Identify and rank the factors affecting the performance of green suppliers in the chain (the case glass factory in Qazvin)

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Abstract: In this era of ever-changing environment and changing the way the company interacts with customers and suppliers and complexity of markets, reduced product life cycle and the importance increase the flexibility of response time and customers, the crucial factor for the competitiveness of the supply chain Green said. Thus, identifying and implementing green supply chain excellence and help it to function better. In this study, the factors affecting green supply chain performance was studied in the literature and expert opinion using 34 indicators to measure the performance of supply chains, green identified. Then, using exploratory and confirmatory factor analysis (correlation and regression) of the indicators identified in 9 of 34 indicators to measure the performance of supply chain green glass industry Qazvin obtained. According to studies of factors affecting green supply chain participants is as follows, where the customers are known as the most important factor.Therefore, the composting processes could be optimized by the application of the developed simulation model. 1.Customer; 2.Process;3. Human; 4.Resources; 5.Cost Flexibility; 6.Environmental Factors; 7.Management; 8.Time; 9.Suppliers;
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1. Introduction

International organizations are always looking to achieve competitive advantage through innovation and new approaches. Some of these organizations by improving environmental performance and compliance with environmental standards, increase knowledge about customers and reduce negative environmental impacts the competitive advantage of products and services can be reached. Globalization, increasing regulations, government agencies and non-government clients on compliance with environmental demands and pressures has caused organizations to review the necessary steps for the implementation of green supply chain management, to improve the environmental performance of economic and pay. Green supply chain management, supply chain management is integrated with environmental requirements at all stages of product design, selection and procurement of raw materials, manufacture, process, distribute, transport, delivery to customers and ultimately the consumer, recycled Management and reuse to maximize the amount of energy and resource efficiency with improved performance of the entire supply chain. (Chen and Pavlraj, 2004).

Sustainability means creating a society of social - economic, cultural and environmental issues is a long-term focus, while supply chain management of all aspects of the product cycle such as raw materials, processing, manufacturing, distribution, retail, customer use covers. When the firm is part of the supply chain in the long-term sustainability is not just a business, but the entire supply chain, from the bottom up or the top down will take. (Cooper and Lambert, 1997).

2. Review of the literature

2.1.Performance Evaluation

Most Performance evaluation is critical to the success of any organization that makes it easy to understand the behavior; it will shape and improve competitiveness. Remarkably, many efforts have been made in the field of performance measurement at the organizational level, but it is very small and few efforts in the organization. It should be noted that at the organizational level, performance measurement, and financial factors has focused primarily on tangible factors. Indigo Gregory and Plats (1955) Quantification of the effect of performance evaluation and performance measures have been defined. Meet customer requirements for the degree of effectiveness and economic efficiency of utilization of company resources in creating a predetermined level of customer satisfaction measures. Hence it can be said that the trick to a set of performance evaluation systems (measures) the efficiency and effectiveness of the measures are small. Sink and Tuttle (1998) have claimed that you cannot manage what you cannot measure it, and it would have provided a measure as

the main reason. Performance evaluation can provide important feedback information that enables administrators to monitor and control an integral part of planning and decision-making with the aim of measuring the effectiveness of various models (evaluation) has been created.

A few companies of its objectives in the field of technological innovation and achieve satisfactory results and the need to measure performance. Performance evaluation based on reliable data is one of the factors for the full value of their investment, it is considered necessary. Despite the importance of performance measurement, introduced over a decade of supply chain management and develop a performance evaluation of the literature on the theory and practice of supply chain, not pay enough attention to evaluate the performance of the supply chain. Although it is said that supply chain performance evaluation can facilitate a better understanding of the supply chain, and have a positive impact on agents' behavior to improve the overall performance.

2.2 Supply Chain

Supply chain, all companies and business activities required to design, manufacture, delivery, or use of a product or service are included. Any business to survive and thrive in its supply chain and any of its affiliated chain plays a role. So far, various definitions of supply chain are presented. The following are some definitions of supply chain expression

- The supply chain consists of a network of channel partners operating from within and outside the organization that affects the utility of the output of the supply chain.
- A supply chain consists of two or more organizations that are legally separated by the flow of materials, information related to finance. These organizations can include companies that parts, components and finished products are produced and logistics service providers and their customers (end) in the fall.
- Supply chain involving a network of distribution facilities and the procurement of materials, transportation of raw materials and final products, and deliver the products to customer's plays.

