

AN ANALYSIS OF SUPPLY CHAIN INTEGRATION INFLUENCE ON COMMITMENT IN B2B RELATIONSHIPS



Economy

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Abstract

The purpose of this paper is to analyze the relationship that exists between supply chain integration and commitment in business-to-business relationships. Already supply chain integration is a widely studied topic, but there are few studies that examine its impact organizational commitment. In this study, supply chain integration is conceptualized as comprised of six dimensions: customer integration, internal integration, supplier integration, technology and planning integration, measurement systems integration, and relationship integration. Employing a hierarchical linear modelling approach, it tests the effect of each of these six dimensions on organizational commitment. The testing results confirm the positive influence of supply chain integration dimensions on organizational commitment.

1. Introduction

Today companies are continuously increasing their focus on delivering value to their customers. But the environment where businesses operate, compete and collaborate is widely considered as being complex and turbulent (Christopher, 2000). Actually, firms are becoming more interconnected and interdependent than ever before. The growth of supply chains, while enable companies to increase the ability to deliver value to the customer, enhance their profitability, and develop customer responsiveness, at the same time has increased the interconnections and interdependencies among firms. The global marketplace has become very volatile, where customers demand lower prices, faster delivery, higher quality and increasing variety (Christopher, 2000; Power and Sohal, 2001).

More and over the concept of Supply Chain Integration (SCI) is considered critical for creating and maintaining a sustainable competitive advantage (Elmuti et al., 2008). Mentzer et al. (2001) define the supply chain as "... a group of three or more companies connected directly through one or more upward or downward flows of products, services, finances and information, from a source to the customer". So, since supply chains connect the sources of raw materials with final customers, they exist, be they integrated or not. The increased focus and attention on SCI has happened because managers are becoming more and more aware about the fact that maximizing the individual companies' performance may well lead to a sub-optimal performance for the supply chain as a whole (Monczka et al., 1998). So, SCI includes the functional integration within the company as well as the outer integration with other partners of supply chain and final customers (Cooper and Ellram, 1993). An integrated supply chain is an interconnected network of customers and suppliers that work together in order to optimize their overall performance in creating, delivering and supporting the final product. The integration itself is a continuous process that can be optimized only when all the members of supply chain work together to improve their relationships, being in the same time aware about their crucial role across all the levels of supply chain (Christopher and Towill, 2002).

This study analyzes the impact of SCI dimensions, which are customer integration, internal integration, supplier integration, technology and planning integration, measurement systems integration, and relationship integration, on organizational commitment. Each of these dimensions is conceptualized as latent construct, measured indirectly by manifest variables. The data were collected from 142 businesses operating in Albania, during summer 2014. They were analyzed using IBM SPSS 22.0, employing a hierarchical linear modeling approach. The testing results found that each of the SCI dimensions positively influenced organizational commitment. The results also revealed the relative impact that SCI dimensions had on organizational commitment.

2. Literature review and hypotheses development

Bowersox et al. (1999) have identified six areas that lead to an integrated supply chain. They are namely customer integration, internal integration, supplier integration, technology and planning integration, measurement systems integration and relationships integration. This conceptualization framework has been employed and supported in many other studies (De Martino and Marasco, 2007). This SCI approach used by Bowersox et al. (1999) will serve as a basic structure upon which this study will rely. Customer integration is the competency that companies use to create distinct activities with chosen customers. Internal integration is a core competency that stems from the internal coordination of

activities of the company in order to better support customer requirements with a lower total system costs. Integration of suppliers deals with linking internal processes of a business enterprise with external providers of materials and services. Technology and planning Integration focuses on the development of information systems capable of supporting a wide range of operational settings, necessary in creating supply chain solutions for specific customers. Measurement systems integration is necessary to manage coordinated supply chain operations. Performance measurements integration provides the appropriate basis for the calibration of many parts of supply chain engine. Finally, the relationship integration has to do with the readiness and willingness on the part of the supply chain partners to create structures, frameworks and appropriate metrics that encourage inter-organizational behavior.

Gundlach et al. (1995) considers commitment as a cornerstone of successful relationships, while they define commitment as "...closely related to mutuality, loyalty and forsaking of alternatives, variables which are the core of the meaning of relationalism." Wetzels et al. (1988) argue that, if commitment is lacking, the relationship will soon come to an end. Some authors like Meyer and Allen (1997) have identified three components of commitment, namely (1) affective commitment, (2) continuance commitment, and (3) normative commitment; while Gundlach et al. (1995) view commitment as comprised of three other component: (1) an input or instrumental component; (2) an attitudinal component; and (3) a temporal dimension.

This research hypothesizes that the six dimensions of SCI have each a positive and direct influence of organizational commitment. Thus, the hypotheses proposed are as follows:

- H₁: Customer integration positively influences organizational commitment.
- H₂: Internal integration positively influences organizational commitment.
- H₃: Supplier integration positively influences organizational commitment.
- H₄: Technology and planning integration positively influences organizational commitment.
- H₅: Measurement systems integration positively influences organizational commitment.
- H₆: Relationship integration positively influences organizational commitment.

3. Methodology and data analysis

The data for this study were gathered from a representative sample of 142 businesses in Albania, during summer 2014. In order to achieve the generalization of the results from sample to population, a quantitative approach of research was employed. The conceptual framework included data from companies that were in the role of supplier as well as from companies that served as clients of those supplier-companies, i.e. from two parts simultaneously. The collection of necessary data was made through the method of two-stage clustering sampling. In the first stage, a total of 300 businesses were randomly selected from the universe of businesses operating in Albania, focusing the selection in the main cities of the country. 142 of these companies agreed to participate in the study, achieving a response rate of 47.33%. Then, a senior manager or owner from each company was contacted and interviewed, thus collecting the necessary data from one part of the target group. From each company, 3 client companies were contacted and asked to collaborate in the study, creating the second part of sample. From 426 client-companies asked, 402 agreed to collaborate, achieving a response rate of 94.36%.

