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INVESTIGATING THE EFFECT OF SUPPLY CHAIN ACTIVITIES ON COMPETITIVE CAPABILITIES IN THE BEHNUSH BEVERAGE INDUSTRY IN GACHSARAN

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ABSTRACT

Organizational competitiveness is based on two resource- and market-based approaches. To reach a good competitive position, organizations should consider both. The optimal performance of a supply chain can be a basis for meeting the requirements of both approaches. This research is aimed at studying the effect of supply chain activities on competitive capabilities of Behnush Beverage Industry in Gachsaran. The research hypotheses are: five dimensions of supply chain activities, including the strategic cooperation of suppliers, communication with clients, the level of sharing information, the quality of sharing information and reducing delays. The statistical population includes all managers and employees of Behnush Beverage Industry Co. in Gachsaran. Data were gathered by a questionnaire and analyzed using structural equation modeling (SEM) in LISREL. Results revealed that the quality of sharing information and the strategic cooperation of suppliers had the most and least impact on the competitive capabilities respectively.

Keywords: *Supply Chain Activities, Supply Chain, Competitive Capabilities, Structural Equation Modeling (SEM)*

INTRODUCTION

In current competitive markets, small and medium-sized enterprises not only need to consider their organizations and internal benefits, but they have to manage and supervise their external interests and columns. Achieving competitive advantage(s) helps companies to gain bigger market share. The supply chain consists of two or more organizations which are officially isolated from each other and are related to each other by materials, information and capital flows. The supply chain is of necessary priorities of industries and organizations to survive in the market and no industry and organization is now excluded from this principle. Beverage industry is composed of small and medium-sized enterprises which are profitable, entrepreneurial and with high value added. This industry faces problems such as dispersion, unhealthy competition, shortage of materials, etc. According to what was mentioned before, the industry should be studied based on the effect of supply chain activities on competitive capabilities. After studies carried out by the researcher on competitive capabilities literature, five factors, including price, quality, guaranteed deliver, innovation and the time to enter the market, were identified as the major factors of competitive capabilities in manufacturing companies.

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Supply Chain

Many matters such as business complications, economic upheavals, and the intensity of competition, new technologies and the speed of changes in customer's needs have forced organizations to take advantages of the fast flow of information, group decisions, and more coordination with trading partners. We can observe these upheavals in a discussion under the title of supply chain with the major purpose of reaching the maximum value (Azar and Momeni, 2012). Stressing on the difference of logistic and supply chain, Sutherland referred to three common approaches but different from supply chain:

1. Supply chain is another view of logistic.
2. Besides logistic, supply chain have other tasks, including purchasing, engineering, production, financial activities, marketing, and controlling activities relating to a single company.

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3. Supply chain includes all above activities in addition to activities relating to the suppliers and customers of a company which is beyond the traditional activities (Forrester, 1961; Ganeshan and Harrison, 1995).

According to another definition, supply chain includes all stages that directly and indirectly affect the process of satisfying customer's need. It encompasses not only the manufacturers and suppliers, but transfer, storage, trailers, and customers (Charmchi, 2000).

Supply Chain Management

Supply chain management means integrating and coordinating the flow of materials and information and financial flow between several organizations (and inside each organization) which are legally independent but all are the members of a chain. The new concept of supply chain management is different from its tradition definition of logistic (Feurer, 1994; Fleury, 2003). Logistic refers to activities occurring at the borders of one single organization. However, the supply chain is a network of companies which work together and coordinate their activities and measures to deliver a product (service) to the market (Aghazadeh and Esfidani, 2008; Ayres, 2009).

