

Identifying and Ranking the Effective Factors of Supply Chain Management on the Quality of Food Products (Case Study: Food Companies in Tehran)

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Abstract

The present research examines the effective variables of supply chain management on product quality by descriptive survey method. The objectives of this research are to identify the variables and components that affect the supply chain management, to determine the structural model of the effect of the explored components on the quality of the products, and finally the weight of each of the factors obtained compared to the rest of the ranking factors. The statistical population in this study consisted of the manufacturers, experts of small and medium enterprises in Tehran. 238 subjects were selected as simple by random sampling. The tool used in this study was a questionnaire whose validity was confirmed by experts. Also, Cronbach's alpha was used to determine the reliability, which was 0.851. Descriptive and inferential statistics were used to analyze the data. Finally, the ranking of the extracted variables was done through the MCDM method. The central element of this structure is a decision matrix containing a set of rows and columns. This matrix expresses the decision results for a set of options and evaluation criteria. The results show that six factors including strategic management, product management, production process management, organizational resources, customer orientation, and industry capacity influence on product quality.

Keywords: Supply Chain Management, Product Quality, Small and Medium Enterprises

Introduction

In the 60s and 70s, organizations were working to increase their competitive ability to produce a better quality product regarding standardization and improvement of their internal processes with lower cost. At that time, the prevailing thinking was that strong engineering and design, as well as coherent production operations, were prerequisites for achieving market demands and, consequently, gaining market share. That's why the organizations focused their efforts on increasing efficiency. In the 1980s, with the increasing diversity in the expected patterns of customers, organizations are increasingly interested to increase the flexibility in the production lines and the development of new products to meet the needs of customers. In the 1990s, along with improvements in the production processes and the use of reengineering patterns, many industry managers found that for market continuation only improvement of internal processes and flexibility in the company's capabilities was not enough, but the suppliers of materials should also provide materials with the best quality and the lowest cost, and product distributors should have close association with market development policies.

On the other hand, in the 21st century, given the globalization and economic activity in the competitive environment, and the growth of companies and enterprises in the international business sector, and their close competition, they have created a complex and highly complex environment for survival and greater market share. It is difficult for managers to make decisions, and today, as we move towards the future, managing agencies and enterprises becomes harder due to faster and more complex changes (Margherita, 2013).

With such an attitude, the supply chain management approaches have been emerged. On the other hand, with the rapid development of information technology in recent years and its widespread use in supply chain management, many of the key activities of chain management are under new methods (Brun2012).

Therefore, supply chain management can be a set of methods used to integrate suppliers, manufacturers, warehouses and vendors effectively and efficiently in order to minimize system costs and meet service needs, distributing and producing the goods are in the correct quantity in right place and time.

Here, according to the research title, it is possible to say that in this research, according to the needs of food industry, management of the supply cycle and production of quality goods has been proposed to provide an effective model for application in the food industry, and in the end, to provide an exploratory model should be addressed. What the innovation shows in this research project is the spatial scope of the food industry, as well as the two-variable relationship that has been less studied in research on different units, and more on the models performed. But in this research, it is intended to do exploratory research and provide an effective model for managers in food industry.

Literature Review

- The role of e-commerce in supply chain management Author: Nategh, Mohammad; Yaghoobi,

Nategh and Yaghoobi examined the effect of e-commerce tools on pursuing relationships based on greater collaboration with their suppliers. It also explains how e-commerce supports more participatory relationships in the core areas of the supply chain. E-commerce essentially rebuilds the traditional supply chain structures in many industries and reduces the costs of integration between buyers and suppliers. E-commerce also creates transparent relationships among supply chain members. This paper tries to emphasize the importance of e-commerce tools as an essential factor in achieving the goals of supply chain integration. Finally, this paper provides a comprehensive approach for e-commerce in achieving the goals of the supply chain.

Blouri (2004) concluded that interoperational and inter-organizational coordination creates several problems beyond supply chain managers. Because conventional and traditional tools and techniques are no longer effective, new parameters are needed, including information sharing systems and how to allocate benefits in a wider and more extensive chain to integrate and coordinate to survive. Because the corporate survival code is the satisfaction of customers' needs and interests. For this purpose, the method of dispute resolution and the methods of increasing cooperation between the members of the supply channel was discussed in this article.

