CENGIZ HAKSEVER · BARRY RENDER

SERVICE MANAGEMENT

An Integrated Approach to Supply Chain Management and Operations

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AN INTEGRATED APPROACH TO SUPPLY CHAIN MANAGEMENT AND OPERATIONS

Cengiz Haksever
Barry Render

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© 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@pearsontechgroup.com. For sales outside the U.S., please contact International Sales at international@pearsoned.com.

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Printed in the United States of America

First Printing June 2013 with corrections September 2013

ISBN-10: 0-13-308877-4
ISBN-13: 978-0-13-308877-9

Pearson Education LTD.
Pearson Education Australia PTY, Limited.
Pearson Education Singapore, Pte. Ltd.
Pearson Education Asia, Ltd.
Pearson Education Canada, Ltd.
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Library of Congress Cataloging-in-Publication Data

Haksever, Cengiz.
Service management : an integrated approach to supply chain management and operations / Cengiz Haksever, Barry Render. — 1 Edition.
pages cm
ISBN-13: 978-0-13-308877-9 (hardcover : alk. paper)
ISBN-10: 0-13-308877-4
1. Service industries—Management. 2. Business logistics. I. Render, Barry. II. Title.
HD9980.5.H345 2013
658—dc23

2013001438

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

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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*.

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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*.

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PREFACE

This book has been written to serve as a resource and reference book for professionals in service organizations. This text has been written from a multidisciplinary perspective. Discussions of topics blend concepts, theory, and practice from fields such as operations, marketing, international management, economics, strategy, psychology, human resources, and management science. The authors believe a multidisciplinary approach is best for efficient and effective management of service organizations and their operations.

The book can also be used as a textbook for college-level courses such as Service Management or Service Operations Management with its companion textbook. Although Parts I and II present nonquantitative material, Parts III and IV present both quantitative and nonquantitative material that can be used for efficient and effective management of service operations. Because of this, it is suitable for a service management course with or without quantitative orientation. It is also suitable for a traditional operations management course with special emphasis on services.

Part I, "Understanding Services," consists of Chapters 1 through 6 and focuses on *understanding services.* It introduces the reader to the service concept and provides background material in several important areas. Chapter 1, "The Important Role Services Play in an Economy," addresses the role of services in our society. Chapter 2, "The Nature of Services and Service Encounters," discusses characteristics of services and examines the importance of the service encounter. Chapter 3, "Customers: The Focus of Service Management," focuses on customers as consumers of services and their needs and motives as they impact service purchase decisions. Chapter 4, "Globalization of Services," provides an international perspective on services and discusses the challenges of globalization. Chapter 5, "Service Strategy and Competitiveness," prepares the groundwork for the three themes of quality, customer satisfaction, and value creation, and focuses on the impact of strategy on competitiveness. Chapter 6, "Ethical Challenges in Service Management," explores ethical issues and challenges managers, in general, and service managers in particular, face.

The emphasis of Part II, "Building the Service System," is on *building the system to create customer value and satisfaction* with superior quality services. Chapter 7, "Technology and Its Impact on Services and Their Management," focuses on the role technology plays in service management. Chapter 8, "Design and Development of Services and Service Delivery Systems," lays out the principles of service design and discusses the application of techniques that have been successfully used in manufacturing to build quality and value into services. Chapter 9, "Supply Chains in Services and Their Management," focuses on supply chains of service organizations. This section concludes with Chapter 10, "Locating Facilities and Designing Their Layout," which discusses two other important topics in building and operating the system: facility location and layout design.

Part III, "Operating the Service System," is concerned with issues related to *operating the service system* and challenges managers of service organizations face. One of the major challenges, managing the demand for and supply of services, is the topic of Chapter 11, "Managing Demand and Supply in Services." A supplement to this chapter, "Queuing and Simulation," covers two important topics: queuing and simulation. Chapter 12, "Service Quality and Continuous Improvement," provides the basic concepts of quality in general and service quality in particular. Technical aspects of quality assurance are presented in a supplement, "Tools and Techniques of Total Quality Management." One of the biggest challenges service managers face is increasing the productivity of service employees. This important topic and approaches to increasing productivity in service organizations are discussed in Chapter 13, "Service Productivity and Measurement of Performance." Also presented is a brief discussion of Data Envelopment Analysis as a powerful tool in measuring the efficiency of service organizations. Part III concludes with Chapter 14, "Management of Public and Private Nonprofit Service Organizations," with a discussion of an important segment of the service industry: public and nonprofit service organizations. The nature of these organizations as well as the challenges their managers face is discussed.

