IDENTIFY AND RANK THE REQUIRED CAPABILITIES ANDCOMPETENCIESTO THESUPPLY CHAIN IN THE MAPNA BOILER COMPANY

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Abstract

The purposeofthis study is identifyingthe capabilities, effective competencesandsensitive points ofsupply chainof MapnaBoiler Company. Inthis research, at first, theconcepts of supply chainare described, and the influenced factorson the supply chainenhance ofits effectivenesshas been detected. This isaction is performed with using of questionnaireswith25questions,whichare distributed between the managersandexpertsinthelogistics fieldof Company.

The research method isa descriptive survey, and based onstatisticalmethods byusingStudent ttest, chi-twoand correlationofSPSS software,thedataanalysisis presented and finally effective factors are categorized by using of analytic hierarchy process and Expert Choice software.

The resultsof this research is showed that theintegrationfactors ofcustomer, internalconsistency(integration), communicational integration, , integration of thesupplier ofthe services/products(materials), planning integration andtechnology andcomparison integration as an effective capabilities toward supply chain of Mapnaboiler company. Also, theintegrity ofthecustomerhas themost impactoneffectiveness on supply chain.

Keywords: purchasing, supply chain, supply chain management, supplychaincompetencies, logistics

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Introduction

Supplychain managementisa newapproachwhich inhas been supervised Operations Manager inrecent years.The supply chainisnetworkof distribution centersthatone of its duties is convertingraw materialsintofinal productsand distributes themamongthe customers. Supplychain managementis coordinatedactivities sothat customerscanobtainproductswith high quality and minimalcost. Supplychain managementcanprovide acompetitive advantagefor thecompany. Supplychain managementincrease the company's desire tocooperation and competition(Faizabady, 1382:5).

Nowadays, will enter to thecompany unprecedented pressures such as theofpressure fromforeign products, introduction of new productsby competitors, decliningproduct life, unforeseenchangesinrelationshipswith customers, promotionsin manufacturingandinformationtechnologies, privatization of public companies, recessionseconomicandstakeholderpressureforreturn the investment. According to thesepressures, themost importantchallengethat manufacturers are facing with them are such as, integration of upstream outsourcingfunctionsanddownstreamtransferfunctions, until the managers can escape from theconcerns ofthepresent age (needs forimprovement activities, increasedglobalization, increase intransportation costs, the importance of international trade, need for manageinventory, competitive pressures) andmake the most preparations ofthe opportunities. The mean of thelarge-scaleintegrationof functions,iscreating a balancebetween the enterprise, while on a smaller-scaleis meaningcoordination betweeninward of departmentssuch as marketing, production, purchasing, logistics(supporting) and...(Stadtler&Kilger, 2005).Oneof the most significantparadigmchangesof modern businessmanagement is acompetitiveunitto theCompany'ssupply chain(Jafarnejadet al, 1389).

Therefore,one of themost important issuesthatorganizations arefaced to them issupply chain managementhowefficientlyand effectively is work. Recently,has been paidattention to supply chain management andsupplier selectionprocess inmanagement context. In the 1990s,many factoriesweresearching fora way of partnershipswith supplierstoimprovetheirmanagement performanceandcompetitiveness through it.Thesubstances (ingredients)chainis shownin Figure1. Relationships between supplier and consumer have beenseriously consideredin productcompanies. When along-termrelationshipbetween them isexisted,supply chainof company is a very serious and strong obstaclein the way ofthecompetitors.

