

Investigate the impact of lean and agile supply chain strategies on organizational performance Abadan Oil Refining Company

Hamid Reza Mir Riahi (Corresponding author), Leila Andervazh

Department Of Business Management, Persian Gulf International Branch, Islamic Azad University, Khorramshahr, Iran

hmr2000@yahoo.com

Abstract: Present study was conducted in 2015 with the aim Investigate the impact of lean and agile supply chain strategies on organizational performance Abadan Oil Refining Company. The statistical population of this study is composed of all employees of Abadan Oil Refining Company with workforce equal to 300. According to Morgan's table, the sample size is equal to 169. The study was selected and questionnaires were distributed among employees. The study had three standard questionnaires of Lean supply chain (Moghimi et. al, 2011) questionnaire of agile supply chain (Toorang Lee et. al, 2005) questionnaire of organizational performance (Hersey and Goldsmith, 1981) were used. Validity of questionnaire was confirmed in terms of content validity, diagnostic validity, construct validity and convergent validity - by the Lisrel software. Questionnaire reliability was confirmed by a Cronbach's alpha test. The Shapiro-Wilk test was conducted in order to test the normality of the variables and structural equation modeling and was conducted in order to test the hypotheses. Results showed that Lean and agile supply chain strategies Abadan Oil Refining Company has a positive impact on organizational performance also impact of Lean supply chain on organizational performance was equal to 0.513 and impact of agile supply chain on organizational performance was equal to 0.506.

[Hamid Reza Mir Riahi, Leila Andervazh. **Investigate the impact of lean and agile supply chain strategies on organizational performance Abadan Oil Refining Company.** *N Y Sci J* 2016;9(3):5-14]. ISSN 1554-0200 (print); ISSN 2375-723X (online). <http://www.sciencepub.net/newyork>. 2. doi: [10.7537/marsnys09031602](https://doi.org/10.7537/marsnys09031602).

Keywords: Lean supply chain, agile supply chain, organizational performance

1. Introduction

Today the world is faced with significant changes in all aspects. In such a complex and dynamic environment, companies inevitably need to design strategies that can help them to increase their performance. Scholars like Klayvr and Pierce believe the ultimate goal of this strategy will be a long-term stabilization superior firm performance (Kispersyka-Moran et. al, 2011). In another word corporate executives seen the results of their decisions in terms of strategy. Compare their performance with past trends and review competitors or industry average and get feedback for future decision making.

That's why one of the main goals of the companies over time is to improve their performance of their continuous (Tuchayy et al., 2012). Key strategies proposed in the area of commercial and industrial supply chain in the decade there were three strategies, Lean, Agile and Lean-Agile (the Agarwal et al., 2006).

The study indicate there were no difference between lean and agile strategies with each other and their impact was the same while others believe leanness and agility requirements was also the same (Wan, 2006). However it appears that the stability required for having low cost and lean manufacturing flexibility the speed required to meet the rapidly changing markets for agility creating paradox became

apparent. Naylor and colleagues claim that the two strategies are different, but they can be used in the entire supply chain. The result is in recent years other commercial philosophy as lean-agile was as one of the options used for supply chain organizations has emerged. Lean-Agile strategy and their benefits of purity for the (removal of waste) and their advantages of agility (speed and flexibility) in their place. In fact this strategy seeks to market opportunities in an effective manner (in terms of cost) exploit (Aghajani et al., 2014). Several studies in recent decades have been conducted on the application of lean and agile strategies, the importance of increasing the use of these strategies reveals and points to the fact that the strategy of lean and agile are practical and effective and can have a positive impact on the company level and among all members of their supply chain. Due to the efforts of many Iranian companies offers better performance is shown and try to take more advantage of a variety of techniques and tools to achieve this.

The present study aims to investigate the impact of supply chain strategies, lean and agile organizational performance Abadan Oil Refining Company, appropriate guidelines for the implementation of these strategies and improving organizational performance Abadan Oil Refining Company to offer.

