SERVICE SCIENCE

The Foundations of Service Engineering and Management

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The Foundations of Service Engineering and Management

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To my family.

Foreword

James C. Spohrer

The science of service is emerging. Undoubtedly, a journey of this complexity, striving to scientifically understand a phenomenon as fundamental and richly diverse as service phenomenon, must be explored along multiple pathways over multiple decades. Therefore, it is always a great pleasure for me to recognize and encourage those embarked on this journey. Truly, we are all students of service, learning from each other as we go.

In this volume, entitled *Service Science: The Foundations of Service Engineering and Management* authored by Robin Qiu, I would like to draw the careful reader's attention to three main aspects of this work.

The Pioneers: In Chapter 3, a brief overview of the evolution of service research is presented. The complexity and diversity of service phenomenon is reflected in part by the number of academic disciplines whose scholars have written on this topic. Scholars from schools of management, engineering, natural sciences, social sciences, as well as arts and humanities (service design), not to mention practitioners and policy makers in government, have all played a role in the exploration. Figure 3.5 entitled “A sustainable socio-technical process-driven service system” provides an excellent visualization of five types of capital (natural, human, social, financial, and infrastructural) and the processes that transform these resources over time. It is worth noting that each of the major scholarly schools has a primary focus on one of the five major forms of capital.

Putting People First: In Chapter 5, I especially enjoyed the section on putting people first. The book presents novel approaches to the mathematical formalization of service, without losing sight of this important fact—service is about

putting people and their experiences first. Pay special attention to Figure 5.8 entitled "Service value diagram corresponding to GE's change effectiveness model"—for though it is one of the simpler diagrams in the book, it highlights that increasing value derives from increasing quality and increasing acceptance, when mutually agreed to and cocreated by providers and customers. Furthermore, with the global rise of smart phones and social media tools, there has never been such an exciting time in human history to gather and analyze big data aspects of service encounters. We are in the age of increasingly powerful tools for value cocreation. This work also makes the important point that value cocreation is also about cotransformation of providers and customers.

Education as a Service: Chapters 7 and 8 provide an excellent example of applying the theoretical developments in this book to the challenge of improving education as a service. Both chapters highlight the value of structural equation modeling techniques as well. Chapter 9 further distills the theoretical developments into a practical and iterative method for daily improvements to service business offerings. Figure 9.3 entitled "Engineering and managing competitive services: scientific perspective" conveys a tremendous amount of methodology quite concisely. Readers familiar with statistical control theory will find this chapter an especially nice summary of the developments in the book.

While much work remains to broadly establish a holistic and lifecycle approach to service systems, this book boldly suggests pathways and approaches to help researchers mathematically formalize service systems and networks in the age of big data, without losing sight of the importance of putting people first. In the coming years, I look forward to reading more along this pathway as the ideas presented are further tested and refined.

James C. Spohrer

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Foreword

Richard C. Larson

Services. What do we think of? Taking cash from an ATM machine? Talking on our cell phones? Surfing the web? Watching TV? Picking up our mail? Yes, all these daily activities and much more. In fact, we would be hard-pressed to identify significant parts of our lives that are not service-related. About 150 years ago, over 50% of the US workforce toiled in agriculture. Today, it is about 2%, and we grow a lot more food. Agriculture is not a service, but its workforce has plummeted while the sector has become more productive. In the US post-WWII boom, in the late 1940s, the fraction of the US workforce in manufacturing peaked at about 35%. Today, it is a mere 9%. The percentage of gross domestic product (GDP) associated with manufacturing parallels these numbers, from being about 30% post-WWII to being about 12% today. What has filled the void? Answer: The US service sector. It has swelled to about 80% of the GDP!

What precisely is the service sector? Economists define it by subtraction. The service sector is everything in the economy that is NOT agriculture (including forestry and fishing) OR industry (manufacturing and also mining and construction). That subtraction leaves us with the majority of the world in which we live! In addition to the mundane day-to-day services chores, we have the health care system (about 18% of the economy), education (8–10% of the economy) and much more—government, transportation, entertainment, utilities, etc. The excellence or nonexcellence of services can literally mean the difference between life and death!

We are fortunate that Robin Qiu has written this book at this time. He reports that we in the United States have had a national obsession with manufacturing and our international competitiveness in that domain. Yet, it is services that comprise the largest part of the economy, by

far. The service sector creates a net international trade surplus for the United States. Scores of books have been written about manufacturing, which is now 12% of the GDP. Far fewer books have been written about services, which constitutes 80% of the GDP. Robin has been a leader in pushing us, not to ignore manufacturing, but to move it upward to its rightful place focusing on the services sector. He is the principle founder of the new INFORMS journal, *Service Science*. This book represents another major contribution to service sector analysis.

At my home institution, the Massachusetts Institute of Technology, the graduate Masters program "Leaders for Manufacturing," founded in 1988, has recently been renamed "Leaders for Global Operations," reflecting the fact that many of today's industrial leaders are in services such as retailing and supply chain management and not manufacturing.

Robin says that a service is provided as part of a complex sociotechnical system. This broad nontechnocratic view is perfect from my point of view. Services cannot be meaningfully studied solely through sharply focused discipline-based glasses. To be effective, service sector analyses cannot be Tayloristic "time and motion" studies. We require an interdisciplinary approach, where aspects of the social sciences often dominate traditional narrow engineering-measurable quantities.

My favorite early example of this is the story of queueing at elevators in the 1950s in New York City. With the post-WWII economic growth, more high rise buildings were constructed in Manhattan—as office buildings, hotels, and apartments. People started to complain about delays for elevators in these buildings, especially at morning and late afternoon rush hours. A narrow engineering-focused queueing analysis might have concluded that some of these buildings should be destroyed and designed over, with more elevator shafts, as the current designs could not support peak load traffic. (I say this only slightly tongue in cheek!) But a colleague of Professor Russell Ackoff of the University

of Pennsylvania was dispatched to study the situation. He indeed verified the numerous customer complaints about elevator delays. Then, in a moment of true creative thinking, he redefined the problem. He thought to himself, "What if the problem is not the *magnitude of the delays* waiting for the next elevator? What if the problem is the *complaints* about those delays?" He postulated that the elevator customers needed a distraction while they were waiting. So, in a spurt of lateral thinking, he purchased and had installed floor-to-ceiling mirrors adjacent to all the elevators in a test building. Guess what? The complaints about elevator delays plummeted to near zero, while the statistics of delay remained unchanged! Problem solved, but not with traditional queueing theory. Here a touch of psychology was needed. And so was born the psychology of queueing, the same year (1955) that Walt Disney opened his first amusement park—in Anaheim, CA. Over the years, the Disney Company has shown itself to be a true master of designing and managing complex sociotechnical service systems—including its queues. The arts and entertainment services industry comprises about 4% of the US GDP.

Reading Robin's book chapters, with its many useful framings of services provision, I started reflecting on my own personal services experiences and preferences. He says that trust and reliability are important aspects of services. Here is trust: I have used the same travel agent for 34 years! And, yes, I am happy to pay more than what is charged by an anonymous discount Internet-based travel service because I know it will be done right, changes will be easy, and that she 'has my back' if anything goes wrong during travel. Car repair: I have an 8-year-old Subaru WRX STI, a rally racing champion. No one touches it except my dealer (and me)! Eight years, one place for maintenance and on rare occasions—repair. They have my back on that car. And I would not trust a random person employed by some discount national auto repair chain to look after this car—which is an extension of me! Medical services: You guessed it, over 35 years with the same organization. Maybe I am too

fixed in my ways. But trust in-services are of paramount importance.

Trust goes in the reverse direction as well: One bad service encounter can lead to a lifetime pledge never to patronize that organization again. The median age of students in a typical graduate class that I teach at MIT is 25. I ask them, "How many of you have had such a bad service encounter in your lives that you have pledged to yourself never ever to go back there again?" These are 25-year-olds, less than 10 years from living with their parents. And, invariably, over half the class raises their hands! How many providers of services are aware of this fact? That continual excellent quality service is required for customer retention. Customer loyalty may go only as far as the next service encounter. Robin Qiu drills the lesson home in this important book.

Services are nuanced, not readily quantified into various measurement bins. Robin describes this in many ways. From my life in Lexington, MA, a historical suburb of Boston with a population of 28,000: We have two Starbucks, one Peet's Coffee, and seven Dunkin Doughnuts! Plus various convenience stores and quick-stop shops located at gasoline stations—all serving coffee to go. I guess Lexingtonians are highly caffeinated! From my home I prefer to drive to the third closest Dunkin Doughnuts. Why? The coffee and food products and prices are identical to each other. Answer: Only in this shop do I get greeted each time with sincere friendly smiles, as if they really want to see me and are happy to have me as a customer. Plus, the place is a neighborhood hangout with many retired folks just sitting around, enjoying each other's company, and passing the time of day—a type of nice 'bar scene' in a coffee shop. The ambience is just right. My minute or two of extra driving is worth it! Again, how many "time-and-motion" type studies would ferret out these concerns? I do not think I'm unique in valuing such nuanced aspects of services as important. Robin Qiu hits the nail on the head. Many others miss it completely.