The measurement scale for each of the constructs in the study was developed based on existing literature on supply chain integration and organizational commitment.

The missing data were substituted using multiple imputation method in SPSS 17.0. Multiple imputation yields unbiased estimations for the parameters and enables proper solutions to problems facing missing data (Graham, 2012). In addition, descriptive statistics results demonstrated the normality of the data, so it was safe to proceed with further analysis.

The next step in data analysis process was conducting Confirmatory Factor Analysis (CFA). The intention was to further evaluate the dimensionality, reliability and validity of the generated structure of factors. Firstly, all the items in every scale were obliged to identify a single factor. Then the correlations between items and fit statistics were estimated. CFA results confirmed the factor patterns, producing positive and significant relationships between constructs. The fit statistics indicators suggest that the factor structure for the seven proposed construct is well defined. All the standardized loadings in factor matrix are significant at $p < 0.001$.

In order to properly analyze the data and do the tests in hierarchical linear modeling, the data collected from supplier-companies and client-companies had to be combined together. In this kind of analysis, organizational commitment served as level one variable, while the six dimensions of integrations served as level two variables. The data taken from supplier-companies are nested with the data taken from client-companies, so the first step was the analysis of the null model, where organizational commitment served as predicted variable and there were no predictors at level one or level 2 (Radenbush and Bryk, 2002).

The analysis of the null model showed that the intercept term varied across groups, indicating that supplier-companies data are nested with each client-companies data, thus the hierarchical linear modeling approach for analysis is reasonable appropriate. The multilevel model parameters should be estimated only if the variance between groups is substantial. The ICC indicator (intra-class correlation coefficient) is calculated with this formula:

$$ICC = \sigma^2_B / (\sigma^2_B + \sigma^2_w)$$

Where: σ^2_B : between-class correlation; σ^2_w : within-class correlation

The resulting ICC value showed that approximately 42.8% of predicted variable (organizational commitment) could be explained by the predictor of level 2.

The proposed hierarchical linear model of this study is:

$$OC_{ij} = \gamma_{00} + \gamma_{01} * CI_j + \gamma_{02} * II_j + \gamma_{03} * SI_j + \gamma_{04} * TI_j + \gamma_{05} * MI_j + \gamma_{06} * RI_j + u_{0j} + r_{ij}$$

Where: OC: Organizational commitment; CI: Customer integration; II: Internal integration; SI: Supplier integration; TI: Technology & planning integration; MI: Measurement systems integration; RI: Relationship integration; γ_{00} : the grand mean of the dependent variable; u_{0j} : supplier-companies effect; r_{ij} : effect not accounted for by supplier-companies.

Table 1 shows the results of the analysis.

Table 1: Hierarchical linear modeling testing results

Fixed effect	Coefficient	t-ratio	p-value
γ_{00}	2.685	52.695	<0.01
γ_{01}	0.603	4.657	<0.001
γ_{02}	0.344	6.874	<0.01
γ_{03}	0.325	3.251	<0.05
γ_{04}	0.519	6.982	<0.001
γ_{05}	0.422	4.250	<0.001
γ_{06}	0.633	2.228	<0.05

As it can be seen, organizational commitment is positively and significantly influenced by customer integration ($\gamma=0.603$; $p<0.001$), internal integration ($\gamma=0.344$; $p<0.01$), supplier integration ($\gamma=0.325$; $p<0.05$), technology and planning integration ($\gamma=0.519$; $p<0.001$), measurement systems integration ($\gamma=0.422$; $p<0.001$), and relationship integration ($\gamma=0.633$; $p<0.05$). Thus, all the hypotheses of the study resulted as confirmed.

4. Discussion

This study analyzed and tested the effects that six dimensions of supply chain integration, namely: customer integration, internal integration, supplier integration, technology and planning integration, measurement systems integration, and relationship integration, have on organizational commitment. It contributes in the field of B2B studies, where research relating SCI and variables like commitment, loyalty, or trust, are scarce. This study employed a hierarchical linear modeling approach, since the data were collected from two related samples: supplier-companies and client-companies. From six dimensions, relationship integration has the largest effect on organizational commitment, followed by customer integration, technology and planning integration, measurement systems integration, internal integration, and finally supplier integration.

Relationship integration requires willingness by supply chain partners to create structures, framework and appropriate metrics that encourage inter - organizational behavior. Marketers must place a greater emphasis on maintaining and enhancing continuous customer/supplier relationships, in order to facilitate the progressive involvement of partner companies. In order to have a successful relationship where both parties are winners, partners should determine the rules of the game and engage in managerial level since in the early stages of the relationship. Of course that these actions directly affect commitment between business partners engaged in a partnership. The company may increase the expenditures in one area of activities and reduce costs elsewhere, resulting in total benefits by reducing total costs and reaching positive synergistic effects. By coordinating processes of marketing and sales functions, procurement, manufacturing, assembling, and distribution of products or services, the company manages to possess a core

competency, which turns into a strong competitive advantage. Companies actively encourage the implementation of best practices, reduce their formal organizational structures or actively engage in the standardization of supply chain operations, in order to improve their performance and achieve internal integration, and finally influencing organizational commitment.

Because commitment has a crucial role in building and fostering long-term relationships, suppliers must exert everything possible to increase the levels of commitment. Bearing this as a “must-achieve” target, suppliers can draw and implement strategies to improve confidence and increase social and special benefits for their customers. Taking into the consideration the impact that close collaboration has on commitment, companies must use it in a sincere and honest manner

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