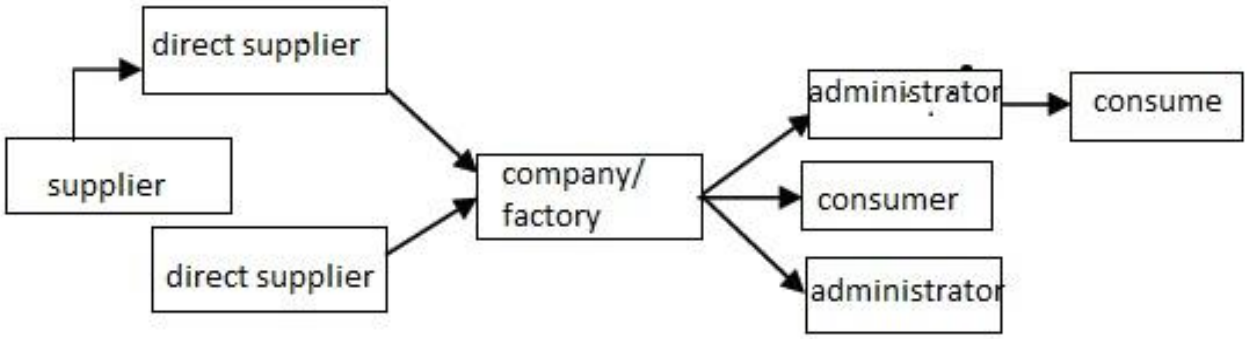


Figure1.flow of goodsandmaterialthroughout thesupply chain(Source:)

The importance ofsupply chainmanagementliesin the definition of supply chain.Stadler(2005) andHuobner(2007) definesthesupply chain, "Supply chainare organizationswhich are divided into upstream and downstream organization and with one product orserviceand throughdoing activities andvarious processeswith following thecreationofvalue is endedfor thecustomer. " The purposeof supply chain management isimproving theefficiency ofthe supply chain process until the right product, on timeandwith minimal costis given to thecustomer(Si & et al. 2007).Believing thatsupply chain managementcan leadtobettermeetcustomerand ultimatelymore profitable, hasarguemany managers withsupply chainmanagement(Ketchen&Giunipero, 2004).

Defy and Stank (2005) supply chain strategy as a concept that is found through the related abilities with the supply chain to gain competitive advantage. A proper supply chain strategy can influence more positively on supply chain performance. Design an appropriate strategy of supply chain is not possible except identifyingcapabilities and competencies that are influenced on the supply chain. So the question that arises here is that firstly, what are these capabilities and competencies that are influenced on the supply chain? And secondly, how much is their impact on the supply chain? Clear answers to these questions will help managers to invest and research in these capabilities, manage their supply chain companies and organizations. Therefore, in this study, the answer to the above questions, to evaluate the required capabilities and competencies for supply chain and logistics, and determine the importance of each of these capabilities. Logistics managers by identifying the competencies can be taken appropriate actions to increase the efficiency and effectiveness of supply chains. because of choosing(selecting) suitable set of suppliers for working with them in side of success of company is one of the most important and vital issue, in this research, we try to consider the effective capabilities and competencies supply chain of Mapna boiler company based on specified framework(which is told above).Mapna

boiler is engineering and manufacturing company, which was established in 1378, responsible for the development of the creation industry of gas powerhouse in the design field and manufacturing of boiler. The activity of this company in the field of design and creation of boiler is based on wide use of internal creating equipment capacities and suitable exploit management of manufacture powerhouse equipments under the pressure and out of pressure and also design and engineering in the field of design and creation of thermal recovery boiler.

Enhance of thecompany's position asaleadingregionalsupplierofboiler,powerand industrialprojects,according to the importanceofprotecting the environmentand commitment tocontinuous improvementandeffectivenessof qualitysystemsandalso customer satisfactionarethestrategic objectives ofMapnaBoiler Company. The reason for selecting this subject and exercising (testing) it in theMapnaboiler Company isachievingthe strategic goalsof the company which All of them are possiblein light ofsupplychain management.

