Chapter 3
A Framework for Nondestructive Evaluation Application in Supply Chain Management

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ABSTRACT

This chapter introduces a general framework for Nondestructive Evaluation (NDE) application in Supply Chain Management (SCM). With the support of emerging and existing technologies related to supply chain implementation, nondestructive evaluation provides an enabling platform to analyze the design, planning, and operational decisions within the upper and downstream ends of the supply chain system. This clarifies supply chain goals, supports making of efficient decisions without constraints, identifies managerial strategies that improve overall supply chain performance, competitive advantage, and profitability. Unfortunately, the desired attention has not been paid to how the numerous nondestructive evaluation technologies can be applied to supply chain management and implementation. This chapter, therefore, considers both technical and business perspectives of this application. It is from

DOI: 10.4018/978-1-4666-7320-5.ch003
1. INTRODUCTION

Supply chain management centers on the idea that practically every product that reaches an end user represents the cumulative effort of multiple institutions and activities. These institutions are referred to collectively as the supply chain. The overall goal of supply chain management is for production to meet the demands of the customers. However, various risk factors are prevalent in the supply chain system. These supply chain associated risks can greatly impact production and the opinion of the customer regarding a product. Understanding both the causes and effects of risks can help supply chain management stakeholders to become more proactive and productive in both avoiding mistakes and in profit maximization. These stakeholders within supply chain management work collectively in order to promote efficiency. All aspects of this collaboration ensure product success in the market. The implication of this collaboration is that all supply chain stakeholders that work within supply chains do have a common goal which hinges on meeting the ever-changing demands of customers.

In Figure 1, all stakeholders in supply chain management are shown. The supply chain is not only limited to the manufacturers and suppliers of products but includes other functional activities like transportation, warehousing, finance, customer service, information technology, sales and marketing.

A typical supply chain is dynamic and involves continuous flow of information and other resources (human, material, methods, money and machines) at every point in time. Supply chain design, planning and implementation decisions play a major role in determining whether a supply chain organization will succeed or fail. The process view of supply chain underscores the sequence of flows that occur between different functional activities which combines to satisfy the need of the customer. For a successful supply chain management, stakeholders must work together to make production, quality and logistical decisions that improve profitability.

As alluded to earlier, supply chain risk factors abound. Typical examples of risk factors are supply risk, demand risk, internal risks, and external or environmental risks. External or environmental risks cannot always be predicted but precautions can be made so that the problems that may arise can be avoided or mitigated. Supply risks are risks on the supply or inbound side of the supply chain. Such risks may be defined as the possibility of disrup-
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Best-Practice of Reducing Risk through a Culture of Total Quality Management