Thus, a supply chain of a company and its customers and suppliers, the company has been formed. In this series, the basic group of members that provides a simple supply chain. Three other members of the supply chain are developed. First, at the beginning of the supply chains, from supplier to supplier or supplier's initial and second at the end of the chain, are the ultimate customer or client. Finally, there's a whole bunch of other companies in the chain are there to serve. These companies provide services such as procurement, finance, marketing and information technology can offer**.**

2.3 Supply Chain Management

Supply chain management coordinating all activities with the activities of a company's suppliers and customers. Effective supply chain management prefers that suppliers and customers together in a harmonious style, participating in free flow, to work together by talking. Rapid flow of information between customers, suppliers, supply centers and transportation systems, corporate development, supply chain enables.

Ensuring that supply chain management is a set of attitudes and manufacturer of integrated warehouse and stores the quantity of goods to the correct location, To illustrate that while the level of customer service servicing costs will be minimal

2.4 Performance Evaluation of Supply Chain

Performance evaluation as an essential tool of management, necessary to improve performance in order to help balance the supply chain provides. However, the supply chain management has become a common practice in the industry and a steady stream of articles about the theory and practice of supply chain management, published the performance evaluation of supply chain so was not concerned with This is why the Researchers believe that all of the supply chain performance evaluation is not enough. On the whole, few attempts to systematically arranging the supply chain performance evaluation criteria were conducted. In addition, the theoretical consensus on the most appropriate classification method among scholars there. Byman (1999) to measure supply chain performance identifies three different criteria: resource, output and flexibility.

Gvnaskaran and others (2001) framework for evaluating the performance level of strategic, tactical and operational supply chain are developed. Under the terms of the supplier's, delivery, customer service and inventory costs and logistics deals. We should note that the performance criteria, which are listed under the surfaces of which are used in this study**.**

3. The review of studies

Altayb and Zaylany (2010) in their study entitled "Green supply chain initiatives among certified companies in Malaysia and stable environment" have done and the result was the discovery of a number of initiatives, green supply chain, which indicates the importance of green supply chain organizations as well as to the external environment.

Zhou et al (2007) in his study entitled "Initiatives and Green Supply Chain Management Implications implementation by Chinese manufacturers" have done and thus firms Electrical / Electronic relatively high levels of supply chain management implementation Green and consequences are outperformed other producers.

Shang Chang et al (2009) in their study entitled "Classification of green supply chain management capacity among manufacturing firms in Taiwan Altkrvnyk dependent" have done and the result of analysis of the factors known to reduce the Green Supply Chain Management Green Supply Chain Management took on the dimensions of 6. The results advocate the use of the resource-based view as a lens through which features a unique group of manufacturing companies related to electronics.

Vachon and D. Klasn (2006) in their study entitled "Green project partnership in the supply chain integration: The Case of the package printing industry" have done to influence the outcome of this research contribute to a green project focuses on practical performance. Green project partnership with the primary supplier delivery performance, while certainly there are partnerships with major customers with quality, flexibility and environmental performance related. This research applies the service is. Firooz affection and Khatami in 1390 in an article entitled "Green supply chain management to fulfill the requirements of the automotive industry in Iran" have done enforcement action resulting in waste management and environmental cooperation with stakeholders, the environment, respectively. First and third priorities are.

Chinese sales and Sheikh Mohammad in 2010 a study entitled "The performance of the petrochemical supply chain green" have led to the integration of environmental and thereby contribute to enhanced cooperation between of knowledge and will As a result of the in the supply chain can develop their organizational capabilities not only has an impact on their environmental performance, but also affects the quality of their performance, such as cost.

Ramezanian and Heidarnia old paper in 2009 entitled "Factors affecting green supply chain management in the tourism industry (case study of Tehran Travel Agency)" have done and thus the amount of backup resources and corporate culture also among the most important Factors influencing the response to irritants which travel along the factors affecting the implementation of green supply chain management, including senior management official, the success rate adoption and implementation of will help determine the strategy environmental.