After reading Robin's book, we would know that there is

only one topic he discusses for which I have a minor disagreement: Internet-based services. To allude to an 'alien' terminology, he equates these to a type of "Service Encounter of the First Kind," that is, rather distant and impersonal. (In the 1977 movie, Close Encounters of the Third Kind, an encounter of the first kind was an alien encounter beyond 500 ft—implying little closeness, complexity, or subtlety.) I agree with him for many Internet services, such as those associated with airlines, hotels, and rental cars. But, there are Internet-based services such as Etsy (https://www.etsy.com) that resemble personal face-to-face interaction. You might call these "Close Service Encounters of the Third Kind," that is, up close and personal, nuanced, and complex. In fact, I have found web sites such as Etsy better than shopping mall face-to-face interactions because I am dealing with the proprietor of a small artisanal business and his/her future success depends 100% on customer satisfaction. The email 'back-and-forth' between proprietor and customer often resembles a conversation of an old country general store of the 1800s! Writing reviews online for all to see can show each customer's satisfaction or dissatisfaction. It is difficult for the average customer to have that type of impact with impersonal national chain stores, with either face-to-face or Internet-based service encounters. My hunch is that Robin will agree with me and say that I may have misread the book with relation to all Internet-based services! And I am sure he would be right!

It is an honor that Robin has asked me to write this foreword. Enjoy the book. See all the many faceted aspects of services that Robin describes and structures. Also, reflect back on your own personal experiences with services, and you will see that Robin hits the mark virtually every time. In addition, if you are in a planning or managerial role in a service firm, you and your company can gain significant competitive advantage listening to what is said in this book. A service is a complex sociotechnical system, and those who recognize it as such are bound to prosper.

Richard C. Larson

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Preface

This book essentially introduces a new perspective of service study. By taking a holistic view of the service lifecycle, we discuss approaches to explore the real-time dynamics of service systems and networks. We advocate that a service must be defined as a value cocreation and transformation process. As such, we can holistically analyze the performance of service systems that enable and execute complex and heterogeneous services. By leveraging the advances in computing and network technologies, social science, management science, and other relevant fields, we present the concept and principles of putting people first in service and demonstrate that service networks in light of service encounters can be comprehensively explored in a closed-loop and real-time manner. The presented framework can be potentially applied in facilitating service organizations to understand and capture market trends, design and engineer service products and delivery networks, execute service operations, and control and manage the service lifecycles for competitive advantage.

Service research is not new. In fact, service research in the field of marketing has an over 30-year-history. In addition to research and development in service marketing, academics and practitioners have actively developed a variety of theories, methods, and tools and then applied them to address service delivery efficiency and effectiveness issues in service operations and management across the service industry for decades. Recently, significant attention in the service research is related to a variety of exploratory studies of service systems, focusing on how to leverage the advances of management science, systems and network theory, and computing and network technologies to help service organizations improve the overall performance of their service systems from both engineering and operational perspectives.

Note that the worldwide economy was dominated by manufacturing during the last couple of centuries. As a result, both academics and practitioners paid much attention to the design, development, production, and innovation of physical products. The economic shift from manufacturing to service made us rethink people's social, physiological, and psychological roles in the economic activities. However, inertial thinking is part of sociopsychological norms to the majority of human beings, resulting in many service organizations offering and delivering their services using manufacturing mindsets. Consequently, the advances in social science, management science, computing technologies, and others are not well integrated and thus leveraged in support of effective service engineering and management as needed in the service industry.

Change is the only constant in today's business world. The effectiveness (E) of a service as a solution to meet the changing needs of customers is equal to the product of the quality (Q) of the technical attributes of the solution and the acceptance (A) of that solution by the customers, that is, $E = Q \times A$. However, the customers' acceptance changes rapidly, varying with people, time, places, cultures, and service contexts. Because people's acceptance is largely subjective, manufacturing mindsets with a focus on physical attributes indeed become ineffective when applied in the field of service engineering and management. Hence, to address the discussed change acceleration phenomena with scientific rigor, we must rely on people-centric and service mindsets. In fact, the introduction of putting employee and customers first in the 1990s radically made a turn in the way how service organizations should develop, operate, and manage businesses and measure their successes. Indeed, people-centered service mindsets have afterwards been emerging and receiving more and more attention in the service industry.

Bearing this discussion in mind, we consider a service as a transformation process rather than an offered product.

Truly, both provider-side and customer-side people are always involved in an interactive manner in service. Hence, we view a service as a value cocreation process. For a service, goods are frequently the conduits of service provision; the physical attributes and technical characteristics that specify the goods are indispensable to the service. The quality (Q) of the technical attributes in the service, indeed, mainly defines the quality of the goods. To a service customer, Q is frequently perceived in service provision as the quality of designated service functionalities that are defined in a service specification. As indicated in the equation of $E = Q \times A$, the value of E also depends on the value of A , which is largely related to sociopsychological perceptions of the customer throughout the service lifecycle. Although this is well understood conceptually, however, the service industry lacks methods and tools to explore and measure Q and A in service in a holistic, real-time, and quantitative manner.

Services are highly heterogeneous. For a given service, a specific customer and a service provider essentially cocreate the service values that meet the respective needs of the customer and the service provider. Thus, each service is unique. The variability of service and the need for measuring sociopsychological perceptions had made extremely challenging the full exploration of the service lifecycle, spanning market discovery, engineering, delivery, and sustaining, in an integrated and quantitative manner.

Indeed, the prior lack of means to monitor and capture people's dynamics throughout the service lifecycle has prohibited us from gaining insights into the service engineering and management in a service organization. Promisingly, we believe that the combination of the following advances in technologies has made possible the design and development of the needed means and methods that can help service organizations overcome the challenges:

- Digitalization
- Networks and telecommunications

- Collaborative methods and tools
- The fast advances in social network media
- Big data technologies and analytics methods and tools

In other words, real-time data on the dynamics of service cocreation processes from both service providers and customers could be comprehensively captured and analyzed if needed. (Surely, people's privacies must never be compromised, which are beyond the coverage of this book.) When the enabling technologies are appropriately implemented, we can create and execute smarter working and consuming practices so that we can make service cocreation processes not only beneficial but also enjoyable.

Simply put, enormous opportunities truly lie ahead of us. We quite often ask ourselves: “Do we have right methods and tools that ensure service systems to perform in such a way that the respective values for both service providers and customers can be optimally cocreated, at present and in the long run?” However, the question remains unanswered, partially or totally. By leveraging both systems methods and networks analytics, in this book we present one solution to address this unanswered question.

Holistically, a service organization is a service system, essentially consisting of service providers, customers, products, and processes. Different from a goods-producing system, a service system must be people-centered. Therefore, a service system surely is socio-technical. On the basis of the earlier discussion, we understand that it is the transformation process that ties all other system constituents together and cocreates the respective values for both service providers and customers. Whether the values can be fully met relies on the efficient, effective, and smart business operations that are engineered, executed, and managed across the service system.

Service is people-centric, truly cultural and bilateral. The type and nature of a service dictate how a service is performed, which accordingly determines how a series of

service encounters could occur throughout its service lifecycle. The type, order, frequency, timing, time, efficiency, and effectiveness of the series of service encounters throughout the service lifecycles determine the quality of services perceived by customers who purchase and consume the services. Note that the people-centered, interactive, and behavioral activities in a service system essentially engender a service cocreation network. Indeed, as the velocity of globalization accelerates, the changes and influences are more ambient, quick, and substantial, impacting us as providers or customers in dynamic and complex ways that have not seen before. The understanding of service networks is essential for service providers to be able to design, offer, and manage services for competitive advantage in the long run.

Because of the sociotechnical nature of a service system, we use a systems approach to evaluate the performance of the service system, aimed at capturing both utilitarian functions and sociopsychological needs that characterize service systems. However, the true people's behavioral and attitudinal dynamics of a sociotechnical system requires conducting real-time, corresponding social network analytics. As a result, the insights of the service interactions in the formed service networks can be truly explored and understood, which assist stakeholders to make respective while cooperative informed decisions at the point of need to improve their service cocreation processes across the service lifecycles in an optimal manner.

