

**Research Article**

**A STUDY OF THE EFFECTS OF INTELLIGENCE CAPABILITIES OF  
THE SUPPLY CHAIN ON THE SUSTAINABLE COMPETITIVE  
ADVANTAGES IN THE GRAINS AND COMMERCE  
COMPANY OF KERMANSHAH**

**Mehdi Izadi and \*Seyed Reza Hassani**

*Department of Business Management, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran*

*\*Author for Correspondence*

**ABSTRACT**

The present research tries to study the effects of intelligence capabilities of supply chain on the sustainable competitive advantages in the Grains and Commerce Company of Kermanshah to provide appropriate solutions for development and application of performance levels of company and also for improvements in the performance of supply chain and grains and commerce markets. The methodology of the present paper is a descriptive survey. Concerning the objective, it is also a practical research. The statistical population of the research involves the managers and staff of the Grains and Commerce Company of Kermanshah. The chosen sampling method in this research is a simple stratified random. The sample size is calculated as many as 200 people, the data collection method of research is questionnaires with five- option- Likert scale, and in order to determine the reliability of the test, the Cronbach's alpha method is used. The collected data is analyzed by using SPSS and Amos software. For examining the research subject a main hypothesis and seven secondary hypotheses are used. The extent of influences and the P-values are calculated too, the results of the general relationship of the research variables suggest the approval of intraorganizational information system capacity with mutual trust and quality of information, flexibility of supply chain with responsiveness and costs of sold goods. Also, the relationship between mutual trust and the variable of information quality has the most influences with the standard coefficient 1.032. Regarding the rejection of the present research hypotheses suggesting the relationship between flexibility of supply chain with the quality of information and the mutual trust, and also the capacity of intraorganizational information system with the personal capacity of the information systems of leadership, and the capacities of strategic planning with the information systems, and regarding the data collected from the studied sample, we can come to the conclusion that the present research enjoys innovations.

**Keywords:** *Intelligence Capabilities, Supply Chain, Competitive, Advantages*

**INTRODUCTION**

***Introduction and Statement of Problem***

The supply chains will relate the suppliers to a manufacturing company and the company to its customers. For the proper handling of the supply chain, it is necessary to make sure of the excellent services to customers, low expenses and short cycling time (Zhang, 2007). The supply chains are of various types, the most important of which are the "integrated construction for storing", "continual refilling after evacuation", "order based construction" and "channel assembly" (Farrelly, 2005). The success of many private, state and military organizations depends on presenting approved outputs, presenting better products in a widespread spectrum and with a low cost and the quick performance. Appropriate presentation of these outputs (cost, quality, operation, delivery, flexibility and innovation) depends on the ability of the organization in handling the material, information, competition and money flow inside and outside the organization. This flow has been known as the supply chain. Due to the probable length and complexity of the supply chain or involvement of a large number of trade partners, some problems may occur. These problems can lead to dissatisfaction of customers and loss of sales and will impose high costs to the organization in case of delay in resolving. Some of the companies in the world class relate many of their successes to the supply chain management (Tourbayan *et al.*, 2006).

## **Research Article**

### **Statement of Problem**

In the present world, considering the rapid reduction of costs of computer software and hardware, traditional electronic information exchange systems with inflexible protocols, heavy costs and less attention to customers is not responsive to companies, and many companies have significantly been inclined to the web-based systems because it is inexpensive and simple. In this way, the electronic trades with suppliers and customers have been much broadened in big companies. In terms of costs these systems have become economical for small and medium companies too. This is while such companies had either no electronic trades or if any, they were so limited or a rare number of customers were capable of tolerating (Aghajani, 2007). The supply chain management is regarded as one of the most powerful operational paradigms in improving the competitive advantage of the manufacturing and service organizations. With the current trend the organizations are no more important today, but you can see the occurrence of value added in the supply chain and its management. On the other hand, with increasing globalization and international competition and appearance of new technologies as information technology, many of the past policies and experiences have no more efficiency. Capabilities of supply chain refer to the ability of an organization in recognition and utilization of the internal and external resources in order to facilitate the integration of supply chain activities. These capabilities involve four dimensions: information exchange, coordination, integration of activities, reactivity of supply chain (Mohammadi *et al.*, 2011). In this study, the information capabilities of supply chain play the role of an independent variable. Today a potential way for keeping the competitive advantage and improvement of the organizational performance is the labour supply chain. Therefore, the competition would not be among the organizations any more, but it will exist among the supply chains and we will show that more effective operation can lead to improving the efficiency of organizations. The supply chain has recently faced instability in the environmental factors due to increased competitions and alterations at the levels of technology. On the other hand, with the appearance of information systems, strategic planning of the information systems has emerged to respond the relevant uncertainty and the alignment of the organization with these changes (Rezaeeyan *et al.*, 2007). Therefore in this research, regarding these fluctuations, we will deal with studying the influences of information capabilities of supply chain on the competitive advantages in Kermanshah Grains and Commerce Company.