2. Research goals:**2.1. The main objectives:**

explain the impact of supply chain strategies, lean and agile organizational performance Abadan Oil Refining Company.

2.2. Secondary objectives:

explain the impact of waste on cost reduction and organizational performance Abadan Oil Refining Company.

explain the impact of quality management on organizational performance Abadan Oil Refining Company.

explain the impact of organizational culture on organizational performance Abadan Oil Refining Company.

explain the impact of standardized goods / services on organizational performance Abadan Oil Refining Company.

explain the impact on organizational performance accountability Abadan Oil Refining Company.

explain the impact on organizational performance worthy of Abadan Oil Refining Company.

explain the impact of flexibility on organizational performance Abadan Oil Refining Company.

explain the impact of speed on organizational performance Abadan Oil Refining Company.

3. Research questions:**3.1. The main question**

1. Is lean and agile supply chain strategies Abadan Oil Refining Company has a positive impact on organizational performance?

3.2. Sub questions

1. Will reduce cost and waste Abadan Oil Refining Company has a positive impact on organizational performance?

2. Does the quality management Abadan Oil Refining Company have a positive impact on organizational performance?

3. Is the corporate culture has a positive impact on organizational performance Abadan Oil Refining Company?

4. Is the standardization of the product / service Abadan Oil Refining Company has a positive impact on organizational performance?

5. Do not respond Abadan Oil Refining Company has a positive impact on organizational performance?

6. Is the merits of Abadan Oil Refining Company has a positive impact on organizational performance?

7. Is the speed of Abadan Oil Refining Company has a positive impact on organizational performance?

8. Is flexibility a positive impact on organizational performance Abadan Oil Refining Company?

4. Definition of terms

Supply Chain Management: A set of approaches that integrate the performance of suppliers, producers and sellers of used equipment. So that products to be the right user, at the right time and place to produce and distribute. While the total cost of the system without reducing the quality of the product and service level at least. The main loop supply chain including raw material suppliers, production facilities, distribution services and end-customers through forward flow of raw materials and the back flow of information linked together (Wong et. al, 2007)

Lean supply chain: Lean supply chain principles governing the bottom and top of the value chain not only thinking and lean principles should be extended, but shall not exceed the boundaries of the organization to the total value of the supply chain optimized (Ngwainbi, 2008). Lean supply chain approach also helps organizations and businesses to use the philosophy of continuous improvement and the use of culture and teamwork, waste in processes to identify, analyze and then delete (Aghayie et. al., 1393).

Agile supply chain: The ability of a supply chain is to respond quickly to the market changes and customer needs (Jafarnejad and methods, 1386). The agile manufacturing is a manufacturing strategy based on the introduction of new products in markets that are rapidly changing and also enable the organization to meet the constantly changing and unpredictable competitive environment. This mode of production is in order to introduce new requirements of mass production were discovered in the competitive environment (Kettunen, 2009).

Organizational Performance: Effective and efficient performance of the process of the quality of past actions (Neill & Rose, 2005).

5. Hypothesis**5.1. The main assumptions of research:**

1. Lean and agile supply chain strategies Abadan Oil Refining Company has a positive impact on organizational performance.

5.2. Sub assumptions of research:

1. Reduce costs and waste Abadan Oil Refining Company has a positive impact on organizational performance.

2. Quality Management Abadan Oil Refining Company has a positive impact on organizational performance.

3. Organizational culture has a positive impact on organizational performance Abadan Oil Refining Company.

4. Standardization of the product / service Abadan Oil Refining Company has a positive impact on organizational performance.

