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Research Report: MISI-2014-15
Cold Chain Evaluation Framework in a Fragmented Market
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Cold Chain Evaluation Framework in a Fragmented Market

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Summary: In a fragmented cold chain industry in developing countries, how should a shipper protect integrity of its products and brands while supporting multiple shipment types, and supply & demand surges? The objective of the thesis is to identify the dynamics behind fragmented cold chain industry, and conceptualize and build a framework to evaluate Cold Chain Service Providers (CCSP) in such a fragmented industry. The framework facilitates evaluation of CCSP in various dimensions of Strategic, Tactical and Operational fit with an organization and suggests a systematic approach to monitor performance of CCSP using key metrics and parameters.



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Introduction

The extent of food spoilage across the food supply chain is poses a serious challenge for all stakeholders (including government and consumers) of Food and beverage (F&B) industry. *Refrigeration & air conditioning (Cold Chain Industry) is steadily becoming a part of everyday life in F&B industry and is a key enabler to protect the integrity of food products.* In general, food products may pass through 17 or more handlers during distribution, enduring delays and substandard intermediate storage. Without a proper tracking system, cold chain breach might go unobserved and even improper temperature control can spoil a product. To address challenges, the use of temperature sensitive products and Cold Chain Service Providers (CCSP) has become an integral part of the success of F&B industry.

However, highly fragmented industry in developing countries as compared with that mostly vertically integrated cold chain in developed countries makes the CCSP evaluation process a challenge. It is critical to protect integrity of products and brands while supporting multiple shipment types, and supply & demand surges. Therefore this paper intends to conceptualize and build a framework to identify, assess and evaluate Cold Chain Service Providers (CCSP) in a fragmented industry.

Approach

The thesis proposes an evaluation framework for CCSP based on quantitative and qualitative criteria is proposed in various dimensions of cultural, operational and strategic fit. A combination of Literature Review, Industry Analysis and Value Chain Mapping from food and beverage industry is used to develop, refine and categorize parameters. Apply Analytic Hierarchy Process (AHP) technique is used to identify local and global weight of parameters and give recommendation for leveraging model findings (refer Figure-1).

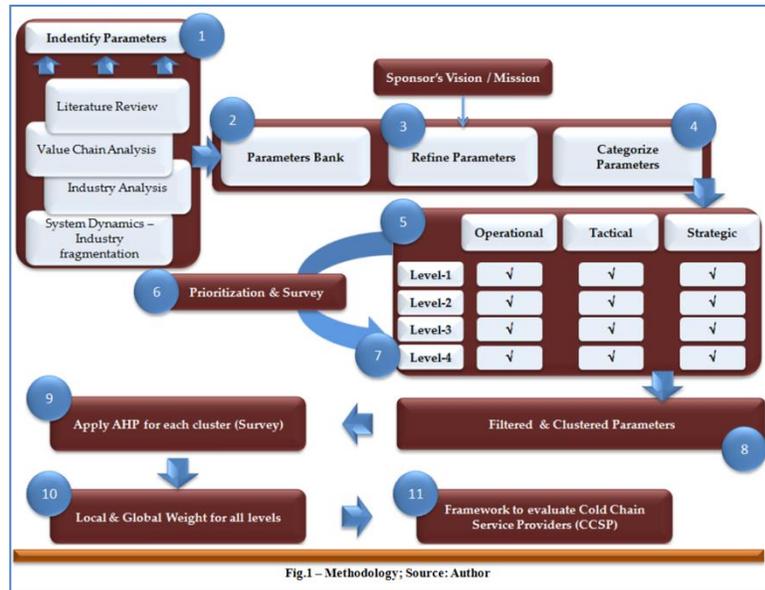


Fig.1 – Methodology; Source: Author

Build Framework:

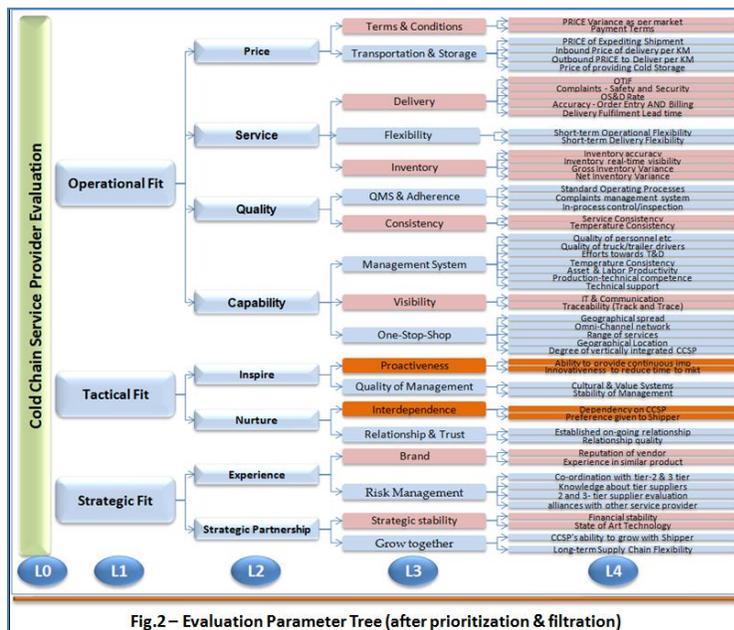


Fig.2 – Evaluation Parameter Tree (after prioritization & filtration)

The final set of parameters described in last section are further segmented into three main categories, namely Operational, Tactical and Strategic fit, called Level-1 parameters. However, evaluation of CCSP cannot be done at such a high level and therefore it's important to break each of Level-1 dimensions into further lower level elements from Level-2 to Level-4. The lowest level is the Level-4 and is the easily measurable elements (refer Figure-2).