The importance of research

Green supply chain is an integral part of today's corporate activities to be environmentally friendly. For example, in America, more than 11 percent of the cost of transportation of goods and services are included; more than 25% will be allocated to the cost of recycling. According to the World Health Organization, 24% (about a quarter) of diseases worldwide are caused by environmental pollution. More than 13 million people worldwide annual deaths caused by the disease are caused by environmental factors. Today the industry is due to the shortening of product life cycle (from product design to sale) and varied products of particular sensitivity of decision-making in supply chain management decisions about environmental issues in the supply chain several decisions such as how to carry sourcing, selection of suppliers and... Will be affected. (Ahmedi, 2005).

4.Problem Statement

In both the 60 and 70 AD, organizations can increase their competitive attempted to standardize and improve their internal processes and cost less to produce a better quality product. At that time, the prevailing thought was that the engineering and robust design and integrated manufacturing operations required to achieve the demands of the market, resulting in a greater market share. For this reason, organizations have focused all their efforts on increasing efficiency. In the 80th with increased variability in expected patterns of customers, organizations and processes to increase the flexibility of the production and development of new products to satisfy the needs of our customers were interested. In the late 90s, along with improvements in manufacturing processes reengineering deployment patterns, managers in many industries that continue to improve internal processes and market presence alone is not enough flexibility in the ability of companies and material suppliers must also materials with best quality and lowest cost producers and distributors of the products will also be closely linked to the market, the manufacturer must develop policies. Such attitudinal approaches to supply chain management and put it into existence. On the other hand, with the rapid development of information technology in recent years and it is widely used in supply chain management, supply chain management, with many key activities of the new method is being done. (Hamidi and civilian Abbey, 2010).

5.Research objectives

This study aimed to identify factors affecting supply chain performance green glass factories Qazvin. These factors are identified, presented and analyzed, evaluated and thereby identify organizational strengths and weaknesses and be able to route it took appropriate solutions. The purpose of this study is defined as follows.

- Identify the factors affecting the performance of green suppliers
- Ranking factors in the performance of green suppliers
- Minimizing logistics costs to maximize

environmental indicators

6.Materials and Methods

This study aims to identify the factors affecting the performance of supply chain in the glass industry is doing that kind of research descriptive survey is based on regression and correlation analysis. The study was conducted in order to identify the factors affecting the performance of green supply chain literature and experts of the industry using the Delphi technique is dealt with. The following factors obtained using exploratory factor analysis technique, was examined and a conceptual model of green supply chain performance evaluation was obtained, and the results were analyzed using confirmatory factor analysis. To perform the factor analysis, a questionnaire was developed to extract parameters of reliability and validity were examined and distributed among experts using sample collection is. Data analysis in this research using statistical software SPSS and end, is executed.

7. Population, sample size and methods of measurement

The study population included all managers, assistants, specialists and teachers in relation to the glass factory in Qazvin, which are equal to 260, to form. In this study, simple random sampling was used. Randomly selected by the JI and without any thought of Order and plan in advance, respectively. Random sampling method to select a part or the whole of society, so that everyone who has a number of possible samples n are fixed to have the same probability of being selected. The target population is limited, so sampling the population is limited to the following formula was used.

$$n = \frac{260 \times 1.96^2 \times 0.5 \times 0.5}{(0.05^2 \times 259) + (1.96^2 \times 0.5 \times 0.5)} \cong 155$$

155 questionnaires among teachers, administrators, assistants, distributors, industry experts and 122 completed questionnaires were received, a questionnaire has been distributed. A questionnaire was developed to test the reliability, Cronbach's alpha was used, and the value of Cronbach's alpha equal to 0.806% was achieved**.**

8.Analysis of data

In this study, the data and information obtained from the sample to estimate and predict population characteristics is discussed. According to research inquiries Factor analysis is used to identify the factors affecting the performance of green supply chain, inventory adjustment, distribute and collect them and use software SPSS Is addressed through the analysis and obtain the value of the priority factors affecting supply chain performance green glass factories have Qazvin. Noted in the literature review of variables affecting green supply chain performance and identify the 34 factors were determined as factors affecting green supply chain performance. Further research using questionnaires to measure these variables were used in the industry; exploratory factor analysis was conducted to allow analysis technique relying on a model for green supply chain performance evaluation is discussed in the industry**.**