### **Importance of the Subject**

The information technology is a revolution whose aim is to engender the basis of electronic supply chain. The intellectual application of information technology would make the electronic information exchange possible, would prevent from the entry of redundant information, would provide required information in the due time, would let the managers receive and follow the complicated information more effectively and also would exchange information with the members of supply chain more simply; therefore the supplier - customer relationships would widely improve (Mohammadi *et al.*, 2011). Since the competition began to increase and the supply based market was replaced by the consumer (customer) based market, the companies had to improve their supply chain management in order to remain in this changing market for a longer time. Simultaneously, the companies began to use the computer systems in order to manage the supply chain. In the 1970s, when a large number of organizations began to settle the information technology, mechanization of activities was their greatest desire. The first applications of the information technology were used in the operational improvement of obtaining orders of inventory management and preparation systems of bills (Fornell and Larcker, 1981). The role of information systems in the organizational performance has effectively changed and today the information systems will create values for organizations (Rezaeeyan *et al.*, 2007). The aim of that was to reduce the costs of data processing in the separate activities, but soon it became clear that the key improvements in efficiency would result from access to the related information systems. In the age of knowledge, the successful organizations are those that quickly run the new strategies based on the competitive advantages and learn from the market and customers; they modify and develop their operations and processes whenever required. By developing the information systems the planning systems of required material were created to reduce the problems of company in planning the production and purchase of materials (Jayaram *et al.*, 1999). Considering the

### **Research Article**

supplier as a supply chain network whose final goal is to present the products expected by the customer was exposed in about 2000. According to the above discussions and the increasing speed of changes of information in the global markets, for achieving the competitive advantages of the market, that is achievement to the ability to deliver qualified products to the customers with the lowest cost in the least possible time, the organizations have no other alternatives except engendering a close, coordinated and highly flexible relation with the whole factors involved in the production process –suppliers, producers and distributors (Youn *et al.*, 2012). In this way, entering the supply chains, the information mechanisms can highly raise the efficiency and effectiveness of these chains, and so they are extremely considered by the pioneer companies in the global markets competition, this significant matter implies the necessity of conducting this research.

### **Review of Literature for Research**

Milgrom and Roberts (1995) dealt with the effects of company size on the relationship between the acceptance level of information technology and three operational, strategic and financial levels of performance in a study. The results suggested that the company size is a key moderating variable in the operational efficiency. In other words, with an effective use of information technology in the relations with major and minor partners in the supply chain, the great companies can shorten the time lag and as a result, promote the operational efficiency. Jayaram *et al.*, (1999) dealt with studying the relation between investment in information technology and operational efficiency in purchasing power. The information analysis showed that investment in information technology has a positive effect on operational efficiency of purchasing. Some of the developed purchasing acts as cooperation with suppliers, evaluation of suppliers, engagement with suppliers in developing and designing products and also logistic integration, accepting the information technology in the supply chain are basically necessary in conducting and also promoting the affairs. Johnston *et al.*, (2004) in a research dealt with the effects of information technology on the capabilities of supply chain and the operation of companies. The findings suggested that involvement of information technology in the communication system of supply chain can lead to creating better facilities in the supply chain in the areas as information exchange, coordination, integration of activities and sensitivity in supply chain.

Jacobs *et al.*, (2010) empirically dealt with studying the relative effects of designing, integrating and sharing information on the efficiency of supply chain. The data investigations show that integrating and sharing information are certain methods for increasing efficiency in the supply chain. The designing of a supply chain has also an important role in achieving the desired level of efficiency.