1.1. Background research

- Thefirst research in the basis ofsupplier selectionwas donebyDicksonin 1966. Inthis study,aquestionnairewas consisted of23 criteriafor273managers andpurchasingagentsfrom theU.S. andCanada has been sent andasked themspecifiedcriteriaandrankthem ona scaleof zero tofour(Dickson, 1996)
- DanielKernandcolleagues(2012) had done a researchintotherisk analysiscarried outin the supply chain in thisresearch with identified the risks, theclassification and thendeterminetheir impact (influence) onthe supply chain, they was presented amodel.
- SadeghiMoghadamand et al(1385) by using of agenetic algorithmmethodare presented a model towards efficient allocationof orders invarious levels ofthe supply chainaccordingto the minimumexpectedcost.
- Makooy(1383) in astudywas considering the variousaspectsofthesupply chainbehavioraltendencies. Heeventually inthis researchhas beendividedthe supply chaininto12differentsections, so that theywill seemunrelated, but all of themarelinkedbyan integratedissues.
- Jafarnejadand et al(1389) in the framework ofthe research project, haveofferedto providea technique formeasuringagilityof supply chain. This technique is acombination ofgraphtheoryandmatrixapproach, fuzzy logicand conceptualstructure modeling.

- Hossainyand et al(1389) by using of extensivefieldstudieshaveprovidedthe suitable frameworkforthe formulation ofsupply chainstrategies and then this designed framework as an operationinapetrochemical companywas implemented in form of case studyof organization.
- FathyHafashjanyand et al(1389) inthe context ofastructural model arestudied,howinfluence oftwo quality approaches of supply chainmanagementwithsome of themost importantsuccess factorsof quality management which these relationships aretaken toward and adjusted, into quality andbusinessperformance ofasupplychain.

2.1. Conceptual model of research

theconceptual modelisa conceptual pattern and it is based onthe theoreticalrelationships that havebeen identifiedin researchissue asan important factors. According to theresearchliteratureandpresented studies, effectivecapabilities andcompetenciesonsupply chainof MapnaboilerCompany are consisted of sixvariables(independent variables). The dependent variable inthisstudywillalsoMapna Boilersupply chain.

