Original Research

A Pattern for Sustainable Development from Perspective of Stakeholders Theory

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Abstract
The aim of this research is to prepare a comprehensive pattern for sustainable development namely, sea transport which is one of the important parts of the transportation industry. The mention focused on improving communications and coordination among maritime organizations in this area. The research written based on a descriptive correlative research method. In the data gathering; we have used a Field – Librarian Method.
First, the Delphi method has been used to examine the framework for sustainable development and its effective components in the mention industry. Required information has been gathered by survey tools such as observations, interviews and questionnaires. Also structural equation technique, path analysis and LISREL software are used to analyze the gathered information. The conclusion of this research is representing a suitable model for explaining the relationships among stakeholder demands, supply chain performance and sustainable development so that we can declare the demands and requests initiated of stakeholders has direct and indirect meaningful relationships with sustainable development. In the long term; relevant organizations will be able to respond effectively to the needs and requests of key stakeholders and also will implement professional human resources which to be one of the most influential elements in the conceptual model.

Keywords - Maritime Transportation; Maritime Transportation Sustainability; Stakeholders; Sustainable development; Delphi method.

1. INTRODUCTION

Today, two concepts of trade and transportation can be considered as two essential foundations for achieving sustainable development and the growth and prosperity of countries in the global economy. These two concepts are complementary and dependent on each other. Also, a relationship between these two categories is equally important in both the international and local environments.

In this regard, the globalization of the economy and the liberalization of trade, which are made of the concept of globalization; creates equal opportunities for all countries to play a role in global trade and achieve a sustainable development. Therefore, by consider to the geographical location of Iran, it should be declared that Iran has 3000 kilometers of land border with some countries like as Afghanistan, Pakistan, Turkmenistan, Turkey, Iraq, and Azerbaijan. Also, Iran has more than 2,700 kilometers of sea border in the Caspian Sea, the Oman Sea and the Persian Gulf. By consider to the extent of the borders of Iran and the vital role of marine transportation in more than 90% of Iran's trade. It can be declared that it is very important to address the weaknesses and challenges of the industry.

One of the most important problems which the industry is facing with is the lack of sufficient coordination and cooperation in decisions making among trusted organizations in the industry. Today, among the members of the maritime community, there is no comprehensive approach for coordinating the common decisions such that each part acts like as a separated island.

This lack of coordination and other weaknesses and structural barriers can be considered and addressed within an integrated strategy which is called Sustainable Development. In other words, at the present, the country's marine industry is suffering from lack of coordination and lack of procedural procedures and standard operating procedures such that because of lack of proper communication among some of important decision-makers leads to formation of a separated islands emergence of inaccurate and unethical policies and decisions, poor reactions to market conditions and consequently loss of many opportunities at the macro and national levels and the backwardness of the country in the field.

2. PROBLEM STATEMENT

In today's competitive environments, efficiency in the use of resources and speed and flexibility is necessary. It seems that in such environments the only way to survive the companies and organizations is to satisfy the requirements and specifications of sustainable development which are based on key dimensions such as the economic dimension, the social dimension, the environmental dimension (Cognitive) and finally governmental dimension.

According to Miandoabchi (2012), "one of the most important factors in achieving sustainable development in the field of maritime trade and transport is to activate participation and interaction of all actors and stakeholders" (Miandoabchi, 2012). In the view, achieving sustainable development indicators in this industry can play a significant role in the growth of the maritime industry. Also, according to Lam (2011), " in this industry, many problems result from intrinsic and intrusive structural challenges such as decentralized and inconsistent decisions at various levels of government, complex and controversial responsibilities of various government departments and incompatibility occurred between targets of government and the private sector. "Transportation, trade, and their sub-sectors often have various principles"(2011, Lam). From the viewpoint of Miandoabchi (2012), because of the lack of a transparent approach for decision-making and coordination, each section acts like an island. According to him standard operating procedures such that the diversity of decision-makers and lack of proper communication between them lead to poor decision-making and adoption of inappropriate policies and decisions, or to slow response to market conditions and the loss of many opportunities at the macro and national levels and, also the backwardness of the country. Among other things, the most important outcomes and consequences these mismatches and the lack of coordination between such stakeholders in this industry are classified as below:

- Irregular scheduling or lack of a plan for transferring stored goods or coordinating with other supply chain members which resulted in static and non-moving goods in the supply chain.
- Weak management in the supply chain and inadequate and inefficient income patterns and slow flow of goods lead to heavy burdening for the owners of the goods and customers that increase the cost of the goods and ultimately affect the final consumers.
- The old and defective structures of the country's supply chain management leads to the formation of high costs, slow reactions to market changes, and rework and goods corruption and so on due to the bureaucracy.
- Lack of integration and coordination in the management of members of the supply chain, which has led to the formation of various centers of decision-making, and lack of coordination among the members of the supply chain.
- Failure in defining standards, rules, regulations, and clear and integrated guidelines among all members of the supply chain of the country.
- Finally, long range of the transportation and distribution process in the supply chain of the country, which is concluded of all above-mentioned issues.

As illustrated in Figure 1 in the industry, most important problems are among marine suppliers, ports, distribution, and forwarders due to the lack of coordination and the existence of multiple decision makers.

This important point leads to many other inappropriate consequences including the continued increase in product durability, the average return time of the container, and imposition of more costs on all supply chain.

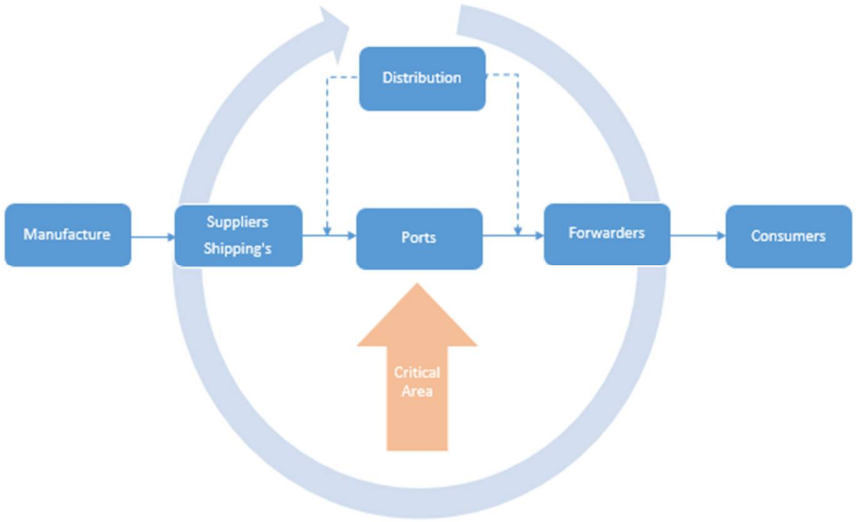

Figure 1
Supply Chain Supply System & Critical Area in Iran

In Figure 2, the rates for theperiod of 2014-2017 are presented for clarifying this issue. Therefore, with regard to the issues and problems encountered in this very important industry which are briefly mentioned in the above, it is essential that policy-making and legislation related to the Marine transportation industry would become more logical and coordinated through the formation of close relationships between various stakeholder groups and various decision-makers both public and private.

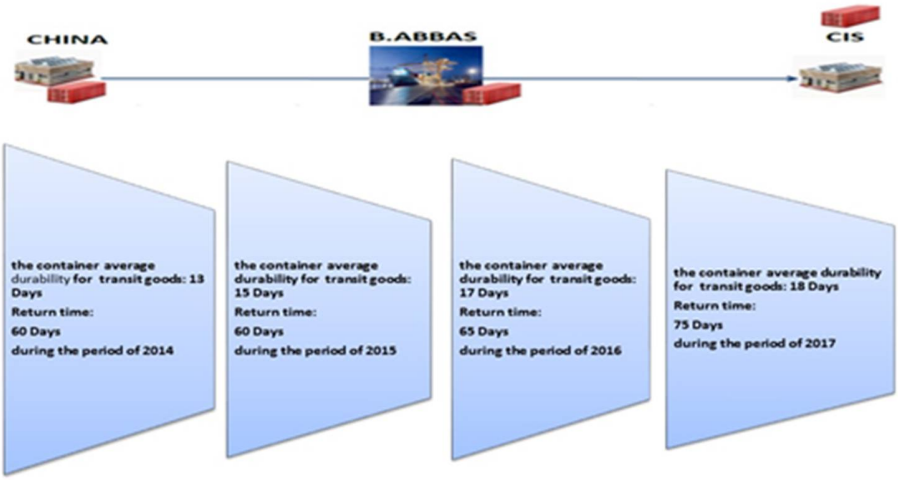

Figure 2
Comparison of the average durability and Return time of the container during the 2014-2017 periods