Model Findings

- Strategic and Tactical fit together comprise 55% of total weight, suggesting that sufficient focus on STRATEGIC & TACTICAL fit is required evaluating CCSP in fragmented industry (Figure-3)
- 11 parameters account for 75% of the total weight of Operational, 3 parameters for Tactical and Strategic Fit and 12 Level-4 parameters comprise 75% of the total weight
- IT capability and Temperature & Service Consistency are more important than pricing parameters
- Pricing parameters comprise 12% weight. However, Non-price levers are much more important in fragmented market

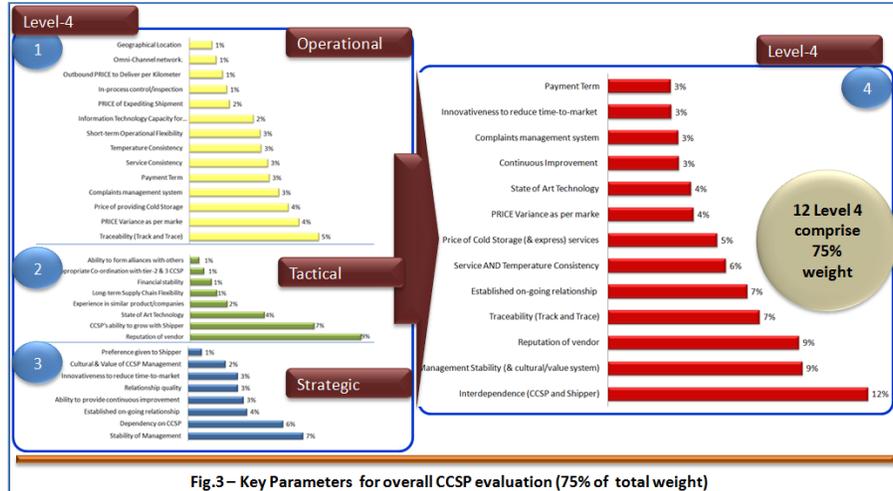


Fig.3 – Key Parameters for overall CCSP evaluation (75% of total weight)

Recommendation

- In a fragmented market, evaluate CCSP not just on the basis on Operational fit but also on Tactical and Strategic fit assessment
- Use of different levels of evaluation framework for evaluating CCSP
- Significant opportunity could be find in the areas of Cost Management, and Network Optimization as Shipper give higher weightage to price parameters, extent of express services and omni-channel needs
- Build long-term relationship with some of the CCSP and take them along while growing in emerging economies (Figure-4)

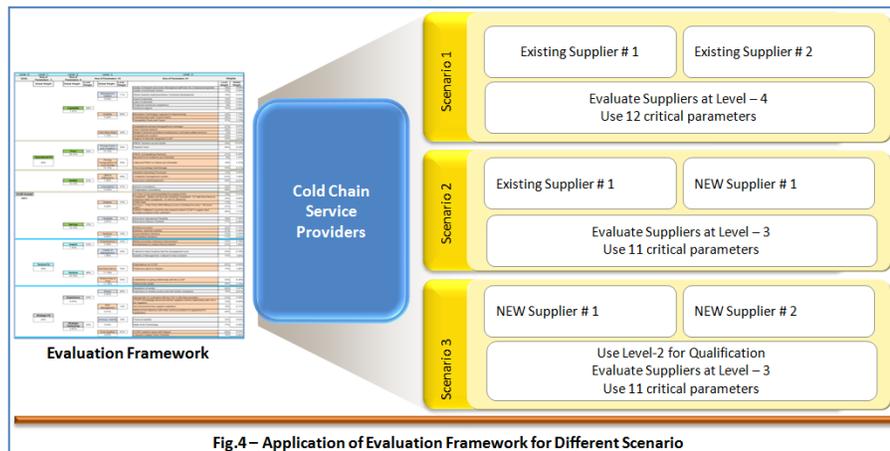


Fig.4 – Application of Evaluation Framework for Different Scenario

Cited Sources:

- Cooper, O., Tadikamalla, P. & Shang, J., 2012. Selection of a Third-Party Logistics Provider : Capturing the Interaction and Influence of Performance Metrics with the ANP
- Saaty, T.L., 2013. The Modern Science of Multicriteria Decision Making and Its Practical Applications : The AHP / ANP Approach The Modern Science of Multicriteria Decision