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Research Article

EVALUATING EFFECT OF SUPPLY CHAIN INFORMATION SYSTEM STRATEGY ON SUPPLY CHAIN PERFORMANCE AND FIRM PERFORMANCE (CASE STUDY: MANUFACTURING COMPANIES PROVIDING NIOC GOODS AND EQUIPMENT)

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ABSTRACT
In today's compact business world, the success of a product and predicting its sell is important. In this context, one of the factors of product success on market is to have an effective and efficient supply chain. One of the most important indicators of supply chain success is its integration, so that it results in movement of goods and information efficiently, orderly and effectively, therefore information management is one of the key factors of success in supply chain, so, given that it is important to improve the performance of manufacturing firms, this study tries to evaluate the effect of supply chain information systems strategy on supply chain performance and firm performance in manufacturing companies providing NIOC goods and equipment. Statistical population of study includes manufacturing companies providing NIOC goods and equipment who communicated and collaborated with National Iranian Oil Company in 2014, thus the analysis unit is company. The instruments used to collect data that are needed for testing 5hypotheses is questionnaire. Questionnaires were distributed among manufacturing companies providing NIOC goods and equipment and ultimately 198 questionnaires were collected. Statistical methods for data analysis include using two-way analysis of variance, multiple regression, Pearson correlation coefficient and chi-square independence test. Data were analyzed using Spss software. The results of data analysis showed that the relationship between variables is significant.

Keywords: *Supply Chain Information Systems Strategy, Supply Chain Performance and Manufacturing Companies Providing Goods and Equipment*

INTRODUCTION
Nowadays many pressures such as pressure of foreign products, introduction of new products by competitors, declining life, unforeseen changes in relationships with customers, progress in the field of information technology and production, privatization of state enterprises, economic records and stakeholder pressures to return capital are imposed on companies. Given these pressures, the most important challenge facing the producers includes integration of upstream outsourcing functions and downstream functions (Yusuf *et al.*, 2004). One of the most significant paradigm shifts in modern business management is the change of the competitive units from firms to supply chain. Today, a brand does not compete with a brand or a store does not compete with other stores, however suppliers- brand-store compete with other suppliers- brand- store or in other words a supply chain competes with other supply chain (Lambert and Cooper, 2001). Supply chain is a complex network of suppliers, production and sales agents, wholesalers, distribution centers and retailers, so that success of supply chain management system depends on the fact that how the components of system can be managed (Cunningham, 2004). Supply chain management is management concept for integration of supply chain processes that its overall aims include reducing costs, increasing profitability, improving performance related to relationships between customers and suppliers and developing services with added value that have competitive advantages for organizations. According to surveys, three main objectives are considered for supply chain management, including: 1) providing appropriate products for appropriate place at the lowest cost; 2) maintaining minimum inventory; 3) reducing production cycle time (O'Brien,

2000). On the other hand, in the current world, information is considered as determining factor in increasing productivity of complex organization, since the capabilities of today's organizations are limited to information processing power and their speed in decision-making. On this basis, forecasts and estimates on supply and demand for raw materials until supply and demand for products in sales and restructuring organizations is necessary in order to achieve such a position. An organization system must coordinate information flow and raw materials needed to produce and deliver products in order to achieve this aim. The result of this action is to facilitate decision-making and implementing supply chain process. Since supply chain systems are like organized complex networks of successful communication between suppliers and customers, at each step, added value is created for products and services until they are obtained by customers. Therefore, availability of timely and comprehensive information during supply chain process management can ensure the success of these systems (Cunningham, 2004). The success of supply chain performance will result in company's success.

The information management of supply chain is one of the key factors of success in supply chain, so, given that it is important to improve the performance of manufacturing firms, the main question of this study is that "Is there relationship between supply chain information systems strategies and supply chain performance and manufacturing companies performance?

Literature

Supply Chain Management

Supply chain management is a process for integrating the supply chain activities using related information flows which improves supply chain relationships and access to reliable competitive advantage. The management range includes the initial suppliers to final consumers that provide products, services and information which create value for customers. Supply chain management is an approach that has evolved from integration of these concepts. Responding customer demand and customer satisfaction is not possible without proper management of material and information flow in supply chain and exchange of information between members of supply chain is a critical factor in order to overcome the distance and cultural differences (Teymuri and Dehghanian, 2005). Generally, the supply chain is a chain that includes all activities associated with goods flow and transformation of materials, from preparation of raw materials till the final delivery to consumer. In the case of goods flow, there are two information flow and financial resources and credit (Laudon and Laudon, 2002).