Part IV, "Tools and Techniques for Managing Service Operations," presents the *tools and techniques for managing service operations.* Chapter 15, "Forecasting Demand for Services," Chapter 16, "Vehicle Routing and Scheduling," Chapter 17, "Project Management," Chapter 18, "Linear and Goal Programming Applications for Services," and Chapter 19, "Service Inventory Systems," are included in this section.

We would like to thank our editor Jeanne Glasser Levine for envisioning this project and her encouragement for its completion. We also thank our project editor Betsy Gratner and the professional staff of FT Press for their help with the preparation of the book for publication. Last but not the least, we hope this text helps you achieve your professional and educational objectives as a successful manager and decision maker in any service organization.

1

THE IMPORTANT ROLE SERVICES PLAY IN AN ECONOMY

1.1 Introduction

There has been a surge of interest in all aspects of service management in recent times. Many books, articles, and research papers on services and service management have appeared in popular and academic business literature starting in the 1980s and continue to be published today. The impetus for this phenomenon can be traced back to two major developments in recent history. First, the quality movement that started in the 1980s had brought most consumers, news media, and academicians to the realization that the overall quality of services in the United States was not ideal, acceptable, or competitive in the international markets. Second, the fact that services no longer formed the least important (tertiary) sector of the economy became obvious. Contrary to the once widely held view among economists, services in the second half of the twentieth century had increasingly played a significant role in the economic life in the United States and in all industrialized countries.

Growing attention paid to service quality and customer satisfaction had stirred managers of many service organizations into action. Even the executives and managers of one service conglomerate almost everyone loved to criticize, the federal government, were not immune to the mounting pressure. A lot has been done to improve quality and customer satisfaction in most service industries during the 1980s and in the twenty-first century. As a result, there have been marked improvements in the quality of many services. Nevertheless, mediocre service quality is still a fact of life in the United States and around the world. Exhibit 1-1 confirms this fact.

Exhibit 1-1 American Customer Satisfaction Index (ACSI)

	Baseline 1994	1995	2000	2005	2010	2012
Manufacturing						
Durable goods	79.2	79.8	79.4	78.9	81.3	83.0
Nondurable goods	81.6	81.2	80.8	81.8	81.3	81.9
Services						
Accommodation & food services	73.2	71.6	71.2	74.2	77.3	79.4
Transportation	70.3	71.1	70.0	72.4	73.3	73.6
Information	78.5	78.3	69.4	65.8	72.8	71.9
Finance and insurance	78.5	74.1	74.4	73.9	76.1	75.4
E-Commerce	NA	NA	75.2	79.6	79.3	80.1
E-Business	NA	NA	63.0	75.9	73.5	74.2
Energy, utilities	75.0	74.0	75.0	73.1	74.1	76.7
Retail trade	75.7	74.6	72.9	72.4	75.0	76.1†
Health care & social assistance	74.0	74.0	69.0	70.8	77.0	78.5
Public administration/government	64.3	61.9	67.0	67.1	66.9	67.0†

NA: Not Available

† 2011 survey

Source: Adapted from American Customer Satisfaction Index 1994–2012 (http://www.theacsi.org/acsi-results/acsi-results)

Exhibit 1-1 presents a summary of American Customer Satisfaction Index (ACSI) numbers for select years between 1994 and 2012. The ACSI is designed to measure the quality of goods and services as evaluated by customers. The index is based on surveys of the customers of more than 200 organizations in more than 40 industries in seven major consumption areas.[1] It measures satisfaction by asking consumers to compare their expectations of a good or service with their actual experience with it. It is clear from the data that overall customer satisfaction with goods and services has fluctuated over the years but has not changed much. Referring to Exhibit 1-1 it can be seen that customer satisfaction with accommodation and food services, transportation, e-Commerce, and e-Business have increased over the years while satisfaction with other services had ups-and-downs. Actually, Information, Finance and Insurance, and Utilities declined from their baseline levels. Over the years, satisfaction with government services has been consistently the lowest of all services.