Also, there should be some mechanisms for consultation and interaction between these groups. Through these mechanisms, it will be possible to arrange, discuss, counsel, and reach consensus between the private sector and the governmental enterprises which are active in the field of marine transportation and trade. Such mechanism will create a coherent environment for enhancing the competitiveness and quality of the trade and transportation system.

On the other hand, it can be declared that considering the concept of sustainable development by utilizing stakeholder theory is a completely new and innovative subject and can be helpful in solving many problems that are currently affecting this important industry in the country. Also, there are some factors in the model proposed by this study which need vital policy makers and strategists such as the creation of a collaborative environment,

Reinforcement of cooperation and mutual trust between decision-makers and stakeholders, greater stability policies

and procedures, facilitation of maritime business

Conditions, rapid response to marketplace changes and conditions in the maritime markets, the fluency flow of information, and transparency of decision-making channels. It should also be acknowledged that by identifying and explaining the variables and key parameters affecting the marine transportation industry, considering the concepts of stakeholder theory and sustainable development and considering the roles of these two concepts have on the maritime marine industry finally can resolve the barriers and problems faced by organizations involved in the field of marine such as the Ports and Maritime Organization, the Iranian Marine Company, the Transportation and Terminals Organization, the Union of Ships Owners.

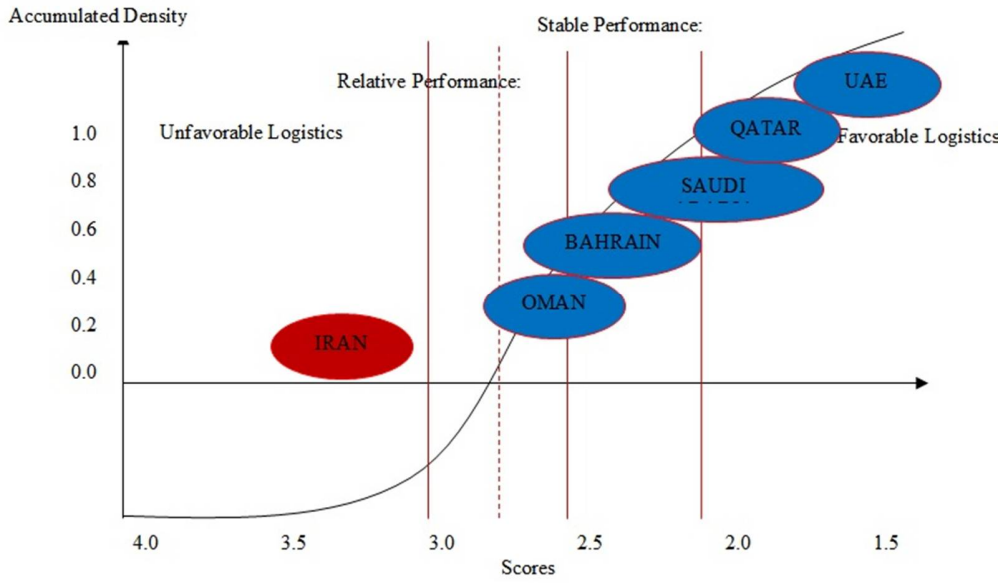

Figure 3
Comparison of the place of Iran with neighboring countries in Persian Gulf in terms of Logistics Performance Index (2012) for Some Middle east Countries

As you can see, Figure 3 shows the place of Iran in the marine transportation industry in terms of the logistic performance index. It clearly indicates the weak logistic performance of the organizations in charge of the country's marine transportation and the transfer of Iran's place to the Neighboring countries in the geographical area of the Persian Gulf and the Sea of Oman.