The main processes in supply chain management

According to Handfield (1999), supply chain management involves three main processes of logistics management, relationship management and information management.

- ***Logistics Management***

Logistics constitute the physical part of the supply chain in analysis of production systems (eg automotive industry). This part includes physical activities from preparing raw material, finished product including transportation, warehousing, production scheduling, etc. and logistics management is related to transporting materials such as raw materials or semi-manufactured and finished products, transportation, distribution and warehousing, inventory management, materials management and interacts directly with production management.

- ***Relationships Management***

Relationships Management effects greatly on all aspects of supply chain and also its performance. In many cases, information and technology systems needed for supply chain management activities are made with high costs in companies, but many early failures in supply chain are due to poor transportation of expectations and behaviors that occur between parties in chain. The most important factor for successful management of supply chain is the relationship between partners in chain so that partners have trusted each other in terms of capabilities and operation. In development of integrated supply chain, developing confidence and trust among partners and reliability are critical elements to achieve sustainable success (Handfield *et al.*, 1999).

• Information Management

The role, importance and place of information are obvious for everyone. Management of information systems and accurate transfer of information have led to more effective and efficient supply chain process and easier management. Coordinated and appropriate management of information between partners will result in increasing effects of speed, accuracy, quality and efficiency of supply chain. Proper management of information will lead to greater integration in chain. Generally, information management effects on following sections of supply chain:

✓ Logistics Management (processing and access to logistics information for integrating processes of transportation, transfer, ordering, manufacturing, changing orders, production scheduling and warehousing).
✓ Data exchange between partners (such as technical information exchange and processing, orders, etc.)
✓ Collecting and processing data for process analysis, sourcing, evaluation and selection of suppliers.
✓ Collection and processing of supply and demand information in order to predict future market trends and conditions.
✓ Establish and improve relations between partners.

Agile Supply Chain

The ability of a supply chain to react quickly to changes in market and customer needs (Jafarnejad and Shahayi, 2007)

Christopher studies broadly the concept of agility and has described characteristics of agile supply chain as follows (Christopher, 2000).

Sensitive to market: Having a close relationship with end user and collection and use of product user interests and use of sales data in order to receive actual demand.

Virtual supply chain: it is a supply chain that is made on the basis of information sharing in supply chain (from buyer to supplier) and creation of virtual organization including partners and suppliers. Virtual supply chains rely on information more than inventory.

Integration of process: Cooperation between buyers and suppliers and joint development of products.

Network Based: consists of forming allied groups and activity in a network of partners instead of independent activity.

Organization Tools for Achieving Agility

1. The organization structure: organization structure must be flexible. In the case of organization area, the following actions will be performed:

✓ Forming partnerships with other organizations
✓ Improving flexibility through focus creation and adopting flexible structures
✓ Promoting transformation and modernization culture

2. People: in agile organization that faces constantly with environment changing, human ability and flexibility plays an important role in this regard, the following measures are effective:

✓ Focus on group activities and participation culture
✓ Delegating authority to personnel
✓ Emphasis on education as an important tool
✓ Training of personnel in various skills

3. Technology: an agile manufacturing system has the ability to deal with unexpected changes. These changes can be in product models. The agile manufacturing system must have the ability to produce new products. In this regard, the following measures will be important:

✓ Investments on appropriate hardware and modern technologies
✓ Using flexible production systems in order to adapt with changes in composition and type of orders
✓ Using flexible production systems support in order to adapt with changing conditions of orders
✓ Founding a virtual manufacturing system

4. Information technology: the distinction between agile systems with other systems is the high information content. In addition, the amount of exchanged information between peer companies is high and emphasizes conservation of key information of any organization. So agile organizations require

advanced information and communication systems and flexibility that ensures the flow of reliable information with regard to problems and adapts with changing circumstances. In this regard, the following actions are recommended:

✓ Using appropriate standards and protocols for exchanging information between organizations
✓ Using modern information and communication technologies and systems in order to make appropriate and timely communication between partner organizations
✓ Integrating distributed components, including customers, suppliers and partners in virtual organizations

5. Innovation and creativity: An agile organization must offer solutions to its customers instead of selling its products. The ultimate aim of agile manufacturing is actual realization of customization and meets the diverse needs of individual customers. The following measures can be effective.