To get a comprehensive understanding of this new perspective of service research, readers should read chapters sequentially. Brief introductions to all chapters in this book are provided in the following:

- *Chapter 1*. Introducing service by briefly reviewing the evolution of service, we emphasize that the holistic view of service is a must in today and the future's world economy.
- *Chapter 2*. Discussing the concept of cocreation in the

service industry. A definition of service for this book is provided, which radically lays the foundation for the remaining chapters in this book.

- *Chapter 3*. Exploring cocreation transformation processes. We articulate that the increasing complexity of service research and development requires the science of service in a new perspective.
- *Chapter 4*. Looking into service science fundamentals. By analyzing the dynamics of service, we define laws of service in general. A holistic and sociotechnical view of service becomes essential for us to develop service science.
- *Chapter 5*. Revealing the digitalization of service systems and networks. We argue that putting people first should be a mindset. The mindset is what service organizations must bear when they design and develop their service systems. Through leveraging process-aware computing systems and sensor-based networks, people's behavioral and sociopsychological data and information can be well monitored and captured.
- *Chapter 6*. Showing computational thinking of service systems and networks. By taking advantage of the digitalization of service systems and networks, we demonstrate that the system dynamics of service cocreation processes can be fully modeled, analyzed, and controlled in a closed-loop, real-time, and quantitative manner.
- *Chapter 7*. Using education examples to show how service and service systems can be explored from a systems perspective. Specifically, we apply structural equation modeling to investigate mechanisms of improving educational service systems. By integrating cross-section and longitudinal analyses, we demonstrate the tremendous potential of the applications of the proposed approach in the general field of service engineering and management.

- *Chapter 8*. Using an online education example to demonstrate the dynamics of service networks. The concept and principles of putting people first are illustrated in great detail in this chapter. When people-sensing mechanisms are well implemented in a service system, service networks that are essentially formed from service interactions within the service system can be fully investigated. We present effective data, network, and business analytics with a focus on looking into the insights of the service system in real time. Ultimately, once system performance modeling and service network analysis are well integrated in a closed-loop, real-time, and quantitative manner, we can truly help service organizations perform optimal service engineering and management throughout the service lifecycle.
- *Chapter 9*. Concluding the book with some final remarks. We articulate that innovative approaches to the development of Service Science are truly needed. However, we advocate that the service research and practice community must appreciate and continue to develop a variety of methodologies and tools that can be well derived and evolved from the known theories and principles in systems theory, operations research, marketing science, organizational behavior and theory, network theory, social computing, and analytics.

This book does not intend to cover the state of the art in the service research field. Instead, this book simply provides readers a new perspective of service research and practice. It could serve as a good reference book for scholars and practitioners in the contemporary service engineering and management field.

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Portions of the content of Chapter 6 were previously published in *Service Science*, 1(1), 42–55, entitled "Computational thinking of service systems: dynamics and adaptiveness modeling" and are used with permission from the Institute for Operations Research and the Management

Sciences (INFORMS, https://www.informs.org). INFORMS is not responsible for the errors introduced in the translation of the original work. During the period of developing this project, the author wrote several editorial columns for *Service Science*. The author made cross-references between those editorial columns and this book.

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Robin G. Qiu, PhD

Chapter *1*

Evolving and Holistic View of Service

1.1 What is Service?

The word “service” has many connotations, varying with domains and settings. We must understand and deal with its extant variability in order to decipher and capture its inherent nature in business (Morris and Johnston, (1987). This is particularly important for this book because we have to stay in focus to discuss one solution, namely our unique and innovative approach to address the challenges that we have faced in the service sector over the years or new challenges that we will confront for the years to come. Put in a straightforward manner, presenting the “BEST” solution to address all the challenges confronted by academics and practitioners in the service sector is surely not our intention as there will never be such a one-size-fits-all solution. Given that the business world becomes more integrated, complex, and interdependent than ever before, a systemic view of service is the mindset that we will hold throughout this book. In other words, by relying on systems thinking and holistic viewpoints (Flood and Carson, (1993), we will explore and accordingly decipher the inherent nature of service in the unceasingly changing business world.

Service is frequently defined as an act of beneficial activity. A service that is considered as an act of beneficial activity actually has a long history. If we retrospect to the simplest material exchange that occurred in ancient times, such as a bushel of wheat exchanged for a barrel of oil, we know that a very basic trading service was performed. No matter what units and containers were used and how the trade was done in ancient times, the exchange or trade, a performed service, was essentially an act of helpful and beneficial activity that met the respective needs of the involved exchangers.

A food service in a restaurant is another good example of an act of beneficial activity. Similar to the above-mentioned simple trading service, we can also easily retrospect to ancient times in the early social and economic development stage thousands of years ago. A food service in ancient times certainly had no conceptual difference from a modern food service. Although the catering setting and foods in a restaurant at that time were limited and simple, a performed service was substantively involved with a list of necessary service elements, provider, consumer, resource, process, and value. The service provider was the owner who owned the restaurant and offered dishes as service products. A service consumer was a client who ordered and ate his or her selected foods. A typical service process started from the time the client entered the restaurant and ended when the client paid for the service and left the restaurant. The process was involved with a transformation with the support of operation resources. The client's order is the process's input. The value for the client and the owner is the process's output. The value could simply be the profit the owner made and the satisfaction the client had. The client's hunger stopped; he/she was happy to some degree. Surely, the service was mutually beneficial. Resources, largely natural and labor-based, were leveraged in an extremely simple manner throughout the simple catering process (Figure 1.1). Without question, the corresponding business operations at that time were radically experience-based.

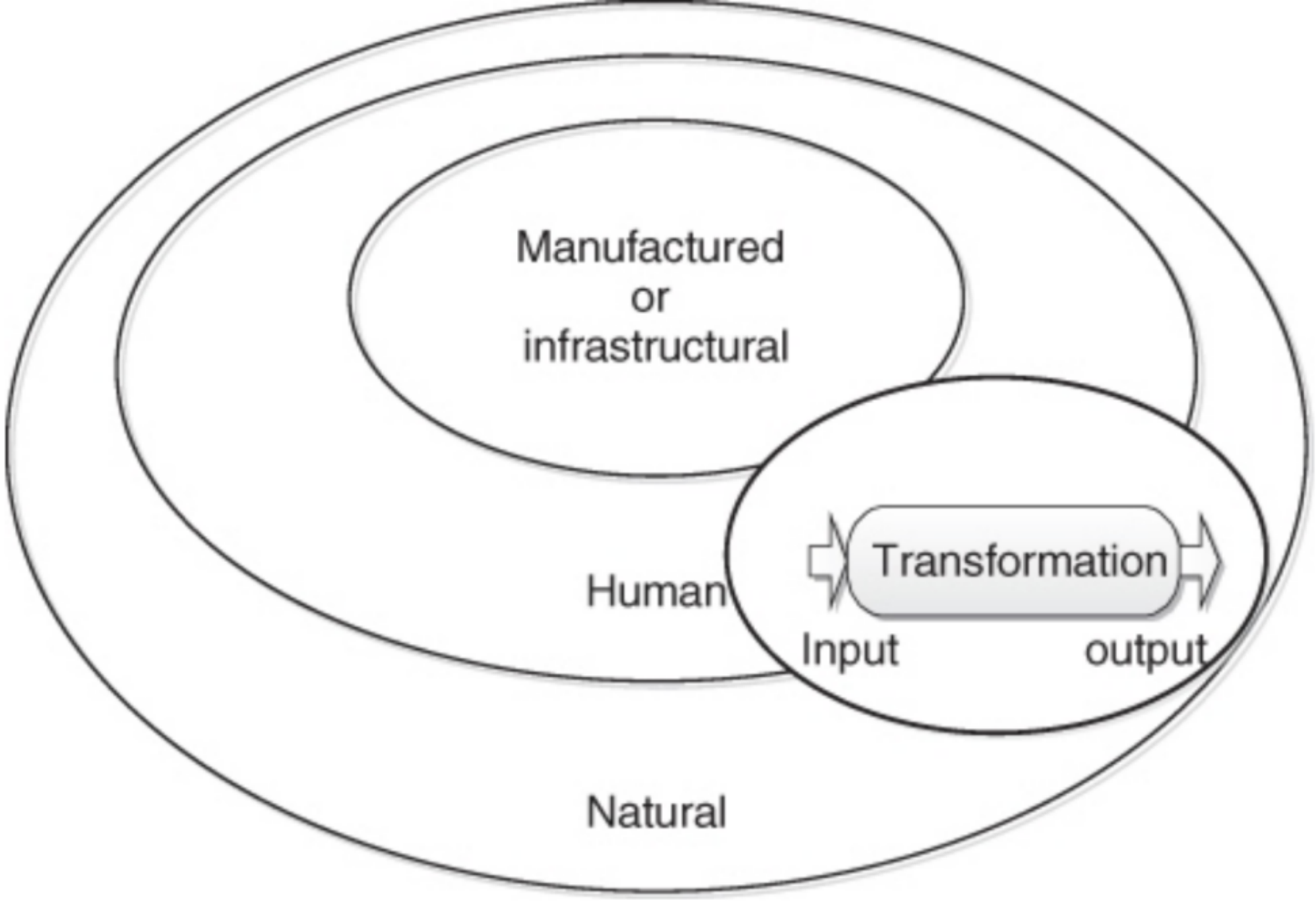

Figure 1.1 A conventional resource model view of a food service.