5. Meet Abadan Oil Refining Company has a positive impact on organizational performance.

6. Merit Abadan Oil Refining Company has a positive impact on organizational performance.

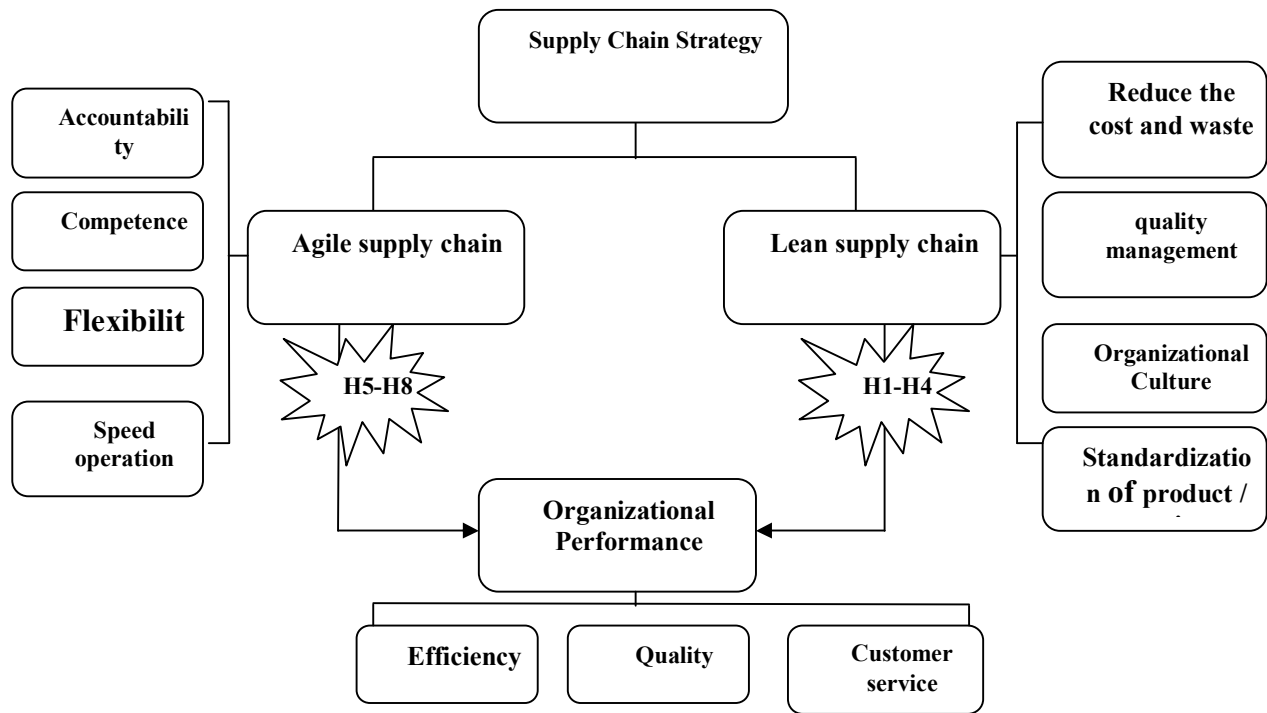
7. Speed Abadan Oil Refining Company has a positive impact on organizational performance.

8. Flexibility Abadan Oil Refining Company has a positive impact on organizational performance.

6. Conceptual model

Scientific research and systematic, theoretical and practical framework needed to be the so-called conceptual model. According to studies and research background in the conceptual model for the study are

presented below. The variable lean supply chain model and its components (reducing the cost and waste, quality management, organizational culture, standardization of goods / services) derived from the research and engaging the enemy theory (1392), Agile supply chain and its components (accountability, competence, speed, flexibility) from research and theory Sharifi and Zhang (2001), Organizational performance and its components (customer service, quality, productivity) from research and theory of Hersey and Goldsmith (1981). The complementarity of all these three independent and dependent variables are related to the measurement indicators and applicable at all levels of the organization, including the reasons for choosing this model.



7. Research methodology

Current research purposes: the applied research category. Findings of this study and suggestions for the companies, which means it can be used to enhance and improve the quality of these organizations.

In terms of data collection: how to obtain the needed data, descriptive and correlational study is in the group. Because it uses structural equation modeling and path analysis, concurrency relationships among variables is tested.

