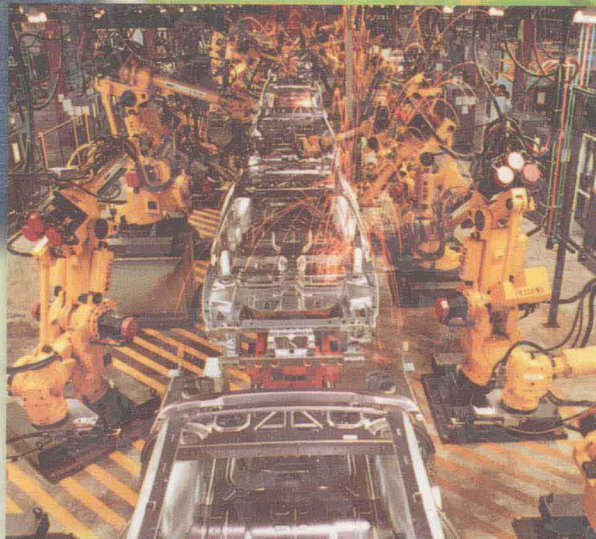
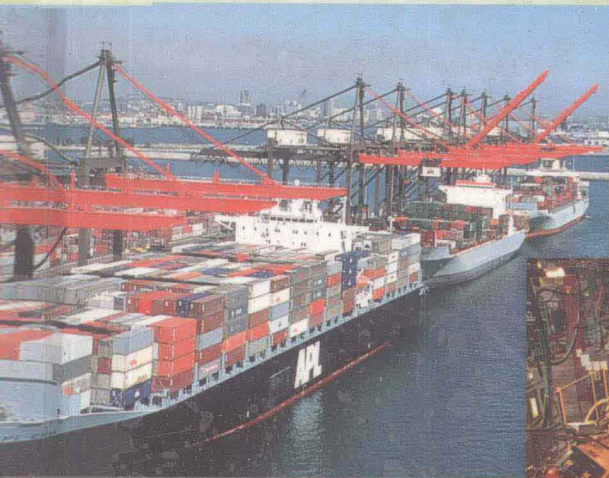
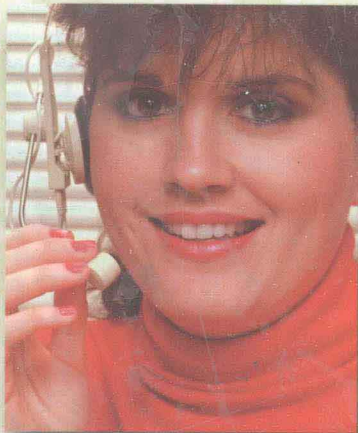


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Operations Management



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Operations Management

Seventh Edition

William J. Stevenson

Rochester Institute of Technology



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Preface

The material in this book is intended as an introduction to the field of operations management. It is suitable for both undergraduate and graduate students. The field of operations management is dynamic, and very much a part of many of the good things that are happening in business organizations. The book is intended to be interesting and informative. Much of what you learn will have practical application.

The subject matter represents a blend of concepts from industrial engineering, cost accounting, general management, quantitative methods, and statistics. Operations activities, such as forecasting, choosing a location for an office or plant, allocating resources, designing products and services, scheduling activities, and assuring and improving quality are core activities and often strategic issues in business organizations. Some of you are or will be employed directly in these areas, while others will have jobs that are indirectly related to this area. So whether this is your field of study or not, knowledge of this field will certainly benefit you and the organization you work for.

The text contains more material than one could normally hope to cover in a one-semester course. Rather than rely on the author's personal bias, each instructor can choose those topics most suited to his or her own proclivities. Those who prefer an analytic quantitative emphasis, for example, will be quite comfortable with the abundance of examples and student problems. Those who prefer a more qualitative approach will welcome the fact that some of the more quantitative material is placed in chapter supplements and that there are memo exercises, operations tours, and cases for assignment. Obviously, there are many possibilities between these two extremes.

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I would also like to thank all of the reviewers of previous editions for their valuable contributions to the success of this book.

Many students and instructors offered valuable suggestions, and I want to thank them as well. And, Ceyhun Ozgur and Phil F. Musa did a great job of accuracy checking.

I would also like to thank the authors of the various CD-ROM supplements and stand-alone supplements that are designed to accompany the textbook. Lee Tangedahl developed the spreadsheet templates; Mehdi Kaighobadi put together the data files; Ceyhun Ozgur updated the Instructor's Manual; Ralph Butler developed Powerpoint presentations; Seung Lae Kim updated the Test Bank and the computerized test bank; and Paul Van Ness coauthored the Study Guide.

