



An investigation into factors affecting Procurement and Supply Chain Management (PSCM) in Dairy industry of Dousheh Haraz in Amol

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Abstract

The dairy industries as one of the commodities with the highest consumption have always been considered. The debate on the final cost of the dairies in the current condition is constantly a challenge to the government and dairy industries. Therefore, dairy companies especially the company under the present paper's study should pay attention to the significance of supply chain and take actions to provide a PSCM. The present paper intends to investigate factors that affect PSCM in the form of a case study. The present paper reviews literature of the PSCM and its position in dairy companies, conceptualize agility in the supply chain of dairy company of Dousheh Haraz in Amol, and determine components and indices of chain agility assessment via statistical methods and correlation test. The statistical population of the research consists of all experts of the company located in Dousheh Haraz of Amol. The statistical population equals 36 people, and its statistical sample equals 30 people. Swafford model is used and a questionnaire consisting of 22 design questions is used to collect data. The five-point Likert scale is applied in the questionnaire. The reliability of the whole questionnaire was obtained from Cronbach's alpha formula equal to 0.78. The results indicate a correlation between distribution management and PSCM; moreover, there is a correlation between production and supply management and PSCM.

Keywords: Supply chain, agility, PSCM.

Introduction

In the present world, change is the only thing that does not change. In the business world which is run based on three concepts of customer, competition, and change, the companies seek for a solution to solve business problems¹. According to the available information of the world successful companies, the concentration on the process approach is one of the solutions of business problem. In fact, companies compete with each other from different competitive aspects such as cost, quality, article delivery, flexibility, and other similar aspects. Thought the condition and environment of competition are determined by unpredictable and continuous change of the market, complexity of the advanced technologies, the decrease of products lifecycle, different needs of customers, a tendency to variety of products, and demand for various products in the global market have reduced the market clarity and increased unreliability. Therefore, Swafford supply chain model is the basis of the present paper². The theoretical principles are associated with re-engineering and agility analyses, the analyses help to determine the components and methods that are effective. The development of the new product, distribution management, and supply and production management are the variables of the present paper³.

Elements and features of agile supply chain: In order to obtain competitive edge in the changing business environment, the companies need to cooperate with suppliers and customers for the efficiency of the operation and going beyond the agility

level of other exclusive companies. Consequently, PSCMs include significant competitive designs. A PSCM intends to satisfy customers and employees. Therefore, a PSCM is able to respond to the changes that occur in the working environment properly. Therefore, a PSCM (an agile supply chain) might be defined as the ability of a supply chain to quickly respond to the market changes and customers' needs. A PSCM is a structure with the purpose of satisfying customers and employees. According to PSCM, any organization could design business strategies, processes, and information systems. Another researcher believes that the structure of supply chain is supported by the following four principles: the control of thorough change and unreliability, the structures of innovation management and virtual organization, cooperative relationships, flexible and intelligent technologies⁴. These four principles are linked to one another via a methodology that transfers them to the strategic competitive capabilities in the form of an integrated system. At the beginning of the 21st century, the world confronted changes in all aspects especially market competitions, technological innovations, and customers' needs. Mass markets intend to divide their markets as a result of high level of customers' demands and expectations. Such developments have improved strategic vision and business priorities. In fact, companies have understood that agility is necessary for their survival and compatibility. Furthermore, it is obvious that no companies have all of the required resources to determine opportunities in the market. Therefore, companies,

suppliers, and customers should uniform the operations in order to achieve the competitive edge in the global market⁵.

Supply chain is a group of dependent companies which are formed to provide harmony in order to achieve mutual common goals. Though the ability of providing agile relationships is slower than what is expected, the agility should be discussed. What is agility and how does ASC assess its ability to respond to various questions? How could a company improve its agility in the field of supply chain to address the barriers? How can an individual achieve agility?