Youn *et al.*, (2012) studied the effects of information technology on the supply chain and on the performance of business. The findings suggest that the information technology through three factors of the technical quality of information technology, usefulness of the information technology program and support of senior managers from information technology can significantly and positively influence the supply chain, and therefore they have a positive and significant relationship with the financial performance of the company.

### **General Objectives**

#### *The General Objective*

Determination of the influences of information potentials of the supply chain on the sustainable competitive advantages in the Grains and Commerce Company of Kermanshah.

#### *The Specific Objectives*

Determination of the influences of intraorganizational information system capacity on the mutual trust in the Grains and Commerce Company of Kermanshah.

Determination of the effects of mutual trust of companies on the information quality in the Grains and Commerce Company of Kermanshah.

Determination of the mutual trust on the flexibility of supply chain in the Grains and Commerce Company of Kermanshah.

Determination of the information quality of company on the inflexibility of supply chain in the Grains and Commerce Company of Kermanshah.

**Research Article**

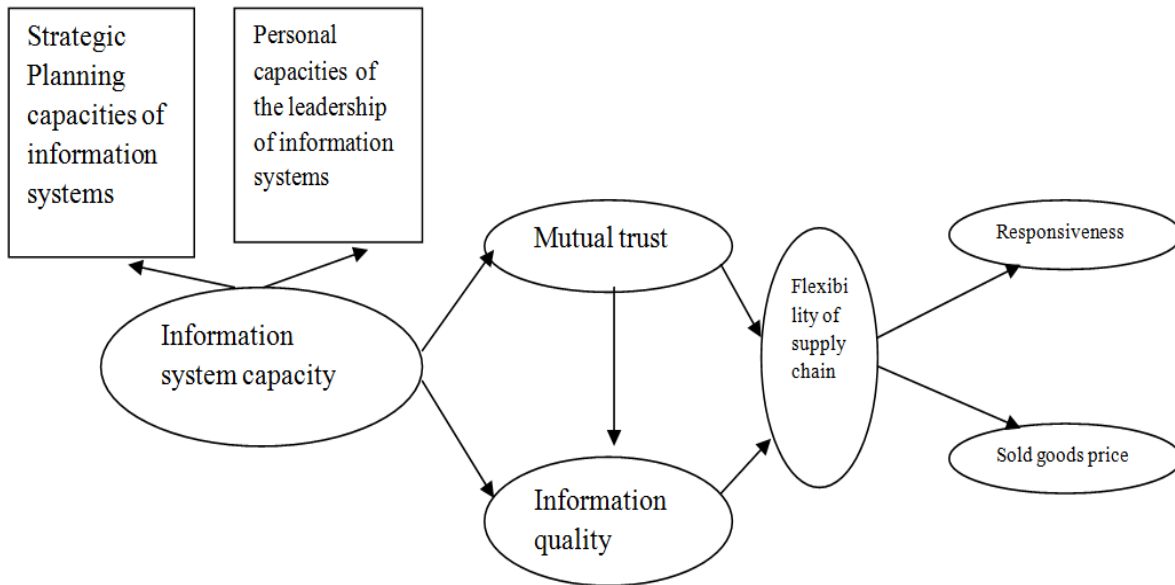
Determination of the supply chain flexibility on responding the customers in the Grains and Commerce Company of Kermanshah.

Determination of the supply chain flexibility on costs of sold goods in the Grains and Commerce Company of Kermanshah.

**Research Model**

Informative capabilities of supply chain

Competitive advantages



Capacity of intraorganizational information system  
 Intraorganizational relational skills  
 Supply chain performance  
 Levels of company performance

**Conceptual model of research: Powell et al., 2014**

**Hypotheses**

*The Main Hypothesis*

The information potentials of supply chain have a significant effect on the sustainable competitive advantages in the company.

*The Sub-hypotheses*

The capacity of intraorganizational information system has a significant effect on the mutual trust of the company.

The capacity of intraorganizational information system has a significant effect on the quality of information in the company.

The mutual trust of company has a significant effect on the quality of information in the company.

The mutual trust of company has a significant effect on the flexibility of supply chain.

The information quality of the company has a significant effect on the flexibility of supply chain.

