



# Analysis of Supply Chain Performance in Oil Industry through Lean Thinking

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## Abstract

In the competitive market, firms and productive addition to the organization and internal resources, to manage and monitor resources and related elements outside the organization needs to have. This process is known as supply chain. Also, due to the changes that occurred today in administration and production systems, tools and techniques developed and applied their frequency. Lean thinking is considered one of the most important, refers to the organization can complete the process without wasting resources or spend fewer resources, more production, is achieved. The aim of this study was to determine the measures and criteria of evaluation of supply chain performance using lean thinking in Abadan Oil Refining Company. A sample of 403 people from the refinery managers and staff selection and performance evaluation based on the Balanced Scorecard questionnaire developed to assess supply chain performance based on lean thinking were distributed among them. Verification of the data by SPSS and LISREL structural equations were tested. The results showed that the financial perspective, the perspective of coordination and customer satisfaction has a positive and significant impact on supply chain performance from the perspective of coordination between the greatest impact on improving supply chain performance.

**Keywords:** Supply Chain Management; Balanced Score Card; The Financial Perspective View of Coordination; Customer Satisfaction

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## Introduction

Success of private organizations, government and military to provide them the ability Output is dependent approved. Provide better products to a wide variety and low costs and do it fast. This effectively outputs (cost, quality, performance, delivery, flexibility and innovation) organization's ability to manage the flow of materials, information and money within and outside the organization is affiliated. This process is known as supply chain. Because supply chains may be lengthy and complicated and contains a large number of business partners, before it comes to the problems. The delay in solving the problem if lead to customer dissatisfaction and loss of sales and higher costs incurred to meet the organization. Company to

many world-class supply chain management of deals, what widely by information technology (IT) support GME [1].

## Importance and necessity of research

In the 60 experts to study the internal relationship between storage and transportation and integrating them were able to reduce their holdings of these studies was called distribution management. In the course of evolution by adding a building management issues, logistics and order management, supply chain distribution logistics concept emerged and the current status of the different operating result of the merger ring at the beginning of its suppliers and customers are at the end of it. A supply chain is the flow of materials,

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information, funds and services from suppliers of raw materials to end customers through workshops and warehouses refers to and includes organizations and processes that goods, information and services are created and delivered to consumers. The chain consists of many tasks such as shopping, flow of funds, bearing materials, planning and production control, inventory control and logistics and distribution and is delivered [2].

Modern supply chain management software aims to reduce uncertainty and risk in the supply chain. However, the positive effects on inventory levels, cycle time, business processes and services that affect customer service. This dynamic process chain activities at the same time, continuous evaluation of the parties involved, technology used in its organizational structure to be included. This technology provides opportunities for customers to have a choice of frequency and for increasing access to information and aimed at the creation of value for the consumer. All these factors contribute to increased profitability and competitiveness. For many years the queuing models are used for supply chain issues. In the 40, queuing models to handle a wide range of issues to resolve interference device was used, the number of people repairman should be allocated for the proper maintenance system, or how many phone operators to handle telephone traffic are needed. Queuing models for the transactions related to the number of serving clients in front of the waiting time used. Obviously, if the number is serving large, high cost of service, but the waiting time (the cost of wasted time client) bottom. Software supply chain planning (Supply Chain Planning) Special mathematical algorithms in order to improve the process and the supply chain and lower inventories of uses. This software is completely "is dependent on the input data for greater accuracy [3].

Decisions regarding the management of the supply chain can be divided into two general categories. Strategic and operational divisions. As its name suggests, Strategic decisions are usually "For a long time horizon and policies designed largely to provide supply chain. On the other hand, operating decisions focus on daily operations. The aim of this move effective and optimal production decisions in the supply chain is defined as strategic. Ecommerce as a very positive attitude to provide solutions to problems in the supply chain is provided. Many supply chain activities taking orders from customers to provide components can be done by e-commerce [1].

Operations Performance by at inside of supply chain function from number lot from variables keywords is often to intensity to together dependent [4]. Today, providing the best performance in the field of marketing, has become the primary concern of managers of manufacturing

companies and try to take advantage of various techniques, to achieve superior performance. The necessities of a production company's acceptance of some kind of supply chain strategies. These strategies on how best to coordinate internal and external business processes insist, as a result of this coordination, best serve customers and consumers is final and enhance the performance of individual members of the organization. With regard to the changes that occurred in the management of organizations and production systems, tools and techniques developed and applied their frequency. Lean thinking is considered one of the most important, refers to the organization can complete the process without wasting resources or spend fewer resources, greater production is achieved. Agile techniques as another example of a variety of techniques to flexible supply chain that looks and is focused on responding to unpredictable changes in the market.