✓ Creating thinking and innovation culture in organizations
✓ Investment and appreciation of new ideas
✓ Establishing mechanisms of close relationship with customers and gathering their views
✓ Creating necessary hardware context in order to support the concept of customization hard (Fathi and Golchinpour, 2006).

Lean Supply Chain

Three views are provided on lean manufacturing: Some see it as a set of tools; others see it as a system whereby a company can reduce costs as well as increase customer satisfaction. In view of the third group, lean is a philosophy that emphasizes on minimizing the resources used in enterprises. The following table has three views (Oracle and Mnrvt, 2005).

Lean manufacturing strategies related to suppliers can be outlined as follows that ultimately reduce costs, increase productivity, enhance quality and improve shipping time:

✓ Ranking suppliers; (Tiers)
✓ Cooperation of suppliers in product design
✓ Considering to geographic distance in selecting suppliers
✓ Ordering in small groups and frequent delivery of goods by suppliers when required
✓ Transparency of information between company and supplier
✓ Collaboration for reducing supplier costs and lower the price
✓ Facilitating transportation
✓ Facilitating buying and ordering
✓ Long term relationship with suppliers
✓ The presence of supplier associations (for each period)
✓ Assessment (Grading) suppliers and inspection of goods each supplier based on grade
✓ Humphreys *et al.,*

Naylr et al have suggested four steps to integrate supply chain in lean manufacturing according to Figure 3-1. In the first step, main activities of flow are identified. In second step functional integration is performed and previous steps are divided into three components of materials management, production management, manufacturing and distribution. Then, components that are identified in third step are integrated and finally, in fourth step, internal supply chain or external components, ie suppliers and customers, are combined and integrated (Qarayi, 2012).

Supply Chain Information Systems (interagency)

Humphreys *et al.,* (2001) define supply chain information systems:

An information system between two or more companies that facilitates information flow and store (usually engineering design, sales, purchase order).

Lowe (2000) believes that supply chain information systems can provide accurately and timely information required for members of supply chain. Also, this system makes possible the exchange of information between customer and all members of supply chain. Companies can use this information to design and implement different strategies and this will increase the speed of customer responsiveness and flexibility of all chains.

Using abilities of an information system, manufacturers do not just respond to customer needs but anticipate customer demands, as a result respond and sensitivity to changing markets is improved. According to Love (2000), in supply chain information systems, companies increase coordination and operational control of supply chain using effective mechanisms of information flow and can do value creation activities more effectively and efficiently with the existence of integrated information system. In other words, activities based on information reflect operations in physical value chain.
Strategic planning of information systems in supply chain