Based on data collected: during a survey (cross-sectional). Survey research answered the question of time and investigator examines the current situation to be examined in the light of current issues in this technique mainly used questionnaires and interviews

to collect data and information. The goal generalization of the results achieved in the survey sample is smaller to the larger community.

Depending on the nature of data: a little bit. The researchers are interested in research data, adjusted for emblems Math in order to use statistical and mathematical functions to describe and analyze social phenomena.

8. Community statistical samples and sampling

The population in this study is Abadan Oil Refinery Employees work force of 300. According to Morgan table, the minim requirement is 169. The manpower taken into account is 300 as selected by sample random.

9. Validity

The study of three techniques apparent content validity and construct validity, convergent, and diagnostic validity have been used. Thus, in order to confirm the validity of the content of the comments was used by supervision. In order to determine the validity - converge and diagnostic validity of the techniques used confirmatory factor analysis and the results are presented in the following. Factor analysis is a method of estimating validity. It can be used to identify and measure the relative strength of different psychological traits. If there is a significant correlation between the couple, this correlation indicates that they all measure one common factor for all kinds of backgrounds (Sharifi, 2004).

To assess the validity converge two criteria must be considered: 1- The hidden factor loadings for each variable must be greater than 0.5 and ideal is greater than 0.7. 2-The average variance extracted for each latent variable must be greater than 0.5 because the average variance extracted all the variables of each factor loadings smaller questions, diagnostic validity for variables is true. (Ramin October and Charstad, 2013).

10. Confirmatory factor analysis first and second lean supply chain

They are a significant factor loadings, the average variance extracted and second lean supply chain diagnostic validity, confirmatory factor analysis are shown in below Table.

Diagnostic validity	Average variance extracted	Significant factor loading	Factor loading	question	variable
☑	0.74	✓	0.84	1	Reduce the cost and waste
		✓	0.85	2	
		✓	0.89	3	
☑	0.77	✓	0.85	4	Quality management
		✓	0.91	5	
		✓	0.88	6	
☑	0.61	✓	0.84	7	Organizational culture
		✓	0.78	8	
		✓	0.73	9	
☑	0.73	✓	0.86	10	Standardization of product and services
		✓	0.82	11	
		✓	0.89	12	

Because the factor loadings greater than 0.5 which is greater than the average variance extracted, construct validity - converge confirmed. Due to the average variance extracted all the variables of each factor loadings are smaller questions, diagnostic validity for variables is true.

Second order factor analysis, factor loadings are significant and the average variance extracted and diagnostic validity of the measurement model lean supply chain is shown in below Table:

Diagnostic validity	Average variance extracted	Significant factor loading	Factor loading	index	structure
☑	0.64	✓	0.74	Reduce the cost and waste	lean supply chain
		✓	0.72	Quality management	
		✓	0.92	Organizational culture	
		✓	0.81	Standardization of product and services	

Because the factor loadings greater than 0.5 which is greater than average variance extracted, Structural convergent validity is confirmed. The average variance extracted structure of factor loadings of each index is smaller, diagnostic validity is confirmed for the structure.

11. First and second order confirmatory factor analysis agile supply chain

They are a significant factor loadings, the average variance extracted first order confirmatory factor analysis and diagnostic validity agile supply chain is shown in Table below:

Diagnostic validity	Average variance extracted	Significant factor loading	Factor loading	question	variable
☑	0.76	✓	0.84	13	Accountability
		✓	0.78	14	
		✓	0.95	15	
		✓	0.91	16	
☑	0.65	✓	0.62	17	competence
		✓	0.83	18	
		✓	0.85	19	
		✓	0.90	20	
☑	0.69	✓	0.79	21	flexibility
		✓	0.83	22	
		✓	0.90	23	
		✓	0.82	24	
☑	0.63	✓	0.76	25	Speed operation
		✓	0.81	26	
		✓	0.93	27	
		✓	0.66	28	

The average variance extracted factor loadings greater than 0.5 which is greater than average, there are convergent validity is confirmed because the average variance extracted all the variables of each factor loadings are smaller in question, diagnostic validity for variables is true.