Therefore, in summary, the most important concerns of the researchers and managers of this industry can be categorized as follows:

- It seems that Principal organizations in the field of marine transportation are not able to satisfy the needs of customers and goods owners. Finally, given the huge volume of investments and the increasing expansion of marine operations among rival and neighboring countries, the goods owners prefer to freight to neighbors ports and then transit their goods to the country.
- The lack of easy coordination and communication between different organizations in marine transportation industry incurred a waste of time and energy for employees and clients (owners of goods, customers, and consumers) and has led to decisions made by organizations such as islands. Therefore, principal organizations can achieve the concept of sustainable development in the industry and establish appropriate and close relationships among themselves and various stakeholder groups by using a comprehensive framework or appropriate model which the research proposes.

3. Theoretical Foundations and Literature Review

Any scientific research should be based on the results of similar studies and in order to advance the evolutionary process pursued by previous studies; therefore, it is necessary to review the theoretical foundations and empirical evidence provided by previous studies.

- **Sustainable Development**

It can be said that the term sustainable development was first introduced by Barbara (1970) in the Cocoyoe Declaration on Environment and Development. Subsequent to the presentation of reports by the Rome Club and the Hammerschlund Foundation and the International Union for

the protection of the Environment and Natural Resources and the presentation of global strategies for the environment and natural resources with a view to achieving sustainable development.

- **Dimensions of sustainable development**

Sustainable development is one of the concepts and a subject that seeks to develop new and technological ways in life through making relationships between different dimensions of development (economic, social, environmental, and sovereignty). Each of the dimensions of development is in a relationship with the other dimensions. Also, it is necessary to obtain a comprehensive and precise understanding of these dimensions and then with their help, some frameworks should be designed and codified to help achieve the highest level of sustainable development. According to Soubbotina (2004), "the concept of sustainable development and its features can be studied in four groups: social, economic, fundamental (institutional) and environmental". In his opinion, "Sustainability is a process for achieving the concept of sustainability in any activity that needs resources and its rapid and integrated replacement". Sustainable development along with economic growth in a society or an advanced economy, beyond sustainable economic development, tries to attain a sustainable development "(2004, Soubbotina). Regarding the concept of sustainability and sustainable development, it can be stated that all experts consider a certain type of acceptable development which reached with sustainability parameters. This view is not only about meeting the daily needs of humans and also influencing the needs and requirements of future generations. According to Davari Nejad (2012), "Sustainable Development involves four main economic, social, environmental and governance dimensions that depend on the development of these items; however, a comprehensive approach looks at it and each of its functions does not damage the other but also complement them "(Davari Nezhad, 2012). From the perspective of Ermaki and Eftekari (2000), "although these dimensions are naturally interdependent and affect each other, making decisions in an integrated manner and needing to a proper management of the implementation methods for each of these dimensions needs to be done in a way that leads to the most efficient production "(Ermaki and Eftekari, 2000).

- **Sustainable development in the marine transportation industry**

The ultimate goal of inter-organizational sustainable development is a continued effort to increase the effectiveness of organizations for activities and planning. According to Chin et al. (2016), "ignoring the indexes that are important in the formation of sustainable development among organizations leads to problems and delays in the marine transportation industry."(2016 Chin). To achieve this goal, it is necessary to develop medium and long-term programs for trusted organizations in the industry and to engage the community in order to create a large-scale national management. Hence, "supervision on the quality of service in all sectors of the marine transportation industry will improve the economic level of the country" (Ermaki & Eftekhari, 2000). Davari Nejad (2012) also refers to the direct impact of this dimension on the achievement of sustainable development goals. he said, "This dimension includes a set of rules, policies, institutionalization, pluralism, respect for human rights and effective participation of people in decision-making and also it regulates the conditions for the pursuit of different purposes or to establish a relationship between them to achieve sustainable development "(Davari Nezhad, 2012). One of the most important tasks in this area is the Feldman (2004) paper, which identifies key criteria for assessing the role of maritime organizations in the sustainable development at ports of Taiwan and then proceeding for the three criteria which they mean concepts of economics, principles, and practices of the environment (ecological) and social concerns and concerns are discussed. Recently, a new dimension called governmental has been added to the total dimensions of sustainable development (2004, Feldman). In this area, we can also refer to Wagner's article (2014) in which he examines the relationship between two main dimensions of sustainable development, namely economic performance and environmental (ecological) in the field of marine transportation. According to it, the degree of influence of each key stakeholder (internal, public, supply chain, legislators and legal observers) effects on achieving sustainable development in the marine transportation industry (2014, Wagner). According to De Langen (2004), "In today's competitive environments, the specialization of port operations and trade facilitation play an important role in ports' performance" (De Langen 2004). Wang et al. (2004) emphasized on the concept of standard oversight and stated that "in the development of the port, the distribution of power across the port, local, regional, national and international levels shows that port policies are not integrated in one way or integrated"(2014, Wang et al.) According to Debrie et al. (2013)," stakeholder management is a key point in monitoring On ports due to the existence of diverse opinions and interests, and sometimes conflicting with each other "(2013, Debrie et al.).