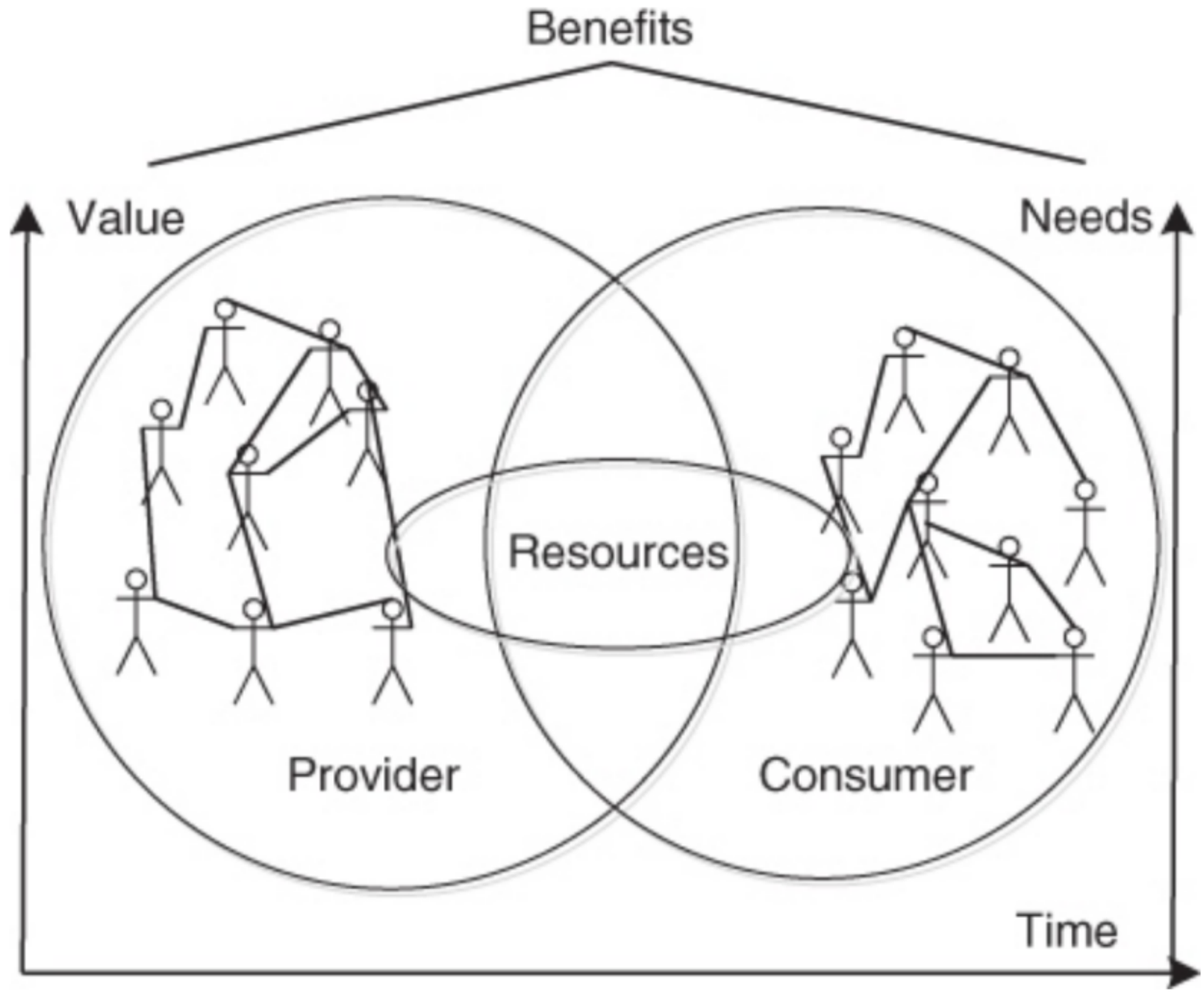

Figure 1.2 A service involving certain fundamental elements.

Figure 1.1 illustrates the conventional classification of resources. By focusing on resource supply and demand in the social and economic activities, we understand how resources are leveraged in the transformation of goods and services to meet human needs and desires. As a result, we traditionally recognize three categories of resources: natural, human, and manufactured or infrastructural resources. Natural resources essentially are the source of raw materials. Human resources consist of human efforts provided in the transformation of products or services. Manufactured or infrastructural resources consists of man-made goods or means of production (machinery, buildings, and other infrastructure) used in the transformation of other goods and services (Samuelson and Nordhaus, (2009); Sullivan et al., (2011).

Regardless of what type of service is provided and consumed, five essential and core

elements characterize a service in a conventional act of helpful and beneficial activity (Figure 1.2). More specifically, the five elements involved in services are resource, provider, consumer, benefit, and time, which can be described in an intuitive way as follows:

- *Resource*. Resources can be in a physical, soft, or hybrid form. For example, foods as a physical, transformable, and consumable resource or service product in a restaurant play a fundamental role in a given food service. Knowledge or experience in a focused subject area transferred in a training service seems to be a soft resource or service product. When a haircut service is performed, both barber's skills and haircut kits as a hybrid resource must be simultaneously applied or operated to make the service performed in a satisfactory manner. Essentially, with the help of resources, the act of performing a transformation task for a customer who asks for it in exchange for acceptable compensation is termed as service provision. Apparently, resources are the radical conduits of service provision to customers (Vargo and Lusch, (2004).
- *Provider*. A service is purposely performed by a service provider. A service provider as an entity can be an individual, group, organization, institution, system, or governmental agency.
- *Consumer*. A service consumer is usually a human being who consumes, acquires, or utilizes a service offered and performed by a service provider.
- *Benefits*. A performed service surely generates certain benefits. Typically, different benefits are pursued by the service provider and the service consumer as they have different value propositions in executing the service. The benefit for the service provider could be value-based, such as a profit. The benefit for the service consumer might be need-based, such as desire and satisfaction.
- *Time*. Small or big, simple or complex, a service certainly takes time to get performed to realize the desired benefits. Interactive activities between the provider and the consumer could occur in an *ad hoc* or predefined, unattended, and/or well-controlled process.

Note that service provider-side employees and customer-side consumers should also be part of recourses if we strictly follow the resource model as is illustrated in Figure 1.1. To make the discussion vivid and people-centric, we have to emphasize the identity of active participants in the service model that will be developed and discussed throughout this book. Therefore, we will always make an exception from the general resource model by distinguishing the elements of providers and consumers or customers from the general human resource concept. The concept of human resource in Figure 1.1 will be needed only when the whole resource model is the focus in a related and focused discussion.

Indeed, no matter how small or big, simple or complex a service is, it surely takes time for its provider to perform and its customer to consume the service. Evidently, the consumer and the provider of the service shall interact with each other, directly or indirectly, consecutively or intermittently, physically or virtually, and briefly or intensively, during the process of performing the service. The interaction time accordingly can be short or long. All of these changing factors that largely characterize provider–consumer interactions vary with the types of services that are actually performed. Hence, there are a variety of perspectives on service in academia and practice.

1.2 Different Perspectives on Service

Because of the existence of the above-mentioned variations in perception, a consumer's perception of one kind of service could differ considerably from another. Different forms of resources applied and operated in executing services and varieties of provider–consumer interactions create many different combinations of consumers' perceptions of services, which consequently complicate our service studies in academia and practice. Different consumers' perceptions of services then give rise to the existence of numerous definitions of service. As a result, different service industries have historically adopted different definitions of services to accommodate their respective needs. For example, service is also quite often defined as the supplying of utilities or commodities in the modern economic society. From an end user's point of view, consuming electricity as a service fits in this definition very well. If we consider the daily consumption of electricity as an example, we will see that there is very little interaction between its provider and customer. Typically, we as home owners or apartment tenants in the United States simply call a local office of an electricity service provider we choose, and then we inform the electricity service provider of the date we move in. When we move out, we simply do the same. The needed simple interaction serves only one purpose, which is basically to ensure that the monthly bill statement will accurately and correctly reflect the usages of electricity when we legitimately stay in the houses or apartments. Unless there could be a problem with power lines or a discrepancy in a monthly bill statement, we might not interact with the electricity service provider at all during our entire stay in the house or apartment. We as consumers feel that there is a very little interaction with a service provider; such a service is undoubtedly defined as the supplying of utilities from an end user's perspective.