In the competitive market, firms and productive addition to the organization and internal resources, to manage and monitor resources and related elements outside the organization needs to have. This is due to the fact reach advantage or competitive advantage to gain a greater share of the market and based on activities such as supply and demand planning, materials procurement, production and product planning, product storage, inventory control, product distribution and deliver customer service that previously was done all at company level now is not just for a specific company and transferred to the supply chain and demand chain coordination and cooperation between members of the large [5].

Reviewing the performance of Iranian companies can be volatile and controversial trend growth and return on investment over the past ten years, while the experts, the potential of companies in the capital market in terms of better performance, more than they know this. In fact, what is the problem and improve performance, selecting the most effective and the best strategy, according to the characteristics of the organization. However, these strategies greatest challenge in its investigation report of the past. Has the best performance present the field of marketing, has become the primary concern of managers of manufacturing companies and try to take advantage of various techniques, to achieve superior performance. According to Cooper superior performance all-round ability of a company to integrate manufacturing with our partners throughout the supply chain dependent logged in. The necessities of a production company's acceptance of some kind of supply chain strategies. These strategies on how best to coordinate internal and external business processes insist, as a result of this coordination, the

Service Update To customers and Consumption Moderators final Provided Is and too Cause Strengthening Function unique unique Member Organization.

Due to the changes that are occurring administration of organizations and production systems as well as to improve productivity, tools and techniques developed and applied their frequency. Lean thinking is considered one of the most important, refers to the organization can complete the process without wasting resources or spend fewer resources, more production research backgrounds [6]. Lean Thinking is another variety of techniques to flexible supply chain that looks and respond to unpredictable changes in the market and taking advantage of these changes by fast delivery and flexibility on the size and type of concentrated product. lean models today considered by many production companies who are looking to improve on their performance, is located. So with regard to the above, this study aimed to determine priorities and assess supply chain performance metrics using lean thinking in Abadan Oil Refining Company will be conducted in 2016.

#### Literature Review and Working Hypotheses

Supply chain set of activities and processes in order to create value in a product or service from beginning to reach customers when achieved, is included. Today, in order to expand the ability of the competition, Organizations need to develop its relations with other organizations in a wide area network from top to bottom. This constant communication and focuses on the concept of supply chain management. Supply chain management involves managing upward and downward communication among organizations in order to create value for customers. In general, supply chain management philosophy is the fact that the overall performance of a supply chain increases the performance of all the organizations related to the process in each individual performance of the organization are optimized. In order to achieve harmony and consistency throughout the organization Related in the supply chain, information is considered necessary. Development In recent decades in the field of information technology and information systems to facilitate cohesion and cooperation and solidarity between the virtual Provides supply chain. Success of the organization Private, government and military to their ability to provide an output Depends approved. Provide better products to a wide variety and low cost, and do it fast. Providing optimal output and (cost, quality, performance, delivery, flexibility and innovation) organization's ability to manage the flow of materials, information and money within and outside the organization is affiliated. This process is known as supply chain.

Because supply chains may be lengthy and complicated and contains a large number of business partners, during which problems arise. In case of delay in solving these problems will lead to customer dissatisfaction and loss of sales and higher costs incurred to meet the organization. company Many world class success Attributed to their supply chain management Day [7].

The way that the consumer supply chain to the producer or manufacturer to produce other participants connected and the product it must travel to reach the final consumer. In the business world, go to the lower levels of this chain, ease of access to resources and leads to higher layers, the product makes it easy to target companies moons. Classical economic system that manages large companies have been based on the premise that the only way to achieve efficiency ideal, or at least capture the entire supply chain, capturing the bulk of the chain. For example, it may be a shoe manufacturing company, to produce skin leather, construction adhesive and rubber from oil and cutting and printing paper for packaging and also to pay for itself, and build a chain of stores advanced transport systems created [2].