The present paper studies literature of the research, and enters agility into supply chain in order to present a PSCM. Supply chain management is the result of completing warehousing management. In 60s, experts studied the internal relation among warehousing, transportation, and their integration in order to decrease its stock⁶. The result of the studies is called distribution management. Later, issues such as construction management, orders, and procurements were added to the distribution management and caused the concept of logistics. The current condition or better to say the supply chain is the result of connection of operating circles whose beginning is related to suppliers and whose ending is related to end customers. A supply chain refers to the flow of materials, information, stock, and services from suppliers of the raw materials to the end customers⁷. The materials are provided by factories and warehouses. Moreover, the end customers might be organizations and processes that produce goods, information, and services in order to deliver them to the consumers. The chain includes many duties such as purchase, flow of stock, materials transportation, production control and planning, stock control, distribution, and so forth. The purposes of the modern supply chain management software is to decrease unreliability and risk in the supply chain, and it positively affects case, time of the production cycle, business processes and customers' services. The supply chain is a dynamic process that includes

simultaneous activities, continuous assessment of the involved parties, the applied technologies, and organizational structure. The technology provides facilities to increase freedom of choice, have access to information, and provide values for the consumers. One of most important challenges for the present organizations is the necessity to respond to the increasing instability of demands. For different reasons, the product and technology lifecycles are shortened, competitive pressures have imposed changes on products, and variety of the consumers' demands has increased. In order to solve this problem, the organizations need to achieve more agility because agility responds to the changes of size and variety in the shortest time. In other words, the organization should quickly organize the outputs in order to adapt itself with the market demand and quickly change itself. A PSCM intends to satisfy customers and employees and it is able to respond to the changes that occur in the working environment properly. Supply chain management (SCM) origins from marketing, supporting, and production. There are three aspects related to the supply chain management⁸:

Inter-functional cooperation, Coordination of functional activities, Cooperation of activities of organizations in the supply chain, this cooperation occurs among organizations which are legally separate from one another. The amount of control on the products process is the factor that managers need in order to achieve cooperation. In order to keep the unity, cooperation rewards should be re-distributed. This issue needs the performance of the following cases:

A new measuring tool which is beyond the normal accounting procedures is needed; it should include data of organizations. The mechanism of sharing information in order to transfer information associated with benefits of information sharing. An allocation method to re-distribute cooperation rewards so that all sections could fairly take advantage of them.

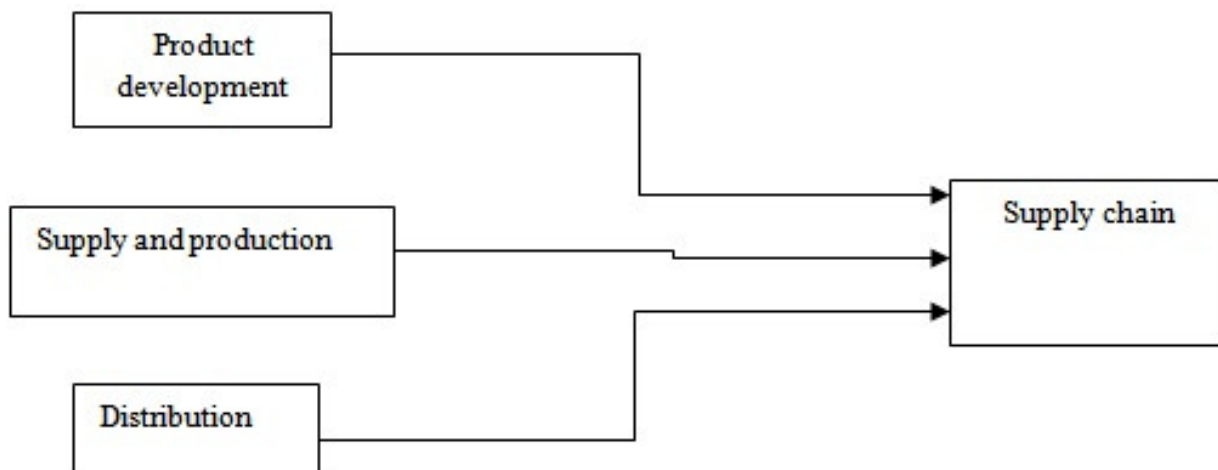


Figure-1
Research conceptual model

Methodology

The company of Dousheh dairy products which are known as Haraz products was founded by Bozorgmehr Dadgar in 2007. It produces different types of milk and its other products such as butter, cheese, and yoghurt. Dousheh Haraz Company is one of the greatest and most valid dairy companies of Iran and it is known in the global level. From the very beginning, it has followed the policy of producing excellent products in the global level, attempted to maintain quality of products, and it has got successful in achieving end-customers' and health organizations' confidence⁹. Regarding purpose, the present research is an applied research and regarding method, it follows the descriptive-correlation method. It studies the present time and describes what exists. The descriptive research includes methods whose aim is to describe conditions or phenomena under study. The implement of a descriptive research could merely be the recognition of the available condition or improvement of the decision making process.