Finally, I want to extend my thanks to all of the people at McGraw-Hill/Irwin for their efforts and support. It is always a pleasure to work with such a competent and professional group of people. Special thank yous go to Dick Hercher, Wanda Zeman, Jean Lou Hess, and Cathy Tepper.

William J. Stevenson

Note to the Student

The material in this text is part of the core knowledge in your education. Consequently, you will derive considerable benefit from your study of operations management, *regardless of your major*. Practically speaking, operations is a course in *management*.

This book describes principles and concepts of operations management. You should be aware that many of these principles and concepts are applicable to other aspects of your professional and personal life. Consequently, you should expect the benefits of your study of operations management to serve you in those other areas as well.

Some students approach this course with apprehension, and perhaps even some negative feelings. It may be that they have heard that the course contains a certain amount of quantitative material which they may feel uncomfortable with, or that the subject matter is dreary, or that the course is about “factory management.” This is unfortunate, because the subject matter of this book is interesting and vital for all business students. While it is true that some of the material is quantitative, numerous examples, solved problems, and answers at the back of the book will help you with the quantitative material. As for “factory management,” there is material on manufacturing as well as on services. Manufacturing is important, and something that you should know about for a number of reasons. Look around you. Most of the “things” you see were manufactured: cars, trucks, planes, clothing, shoes, computers, books, pens and pencils, desks, and cell phones. And these are just the tip of the iceberg. So it makes sense to know something about how these sorts of things are produced. Beyond all that is the fact that manufacturing is largely responsible for the high standard of living people have in industrialized countries.

After reading each chapter or supplement in the text, attending related classroom lectures, and completing as-

signed questions and problems, you should be able to do each of the following:

1. *Identify the key features* of that material.
2. *Define and use terminology*.
3. *Solve typical problems*.
4. *Recognize applications* of the concepts and techniques covered.
5. *Discuss the subject matter* in some depth, including its relevance, managerial considerations, and advantages and limitations.

You will encounter a number of chapter supplements. Check with your instructor to determine whether or not to study them.

This book places an emphasis on problem solving. There are many examples throughout the text illustrating solutions. In addition, at the end of most chapters and supplements you will find a group of solved problems. The examples within the chapter itself serve to illustrate concepts and techniques. Too much detail at those points would be counterproductive. Yet, later on, when you begin to solve the end-of-chapter problems, you will find the solved problems quite helpful. Moreover, those solved problems usually illustrate more and different details than the problems within the chapter.

I suggest the following approach to increase your chances of getting an “A” in this course:

1. Look over the chapter outline and learning objectives.
2. Read the chapter summary, and then skim the chapter.
3. Read the chapter and take notes using the study questions on the CD-ROM.
4. Look over and try to answer the discussion and review questions.

5. Solve the problems, referring to the solved problems and chapter examples as needed.
6. Take the quizzes on the CD.

Note that the answers to many problems are given at the end of the book. Try to solve each problem before turning to the answer. Remember—tests don't come with answers.

A study guide is also available. It includes a list of key ideas, study tips, glossaries, sample quizzes with answers, and problems with solutions. If your bookstore does not stock it, you can ask them to order it for you.

Enjoy!

W.J.S.

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PART ONE

Introduction

Chapter 1 introduces you to the field of operations management. It describes the nature and scope of operations management, and how operations management relates to other parts of the organization. Among the important topics it covers are the different types of operations systems, a comparison of manufacturing and service operations, a brief history of operations management, and a list of trends in business that relate to operations. After you have read this chapter, you will have a good understanding of what the operations

function of a business organization encompasses.

Chapter 2 discusses operations management in a broader context, and presents the issues of competition, strategy, and productivity. After you have read Chapter 2, you will understand the importance of the operations function relative to the goals of a business organization. This chapter also describes time-based strategies, which many organizations are now adopting as they seek to become more competitive and to better serve their customers.

Introduction to operations management includes two chapters:

- 1** Introduction to operations management, Chapter 1
- 2** Competitiveness, strategy, and productivity, Chapter 2



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LEARNING OBJECTIVES

After completing this chapter, you should be able to:

- 1** Define the term *operations management*.
- 2** Identify the three major functional areas of organizations and describe how they interrelate.
- 3** Describe the operations function and the nature of the operations manager's job.
- 4** Differentiate between design and operation of production systems.
- 5** Provide a general description of the different types of operations.
- 6** Compare and contrast service and manufacturing operations.
- 7** Briefly describe the historical evolution of operations management.
- 8** Describe the key aspects of operations management decision making.
- 9** Identify some of the current trends in business that impact operations management.