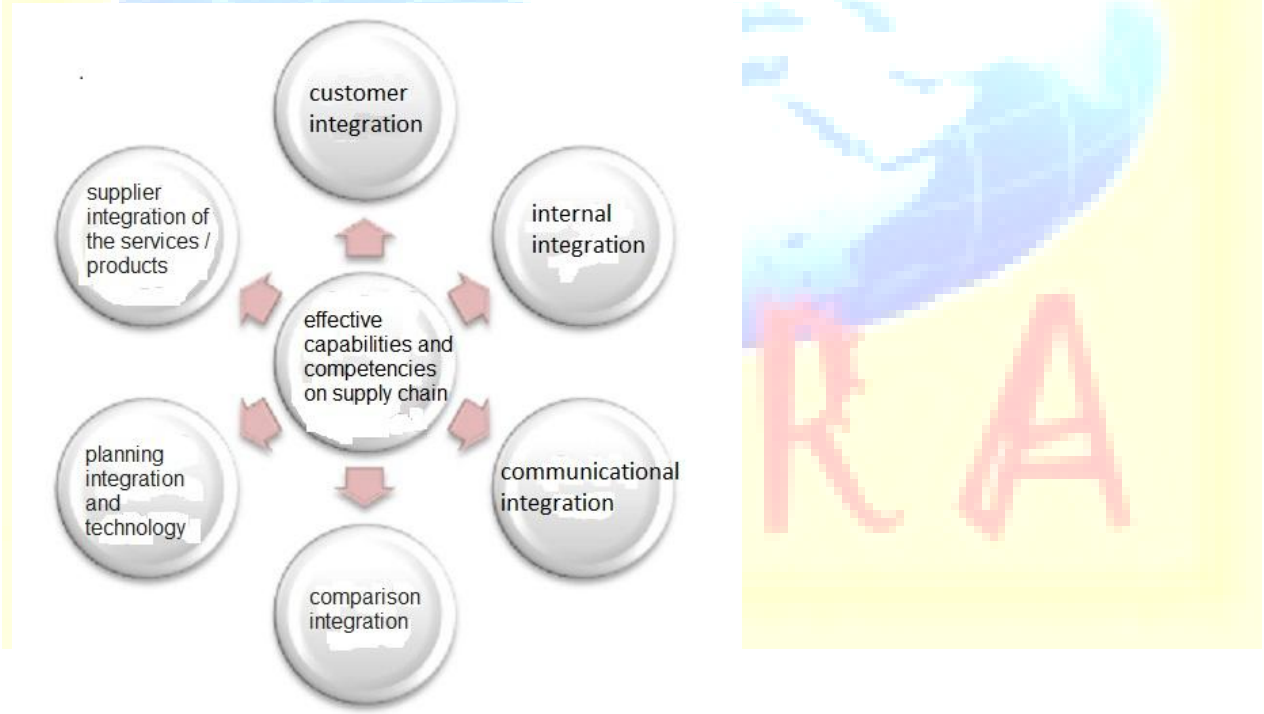


Figure 1Conceptual model(Source :)

Therefore,inthisresearch6 hypothesesare introduced as thefollowingandthey'relooking toprove or disprove them:

- There is a directrelationship between theintegrity of thecustomerandthesupply chain of MapnaBoiler Company.
- There is a directrelationship between theinternal integrationandsupply chain of MapnaBoiler Company.
- There is a directrelationship between thesupplier integration of the services/productsandsupply chain of MapnaBoiler Company.
- There is a directrelationship between the planning integration and technology andsupply chain of MapnaBoiler Company.
- There is a directrelationship between the comparison integration andsupply chain of MapnaBoiler Company.
- There is a directrelationship between the communicational integration andsupply chain of MapnaBoiler Company.

3.1. Research Method

This studyisa descriptivesurvey. Itisdescriptivebecause itdescribesand interprets perfectly everything andwhatare thecircumstances orrelationships, commonbeliefs, thecurrentprocess, obvious results with developingprocessare paying attention. (Bast,1384:125), and survey because asurveyresearcherruns a kind of survey on asampleorthewholesociety, to define writings, thoughts, behaviorsor characteristics of society (Danaifardand others, 1388:147). Datacollections based on emergency of issue at first were used ofthe Libraryand then thequestionnaires, interviews and observations inorder toachieve the desiredand goodresults. The population society of the survey isallmanagersandexpertsofthis company which they are52 numbers. Finally, according to Morgan's table, 35 people were selected to study and distribute the questionnaires.

TABLE.1questionnairesStructure

Rank of questions	Number of questions	paragon	Row
1-4	4	Customer integration	1
5-9	5	Internal integration	2
10-13	4	integration of the services/products	3

14-17	4	planning integration and technology	4
18-21	4	Comparison integration	5
22-25	4	Communicational integration	6

Cronbach's alpha was used to assess the reliability.Cronbach's alpha coefficient of study was obtained 0.914, which is very convenient coefficient. Also, The Cronbach's alpha values were calculated for each hypothesis is as follows:

Cronbach's alpha	Number of questions
0.914	25

The Cronbach's alpha values were calculated for each hypothesis is as follows:

Table 2. Cronbach'sAlpha ofassumptions (hypothesis) (Source: Survey Results)

Cronbach's Alpha	**Number of questions**	**hypothesis**
0.705	4	First hypothesis
0.467	5	second hypothesis
0.689	4	third hypothesis
0.765	4	Fourth hypothesis

0.687	4	Fifth hypothesis
0.716	4	Sixth hypothesis

It is noteworthythat the alpha coefficientless than60percent are usually weak. The amplitude of 70 percent are acceptableandrangeof over80percentis consideredgood Andwhateverratiois closertoone it isbettervalue(Sakaran, 1381: 385) .

2. Data Analysis

after collecting data for thesurvey,by using of SPSS software, were analyzed the research hypotheses.By using of the Student's t-test at the beginning of this study we investigated whether are the dependent variables of study (customer integration, internal integration, integration of the supplier of the services / products, planning integration and technology, comparison integration, communicational integration) as the effective capabilities and competence on supply chain of boiler Mapna Company? As below, all hypotheses are verified at 0.05 level of alpha.

1.2. Test theresearch hypotheses

Due tothe large amountof computing andthe operationonhypothesis,here, onlythe final resultsare presented.

We use Student t-test, chi-two and correlationtests with using of SPSSsoftwaretoexaminethe hypothesis.