In defining the supply chain can be said that the supply chain is a collection of manufacturers and distribution base raw materials into finished products and make them available to end-customers, can bed. Achieved through strategies affecting the performance, supply chain strategies and specifically the different types of supply chain strategies as well as relevant and effective lean strategy that will lead to superior performance, has selected. Supply chain strategies on how best to coordinate internal and external business processes insist, as a result of this coordination, the Service Update to customers and consumption moderators final Provided Is and too Cause Strengthening Function unique unique member organization [8].

According to the literature can be said of supply chain manufacturing companies are trying to appeal to new supply chain strategies perform better in their day competitive market today. One of supply chain strategies, lean or lean thinking is strategy. Lean thinking can be summarized in five principal; the exact understanding of the basics and then trying to tying them to each other, can be the perfect way of applying the methods and techniques of lean manufacturing strategy to the sustainable organization and its processes. The five principle include:

1. The exact determination of the value of any given product (Value).
2. Identify the flow of product value (Value Stream).

3. Make a move without interruption on this value (Flow).
4. Allow the customer to be able to value the pull from the manufacturer (Pull).
5. Pursuit of perfection (Perfection)

*The first principle - the value (Value)*

The basic starting point for lean thinking, value. This is only the final consumer can define value and value has meaning only when it is expressed in terms of a given product, the product that your customer needs to satisfy a specified price at a certain time. Note that this manufacturer that creates value. Two issues must be addressed in this article, one certain products that the manufacturer is waiting to certain consumers, in exchange for a certain price and to buy them spin and the other how to modify the company's business operations and deliver quality products so that continuously be reduced from their original costs. Thus, pure thinking must begin with a conscious effort to precisely define value in terms of certain products that meet certain capabilities offered in exchange for a regulated price that is the result of dialogue with certain customers.

*The second principle - recognition of the value (Value Stream)*

The aggregate value of all the essential functions for a given product, this includes all processes, products and services, from concept to market entry covers products and services. Identify the value stream for each product family of each product specific and sometimes for the next step in lean thinking. In this way, there is a very high volume of waste (Muda) in the organization is exposed. Value-stream maps all actions necessary to design, customize and build a identifies the specific product, value stream analysis shows that take place during the course of the three types of activities:

1. Activities that turns out to be openly create value.
2. Activities that are not measured values but turns out to be due to the existing technical knowledge and productive assets, are not possible.
3. Additional activities that create no value turns out to be not prompt and cannot be deleted.

*The third principle - the creation of motion without interrupting the value (Flow)*

When the value is determined to be precise and firm Lean value stream mapping a given product will be removed and lossy steps, then comes the turn of the next step which is to mobilize lean thinking is value-creating steps. Move (Flow) following tasks are progressively throughout the

value stream so that a product without stopping, without waste and without retreat, from design to market, order and delivery of raw materials to reach the buyer. To achieve this end, when the entire value stream is defined and identified, the first step is to focus on the real goal is a means to focus on a specific plan, a specific order, your product in front of it from start to finish. The second step of ignoring traditional boundaries jobs, career paths, corporate functions and business to the pure form, a phenomenon that can all obstacles in the way of continuous motion to eliminate certain product. The third step is to rethink certain functions and tools, in order to eliminate any rollback and standstill and design, ordering and production of a certain product can go steady [9].

*The fourth principle - create traction system (Pull)*

Allowing customers to extend this value from producers pull out, pull (pull) means that no company in the top of the stream, goods or services unless the customer does not generate downstream, it is asked. The best way to understand the logic of pulling out that first go into a real customer who wants a real product, then turn back and all steps should be taken to the product to the customer's assay. This is in contrast to eject (Push) is. Article evoke the laws and rules related to the planning and control of materials and products (full or semifinished), as well as feeding mother factory production lines and how to communicate with suppliers (Supplier) will change. Production technique in time (JIT) guide the organization's work in allowing Jupiter to pull these values from the manufacturer.

*The fifth principle - the pursuit of perfection (Perfection)*

When the correct value to determine the Organization, identify the entire value stream, creating a continuous motion making gestures to create the value of the products used are determined and allow the client the value of enterprise-out takes time addressing the fifth principle of lean thinking, namely the pursuit of perfection. And perfection is removing is complete to muda – all the activities.

