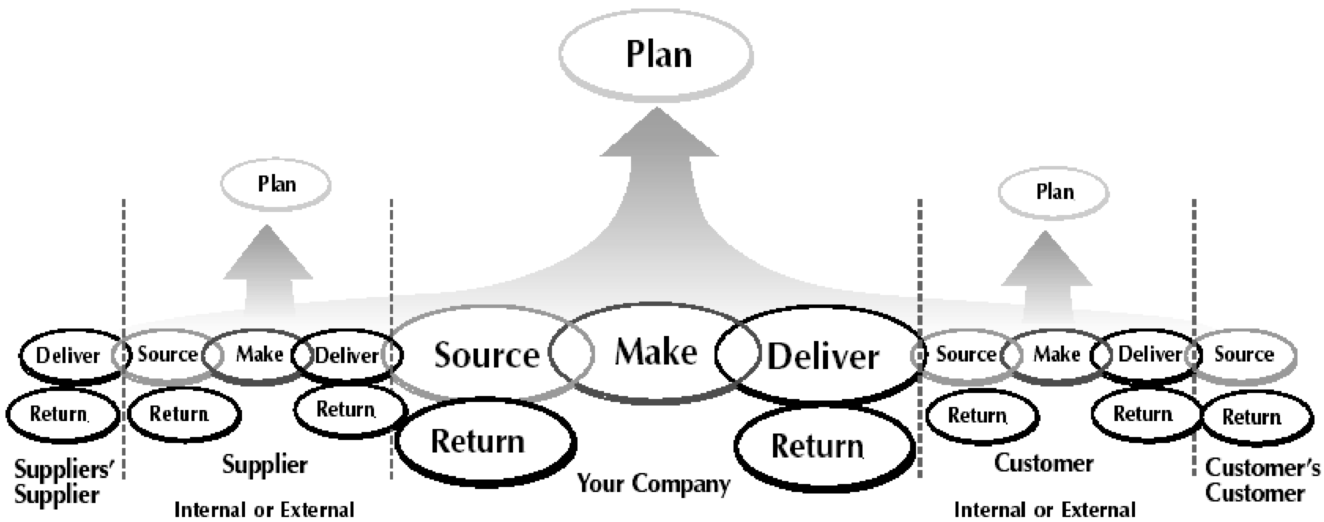

Fig. 3. Level-1 processes of SCOR

1- Planning (Pn): A process that aligns expected resources to meet expected demand requirements. Planning processes:
   - Balance aggregated demand and supply
   - Consider consistent planning horizon
   - (Generally) occur at regular, periodic intervals
   - Can contribute to supply-chain response time
2- Execution (Ex): A process triggered by planned or actual demand that changes the state of material goods. Execution processes:
   - Generally involve Scheduling/sequencing, Transforming product and/or Moving product to the next process.
   - Can contribute to the order fulfillment cycle time
3- Enable (En): A process that prepares, maintains, or manages information or relationships on which planning and execution processes rely

What is exactly meant by Level-2 processes of SCOR model is formed by crossing over the up going processes and Level-1 processes. Table 1 shows the exact Level-2 processes of SCOR as following:

Now, we review the definitions of level-2 Processes. The analysis of Return processes is beyond the the scope of the study;therefore, we skip them. It should be noted that in order to understand the Execution-related processes better, initially we need to explain the three following terms:

-Stocked Product: The product which is usually with high fill rate and ready and available as inventory (related to S1, M1, D1).

- Make-to-Order: The product which is customer order-driven and usually standard so that the supplier can easily recognize the order specifications (related to S2, M2, and D2).

- Engineer-to-Order: The product which is customer requirements -driven and usually needs sourcing new materials. The recognition of the specifications usually needs engineering maps and figures (related to S3, M3, and D3).

