

# Preface

The aim of this book is to propose, to describe in details and to show the practical implementation of an advanced after-sales management framework devoted to warranty management. This framework is proposed for companies producing either standardized or customized products. Such a management tool will allow easy organizational improvement and will support innovative decision making processes for technical assistance in after-sales services.

The content of the book is divided into six parts:

- The Part I ([Chap. 1](#)) is an introduction to the book and describes the context and the purpose of the work. An introductory material to the process followed for the elaboration of the book is also provided.
- The Part II presents the fundamental issues and current research topics in warranty management and after-sales services. A literature review illustrates current state of the art including main international research contributions and best practices. Case studies are presented to illustrate these issues accordingly. This Part II is structured in the following chapters:
  - [Chapter 2](#): This section presents a case study to illustrate a range of typical circumstances in the management of warranty claims, such as spare parts management, inter-departmental decision-making processes, cost related issues, etc.
  - [Chapter 3](#): The state of the art in this area including models, techniques, methodologies, tools and other contributions developed by different authors will be here presented.
- The Part III contains the main contribution of the book: a proposal for a warranty management framework. Specifically, the following chapters are included:
  - [Chapter 4](#): Existing models for assets maintenance management are commented and compared with each other, highlighting the difference between process-oriented versus declarative models. These models will be adapted to the after-sales management process showing the actions and stages in order to lead and manage the organization of a warranty assistance program.

- **Chapter 5:** Based on the above chapters, a framework for warranty management is proposed. This framework is divided into four steps or stages considering the effectiveness, efficiency, assessment and continuous improvement of a technical assistance program.
- **Chapter 6:** This chapter exemplifies the proposed framework for the initial case study in **Chap. 2**. This chapter also shows various ways to follow for the analysis of quality and maturity in terms of customer service management.
- The Part IV explores the different stages of the proposed framework more deeply. The idea is to specify different methods and techniques that can be used to improve decision making in the different stages of the after-sales service management process. This part includes the following chapters:
  - **Chapter 7:** Deals with the warranty program effectiveness. Techniques like The Balance Score Card, Criticality Analysis and the Root-Cause Failure Analysis are applied to different case studies.
  - **Chapter 8:** Focusses on the warranty program efficiency. The implementation of tools like Integrated Logistics Support or Cost-Risk-Benefit Analysis is considered within the after sales service.
  - **Chapter 9:** Warranty assessment and control. The application of methodologies like: Life Cycle Cost Analysis (LCCA), and the Reliability, Availability, Maintainability and Safety (RAMS) analysis is suggested and exemplified.
  - **Chapter 10:** Devoted to the continuous improvement in customer service management. This chapter considers the implementation of techniques such as Six Sigma, CRMs, and new ICTs in order to make data processing and communications easier.
- The Part V of the book presents extensions to the warranty management framework considered above. Different ideas and contributions are introduced to strengthen the structure and foundations of the framework. specifically the following chapters are added:
  - **Chapter 11:** The value of Intellectual Capital in the customer service is here analysed, quantifying the worth generated for the company by the customer service department.
  - **Chapter 12:** The maintainability index is defined and assessed by attributes related to staff, product design, as well as logistic support needs.
  - **Chapter 13:** In the final part we explore how the proposed framework can be extended by applying System Dynamic Model and simulation to the after sales services. Also we tackle the problem of disassembly of a complex industrial asset planning using the Theory of Bayesian probability.
  - Finally, the sixth and final part is devoted to the conclusions of the entire work, specifying the different parts and summarizing the results obtained (**Chap. 14**).

This book illustrates our personal experiences within this field and offers the readers a real perspective of the use of the tools defining a framework for warranty management of engineering industrial assets.

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After-sales Service of Engineering Industrial Assets

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