One sample Test Test Value = 3				Dependent variable	Independent variable	hypothesis
T	df	Sig(2-tailed)	Mean			
4.659	44	0.00	3.43	Supply chain	Customer integration	one
4.943	44	0.00	3.34	Supply chain	Internal integration	two
3.08	44	0.003	2.99	Supply chain	integration of the services/products	three
3.68	44	0.001	3.38	Supply	planning	four

				chain	integration and technology	
4.21	44	0.00	3.38	Supply chain	Comparison integration	five
3.20	44	0.002	3.35	Supply chain	Communication integration	six

Table9Studentt-test(Source: Survey Results)

2.2.Correlationsbetween hypotheses.

In this section, weexamine thecorrelations betweentwovariables,of sixvariables which are presented in the research process.Allthese variablesareexpressedthat are knownto influenceon competenciesthesupply chain of MapnaBoilers Company. Allthese correlationsaresignificantat thelevel of0.05 and0.01 alphas.

Sixth hypothesis	fifth hypothesis	fourth hypothesis	third hypothesis	second hypothesis	first hypothesis		
0.589	0.684	0.641	0.457	0.580	1	Pearson's correlation coefficient	**First hypothesis**
0.000	0.000	0.000	0.002	0.000	45	significantamount numbers	
0.464	0.580	0.611	0.332	1	0.580	Pearson's correlation coefficient	**Second hypothesis**
0.001 45	0.000 45	0.000 45	0.026 45	45	0.000 45	significantamount numbers	
0.327	0.391	0.536	1	0.332	0.457	Pearson's correlation coefficient	**Third hypothesis**
0.028 45	0.008 45	0.000 45	45	0.026 45	0.002 45	significantamount numbers	
0.605	0.660	1	0.536	0.611	0.641	Pearson's correlation coefficient	**Fourth hypothesis**
0.000 45	0.000 45	45	0.000 45	0.000 45	0.000 45	significantamount numbers	
0.685	1	0.660	0.391	0.580	0.684	Pearson's correlation coefficient	**Fifth hypothesis**

0.000 45	 45	0.000 45	0.008 45	0.000 45	0.000 45	significantamount numbers	
1	0.685	0.605	0.327	0.464	0.589	Pearson's correlation coefficient	**Sixth hypothesis**
 45	0.000 45	0.000 45	0.028 45	0.001 45	0.000 45	significantamount numbers	

Table10.Correlationbetweenthe research hypotheses (Source: Survey Results)

asyou can be seenin thetable 10, the maximumlinear correlation,betweenthe fifth and sixthhypotheses are shown, it means comparison integrity variables and communicational integrity variables with rate of 0.685. First and fifth researchhypotheses- thevariablesof customer integrationand comparisonintegrationwith rate of0.684are insecond place.

Chi-square Test			**Dependent variable**	**Independent variable**	**hypothesis**
Chi-square	Df	Asymp.sig			
112.523	4	0.00	Supply chain	Customer integration	one
141.313	4	0.00	Supply chain	Internal integration	two
98.278	4	0.00	Supply chain	integration of the services/products	three
96.556	4	0.00	Supply chain	planning integration and technology	four
120.944	4	0.00	Supply chain	Comparison integration	five
81.5	4	0.00	Supply chain	Communicational integration	six

Table11. Results of chi-two test (Source: Survey Results)

In the next section,was examined the relation between the independent variables of study with supply chain of Mapna Boiler Companyby using of Pearson test. Also, in this test, direct relation of all variables with supply chain was proof and accepted in the level of 0.05 alphas.