4. Research Objectives

The main objective of this research was to provide a conceptual framework based on theoretical backgrounds such that it can clearly explain the relationship between the three main components of the research (stakeholder demands, marine supply chain sustainable development, and improving the performance of marine transportation industry). Also, by reviewing the research literature, the conceptual model and the three main components of the constituent and substructures of each of them are identified.

5. Research Hypotheses

With regard to the pressures and demands that stem from the various stakeholders in order to achieve sustainable development (from four dimensions of economic, social and governance and environment) at marine transportation industry. Therefore, it is possible to develop the following hypotheses:

- Stakeholder demands have a significant impact on the marine transportation industry sustainable development.
- Marine transportation industry sustainable development has a significant effect on improving the performance of marine transportation industry.
- Stakeholders' demands have a significant impact on improving the performance of marine transportation industry by the marine transportation industry sustainable development.

Finally, based on research hypotheses, the conceptual model is depicted in Figure 4.

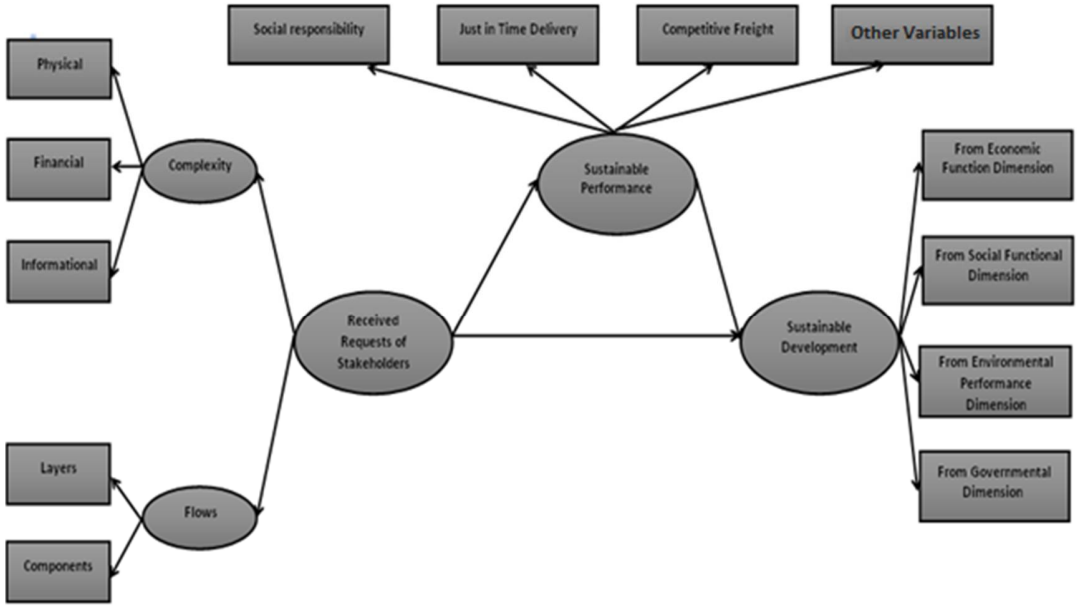

Figure 4
A picture of the conceptual model of research Methodology of research

the purpose of the study was determining the key criteria affecting sustainable development and in continue designing a suitable model based on stakeholder theory using techniques such as observation, interviewing with experts and specialists and distributing a questionnaire among them in order to gathering Required data by referring to libraries and specialized archives of relevant organizations, therefore, the research method is a descriptive-field survey study.

