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# Identifying and Ranking the Factors Associated with Supply Chain Management Improvement Using AHP Method

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Abstract---Supply chain management includes integrated and coordinated guidance of all members of the supply chain to improve performance in order to increase efficiency and achieve greater profits; and supply chain managers look for ways of faster delivery of goods and services, costs reduction, and quality increase. The aim of this research is to identify and rank the factors associated with supply chain management improvement. Methods: The present study is an applied research in terms of its purpose and is a descriptive and survey study in terms of its methodology. The sample of this study was selected from the senior experts and the managers who are official members of Golestan Province Gas Company through the census method due to the limitation of decision making team. The data used in this study were obtained from two semi-structured questionnaires. First, to identify factors related to supply chain management improvement, the experts' views were listed and categorized into two parts of criteria and sub-criteria using structural analysis. Second, experts rated the criteria and sub criteria using AHP pair-wise comparison standard questionnaires and their ratings were considered in the calculation of points. To analyze the data, Expert Choice and Spss19 soft wares were used. Results: This study shows that, in the main criteria, marketing factors, weighing 0.318, were placed in the first rank followed by the financial, strategic and organizational relationships criteria. In ranking the sub-criteria, sub-criteria of study and identification of the supplier with a final weight of 0.084, product diversification strategies with a final weight of 0.068, and approaches the final cost of the product by the final weight of 0.066, ranked as the first, second and third respectively, were considered as the priorities related to supply chain management improvement from the experts' views.

*Keywords---*factors related to supply chain improvement, key processes of supply chain, supply chain management, supply chain.

# Introduction

In this era, companies encounter fierce challenges and pressures of the competitive market such as globalization, competition and cooperation, diversity of customer requirements, and short life cycles of the products. Thus, the supply chain, as a matter of principle, has been of interest to corporate executives. In other words, senior managers, in addition to focusing on domestic activities, pay special attention to appropriate and timely communication and interaction with suppliers and customers and try to manage the supply chain of their products effectively and efficiently. To put it in other words, efforts to optimize organizational processes seem useless regardless of suppliers and customers; and organizations working together for common goals appears to have a better performance (Child hous & Touil, 2003).

In recent years, the concept of Supply Chain Management is presented to depict the integrity of corporate operations from order to receipt of raw materials through production processes, and distribution and delivery of products to customers. This view enables the organizations to achieve quality improvement for products and customer service, at the expense of "reduced supply" (Ohdar & Ray, 2004). One of the primary activities of a value chain model is that it provides customer some services, thereby adding value to the network value chain. Moreover, the goal of any organization is to maximize value creation, while minimizing costs. So, selecting a supplier plays a crucial role in the value chain; and the process of selecting the supplier is the most important variable in the effective management of the modern supply chain networks because access to high-quality products and customer satisfaction help the organizations (Bhattacharya *et al.*, 2010).

Modern supply chains require IT support to satisfy different stakeholders. An IT application provides benefits to the supply-chain system in different ways and does not require any proof (Kumar *et al.*, 2013).

The process of selecting good suppliers is very important in the purchase and efficient production. The distinction between the suppliers points out to the differences that originate from some features among them, such as organizational culture, manufacturing process, technology capabilities and distribution of geographic location (Chen & Huang, 2010).

### Review of the Literature

#### a. Supply Chain

The supply chain is a network of topological structure made up of autonomous or semi-autonomous corporations. These corporations, all together, perform procurement, production, delivery, and other things. There is a major corporation in each supply chain that is responsible for supply chain configuration based on data on demand as well as the use of financial flows, material, and information as a means to achieve the value throughout the chain (*Lou et al.*, 2004).

The supply chain includes all activities related to the transformation of goods from raw material stage to the final state and also information flows associated with them (Kord & Golshahi, 2012). In another definition: supply chain includes a network of facilities and distribution methods playing the role of procurement and preparation of materials, transportation of raw materials and final products and sending these products to customers. (Papageorgion, 2009).

### b. Supply Chain Management

Morgan & Hunt (1994) stressed the importance of establishing, developing and maintaining uniform and continuous relationships with customers, suppliers, distributors, enterprises, and groups with others specific goals (Polo *et al.*, 2008).

Supply chain management is a way to strengthen the competitive forces that steadily becomes more significant (Vaaland & Heide, 2007). The purpose of supply chain management is to improve the efficiency of delivery and product offering processes in the entire path of material supply chain to the final customer with minimal intermediation (Hoover *et al.*, 2001).