Second order factor analysis, the average variance extracted has a significant factor loadings and diagnostic validity of the measurement model is agile supply chain in below Table:

Diagnostic validity	Average variance extracted	Significant factor loading	Factor loading	index	structure
☑	0.63	✓	0.74	Reduce the cost and waste	agile supply chain
		✓	0.70	Quality management	
		✓	0.89	Organizational culture	
		✓	0.85	Standardization of product and services	

The average variance extracted factor loadings greater than 0.5 which is greater than average, there are convergent validity is confirmed. The average variance extracted structure of factor loadings of each index is smaller, diagnostic validity is confirmed for the structure.

12. First and second order confirmatory factor analysis of organizational performance

They are significant factor loadings, the average variance extracted and diagnostic validity of the first order confirmatory factor analysis Organizational performance in below Table reads:

Diagnostic validity	Average variance extracted	Significant factor loading	Factor loading	question	variable
☑	0.63	✓	0.75	29	Customer service
		✓	0.84	30	
		✓	0.80	31	
☑	0.56	✓	0.74	32	quality
		✓	0.72	33	
		✓	0.79	34	
☑	0.65	✓	0.86	35	efficiency
		✓	0.84	36	
		✓	0.72	37	

The factor loadings greater than 0.5 which is greater the average variance extracted, convergent construct validity is confirmed. Also, because the average variance extracted all the variables of each loadings of the questions is smaller, diagnostic validity for variables is true.

They are significant factor loadings, the average variance extracted and diagnostic validity of the second order factor analysis function Organization in below Table reads:

Diagnostic validity	Average variance extracted	Significant factor loading	Factor loading	index	structure
☑	0.65	✓	0.79	Customer service	Organizational performance
		✓	0.85	quality	
		✓	0.79	efficiency	

The factor loadings greater than 0.5 which is greater than average, the average variance extracted, convergent construct validity is confirmed. The average variance extracted structure of factor loadings of each index is smaller, diagnostic validity is confirmed from the structure.

13. Reliability

To assess the internal consistency of the questionnaire, Cronbach's alpha coefficient calculated for each of the factors separately, and the results are shown in below Table is provided. Cronbach's alpha coefficient values calculated for different parts of the questionnaire suggests that the instrument of reliability is required:

Variable alpha	Question amount	variables
0.781	12	Lean supply chain
0.890	16	agile supply chain
0.793	9	Organizational performance

14. Analysis data

The reliability of the questionnaire by Cronbach's alpha technique software (SPSS) is done.

Check the validity of the questionnaire by Validity - look, convergent construct validity and reliability of diagnostic Software verification techniques, factor analysis (LISREL) is done.

15. Descriptive statistics:

Describe the data analysis, frequency tables and graphs by software (SPSS) be done.

Inferential statistics were (in order to test the hypotheses, the following steps will be):

Normality test variables using the Shapiro-Wilk test software (SPSS) is done.

Test hypotheses using structural equation modeling techniques SEM (test path analysis software PLS- Smart) is done.

16. Normality test variables

One of the prerequisites for the use of SEM, normalized data set of variables. This study was to examine normal Shapiro test data being used variables that result in below Table come is:

test	components	Test statistics	variables
0.896	Reduce the cost and waste	0.912	Lean supply chain
0.915	Quality management		
0.898	Organizational culture		
0.848	Standardization of product and services		
0.928	Accountability	0.918	agile supply chain
0.955	competence		
0.912	flexibility		
0.829	Speed operation		
0.901	Customer service	0.898	Organizational performance
0.947	quality		
0.820	efficiency		

16.1. The hypothesis

The main hypothesis: lean and agile supply chain strategies Abadan Oil Refining Company a positive impact on organizational performance.

H_0 = lean and agile supply chain strategies Abadan Oil Refining Company a positive impact on organizational performance No.

H_1 = lean and agile supply chain strategies Abadan Oil Refining Company a positive impact on organizational performance.