Perhaps the most important revelation of the ACSI data is that no service in the recent past has had a customer satisfaction index equal to those for goods. It is not certain if an index of 100 percent satisfaction will ever be achieved, or if that is even possible, in any industry. However, it is clear that both private and public service organizations have a long way to go, and managers of these organizations face a tremendous challenge. Will they rise to the challenge and raise customer satisfaction with services to the same levels attained by manufacturers, or possibly surpass them? We certainly hope so! This book is written with the hope that it can help managers of service organizations develop strategies and practices to do so. Chapter 1 begins by defining services and exploring the role of services in our society.

1.2 What Are Services?

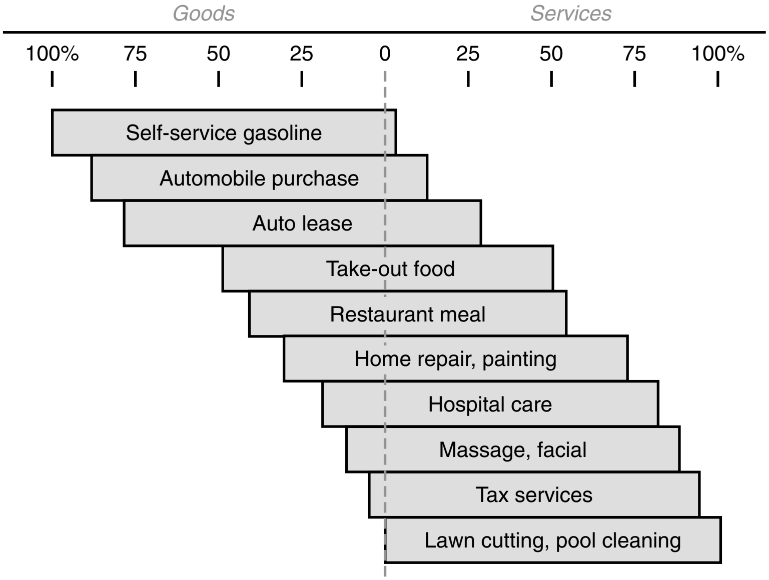
The material gains of a society are achieved by adding value to natural resources. In advanced societies, there are many organizations that extract raw materials, add value through processing them, and transform intermediate materials and components into finished products. There are, however, other organizations that facilitate the production and distribution of goods, and organizations that add value to lives through a variety of intangibles they provide. Outputs of this latter group are called **services**.

Services can be defined as economic activities that produce time, place, form, or psychological utilities. Services are acts, deeds, or performances; they are intangible. A maid service saves the consumer **time** from doing household chores. Department stores and grocery stores provide many commodities for sale in one convenient **place**. A database service puts together information in a **form** more usable for the manager. A "night out" at a restaurant or movie provides **psychological** refreshment in the middle of a busy workweek.

Services also can be defined in contrast to goods. A **good** is a tangible object that can be created and sold or used later. A **service** is intangible and perishable. It is created and consumed simultaneously (or nearly simultaneously). Although these definitions may seem straightforward, the distinction between goods and services is not always clear-cut. For example, when we purchase a car, are we purchasing a good or the service of transportation? A television set is a manufactured good, but what use is it without the service of television broadcasting? When we go to a fast-food restaurant, are we buying the service of having our food prepared for us or are we buying goods that happen to be ready-to-eat food items?

In reality, almost all purchases of goods are accompanied by **facilitating services**, and almost every service purchase is accompanied by **facilitating goods**. Thus the key to understanding the difference between goods and services lies in the realization that these items are not completely distinct, but rather are two poles on a continuum. Exhibit 1-2 shows such a continuum.