The concept of supply chain management was created when the manufacturers experienced strategic partnership with their direct suppliers. SCM means a network of organizations involved in the processes and activities in an upside-down relationship, and creates value in the form of the form of products and services provided to the final customer (Christopher, 1998). In Papageorgion's (2009) view, supply chain consists of a network of facilities and distribution methods that play the role of material procurement and preparation, transportation of raw materials and final products, and bringing these products to the customers (Safarzad *et al.*, 2014).

According to the Kumar *et al.*, (2013), Most of the earlier studies were conducted without any product-specific supply chain in focus. However, it is important to understand differences in different supply chains. The supply chain of agri-food products in India is very much different from other conventional supply chains such as automotive products, electronics goods, personal computers or FMCGs. Some authors such as Charan *et al.*, (2009); Gupta (2011); Humphrey (2003); Luthra *et al.*, (2011); Sahay & Mohan (2003); Viswanadham (2006) have recognized a supply chain of automotive products with names of one of key supply-chain partners like Maruti, Hero Honda, or in case of personal computers, with names such as of Dell or HP, and so on, but in a supply chain of agri-food products like pulses, food grain, etc., it is not possible to recognize it with a single name. Characteristics such as high degree of perishability, no proper identity of individual supply chain, limited outsourcing, unorganized structure and limited customer orientation make supply chain of agri-food products different from supply chains of other products (Aramyan *et al.*, 2007; Joshi *et al.*, 2009; Kumar & Basu, 2008; Narula, 2009; Sagheer *et al.*, 2009).

Three main factors made the managers to pursue the subject of supply chain management seriously, including:

- 1. Information Revolution
- 2. Customer demand for purchasing high-quality products and services at a lower cost, through better delivery, more modern technology, and greater longevity which eventually led to increased competition among manufacturers.
- 3. The need for a new structure in inter-organization relations (Petri et al., 2007).

The place of supply chain management with regard to the type of the structure:

Type of organization	The place of supply chain management unit	The domain under the control of the management unit	Theoretical background
Non SCM-oriented organization	No special unit is responsible for supply chain management, though related activities are done in the IS unit.	Doing traditional activities that control global units. Supply chain activities are not performed by a special unit. Planning and deployment of SCMIS are done by the IS unit.	Lambert and Stock (1993) Bowersox and Daugherty (1995) Bowersox <i>et al.</i> , (2002) Monczka <i>et al.</i> , (2002) Head (2005) Jabnoun and Sahraoui
Functional structure	There is one exclusive unit for SCM	SCM unit carries out traditional activities of SCM. Both SCM and IS units are responsible for planning and implementing SCMIS.	(2004) Lambert and Stock (1993) Bowersox and Daugherty (1995); Johannessen and Solem (2002)
Integrated linear structure	Other function units are placed at a lower position and this unit controls all overall activities	SCM unit integrates all external task of the SCM that includes is activities	Monczja <i>et al.</i> , (2002) Johannessen and Solem (2002) Jabnoun and Sahraoui (2004) Head (2005)

 Table 1

 The place of supply chain management (Kim, 2007)

The Main Processes of the Supply Chain

The matrix	A unit with equal status with	SCM focuses on inter-	Pritsker (1997) Johnson
structure	the other units, but its	organization coordination	(1997); Huang and Lin
	responsibility is coordination	and its relationship with external	(2002) Monczka et al.,
	and planning.	members	(2002) Johannessen and
			Solem (2002) Bowersox
			et al., (2002)
The staff structure	SCM unit position is higher	SCM practical activities are	Benita et al., (1992)
of the process	than the other units, also	performed in the form of linear	Lambert and Stock (1993)
•	includes the IS unit, and is	task including IS unit.	Bowersox and Daugherty
	responsible for the overall	-	(1995) Johannessen and
	coordination and		Solem (2002) Monczka et
	administrative tasks.		al., (2002)

Five main sections of the supply chain management are discussed in the following:

Planning- This is the strategic section of the supply chain management. It is the management of the resources that are used to meet customer requirements for your product or service you. Strategic planning is needed. Most of the planning process is devoted to implementation of measures to monitor the supply chain so that it would be optimized and cost-effective and meets the customer's desired quality and value.

Resources – choose suppliers and vendors who provide the products and services used in producing your required products and services. Determine procedures for pricing, delivery, and payment to the suppliers, provide a set of monitoring and optimization measures to communicate with them. Then, determine warehouse management

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processes including receiving emails, reviewing and transferring goods and services to their product lines, as well as how to pay to the suppliers.

