

# **SELECT ISSUES IN SUPPLY CHAIN PERFORMANCE MEASUREMENT SYSTEM**

By

**PARIKSHIT CHARAN**

Department of Management Studies

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## CERTIFICATE

This is to certify that the thesis entitled “**Select Issues in Supply Chain Performance Measurement System**” being submitted by **Parikshit Charan** to the Indian Institute of Technology Delhi for the award of the degree of **Doctor of Philosophy** is a bonafide record of original research work carried out by him. He has worked under our guidance and supervision and has fulfilled the requirements for the submission of the thesis, which has reached the requisite standard.

The results contained in this thesis have not been submitted, in part or full, to any other University or Institute for the award of any degree or diploma.

**(Dr. Rajat K. Baisya)**  
Professor  
Department of Management Studies  
Indian Institute of Technology Delhi  
New Delhi-110016  
INDIA

**(Dr. Ravi Shankar)**  
Professor  
Department of Management Studies  
Indian Institute of Technology Delhi  
New Delhi-110016  
INDIA

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## ABSTRACT

The term “Supply Chain Management” has become one of the most common buzzword these days. Today businesses are focusing on supply chain concepts to lower cost, reduce cycle times, provide better services, and achieve competitive advantage in increasingly heterogeneous markets. In the wake of this realization, supply chain performance measurement system assumes special importance for a supply chain to perform its intended function.

This research is aimed at examining different issues related to supply chain performance measurement in select Indian industries. An exhaustive literature review has been conducted to identify the “gaps in literature” in this area. To understand supply chain initiatives adopted by Indian industries, two case studies in select sectors have been investigated. A questionnaire-based survey has been conducted to gain insight into various issues related to the supply chain performance in two sectors of Indian industries. These two sectors of the Indian manufacturing industry are auto and electrical & electronics. This research has attempted to fill some of the gaps in the contemporary research. The descriptive statistics from the survey, hypotheses testing, and case studies of leading Indian companies provide insights into the practices of supply chain performance measurement in the Indian industries. Interpretive Structural Modeling (ISM) has been used to identify the relationships among important enablers and result variables of supply chain performance measurement system implementation. Further, a combination of Analytic Network Process (ANP) and Balanced Scorecard approach has been used to select an appropriate supply chain performance measurement system alternative.

The major contributions of this research can be summarized as follows:

- A literature review has been conducted to identify various issues, related to SCM, in general, and supply chain performance measurement, in particular.

- Case studies of two Indian companies, which represent two sectors of the Indian industry, have been developed and analyzed using Situation-Actor-Process-Learning-Action-Performance (SAP-LAP) framework.
- A questionnaire has been developed to identify the issues related to supply chain performance measurement practices in Indian industries.
- Various issues related to the supply chain performance measurement in Indian companies have been identified through this survey and discussed.
- Eleven hypotheses concerning common supply chain issues and sector-specific practices have been formulated and tested using statistical tools.
- An ISM-base framework has been developed for the enablers and result variables of supply chain performance measurement system implementation, so as to identify the key variables, which have high driving power in the performance of a supply chain.
- An analytical framework, using the combination of ANP and balanced scorecard has been developed to identify an appropriate supply chain performance measurement system. This framework is holistic in the sense that it takes into account both the tangible and intangible factors while arriving at the final selection.

The present research focuses on some issues related to supply chain performance measurement. It provides a better understanding of the status of supply chain performance in select sectors of Indian industries. Finally, the research provides an ISM-based framework for handling the ‘enablers and result variables’ in the implementation of supply chain performance measurement system. An ANP-based framework for the selection of supply chain performance measurement system is also presented.

**Keywords:** Supply chain management (SCM), Supply chain performance measurement system (SCPMS), Performance measurement system (PMS), Performance measures (PMs), Interpretive structural modeling (ISM), Analytic network process (ANP), Balanced scorecard (BSC).

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