The unceasingly increased online shopping in the twenty-first century presents another perfect example for a service that is defined as the supplying of commodities. It is well understood in the retailing industry that this supplying of commodities as a service includes commodities, related distributions, and retailing. However, to an end user, such an online shopping service is nothing but the supplying of the needed commodities. We as online shopping customers place orders from a website powered by an online retailer (i.e., a service provider). The orders will be delivered to us regardless of how the orders are fulfilled and how far away the orders have to be transported. Just like utilizing electricity at home, unless there would be a problem with the ordered commodities, we might not interact with the online retailer after the initial online order placement. Obviously, there is surely little physical interaction between a service provider and a service customer throughout the lifecycle of such a typical online shopping service.

Other forms of definitions of service include the providing of accommodation and activities required by the public or the supplying of public communication and transportation. A variety of services in the modern economic society fit in this category of service definition. A list of good examples will be trading, communication, transportation, tourism, hospitality, and health care services. Nevertheless, services provided by educational institutions, security and military, and governmental agencies can also be well classified in this category of definition.

As mentioned earlier, different consumers' perceptions of services have historically resulted in the existence of numerous definitions of service. At first glance, different forms of definitions of service seem to define different things. When we further examine these definitions, it is not difficult for us to find that regardless of how a service is defined in a given discipline in academia or in a specific service sector in practice, a service must include the five core elements shown in Figure 1.2. The differences felt or perceived by customers based on their perceptions of services

come from user's experiences (Qiu, (2013) acquired from service encounters by the customers throughout the lifecycle of service executions.

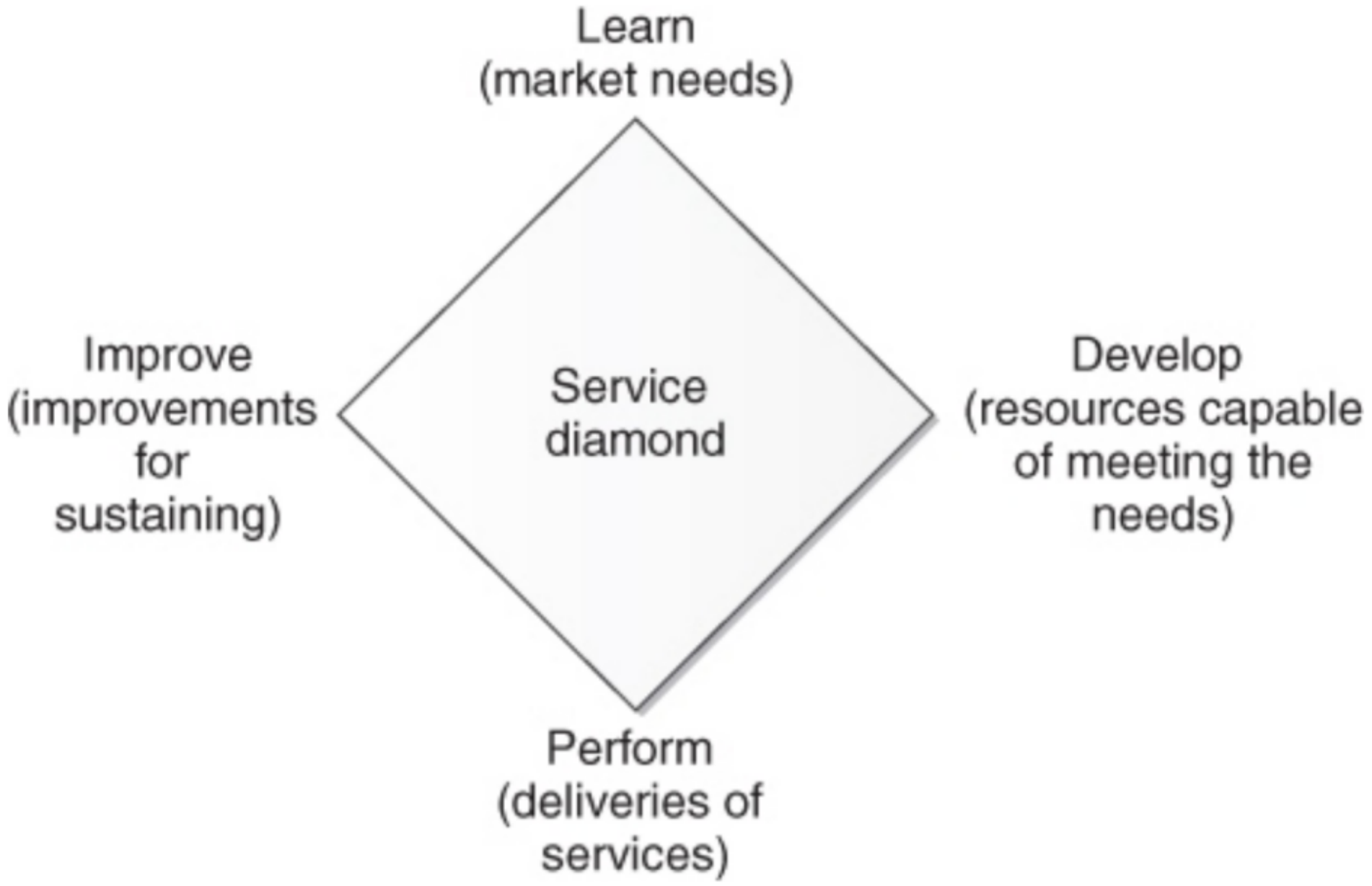

Figure 1.3 The lifecycle of service: a classic service diamond.

1.3 The Lifecycle of Service

In both academia and practice, we can find many versions of defined phases that compose the lifecycle of service. Depending on what we expect for a service or largely perceive during the process of consuming a given service, we might use different constituting stages to compose a service lifecycle. Quite often, we are subjectively or objectively impressed by certain phases or stages of the lifecycle of service. Then, we tend to ignore other phases that we prejudicially think they are less important. The information technology infrastructure library (ITIL®) version 3 (ITIL, (2011) is a nonproprietary and publicly available set of best practices for information technology (IT) service management. ITIL v3 defines five phases of service lifecycle, service strategy, design, transition, operation, and continual service improvement, and accordingly provides comprehensive guidelines throughout all the phases for aligning IT services with the needs of business. We also frequently derive the definitions from the ones widely applied in the manufacturing sector. As a result, just like service, a variety of terms or definitions of the lifecycle of service exist.

Regardless of how many versions we can find in the extant literature, all the described lifecycles of services should always be composed of four essential and classic phases, “learn,” “develop,” “perform,” and “improve,” from a service provider point of view. We use these four essential and sequential phases in a service lifecycle to define the fundamental service diamond relationship in a service organization, which are illustrated in Figure 1.3. These four phases are briefly discussed as follows:

- *Learn*. We have to know what the market need is before the concept of a new service product gets conceived. Regardless of the type of service, we have to learn the market to identify the needs of prospective customers through a variety of approaches. We understand that customer needs keep changing as time goes. Therefore, we have to learn and capture the changes and accordingly incorporate the changes into service provision throughout the lifecycle of services.

- *Develop*. We develop, transform, or leverage resources to serve customers and meet their needs. Frequently, the resources in service are mainly and paradoxically perceived as service products. Indeed, as we discussed earlier, the resources in the service industry can be in a physical, soft, or hybrid form. Leveraging all natural, human, and infrastructure resources are essential in service provision. The operand or operant roles of resources in rendering services are significantly more sophisticated than the ones in the manufacturing industry. As a matter of fact, operant resources in service provision produce the effects that are largely perceived and truly appreciated by customers (Vargo and Lusch, (2004).
- *Perform*. This phase is largely highlighted by a process of service provision. Typically, the performing phase in a service lifecycle is known as the delivery of the service. For a service designated to a given customer, this is also the phase that the majority of service encounters occur from the customer's perspective.
- *Improve*. As we know that customer needs keep changing as time goes, we must continuously improve our services to stay cutting-edge in the business. Indeed, the improvements in all aspects of services are crucial to keep our services competitive (Qiu, (2013).

