

# STUDENT WORKBOOK

CENGİZ HAKSEVER • BARRY RENDER

## SERVICE MANAGEMENT



An Integrated Approach to Supply Chain  
Management and Operations

# **SERVICE MANAGEMENT, STUDENT WORKBOOK**

*This page intentionally left blank*

# SERVICE MANAGEMENT, STUDENT WORKBOOK

AN INTEGRATED APPROACH  
TO SUPPLY CHAIN MANAGEMENT  
AND OPERATIONS

Cengiz Haksever  
Barry Render

Vice President, Publisher: Tim Moore  
Associate Publisher and Director of Marketing: Amy Neidlinger  
Executive Editor: Jeanne Glasser  
Editorial Assistant: Pamela Boland  
Operations Specialist: Jodi Kemper  
Marketing Manager: Megan Graue  
Cover Designer: Alan Clements  
Managing Editor: Kristy Hart  
Project Editor: Betsy Gratner  
Copy Editor: Apostrophe Editing Services  
Proofreader: Debbie Williams  
Senior Compositor: Gloria Schurick  
Manufacturing Buyer: Dan Uhrig

© 2013 by Cengiz Haksever and Barry Render  
Published by Pearson Education, Inc.  
Publishing as FT Press  
Upper Saddle River, New Jersey 07458

FT Press offers excellent discounts on this book when ordered in quantity for bulk purchases or special sales. For more information, please contact U.S. Corporate and Government Sales, 1-800-382-3419, [corpsales@pearsoned.com](mailto:corpsales@pearsoned.com). For sales outside the U.S., please contact International Sales at [international@pearsoned.com](mailto:international@pearsoned.com).

Company and product names mentioned herein are the trademarks or registered trademarks of their respective owners.

All rights reserved. No part of this book may be reproduced, in any form or by any means, without permission in writing from the publisher.

Printed in the United States of America

First Printing June 2013

ISBN-10: 0-13-308885-5

ISBN-13: 978-0-13-308885-4

Pearson Education LTD.  
Pearson Education Australia PTY, Limited.  
Pearson Education Singapore, Pte. Ltd.  
Pearson Education Asia, Ltd.  
Pearson Education Canada, Ltd.  
Pearson Educación de México, S.A. de C.V.  
Pearson Education—Japan  
Pearson Education Malaysia, Pte. Ltd.