Exhibit 1-2 A Comparison of Various Goods and Services



Source: Based on Earl W. Sasser, Jr., R.P. Olsen, and D. Daryl Wyckoff, *Management of Service Operations* (Boston, Allyn and Bacon, 1978), p.11.

Referring to Exhibit 1-2, one would probably classify the first three items as "goods" because of their high-material content. There is little service in purchasing self-service gasoline; an automobile is mostly a physical item; and although its lease does require some service, a leased car is a good. Take-out food can be considered as consisting of half good and half service. One would probably classify the remaining items as "services" because of their high-service content; although, some physical materials may be received. For instance, restaurants not only give the customer a meal of physical food and drink, but also a place to eat it, chefs to prepare it, waiters to serve it, and an atmosphere in which to dine. Tax preparation is almost pure service, with little material goods (most tax returns are now filed electronically) received by the consumer.

1.3 The Service Sector of the U.S. Economy

From a macro viewpoint, an economy may be divided into three different sectors for study: the extractive sector, which includes mining and agriculture; the goods producing sector, which includes manufacturing and construction; and the service sector. The service sector has a tremendous impact on the U.S. economy. The next five headings discuss this impact.

Employment—The role services play in terms of employment is the easiest to illustrate. The U.S. economy today is characterized as a "service economy." This is because the majority of the working population is employed in the service sector. Trend analyst John Naisbitt made the following observation: "In 1956, for the first time in American history, white-collar workers in technical, managerial, and clerical positions outnumbered blue-collar workers. Industrial America was giving way to a new society, where, for the first time in history, most of us worked with information rather than producing goods."[2] The share of the service jobs grew steadily to 76 percent by the mid-1990s, and as indicated in Exhibit 1-3, it had reached 84 percent by 2010. In other words, anyone who is planning to enter the workforce today has about an 84 percent chance that she'll be working in a service organization. Exhibit 1-4 illustrates the dramatic increase in service jobs since 1970.

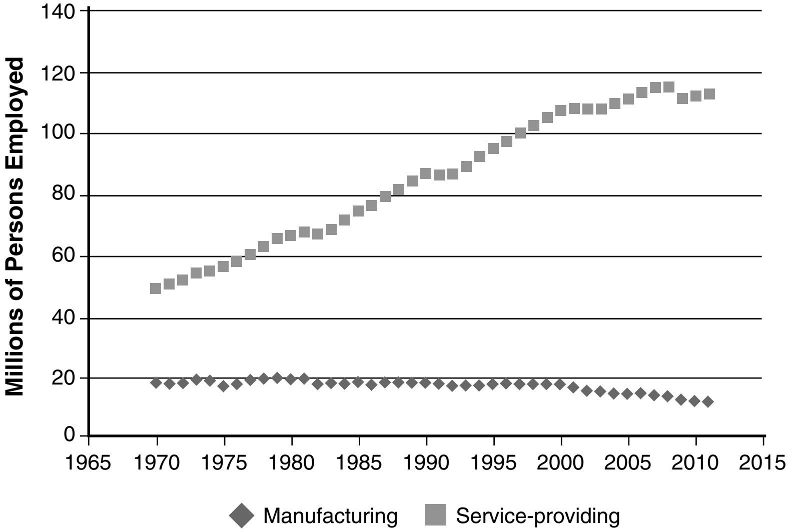
Exhibit 1-3 U.S. Employment by Industry (Millions)