This classic service diamond relationship in a service organization clearly marks the four key milestones across the lifecycle of service. When the first version of services is conceived, developed, and offered by a service organization, clear and well-specified milestones that are explicitly based on the above-defined sequence might be created and followed from the operations and management perspectives. During each phase, the service organization usually has different business objectives set as the highest priority in management and operations. The diagram in Figure 1.4 shows a normal and classic view of managerial and operational priorities pursued in the service operations and management of a service firm, in which a milestone priority shifts along with the emergence of a new phase during service business operations. These typical four priorities that are logically identified throughout the lifecycle of service are briefly discussed as follows:

- *Innovation*. A service is not competitive unless it is creative and innovative. Service products are just part of a service. First of all, we should focus on the transformation of resources to innovate services that are aimed at positioning our services in the market for competitive advantage. Innovations must be thoroughly embodied in not only the service products, but the processes of delivering and improving the services.
- *Value Proposition*. The execution of a service by a service provider must create a value for the service provider. As a service takes time from beginning to end, we must have the value of a service clearly defined in order to have the value appropriately measured, monitored, and realized in the process of service provision.
- *Value Creation*. The targeted value is usually created in the process of service delivery. However, it is not uncommon in the service industry that we argue that the delivery of a service actually starts from its development phase.
- *Performance*. We know how a service meets the needs of its end user once the service is delivered. Quite often, we would like to have the deliveries to be monitored, so the real-time performance of our service businesses can be captured and then weakness can be identified for further improvements.

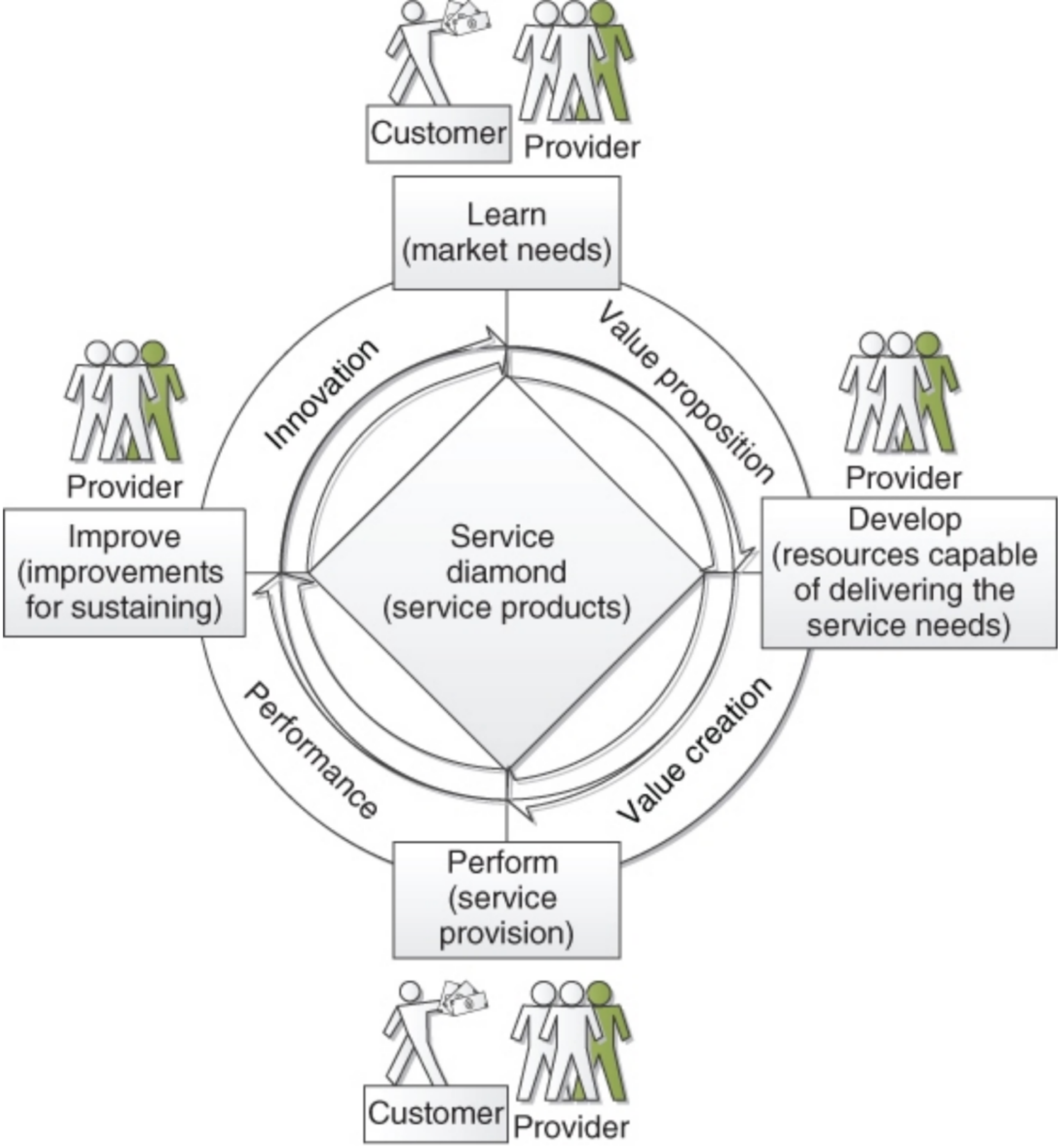

Figure 1.4 Priority shifts in service business operations and management.

Similar to the lifecycle of manufactured goods, the relationships defined in Figure 1.4 are most likely neither strictly linear nor purely sequential. In other words, the four priorities should not be separately considered during business operations in a competitive service organization. Frequently, a service organization will operate all the four phases in parallel as soon as the first batch of services gets completed. Please keep in mind, the first batch of services could simply be prototype or trial-based services. Competitive services are the results of both the coordinated and collaborated business actions taken by all the employees in the service provider, resulting in that satisfactory consumptions are realized and thus quality services are perceived by the customers.

1.4 Service Encounters Throughout the Lifecycle of Service

Before the emergence of the Internet, a physical context type of interactions between a service provider and a service customer was radically necessary in the process of performing a service. We define a service encounter as an act where a customer interacts with the service the customer wants. Therefore, a service encounter essentially is a social and transactional interaction in which a service provider

performs a service activity beneficial to its corresponding service customer (Czepiel et al., (1985); Czepiel, (1990); Bitner, (1992). Undoubtedly, each service encounter becomes a moment of truth. For a given service, we are the service provider and might perform "good" or "bad" services by rendering "good" or "bad" user/service experience. In other words, we have the ability to either satisfy or dissatisfy a customer when we are engaged in a service encounter. With a previously dissatisfied customer, surely we can rely on another service encounter to offer a service recovery that will be satisfying such a previously dissatisfied customer and potentially making him/her a future loyal customer (Surprenant and Solomon, (1987); Bitner, (1990); Tax and Brown, (1998).

Product, price, and place consist of the rudimentary marketing mix (Figure 1.5a) that is crucial when a product is set for sale. Marketers have reconstituted and/or expanded the mix by including different components to accommodate the differences derived from different goods and the changing customers' needs in the market, aimed at improving sales from time to time. Since the 1960s, product, price, place, and promotion (or simply called 4 Ps) have been widely and steadily used as the pillar components (Figure 1.5b) in the supply-side marketing management to define or describe the marketing mix that can be applied for identifying the niche of a physical product for sale (McCarthy, (1960).