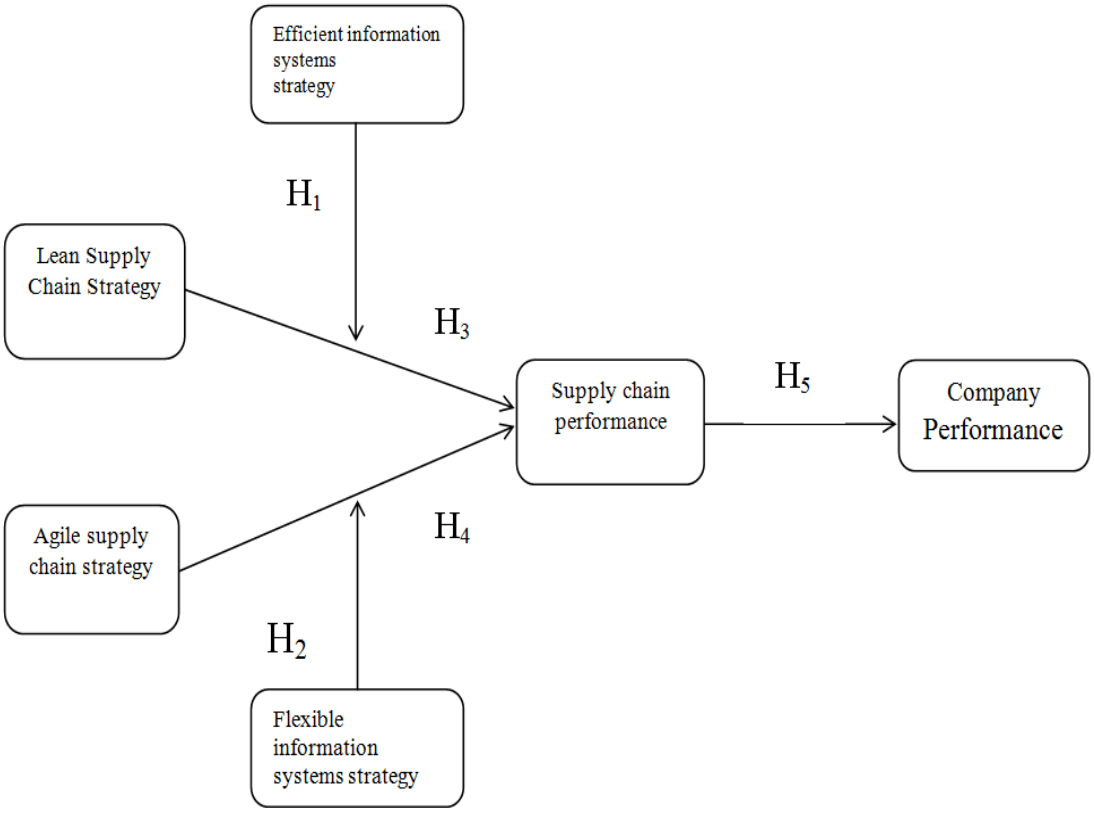

Figure 1: Qrunfleh and Tarafdar model (2013)

Nowadays organizations emphasize on strategic planning with the aim of developing programs and long-term changes in their organizations in order to improve their competitive position. Strategic planning of information systems must support long-term goals and objectives of supply chain in terms of flexibility and responding market changing requirements. For example, it facilitates information technology, organization and participation in chain by availability of accurate and timely information.
Two Australian researchers conducted studies on strategic planning process of information systems in large organizations of this country. They have analyzed strategic planning of information systems from different aspects including factors affecting the strategic planning of information systems, information systems maturity effects on strategic planning of information systems and key issues in strategic planning and information systems.
IT must lead to integration between business partners and can help to create a virtual organization. Tarowski, referring to this, states that integration is not possible simply and needs the changes in some processes of some old structures (Tarowski, 2002). Strategic planning of information systems is one subject that considers always process reengineering among all stakeholders and therefore it can provide a good platform for implementation of supply chain management in organizations. Specifying the strategic dimensions of information technology effect on supply chain management are important issues which is

crucial for managers. In strategic planning of information systems, it is appeared in prioritizing activities and projects (Taluri, 2000).

The effect of information technology can be found in information systems of production. MRP generation is an indication of coordination effects on supply chain. These systems have led organizations to gain competitive advantages through reducing negative points of producers and suppliers and this is the aim of strategic planning of information systems (Zimmerman, 2000). So, thinking and approach of supply chain management and information systems planning have always a mutual influence and plays role in evolution of each other.

Research Hypotheses

1. There is significant relationship between lean supply chain strategy and higher levels of supply chain performance.
2. There is significant relationship between agile supply chain strategy and higher levels of supply chain performance.
3. Efficient information systems strategy adjusts positively the relationship between lean supply chain strategy and supply chain performance.
4. Flexible information systems strategy adjusts positively the relationship between agile supply chain strategy and supply chain performance.
5. There is significant relationship between supply chain performance and firm performance.

MATERIALS AND METHODS

The present is applicable and is, descriptive and correlation based on data collection method. Statistical sample size includes approximately 196 companies. Cronbach's alpha coefficient is used to determine the reliability of questionnaire that is 0.936. In this study, Pearson test correlation coefficient, multiple regression, chi-square independent test and two-way analysis of variance are used to analyze findings.

Data Analysis

Examining Data Normality

Kolmogorov - Smirnov Test is used to check the normality of variables

Table 1: The results of research variables

Row	Normal status	sig	Kolmogrov - Smirnov Z	SD	Variable name
1	Normal	0.059	1.328	5.40	Lean Supply Chain Strategy
2	Normal	0.52	1.564	5.11	Agile supply chain strategy
3	Normal	0.56	1.339	4.92	Efficient information systems strategy
4	Normal	0.51	1.581	3.99	Flexible information systems strategy
5	Normal	0.52	1.600	8.78	Supply chain performance
6	Normal	0.133	1.164	6.06	Company Performance

The results of Kolmogorov - Smirnov test revealed that according to sig value in Table 1, the hypothesis of data normality has been approved in all variables and data are normally distributed.