	1970		1980		1990		2000		2010	
Extraction	*4.14*	*6%*	*4.44*	*5%*	*3.99*	*4%*	*4.35*	*3%*	*4.17*	*3%*
Agriculture	3.46		3.36		3.22		3.75		3.42	
Mining and logging	0.68		1.08		0.77		0.6		0.75	
Goods producing	*21.5*	*30%*	*23.18*	*25%*	*22.96*	*20%*	*24.06*	*18%*	*17.04*	*13%*
Construction	3.65		4.45		5.26		6.79		5.52	
Durable goods	10.76		11.68		10.74		10.88		7.06	
Nondurable goods	7.09		7.05		6.96		6.39		4.46	
Service providing	*46.1*	*64%*	*66.26*	*70%*	*85.77*	*76%*	*107.1*	*79%*	*112.12*	*84%*
Wholesale trade	3.42		4.56		5.27		5.93		5.45	
Retail trade	7.46		10.24		13.18		15.28		14.44	
Utilities	0.54		0.65		0.74		0.6		0.55	
Transportation and warehousing	NA		2.96		3.48		4.41		4.19	
Information	2.04		2.36		2.69		3.63		2.71	
Financial activities	3.53		5.03		6.61		7.69		7.65	
Professional and business services	5.27		7.54		10.85		16.67		16.73	
Education and health services	4.58		7.07		10.98		15.11		19.53	
Leisure and hospitality	4.79		6.72		9.29		11.86		13.05	
Other services	1.79		2.75		4.26		5.17		5.33	
Government (Federal, state, and local)	12.69		16.38		18.42		20.79		22.49	
Total employed	**71.74**	**100%**	**93.88**	**100%**	**112.7**	**100%**	**135.6**	**100%**	**133.33**	**100%**

Source: Bureau of Labor Statistics, Employment, Hours, and Earnings from the Current Employment Statistics survey (National), http://data.bls.gov/cgi-bin/surveymost?ce (Accessed on 07/5/12).

Gross domestic product—Gross domestic product (GDP) is the total output of goods and services produced in the United States, valued at market prices. In other words, GDP represents the total value of goods and services attributable to labor and resources located in the United States. Services will be producing more than 82 percent of GDP in the years ahead. Exhibit 1-5 presents data on the breakdown of GDP and change in its composition since 1970. It is clear from this exhibit that service sector produces most of the value in our economy. This does not imply that manufacturing will eventually disappear or become unimportant, but it does indicate that more of the economic activity will be in the service sector. As shown in Exhibits 1-5 and 1-6, the share of GDP in extraction industries has been hovering above an average of approximately 2.5 percent in the last three decades. The share of goods production, however, has steadily declined to 15 percent in 2010 from a high of 27 percent in 1970.

Exhibit 1-4 How Jobs in the Service Sector Have Soared



Source: Bureau of Labor Statistics, Employment, Hours, and Earnings from the Current Employment Statistics survey (National), http://data.bls.gov/cgi-bin/surveymost?ce (Accessed on 07/5/12).

Exhibit 1-5 U.S. Gross Domestic Product by Industry (in Billions of Dollars)