Validity: Validity refers to the purpose that the test intends to achieve and test materials will be valid, if they are proper to measure what they are supposed to measure. The validity indicates the extent the elements of a concept are supported. In other words, a valid test material is proper for measuring what it is supposed to measure¹⁰. Therefore, to study the validity, first one needs to determine whether the tools have measured what they are supposed to measure. In order to answer the mentioned question, the test questions were studied with the help of experts and the result confirmed the validity of the research¹¹.

Reliability: Reliability is one of the technical features of measurement tools. Reliability determines the extent a person could achieve the same results in the same conditions. Reliability pays attention to the precision, repeatability, and constancy of the test results. In other words, reliability coefficient indicates the extent the measurement tool assesses features of a variable. According to the data achieved via the questionnaire, the reliability of Cronbach's alpha was determined via statistical software of SPSS. Totally, the questionnaire has Cronbach's alpha of 0.78 and this value indicates the constancy and internal consistency of the questionnaire. The variance of scores related to sub-sets of the questionnaire questions and the total variance should be calculated to determine coefficient of Cronbach's alpha¹².

Data analysis method: In order to analyze the collected data, the questionnaire options are pointed from one to five. The numbers respectively indicate "I absolutely agree" to "I absolutely disagree" via SPSS software version 16.

Spearman's correlation coefficient: Since the variables measurement scale is ordinal and type of them is qualitative, Spearman's correlation coefficient is used. Spearman's correlation coefficient is calculated based on the following relation:

$$r_s = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

Where: d_i stands for subtracting corresponding ranks of two features and n stands for the number of ordered couples in the sample.

Research hypotheses: In order to assess factors affecting agility of supply chain based on Lean model, four hypotheses have been determined and each of them have been studied separately¹³. Hypothesis1: there is a significant and positive relation between distribution management and PSCM. Hypothesis 2: there is a significant and positive relation between development of the new product and PSCM. Hypothesis3: there is a significant and positive relation between supply and production management and PSCM.

Results and Discussion

Hypotheses test: In order to study research hypotheses, Spearman's correlation coefficient test is used. In order to reject or confirm a hypothesis the following order is followed: If the calculated significance at 95 percent of level of confidence is greater than error level (0.05), H_0 will be accepted and if the calculated significance at 95 percent of level of confidence is less than error level (0.05), H_0 will be rejected, while H_1 will be accepted¹⁴. There is a significant and positive relation between distribution management and PSCM. H_0 : there is not a significant and positive relation between distribution management and PSCM. H_1 : there is a significant and positive relation between distribution management and PSCM.

$$H_0 = \rho = 0$$
$$H_1 = \rho \neq 0$$

Test result: At 0.95 level of confidence, the calculated significance is less than error level (0.05), therefore, H_0 is rejected. As a result, there is a significant and positive relation between distribution management and PSCM¹⁵. There is a significant and positive relation between development of the new product and PSCM. H_0 : there is not a significant and positive relation between development of the new product and PSCM. H_1 : there is a significant and positive relation between development of the new product and PSCM.

$$H_0 = \rho = 0, H_1 = \rho \neq 0$$

Test result: At 0.95 level of confidence, the calculated significance is greater than error level (0.05), therefore, H_0 is confirmed. As a result, there is not a significant and positive relation between development of the new product and PSCM¹⁶.

There is a significant and positive relation between supply and production management and PSCM. H_0 : there is not a significant and positive relation between supply and production management and PSCM. H_1 : there is a significant and positive relation between supply and production management and PSCM.

Table-1
Test of the 1st hypothesis (correlation coefficient between distribution management and PSCM), Correlations

		Distribution	PSCM
Spearman's distribution	Correlation coefficient	1.000	.449*
	Sig. (2-tailed)	0	.013
	N	30	30
PSCM	Correlation coefficient	.449*	1.000
	Sig. (2-tailed)	0.013	0
	N	30	30

*. Correlation is significant at the 0.05 level (2-tailed)

$$H_0 = \rho = 0, H_1 = \rho \neq 0$$

Test result: At 0.95 level of confidence, the calculated significance is less than error level (0.05), therefore, H_0 is rejected. As a result, there is a significant and positive relation between supply and production management and PSCM.