Table 1
Level-2 processes of SCOR model

Level-2 Processes					
	P	***S***	***M***	***D***	***R***
Pn	P1	P2	P3	P4	P5
Ex	---	S1 S2 S3	M1 M2 M3	D1 D2 D3 D4	SR1 DR1 SR2 DR2 SR3 DR3
En	EP	ES	EM	ED	ER

A brief definition of level-2 processes is as follows:

1- P1 (Plan Supply Chain): The development and establishment of a course of action over specified period representing a projected appropriation of supply chain resources to meet supply chain requirements.

2- P2 (Plan Source): The development and establishment of course of action over specified period representing a projected appropriation of material resources to meet supply requirements.

3- P3 (Plan Make): The development and establishment of a course of action over specified period representing a projected appropriation of production resources to meet production requirements.

4- P4 (Plan Deliver): The development and establishment of a course of action over specified period representing a projected appropriation of delivery resources to meet delivery requirements.

5- S1 (Source Stocked Product): The procurement, delivery, receipt and transfer of raw material items, subassemblies, product and or services.

6- S2 (Source Make-to-Order): The procurement and delivery of product that is built to a specific design or configured based on the requirements of a particular customer order.

7- S3 (Source Engineer-to-Order): The negotiation, procurement and delivery of engineer-to-order assemblies or specialized product or services that are designed and built based on the requirements or specifications of a particular customer order or contract.

8- M1 (Make-to-Stock): The process of manufacturing in a make-to-stock environment adds value to products through mixing, separating, forming, machining and chemical processes. Make- to -stock products are intended to be shipped from finished goods or “off the shelf” are completed prior to the receipt of a customer order and are generally produced in accordance with a sales forecast.

9- M2 (Make-to-Order): The process of manufacturing in a make-to-order environment. Products are completed after the receipt of a customer order.

10- M3 (Engineer-to-Order): The process of manufacturing distinct items, such as parts that retain their identity through the transformation process and are intended to be completed after the receipt of a customer order. These Products are designed, developed and manufactured in response to a specific customer request.

11- D1 (Deliver Stocked Product): The process of delivering a product that is maintained in a finished goods state prior to the receipt of a firm customer order.

12- D2 (Deliver Make-to-Order): The process of delivering a product that is manufactured, assembled or configured from standard parts or subassemblies.

13- D3 (Deliver Engineer-to-Order): The process of delivering a product that is designed, manufactured and assembled from a BOM that includes one or more custom parts.

14- D4 (Deliver Retail Product): Delivery of retailed products.
15- EP (Enable Planning): Enabling planning by using integration, IT and other techniques.
16- ES (Enable Source): Enabling sourcing by using integration, IT and other techniques.
17- EM (Enable Make): Enabling making by using integration, IT and other techniques.
18- ED (Enable Deliver): Enabling delivery by using integration, IT and other techniques.

SCOR has good enough details on Level-3 processes but does not give any explanations for Level-4 processes. Level 3 processes are the sub processes of Level-2 processes and the detailed explanation of them is in the Supply-Chain Council [10]
As it will be mentioned later on, the processes of P1, P2, P3, P4, S1, S2, M1, M2, D1, D2, EP, ES, EM and ED have been selected from among all the Level-2 processes based on IOC supply chain processes. Table 2 illustrates the Level-3 processes and their related Level-2 processes.

Table 2
Selected level-3 processes of SCOR model for studying

Row	Level-2 process	Level-3 Process	Row	Level-2 process	Level-3 Process
1	P1	P1·1, P1·2, P1·3, P1·4	8	M2	M2·1-M2·6
2	P2	P2·1-P2·4	9	D1	D1·1-D1·13
3	P3	P3·1-P3·4	10	D2	D2·1-D2·12
4	P4	P4·1-P4·4	11	EP	EP1-EP9
5	S1	S1·1-S1·5	12	EM	EM1-EM8
6	S2	S2·1-S2·5	13	ED	ED1-ED8
7	M1	M1·1-M1·6	14	ES	ES1-ES9