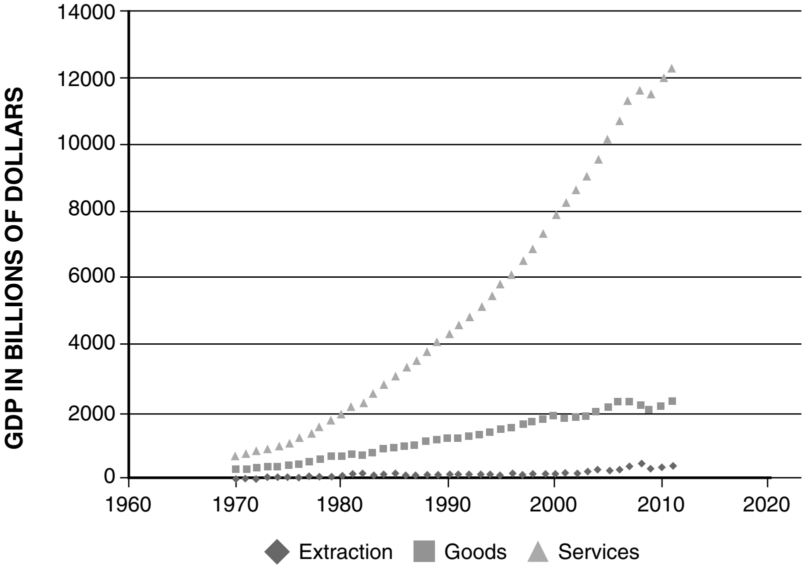
	1970		1980		1990		2000		2010	
Extraction	*42.4*	*4%*	*152.9*	*5%*	*184.1*	*3%*	*204.5*	*2%*	*396.5*	*3%*
Agriculture, forestry, fishing, and hunting	27.3		62.1		95.7		95.6		157	
Mining	15.1		90.8		88.4		108.9		239.5	
Goods producing	*285.1*	*27%*	*689.8*	*25%*	*1212.5*	*21%*	*1882.9*	*19%*	*2213.5*	*15%*
Construction	49.5		131.5		243.6		467.3		511.6	
Manufacturing	235.6		558.3		968.9		1415.6		1701.9	
Service producing	*711.0*	*69%*	*1945.3*	*70%*	*4404.1*	*76%*	*7864.1*	*79%*	*11916.5*	*82%*
Wholesale trade	67.7		186.3		347.7		617.7		797.3	
Retail trade	83		198.3		400.4		686.2		884.9	
Utilities	21.7		61		145.5		173.9		264.9	
Transportation and warehousing	40.2		102.6		172.8		301.4		402.5	
Information	37.4		108.3		235.6		417.8		623.5	
Finance, insurance, real estate, rental, and leasing	152.8		446.8		1049.2		1997.7		3007.2	
Professional and business services	52		173.1		516.5		1116.8		1782.8	
Educational services, health care, and social assistance	40.3		134.1		376.7		678		1272.3	
Arts, entertainment, recreation, accommodation, and food services	29.8		83		199.6		381.6		555.8	
Other services, except government	27.8		68.5		153.9		277.6		356.8	
Government	158.3		383.3		806.2		1215.4		1968.5	
Total Gross domestic product (*)	**1038.3**	**100%**	**2788.1**	**100%**	**5800.5**	**100%**	**9951.5**	**100%**	**14526.5**	**100%**

*Sum of extraction, goods producing, and service producing may not be equal to totals due to rounding.

Source: Bureau of Economic Analysis, “GDP by Industry.” http://bea.gov/iTable/iTable.cfm?ReqID=5&step=1 (07-06-2012)

Number of business starts—Some of the new jobs are created in the existing organizations as they grow, but others are created when new companies are established. The service sector is where most new companies are formed. About 73 percent of all new private businesses are service companies. In other words, the service sector is "where the action is" and where entrepreneurial spirit is most vigorous.

Exhibit 1-6 Changes in Major Components of GDP over the Years 1970–2011



Source: Bureau of Economic Analysis, "GDP by Industry."
http://bea.gov/iTable/iTable.cfm?ReqID=5&step=1 (07-06-2012)

International trade—Services also play an important role in the U.S. international trade. During the 1960s and 1970s, service exports constituted approximately 22 percent of the U.S. exports. However, in the 2000s the service exports have reached approximately 30 percent of the total exports. The United States also imports services from abroad; currently, approximately 20 percent of the imports are services. The most important fact, however, is that the service exports consistently exceeded service imports since 1971. In other words, services exported bring more revenue than what is paid to other nations for their services. The U.S. has had a negative trade balance every year since 1976. That is, what we paid to other countries for goods and services we bought from them exceeded what we received from them for the goods and services we sold to them. Exhibit 1-7 provides international trade balance data from the recent past. As can be seen from this exhibit, the trade deficit would have been much bigger if it weren't for the surplus in service trade.

Exhibit 1-7 U.S. Trade Balance (Billions of Dollars)

Year	Total	Goods	Services
1960	3.51	4.89	–1.38
1970	3.90	2.58	–0.35
1980	–19.41	–25.50	6.09
1990	–80.87	–111.04	30.17
2000	–376.75	–445.79	69.04
2010	–516.90	–645.12	150.39

Source: Bureau of Economic Analysis, Table 1 U.S. International Transactions, http://www.bea.gov/international/xls/table1.xls (07/10/2012).

Contributions to manufacturing—Although we customarily divide the economy into three sectors, these sectors are not wholly independent of each other. The relationship between manufacturing and services is the strongest; one cannot exist without the other. Some services would not exist if not for goods. For example, automobile repair service would not exist without cars. Similarly, some goods would not exist without the existence of services. For example, stadiums would not be built if there were no football, baseball, or soccer to be played in them; or there would be no drugs to cure illnesses without research and development services.

