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Chapter VIII

A Framework for Analyzing Information Systems in an Integrated Supply Chain Environment: The Interaction Approach

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Abstract

The concept and study of supply chains are nothing new. The concept of integrated supply chain environments (ISCE), however, has received increased study as of late. Technology has become the enabling factor for corporations to share information externally and to improve material flow within the supply chain. Many benefits can be realized from an integrated supply chain environment, including improved customer relations, cost reductions, and increased competitive advantage. Despite the potential benefits, there are many factors that lead to failed integrated supply chain implementations. Many of the major factors that lead to failure are not due to technological reasons but rather to the failure of the project team to recognize the complexities of the implementations of integrated supply chains. This chapter introduces the Interaction Approach methodology as a framework for analyzing supply chains in the hope of improving the design, development, and implementation of integrated supply chain environments.

Introduction

In today's economy, information and information technology seem to drive the supply chain to new requirements and dimensions (Evans & Wurster, 2000). This inevitably leads to the integration of supply chains across organizations. Integration allows entities within a supply chain to operate in a coordinated manner and, therefore, in an economical manner. As the economy becomes global, enterprises will be forced to exploit integration techniques in order to stay competitive.

Despite the many benefits advertised by supply chain management software vendors, there still exists major issues when implementing an integrated system, including the failure to correctly assess the implications and complexities of supply chain systems integration during the analysis phase (Lan, 2003).

This chapter will begin by presenting a review of the current literature concerned with the integration of supply chains through information technology. Four major technologies will be presented and discussed. Next, integrated supply chains will be defined, and the benefits of integration will be presented. After the benefits are presented, the chapter will explore current issues that hinder the implementation of integrated systems and cause projects to fail. In response to the issues, a new methodology for analyzing information systems in supply chains will be presented. The methodology provides a framework for analysis, which lends itself to object-oriented, agent-oriented, or structured design and development approaches.

Literature Review

There is much research aimed at and study conducted on the integration of supply chains using information technology. There are many approaches used for the integration, each exploring and exploiting a different technology. The following literature review presents work related to the major prevalent integration technologies, which includes EDI and XML, Internet and Web-based, and Intelligent Agents and Fuzzy Logic.

EDI and XML

Nurmilaasko, Kettunen, and Seilonen's (2002) research focuses on the implementation of an XML-based integration system. Their study outlines cases in which XML is more suited toward integration efforts than traditional EDI. They conclude that, because XML enables customized business documents and because integration systems are Internet based, the XML prototype is more flexible to implement and operate than EDI. They find that XML is a cost-effective alternative to EDI, despite the recent slowdown in adoption of XML technologies.

In a more recent research, Nurmilaasko (2002) teamed with Kotinurmi (2004) to analyze and explore various e-business frameworks of supply chains, such as document-centric,