2.2. SCOR as a Supply Chain Performance Measurement

SCOR provides the supply chain with a few criteria or metrics to measure the supply chain performance. Table 3 depicts the level 1 metrics and their related performance attributes. The metrics are the calculations by which an implementing organization can measure how successful they are in achieving their desired positioning within the competitive market context . Most metrics in the model are hierarchical,so are process elements .
Reliability, responsiveness and flexibility are customer-oriented metrics. That is ,they are important from the viewpoint of the customers. In other words ,the addressed metrics measure supply chain performance from the customers' viewpoint. Cost and assets are metrics which measure supply chain from the viewpoint of internal performance of a supply chain. A brief definition of the metrics is as follows:
-Reliability: The performance of a supply chain in delivering the correct product to the correct place at the correct time in the correct condition and packaging in the correct quantity with the correct documentation to the correct customer.
-Responsiveness: The velocity at which a supply chain provides products to the customer.
-Flexibility: The agility of a supply chain in responding to marketplace changes to gain or maintain competitive advantage.
-Cost: The cost associated with operating the supply chain.
-Assets: The effectiveness of an organization in managing assets to support demand satisfaction: this includes the management of all assets including fixed and working capital.

2.3. A Brief literature Review

Huan et al. [5] provided a brief introduction of the SCOR model, analyzed its strength and weakness, and discussed how it could be used to assist managers for strategic decision making. Kasi [7] addressed one aspect of SCOR along with presenting a short overview of its underlying concepts and use. Specifically, he examined SCOR from a methodological perspective, adopting a systems development framework and using a socio-technical lens as a basis for assessment. He inferred that SCOR was strong on the technical dimensions such as modeling process and techniques but weak on the social dimensions. Huang et al. [6] summarized the SCOR model, its benefits along with illustrative case stories and described a computer-assisted tool to configure supply chain threaded diagram per SCOR specification.
Persson and Araldi [8] integrated SCOR methodology and a simulation software (ARENA) in order to make a tool to dynamically present and analyze the supply chains. Desodt et al. [3] collected information from textile and garment industry supply chains in order to model the supply chain.

Table 3
Level 1 SCOR metrics

	Customer-Facing			Internal-Facing	
Performance Attribute	Reliability	Responsiveness	Flexibility	Cost	Assets
Delivery performance	√				
Fill Rate	√				
Perfect order fulfillment	√				
Order fulfillment lead time		√			
Supply-chain response time			√		
Production flexibility			√		
Supply chain management cost				√	
Cost of goods sold				√	
Value-added productivity				√	
Warranty cost or returns processing cost				√	
Cash-to-cash cycle time					√
Inventory days of supply					√
Asset turns					√

Then, using these performance data they identified important variables and investigated the endogenous and exogenous relationships amongst variables. The SCOR model had to be adapted to this study. Chungrui et al. [2] presented a comprehensive framework for supply chain performance management including all aspects of performance management from performance measurement to performance improvement based on the SCOR model. Röder and Tibken [9] developed a simulation-based decision support system using a modular modeling concept for intra- and inter-company process chains based on the SCOR model. The developed concept allows the evaluation of different configurations of process chains with different sets of parameters describing realistic production and inventory processes within the automotive industry.
Govindu and Chinnam [4] proposed a generic process-centered methodological framework, Multi-Agent Supply Chain Framework (MASCF), to simplify Multi-Agent Systems (MAS) development for supply chain applications. MASCF introduces the notion of process-centered organization metaphor and creatively adopts SCOR model to a well-structured generic MAS analysis and design methodology, Gaia, for multi-agent supply chain system development. Berrah and Cliville [1] studied the supply chain performance formalization. They proposed building a performance measurement system (PMS) by linking an overall performance expression to elementary ones. The overall performance is associated to a global objective whose break-down provides elementary objectives. Elementary performances are thus aggregated in a corollary way. The problem with the design of such PMS's, by the break-down/aggregation model, concerns both the coherent elementary performance expressions and the definition of the links between them. Considering the SCOR model break-down, they proposed to extend the proposed approaches for expressing the overall performance of a supply chain.
To the best of our knowledge and considering the literature review, no research or practical work has been reported yet on applying the SCOR model for analyzing the supply chains in industries. Our paper reports the application of SCOR model in a steel supply chain.