Production – plan the activities needed for quality control production, packing, and preparing to send the emails. Measure quality levels, production output, and the employment of workers and employees.

Sending- this section is often called logistics; in this section, you should arrange the customers' received orders, prepare a network of warehouses, and choose ways of transporting the products to the customers and the payment methods.

Rejection- establish the section of network supply chain problems for rejection of defective goods from customers (Sezkeli, 2005).



Fig. 1 The main supply chain processes that should be checked to asses(Sezkeli, 2005, p.5)

Background	of the	research
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Researcher	Subject	Year	Results
Xiaoyuan, Jayashankar and Swaminathan	Improvements in supply chain management	2015	Key issues related to supply chain management following the discussion on the complexities associated with the supply chain management are provided. After that, the inefficiencies of weak supply chain management is discussed. Finally, a summary of up-to-date research activities and discussion on the future challenges related to supply chain management are provided.
Abdul-Kader and Shaik	The framework of environmental criteria, green criteria, and organizational criteria to select a green supplier	2014	It creates a hierarchy to assess criteria and sub-criteria of green suppliers which leads to the formulation of appropriate habitable strategies by managers.
Safarzad <i>et</i> al., 2014	Identification and evaluation of supply chain agility through AHP method.	2014	For the purposes of this study, three criteria and 12 sub-criteria of ranking of supply chain agility, based on the Lin et al. model were modified by the staffs and 81 options (components of supply chain agility), related to sub-criteria, were identified. After that, a questionnaire containing 41 factors, as the main factors, was distributed among 30 respondents. Among several options, the following expressions were selected as the most important factors from the participants' perspective: the electronic systems should be used in the interactions for the supply and delivery of goods. Software should be to detect future needs of the product candidates and ability to predict the market changes.

Tseng, and chiu	Evaluation of the Green supply chain management of the Company in linguistic preferences	2013	A total of 18 criteria- out of which the most important ones are environmental standards, environmental management system, the profitability of suppliers and close relationships with the suppliers, were selected for the study and then fuzzy theory was used to change linguistic criteria to definite numbers.
Tseng	Implementing green supply chain management for selecting the suppliers	2012	Both environmental and non-environmental criteria were developed in the under-investigation company and weight of the criteria was determined based on two quantitative and qualitative factors, and finally gray analysis method was used to rank vendors.
Sila, Ebrahimpour, and Birkholz	Quality in the supply chain: an empirical analysis. Supply Chain Management	2006	They showed that two activities of "supplier quality management" and "focus on customer " are two important activities of quality management that are included in the scope of supply chain management specifically; thus, they offered that managers should develop activities based on cooperation and interaction at the supply chain level and integrate upstream and downstream processes of quality improvement in order to

The Proposed Model for the Research

The aim of this study is to identify and rank the factors related to supply chain management improvement in Golestan province gas companies using AHP hierarchal analysis method. The research model is provided in the following pattern based on theoretical research background as well as expert opinion.

Each of the criteria and sub-criteria of the model has been extracted from various articles. Organizational factors are extracted from Shafiee (2013), Kelidbory *et al.*, (2013), Ahmad *et al.*, (2012), and Xiaoyuan *et al.*, (2015). Marketing factors are introduced by Golshahi (2012) and Sila *et al.*, (2006). Financial factors are discussed by Javadian (2014), Kord & Golshahi (2012), Dezh *et al.*, (2013), and Safaee *et al.*, (2012). Strategic relationships are explained by Ghassemieh *et al.*, (2012) and Abdul-Kader & Shaik (2014).



Fig 2 The conceptual model of the research

# **Research Methods**

This study is an applied research in terms of its objectives and is a descriptive and survey one in terms of its method. The sample of this study was selected from the senior experts and the managers who are official members of members of Golestan Province Gas Company through the census method due to the limitation of decision-making team.

# **Research Instruments**

In this study, descriptive statistics such as frequency distribution table, percentages, and charts are used. After collecting research corpus and the expert opinions, AHP hierarchical fuzzy analysis questionnaire was developed to

analyze the data. After gathering the responded questionnaires, they were analyzed by soft-wares such as Excel and Expert Choice. Multi-criteria decision-making methods used in this study has several advantages such as taking into account the uncertainty related to the subjective preferences of decision makers.