Business organizations to become lean, suitable substrates should be provided to the institutionalization of lean thinking at all levels; the institutionalization of this type of thinking is closely related to attitudes and values of the organization and its employees. Lean thinking should become a culture in the organization know as much commitment to the core values and people centered organization (such as lean thinking) is more and more members believe that the value of culture and values is stronger and a greater impact on the

behavior of members of the organization is in a strong culture there is more agreement about the organization's mission and unity of purpose leads to solidarity, loyalty, commitment and reduce turnover; in a strong culture of management to guide employee behavior is less need for rules and official procedures, Why which guides behavior when employees accept the organization's culture, internalized; the other hand, for the people to accept the cultural values they need to know. So the first practical measures for strengthening the institutionalization of lean thinking in an organization, its staff is teaching these concepts.

What is certain is that we can lean thinking to improve business performance for removal of waste to be used by the utility. Many organizations in the not too distant past, Lean Thinking to manage and improve their competitive position were chosen. After that, the idea of agile manufacturing was considered as an alternative to pure way. In some Fazbndyha, agility and leanness step after they were introduced. This could mean that as soon as the quintessential characteristics were obtained, an institution may strive for agility and plan. Our approach to the importance of mitigation lean supply, improve the flow and thus reducing the need for inventory and capacity shows confidence. But with increased sensitivity to fashion and the subsequent market demand uncertainty, supply chain requires strategic location and capacity is going to improve. Doing so requires a comprehensive vision and expertise, especially as we were told that internal decisions, swings and more waste than any other factors suggests. Instead of investing in capacity to improve material flow is basically the same approach agile supply (Solomon, 2015) [9].

By doing research on effective strategies on yield, it becomes clear that a strategy with its various aspects How can affect the performance of the company. Manufacturing companies to survive in the competition and to enhance effectiveness, require that continually improve their performance

and this requires an understanding of a variety of strategies, including supply chain strategies. Understanding the different aspects of the supply chain strategies that help companies and becoming familiar with the dimensions and their position in this regard, they can use this strategy to achieve optimal performance. The supply chain strategy requires the adoption of norms in relation to the coordination and integration among all supply chain members as well as extensive organizational accountability is information about actual and potential customers. In addition, companies need to provide competitors in the coordination among supply chain members to analyze the market and respond to the needs of pre-emption, and this is important to be able to resort to the strategy of the supply chain Day. Several studies in recent decades, in terms of lean and agile strategies in the manufacturing companies was conducted to reveal the increasing importance of the application of these strategies and indicative of the fact that the strategy of lean and agile, effective, and applications can have positive effects on the corporate level and among all members of the supply chain. Since today's Iranian manufacturing companies efforts to provide better performance on the market demonstrated and try to take advantage of techniques and tools to achieve this important goal.

H1. The financial perspective having on improving supply chain performance means there is a significant positive impact and fitted.

H2. Having to coordinate views on improving supply chain performance and has a positive impact on improving the supply chain mean-ing.

H3. Consumer satisfaction on the positive impact and improve supply chain performance means you are fitted.

### The conceptual model

With supply chain integration is mentioned criteria has been considered as the dependent variable. Ade is the relationship between independent and dependent variables in the figure 1.

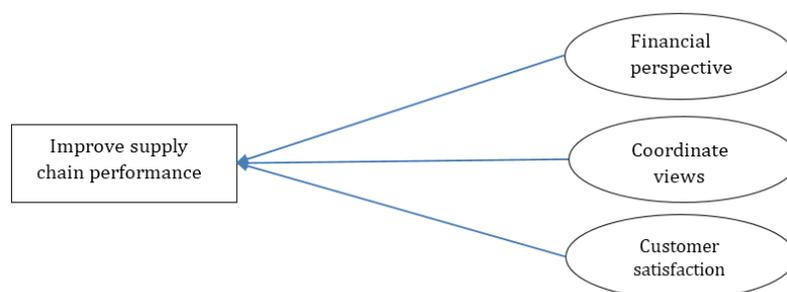


Figure 1. Conceptual model.

## Methodology

The purpose of this research and its results can be applied Abadan Oil Refining Company, National Petroleum Company, Petroleum Engineering and Development Company, universities and higher education institutions to be used.