Result	R ²	t-value		Path coefficient		path	hypothesis
	Organizational performance	From: agile supply chain to: org. performance	From: Lean supply chain to: org. performance	From: agile supply chain to: org. performance	From: Lean supply chain to: org. performance		
Accepting hypothesis H1	0.938	9.084	9.317	0.506	0.513	From: Lean & agile supply chain to: org. performance	main

According to the above Table, lean and agile supply chain strategies impact on organizational performance at the level of one percent (99%) is significant and shows that lean and agile supply chain strategies 93% of predicted changes in organizational performance and estimates. In addition, because the path coefficient, a positive figure 0.513 and is therefore inferred 0.506 lean and agile supply chain strategies for organizational performance had a positive effect as well.

16.2. Indices of model:

1. Index R²

Chin three values of 0.19, 0.33 and 0.67 as the criterion for quantities of weak, medium and strong R² Introduces.

As shown in Figure below specified, the value for the dependent variable R², 0.938 obtained. Therefore, this value is R² strong.

2. GoF index

To review both the overall model fitting measurement model and structural controls of GoF criteria are used:

According to Smart- PLS the values are:

structure	Question/index	Factor loading	communalities	<u>communalities</u>	R ²	<u>R²</u>	Gof			
Lean supply chain	Reduce the cost and waste	0.870	0.590	0.593	--	0.938	0.745			
	Quality management	0.725								
	Organizational culture	0.706								
	Standardization of product and services	0.737								
agile supply chain	Accountability	0.863	0.568		0.593			--	0.938	0.745
	competence	0.693								
	flexibility	0.749								
	Speed operation	0.699								
Organizational performance	Customer service	0.736	0.621	0.593		0.938	0.938	0.745		
	quality	0.820								
	efficiency	0.807								

Wetzel et three values of 0.01, 0.25 and 0.36 as the criterion for values of low, medium, and GoF introduces strong. Thus, the amount of 0.745 for GoF show the overall fit of the model is highly desirable.

17. Analysis of results

17.1. Findings from basic hypotheses

Lean and agile supply chain strategies of Abadan Oil Refining Company have a positive impact on organizational performance. The effect of the

independent variable (lean and agile supply chain) on the dependent variable (performance) at 0.513 and 0.506 is. Lean and agile supply chain strategies 93% of predicted changes in organizational performance and estimates. In addition, because the path coefficient has, a positive figure, 0.513 and has therefore concluded 0.503 lean and agile supply chain strategies and the positive effect on organizational performance of Abadan Oil Refining Company's direction.

The findings of the research Ajly and colleagues (1390), Tuchayy et al (2012) that there is a positive impact on organizational performance which is consistent with lean supply chain. On the other hand, the results of Ajly and colleagues (2014) that there is a positive impact on organizational performance are consistent with agile supply chain.

In explaining hypothesis suggests that lean and agile supply chain strategy is closely related to organizational performance. This means the higher the correlation coefficient is the relationship of the target population will benefit from the results.

18. The research proposal

Recommendations resulting from the study

In this study, lean and agile supply chain strategies and their impact on organizational performance are discussed. The results showed that in nature there is no contradiction between the two strategies. But lean and agile strategies difference in the care that is given to the criterion of cost and accountability. In other words, the purpose of estimating demand in lean supply chain at minimal cost, while the agile supply chain to estimate demand with maximum responsiveness and speed. Lean supply chain strategies are to improve the efficiency of the company is proposed to use higher capacity, lower inventories and lower-cost transportation policies and be given more importance. The agile supply chain strategies are to improve efficiency in the use of machines and production systems. Reconfigurable flexible, innovation in products and services, Quicker shipping methods and other methods that increase the speed of response are given more importance.

19. Practical suggestions

According to the first hypothesis suggested to others:

Reducing inventory levels to reduce costs and waste.

According to the second hypothesis is suggested to others:

Continue improvement by the use of the Kaizen methods.

All goods and services and processes designed to satisfy the needs and expectations of domestic and

foreign customers, and ultimately reviewed and approved the necessary controls on them.