Conclusion

The first hypothesis indicates the relation between distribution management and PSCM. The results indicate the positive impact of distribution management on PSCM. It is because of the fact that responding to the orders in the company of Dousheh Haraz of Amol is at a desirable level. In the area of good delivery, there are few delay reports. Therefore, the company has been successful in minimizing the distance between ordering and delivery of goods. The second hypothesis is related to the relation between development of the new product and PSCM. The results indicate that development of a new product does not have a positive impact on PSCM. It is because of the fact that in designing the product, there is not a matching between the production and customer's need, the continuous improvement of production is not emphasized,

presenting new products to the market is less than that of the competitive companies, and customers' opinions are less considered in design and production. The third hypothesis indicates the relation between supply and production management and PSCM. The results indicate the positive impact of supply and production management on PSCM. It is because of the fact that providing the raw materials has not brought about extra costs, the production system has been used properly, warehousing costs has been at a low level, and transportation cost allocates a little percent of selling price to itself.

References

1. Jafarian Ahmad and Hasanzadeh Amir, bullwhip effect in the present managers' supply chains, (2010)
2. Rasouleh vandi, Mohamad Bager, Production control and planning in supply chain management, (2011)
3. Kiani Mogadam, Mnsour Hughes and Michael Bakhshzadeh Alireza, Supply chain and logistics in national and international levels, commercial studies institute, (2010)

Table-2
Test of the 2nd hypothesis (correlation coefficient between development of the new product and PSCM), Correlations

		PSCM	Development of the new product
Spearman's PSCM	Correlation coefficient	1.000	.204
	Sig. (2-tailed)	0	.279
	N	30	30
Development of the new product	Correlation coefficient	.204	1.000
	Sig. (2-tailed)	.279	0
	N	30	30

Table-3

Test of the 3rd hypothesis (correlation coefficient between supply and production management and PSCM), Correlations

		PSCM	Supply and production management
Spearman's PSCM	Correlation coefficient	1.000	.684**
	Sig. (2-tailed)	0	.000
	N	30	30
Supply and production management	Correlation coefficient	.684**	1.000
	Sig. (2-tailed)	0.000	0
	N	30	30

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

4. Momeni Mansour, Ghayoumi Ali, statistical analyses via SPSS, Ketab-e-No pub, (2010)
5. Hogus, Michael, trans. Mohsen Sheikh Sajadieh, Mohamadreza Akbari Jokar, principles of supply chain, Adineh pub, (2008)
6. Agarwal A., Shankar R. and Tiwari M.K., Modeling agility of supply chain, Industrial Marketing Management, (2007)
7. Agarwal A., Shankar R. and Tiwari M.K., Modeling the metrics of lean, agile and leagile supply chain: An ANP-based approach, *European Journal of Operational Research*, (2005)
8. Alotaibi M.A., Productivity Enhancement Through Process Integration, Ph.D thesis, Texas A and M University, (2005)
9. Baker Peter, The design and operation of distribution centers within agile supply chains, *International Journal of Production Economics*, 111, 27-41 (2008)
10. Based on Honda, (<http://world.honda.com>), Investors Annual Report, (2011)
11. Bolanos R., Fontela E., Nenclares A. and Paster P., Using interpretive structural modeling in strategic decision making groups, *Management Decision*, 43(6), (2005)
12. Bowersox, Donald J., Supply chain logistics management, McGraw-Hill Boston, Mass, (2006)
13. Browne J., Dubois D., Rathmill K., Sethi S.P. and Stecke K.E., Classification of flexible manufacturing systems, *Flexible Manufacturing Systems Magazine*, 2(2), (1984)
14. Carter M.F., Designing Flexibility Into Automated Manufacturing Systems. In: Stecke, K.E., Suri, R. (Eds.), Proceedings of the Second ORSA/TIMS Conference on Flexible Manufacturing Systems, Ann Arbor, MI. Elsevier, Amsterdam (1986)
15. Chorafas Dimitris, Integrating ERP, CRM, supply chain management, and smart materials, Auerbach: London, (2011)
16. Coopers, Price water house, Consultancy Data Base, (2010)
17. Swafford PM, Gahosh S and Murthy NN (2006)