

Explaining and Recognizing the Effect of Operational Advantages of Enterprise Resource Planning on Supply Chain Management Capabilities

Dr. Rasoul Shafieeun

Department of Management and Accounting, Mobarakeh Branch, Islamic Azad University,
Mobarakeh, Iran

Dr. Hassan Ghorbani

Department of Management and Accounting, Mobarakeh Branch, Islamic Azad University,
Mobarakeh, Iran

Alireza Khodadadi

Department of Management and Accounting, Mobarakeh Branch, Islamic Azad University,
Mobarakeh, Iran

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Abstract

It was tried in the current study to explain and recognize the effect of operational advantages of enterprise resource planning on supply chain management capabilities. Therefore, three major advantages obtained through implementation of enterprise resource planning including operational advantages on three capabilities of supply chain management containing integration of operational processes, integration of customer relationship and integration of control and planning were measured. The present study was conducted using field-correlation method. Tools of data collection were historical study as well as field study including the questionnaire. Validity of the questionnaire was confirmed through content validity and views of supervisor and advisor professors. Also Cronbach's alpha coefficient was equal to 0.88 that showed good reliability of the questionnaire. The statistical population included two-thousand three-hundred managers, supervisors and experts of Esfahan Steel Company that the sample was consisted of one-hundred seventy four persons using random sampling and Cochran formula. Regression analysis and variance by means of SPSS software as well as structural equations modeling by LISREL software were used for data analysis. Results of regression and LISREL confirmatory analysis indicated the positive effect of operational advantages of implementing enterprise resource planning on capability of integration of operational processes, integration of customer relationship and integration of control and planning.

Key words: Supply Chain Management, Enterprise Resource Planning, Operational Advantages

Definition of enterprise resource planning

Enterprise resource planning is a software solution that tries to define and establish all activities of various units of the firm (such as guild and staff) integratedly in a unified software system so that the units can receive their work and information needs from it (Piruzfar, 2006).

Simply, enterprise resource planning systems use a unified information bank and control the whole information related to business of the firm such as production, finance, purchasing, selling, storage and human force (Mansouri, 2007).

Enterprise resource planning system mechanizes work processes by using an integrated plan, data and information bank as well as an integrated programming language (Chen et al., 2005).

Comprehensive planning systems of resources are computer-based that are designed for processes of a firm and integrate planning, production and responsiveness to customers. It is an information technology-based solution that all resources of the firm can be controlled by managers at various levels of the firm by a continuous system with a high speed, accuracy and quality to manage the planning process and organizational operation appropriately (Taghva et al., 2009).

This system can be defined as an integrated software which has different elements or measures in various domains of firms such as production, human resources management, project management, supply and sale chain management, financial management, asset management, transportation management, etc. Structure of enterprise resource planning systems provides integration and comprehension of information at the organizational level and a fluid flow of information is established among various sectors of the firm (Shokri et al., 2012).

Definition of supply chain and supply chain management

Supply chain includes a network of participators and different channels of operations from inside and outside of the organization that is effective on utility of supply chain outputs (Amid et al., 2008). It contains all activities associated with exchange of goods and services from the primary raw material to the final product that can be consumed by the customer. Such transfers include the information and financial flow besides the flow of materials (Rahman Seresht & Afsar, 2009).

Supply chain management can be observed from several aspects. Definitions of supply chain management should cover both strategic and tactical purposes as most management philosophies (Zangueenezhad, 2007). It emphasizes integration of supply chain activities and also the related information flows through improving supply chain relations to achieve a reliable competitive advantage (Hamidi & Maleki, 2011). Supply chain management coordinates all these activities so that customers can obtain high quality products and reliable services with minimum cost. It can provide competitive advantage for the firm (Feizabadi, 2004).

Having reviewed the above definitions about supply chain management, it can be concluded that supply chain management includes managing all activities related to transfer of goods from raw materials to the final user that contains sourcing and supply, production scheduling, order processing, inventory management, warehousing transfer and customer service. Also it includes the required information systems for coordination and supervision of activities (Manian et al., 2011).

Integration of the executive process

Executive operations include processes that facilitate order completion across the supply chain. Effective completion of order requires coordination inside a company and among the partners of supply chain (Bowersox et al., 2011).