The Inferential Results of Study Hypotheses

The First Hypothesis

H0: There is no significant relationship between lean supply chain strategy and higher levels of supply chain performance.

H1: There is significant relationship between lean supply chain strategy and higher levels of supply chain performance.

Table 2: Pearson correlation test results

N	Error level	Sig	Pearson correlation coefficient	
198	0.05	0.000	**0.780	Lean Supply Chain Strategy and Supply chain performance

Correlation is significant at the 0.01 level (2-tailed). **

The results of Table 2 show that Pearson correlation coefficient is significant with significance level of p= 0.000<0.05 and with 95% confidence level (SEM 0.05) it can be said that there is relationship between these two variables. In other words, H0 is rejected and H1 is confirmed. As a result, according to the fact that the coefficient is positive, it can be said that lean supply chain strategy is directly related to supply chain performance.

The Second Hypothesis

H0: There is no significant relationship between agile supply chain strategy and higher levels of supply chain performance.

H1: There is significant relationship between agility supply chain strategy and higher levels of supply chain performance.

Table 3: Pearson correlation coefficient test results

n	Error level	Sig	Pearson correlation coefficient	
198	0.05	0.000	**0.084	Agile supply chain strategy and Supply chain performance

Correlation is significant at the 0.01 level (2-tailed). **

The results of Table 3 show that Pearson correlation coefficient is significant with significance level of p= 0.000<0.05 and with 95% confidence level (SEM 0.05) it can be said that there is relationship between these two variables. In other words, H0 is rejected and H1 is confirmed. As a result, according to the fact that the coefficient is positive, it can be said that agility supply chain strategy is directly related to supply chain performance.

Since there is significant relationship between variables of lean and agile supply chain strategy and supply chain performance, multiple regressions test is used in order to evaluate their effects

Table 4: Results of multiple regression analysis between independent variables and dependent variable

Regression coefficients Beta	Ratio F probability P	The determination coefficient (RS)	Correlation coefficient (MR)	Indicators of independent variables	Dependent variable
β_1=0.388 t=6.155 P=0.000	F=231.086 P=0.000	0.703	0.839	Lean Supply Chain Strategy	Supply chain performance
β_2=0.498 t=7.899 P=0.000				Agile supply chain strategy	

Multiple regression results in Table (4) show that F=231.086 with significance level of P=0.000<0.05 is significant and with a 95% confidence level (SEM 0.05) it can be said that there is relationship between lean and agile supply chain strategy and supply chain performance. That is, the independent variables

predict and explain the supply chain function. According to Beta coefficient, agile supply chain strategy variable has the most effect of β_2= 0.498 and lean supply chain strategy variable has the least effect of β1=0.388.

The Third Hypothesis

H0: Efficient information systems strategy does not adjust positively the relationship between lean supply chain strategy and supply chain performance.

H1: Efficient information systems strategy adjusts positively the relationship between lean supply chain strategy and supply chain performance.

Table 5: Results of two-way ANOVA

Error level	Sig	Ratio F	Mean square	DF	Sum of squares	Variation source
0.05	0.000	4.378	87.035	21	1827.725	Lean Supply Chain Strategy variable
0.05	0.002	2.728	54.230	17	921.910	Efficient information systems strategy variable
	0.047	1.286	25.562	93	2377.253	Interaction between efficient information systems strategy and lean Supply Chain Strategy
			19.880	66	1312.067	Intragroup error
				198	266869.000	Total

The Results of Table 5 show that F=1.286 is for studying the adjustment between variables of efficient information systems strategy and lean supply chain strategy with significance level of P=0.047<0.05 is significant. This means that efficient information systems strategy adjust the relationship between lean supply chain strategy and supply chain performance. According to the Tukey test results, we can conclude that there is a significant difference among all categories of low, medium and high lean supply chain strategy and adjusting variable effects indirectly on relationship between two variables of lean supply chain strategy and supply chain performance.