Table 1: Components of supply chain processes

Row	Components of supply chain processes	References
1	Information management, logistic management, relation management	Field and Nicolas
2	Operational processes (providing and developing a perspective and strategy, developing products and services, marketing and selling products and services, delivering products and services, customer service management)	American Quality and Productivity Association
	Supporting processes (management and development of human capitals, information technology management, financial resource management, ownership, construction, property management, environmental health and security management, extra-organizational relation management, knowledge, improvement and upheaval management)	
3	Input logistic, production and manufacturing, output logistic, marketing and sale, after sale services, support processes (organizational substructures (financial accounting of management), human resource management, research and development, supply and provision)	Porter Supply Chain (1999)
4	customer relationship management, internal Supply Chain Management (ISCM), and supplier relationship management (SRM)	Chupra and Mindel (2007)
5	Programing, resourcing, manufacturing, delivering, return	Supply Chain Organization (SCOR)
6	Customer relationship management, customer service management, development and commercializing products, demand management, manufacturing management, supplier relationship management, delivering orders, return process	Global Supply Chain Finance (GSCF)
7	Customer relationship management, supply chain programming and demand management, manufacturing and logistics management, supply and provision, supplier service management, delivering orders, return process	Chan <i>et al.</i> , (2003)

Components of Supply Chain Management

In a perspective, the supply chain management consists of components that the coordination of which make the whole system successful.

There are four major actors in a supply chain, including:

1. Suppliers who are in the input of system;
2. Producers who are in the processing section;

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3. Distributors;
4. Customers who are in the output of system.

Considering these factors we can depict the different states of the supply chain as follows (Christopher, 1998 and Christopher, 2000).

Michel (1985) was among the ones who raised the subject of competitiveness. He considered the competitiveness in three levels of national, industry and enterprise. In terms of enterprises, he believed that the competitive power was the higher value a company could bring in relation to other competitors. In other words, the competitive power is the additional attraction of a company's offers comparing to competitors on the view of customers (Appel, 2000; Barney, 1986). The concept of competitive power is in direct relation with customer-related values. Put it differently, in an inductive range, the more closer the values offered by an organization is to the customer's value, the more power and superiority the organization enjoys in one or several competitive criteria (Ayres, 2009; Bast, 2011).

Effect of Supply Chain Management on Competitiveness

The development of markets and products leading competitions from the interrelation of companies toward the interrelation of supply chain and the focus on improving the performance of chains is the only route to achieving competitive advantages in today's global business market (Chopra and Meindl, 2001). In this regard, the insight of the supply chain management is of strong strategies to increase the competitiveness of companies and their supply chains. Accordingly, after introducing the term of supply chain management have widely emerged in applying this phenomenon. And many organizations believe that these are the supply chains that are competing with each other not organizations (Ambashta and Momaya, 2002).

The current trend of applying new approaches of production and operation management is an indicator of an additive mode in using supply chain management among different industrial and service companies which is realized with the aim of reducing costs and increasing the market share and competitiveness (Barney, 1999; Bernon and Mena, 2013). Integration includes all components creating collaborative and long-term relationships between organizations which are the members of the supply chain. The components include:

1. Selection of partners;
2. Network organization and inter-organizational cooperation;
3. And leadership

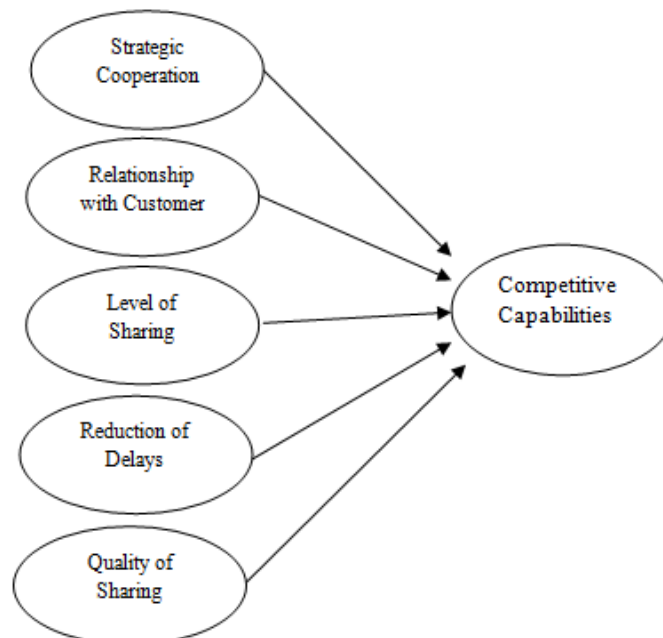


Figure 1: The conceptual model of research

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MATERIALS AND METHODS

This is a cross-sectional research in terms of time and practical by nature. Practical research studies are led toward scientific application of knowledge. Our research is also descriptive as a limited statistical population (around 600 managers, experts and employees working in Behnush Beverage Industry in Gachsaran) has been considered and experts and specialists, present in the company, are asked to comment. As there are around 600 managers and experts in the company, we have:

$$n = \frac{\frac{Zpq}{d}}{1 + \frac{1}{N} \left(\frac{Zpq}{d} - 1 \right)} = \frac{\frac{(0.95)^2 (0.5)(0.5)}{(0.05)^2}}{1 + \frac{1}{600} \left(\frac{(0.95)^2 (0.5)(0.5)}{(0.05)^2} - 1 \right)} = 243$$

Z: confidence coefficient to results ($z_{\frac{\alpha}{2}}=1.96$)

P: the ratio of adjective in the statistical sample (P = 0.5)

P – 1: the ratio of lack of adjective in the statistical sample p – 1 = 0.5

D: the accuracy of estimation or the maximum acceptable error ($\varepsilon = 0.05$)

To be assured of the sufficient completed questionnaires, 300 questionnaires were distributed among employees. About 251 questionnaires were finally answered (83% return rate) and statistical tests were done over them. Samples were randomly clustered. Each of the three groups of managers, experts and employees were considered as a cluster and the questionnaires were randomly distributed among them.

Data Analysis

To analyze data and test the hypotheses, descriptive and inferential statistics were used. The gathered data were summarized in tables and frequency distribution diagrams. Descriptive statistic indices and different parametric and non-parametric tests were used to test hypotheses. Accordingly, the statistical operations were carried out in SPSS and LISREL.

Table 2: Fitness indices obtained by factor analysis confirming the competitive capabilities

Relative Chi-Square	χ^2/df	2.93	<3	Very Good
Root mean square of approximation	RMSEA	0.059	0.1>	Acceptable
Square root of the remainders	RMR	0.057	About zero	Very good
Normalized fit index	NFI	0.98	>0.90	Very good
Soft fit index	NNFI	0.98	About 1	Very good
Comparative fit index	CFI	0.99	>0.90	Very good
Relative fit index	RFI	0.97	>0.90	Very good
Extra fit index	IFI	0.99	>0.90	Very good
Fit index	GFI	0.95	>0.90	Very good
Adjusted fit	AGFI	0.92	>0.90	good

The following table indicates the fit indices after factor analysis confirming supply chain activities, which show an acceptable fitness.

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Table 3: The fit indices after factor analysis confirming supply chain activities

Relative Chi-Square	χ^2/df	2.84	<3	Very Good
Root mean square of approximation	RMSEA	0.045	0.1>	Good
Square root of the remainders	RMR	0.96	About zero	Acceptable
Normalized fit index	NFI	0.96	>0.90	Very good
Soft fit index	NNFI	0.97	About 1	Very good
Comparative fit index	CFI	0.95	>0.90	Very good
Relative fit index	RFI	0.97	>0.90	Very good
Extra fit index	IFI	0.92	>0.90	Very good
Fit index	GFI	0.91	>0.90	Very good
Adjusted fit	AGFI	0.045	>0.90	good

Reliability Analysis

After being assured of validity, the reliability should be tested in SPSS to show the alpha coefficient as an output.

Table 4: Chronbach's alpha coefficient of variables

Variables	Number of Factors	Alpha Coefficients
Strategic cooperation of suppliers	6	0.871
Relationship with customers	5	0.837
Sharing information	6	0.836
Reduction of delays	3	0.790
Quality of sharing information	5	0.849
Supply chain activities	25	0.892
Prices	2	0.906
Quality	3	0.852
Reliability of delivery	3	0.740
Innovation	3	0.917
The time of entering market	4	0.863
Competitive capabilities	15	0.852
Whole questionnaire	40	0.833

Given Chronbach's alpha coefficients in table 10, all variables are above 0.70. No question is, thus, eliminated in this stage and the reliability of questions and generally the questionnaire is confirmed. The following table summarizes hypothesis results.