This descriptive survey research data collection method that consists of three parts:

A) Library studies on supply chain management, performance concept and its importance and significance of a result to assess supply chain performance based on criteria of Lean Thinking, including domestic and foreign literature study and field research in this area has been done in the past. Designing and distributing a questionnaire study based on hypotheses, documentary and benefit of the views of professors, experts and CEOs. C) Analysis of the questionnaire using SPSS software.

**The sample and sampling** to species that are reasonably representative of society to work its subjects, and select the check results are generalized to the entire community. However, due to errors in this action, it is necessary to calculate the error rate and confirm them.

In this study due to lack of access to everyone in the community have used random sampling method available for sampling.

### *The method of data collection*

In order to collect data in this study, library and field methods used. prove the hypothesis based on field studies and the design, distribution and analysis of questionnaires will be done.

### *The assessment tool*

Measurement tools are devices that can be achieved using information they need to gather and provide a little. A variety of collection tools include questionnaire, observation, and interview.

Test is a common research tool and direct way to obtain research data. Inventory is written set of questions about a research topic variables set, made in the form of direct or indirect, directly or indirectly be completed by the respondents.

This questionnaire is a total of 4 components and 32 items.

Various methods are used to calculate the reliability of such as run again (retest), parallel (matched), the composition (the split-half), Cronbach's alpha coefficient method and Richardson pointed out the cord.

In this study, Cronbach's alpha coefficient was used to calculate reliability. And Cronbach's alpha coefficient was calculated for different variables investigation under the following table.

**Table 1.** Cronbach's alpha coefficient independent variable

Cronbach's alpha	Correspondence questions in the questionnaire.	Title
0.82	Questions 1 to 7	Financial perspective
0.79	Question 8 to 16	Coordinate views
0.84	Questions 17 to 24	Customer Satisfaction
0.83	Questions 25 to 32	Integration

Since Cronbach's alpha coefficient of 0.7 is more research for different variables, reliability is approved.

### *The method of data analysis*

In this study, the data collection, data processing and verification were used for analysis. In this study, descriptive and inferential statistical methods were used to analyze the data. Descriptive statistics, including mean, median or mode facade, range, maximum and minimum, variance and coefficient of variation in statistics and structural equation analysis using SPSS statistical software version 20 and version 8.8 software was used Lisrel.

### *variable descriptive statistics on the financial perspective*

As table 2 shows that according to the average obtained for each of the questions related to the

variable financial perspective, consider the idea of closer options. The coefficient of skewness and kurtosis obtained indicate asymmetry in the distribution of the amounts are smaller. The strain response is to oppose the option.

### *variable statistics relating to the coordination view*

As shown in table 3 see, according to the average obtained for each of the questions related to variable coordination perspective, respondents seem to agree closer option. Also according to the coefficient of skewness and kurtosis obtained can be assumed that the distribution is asymmetric and strain into smaller quantities.

**Table 2.** Descriptive statistics Variable financial perspective

Deviation of elongation	Coefficient of skewness	Standard Deviation	Average	Question
-1.206	0.179	1.048	2.68	Q1
-1.317	0.162	1.113	2.62	Q2
-1.413	0.026	1.143	2.78	Q3
-0.829	0.201	0.886	2.69	Q4
-0.703	0.528	0.983	2.93	Q5
-1.326	0.068	1.341	3.08	Q6
-0.791	0.138	0.957	3.24	Q7

**Table 3.** variable descriptive statistics coordination view

Deviation of Elongation	Coefficient of Skewness	Standard Deviation	Average	Question
0.218	-0.370	0.915	3.43	Q8
-0.649	0.725	1.31	2.97	Q9
2.305	1.402	0.982	3.87	Q10
2.479	-1.187	0.758	3.1	Q11
0.042	0.422	0.504	3.2	Q12
-0.869	0.675	1.42	3.28	Q13
1.346	1.318	0.738	3.61	Q14
0.234	-1.237	0.876	3.47	Q15
0.067	0.537	0.943	3.85	Q16

Descriptive statistics related to variable customer satisfaction

As shown in table 4 see the average of responses to questions reflect the dispersion of the responses to the options that were given to the coefficient of skewness and kurtosis can be said that the distribution is asymmetric.

*Descriptive statistics related to supply chain performance*

Table 5 shows the descriptive statistics of the components of supply chain performance. According to the average obtained for each of the components can be said that the components of the

financial perspective, the perspective of coordination and customer satisfaction, in terms of total options and component integration idea is closer to disagree options. Coefficient of skewness and kurtosis obtained for all factors indicates a lack of symmetry society.