Therefore, this research is in terms of its orientation, exploratory-practical, and is a descriptive-field survey in terms of purpose. Also, its purposed statistical population was all organizations, companies and active institutions in the field of marine transportation industry which their organizational nature, duties, structures, and missions were in the field of maritime industry. According to the latest estimates, the total number of these active organizations in the field of marine transportation in Iran (statistical population) is 4093 active items, as presented in Table 1 (Iran Marin Book, 2017).

Table 1
Members of the purposed Statistical population of the Maritime Transportation Industry Based on their Nature and duties (Iran Marin Book, 2017).

Row	Type of company, institution, organization related to maritime transportation industry	number
1	operators and owners of the ship	800
2	organizations 69	69
3	Inspections	109
4	contractors and consultants	459
5	Maintenance	190
6	Manufacturers and Sellers	585
7	Professional Services	951
8	Marine services	261
9	Shipbuilders and repairers	168
10	port operations and port equipment	501
	Total number of statistical population	4093

In the following, main equation for calculating the Cochran sample size is presented:

$$n = \frac{\frac{z^2pq}{d^2}}{1+\frac{1}{N}\left(\frac{z^2pq}{d^2}-1\right)}$$

N = volume of statistical population

n = sample size

d = permissible error value

Z = 1.96

p = q = 0/5

Z = the standard normal variable at 95% confidence level which is 1.96

P = is the ratio of the attribute in the population which if it is not available it can be considered as 0.5

q = Percentage of people who do not have that attribute in statistical population (q = 1-p).

Based on the statistical population which is defined in the previous step, 350 active organizations are selected (from each class in the previous table 35 companies), in continue from each of these companies and organizations, one senior executive is selected as the respondent and a questionnaire is distributed among these individuals. Therefore, according to the Cochran formula at 95% confidence level (5% error limit), the sample size will require 350 people.

6. Validity and Reliability

- **Reliability**

Reliability means the precision and stability of the measuring instruments when performing an experiment or research. From Khaki's point of view (2003), a test is reliable when its real score is of a high correlation, i.e. another future study achieves similar results.

In this research, two important indicators for reliability evaluation are used, namely, the combined reliability index (CR) and Cronbach's alpha(α). It is necessary to confirm the reliability of these indices higher than 0.7. The Cronbach's Alpha formula is as follows:

$$\alpha = \frac{k}{k-1}\left[1-\frac{\sum_{i=1}^{k} s_i^{\,2}}{s^2}\right]$$

Here α = is the Cronbach's alpha value

k= is the subset of the questionnaire

$s_i^{\,2}$=The variance of the sub-test i

s^2= The variance of the sub-test

According to Table 2, the Reliability of the questionnaire was calculated by calculating the Cronbach's alpha, which shows that all of the main components (dimensions of the questionnaire) have a Cronbach's alpha index higher than 0.7 and therefore all are confirmed.

Table 2
Internal reliability of research

Row	Dimensions of Questionnaire	Internal Reliability
1	Total	0.97
2	Requests received from the stakeholders	0.99
3	Sustainable supply chain performance	0.964
4	Sustainable development of the supply chain	0.959

- **Validity**

Validity means that the questionnaire measures what it is designed for. There are several ways to measure validity. In this study, the construct validity and discriminate validity were examined. Construct validity is used to examine the importance of selected indicators for measuring structures. Discriminate validity also means that the markers of each structure can provide a good differentiation in terms of measurement than other structures of the model. In other words, each indicator measures only its own structure and their composition is in a way that the structures are well detected from each other. Therefore, the content validity of the said instruments has been re-approved by a number of experts. Findings In this study, Pearson correlation and structural equation modeling were used for testing the accuracy of the research hypotheses. Pearson correlation coefficient is used to determine the intensity, type and direction of the relationship between of the two variables which can be calculated using the following equation:

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n(\sum x^2) - (\sum x)^2][n(\sum y^2) - (\sum y)^2]}}$$

Here, if r = 1, it shows that a complete direct relationship exists between the two variables,

And if r = -1, so then there is a complete inverse relationship between the two variables.

