This chapter provides two kinds of background information that we consider important to the subject area. First, we surveyed the supply chain management, operations management, and management science literatures for those works contacting life-cycle issues and at the same time that use quantitative or modeling approaches. We then developed synoptic summaries of these publications and provide some analysis of their central topics, trends, and themes. Hopefully the results will be a helpful reference guide to the related literature to date for both practicing managers and researchers. In the second part of the chapter, we introduce the standard quantitative methods and models used for mathematical life-cycle models. These have been developed under the label of diffusion models and most of the work has been carried out by marketing scientists. This topic should be useful to practitioners in making forecasts, constructing estimates related to capacity, and other supply chain management forecast and planning issues. We also note that some research needs in this area.
Introduction

In this chapter, we first review a number of articles related to life cycles in the supply chain management and operations management literatures. Next we discuss some theory behind the mathematical analysis of product life-cycle curve models. Much of this work has been developed by marketing scientists under the label of product diffusion modeling. Two classes of such models can be distinguished. Several models are described in detail along with the problem of parameter estimation. We also suggest some topic areas for further research.

Background

We next present a survey of research involving life cycles and modeling. The review of these articles is presented in chronological order based on year of publication and alphabetical on first author name within year of publication. For authors with multiple publication years the more recent year was used for ordering. Under the term modeling, we broadly include quantitative modeling as well as tabular, diagram-based, and miscellaneous typologies. We also review some articles that deal with short product life cycles as we provide a more thorough dynamic modeling example in the next chapter. Some additional related articles are referred to later in the chapter. These articles were obtained by searching a number of databases. Every effort was been made to include relevant works as of the date of writing. While completeness can not be assured, we believe this collection of works will be representative of the general trends and types of results that make contact with life-cycle considerations.

Main Focus of the Chapter

Review of Life-Cycle Related Research

Parlar and Weng (1997) consider joint coordination between a firm’s manufacturing and supply departments in the short life-cycle case. Demand is mod-
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