*The second part, analyze the data (statistics) Statistical distribution of data*

The Kolmogorov-Smirnov test results indicate normality of the distribution of the results of this test in the table 6 is given.

**Table 4.** variable descriptive statistics related to satisfaction

Deviation of Elongation	Coefficient of Skewness	Standard Deviation	Average	Question
-0.854	0.493	1.3	2.47	Q17
-0.781	0.223	1.13	2.97	Q18
-0.767	-0.522	1.22	3.47	Q19
-0.843	-0.497	1.28	2.97	Q20
-0.381	-0.859	1.19	3.6	Q21
-0.167	-0.847	0.98	4.07	Q22
-0.761	0.654	0.845	3.56	Q23
-0.850	-0.718	1.015	2.47	Q24

**Table 5.** descriptive statistics related to supply chain performance

Deviation of Elongation	Coefficient of Skewness	Standard Deviation	Average	Questions	IT components
-0.949	-0.069	0.811	2.86	Question 1 to 7	Financial Perspective
-0.853	-0.132	0.445	3.42	Question 8 to 16	Coordinate Views
0.380	-0.047	0.606	3.19	Question 17 to 24	Customer Satisfaction
-0.189	0.256	0.886	2.39	Question 25 to 32	Integration

**Table 6.** Kolmogorov-Smirnov

Integratation	View Customer Satisfaction	Coordinating Views	Financial Perspective	Number
403	403	403	403	Number
0.734	0.467	0.694	0.973	Kolmogorov Smirnov Z
0.106	0.216	0.134	0.078	Significance Level

*Hypothesis testing using factor analysis and structural equation*

The first part of the research variables and then continue to confirm the hypotheses are tested using structural equation.

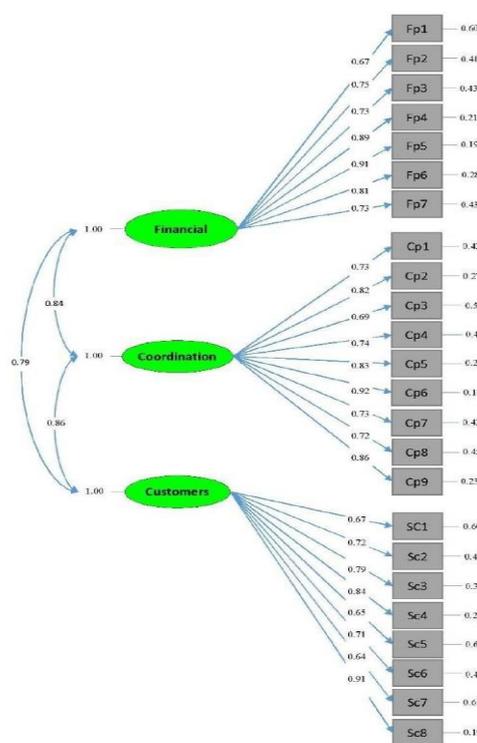
*Approved agent components supply chain performance*

Related questions in this section to verify the financial perspective approved as the independent variable factor used. Operating results were confirmed using LISREL software come in figure 2. Benchmark verified any of the questions, factor loadings higher than 0.3. In this study, greater efficiency, and we'll authorize a load factor greater than 0.5

As you can see in figure 2 times the cause of all questions related to component supply chain performance (financial perspective, the perspective of coordination and customer satisfaction) 0.5 is more than can be said therefore are considered an indicator of the questions correctly. This indicates the suitability of the questionnaire and its validity and reliability is high. Since the questionnaire external supply chain performance translates a standard questionnaire and its validity and reliability had been approved, so it is not farfetched questions Tide factor.

*Operating performance supply chain*

As you can see in figure 3 times the cause of all 32 questions related to component supply chain performance is more than 0.5 CLS can therefore be said that the questions raised are approved to measure supply chain performance. This also represents a governor of a questionnaire designed to measure supply chain performance, and is designed to reflect the high level of reliability.



Chi-square=217.88, df=402, P-value=0.000, RMSEA=0.083

**Figure 2.** Verification of components supply chain performance

**Test research hypotheses**

Subsequently a conceptual model and estimates are significant numbers in both standard fit indices considered.