8.1.Results of exploratory factor analysis

Sampling was done based on the data analysis results in Table 1 have been obtained. The data were analyzed using principal factors with varimax rotation and the total variance explained is equal to 65.819. In other words, the model obtained in the study of factors affecting the performance of 65.819, presents a green supply chain. The total variance explained as a measure of the validity of the model used. Exploratory factor analysis results suggest that the structure of 9 with respect to the time variable content in each structure is selected for a suitable name. According to Table 1, the load factor for each variable in each structure can be observed. To the time factor regression (correlation) of variables associated with the structure itself is a confirmatory factor analysis.

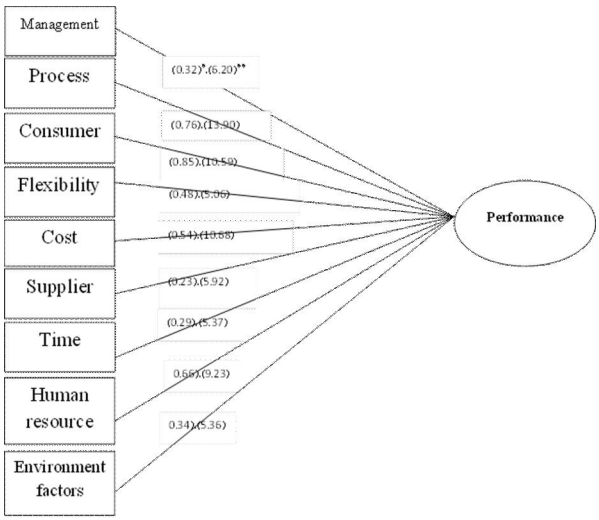
8.2. Results of confirmatory factor analysis

Confirmatory factor analysis, principal investigator is in default under a specific set of variables associated with each factor. The minimum requirement for factor analysis is realized in the model number, the default is set before analysis. In general, to test assumptions about the measurement model using confirmatory factor analysis techniques can only be. According to the results of the confirmatory factor analysis hypotheses based on a positive and significant relationship between factors affecting green supply chain was approved. It is to approve or reject the assumptions of standard coefficients (loadings) and the numbers are significant. Given all coefficients above 0.5 are standard and a significant number of them are above 1.96 can be concluded that all the factors identified in the Green Supply Chain.

Figure 2 provides the model is the result of exploratory factor analysis. The form factors of supply chain management in the 9 factors, human resources, environment, time, cost, customer, flexibility, supplier and shows the process. Thus the vegetable supply chains that have a better performance in the nine factors are also have a higher yield, so it's not fully functional structures, green supply chain in this industry offer.

Table1. Results of exploratory factor analysis

supplier	time	management	Environment factor	flexibility	cost	Human resource	process	client	factors / variant
								0.751	Customer Satisfaction
								0.812	How to deliver quality
								0.669	Rate of return (return)
								0.768	advertisement
								0.602	Customer understanding of the product
								0.696	Probability of lack of inventory and customer order
							0.862		Effectiveness of distributed scheduling
							0.764		Ways to order
							0.854		The accuracy of prediction methods
							0.521		Level of information sharing
						0.801			Workforce expertise
						0.833			Employee participation
						0.802			Employee Satisfaction
					0.844				Storage costs
					0.823				ROI
					0.899				Inventory levels of circulating
				0.815					Rates respond to urgent orders
				0.771					Supply rate
				0.864					Degree of flexibility in meeting customer needs
				0.901					Diversity of products and services
			0.817						Domestic law and international
			0.701						Environmental factors (sanctions, war and terrorism, etc.)
			0.831						Retardation of technological change and new technologies
			0.726						Government support (import, taxes, loans, etc.)
		0.607							Support and commitment of senior management
		0.881							Environmental policy and management strategies for the following programs
		0.876							Purchasing power of prediction markets
	0.743								Cycle time
	0.921								Latency (LT)
	0.725								Purchase order cycle time
0.827									Amount of defect-free products delivered by suppliers
0.786									Quality Capabilities Supplier
0.809									Providers of assistance in resolving technical issues
0.704									Supplier cooperation
6.439	6.613	6.674	6.735	6.820	7.148	7.453	7.693	10.245	Variance determined
65.819	59.381	52.768	46.094	39.359	32.538	25.391	17.938	10.245	Determined by the cumulative variance
2.189	2.248	2.269	2.290	2.319	2.430	2.534	2.615	3.483	Special value