The flexibility of supply chain has a significant effect on the responsiveness to the customers.

The flexibility of supply chain has a significant effect on the costs of sold goods.

**The Statistical Population of Research**

The statistical population of the present research involves the managers and staff of Grains and Commerce Company of Kermanshah. Considering the fact that the statistical population size is limited, to determine the sample size of research and to examine the reliability of the questionnaires as well, the primary study was conducted at first with 25 samples, after the data collection and information analysis and estimation of the mean and standard deviation and being placed in the sample size determination

### ***Research Article***

formula of the limited population, the sample size was estimated as many as 200 people; to determine the reliability of the test Cronbach's alpha was used.

## **MATERIALS AND METHODS**

### ***Research Methodology***

The present research is practical regarding the objective, and regarding the variable it involves the qualitative variables and can be categorized in the causative-descriptive research class. Regarding the data collection method, it is a descriptive survey.

### ***The Method and Tools of Data Collection***

#### ***Library based Studies***

The library resources, note taking, required books and also World Wide Web were used as sources of information for the theoretical and literature review of the research.

#### ***Fieldwork Survey***

In this section, in order to collect data and information for analysis, the questionnaires were used. The data collection method of the research is a field work and the data collection tool is a questionnaire. The distributed questionnaires involves 30 questions; for responding to the questions the five- item Likert scale (number five comes frequently while number one comes rarely) was used.

### ***Data Analysis Methods and Tools***

For data analysis and hypothesis testing in this research, the descriptive statistics and inferential statistics especially confirmatory factor analysis and structural equation method with AMOS software were used. In the section of inferential statistics used in this research, SPSS software was used which involved the following case: Kolmogorov-Smirnov test.

This test was used for studying the normality of observations; in order to examine the relationship between the dependent and independent variables and to study the research hypotheses using SPSS22 software, we used Pearson correlation coefficient test or Spearman test.

For that aim, the statistical tests as T-student test, for examining the significance of correlation coefficients, analysis of variance and multiple comparisons and/or their non-parametric equations regarding the results of Kolmogorov-Smirnov test were used.

Also, for testing the set of causal relationships of the influential variables on the competitive advantage and on the studied components as well, the structural equations among the variables became equalled through AMOS software.

### ***Data Analysis***

In this article, the collected data through questionnaires was analyzed by the appropriate statistical techniques and the results were presented through descriptive and inferential statistical techniques.

### ***Calculation of Correlation among the Research Variables***

In order to calculate the correlation among the research variables the Pearson correlation test was used due to the data normality.