Secondary research in test hypotheses using structural equation modeling, software output, first showed that the fitted structural model to test the hypothesis. One of the best indicators to evaluate

the goodness of fit, chi-square relation to the degree of freedom ( $\chi^2 / d$ ) is. Resources to the limit in 2000 this index was less than 3 knew. But Schumacher (2004) and Tennessee (2000) believe that the index may be less than 5. In this study, the amount of ( $\chi^2 / d$ ) less than 5 is obtained on the basis of belief and Schumacher (2004) and Tennessee (2000) are desirable [10].

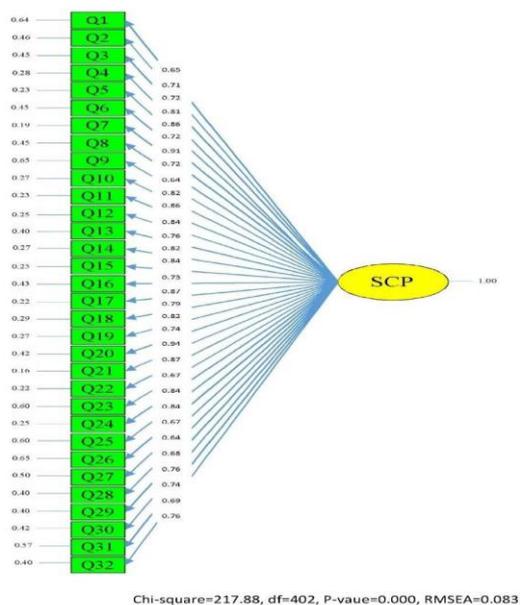


Figure 3. Verification of supply chain performance

Another indicator RMSEA (mean squared errors of the model) is. Schumacher (2004) and Tennessee (2000) have established limits to 0.09 The value of the index in this study (0.086), which is slightly less than the limit.

To determine the value of the model, rather than relying on a better indicator at the same time using different measures, and as can be seen in table 7, other indices are in optimum value, so it could be argued that the current model of value well.

Table 7. Indices conceptual model

NFI	NNFI	CFI	IFI	RFI	GFI	AGFI
0.89	0.91	0.90	0.94	0.95	0.96	0.94

To confirm or reject the hypothesis of standardized coefficients and significant numbers have been used. The significance of a coefficient, a significant number must be greater than 1.96 or less than -1.96 and the total is used to approve or reject the hypothesis.

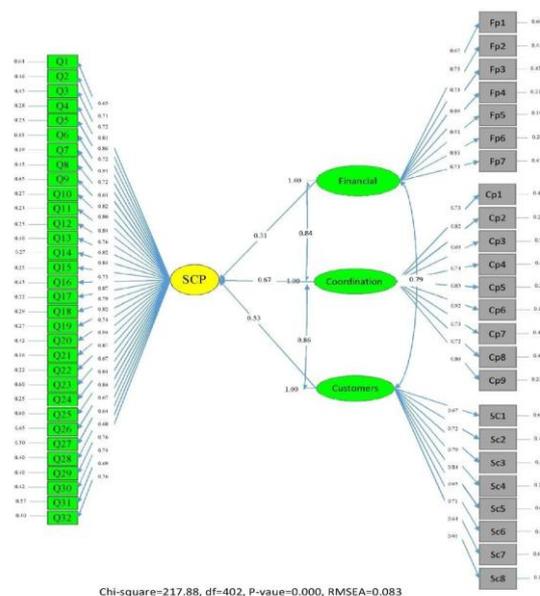


Figure 4. The conceptual model output in standardized coefficients

The results of the conceptual model in two significant coefficients and standard estimation in the tables 8, 9 and 10 is shown.

First hypothesis as "having a positive impact and significant financial perspective is to improve supply chain performance." It was stated that due to the number on the assumption Mnaday (statistic  $t = 4.52$ ) More of a critical region ( $1.96 > t$  &  $t < -1.96$ ). Therefore, the first hypothesis is confirmed (figure 4).

