Predictor Model of the Supply Chain Effectiveness based on Critical Success Factors

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Abstract. The business environments of the globalized economy present increasing complexity, under highly variable conditions of volatility, risk and uncertainty which exert intense pressures to organizations and confronts them, with increasing frequency, to disruptive and unexpected events. Some organizations develop a resilience profile to increase the capacity to anticipate, adapt and recover equilibrium or even, gain a new advantage position after the disruption. This paper is about the determination of the factors of organizational resilience and the development of a structural equation model. The first section presents the background, the description of the problem and a literature search of the resilience factors and their classification. The Methodology section explains the development of a questionnaire based in those factors, which was applied for the determination of the relative importance of the factors in several industrial sectors. The questionnaire was validated with the Cronbach alpha index and then was applied in a sample of manufacturing companies of the twin plant industry of Ciudad Juarez, México. By means of a Partial Least Squares Structural Equation Modeling Approach, a structural model was developed and identified the key "driver" factors related to the development of Organizational Resilience. The section of results describes the model and in the last section, the conclusions are discussed.

Keywords: Supply Chain Management, Factor Analysis, Path Analysis, predictor models.

1. Introduction

Large commercial and retail companies are submitted to intense pressures because of the highly increasing rivalry, the creation and development of logistic technologies, the increases in worldwide free markets and the economic globalization, all together demand the improvement of the customer service level, to which, companies respond with the deployment of strategic programs for the creation and development of the technological capabilities required, as a primary source of competitive advantage. Among the strategic programs deployed for the creation of competitive advantage sources is the improvement of the supply chains. Commercial businesses depend, to great extent, to the ways their goods for sales are obtained and replenished, processes that include a wide diversity of activities and whose performance is under multifactor variation. For instance, some of the influence factors are the industrial sector production and the logistic technologies for procurement, inventory management and distribution. The improvement of logistic technologies increases efficiency, flexibility and information quality for enhanced communication with suppliers and customers and together increase the client service level.

Because of the importance of the supply chain effectiveness as a source of competitive advantage and the technologies used by the companies in the industrial sectors of commerce by retail, their management is critical for the success of the companies, although, in the industrial practice, reports commonly inform that the development of the supply chain takes more time and costs more than expected, besides, results are questionable in quality and quantity terms, the source of competitive advantage is compromised. There are noticeable differences in the supply chain management between industrial sectors, even, among companies in the same sector and within companies. Although the improvement is a common effort in commercial businesses, literature is anecdotal and report empirical projects without a generally accepted industrial practice, in fact, the industrial practice is the internal development, by experience, of the management and deployment of the improvement project. In the search for answers, the management and logistics literature comes short. The factors influencing the performance of the supply chain is long and they are not discriminated by their relative contribution to effectiveness. Reports are not coincidental, neither is the factors lists or in their importance. This situation does not explain the best way to deploy supply chain improvement projects. The actual explanation capacity of the theory is questionable.

Although the supply chain improvement has a strategic importance because of the logistic costs. In Mexico, the ANTAD (National Association of Departmental and Auto-service Stores) reports that in the cost structure of their members, logistic cost comes up to 5% of the total cost and in the highest, for large stores without centres for distribution goes up to 10%