The relationship between manufacturing and services goes much beyond this simple relationship in which one uses the output of the other. Most manufacturing companies would not produce goods without the support of numerous services. Some of these services are commonly provided internally, such as accounting, design, advertising, and legal services. Other services are provided by outside vendors in areas such as banking, telecommunication, transportation, and police and fire protection.

1.4 Theories Explaining the Growth of Services

Economists have been studying the reasons for the growth of services for many years. An early contribution to this line of inquiry was by A.G.B. Fisher who introduced the concept of primary, secondary, and tertiary industries.[3] Primary production was defined as agriculture, pastoral production, fishing, forestry, hunting, and mining. Secondary production consisted of manufacturing and construction. Some authors included mining in this category. Finally, tertiary production was composed of transportation, communications, trade, government, and personal services. Fisher suggested that an economy can be characterized with respect to the proportion of its labor force employed in these sectors. He also argued that as income rises demand shifts from the primary to secondary and then to tertiary sectors. Sociologist Daniel Bell described the development of human societies in three general stages.[4]

Preindustrial society—The dominant characteristic of economic activity in pre-industrial society is extractive, that is, agriculture, fishing, forestry, and mining. Life is primarily a game against nature. The level of technology is low or nonexistent; people are dependent on raw muscle power to survive, and therefore the productivity is low. Their success is largely dependent on the elements: the seasons, the rain, and the nature of the soil. The social life is organized around the family and extended household. Because of low productivity and large population, there is significant underemployment, which is resident in both the agricultural and domestic-service sectors. Because most people in this society struggle not to starve, they often seek only enough to feed themselves. Thus there is a large number of people employed or available to be employed in personal or household services (see Exhibit 1-8).

Exhibit 1-8 Preindustrial Society

Economic Sector	Occupational Scope	Technology	Design	Methodology	Time Perspective	Axial Principle
PRIMARY: EXTRACTIVE ■ Agriculture ■ Mining ■ Fishing ■ Timber	■ Farmer ■ Miner ■ Fisherman ■ Unskilled	■ Primitive ■ Raw materials	■ Game against nature	■ Common sense and experience	■ Orientation to the past ■ Ad hoc responses	■ Traditional ■ Limited resources

Source: Adapted from Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting* (New York, Basic Books, 1973), p. 117.

Industrial society—The dominant characteristic of economic activity in industrial society is goods production. Life is a game against fabricated nature. Economic and social life has become mechanized and more efficient. Machines and the energy that powers them dominate production; they have replaced muscle power. Productivity has increased tremendously; the art of making more with less is valued. The economic watchwords are maximization and optimization. Division of labor is further extended. Technological advancements lead to new, faster, and more specialized machines that constantly improve productivity and replace more workers. The workplace is where men, women, materials, and machines are organized for efficient production and distribution of goods. It is a world of planning and scheduling in which components for production are brought together at the right time and in the right proportions to speed the flow of goods. The workplace is also a world of organization based on bureaucracy and hierarchy. People are treated as "things" because it is easier to coordinate things than people. The unit of social life is the individual in a free market society. Quantity of goods possessed by an individual is an indicator of his standard of living (see Exhibit 1-9).

Exhibit 1-9 Industrial Society

Economic Sector	Occupational Scope	Technology	Design	Methodology	Time Perspective	Axial Principle
SECONDARY: ■ Goods producing ■ Manufacturing	■ Semiskilled worker ■ Engineer	■ Energy	■ Game against fabricated nature	■ Empiricism ■ Experimentation	■ Ad hoc adaptiveness ■ Projections	■ Economic growth: State or private control of investment decisions

Source: Adapted from Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting* (New York, Basic Books, 1973), p. 117.