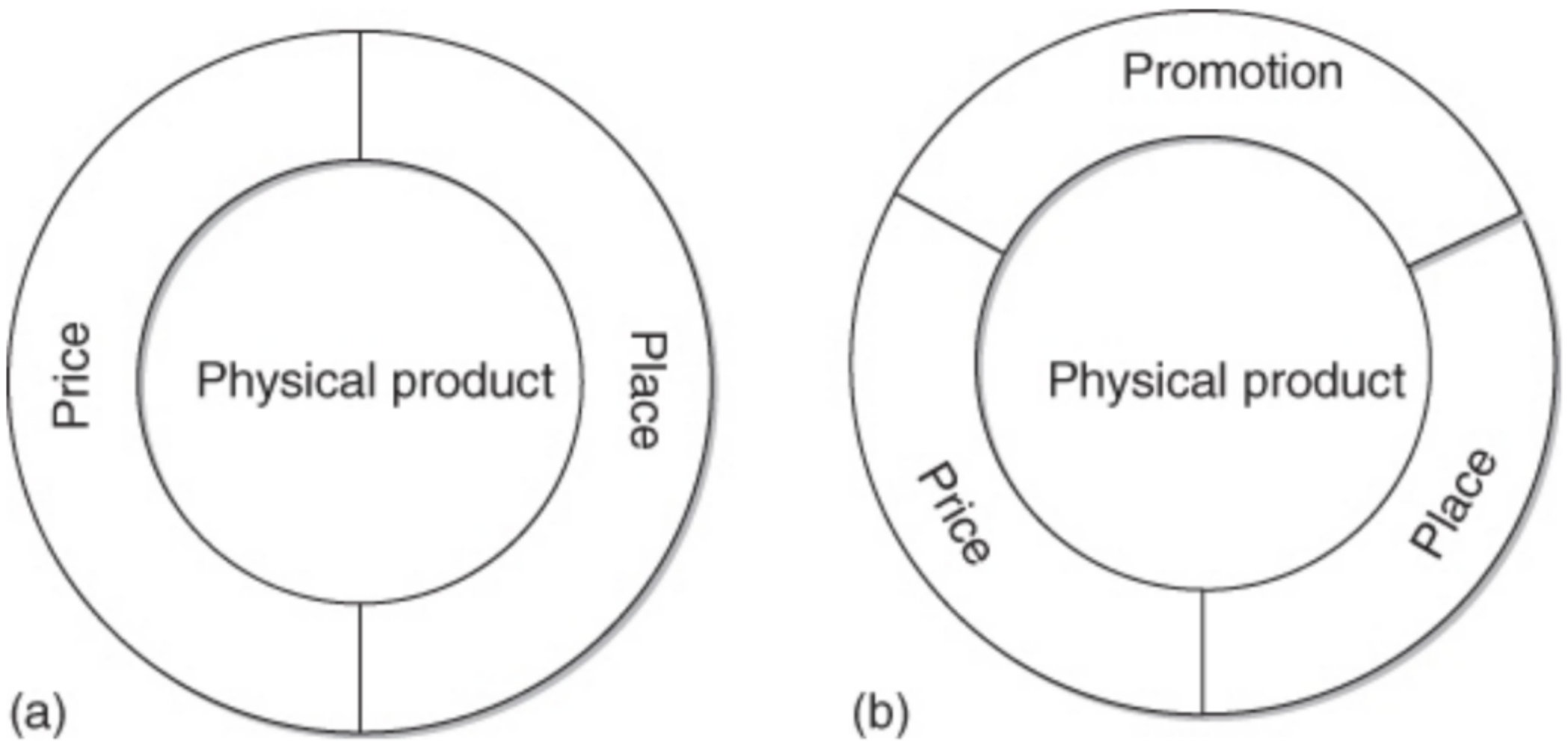

Figure 1.5 The rudimentary and popular marketing mix. (a) Rudimentary 3 Ps and (b) Popular 4 Ps.

In the business world, the effectiveness of marketing a product or service has traditionally and largely depended on how 4 Ps would be coordinated in the product or service marketing and sales process. The fundamental concepts of these components in marketing goods can be briefly summarized as follows:

- A quality physical product has long been the core in the goods marketing. The value of a piece of goods lies in its ability to satisfy the needs of a customer, which is mainly seen in the physical attributes and technical functions of the provided product.
- The price of a product has a lot of impact on its customer's satisfaction level. Quite often, right price is the first step to help push products into the marketplace to get quickly accepted by the customers.
- The price of a product for a designated marketplace should be appropriately set. Varying with socioeconomic statuses, customers in different places frequently have different affordability. They might also have quite different preferences to the physical attributes and technical functions of the provided product because of

their cultural preferences and physiological characteristics.

- Promotion plays a critical role in attracting prospective customers in a given marketplace. It varies with marketplaces; it might also change with seasons. This is particularly true when a holiday is approaching. Manufacturers (or retailers) tend to take advantage of the increased number of shopping days if the products are primarily for consumers.

As the competition gets intensified over the years, organizations have shifted their foci to customers, resulting in a customer-focused marketing mix, which is termed as 4 Cs (commodity, cost, channel, and communication) (Tannenbaum and Lauterborn, (1993). The 4 Cs marketing mix model essentially replaces 4 Ps (i.e., product, price, place, and promotion), providing a customer-centric version alternative to the 4 Ps in the goods marketing. Commodity promotes the pleasure realized when a product is used by a customer. Cost considers not only the producing cost but also the use and social costs applied to the customer over time. Channel focuses on the convenience provided to the customer when the product is purchased. Communication highlights the interaction and education to help the customer use the product in an optimal and satisfactory manner.

The focus shift from supply to customer clearly shows that organizations know the increasing importance of inclusion of customers in business operations and management. This is especially critical in the service sector as service encounters bundled with additional distinguishing characteristics of service directly impact the corresponding service quality and satisfaction perceived by customers. Over the years, the academics and practitioners have expanded 4 Ps to 7 Ps in the service marketing and delivery model by including three more components, people, process, and physical evidence, to reflect the substantively changed market needs and the evolution of customer-centric service marketing and delivery (Booms and Bitner, (1981); Bitner, (1990).

- People are crucial in service provision. People are human actors centered at service encounters, including employees, customers, and other personnel who are directly or indirectly involved in the service encounters.
- Processes define and govern the procedures, mechanisms, and flow of activities in service encounters, extremely important for service providers to conduct effective marketing and deliver quality and satisfactory services.
- Physical evidence refers to the physical surroundings and tangible cues that could influence the customer's perception of services. As services quite often are intangible, customers intuitively rely on certain tangible cues that can assist them to assess the offered services.

Although we can learn quite a lot from the manufacturing industry, we have inevitably confronted unprecedented challenges in understanding people's roles in rendering services in the service industry. It becomes clear that a service organization must put *people* (customers and employees) rather than physical goods in the center of its organizational structure and operations to keep businesses competitive (Qiu et al., (2007) (Figure 1.6a). For example, service quality is highly regarded as a comparison of customers' expectations with performance perceived in service provision. Thus, service quality can be extremely subjective. As a result, service productivity and quality are extremely difficult to monitor and measure as they vary with circumstances. Lovelock and Wirtz (2007) include productivity and quality in the service marketing and delivery model, as shown in Figure 1.6b, to warrant that service productivity and quality are well considered throughout service lifecycles. To be competitive, service organizations must control and manage the

total lifecycle of service in a cost-effective and efficient manner.

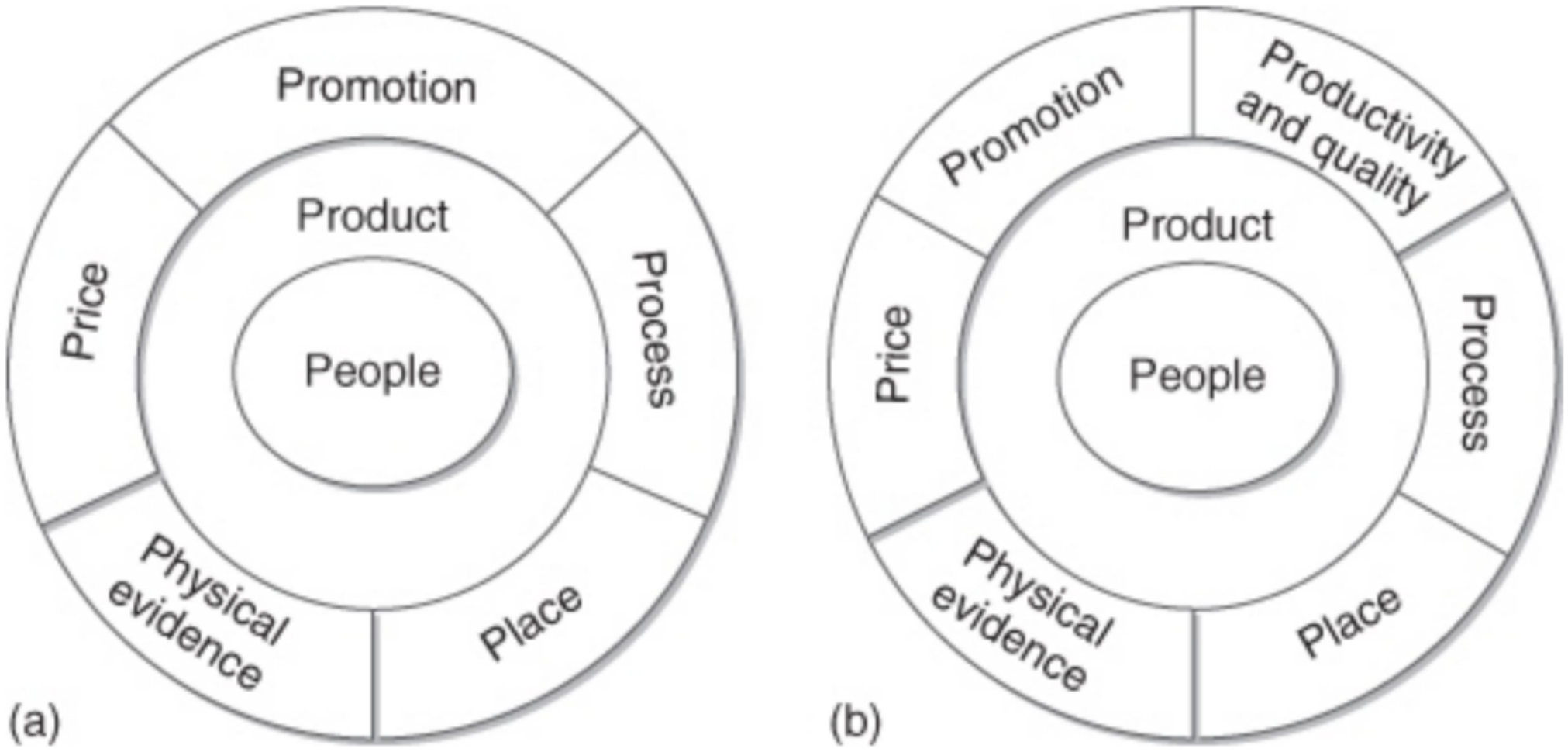

Figure 1.6 The 7 and 8 Ps of services marketing and delivery model.

