STUDY OF SELECT ISSUES IN SUPPLY CHAIN DIGITALIZATION

A thesis submitted

in partial fulfilment for the Degree of

Doctor of Philosophy

by

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MAY 2021

ABSTRACT

Supply chain management and supply chain digitalization are the dominant topics for research in the digital era. The research was conducted to address some of the vital problems in the domain of supply chain digitalization. The issues related to supply chain digitalization were considered in an Indian context by choosing representative case studies. Five problems were addressed in this research by developing suitable methodologies. The *first* problem of the research was to identify and prioritize the customer and design requirements for supply chain digitalization. An integrated analytic network process and quality function deployment methodology has been applied for prioritizing the customer and design requirements. The findings could be effectively used by the practicing managers and academicians in effective decision making during supply chain digitalization.

The digital transformation process is influenced by enablers and barriers. Hence, there exists a need to properly identify the enablers and remove the barriers for effective supply chain digitalization, which is considered as the *second and third* problems respectively. The hierarchical and contextual influences among the key enablers and the barriers affecting the digitalization process are found out using interpretive structural modelling and MICMAC approach. Grey-DEMATEL method was also applied to find out the cause-effect relationship among the enablers and barriers. Robustness of the methods used was verified using sensitivity analysis. The policy decision makers could consider the results of this analysis to identify and understand the interrelationships among the key enablers and barriers for effective digitalization of supply chain.

The development of a conceptual framework supply chain digitalization is considered as the *fourth* problem. A framework is developed by using a novel method which involves integrated systems model approach and Data, Information, Knowledge and Wisdom hierarchy and Decision Support System. This study aims to contribute to the literature on a better understanding of the relationship between the major decision making factors affecting digitalization and linking with integrated framework for digitalization. Interpretive Structural Modeling method is used to validate the framework through its evaluation in electronics supply

chain. The framework developed can also be used by the researchers for conducting a broader level of analysis of the decision making factors in another firm or industry.

The *fifth* problem addressed in the thesis is designing a model for selection of the most appropriate inter-organizational information systems alternative for supply chain digitalization. A novel model for selection is developed by using Analytic Hierarchy Process integrated TOPSIS method. The proposed method can also identify and select suitable inter-organizational information systems required by an organization to digitalize its business activities. This research also helps provide insights into the process of shortlisting criteria and selecting suitable IOIS alternatives. The decision model developed can be used by scholars and practicing managers for conducting a more comprehensive level of examination of the key decision making factors and selection of inter-organizational information systems in any industry or firm.