



# Designing a reverse logistics operation for short cycle time repair services

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## Abstract

An important means for companies to differentiate themselves, as well as increase profitability, in highly competitive environments is through the use of service management, i.e., those activities and interactions which follow a product's sale. One of the most important service management activities is repair services. And the existence, effectiveness, and efficiency of service management activities, such as repair services, depend heavily on effective reverse logistics operations.

Because reverse logistics operations and the supply chains they support are significantly more complex than traditional manufacturing supply chains, an organization that succeeds in meeting the challenges presents a formidable advantage that is not easily duplicated by its competitors. This paper discusses the competitive value of service management activities, particularly repair services, as well as the importance of the supporting role of effective reverse logistics operations for the successful and profitable execution of repair service activities. In addition, the manuscript presents a case study of a major international medical diagnostics manufacturer to illustrate how a reverse logistics operation for a repair service supply chain was designed for both effectiveness and profitability by achieving a rapid cycle time goal for repair service while minimizing total capital and operational costs.

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## 1. Introduction

How do companies differentiate themselves when operating in industries where most, if not all firms offer high quality products and customer service at the time of sale? As James Stock put it,

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“After a while, those features just become your admission to the game” (Meyer, 1999, p. 28). A potential solution to this dilemma is offered by Dennis and Kambil (2003), using what they term “service management,” which provides both competitive differentiation and an opportunity to increase profits. Service management is “the sum of all customer interactions that follow a product’s sale, delivery, and installation ... include (ing) customer support; training; warranties, maintenance, and repair; upgrades; product disposal; and sale of complementary goods” (Dennis and Kambil, 2003). The benefits of service management can also be related to the service profit chain framework, which integrates investments in service operations with customer loyalty and firm profitability (Heskett et al., 1994).

One of the most important service management activities is repair services. According to Blumberg (1999), the demand for repair services is robust and increasing, both in the US and worldwide. Furthermore, the existence, effectiveness, and efficiency of service management activities, such as repair services, depend heavily on effective reverse logistics operations.

Because reverse logistics operations and the supply chains they support are significantly more complex than traditional manufacturing supply chains (Dennis and Kambil, 2003), an organization that succeeds in meeting the challenges presents a formidable advantage that is not easily duplicated by its competitors. Effective reverse logistics operations benefit both the organization and its customers. Service management activities, such as repair services, positively impact customers’ total cost of ownership (Tibben-Lembke, 1998), thereby increasing customer loyalty. Consequently, the organization benefits because it has the opportunity to realize additional profit streams from after sale services as well as repeat purchases from loyal customers.

In the next section, we discuss the issues surrounding the value of after sales service, i.e., service management, particularly repair services. We also discuss the importance of the supporting role of effective reverse logistics operations to the successful and profitable execution of repair service activities.

In the last section, we show how a reverse logistics operation for a repair service supply chain (RSSC) can be designed for both effectiveness and profitability by achieving a rapid cycle time goal for repair service while minimizing total capital and operational costs. To illustrate this method, we utilize a case study of a major international medical diagnostics manufacturer with a repair cycle time goal of just 6 hours. The RSSC design process includes analysis of the following questions:

- Where to stock parts inventory.
- How much parts inventory to carry.
- Where to locate service crew domiciles.

In the final section, we offer conclusions for the case study presented, as well as managerial implications of designing service-to-profit supply chains for effective, short cycle time repair services supported by competent reverse logistics operations.

## 2. Background

### 2.1. After sale services

For many products, a customer’s relationship with the product’s manufacturer does not end with product purchase. In fact, this relationship can be significantly influenced by the activities that occur after purchase, during the entire period of product ownership. After sales services can encompass multiple activities, including: customer support through training; product warranties; maintenance and repair; product upgrades; sales of complementary products; and product disposal. Management of these service activities can form an important part of corporate strategy. For instance, when customers perceive that an organization supports its products, the products may be able to command premium prices (Cohen and Lee, 1990). In addition, after sale services represent important opportunities to create and strengthen customer loyalty. After sale support services can also be the source of significant revenue potential, accounting for as much as 25% of revenues and 40%–50% of profits for manufacturers (Dennis and Kambil, 2003).

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