In the executive operations process the company needs to enhance its capabilities in the field of internal integration and suppliers, services and materials integration. If a firm can decrease the execution time effectively in a certain path, capability of order completion in supply chain management can be increased. Successful internal integration depends on the ability to merge multiple executive activities with a common (unified) process that includes mutual functional planning, sourcing, production and change to achieve superiority across the organization (Chen & Lin, 2009).

Customer relationship integration

Customer relationship integration refers developing and maintaining a common mental framework with customers and suppliers by considering inter-organizational dependency and principles of cooperation (Bowersox et al., 2011).

Integration of control and planning process

Control and planning process contains the ability and capacity of the technology and planning integration refers information systems that can support an extensive range of operational forms. It also refers to the progress of measurement systems that facilitate the individual processes and strategies to maintain various measurements of the market. Information technology and measurement systems should facilitate the planning and control of integrated operations across the supply chain (Hejazi & Bashiri Manesh, 2006).

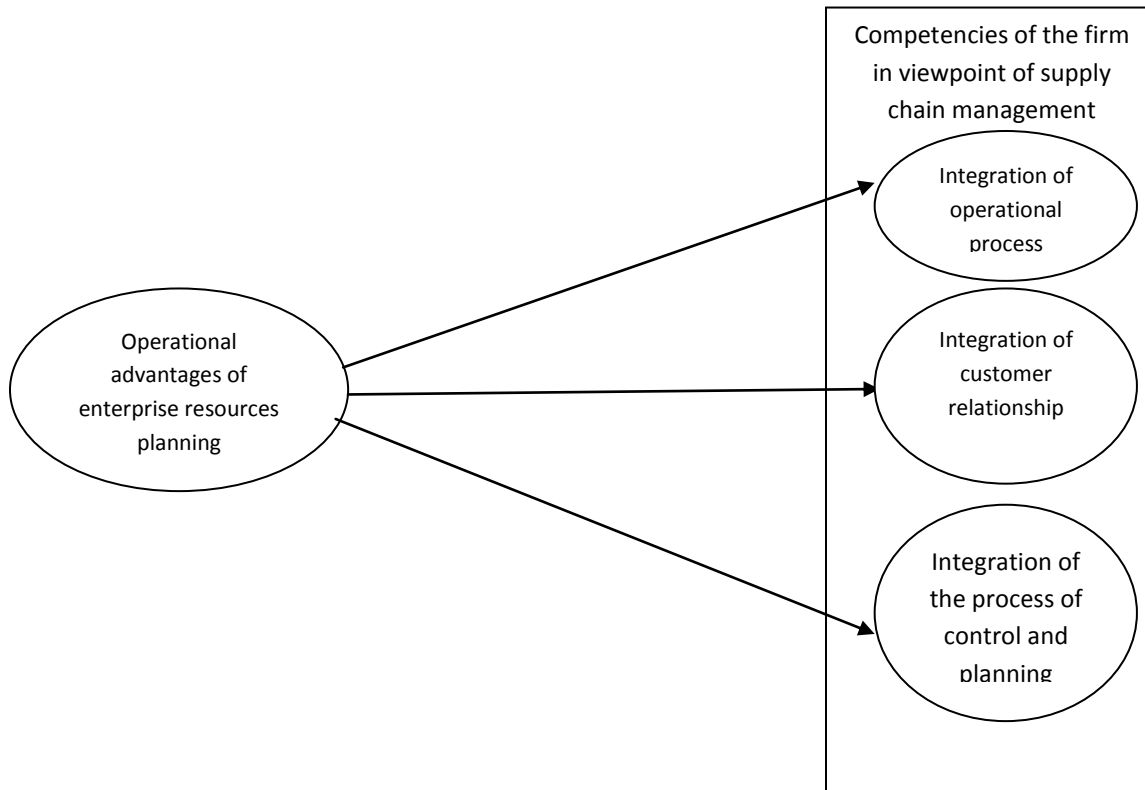
Hypotheses

Primary hypothesis: Operational advantages of enterprise resource planning have a significant effect on supply chain management capabilities in Esfahan Steel Company.