3. Level-2 Processes of IOC

Figure 4 illustrates the Level-2 processes of IOC. The lube cut, chemicals and additives are sourced according to a prescheduled plan and the suppliers have them stocked in their storages, so they experience make-to-stock type sourcing. Spare parts and containers are produced in response to IOC's order. Making process is make-to-stock except for industrial products which are from make-to-order. Dealers and exclusive representatives' sourcing is make-to-stock but industrial factories and external customers' sourcing is make-to-order.

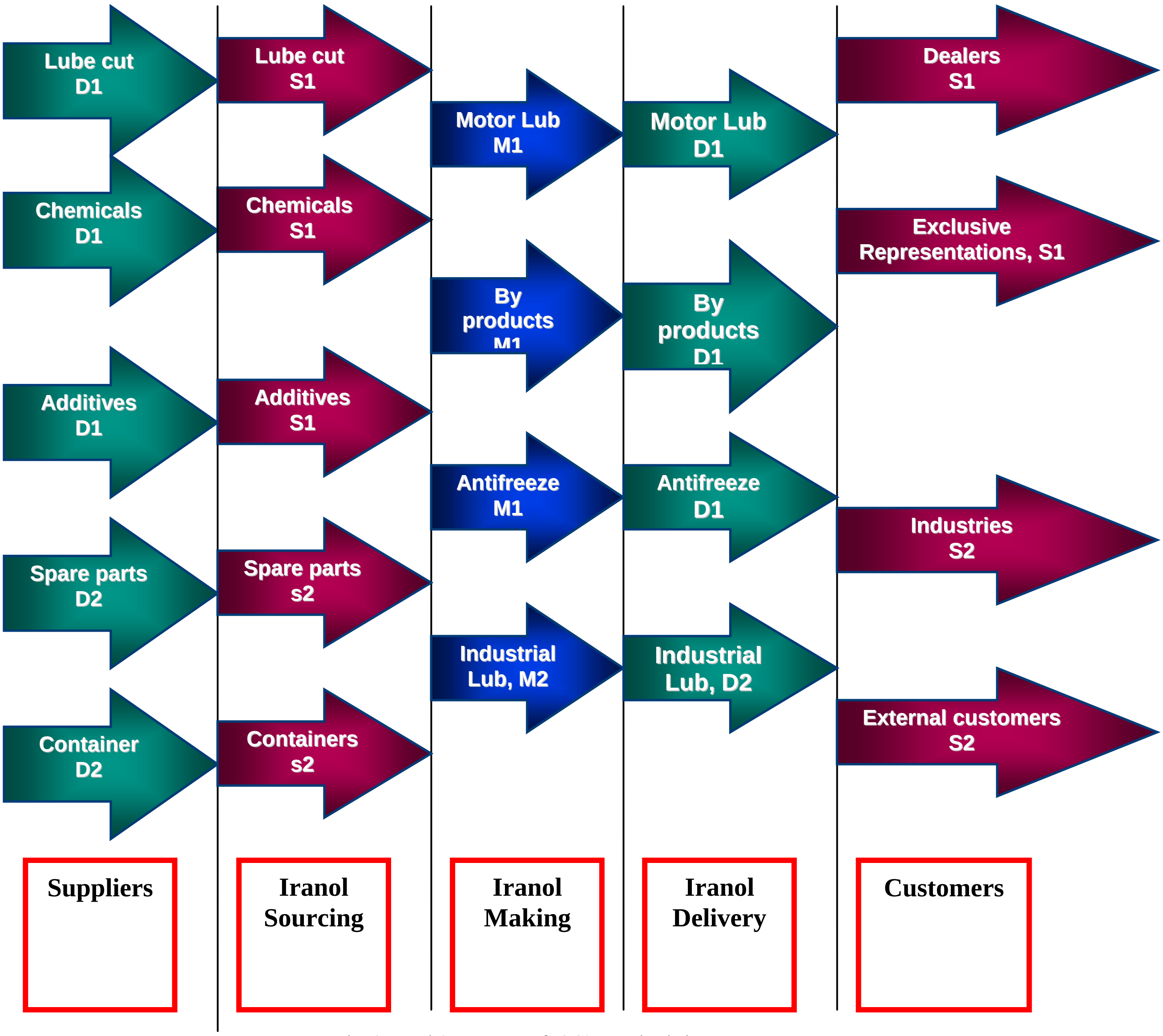

Fig. 4. Level-2 processes of IOC's supply chain

4. Analysis of Level-3 processes based on SCOR best practices

Numerous documents were collected and several managers of the company were interviewed during the research. The documents and interviews were on the logistics, including internal and external transportation and storage, on the planning processes including long -term, mid- term and short -term planning, on the information flows and relationships within the supply chain.

Here is just given a sample of analytical results of level-3 processes compared to SCOR best practices in the addressed supply chain. Table 4-7 gives the results.

Table 4
P1·1 process analysis

process	P1·1
Definition based on SCOR	The process of identifying, aggregating and prioritizing all sources of demand for the integrated supply chain of a product or service at the appropriate level, horizon and interval (sales forecasting system).
Analysis	Sales Forecasting is just done based on historical data and using simple time series methods. The process does not seem reasonable. It is proposed to revise the sales forecasting system and interfering qualitative factors such as company promotions, competitors possible actions, future market conditions as well as advanced quantitative time series methods.

Table 5
EP.1 process analysis

Process	EP·1