### The Validity and Reliability of the Instrument

The validity of the instruments used in this study is, in a sense, a kind of logical or content validity that is related to the employed method. In paired comparison method, all the factors are assessed together that it illuminates any probability related to ignoring one factor or one question.

Reliability of the scale and ranking the factors associated with supply chain management improvement were done through pre-test which is presented in Table 2. Cronbach's alpha values obtained for sub-indices are generally acceptable, so the reliability of the questionnaire is confirmed.

Table 2

Reliability	of the questionnaire					
Reliability statics						
Cronbach,s Alpha	Number. of Items					
0.87	20					

# **Results and Analysis**

# Data Analysis

According to analysis, factors related supply chain management improve were identified in the 4 criteria and 20 subcriteria, and the hierarchical structure of the questionnaire is as follow.



Figure 3. The hierarchical structure of the factors related to supply chain management improvement

# Calculating Weights of Various Levels

In this step, to calculate the relative importance (weight) of each of the different levels (Level I, Level II, and Level III), a questionnaire in accordance with the AHP format (Pairwise comparison test) was provided and distributed to collect the opinions and comments of the decision-making team. The questionnaire includes a matrix for pairwise comparison of the factors. So, their numbers are equal to the number of the comparisons.

The number of comparisons or the number of the questions is equal to:  $10 = \frac{()}{()} = \frac{()}{()}$ 

In other words, there are 10 pairwise comparisons for sub-criteria of each factor. After collecting the questionnaires, the rate of adjustment of each factor was examined individually from the 30 collected questionnaires. That questionnaire which their adjustment rate was less than or equal to 0.1 were analyzed and the respondent's opinions were combined using Expert Choice 11 software.

Main factors	Organizational factors	Marketing factors	Financial factors	Strategic relations	Weights	rank
Organizational factors	1	0.71	0.66	1.21	0.215	4
Marketing factors	1.41	1	1.34	1.41	0.318	1
Financial factors	1.50	0.75	1	0.94	.247	2
Strategic relations	0.83	0.71	1.06	1	0.220	3
-	IR=0.01 < 0.1					

 Table 3

 The integrated matrix of pairwise comparisons of the main factors associated with supply chain management improvement

The matrix inconsistency index is 0.01, and this value is less than 0.1; therefore, the validity of the matrix is acceptable. Among the four factors- associated with supply chain management improvement- that were compared, according to the above matrix, criteria of marketing factors weighing 0.318 was ranked in the first place of importance followed by financial factors weighing 0.247 ranked in second place of importance, criteria of strategic relations with a weight of 0.220 ranked in the third place, and organizational factors criteria with a weight of 0.215 ranked in the fourth place of importance.

### Calculating Weight of the Sub-factors (level III)

Sub-factors	Management and organizational commitment	The effectiveness of the organizational chart	Establishing Aligning with payroll organizational management goals system		Supplying and nurturing human resources	Weight	rank
Management and organizational commitment	1	0.73	0.65	1.29	1.41	0.194	2
The effectiveness of the organizational chart	1.36	1	1.48	1.63	0.79	0.240	1
Establishing payroll management system	1.54	0.67	1	0.87	0.85	0.189	3
Aligning with organizational goals	0.77	0.61	1.15	1	1.26	0.183	4
Supplying and nurturing human resources	0.71	1.26	1.18	0.79 IR=0.02 < 0.1	1	0.194	2

 Table 4

 The integrated matrix of pairwise comparisons of organizational sub-factors

The matrix inconsistency index is 0.02, and this value is less than 0.1, so the validity of this matrix is acceptable. Among the five sub-criteria of organizational factors which were compared, according to the above matrix, subcriteria of the effectiveness of the organizational chart weighing 0.240 was ranked in the first place of importance, followed by sub-criteria of management and organizational commitment and Supplying and nurturing human resources with a weight of 0.194 ranked in the second place of importance, establishing payroll management system with a weight of 0.189 ranked in the third place of importance, and sub-criteria of aligning with organizational goals with a weight of 0.183 placed in fourth rank of importance.