Communicational integration	Comparison integration	planning integration	integration of the supplier	Internal integration	Customer integration	**Correlation coefficient**

		and technology	services/products			
0.796	0.848	0.864	0.645	0.726	0.835	**Supply chain**
0.00	0.00	0.00	0.00	0.00	0.00	**Sig. (2-taild)**

Table12. Pearson's test results (Source: Survey Results)

variables	Customer integration	planning integration and technology	Comparison integration	Communicational integration	Internal integration	integration of the supplier services/products
Customer integration	1	3.07	1.23	0.47	1.30	2.13
planning integration and technology		1	1.46	1.45	2.22	1.88
Comparison integration			1	1.13	1.18	1.29
Communicational integration				1	2.35	0.88
Internal integration					1	0.71
integration of the supplier services/products						1

3. Using analytical hierarchy process (Hierarchical Analysis Process)

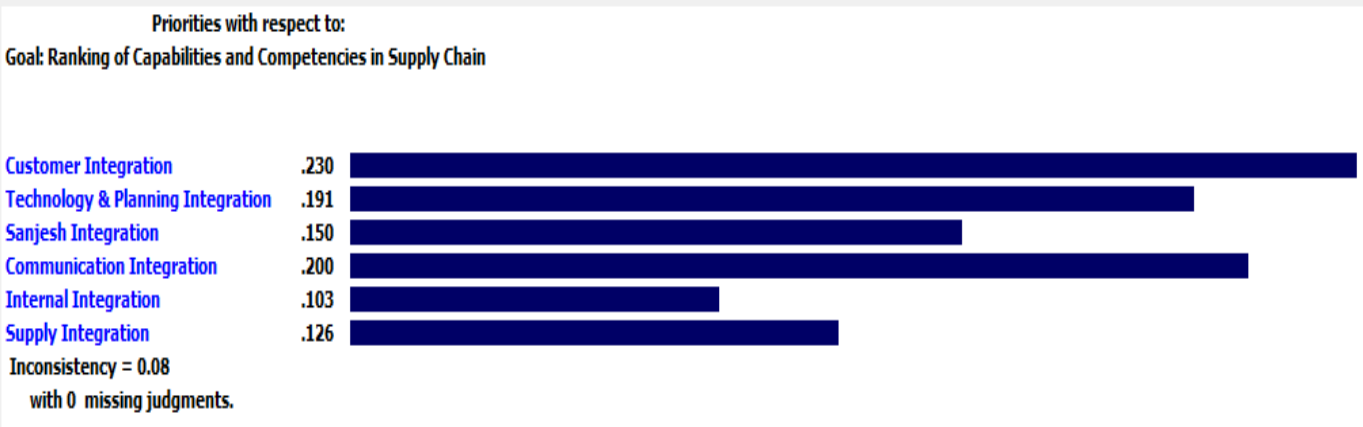
3.1Rating variables

In this stage byusing AHP to ranking the variables and explain them. Thus, we design a questionnaire of priorities and the importance of binary variable according to the following table; we asked managers and experts ideas of MapnaBoiler Company. Table13. Matrix of comparisons of binaryvariables (Source: Survey Results) After collecting the ideas by means of Expert Choicesoftware, weight of variables is calculated as follows:

Comparative weight	variables
0.230	Customer integration
0.191	planning integration and technology
0.150	Comparison integration
0.200	Communicational integration
0.103	Internal integration
0.126	integration of the supplier services/products

As you can be seen in the table, the customer integrationfactor with the weight of 0.230 Maximum rated and internal integration factors with the weight of 0.103 is allocated the lowest rated. So the customer integration variable is in the first step, the variable of communication integration isin the second, the planning and technology integration variable is in third step, comparison integration variable is ranked in the fourth step, supplier integration services / materials variable are ranked fifth and internal integration variable is in the sixth. In addition, the inconsistency rate is 0.08, which is acceptable.

Figure 3, the output of the software. (Source: Survey Results)



4. Discussion and conclusions

in the previous parts of this research, with general review of literature and background of similar researches and also with analyzing the opinion poll forms, binary questionnaires and interview with experts, the variables of problem (issue) are obtained. Then, the variables and data of issue are analyzed by using the correlation statistical methods and eventually, designed capabilities and competencies about the supply chain in MapnaBoiler Company are categorized with AHP (analytical hierarchy process) and expert choice software.