Definition based on SCOR	The process of establishing, maintaining and forcing decision support criteria for supply chain planning which are translated to rules for conducting business, i.e. developing and maintaining customer and channel performance standards of an entire supply chain such as service levels. Business rules align PLAN process policies with business strategy, goals and objectives
Analysis	According to IOC strategic plan, the company should achieve more share of the distribution channel. Given that a great amount of the customers are in Tehran, it is proposed to design a distribution channel in the city. The company can gain a great deal of the added value in the distribution channel.

Table 6
ES.2 process analysis

Process	ES·2
Definition based on SCOR	The process of measuring actual supplier performance against internal and/or external standards, providing feedback to achieve and maintain the performance required to meet the customers' business and/or competitive needs.
Analysis	The company has no active supplier performance measurement system which is important for additives and chemicals. It seems ttaht company can not do much about lube cut suppliers since they are monopole (the oil refineries in the site).

Table 7
M1·1 process analysis

Process	M1·1
Definition based on SCOR	Given plans for the production of specific parts, products or formulations in specified quantities and planned availability of required sourced products, the scheduling of the operations needs to be performed in accordance with these plans. Scheduling includes sequencing and depending on the factory layout and setups. In general, intermediate production activities are coordinated prior to the scheduling of the operations to be performed in producing a finished product
Analysis	The scheduling process in the company production sites is done using a simple spreadsheet program. It seems that company can revise the system using advanced planning modules in order to balance efficiency and cost in the supply chain.

