

## **Preface**

In industrialized societies, new products are appearing in the marketplace at an ever-increasing pace. Their introduction is either market driven – a result of increasing customer expectations and needs – or technology driven – resulting from advances in technology. In addition, the complexity of products tends to increase with each new generation. A further complicating factor is that customers are uncertain about, and have no easy way to research, new product performance.

Two items that are becoming more critical and important in the customer purchase decision process are:

1. Pre-purchase services – including information regarding product performance, useful life, cost of operation, etc., and
2. Post-purchase support services – including training in product use, availability of spares, maintenance, assistance with problems, etc.

Customers want assurance that the product will perform satisfactorily during the useful life of the product. Manufacturers not only need to provide this assurance, but more importantly, need to ensure customer satisfaction as well. Without this, survival in a fiercely competitive global market environment would be impossible. Warranties play an important role in this context.

The use of warranties is widespread and they serve many purposes. These include protection for manufacturer and buyer, signals of product quality, assurance that the product will perform satisfactorily, providing a means of compensating buyers when a purchased item does not perform as promised, and resolving disputes between buyer and manufacturer. Many different types of warranties have been studied in detail from various points of view. A warranty of any type, since it involves an additional service associated with a product, will lead to potential costs beyond those associated with the design, manufacture and sale of the product. These costs, in fact, are unpredictable future costs and have a significant impact on the total profits for a manufacturing business. In most cases, these costs range from 1% to 10% of total sales, depending on the product and the manufacturer. At present, the North American automotive industry spends about 8.5 billion dollars on servicing warranty claims each year. The costs of warranty

depend on product reliability and warranty terms. Product reliability, in turn, is influenced by the decisions made during the design and manufacture of the product.

Warranty management deals with decisions with regard to product warranty. Warranty decisions must be integrated with decisions relating to technical issues such as design, development and manufacturing, and to commercial issues such as marketing, price, sales, revenue, etc. Warranty must be managed so as to ensure that the business objectives – profits, return on investment, market share, and so forth – are achieved, while at the same time providing adequate assurance to customers and ensuring customer satisfaction.

Unfortunately, most businesses view warranty as only providing the assurance, and warranty management as efficient administering of warranty claims. The focus is on monitoring claims to ensure that they are valid and to prevent loss through warranty fraud. This can be termed Stage-1 warranty management. Few businesses have moved beyond this to Stage-2 warranty management, where the focus is on improving business performance through actions that lead to warranty cost reduction and/or increase in customer satisfaction. This is achieved through changes to product design, production and warranty servicing logistics through a proper analysis of data obtained during the servicing of warranty claims. In both of these approaches to warranty management, warranty is viewed as an afterthought and warranty decisions are not linked to other product life cycle decisions. Stage-3 warranty management views warranty from a strategic perspective. This begins with a warranty strategy that is linked to the various technical and commercial strategies from the very start of the new product development process. The aim of warranty management is to achieve the overall business objectives by focusing on product performance assurance as well as ensuring customer satisfaction.

This book deals with Stage-3 warranty management and looks at both strategic and operational aspects. It is the third and final book in the warranty trilogy written/edited by the authors. The first two books are *Warranty Cost Analysis* (Marcel Dekker, 1990) and *Product Warranty Handbook* (Marcel Dekker, 1994).

The objective of the book is to provide a comprehensive, integrated framework for strategic warranty management. This requires an understanding of the role and impact of warranty on design, engineering, development and production of a product, as well as on quality assurance, marketing, and post-sale service. Each of these aspects of warranty is discussed in some detail in the book. The approach taken is conceptual, using few symbols and no mathematics, with some formulas and mathematical discussion given in footnotes for the interested reader, and references cited for details and further results. Finally, some accounting and legal aspects of warranty that are relevant for effective warranty management are briefly discussed.

The book is primarily intended for managers at all levels (senior, middle and junior) in manufacturing businesses. We recommend the following sequence for initial reading of the book:

*Senior Level Managers*

CEO: Chapters 1, 3, 4 and 14

Manager in charge of Design and Development: Chapters 1, 2, 3, 4, 5, 14

Manager in charge of Production: Chapters 1, 2, 3, 4, 5, 9, 14

Manager in charge of Marketing: Chapters 1, 3, 4, 5, 10, 14

Manager in charge of Post-sale Support: Chapters 1, 3, 4, 5, 11, 14

*Middle and Junior Level Managers*

All managers: Chapters 1 – 14

Managers at the middle and junior levels should supplement this by extra reading as indicated in the endnotes for the various chapters.

The book can also be used as textbook for a graduate level course in Business Management, Operations Management and Industrial Engineering programs as part of managing new product development.

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