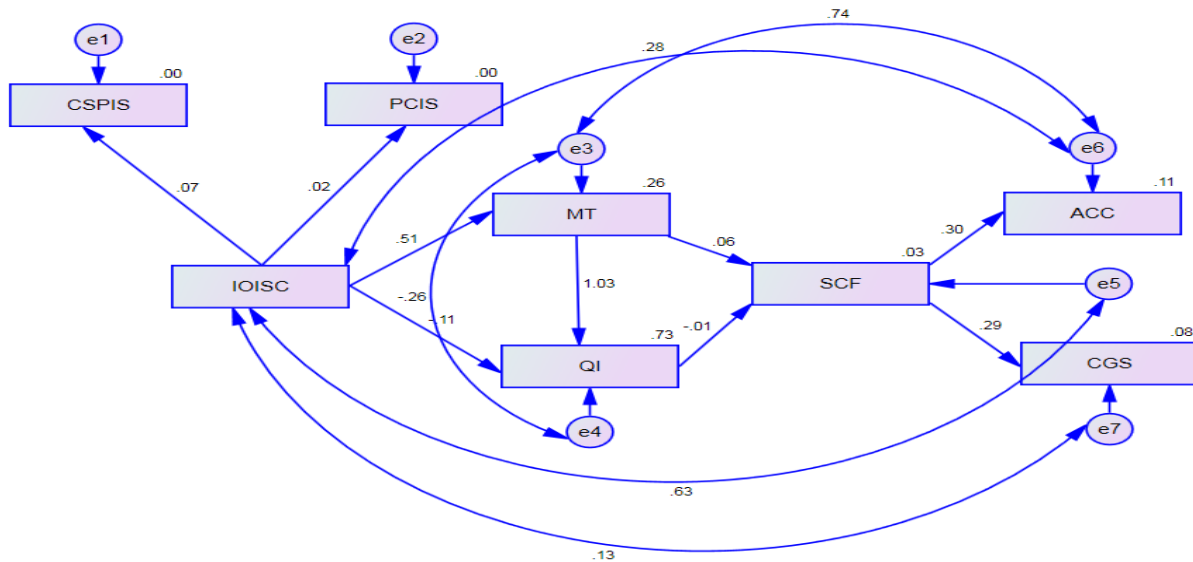
**Research Article**

**Calculation of Correlation among the Research Variables**

Variable	Capacities of strategic planning of information system	Individual capacities of information systems	Capacity of intraorganizational information system	Mutual trust	Information quality	Flexibility of supply chain	responsiveness	Sold goods cost
Capacities of strategic planning of information system	1	0.021=sig 0.000	0.069=sig 0.000	0.68=sig 0.000	0.091=sig 0.000	0.103=sig 0.000	0.062=sig 0.000	0.057=sig 0.000
Individual capacities of information systems	-	1	0.020=sig 0.000	0.071=sig 0.000	0.077=sig 0.000	0.015=sig 0.000	0.028=sig 0.000	0.093=sig 0.000
Capacity of intraorganizational information system	-	-	1	0.511=sig 0.000	0.421=sig 0.000	0.639=sig 0.000	0.430=sig 0.000	0.318=sig 0.000
Mutual trust	-	-	-	1	0.862=sig 0.000	0.358=sig 0.000	0.847=sig 0.000	0.219=sig 0.000
Information quality	-	-	-	-	1	0.289=sig 0.000	0.819=sig 0.000	0.238=sig 0.000
Flexibility of supply chain	-	-	-	-	-	1	0.334=sig 0.000	0.291=sig 0.000
responsiveness	-	-	-	-	-	-	1	0.166=sig 0.000
Sold goods cost	-	-	-	-	-	-	-	1

**Research Article**

**The Final Structural Model and the Fitting Indices**



The graph of the modified structural model of research with standard coefficients

**Hypothesis Testing**

In the following table, the results of hypotheses testing used in the research will be presented:

Hypothesis results	Standard coefficient	Significance level	Critical ratio	Standard error	Non-standard estimation	General relation of the research variables
supported	0.510	***	8.456	0.059	0.501	Capacity of intraorganizational information system → Mutual trust
supported	-0.106	0.023	-2.274	0.050	-0.113	Capacity of intraorganizational information system → Information quality
supported	1.032	***	18.520	0.060	1.112	Mutual trust → Information quality
rejected	-0.010	0.926	-0.093	0.108	-0.010	Information quality → Supply chain flexibility
rejected	0.056	0.618	0.498	0.123	0.061	Mutual trust → Supply chain flexibility
rejected	0.020	0.783	0.276	0.671	0.185	Capacity of intraorganizational information system → Personal leadership capacities of information systems
rejected	0.069	0.327	0.981	0.506	0.496	Capacity of intraorganizational information system → Strategic planning capacities of information systems
supported	0.303	***	5.626	0.052	0.0293	Supply chain flexibility → responsiveness
supported	0.288	***	4.237	0.065	0.274	Supply chain flexibility → Sold good cost

## **Research Article**

### **RESULTS AND DISCUSSION**

Information quality will cause some changes in works and organizations. Instead of direct supervision, for example, the works will be controlled by computers, and as a result, the managers' control area will expand and the organizations will be broadened horizontally, and in this way, the information quality will improve. We live in the age of dissociation, so the financial shocks or traumas are continually injuring the organizations and they have to adjust themselves permanently with these changes. In the global economic system the competitors from around the world are facing each other. The increased competition will equip the organizations thoroughly against their traditional competitors that try to produce new products and also against the innovative organizations which deal with creativity, initiative and entrepreneurship. The successful organizations are those which can react properly against the quick changes occurring in the competition scene.

