Fuzzy ISM for Analyzing the Inhibitors of a Telecom Service Supply Chain

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ABSTRACT

ISM is well-proven for analyzing the synergic influences of various attributes to the overall system under study. Its unique feature is the competency to analyze the attributes based on their driving power and dependence. In the current research, the ISM has been developed for a leading Indian telecom service provider. The inhibitors in the service supply chain have been identified. Initial reachability matrix and final reachability matrix have been made. In this paper, in addition to the traditional methodology, an attempt to quantify the fuzzy interrelationships has been made. This gave a better representation of the situation than the traditional endeavours, which were based on binary elements. The hierarchy of various inhibitors has been established based on the outcomes of the final reachability matrix. The digraph has been constructed. In order to have a better analysis, the relationships were quantified and plotted. Finally MICMAC analysis has been carried out. The inhibitors have been categorized into four clusters. The paper is concluded with managerial implications and scope for future work.

Keywords: Fuzzy Interpretive Structural Modelling, Interpretive Structural Modelling (ISM), Microscopic-Macroscopic (MICMAC) Analysis, Supply Chain Management (SCM) Inhibitors, Telecom Service, Transitivity

INTRODUCTION

In continuation to the recent paradigm shifts in the industrial world, a well-designed and reliable supply chain has become an unavoidable one for an organization to escalate the triumphant competitive advantage (Faisal et al., 2007a). The ever vibrant waves of globalization, liberalization, rapid proliferation of information technology, and the recent industrial recession, further catalysed these trends. This research considers the power of service supply chain (SSC) inhibitors to suppress the smoothness of the entire chain based on their interrelationships. Like all supply chains, SSCs are also subjected to severe inhibitors, which are the outcomes of various industry specific variables. Generally, there exists a direct correlation between various inhibitors of a SSC. These inhibitors not
only disrupt the smoothness of SSC, but also influence one another (Faisal et al., 2007b).

Telecom industry is exponentially developing throughout the world including India. In continuation to this, phenomenal changes are occurring in all aspects of the industry including supply chain. In order to have a smooth, untainted and seamless telecom service supply chain (TSSC), these inhibitors have to be mitigated accordingly. This has motivated to understand the interrelationship between those inhibitors. The purpose of the study is two fold. It has been initially aimed for identifying those inhibitors and next to trace the interrelationship between them. Generally, there will be two sorts of inhibitors: (i) driving inhibitors and (ii) driven inhibitors. Driving inhibitors lead to some other inhibitors. Driven Inhibitors are those, which are influenced by other inhibitors. The appropriate analysis of these inhibitors helps the management to concentrate their future strategies in those directions.

Interpretive structural modelling (ISM) is a well-proven and widely accepted methodology for identifying the interrelationships among the variables, which define the system under study (Jharkharia & Shankar, 2005). With the pioneering endeavors of the current researchers and experts, the fields of applicability of ISM have been widened. The case organization was a leading Indian telecom service provider. In the current research, thirteen inhibitors, which define the system under study, have been identified and finalized by referring various literature and the incorporating the opinion from experts of the organization and academia. This yields a clear picture of the interrelationships between the inhibitors. In addition to that, it helps to estimate their driving power and dependence.

ISM METHODOLOGY

ISM is a well-proven strategy for identifying the structural relationships among system specific variables, which define the problem under study (Warfield, 1974; Sage, 1997). It brings into consideration a system of directly and indirectly related elements, which portray complex case organizational issues. Such an analysis glimpses largely on unpredictable and counterintuitive behaviours of inhibitors in order to observe the synergic behavioural patterns, and to analyse how they can possibly influence the entire chain. ISM helps to assess the interrelationships among these elements and their degree of associations (on a driver-dependence scale). Management research is nourished with a plethora of ISM applications in various fields (Thakkar et al., 2008). Therefore, the procedural steps reported by the previous researchers, apart from ISM application were replicated for the current study. The synergic combinations of all the inhibitors and their influence on the entire SSC have been presented in a better-quantified

RELEVANCE OF THE RESEARCH

This section highlights the novelty of the current research. The current industrial world witnesses an unprecedented growth in telecom service sector. While having a bird’s eye view on the world of SCM literature, there can be observed a substantial amount of research focused on the interpretive behaviour of various supply chain elements. However, a research on the interpretiveness of TSSC has observed as a missing link in the plethora of SCM literature. Similarly research on importing SC concepts and a systematic analysis of the inhibitors of the telecom service sector is still a missing link. There is hardly any evidence in literature till date of such research being undertaken in telecom service sector. This research is an endeavour in that direction to fill the research gap. In addition to that the fuzziness of the driving power and dependence of the inhibitors has also been analysed. In the current study, various inhibitors influencing Indian telecom service provider supply chain have been analyzed using ISM approach incorporating the fuzziness of interrelationships. This yields a clear road map on the relationships among the inhibitors, and their driving power and dependence.