5. Improvement Projects and the Prioritization

Analyzing all the related level-3 processes of the supply chain, 13 projects were proposed for improving the supply chain performance. Table 8 gives the projects titles; related level-3 SCOR process(s) and the expected benefits obtained from the projects as well as the SCOR metrics that ahd impact on performing the projects.
In order to prioritize the projects, we have made the two following Tables based on the project team ideas. Table 9 depicts the results of the pair -wise comparisons of SCOR metrics (using 1,3,5,7 and 9 ; 1 represents the identical importance of the metrics and 9 represents the highest importance rate) and Table 10 shows the affection coefficient of the projects on each metric where 1,3,5,7 and 9 are defined as very low, low, middle, high and very high respectively. The projects do not have any predecessor relationships.
Reporting the calculations related to the pair- wise comparison matrix and also normalizing the matrix in Table 10, we present the metrics weight and normalized values of the affection coefficients in Table 11. Assuming a_{ij} to be the affection coefficient of project *i* on metric *j* its normalized value (n_{ij}) is obtained from (1) as in TOPSIS.

$$n_{ij} = \frac{a_{ij}}{\sqrt{\sum_i a_{ij}^2}} \qquad (1)$$

n_{ij} multiplied by the *jth* weight (*j=1, 2, 3, 4, 5*), gives the downscaled weighted matrix as in Table (12).
Showing the values of Table 12 by v_{ij} and the best project for the metric *jth* by v_j^+ and the worst project for the metric *jth* by v_j^- then based on the TOPSIS method we should calculate d_i^+ and d_i^- as in (2) and (3). The Priority of the projects is determined by sorting the values of

$$\frac{d_i^-}{d_i^+ + d_i^-}$$

The project *ith* with higher value is from higher priority.

$$d_i^+ = \sqrt{\sum_j (v_{ij} - v_j^+)^2}, \quad \forall i \qquad (2)$$

$$d_i^- = \sqrt{\sum_j (v_{ij} - v_j^-)^2}, \quad \forall i \qquad (2)$$

The results are as in Table 13,

Table 8
Supply chain performance improvement projects

Code	Title	SCOR Process	Benefits and affected SCOR metrics
101	Revising the current sales forecasting system	P1·1	Reducing uncertainty in the supply chain and increasing the accuracy of plans.
102	Designing a new container making complex in Abadan site	P1·3 P1·4	Reducing transportation costs in the supply chain.
103	Revising the products mixture in Abadan site in order to decrease export costs	ED P3·4	Reducing transportation and storage cost and decreasing the delivery time to external customers.
104	Designing a pilot distribution channel in Tehran market	EP·1	Increasing the added value of company
105	Feasibility study of purchasing Tehran oil refinery	ES.5	Increasing the reliability of the supply chain.
106	Revising the finished goods inventory control system	ED.4	Decreasing the inventory system costs.
107	Designing the inventory control system of spare parts in both sites	ES.4	Decreasing the inventory system costs.
108	Automating the scheduling process of the production sites	M1·1	Decreasing the production planning time and optimizing the scheduling methods and sooner delivery to customers.
109	Feasibility study of eliminating metal containers (just using plastic containers)	ED·6	Decreasing transportation costs.
110	Optimizing the number of suppliers	ES·7	Decreasing supply costs and increasing the reliability of supply chain.
111	Designing the system of suppliers identification and selection	ES·7	Decreasing supply costs and increasing the reliability of supply chain.
112	Designing the system of identification of suppliers' capabilities	ES·7	Making supply chain to be capable to respond to customer's various orders.
113	Designing the performance evaluation system of suppliers	ES·2	Decreasing the delivery time of products to customers.

Table 9
Pair wise comparisons of the SCOR metrics

	Reliability	Responsiveness	Flexibility	Cost	Assets
Reliability	1	3	$\frac{1}{3}$	$\frac{1}{5}$	1
Responsiveness	$\frac{1}{3}$	1	$\frac{1}{5}$	$\frac{1}{5}$	1
Flexibility	3	5	1	$\frac{1}{3}$	3
Cost	5	5	3	1	5
Assets	1	1	$\frac{1}{3}$	$\frac{1}{5}$	1