The rapid technological changes, increased risks, globalization and the privatization expectations are the present specialties with which the commercial organizations are faced. In order to be successful in such an environment, agility can create a competitive advantage that can be kept with fame in innovation and quality. The supply chain is a network that involves all the activities relevant to processing and changing of goods from the stage of raw materials to the final products and also the related information flow. Both the material and information are current above and below the network, and to be able to perform well and satisfy the customers, the supply chain needs a kind of correct management to engender mutual trust in the organization.

The flexibility of supply chain is a means that can satisfy the ideals of customers, companies and managers for access to better quality, more speed and better services with lower price. One of the services provided through the flexibility of supply chain for the commerce and business is the fairly complete and extensive information about the goods regarding their technical and commercial particularities. Such services in the real world would have high commercial values that cannot be achieved without spending much time and money. The companies that try to sale their products and services in this way are constantly in contact with their customers through various quick and low cost methods, and the constant support can encourage the people to buy products. Using the present resources and the derived experiences in this way, we try particularly and at a specific level to consider a list of verifiable subjects at the graduate (and occasionally at the PhD) levels in the form of a research project or dissertation or any other forms. The comparative study of management and utilization of fluctuations and deviations emphasizing on the intraorganizational information system.

Presenting a model for influencing the leadership methods in the responsiveness and flexibility of supply chain.

Evaluation of the supply chain performance in critical conditions.

Focusing on evaluation of the general performance of the supply chain and more consideration of the criteria for referral management and services to customers.

Influential factors on the success or failure of implementation of performance appraisal systems.

Studying the probable efficiency of efforts in implementation of the performance appraisal systems regarding the costs, especially for small and medium organizations.

### **REFERENCES**

- Aghajani Zahra (2007)**. Application of Information Technology in the Supply Chain (Electronic Logistics). *Commercial Studies* **24** 92-99.
- Amid Amin, Rezaeeyan Ali and Bagheri Mehdi (2007)**. An Analysis and Study of the Strategic Planning of the Information Systems for Performance Improvement of the Supply Chain. *Management Message* (25) 5-34.
- Farrelly F and Quester P (2005)**. Investigating large-scale sponsorship relationships as co-marketing alliances. *Business Horizons* **48**(1) 55–62.
- Fornell C and Larcker DF (1981)**. Evaluating Structural Equation Models with unobservable Variables and Measurement Error. *Journal of Marketing Research* **18**(1) 39–50.



**Research Article**

- Jacobs BW, Singhal VR and Subramanian R (2010).** An Empirical Investigation of Environmental Performance and the Market Value of the Firm. *Journal of Operations Management* **28**(5) 430–441.
- Jayaram J, Vickery SK and Droge C (1999).** An Empirical Study of Time-based Competition in the North American Automotive Supplier Industry. *International Journal of Operations & Production Management* **19**(10) 1010–1034.
- Johnston DA, McCutcheon DM, Stuart FI and Kerwood H (2004).** Effects of Supplier Trust on Performance of Cooperative Supplier Relationships. *Journal of Operations Management* **22**(1) 23–38.
- Milgrom P and Roberts J (1995).** Complementarities and Fit Strategy, Structure, and Organizational Change in Manufacturing. *Journal of Accounting and Economics* **19**(2–3) 179–208.
- Moahammadi Ali, Sahrakar Maryam and Yazdani Hamidreza (2011).** A Study of Effects of Information Technology on Potentials and Performances of Supply Chain in Dairy Companies of Fars Province: A Case Study. *Information Technology Management* **3**(7) 151-170.
- Powell TC and Dent-Micallef A (1997).** Information technology as competitive advantage.
- Tourbayan Hosein, Sadeghi Mahmoud and Rahimi Abolfazl (2006).** *Supply Chain Management*, first edition (Publications of Industrial Training and Research Center of Iran) Tehran.
- Youn S, Yang M and Hong P (2012).** Integrative Leadership for Effective Supply Chain Implementation: An Empirical Study of Korean Firms. *International Journal of Production Economics* **139**(1) 237–246.
- Youn S, Yang M and Roh JJ (2012).** Extending the Efficient and Responsive Supply Chains Framework to the Green Context. *Benchmarking: An International Journal* **19**(4–5) 463–480.
- Zhang Li (2007).** An Investigation on the Direct and Indirect Effect of Supply Chain Integration on Firm Performance. *International Journal of Production Economics* **119** 328-46.