The Fourth Hypothesis

H0: Flexible information systems strategy does not adjust positively the relationship between agile supply chain strategy and supply chain performance.

H1: Efficient information systems strategy adjusts positively the relationship between lean supply chain strategy and supply chain performance.

Table 6: Results of two-way ANOVA

Error level	Sig	Ratio F	Mean square	DF	Sum of squares	Variation source
0.05	0.000	5.263	110.565	18	1990.161	Agile Supply Chain Strategy variable
0.05	0.003	2.618	55.008	14	770.108	Flexible information systems strategy variable
	0.044	0.992	20.852	74	1543.018	Interaction between flexible information systems strategy and agile Supply Chain Strategy
			21.010	91	1911.879	Intragroup error
				198	266869.000	Total

The Results of Table 5 show that F=0.992 is for studying the interaction between variables of flexible information systems strategy and agile supply chain strategy with significance level of P=0.044<0.05 is

significant. This means that flexible information systems strategy adjusts the relationship between agile supply chain strategy and supply chain performance.

The Fifth Hypothesis

Null hypothesis: There is no significant relationship between supply chain performance and firm performance.

Hypothesis 1: There is significant relationship between supply chain performance and firm performance.

Table 7: Results of the chi-square test

N	Error level	Sig	df	Chi -square	Variables Indicators
198	0.05	0.000	660	879.398	Company performance and Supply chain performance

Table 8: Results of Pearson correlation test

n	Error level	sig	Pearson correlation coefficient	Variables Indicators
198	0.05	0.000	**0.778	Company performance and Supply chain performance

Correlation is significant at the 0.01 level (2-tailed). **

The findings of two tables (7) and (8) show that chi- square of 879.398 is significanct with significance level of p =0.000< 0.05 and with 95% confidence level (SEM 0.05) it can be said that there is a relationship between these two variables. Pearson correlation test results show that p =0.000< 0.05. Thus, H0 is rejected and H1 is confirmed and this relationship is about 77%. In other words, the correlation coefficient is 0.77 between supply chain performance and firm performance.

Results

The First Hypothesis

The claim was that there is a significant relationship between lean supply chain strategy and higher levels of supply chain performance, the results confirm the relationship between variables using Pearson correlation coefficient test. The correlation coefficient was 0.780 between two variables of lean supply chain strategy and supply chain performance that indicates a direct correlation between these two variables; this means that there is relationship between two variables of lean supply chain strategy and supply chain performance. The hypothesis results have consistency with research findings of Qranflh and Trafdr (2013). In other words, the examined lean supply chain strategy was confirmed by Trafdr Qranflh.

The Second Hypothesis

The claim was that there is a significant relationship between agility supply chain strategy and higher levels of supply chain performance, the results confirm the relationship between variables using Pearson correlation coefficient test. The correlation coefficient was 0.804 between two variables of agility supply chain strategy and supply chain performance that indicates a direct correlation between these two variables; this means that there is significant relationship between two variables of agility supply chain strategy and supply chain performance. The hypothesis results have consistency with research findings of Qranflh and Trafdr (2013). In other words, the examined agility supply chain strategy was confirmed by Trafdr Qranflh.

The Third Hypothesis

F=1.286 is significant using two- way variance analysis test for studying the interaction between variables of efficient information systems strategy and lean supply chain strategy with significance level of P=0.047<0.05. This means that efficient information systems strategy adjusts the relationship between lean supply chain strategy and supply chain performance. The hypothesis is confirmed. The hypothesis results have consistency with research findings of Qranflh and Trafdr (2013). In other words, the adjustment effect of efficient supply chain strategy was confirmed by Trafdr Qranflh.

The Fourth Hypothesis

F=0.992 is significant using two- way variance analysis test for studying the interaction between variables of flexible information systems strategy and agility supply chain strategy with significance level of P=0.044<0.05. This means that flexible information systems strategy adjusts the relationship between agility supply chain strategy and supply chain performance. The hypothesis is confirmed. The hypothesis results have consistency with research findings of Qranflh and Trafdr (2013). In other words, the adjustment effect of flexible supply chain strategy was confirmed by Trafdr Qranflh.

The Fifth Hypothesis

The claim was that there is a significant relationship between supply chain performance and firm performance; the results confirm the relationship between variables using Pearson correlation coefficient test and chi- square test.