Secondary hypotheses

- 1- Operational advantages of enterprise resource planning have a significant effect on capabilities of the firm in supply chain management in integration of operational process of Esfahan Steel Company.
- 2- Operational advantages of enterprise resource planning have a significant effect on capabilities of the firm in supply chain management in customer relationship integration of Esfahan Steel Company.
- 3- Operational advantages of enterprise resource planning have a significant effect on capabilities of the firm in supply chain management in integration of control and planning process of Esfahan Steel Company.

Figure 1- Conceptual Model



The present study was conducted using field-correlation method. Tools of data collection were historical study as well as field study including the questionnaire. Validity of the questionnaire was confirmed through content validity and views of supervisor and advisor professors. Also Cronbach's alpha coefficient was equal to 0.88 that showed good reliability of the questionnaire. The statistical population included two-thousand three-hundred managers, supervisors and experts of Esfahan Steel Company that the sample was consisted of one-hundred sixty four persons using random sampling and Cochran formula. Regression analysis and variance by means of SPSS software as well as structural equations modeling by LISREL software were used for data analysis.

$$n = \frac{2300 * (1.96)^2 * 0.1226}{2299 * (0.05)^2 + (1.96)^2 * 0.1226} = 174$$

Diagram 1- Model of the coefficients

Structure	Effect of the structure	Path coefficient	T	Test result
Integration of operational process	_____	0.66	2.24	Rejection of null hypothesis
Integration of customer relationship	_____	0.64	3.68	Rejection of null hypothesis
Integration of control and planning process	Operational advantages	0.56	2.11	Rejection of null hypothesis

Hypothesis 1: Operational advantages in enterprise resource planning have a significant effect on capabilities of the firm in supply chain management in integration of operational process of Esfahan Steel Company.

The effect of operational advantages on integration of operational process was calculated equal to 0.66 and t-value for the calculated parameter was calculated more than 1.96. Therefore, this hypothesis is confirmed.

Hypothesis 2: Operational advantages in enterprise resource planning have a significant effect on capabilities of the firm in supply chain management in customer relationship integration of Esfahan Steel Company.

The effect of operational advantages on customer relationship integration was calculated equal to 0.64 and t-value for the calculated parameter was calculated more than 1.96. Therefore, this hypothesis is confirmed.

Hypothesis 3: Operational advantages in enterprise resource planning have a significant effect on capabilities of the firm in supply chain management in integration of control and planning process of Esfahan Steel Company.

Conclusion

Primary hypothesis stated that operational advantages of enterprise resource planning have a positive effect on supply chain management capabilities in Esfahan Steel Company.

In an article entitled "the relationship between benefits obtained from ERP systems implementation and its effects on the firm's performance from SCM viewpoint" Sue and Young (2009) obtained results consistent with this hypothesis.

With regard to secondary hypothesis one, results of regression analysis between the independent variable (operational advantages) and the dependent variable (integration of operational process) show that there is a positive and significant correlation between the two variables. The significance level is less than 0.05 and value of effect is equal to 0.720. If operational advantages are increased one unit, integration of operational process is increased equal to 0.720. Similarly based on structural equations modeling the effect of operational advantages on integration of operational process was calculated equal to 0.66 that t-value for the calculated parameter is more than 1.96. Thus the hypothesis is confirmed.

With regard to secondary hypothesis two, results of regression analysis between the independent variable (operational advantages) and the dependent variable (customer relationship integration) show that there is a positive and significant correlation between the two variables. The significance level is less than 0.05 and value of effect is equal to 0.708. If operational advantages are increased one unit, customer relationship integration is increased equal to 0.708. Similarly based on structural equations modeling the effect of operational advantages on customer relationship integration was calculated equal to 0.64 that t-value for the calculated parameter is more than 1.96. Thus the hypothesis is confirmed.

With regard to secondary hypothesis three, results of regression analysis between the independent variable (operational advantages) and the dependent variable (integration of control and planning process) show that there is a positive and significant correlation between the two variables. The significance level is less than 0.05 and value of effect is equal to 0.546. If operational advantages are increased one unit, integration of control and planning process is increased equal to 0.546. Similarly based on structural equations modeling the effect of operational advantages on integration of control and planning process was calculated equal to 0.56 that t-value for the calculated parameter is more than 1.96. Thus the hypothesis is confirmed.

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