IT-ENABLED SUPPLY CHAIN MANAGEMENT: STUDIES IN SELECT INDIAN INDUSTRIES

By

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CERTIFICATE

This is to certify that the thesis entitled **"IT-Enabled Supply Chain Management: Studies in Select Indian Industries"** being submitted by **Sanjay Jharkharia** 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 my guidance and supervision and has fulfilled the requirement 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.

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(Sanjay Jharkharia)

ABSTRACT

For effective management of a supply chain, it is essential that the chain is integrated. Advanced information technologies have proved to be one of the major tools in improving the information sharing in a supply chain network and thereby integrating the enterprises in a supply chain.

This research is aimed at examining the supply chain management (SCM) practices in the Indian industries with a focus on use of IT in the management of supply chains. A questionnaire-based survey has been conducted to gain insight of various issues related to IT-enablement of the supply chains in select sectors of Indian industries. Four sectors of the Indian manufacturing industry namely auto, engineering, process, and fast moving consumer goods have been covered. A literature review has been conducted to identify the gaps in SCM research especially in the Indian context. This research has attempted to fill some of the gaps in the contemporary research. Some hypotheses are framed and a questionnaire instrument is developed. The descriptive statistics from the survey, hypotheses testing, and three case studies of leading Indian companies provide us an insight about SCM and IT practices in the Indian industries. Due to increasing demand and importance of logistics outsourcing, an ANP-based framework has been developed for the selection of logistics service provider. Finally, Interpretive Structural Modeling has been used to identify the relationships among important barriers to the IT-enablement of supply chains.

The major contributions of this research are as follows:

- A literature review has been conducted to identify various issues related to SCM in general, and use of IT in supply chains in particular. Thereafter, a questionnaire has

been developed to identify the issues related to IT-enablement of supply chains in Indian manufacturing industry.

- Various issues related to the IT-enablement of supply chains in Indian manufacturing industry have been identified and discussed on the basis of the empirical study.
- Eight hypotheses concerning common supply chain issues and sector-specific practices have been formulated and tested using statistical tools.
- Case studies of three Indian companies, which represent three sectors of the Indian industry, have been developed and analyzed using SAP-LAP methodology. These studies provide an insight about IT-enabled SCM.
- An ANP-based model has been developed for the selection of a logistics service provider.
- An Interpretive Structural Modeling-based framework has been developed to establish the relationships among important barriers to IT-enabled supply chain. These relationships are useful in managing these barriers.

The present research focuses on various issues related to IT-enablement of supply chains. It provides a better understanding of the status of IT-enablement of supply chains in select sectors of Indian industries. Finally, the research provides an ANP-based framework for the selection of logistics service provider and an ISM-based framework for handling the barriers in the IT-enablement of supply chains.

Key Words: Information technology, Supply chain management, Logistics, Analytic Network Process, Empirical Study, Interpretive Structural Modeling

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