Chi-Square=54.50, df=29, P-value=0.00000,
RMSEA=0.021
Standardized coefficients
A significant number

Figure 2: The model of green supply chain performance measurement

This factor model using chi-square, root mean square error of approximation, Akaeike information criteria, application of non-suitability, goodness of fit index, adjusted goodness of fit index was done by applying LISREL. For the measurement model, commonly used for several indicators, the Klein and Sun (2005) statistics and suggests the following indicators: chi-square index (X 2) Conceptually, this index than the sample size is changed, and the difference between the observed covariance matrix and the covariance matrix of the model shows that the relationship between the variables is zero, the square root of the variance of the estimation error of approximation index covariance of the remaining average - proportion of the variance covariance matrix of the model - variance shows a typical cut-off point is 50 hundredths and 50 hundredths is less than its value. The goodness of fit of the relationship between the variance and covariance of the show, which range between zero and one is, and what its value is closer to an index, the better the fit of the model shows the index of goodness of fit of the modified GFI That needs to be corrected, show (Jarzgag and Svrbvm, 2005).

Approved the proposed model can be noted that the RMESA The result is equal to 0.021 and less than 0.05 and two indices GFI And AGFI 0.096 and 0.94, respectively, indicating that the fit of the model itself is derived from the ratio of chi-square value to the degrees of freedom equal to 1.86 is obtained from the value of the 3 lower, have been achieved so result that the models fitted was adequate and appropriate.

Conclusions

These studies aimed to identify factors affecting supply chain performance influencing variables were green. Using the Delphi technique and literature were identified variables affecting green supply chain performance and then using factor analysis, they examined Significant based on the conceptual model of factors affecting the performance of green supply chain in the glass industry Qazvin was developed. According to the model presented in this study, the factors affecting the performance of supply chain consists of suppliers, cost, flexibility, process, consumer, human resources management, environment and time. Each of these dimensions is defined by The following variables. Many of these variables in distributed research as factors affecting green supply chain performance are presented. By comparing the obtained models with a more complete investigation of the cases presented in the past and at the same time for the industry are native country. Parameters such as time cost, accountability, flexibility is provided by Byman, Gvnaskaran and Chan and Kee but the extents of their relationship in these studies are often qualitative and subjective points. In this study, the most comprehensive model to assess the impact of these factors will also be discussed. Results are presented from the perspective of a glass factory in Qazvin experts about the importance of each factor on the performance of green supply chain offers. The accuracy of these results, we discover that the most important factor in this chain are in fact corporate clients in the first category and the companies of the bargaining power of in this industry, it is clear that they have the They measure the performance of these chains is very high. The second factor is the process that it represents the business processes in this industry and this is a great weakness in the eyes of the industry experts be one of the most important issues to improve the performance supply chain Green be.

Variables such as the level of information sharing, truth and prediction methods in order to distribute the agents are located. Managing human resources as another factor was introduced and given the nature of today's organizations, human resources as the most important assets in organizations is one of great influence in the industry, and the cost is another factor in this model, the is considered important, it is quite clear that the crystallization was not very cost-effective in the industry and experts in the industry looking for cost-effective ways to produce products at lower costs for customers are final. Flexibility, environmental management, there are other factors as influencing factors are presented in the green supply chain, time is one of the most ineffective in this model are presented. Markets closed due to high bargaining power industry in response to the

customers' needs from the perspective of time, so the experts are not a competitive. Suppliers as the least effective agent in this new model is presented and the main reasons of green supply chain in the country. However, the results show that the finiteness of our industry in this area not responding to competitive priorities, time and flexibility is not, but still competitive priority due to inefficiency of production systems for this industry, the cost remains.

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