Esmaili investigated the effect of vehicle supply chain components on performance; prioritize (rank) influential variables in the automotive supply chain in order to determine the most effective components in the performance of the car supply chain and provide solutions for the purposeful construction and Using parts of the car supply chain. This research is redefining in nature. The results of the research show that improving the Saipa supply chain components will improve its performance.

Pero and Lamberti (2013) assumed a supply chain in which a producer produces a new product through a third-party logistics provider (3PL) to a distant market where a distributor buys and sells to end customers. Slowly Market demand is random, sensitive to the price of sales and also the product's newness. They noticed that the presence of the 3PL provider in the supply chain has a significant impact on its performance and presented a schematic for supply chain coordination.

Brun and Pero (2012) focused on manufacturing companies to examine the relationship between the appropriateness of the supply chain and the performance of companies, namely, the proportion between supply of products and the demand uncertainty as well as the basic schemes of the chain Supply was investigated.

Khan et al. (2012) designed a mathematical model based on product design policy for multi-stage production / distribution networks. This model consists of product analysis in the retailer's market, the demand process in the market, and product design analysis among the product of the same competitors. The ultimate goal is to minimize costs, including available product costs, shipping, purchasing and ordering.

Diabat et al. (2012) tried to provide a framework for the development of supply chain strategies and management risk reduction using field studies, and then this framework was designed to be operational in a case study. In this research, following the design and implementation of the supply chain development framework, the production system is suited to this strategy and risk management. In the decision making process, hierarchical analysis method is used and using the views of experts and senior managers of the organization, the final results are obtained.

Conceptual Model of Study

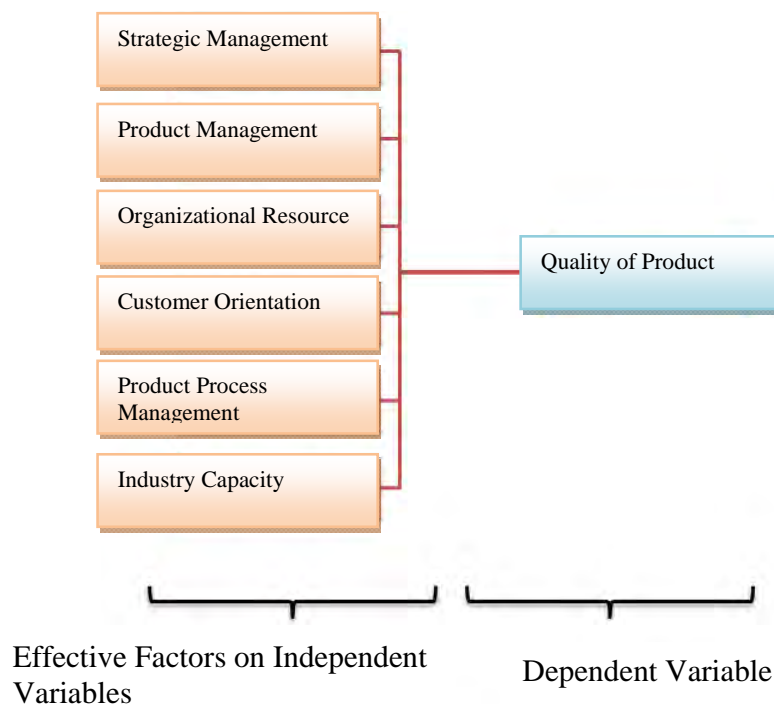


Figure 1. Conceptual Model of Study

Methodology

The present research is survey in terms of research questions. Questions like: how the nature of the situation, the relationships between data, the status of the situation and ... are part of the survey research questions. This is an applied research in term of purpose. the research method is causal. In general, a descriptive survey method was used. To assess the validity of the questionnaire, the opinions of the supervisors, consultants and experts, and the logical content

method were used, and the reliability was measured by the internal consistency method by calculating the Cronbach's alpha coefficient.

The research population consisted of the managers and experts of the small and medium enterprises of food industry. Considering the exploratory method and structural equations and rankings used in this research, a large sample size (at least 200 people) is needed to conduct the research. Morgan table was used to determine the sample size. In this research, considering that the size of the community was estimated at about 650 people, 242 questionnaires were distributed, of which 238 appropriate of them were returned.