Sub-factors	Product diversification strategies	Studying and identifying the suppliers	Identifying mechanisms of internal and external markets	Sales engineering	Appropriate interaction with customers	Weight	Rank
Product diversification strategies	1	0.56	2.74	1.65	1.92	0.258	2
Studying and identifying the suppliers	1.78	1	1.54	2.08	2.23	0.313	1
Identifying mechanisms of internal and external markets	0.36	0.65	1	0.62	0.55	0.116	5
Sales engineering	0.61	0.48	1.61	1	1.92	0.181	3
Appropriate interaction with customers	0.52	0.45	1.83 IR= 0.	0.52 02 < 0.1	1	0.138	4

Table 5	
The integrated matrix of pairwise comparisons of marketing sub-	factors

The matrix inconsistency index is 0.02, and this value is less than 0, thus the validity of this matrix is acceptable. Among the five sub-criteria of the marketing factors that were compared, according to the above matrix, sub-criteria of Studying and identifying the suppliers weighing 0.313 was ranked in the first place of importance, then sub-criteria of product diversification strategies with a weight of 0.252 was ranked in the second place of importance, followed by the sub-criteria of sales Engineering with a weight of 0.181 in the third place, sub-criteria of appropriate interaction with customers weighing 0.138 in fourth place of importance, and sub-criteria of Identifying mechanisms of internal and external markets with a weight of 0.116 placed in the fifth rank of importance.

Access to	1	0.62	0.66	0.83	1.75	0.182	4 resources at a	a lower cost	
Ability to	1.62	1	0.75	0.69	0.63	0.174	5 analyze cost a	and benefit	
The 1.51	1.33	1	0.74	1.78	0.236	1 produ	uct's final price strategies		
Flotation of	1.21	1.44	1.35	1	0.73	0.218	2 the price based on the cost		
Table 6. Integrated matrix of pairwise comparison of financial sub-factors									
Sub-factors	Access to	o Abi	lity to	The	Fl	lotation of	Government	Weight	Rank
	resources	at anal	vze	product	<u>'s</u> th	e price	restrictions		
	<u>a</u> lower	cost	and	<u>final</u> pri	ice ba	ased on	(public rating		
	cost	ben	efit	strategi	es th	e cost			
Government	0.57	1.58	0.56	1.36	1	0.190	3 restrictions		
(public rating					_				
	IR= 0.04	< 0.1							

The matrix inconsistency index is 0.04, and this value is less than 0.1, so the validity of this matrix is acceptable. Among the five sub-criteria of financial factors were which compared, the product's final price strategies with a weight of 0.236 was ranked in the first place of importance, Flotation of the price based on the cost with a weight of 0.218 was ranked in the second place of importance, government restrictions with a weight of 0.190 was ranked in third place, subcriteria of access to resources at a lower cost with a weight of 0.182 was ranked in the fourth place of importance, and sub-criteria of Ability to analyze cost and benefit with a weight of

0.174 was ranked in the fifth place of importance.

Sub-factors	Crea mecl s for feed	ting nanism back	Activati the proc for meet the custome complai	ng C ess p ing c v rs' c nts	Creating oortals to ommunicate vith ustomers	Acce appr cont com	ess to opriate racting panies	Identifying and categorizing the activities	Weight	Rank
Creating mechanisms for feedback	1		1.32	1	.36	1.51		0.67	0.220	2
Activating the complaints	0.76	1	1.29	1.65	0.64	0.198	3 proce	ess for meeting t	he custome	ers'
Creating portals	0.73	0.77	1	1.72	1	0.196	4 to co	mmunicate with	customers	
Access to	0.66	0.61	0.58	1	1.01	0.150	5 appro	priate contracti	ng compan	ies
Identifying and	1.49	1.55	1	0.99	1	0.237	1 categ	orizing the activ	vities	
	IR= 0.	03 < 0.1								

 Table 7

 The integrated matrix of pairwise comparison of strategic relations sub-factors

The matrix inconsistency index is 0.03, and this value is less than 0.1, so the validity of this matrix is acceptable. Among the five sub-criteria of the strategic relations which were compared with respect to the above sub-criteria matrix, to identifying and categorizing activities with a weight of 0.237 was ranked in the first place, sub-criteria of creating mechanisms for feedback with a weight of 0.220 was ranked in the second place of importance, Activating the process for meeting the customers' complaints with a weight of 0.198 was ranked in the third place, Creating portals to communicate with customers with a weight of 0.196 was placed in the fourth place, and Access to appropriate contracting companies with a weight of 0.150 was ranked in the fifth place of importance.

# Step Three: The Final Weight of the factors and Ranking

The matrix inconsistency index is 0.01, and this value is less than 0.1, so the validity of this matrix is acceptable.