In Table 3, the value of Pearson correlation indicates a direct or positive relationship, which indicates that if one of the variables increases (decreases), the other also increases (decreases). Also Table 2 indicates that between the component of "the requests of stakeholders" (0.823), "the types of flows" (0.883), "the types of complexity" (0.913), "physical flows "(0.952), "Financial flows" (0.864), "information flows" (0.748), "layer complexity" (0.952) and "elemental complexity" (0.752) with regard to sustainable development in the maritime transportation industry has a direct and meaningful relationship (in 99% of significant level). Therefore, based on Table 3, there was a direct and positive and significant relationship between the sustainable performance of the supply chain (0.7768), competitive Freight Rate (0.875), just in time delivery of goods (0.775), social responsibility (0.821) with a sustainable development in the maritime transportation industry at a significant level of 99%. In the following, process of structural equation modeling is carried out using the LISREL software Package.

The image of the final model of structural equations in the standard Mode is presented in Figure4. Also, the validity of the structural model is dependent on Suitability of Goodness of Fit indicators and significance of standard coefficients, as shown in Table 4. As shown in this table, by comparing all Goodness of Fit indices with their corresponding acceptable values, the conceptual model has a relatively high fitness. To achieve optimal fitness, using path analysis techniques, estimated path coefficients of the structural model were evaluated which ultimately showed that all the hypotheses are strongly confirmed.

Table 3
Matrix of correlation coefficients

	Requests & Demands of Stakeholders (0.823)					Sustainable Supply Chain Performance(0.768)		
	Complexity(0.913)		Flows(0.853)			competitive Freight Rate (0.875)	just in time delivery of goods(0.775)	social responsibility(0.821)
	Components	Layers	Information	Financial	Physical			
Sustainable development	0.752	0.952	0.748	0.864	0.952	0.875	0.748	0.786
Significant level	99%	99%	99%	99%	99%	99%	99%	99%

