

# Achieving Product Quality Performance: Information Technology

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**Abstract**—The purpose of this paper is to increase the understanding of supply chain integration implementation through a selection of appropriate types of information technology (IT). Survey response from production/purchasing managers in 111 Thai suppliers and automakers in the automotive industry were analyzed to test the effect of types of information technology on the relationship between supply chain integration and product quality performance. Univariate analysis was used to analyze the data. The results suggest an interaction effect of collaboration/decision support information technology to enhance the effectiveness of supply and customer integration. The findings of this study provide framework linking supply chain integration strategies and product quality performance leading to valuable insights into how different information technology types can be configured to enhance product quality.

## I. INTRODUCTION

In an increasingly competitive global marketplace, most firms are competing with a high level of market pressure worldwide. In the context of supply chain management, it is necessary for industry to develop supply chain networks of activities involved in producing and delivering final products from suppliers to end customers. A prerequisite for successful supply chain management (SCM) is the integration of information flow, material flow and all the business processes within a supply chain network. Effective and efficient supply chain management requires integrated business processes that go beyond purchasing and logistics activities. Effective supply chain integration among entities in a supply chain has currently come to play a major role in competitive advantages, especially in terms of product quality [1].

However, it is important to recognize that one of the primary prerequisites for successful supply chain integration is the implementation of appropriate information technology (IT). In other words, advances in information technology have had a huge impact on the integration of supply chain processes. Information Technology could improve the interconnections in the supply chain by coordinating the links to the outside and increasing product quality. Little research has been conducted to address the type of information technology involved in determining the implementation of supply chain integration. In this case, the researcher's objective is to discover whether or not product quality requires different types of information technology in

implementing supply chain integration.

In the following section, the existing literature is reviewed in order to build a theoretical background for developing hypotheses. Section III describes the questionnaire design and data collection. The collected data have been examined by using univariate analysis. The results of the statistical analysis are explained in Section IV, while section V concludes the findings and contributions of this study. The implications and limitations of the study are also identified with suggestions for future research.

## II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### A. Supply Chain Integration

In today's business environment, integration among organizations in the form of cooperation and coordination has been recognized for years as a problem-solving strategy for business systems. Cooperation focuses on the need to integrate business functions, and views these functions as interdependent parts in responding to customer needs. With organizational integration theory, for example, reference [2] studied contingency models of integration and found that both differentiation and integration between departments were needed for organizations to be successful in a turbulent environment.

The traditional supply chain, which relies on discrete information flows, can create three major disadvantages. First, forecast accuracy decreases with each step back in the supply chain due to the increase of demand uncertainty. This, therefore, results in excess inventory for manufacturers and retailers. Second, the traditional supply chain reacts to demand changes very slowly. If a particular item suddenly starts to sell out, replenishment orders go to retailers' distributions centers until minimum inventory levels are reached and then orders are placed with the manufacturer. As a result, the traditional supply chain does not communicate underlying customer demand trends and, therefore, tends to create under-supply. The third disadvantage is that the traditional supply chain treats all items in very much the same manner. Common material handling approaches are used across high and low volume items. Consequently, opportunities are missed for reducing supply chain operating costs. For these disadvantages, success is no longer measured by a single transaction. Rather, competition is evaluated as a network of cooperating companies competing with other firms along the effective supply chain.

Within the requirements of the new competition, an increase in the level of partnership among businesses is required. Reference [3] summarizes the development of

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