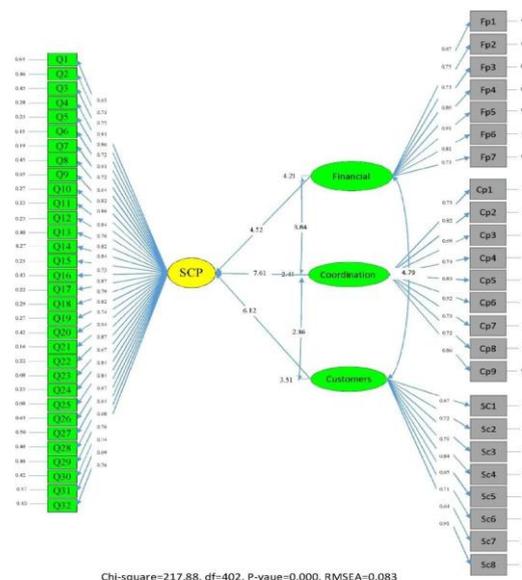


Figure 5. is a significant factor in the conceptual model output

The second hypothesis as "a coordinated approach to improving supply chain performance is a positive and significant impact on improving the supply chain." It was stated that due to the number on the assumption Mnaday (statistic  $t = 7.61$ ) greater than the critical area ( $1.96 > t$  &  $t < -1.96$ ). Therefore, the second hypothesis is confirmed (figure 5).

The third hypothesis as "consumer satisfaction is a positive and significant impact on improving supply chain performance." It was stated that due to the number on the assumption Mnaday (statistic  $t = 6.12$ ) larger than the critical zone ( $1.96 > t$  &  $t < -1.96$ ). Therefore, the third hypothesis is confirmed.

**Table 8.** statistics about the H1

Result	R <sup>2</sup>	T-Statistic	Path Coefficient	Relation	H1
confirm	0.10	4.52	0.31	perspective and improve supply chain performance	

**Table 9.** statistics about the H2

Result	R <sup>2</sup>	T-Statics	Path Coefficient	Relation	H2
confirm	0.45	7.61	0.67	The relationship between vision and coordination, improve supply chain performance	

**Table 10.** statistics about the H3

Result	R <sup>2</sup>	T-Statics	Path Coefficient	Relation	H3
confirm	0.28	6.12	0.53	The relationship between customer satisfaction and improve supply chain performance	

## Findings

### *Findings of inferential statistics variables and hypotheses*

After review and analysis of the results of descriptive statistics, inferential statistics results in studied was placed. it is safe to say normal population.

Then, according to the nature of the relationship between demographic questionnaire and assess supply chain performance evaluation of supply chain performance as the dependent variable was analyzed. Results of analysis of variance explained was that the responses to questions related to variables financial perspective view of coordination, customer satisfaction and integration in terms of all demographic factors such as gender, age and education there is no significant difference. This indicates that assess supply chain performance and understanding regardless of gender, age and education. Structural equation modeling to test research hypotheses and verify factor is used. In the first stage using a factor authentication method, questions related to the components of supply chain performance were evaluated. As a result, the load factor is less than 0.5 their relationships, are rejected.

After entering data in confirmatory software-based modeling conceptual model based on the type of questions and its relationship with the financial perspective, the perspective of coordination and customer satisfaction, operating time of 0,5 was obtained Much In conclusion, that all questions

related to the variable component supply chain performance to properly express their evaluation. Next, the relationship between supply chain performance evaluation questions to "The yen was evaluated as a whole. Their supply chain performance.

Finally, research sub-hypotheses using structural equation modeling, software output, first showed that the fitted structural model for test. One of the best indicators to assess the degree of freedom chi-square goodness-of-fit relation ( $\chi^2 / d$ ) is. Resources to the limit in 2000 this index was less than 3 knew. But Schumacher (2004) and Tennessee (2000) believe that the index may be less than 5. In this study, the amount of ( $\chi^2 / d$ ) less than 5 is obtained on the basis of belief and Schumacher (2004) and Tennessee (2000) are desirable. Another indicator RMSEA (mean squared errors of the model) is. Schumacher (2004) and Tennessee (2000) have established limits to 0.09. The value of the index in this study (0,086), which is slightly less than the limit.

To confirm or reject the hypothesis of standardized coefficients and significant numbers have been used. The significance of a coefficient, a significant number should be greater than or less than 1.96 and -1.96 the total is used to confirm or deny the hypothesis. The results for all three sub-hypothesis implies a significant number considering that the number is significantly larger than 1.96 are therefore approved. The results of the study moderator and co-workers (2013) is consistent.

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