Senior management directly and actively participate in activities to improve quality.

According to the third hypothesis is proposed to others:

Educate the culture in the importance of lean supply chain.

Reward and punishment system designed for field deployment lean supply chain.

According to the results of the fourth hypothesis is suggested to others:

Defining priorities, strategies and standardization of the product / service organization should be appropriate to the circumstances.

According to the fifth hypothesis is research to suggest others:

Reduction of latency across the supply chain.

According to the results of research to others sixth hypothesis is proposed:

Improvement of the quality products /services per customers' demands.

According to the results of research to others seventh hypothesis is proposed:

Make quick changes in the design of products /services.

According to the results of research to others eighth hypothesis is proposed:

Flexibility throughout the supply chain services to meet the needs of customers.

20. Recommendations for future research

Recommended "effect on the performance of the company's marketing strategies, supply chain lean and agile manufacturing" will also be studied.

It is recommended to lean and agile supply chain relationship management strategies to meet the supply chain affiliates in the refining and petrochemical industries as well as broadcast affiliates also be studied.

Recommend "electronic supply chain impact on customer satisfaction with lean manufacturing approach" will also be studied.

It is recommended to "compare the performance of supply chain strategies, lean, agile and lean - agile manufacturing companies" will also be studied.

References:

1. Gentleman, or, Salehi Sadaghiani, c, Ghorbanzadeh, Michael, F. (1394). Lean supply chain model is designed using structural equation modeling techniques, Journal - Industrial Management Studies - Year Issue 63, pp. 113-95.
2. Aqajani, H, Akbarzada, G. (1393). Comparative study of lean supply chain strategy, agile and lean - Chabk, the first national economic