### Final Weights of Sub-criteria of the Factors Related to Supply Chain Management Improvement

Out of the 20 sub-criteria categorized under four main factors related to supply chain management improvement that was examined, a comprehensive ranking of 20 sub-criteria is presented in Table 8 to determine which sub-criteria gained the higher priority and which gained the lower priority; and ratings of 1 to 20 belong to which sub-criteria in general.

Goal	Criteria	Final weights of the criteria	Ranking of the criteria	Sub-criteria	weights of the sub- criteria	Final weights of the subcriteria	The final ranking of the subcriteria
Factors related to supply chain managem ent improve ment	Organizatio- nal factors			Management and organizational commitment	0.194	0.045	11
	Marketing factors	0.215	4	The effectiveness of the organizational chart	0.240	0.055	6
					0.189	0.044	12
				Establishing payroll management system	0.183	0.042	13
				Aligning with organizational goals	0.194	0.045	11
				Supplying and nurturing human resources	0.252	0.068	2
				Product diversification	0.313	0.084	1
				strategies Studying and identifying the suppliers	0.116	0.030	15
					0.181	0.047	10
				Identifying mechanisms of internal and external markets	0.138	0.036	14
					0.182	0.049	9
				Sales engineering			

 Table 8

 Ranking Factors Related to supply chain management improvement based on Analytic Hierarchy Process (AHP)

 Financial factors	0.247	2	Appropriate 0.17 interaction with			0.047	10
incloss			customers	0.236		0.066	3
			Access to resources at a lower cost	0.218		0.061	4
			Ability to analyze cost and benefit				
			The product's final price strategies				
			Flotation of the price based on the cost				
			Government restrictions (public rating	0.190		0.051	8
Strategic relatives			Creating mechanisms for feedback	0.220		0.053	7
		A	Activating the process for meeting the customers' complaints	0	.198	0.047	10
0.220	3	Crea	ting portals to communic with customers	cate 0	.196	0.047	10
		Acce	ess to appropriate contrac companies	ting 0	.150	0.036	14
		Ider	tifying and categorizing activities	the 0	.237	0.056	5
	Tot	al incon	sistency index			IR=0.0	01 < 0.1

According to Table 8 sub-criteria of Studying and identifying the suppliers with a final weight of 0.084 ranked in the first place, sub-criteria of product diversification strategies with a final weight of 0.068 ranked in the second place, sub-criteria of the product's final price strategies with a final weight of 0.066 ranked in the third place of importance, sub-criteria of flotation price based on the cost with the final weight of 0.061 ranked in the fourth place, and access to appropriate contracting companies, appropriate interaction with customers and identifying mechanisms of internal and external market with final weights of 0.036, 0.036, and 0.030 were ranked in the 14th and 15th place of importance.

# Conclusion

The present study aimed to assess factors associated with supply chain management improvement in Golestan Province Gas Company. After identifying the associated factors, they were ranked with the use of AHP hierarchical method; and the results showed that marketing factors, financial factors, strategic relations, and organizational

factors obtained the highest priorities, respectively. The results of Kelidbory et al., (1393), show that use of a higher level of supply chain management practices and competitive advantage have a positive impact on organizational performance improvement; as well the use of supply chain management practices have a positive impact on the competitive advantages. In the era of knowledge, those organizations are successful that employ the strategies based on competitive advantages quickly and refine and improve processes and operations wherever necessary by learning from the market and customers. One of the primary activities of a value chain model is to provide customer services by which add a value to the value chain network. Moreover, the goal of any organization is to maximize value while the costs are kept at a minimum. So selecting a supplier plays a crucial role in the value chain and the process of supplier election is the most important variable in the effective management of modern supply chain networks because access to high quality products and customer satisfaction helps the organizations. Business always relates to the supply chain. That means the companies buy raw materials, components, and accessories used to create their products and services, and deliver them to customers who purchase their products. What is new is that the speed by which goods and services pass the chains related to the supply has significantly increased because advances in computer and communication have increased exchange rate of information. Though, a company just sees its direct providers and buyers. The group of buyers and customers are quite complex (Hosseini & Sheikhi, 2012). Xiaoyuan et al., (2015), stated that supply chain management is an important aspect of any business. Javadian (2015), declared that when the main factors influencing the behavior of the whole system and the relationships between them are well-known, three policy measures are implemented and suggested in the model to improve the known indices of supply chain performance evaluation. The policies include reducing the number of lost sales, reducing the inventory and getting the right information which implementation has improved indices. The results enable us to predict the results of any change in the variables, relationships, or chain structure that is very important due to the complexity of the supply chain.

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