Table 9: Summary of testing hypotheses results

Row	Results	Rejected/ confirmed	Sig	Hypothese
1	There is significant relationship between lean supply chain strategy and higher levels of supply chain performance.	Confirmed	0.000	There is significant relationship between lean supply chain strategy and higher levels of supply chain performance.
2	There is significant relationship between agile supply chain strategy and higher levels of supply chain performance.	Confirmed	0.000	There is significant relationship between agile supply chain strategy and higher levels of supply chain performance.
3	Efficient information systems strategy adjusts positively the relationship between lean supply chain strategy and supply chain performance.	Confirmed	0.047	Efficient information systems strategy adjusts positively the relationship between lean supply chain strategy and supply chain performance.
4	Flexible information systems strategy adjusts positively the relationship between agile supply chain strategy and supply chain performance.	Confirmed	0.044	Flexible information systems strategy adjusts positively the relationship between agile supply chain strategy and supply chain performance.
5	There is significant relationship between supply chain performance and firm performance.	Confirmed	0.000	There is significant relationship between supply chain performance and firm performance.

The correlation coefficient was 0.778 between two variables of supply chain performance and firm performance that indicates a direct correlation between these two variables; this means that there is significant relationship between two variables of supply chain performance and firm performance. The

hypothesis results have consistency with research findings of Qranflh and Trafdr (2013). In other words, the supply chain performance was confirmed by Trafdr Qranflh.

This section summarizes the results of hypotheses confirmation and rejection.

Suggestions

1. Managers and officials are suggested that pay more attention to supply chain strategy in order to improve lean supply chain performance, because it was shown that lean supply chain strategy of companies enable supply chain to reduce stock and time required for activities such as setting up, therefore, economic production empowers small quantities and strengthens flexibility of supply chain. In addition, lean supply chain strategy requires partners to cooperate in order to solve common problems in terms of removing waste, reducing costs and increasing efficiency of supply chain. This would lead to greater integration of supply chain, while many suppliers participate in strategic alliances and partnerships for removal of costs and achieve incremental improvements in designing products.
2. Managers and officials are suggested to pay more attention to agile supply chain strategies in order to improve the supply chain performance, since it was shown in this study that the more size of agility in supply chain, the supply chain will operate better. Agile supply chain strategy requires a dynamic supply chain that is content- specific and changes dynamically; agile supply chain strategy allows supply chain to face with customers and quickly adapt with changes in future. As a result, the supply chain can provide various products in different volumes and delivers them according to demands of different markets.
3. Managers and officials are suggested to pay more attention to efficient strategy information systems in order to improve supply chain performance through lean supply chain strategies; because it was shown that efficient strategy information systems adjust positively relationship between lean supply chain strategy and supply chain performance. This means that efficient strategy information systems facilitate supply chain performance improvement from lean supply chain strategy. In particular, if a holding company designs lean or cost efficiency of supply chain, the company must adopt functions that are known using efficient information systems strategy of supply chain such as transaction processing systems, inter- and outer-organizational workflow and applications that help to coordination and improvement of operational information sharing with suppliers. The compatibility between two strategies leads to improvement of supply chain performance and company performance.
4. Managers and officials are suggested to pay more attention to flexible information systems in order to improve supply chain performance through agile supply chain strategy, since it was shown in this study that flexible information systems strategy adjusts positively the relationship between agile supply chain strategy and supply chain performance. Since it is possible that agile supply chain strategy exists in market- product environment which are relatively dynamic and may require re-orientation of supply chain resources, on the other hand, information systems need time for creation, configuration and implementation. Therefore, there may be need for application of appropriate information systems in order to develop relatively fast agile supply chains, but in a manner that is reconfigurable, frequency and in harmony with environment variables. Hence, the details and issues of implementation may be important factors in ability of agile supply chain strategy for appropriate benefits of flexible information systems strategy.

5. Managers and officials are suggested to pay more attention to performance of supply chain in order to improve company performance, if supply chain works well (ie, the integration is performed, be flexible to market changes, or be responsive to customer requirements), then, holding company will benefit from better performance in terms of price, quality, delivery time and product.

Since this study has been done among manufacturing companies providing NIOC goods and equipment, all organizations, authorities and those involved in production are recommended to use results in order to improve country and organizations' business position internationally.

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