Postindustrial society—The dominant characteristic of economic activity in postindustrial society is service production. Life is now a game between persons. What matters now is not muscle or machine power or energy, but information and knowledge. The central character of economic life is the professional. She possesses the kinds of skills and knowledge increasingly demanded in this society. This demand for increased technical knowledge and skills in the workplace makes higher education a prerequisite to entry into postindustrial society and good life. The quantity and quality of services such as health, education, and recreation that an individual can afford are indicators of his standard of living. Citizens' demand for more services such as healthcare, education, arts, and so on and the inadequacy of the market mechanism in meeting these demands lead to the growth of government, especially at the state and local level (see Exhibit 1-10).

Exhibit 1-10 Postindustrial Society

Economic Sector	Occupational Scope	Technology	Design	Methodology	Time Perspective	Axial Principle
TERTIARY: ■ Transportation ■ Recreation						
QUATERNARY: ■ Trade ■ Finance ■ Insurance ■ Real estate	■ Professional and technical ■ Scientists	■ Information	■ Game between persons	■ Abstract theory: models, simulation, decision theory, systems analysis	■ Future orientation ■ Forecasting	■ Centrality of and codification of theoretical knowledge
QUINARY: ■ Health ■ Education ■ Research ■ Government						

Source: Adapted from Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting* (New York, Basic Books, 1973), p. 117.

Several substages are involved in the transition from an industrial to a postindustrial society. First, an expansion of services such as transportation and public utilities is needed for the development of industry and distribution of goods. Second, mass consumption of goods and population growth require an expansion of wholesale and retail services, as well as services such as finance, real estate, and insurance. Finally, as personal incomes rise, the percentage of money devoted to food declines. Increments in income are first spent for durable consumer goods, such as housing, automobiles, and appliances. Further increases in income are spent on services such as education, healthcare, vacations, travel, restaurants, entertainment, and sports. This tendency in consumption behavior leads to the growth of the personal services sector.

There are many other reasons given to explain the growth of services; some inspired by the theories previously discussed, and some are independently developed by various researchers. Some of these are summarized as follows.[5]

- The increase in efficiency of agriculture and manufacturing that releases labor to services
- The flow of workers from agriculture and other extraction to manufacturing and then to services

- The application of comparative advantage in international trade
- A decrease in investment as a percentage of gross domestic product (GDP) in high-income industrialized countries or an increase in the percentage of the GDP in low-income countries
- A rise in per capita income
- An increase in urbanization
- Deregulation
- Demographic shifts
- An increase in international trade
- Joint symbiotic growth of services with manufacturing
- Advances in information and telecommunication technologies

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 we have also included some of the topics covered in those books. The discussions draw upon the knowledge and experience of various areas of business as well as 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 service management 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

This chapter examined the concept of services from a macro viewpoint. Definitions of service and service economies were presented, as well as the importance of services in our society. 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. We 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 were discussed.

Endnotes

1. Claes Fornell, Michael D. Johnson, Eugene W. Anderson, Jaesung Cha, and Barbara E. Bryant, “The American Customer Satisfaction Index: Nature, Purpose, and Findings,” *Journal of Marketing*, Vol. 60 (October 1996), pp. 7–18.
2. John Naisbitt, *Megatrends: Ten New Directions Transforming Our Lives* (New York, Warner Books, 1982), p. 12.
3. A. G. B. Fisher, “Economic Implications of Material Progress,” *International Labour Review* (July 1935), pp. 5–18; and “Primary, Secondary and Tertiary Production,” *Economic Record* (June 1939), pp. 24–38.
4. The discussion of preindustrial, industrial, and postindustrial societies has been adopted from Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting* (New York, Basic Books, 1973), pp. 123–129.

5. For a more detailed discussion of the various theories explaining the growth of services, see P. W. Daniels, *Service Industries in the World Economy* (Oxford, UK, Blackwell Publishers, 1993), Chapter 1, pp. 1–24; Steven M. Shugan "Explanations for the Growth of Services," in Roland T. Rust and Richard L. Oliver (Eds.), *Service Quality: New Directions in Theory and Practice* (Thousand Oaks, London, Sage Publications, 1994), pp. 223–240; and J. N. Marshall and P. A. Wood, *Services and Space: Key Aspects of Urban and Regional Development* (Essex, England, Longman Scientific and Technical, 1995), Chapter 2, pp. 9–37.

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