Table 10
The affection degree of the projects on the Metrics

Metrics / Projects	Reliability	Responsiveness	Flexibility	Cost	Assets
101	1	3	1	5	5
102	1	7	12	7	5
103	1	7	3	9	7
104	3	5	1	5	5
105	7	3	1	3	5
106	1	1	1	7	3
107	1	1	1	7	3
108	1	5	1	5	3
109	1	1	1	7	3
110	5	1	1	7	1
111	5	1	1	5	1
112	1	1	7	3	1
113	5	7	1	5	1

Table 11
Metric weights and scores for each project

Metric / Projects	Reliability (0.112)	Responsiveness (0.067)	Flexibility (0.255)	Cost (0.481)	Assets (0.085)
101	0.0842	0.2018	0.0687	0.2309	0.3637
102	0.0842	0.4709	0.8242	0.3232	0.3637
103	0.0842	0.4709	0.2060	0.4156	0.5092
104	0.2526	0.3363	0.0687	0.2309	0.3637
105	0.5895	0.2018	0.0687	0.1385	0.3637
106	0.0842	0.0673	0.0687	0.3232	0.2182
107	0.0842	0.0673	0.0687	0.3232	0.2182
108	0.0842	0.3363	0.0687	0.2309	0.2182
109	0.0842	0.0673	0.0687	0.3232	0.2182
110	0.4211	0.0673	0.0687	0.3232	0.0727
111	0.4211	0.0673	0.0687	0.2309	0.0727
112	0.0842	0.0673	0.4808	0.1385	0.0727
113	0.4211	0.4709	0.0687	0.2309	0.0727

Table 12
Downscaled weighted matrix of TOPSIS method

Metrics / Projects	Reliability	Responsiveness	Flexibility	Cost	Assets
101	0.0094	0.0135	0.0175	0.1111	0.0309
102	0.0094	0.0315	0.2102	0.1555	0.0309
103	0.0094	0.0315	0.0525	0.1999	0.0433
104	0.0283	0.0225	0.0175	0.1111	0.0309
105	0.0660	0.0135	0.0175	0.0666	0.0309
106	0.0094	0.0045	0.0175	0.1555	0.0185
107	0.0094	0.0045	0.0175	0.1555	0.0185
108	0.0094	0.0225	0.0175	0.1111	0.0185
109	0.0094	0.0045	0.0175	0.1555	0.0185
110	0.0472	0.0045	0.0175	0.1555	0.0062
111	0.0472	0.0045	0.0175	0.1111	0.0062
112	0.0094	0.0045	0.1226	0.0666	0.0062
113	0.0472	0.0315	0.0175	0.1111	0.0062

Table 13
Proposed projects priority for performing

Projects	d_i^+	d_i^-	$\frac{d_i^-}{d_i^+ + d_i^-}$	Priority
101	0.2207	0.0516	0.1895	12
102	0.0730	0.2153	0.7468	1
103	0.1675	0.1452	0.4643	2
104	0.2160	0.0572	0.2094	11
105	0.2353	0.0624	0.2096	10
106	0.2089	0.0897	0.3004	5
107	0.2089	0.0897	0.3004	6
108	0.2211	0.0495	0.1829	13
109	0.2089	0.0897	0.3004	7
110	0.2038	0.0965	0.3213	4
111	0.2179	0.0583	0.2111	9
112	0.1753	0.1051	0.3748	3
113	0.2162	0.0643	0.2292	8

6. Conclusions and Suggestions for Further Research

In this paper, the results of applying SCOR model to analyze the supply chain of IOC was presented. Some improvement projects were proposed, based on the SCOR best practices and the level-3 processes. The projects were prioritized using TOPSIS method. The main contributions of this paper could be applying the SCOR model in practice, applying SCOR in a lubricant supply chain and using TOPSIS method to prioritize the proposed projects according to the SCOR metrics as the criteria.

As further research it is suggested to apply SCOR model in other supply chains and prioritizing the projects by other Multi criteria decision- making methods.

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