In this research, the reliability of the questionnaires was confirmed by distributing randomly among managers and experts in the small and medium-sized food industry in Tehran. The Delphi method and the experts' viewpoint also identified the effective variables of supply chain management and by integrating it with the extracted variables from the related articles and related theses and the special questionnaire of experts, and distributed among the specialists of these companies, all of which were active in the food industry. A questionnaire was prepared and distributed among the statistical sample (238 persons), then using the SPSS software, the Cronbach's alpha coefficient was calculated. The questionnaire was calculated to be 0.851. According to the type of research, two methods of descriptive and inferential statistics are used to analyze the information. Descriptive statistics method was used to categorize the subjects for different traits and describe the characteristics of the statistical population, mean, percentage, frequency, variance, and standard deviation. Inferential methods were used as correlation coefficients, nonparametric and parametric tests, and t used. Computer software used by SPSS.

Research Questions and Hypotheses

Research question: What are the effective factors of supply chain management on product quality?

H1: Strategic management is effective on product quality.

H2: Product management is effective on the quality of products.

H3: Organizational resources are effective on the quality of the products.

H4: Customer orientation is effective on the quality of products.

H5: Production process management is effective on the quality of the products.

H6: Industry capacity is effective on the quality of the products.

Research Findings

Based on the calculations, the research hypotheses are reviewed and a conclusion is explained:

Table 1. Results of Research Hypotheses

Alternative Hypothesis	P	Estimate	Result
Strategic Management	P<0.001	0.829	Accept
Product management	P<0.001	0.821	Accept
Manage the production process	P>0.05	-0.037	Reject
Organizational resources	P<0.001	0.904	Accept
Customer Orientation	P<0.001	0.916	Accept
Industry capacity	P>0.05	0.226	Reject

As shown in Table 1, the significance level is 0.00 which is less than 0.05. As a result, according to this evidence, we can say that the hypothesis is rejected and the other hypothesis is confirmed. This means that strategic management is effective on the quality of the products..

Regarding the results in Table 1, the significance level is 0.00 which is less than 0.05. As a result, according to this evidence, we can say that the hypothesis is rejected and the other hypothesis is confirmed. This means that product management is effective on product quality.

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In addition, the significance level is 0.00 which is less than 0.05. As a result, according to this evidence, we can say that the hypothesis is rejected and the other hypothesis is confirmed. This means that customer orientation is effective on product quality.

Further, the significance level is 0.00 which is less than 0.05. As a result, according to this evidence, we can say that the hypothesis is rejected and the other hypothesis is confirmed. This means that managing the production process is effective on the quality of the products.

Finally, the significance level is 0.00 which is less than 0.05. As a result, according to this evidence, we can say that the hypothesis is rejected and the other hypothesis is confirmed. This means that industry capacity is effective on the quality of the products.

Accordingly, the effective factors of supply chain management on the quality of food products are ranked according to Table 2:

Table 2 .Variable rankings

Ranking	Variables	Weights
1	Networking	0.166
2	Upstream industries	0.100
3	Organizational capabilities	0.081
4	Strategic integration	0.073
5	Logistic	0.073
6	Organizational market share	0.055
7	Outsourcing production capacity	0.053
8	Systematic combination of resources	0.053
9	Package of goods	0.049
10	Industry growth rate	0.049
11	The level of trust between the stakeholder chain	0.035
12	Product marketing	0.035
13	New product development	0.034
14	Manage product life cycle	0.033
15	Product diversity	0.032
16	Optimizing existing processes	0.032
17	Sharing resources	0.027
18	Providing maximum value to all stakeholders	0.018

Conclusion

Based on the findings of the research and according to the results and rankings, the priority type for supply chain management is shown on the quality of products as follows.

Networking: Networking involves gathering information and facilities from outside the organization to advance organizational goals. To this end, organizational managers must create a network by collecting market information, customers, stakeholders, organizational partners and competitors, and using outside actors. So that they can use the network in case of a problem or if they try to seize more market share, because the networks with the ability to refer and collect information and the speed of responding to changes can help the organization to improve product quality.

Upstream industries: Other things that are suggested to be considered for improving the supply chain are the upstream industries, including industries that provide raw materials to the industry. If these industries provide the right products and raw materials to the organization, the organization can also market the quality product.

Organizational capabilities: Organizations need to use organizational capabilities and competencies to compete successfully in the marketplace. An organization that has a competitive edge can do things better than its other competitors. Therefore, it is suggested that organizations in some cases, such as capability capability, training capability and capabilities such as organizational learning, behave like market changes Which can use these capabilities to produce and deliver quality products tailored to the needs of the customer.