4.1. Conclusions

The assumptions (hypotheses)of this research were examined, in the previous sections, by using of the Student t-test, chi-two and correlation test. Performed statistical tests are shown that each six assumptions of this study have been confirmed and therefore we can conclude that the variables of customer integration, internal integration, and integration of the supplier of the services / products, planning integration and technology, comparisonintegration, communication integration are known as an effective capabilities and competencies on the supply chain.

correlation	-testt	Comparative weight	Effective capabilities and competencies on the supply chain	step
0.835	3.43	0.230	Customer integration	1
0.796	3.35	0.200	Communication integration	2
0.864	3.38	0.191	Planning integration and technology	3
0.848	3.38	0.150	Comparison integration	4
0.645	2.99	0.126	Supplier of the services/products integration	5

0.726	3.34	0.103	Internal integration	6

Table15. Test hypotheses of the research. (Source: Survey Results)

As you can be seen in the table, the customer integration in the supply chain has the most paramount importance, and the internal integration in the supply chain ofMapnaBoiler Company has the last degree of importance among the variables.

4.2.Suggestions

4.2.1.Research-based recommendations

- In this part, we are recommending some suggestions in a relation with each of examination which Mapna Boiler company can be affected by using of these suggestions towards being more effectiveness.

4.2.1.1. Suggestions related to the first research hypothesis (customer integration and supply chain)

- Company is tried to design and improve special programs for the customers and save the relationships with them and try for their success, because success of customer eventually, is affected on Mapna Boiler Company and also improve the customers' commitment.
- Company in order to ensure compliance withcustomer reviews, to be held scheduled meetings with clients to understand their needs changes and should be consistent with them.
- The company shows more flexibility in the field of unexpected operating conditions in the industry.

4.2.1.2Suggestions related to the second research hypothesis (internal integration and supply chain)

- Thecompany collects operations of the organization as writing documents to be more manageableand effective and finally analyze them.
- Company identifies the politics and affecting procedures on the supply chain and tries to keep them.
- Company plans in the field of maintenance of physical assets to facilitate and procurement the administration set of supply chain.

4.2.1.3. Suggestions related to the third research hypothesis (Supplier of Services / materials Integration and supply chain)

- Company set some meetings in the field of its own strategic programs with suppliers and customers and pays attention to their opinions in the company's programs.
- Company supplies the hierarchical structure of suppliers and coordinates with the internal structure of company.

4. 2.1.4. Suggestions related to the fourth research hypotheses (planning integration and technology and supply chain)

- Company in order to reduce the company's purchasing and ordering in supply chain, draw up plans and instructions.
- Company has exchange of information with its supply chain partners timely and useful.

4.2.1.5. Suggestion related to the fifth research hypotheses (comparison integration and supply chain)

- Company adjustments (self-regulates) financial indicators in the field of measurement performances of supply chain with partners.
- Company regulates overall indicators in the field of supply chain performance of itself and as a self-formulated assesses them.

4.2.1.6. Suggestions related to the sixth research hypotheses (communication integration and supply chain)

- Company identifies the responsibility of individuals in the supply chain and determines their role in the effectiveness and success of supply chain.
- Company tries to exchange technical and operational information with the supply chain partners.
- Company regulates a framework for equitable division of gratuities and fines in supply chain with the partners and considers them as a part of company.

Inageneralsummaryand with pay attention to theresults ofresearch, suggestionsof researcher forimprovingperformance of supply chainare as follows:

- Research in Financialinvestmentsjointwiththe goals ofstrengthening of thecompany'ssuppliers.
- Developacommon visionaccording to sharedresponsibilitiesbetween the companyand suppliers.

- Programming fordevelopmentthe capability measureand supplier evaluation performance.

4.2.2.Suggestions forfutureresearches

Based on thefindingsand results of thisstudy, suggestionsforfutureresearchare as following:

- Evaluationframeworksandbackgroundof sharing knowledgebetween supply chain members
- Provide amethodology toimprove thecompetencies andcapabilities ofthesupply chain
- Examiningthe challenges andbarriersthat are impededthe developmentof capabilities andcompetencies ofthe supply chain.