Table 5: Results obtained by structural equation modeling

Hypotheses	Standard Coefficients	Significance Level
Strategic cooperation of suppliers- competitive capabilities	0.07	2.06
Relationship with customers- competitive capabilities	0.11	2.07
Sharing information- competitive capabilities	0.34	3.56
Quality of sharing information- competitive capabilities	0.35	5.38
Reduction of delays- competitive capabilities	0.39	4.09
Strategic cooperation of suppliers	0.07	2.06

According to results, the positive and significant correlation of all factors is verified. Table 12 presents the fit indices. All indices show that the indices are acceptable.

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Table 6: Fit indices of the research model

Chi-Square	χ^2/df	1.22	<3	Very Good
Root mean square of approximation	RMSEA	0.068	0.1>	Good
Square root of the remainders	RMR	0.046	About zero	Acceptable
Normalized fit index	NFI	0.96	>0.90	Acceptable
Soft fit index	NNFI	0.96	About zero	Very good
Comparative fit index	CFI	0.97	>0.90	Very good
Relative fit index	RFI	0.95	>0.90	Very good
Extra fit index	IFI	0.97	>0.90	Very good
Fit index	GFI	0.97	>0.90	Very good
Adjusted fit	AGFI	0.94	>0.90	good

RESULTS AND DISCUSSION

First Hypothesis

Given the significance level (2.06), we can state that as the value is above the critical value of 1.96 and as the standard coefficient (0.07) is positive, this hypothesis is confirmed. This means that the strategic cooperation of suppliers has a positive and significant correlation with competitive capabilities in Behnush Beverage Industry in Gachsaran. As it was mentioned before, this variable refers to the long-term relationship between the organization and its suppliers. This is applied to increase the strategic and operation capabilities of employees and helps them achieve important advantages. Strategic cooperation with suppliers stresses on the direct and long-term relation and encourages the mutual efforts for programming and solving problems. According to results about the standard coefficients of the structural equation modeling, the participation of major suppliers in producing new products (0.91) and in programing and targeting (0.82), considering the quality as one of the important criteria in selecting suppliers (0.62), regularly cooperation of the company with suppliers to solve their problems (0.59), considering improvement programs including the major suppliers (0.57) and helping suppliers to solve their problems by the company (0.56) were identified to explain the strategic cooperation of suppliers. Based on results, the engagement of suppliers in the organization and the current process is highly important and the company should take advantage of their valuable comments. Comparing the significance values also shows that this variable has a slight impact on the competitive capabilities, and the company should improve it and use it as much as possible to gain the required competitive advantages. Results agreed with what Manian *et al.*, (2010) and Lee *et al.*, (2006) found in this regard and confirmed their findings.

Second Hypothesis

Regarding the significance level (2.07), we can state that as the value is above the critical value of 1.96 and as the standard coefficient (0.11) is positive, this hypothesis is confirmed. This means that relationship with customers has a positive and significant correlation with competitive capabilities in Behnush Beverage Industry in Gachsaran. As it was mentioned before, this variable refers to using methods for handling customer's complaints and creating a long-term relationship with them and increasing their satisfaction. Customer relationship management is of the important components of supply chain. It requires a customer-oriented philosophy and a culture of supporting the effective marketing processes and after-sale services. The customer-oriented culture is a simple concept of the mutual relationship between customers and vendors. In such approach, any customer is regarded as a person with his/her own demands, purchases and needs. The customer relationship management is a general trading strategy that enables companies to effectively handle the relationship with their customers. It depicts a general view of customers for the organizational members. According to this concept, anyone should concentrate on customers and information relating to them. All sections which are in touch with customers should be, thus, totally and equally provided with the needed information. Regarding the standard coefficients, regularly measuring the customer's satisfaction by the company (0.74), smoothing

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the route for customers to ask for help from the company (0.70), regularly determining customer's expectations from the company side (0.68), and interacting with customers to adjust standards (0.65) were identified as effective factors for explaining the relationship with customers. The company has to put more efforts in raising the effect of this variable. According to Katler, the cost of each new customer is 10 times higher than preserving the old customers. Moreover, unsatisfied customers transfer their unpleasant experience of consuming a product to other people. Results agreed with findings obtained by Lee *et al.*, (2006) and Kim (2009).