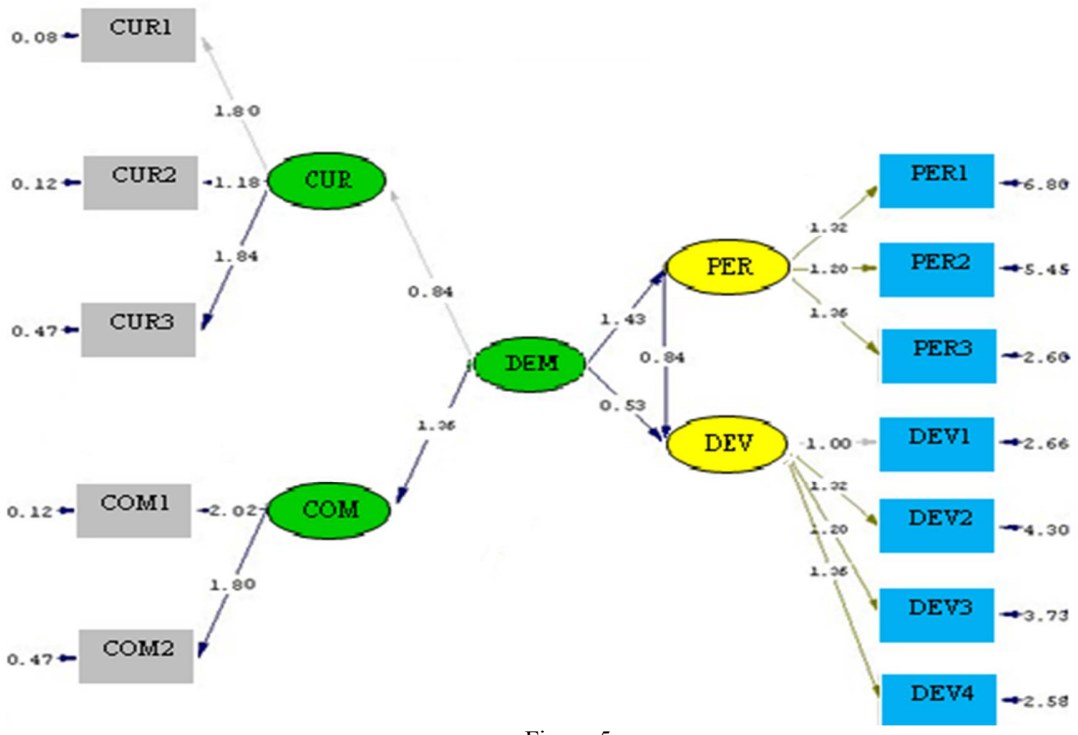

Figure 5
Structural Equation Modeling in Standard Mode

Table 4
Goodness of Fit indicators of the tested research model

INDEX	Value of the index obtained in this research	Acceptable Value
CFI	0.953	More than 0.9
IFI	0.830	0-1
GFI	0.942	More than 0.9
NFI	0.965	More than 0.9
PCFI	0.73	More than 0.6
RMSEA	0.046	Less than 0.05
Chi-Square	49.27	
Relative Chi-Square	1.78	Between 1-3

The results obtained from the implementation of the path analysis technique (Table 5) indicated that the received requests from the stakeholder will have a direct and significant effect on the sustainable development of the supply chain. Also, there is a significantly direct relationship between the stakeholders' demands and the improvement of the performance of the marine supply chain.

Table 5
Results of Path Analysis Technique

Direction	Significant Level	Standard Coefficient	t Student Statistics
Received Demands → Sustainable Development	0.99	0.67	2.69
Received Demands → Stable Performance	0.99	0.69	3.11
Received Demands → Stable Performance → Sustainable Development	0.99	0.21	2.85

Table5 shows that the stakeholders' demands indirectly affect the improvement of the sustainable performance of the marine supply chain by sustainable development (mediating variable).

Also, the direct and indirect effects of the stakeholders' demands on other variables and the main components of the conceptual model are shown in the following table. The results of the analysis of the research data presented in Table 6 show that the demand received by the various stakeholders with a coefficient of 0.67 directly and with a coefficient of 0.21 indirectly effect on the sustainable development of the supply chain.

Table 6
Direct and indirect impact of requests received from stakeholders' demands On Sustainable Performance and Sustainable Development of the Supply Chain

	Stable Performance	Sustainable Development
Received Demands of Stakeholders		
Direct	0.69	0.67
Indirect	----	0.21
Total		0.87

7. Discussion and Conclusion

The results of this research indicate that the demands and requests received by the various stakeholders involving with the marine supply chain of the country have a direct effect on improving the performance of the marine transportation industry; they also indirectly affect the performance improvement because of a key factor called the marine supply chain sustainable development. Therefore, one of the strategies to satisfy the needs and demands of customers, stakeholders and owners of goods within the scope of the supply chain is to achieve a satisfactory and sustainable level of sustainable development in the field of transportation industry through the consideration of the constituents and variables of sustainable development.

Also, these results indicate that in this key industry, executives and practitioners based in different levels and organizations and in order to effectively achieve to their goals are required to use various human, material, and financial resources in an efficient and productive style. Meanwhile, the share of human resources is very important. Human resources must have the skills and abilities, appropriate professional attitudes, desirable psychological conditions, and personality traits to achieve success and important goals and organizational mission. In the long term, organizations associated with this industry will be able to respond to the needs and requests of key stakeholders and they have to have effective and professional human resources that have been shown to be one of the most influential elements in the conceptual model of this research.

8. Suggestions

Regarding the problems encountered in this industry, it is necessary for the policy-making in this industry to create close relationships between interest groups and various decision-making centers. To this end, there should be an appropriate mechanism for consulting and interacting opinions and resolving disputes between these institutions. Therefore, it is suggested that a single authority, accepted by all public and private entities, should continuously control and monitor the operation OF the whole chain and if necessary, approve and enforce laws that are agreed upon by all members of the marine community. Regarding the wide scope of the concept of sustainable development and its flexibility and capabilities for employing in a wide range or in other industrial sectors, it is suggested that the organizations in charge of industries use the model

proposed in this study in other similar industries that have a similar nature TO the marine transportation industry. The similar industries may include public inland and outland transportation systems, airlines, railroads, combined transportation. It is suggested that the selection of managers and staff in governmental and private organizations associated with this industry should be in a way that their personal and mental health features are considered such that their PROMOTION at all levels of the organization is entirely dependent on the passing of training courses and necessary skills and in accordance with the latest standards and requirements of this industry. It is suggested that senior executives of these organizations define plans for promoting culture and developing satisfactory human relationships to improve business conditions in operational environments and determine some budgets for this purpose.

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