Strategic Integration: In supply chain management, the organization must be merged with some organizations to succeed in the market. These mergers can take the form of strategic unions or other competing companies. In strategic mergers, it is recommended that mergers be made more closely with organizations that are part of the organization's current business, mergers can be either horizontally or verbally, each of which depends on the type of industry and depends on the type of enterprise production. Proper integration can provide organizations and customers with the organization's access to materials and facilities for producing goods.

Logistic: It is to supply logistics components and support within the organization. Supply chain management inside and outside the organization is equally at stake. In the logistics debate, the optimal support for that organization can be achieved by creating raw material purchasing units, procurement and support for production lines, a quality product, and a suitable product.

The market shares of the organization: When a product arrives on the market, the organization must proceed with the market share for this product and for its other components of production, the market shares of the organization, given the competitive pressure of competitors, as well as the presentation of the product with The quality and pricing strategy and advertising are impressive.

Outsourcing production capacity: Sometimes organizations use outsourcing to make the most of their use of their production lines and their forces for optimal use of the facility. For this purpose, it is better for organizations to use supply chain partners who have the ability to produce a product of a quality that meets the standards of the organization and the market.

The systematic combination of resources: Enterprise resource planning, or ERP, can be one of the things that affects the delivery of quality products in an organization. Organizations, if they can not make optimal use of their corporate resources, will waste capital and accumulate resources in the long run. To this end, enterprise executives must make the best use of them in order to produce a product that meets the needs of the customer by planning the right resources.

Packaging of goods: As we know, the product is one of the things that special attention has been paid to the marketing mix, which can be considered as packaging of the product sub-sets. Organizations can attract customers by packaging products, which are the main showcase of the product. In recent years, the product packaging has been given special attention after several years of neglect. Organizations can have a significant impact on demand and market share by appropriate packaging.

Industry growth rates: Organizations can periodically review the growth rate of their industry to manage their market share, as well as the current and future demand of their customers, in order to provide the organization with an increase in investment when needed, and when changes such as stagnation in the market, the decline in industry growth, or the decline in its growth rate, will outsource capital or reduce investment in the organization.

The level of trust between the supply chain stakeholders: The supply chain is formed between different stakeholders. If the trust is between manufacturers, suppliers, customers and raw material producers, the supply chain can be improved by maintaining the competitive position of each member. For this purpose, building confidence among the components can be achieved by holding regular meetings with other stakeholders in using information and organizational data.

Product commercialization: After creating an idea for product development, it is being commercialized. Commercialization means mass production on a commercial scale for final consumer use. Before doing commercialization, organizations are encouraged to collect market and customer data and estimate market demand and demand so that they can not cope with the accumulation of products in warehouses after product production. If the product has a good quality and also a suitable commercialization model, it can be hoped that this product will succeed in the supply chain cycle.

New Product Development (NPD): One of the indicators of success in organizations is the development of new products or services that can increase the market share of the organization by responding to the needs of customers and providing products with high quality. In this strategy, you can increase the market share of the organization by adding features to the current product or by innovating the product. In addition to R & D units, organizations can also have units known as new product development to study customer needs.

Manage product life cycle: Any product produced within the organization is like a life-time survival creature that is the customers that determine the life span of the product. Product life expectancy, which includes four stages of introduction, growth, maturity and decline, can affect the organization at any cost at its own expense. For this purpose, it is recommended that organizations improve their product lifecycle. Innovate and encourage customers to buy their products.

Product diversity: Organizations can provide diverse products with market demand management, which can increase their market share, thus, by creating demand among potential customers and turning them into actual customers, and by supplying new products, they will steal a share from competitors, or by providing a new product, it will create a new market share.

Sharing resources: Organizations can prevent the loss of resources by sharing resources. To do this, organizations must spend their resources on projects with the most accurate planning, which will maximize their use and minimize costs for the organization. Organizational partners can be considered appropriate choices to use the resources of the organization and their use of resources.

Optimizing Existing Processes: Organizations need to modernize and improve existing processes due to technological changes and changes in customers' taste; therefore, it is suggested that organizations, by carefully studying the efficiency of existing processes, and examining

organizational performance as well as the efficiency and effectiveness of existing processes, better efficiency in the organization.

Providing maximum value to stakeholders: In supply chain management, stakeholders play a key role. Providing value to stakeholders can encourage them in partnership with the organization and the product development cycle. Therefore, organizations should be able to profit from higher levels of organizational interest and, in fact, maximize value, by taking into account their partnerships with other partners, by providing the optimal product and enhancing their market share.

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