Third Hypothesis

Considering the significance level (3.56), we can state that as the value is above the critical value of 1.96 and as the standard coefficient (0.34) is positive, this hypothesis is confirmed. This means that the level of sharing information has a positive and significant correlation with competitive capabilities in Behnush Beverage Industry in Gachsaran. This variable refers to sensitive and specialized information which is shared with a supply chain. This information contains costs and other information which is not provided for the supplying chain because of the fear of competition and being used by others in their own interest. Lack of information about the profit members can gain makes distrust and destroys the coalition of the chain. It is necessary to provide and distribute the essential information about the profits of each member. Regarding the standard coefficients of the structural equation modeling, we can say that informing the company and partners of events and changes may also affect other partners (0.82). Other factors such as sharing the needed knowledge of business processes with company by trading partners (0.77), exchanging information between company and trading partners to establish the business plan (0.71), having a comprehensive information about issues affecting the business by trading partners (0.70), and informing trading partners of company information (0.49) were identified as effective factors for explaining the level of sharing information. Results agreed what Rahmanseresht and Afsar (2008) and Dow (2007) found in this regard.

Fourth Hypothesis

Given the significance level (5.38), we can state that as the value is above the critical value of 1.96 and as the standard coefficient (0.35) is positive, this hypothesis is confirmed. This means that the quality of sharing information has a positive and significant correlation with competitive capabilities in Behnush Beverage Industry in Gachsaran. This variable refers to the precision and update of information which is exchanged. Today, regarding the speed of environmental changes, technological development and the globalization of markets, organizations increasingly require the optimization of supplying chain performance instead of individual organizations. To successfully survive and compete in this environment, companies try to relate more with trading partners to increase the resources and the knowledge of suppliers and customers. As a compass, the quality specifies the direction of all organizational activities and efforts. Standard coefficients of the structural equation modeling reveal that the sufficiency of information sharing with the company and trading companies (0.71), reliable information sharing between the company and trading partners (0.68), the complete information sharing between the company and trading partners (0.53), the correct information sharing between the company and trading partners (0.47), and in-time information sharing between the company and trading partners (0.38) can help us explain the quality of sharing information. As results show, the sufficiency of sharing information is a matter of the utmost important. The quality of sharing information has the strongest impact on competitive capabilities. Results agreed with the findings of Nazemi and Kharidar (2012) and Kim (2006) and confirmed their results.

Fifth Hypothesis

Given the significance level (4.09), we can state that as the value is above the critical value of 1.96 and as the standard coefficient (0.39) is positive, this hypothesis is confirmed. This means that reducing delays has a positive and significant correlation with competitive capabilities in Behnush Beverage Industry in Gachsaran. As it was mentioned before, this variable refers to the forward-moving methods in one or more activities (manufacturing, resourcing and delivering) and to a very distant point in the supplying chain. Delay enables the organization to develop its products to satisfy customer's ever-changing needs.

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According to standard coefficients of the structural equation modeling, developing products based on cell montage (0.76), postponing the production of end-products to the time of achieving the last position (or the closest point to customers) in the supplying chain (0.74), and postponing the production of end-products to the time of receiving the order of end-users (0.66) help us explain the effect of reducing delays. As a new method of production management, cell montage has an important effect on the quality of sharing information. Prices play a key role in competitive capabilities. Innovation, reliable delivery, quality and the time entering markets are in next ranks. Results agreed with what Manian *et al.*, (2010) and Romano *et al.*, (2003) found in this regard.

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