*This book is dedicated to  
Fulya —CH  
and to  
Donna, Charlie, and Jesse —BR*

*This page intentionally left blank*

---

# CONTENTS

---

## Part I: Understanding Services

### 1

THE IMPORTANT ROLE SERVICES PLAY  
IN AN ECONOMY 1

### 2

THE NATURE OF SERVICES AND  
SERVICE ENCOUNTERS 5

### 3

CUSTOMERS: THE FOCUS OF  
SERVICE MANAGEMENT 9

### 4

GLOBALIZATION OF SERVICES 13

### 5

SERVICE STRATEGY AND COMPETITIVENESS 15

### 6

ETHICAL CHALLENGES IN  
SERVICE MANAGEMENT 19



## **Part II: Building the Service System**

### **7**

TECHNOLOGY AND ITS IMPACT ON SERVICES  
AND THEIR MANAGEMENT 23

### **8**

DESIGN AND DEVELOPMENT OF SERVICES  
AND SERVICE DELIVERY SYSTEMS 27

### **9**

SUPPLY CHAINS IN SERVICES AND  
THEIR MANAGEMENT 31

### **10**

LOCATING FACILITIES AND  
DESIGNING THEIR LAYOUT 33

## **Part III: Operating the Service System**

### **11**

MANAGING DEMAND AND SUPPLY IN SERVICES 43

### **11 Supplement**

QUEUEING AND SIMULATION 47

### **12**

SERVICE QUALITY AND  
CONTINUOUS IMPROVEMENT 55

**12 Supplement**  
TOOLS AND TECHNIQUES  
OF TOTAL QUALITY MANAGEMENT 57

**13**  
SERVICE PRODUCTIVITY AND MEASUREMENT  
OF PERFORMANCE 61

**14**  
MANAGEMENT OF PUBLIC AND PRIVATE NONPROFIT  
SERVICE ORGANIZATIONS 67

**Part IV: Tools and Techniques for  
Managing Service Operations**

**15**  
FORECASTING DEMAND FOR SERVICES 71

**16**  
VEHICLE ROUTING AND SCHEDULING 81

**17**  
PROJECT MANAGEMENT 87

**18**  
LINEAR AND GOAL PROGRAMMING  
APPLICATIONS FOR SERVICES 95

# 19

SERVICE INVENTORY SYSTEMS 105

## Appendix A

AREAS UNDER THE STANDARD  
NORMAL CURVE 109

## Appendix B

ANSWERS TO SELECTED  
PROBLEMS 113

# ABOUT THE AUTHORS

---

**Cengiz Haksever** is a Professor of Management Sciences at the College of Business Administration of Rider University. He received his B.S. and M.S. degrees in Industrial Engineering from Middle East Technical University in Ankara, Turkey, his M.B.A. from Texas A & M University in College Station, Texas, and his Ph.D. in Operations Research from the University of Texas in Austin.

His research interests include service management, supply chain management, operations research, operations management, quality and continuous improvement, and data envelopment analysis. Dr. Haksever's work appeared in *European Journal of Operational Research*, *Journal of the Operational Research Society*, *Computers & Operations Research*, *Computers & Industrial Engineering*, *Journal of Construction Engineering and Management*, *International Journal of Production Economics*, *Journal of Small Business Strategy*, *Journal of Business Ethics*, *Education Economics*, *International Journal of Production Economics*, *International Journal of Information and Management Sciences*, and *Business Horizons*.

He has taught courses in operations management, supply chain management, service operations management, management science, quality assurance, statistics, and regression in undergraduate and M.B.A. programs. He served as examiner and senior examiner for the New Jersey Governor's Award for Performance Excellence. During the 1993–1994 academic year, he was a Fulbright Senior Lecturer at Marmara University in Istanbul, Turkey. At Rider University, he was awarded the Jessie H. Harper Professorship for the academic year of 2000–2001. Dr. Haksever served on the Editorial Advisory Board of *Computers & Operations Research* and was a guest editor of a special issue of the journal *Data Envelopment Analysis*.

**Barry Render** is Professor Emeritus, the Charles Harwood Professor of Operations Management, Crummer Graduate School of Business, Rollins College, Winter Park, Florida. He received his B.S. in Mathematics and Physics at Roosevelt University and his M.S. in Operations Research and Ph.D. in Quantitative Analysis at the University of Cincinnati. He previously taught at George Washington University, University of New Orleans, Boston University, and George Mason University, where he held the Mason Foundation Professorship in Decision Sciences and was Chair of the Decision Sciences Department. Dr. Render has also worked in the aerospace industry for General Electric, McDonnell Douglas, and NASA.

Professor Render has coauthored 10 textbooks for Prentice Hall, including *Managerial Decision Modeling with Spreadsheets*, *Quantitative Analysis for Management*, *Service Management*, *Introduction to Management Science*, and *Cases and Readings in Management Science*. *Quantitative Analysis for Management*, now in its eleventh edition, is a leading text in that discipline in the United States and globally. Dr. Render's more than 100 articles on a variety of management topics have appeared in *Decision Sciences*, *Production and Operations Management*,

*Interfaces, Information and Management, Journal of Management Information Systems, Socio-Economic Planning Sciences, IIE Solutions, and Operations Management Review*, among others.

Dr. Render has been honored as an AACSB Fellow and was twice named a Senior Fulbright Scholar. He was Vice President of the Decision Science Institute Southeast Region and served as Software Review Editor for *Decision Line* for six years and as Editor of *The New York Times* Operations Management special issues for five years. From 1984 to 1993, Dr. Render was President of Management Service Associates of Virginia, Inc., whose technology clients included the FBI, the U.S. Navy, Fairfax County, Virginia, and C&P Telephone. He is currently Consulting Editor to *Financial Times Press*.