- conference and practical management approach, Babolsar, a research firm Torud north.
3. Eide, M, Pyrzadyan, M, celebrated seek, or. (1394). Factors affecting supply chain agility and providing a model for the study of Ilam refinery managers.
 4. Amirizadeh, d. (1389). A Mathematical Model for Evaluating the Performance of National Broadcasting Iranian Oil Company's 37 regions. Master's Thesis Industrial Management, Azad University of Shiraz.
 5. Illumination ancestor Jahromy, AS, and Farzami, b. (1383). The effect on productivity, inventory levels in the supply chain. Tehran: Proceedings of the First International Conference on Logistics and Supply Chain.
 6. Bavarsad, B, Zanganeh, and, Haidari, and. (1393). Agile supply chain analysis of the relationship between production Bamkrd the second International Conference on Management Challenges and Solutions, Shiraz, Scientific Conference Center Conference journalist.
 7. Jafarnejad, and, mice, B. (1386). Introduction to organizational agility and agile manufacturing, Tehran, kind of publishing, printing.
 8. Welcome R, H. (1394). mqays-h simultaneous use of lean and agile supply chain strategies Case study: Industrial Complex evening dinner.
 9. Enemy-consuming, S. (1392) Lean Supply chain approach to competitiveness, the National Conference of modern management science Golestan Province, Gorgan.
 10. Agarwal, A, Shankar, R and Tiwari, M.K. (2006), Modeling the metrics of lean, agile and leagile supply chain: an ANP-based approach, European Journal of Operational Research, Vol. 173, pp. 211-225.
 11. Alony, I, Caputi, P, Coltman, T. (2011). Informing Implementers of Lean Strategy in Process Industries – The Central Role of Schedulers, Issues in Informing Science and Information Technology.
 12. Azevedoa, S.G, Govindanb, K, Carvalhoc, H.(2012).An integrated model to assess the leanness and agility of the automotive industry, Resources, Conservation and Recycling, Volume 66, Pages 85–94.
 13. Banker, R.D., Chang,H., Janakiraman, S.N., & Konstans, C. (2004). A balanced scorecard analysis of performance metrics. European Journal of Operational Research, Vol 154, 423–436.
 14. Banomyong, R, Veerakachen, V. & Supatn, N. (2008) Implementing leagility in reverse logistics channels, International Journal of Logistics: Research and Applications, 11(1), 31-47.
 15. Christopher, M. (2000). The Agile Supply Chain Competing in Volatile Markets. Industrial Marketing Management, Vol. 29, 37–44.
 16. Gunasekaran. A. (2004). Supply chain Management: theory and application. European Journal of operational research, 159, 265 -268.
 17. Gunasekaran, A, Lai, K. H.; Edwin Cheng, T.C. (2008). Responsive Supply Chain: A Competitive Strategy in a Networked Economy”, Omega 36, 549- 564.
 18. Handfield, R. B., & Nichols, E. L. (2000). Introduction to Supply Chain Management. Upper Saddle River. NJ: Prentice-Hall.
 19. Harris, S. G., & Mossholder, K. W. (1996). The affective implications of perceived congruence with culture dimensions during organizational transformation. Journal of Management, 22, 527-548.
 20. Jain, V, Benyoucef, L. and Deshmukh, S.G. (2008), New approach for evaluating agility in supply chains using Fuzzy Association Rules Mining, Engineering Applications of Artificial Intelligence, Vol. 21, pp. 367–385.
 21. Kettunen, P. (2009). Adopting key lessons from agile manufacturing to agile software product development A comparative study. Technovation 29, 408- 422.
 22. Kisperska-Moron, D. and Haan, J.D. (2011), Improving supply chain performance to satisfy final customers: Leagile experiences of a polish distributor, International Journal of Production Economics, Vol. 133 NO. 1, pp. 127-134.
 23. Krause, D.R., Vachon, S., & Klassen, R. (2009). Special topic forum on sustainable supply chain management: Introduction and reflections on the of purchasing management. J.Supply Chain Manag, 45,18-24.
 24. Lambert, D. M., James, R.S, & Ellram, L. M. (2001). Fundamentals of Logistics Management. Boston, MA: Irwin/McGraw-Hill.
 25. MaCarthy, M., & Caravan, T.N. (2001). 360 Feedback and processes: performance improvement and employee career development. J Euro Industrial Training, 5-32.
 26. Moron, D.k, Swierczek, A. (2009). The agile capabilities of Polish companies in the supply chain: An empirical study. International Journal of Production Economics 118, 217–224.
 27. Moores, K., & Craig, J. (2010). Strategically aligning family and business systems using the Balanced Scorecard. Journal of Family Business Strategy, 1, 78–87.
 28. Ngwainbi, M. F.(2008).A Framework Supporting the Design of a Lean-Agile Supply Chain towards Improving Logistics Performance, Mälardalen University.

29. Neill, A.D, Rose, C. (2005) *The Performance Prism: The Scorecard for Measuring and Managing Stakeholder Relationships*, Financial Times/Prentice Hall, London.
30. Perez, C, Castro, R., Simons, D. & Gimenez, G. (2010). Development of lean supply chains: a case study of the Catalan pork sector», *Supply Chain Management: An International Journal*, 15(1), 55–68.
31. Qrunfleh, S, Tarafdar, M. (2013). Lean and agile supply chain strategies and supply chain responsiveness: the role of strategic supplier partnership and postponement Department of Management Science, Lancaster University, Lancaster, UK, *Supply Chain Management: An International Journal*, Volume 18, Number 6, 571–582.
32. Rahimnia, F. and Moghadasian, M. (2010), Supply chain leagility in professional services: how to apply decoupling point concept in healthcare delivery system, *Supply Chain Management: An International Journal*, Vol. 15 No. 1, pp. 80–91.
33. Sharifi, H., Colquhoun, G., Barclay, I., Dann, Z., (2001). Agile manufacturing: a management and operational framework, *Proceedings of the Institution of Mechanical Engineering-Part B Engineering Manufacturing*, 215(6), 857-869.
34. Swafford, P.M., Ghosh, S., & Murthy, N.N. (2006). A framework for assessing value chain agility. *International Journal of Operations & Production Management* 26(2), 118-140.

2/28/2016