Dr. Render has taught operations management courses in Rollins College's M.B.A. and Executive M.B.A. programs. He has received that school's Welsh Award as leading professor and was selected by Roosevelt University as the 1996 recipient of the St. Claire Drake Award for Outstanding Scholarship. In 2005, Dr. Render received the Rollins College M.B.A. Student Award for Best Overall Course and in 2009 was named Professor of the Year by full-time M.B.A. students.

# THE IMPORTANT ROLE SERVICES PLAY IN AN ECONOMY

---

## 1.5 Overview of the Book

This book covers a wide range of issues in managing service organizations and their operations. It focuses on creating value and customer satisfaction. Therefore, the book is designed to provide a comprehensive coverage of topics relevant to that end. Its content is quite different from traditional operations management textbooks; although some of the topics covered in those books are included. The discussions draw upon the knowledge and experience of various areas of business and on disciplines other than business. For example, discussions frequently rely on the theory and practice of strategy, marketing, international management, human resources, management science, economics, psychology, and sociology. Hopefully, this multidisciplinary and cross-functional approach helps managers and future managers develop a well-rounded and solid understanding of the complexities of services and their management.

The book is organized in four parts. Part I, Chapters 1–6, begins with this introduction and focuses on developing an in-depth understanding of services. Chapter 2 discusses the nature of services and service encounters. Chapter 3 examines customers and their needs, and factors that influence their decisions in services purchasing. Chapter 4 discusses the globalization of services and forms of globalization. Chapter 5 deals with the issues concerning value creation and service strategy. Finally, Chapter 6 contains a discussion of ethical issues in business in general and in service management in particular and ethical challenges managers face.

Part II covers topics relevant to developing service systems. Building a competitive service system that creates value and customer satisfaction requires the effective use of certain inputs. These inputs are technology (Chapter 7), service design and development (Chapter 8), service supply

chains (Chapter 9), the selection of an appropriate site for a service facility, and the design of its layout (Chapter 10).

Part III is devoted to topics that are crucial to managers for operating a service system effectively and efficiently. Topics covered in this part include managing demand and supply (Chapter 11), service quality and continuous improvement (Chapter 12), and service productivity and measurement of performance (Chapter 13). Chapter 14 includes a brief study of the management of public and nonprofit service organizations because these organizations play an increasingly important role in our economic and social life.

Part IV presents various quantitative tools and techniques for managing service operations. This part contains chapters discussing some of the most powerful and widely used quantitative techniques in managing operations of both manufacturing and service organizations. Chapter 15 discusses forecasting. Chapter 16 focuses on techniques to optimize decisions in routing vehicles. Project management is discussed in Chapter 17 and linear and goal programming is discussed in Chapter 18. Chapter 19, the final chapter of this part, covers inventory systems for service operations.

## 1.6 Summary of the Chapter

This chapter examined the concept of services from a macro viewpoint. Definitions of service and service economies are presented, as well as the importance of services in modern societies. It discussed the important role services play in the U.S. economy for employment, gross domestic product, number of business starts, international trade, and contributions to manufacturing. It then considered the theories explaining why services grew so much in the economies of industrial nations in the second half of the twentieth century. Theories concerning the three types of production, primary, secondary, and tertiary industries and how societies may migrate from one dominant form of production to the next also are discussed.

## Discussion Questions

1. Why is it difficult to define a service? What is meant by the term **facilitating good**?
2. Discuss why the service sector is important to the U.S. economy.
3. What are the primary, secondary, and tertiary industries?
4. What are the characteristics of a preindustrial society?
5. What are the characteristics of an industrial society?
6. What are the characteristics of a postindustrial society?
7. Why do service economies necessarily follow industrial economies?
8. What things indicate that the United States has become a service economy?

9. What is happening in other countries? Is Japan, for example, also becoming a primarily service economy?
10. “There are no such things as service industries...only industries whose service components are greater or less than those of other industries.” Explain this statement. Do you agree or disagree?



*This page intentionally left blank*