In exploring service encounters in the service industry, the literature has thus developed a series of concepts and models and applied different combinations of 8 Ps to meet the specific needs under different business circumstances, such as marketing, operations and management, and business strategic planning. As discussed earlier, when a service is performed, its consumer and provider interact with each other, directly or indirectly, consecutively or intermittently, physically or virtually, and briefly or intensively, during the process of performing the service. We illustrate a series of service encounters in Figure 1.7 to highlight a variety of possible social and transactional interactions throughout the lifecycle of service.

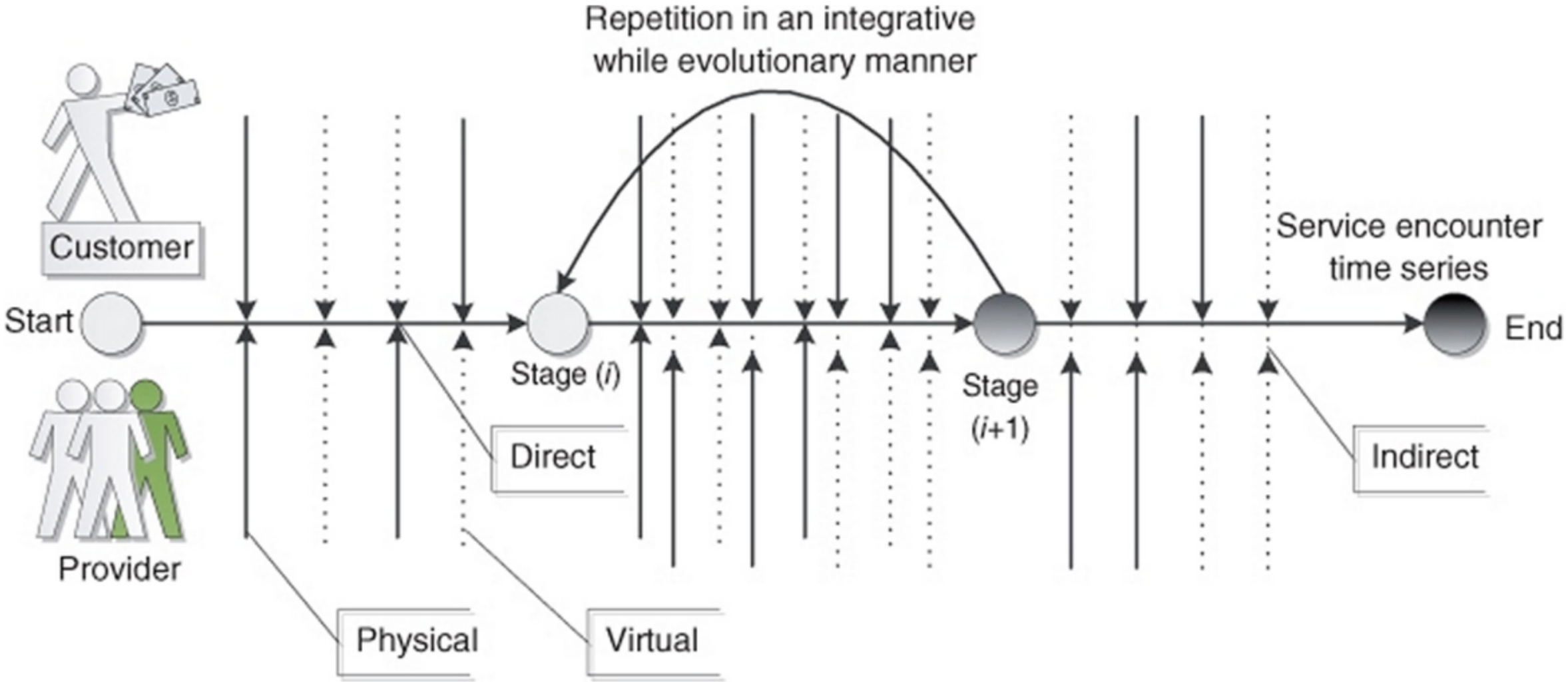

Figure 1.7 A series of service encounters throughout the lifecycle of service.

It is worthy to mention that this book promotes a new look of service encounters. Instead of focusing on the interacting activities between providers and customers during the process of service deliveries, we explore all the interactive activities between service providers and customers throughout the service lifecycle, from service conceiving to service termination. Consecutive service encounters form a service encounter chain (Svensson, (2004), which can be modeled using an event-based time series. Furthermore, highly correlated service encounter chains thus create a service encounter network. A comprehensive discussion on service encounter networks across the lifecycle of service is provided in Chapter 3.

At first glance, the concepts that are illustrated in Figures 1.3 and 1.4 seem to have

no difference from any other illustrations of lifecycles of businesses in any industry. Just like a manufacturing firm, the lifecycle phases in a service organization can be recursive, nested, repetitive, or in parallel during business operations. Indeed, a moment of truth for a service is an instance wherein a customer and a provider-side employee interact to execute the service. An instance might be considerably different from another as the number of involved Ps would change and the constituents of the involved Ps and their relationships could also change (Chase, (1978); Booms and Bitner, (1981); Czepiel et al., (1985); Czepiel, (1990); Bitner, (1990); Bitner, (1992). As indicated in Figure 1.7, various instances could constitute moments of truth in completing the total performance of a designated service. As time goes, to an end consumer, satisfactory services shall evolve with further improved user experiences, while to the service organization services shall evolve iteratively in rendering further enriched and pleasing moments of truth to loyal and new customers.

Physical interactions describe interactions in which a service consumer and a service provider perform service activities to realize the mutual benefits with certain physical evidences that are directly and real-time related to the service required by the consumer. Daily service examples that largely depend on physical interactions include in-person meetings in a physical facility, depositing checks in a bank branch office, eating food in a restaurant, attending a class at school, shopping for merchandises in a shopping mall, or seeing a doctor in a clinic office or a hospital. Without question, physical interactions are radical and key parts of service encounters.

By contrast, virtual interactions describe interactions in which a service provider performs actions to serve a service consumer without providing the physical evidences that are directly and real-time related to the service requested by the consumer. The service encounters are essentially telecommunication or cyber based, such as checking an order status by phone, tracking an order by accessing a website, e-banking, online shopping, online education, or playing computer games over the Internet (Bitner et al., (2000). Virtual interactions have unceasingly increased their roles in service encounters. In particular, self-service systems have received tremendous attentions. On one hand, a service provider can considerably reduce the cost of service management and operations while maintaining a uniformity of services when toward uniformity makes more sense in the services. On the other hand, a service customer can take advantage of the convenience that is entailed by the self-service systems as this kind of service can be consumed anytime and anywhere. Virtual interactions essentially are those interacting activities that are mediated by technical devices (e.g., phones, webs, and social networks).

When interactions occur between a service consumer and a service provider without any help or assistance from a third party, they are essentially direct interactions. For example, a patient sees his/her family physician; or a customer has his/her lunch in a fast food restaurant. The services are directly performed between a service provider and a service customer. By contrast, when services that a service provider promises to offer to customers are actually delivered by a partner of the service provider, the incurring service encounters are described by indirect interactions as the customers indirectly interact with the service provider. A perfect example for an indirect interaction in a service encounter will be a service that a customer buys a set of lovely furniture from a local furniture dealer. Many furniture manufacturers contract many local dealers to sell their famous brands. A set of furniture will be delivered to a customer house only after it has been purchased by a customer. To the customer and the furniture supplier, the interaction occurs indirectly. Figure 1.8 graphically shows direct and indirect interactions in service encounters that most

likely occur in service operations from an organizational point of view.

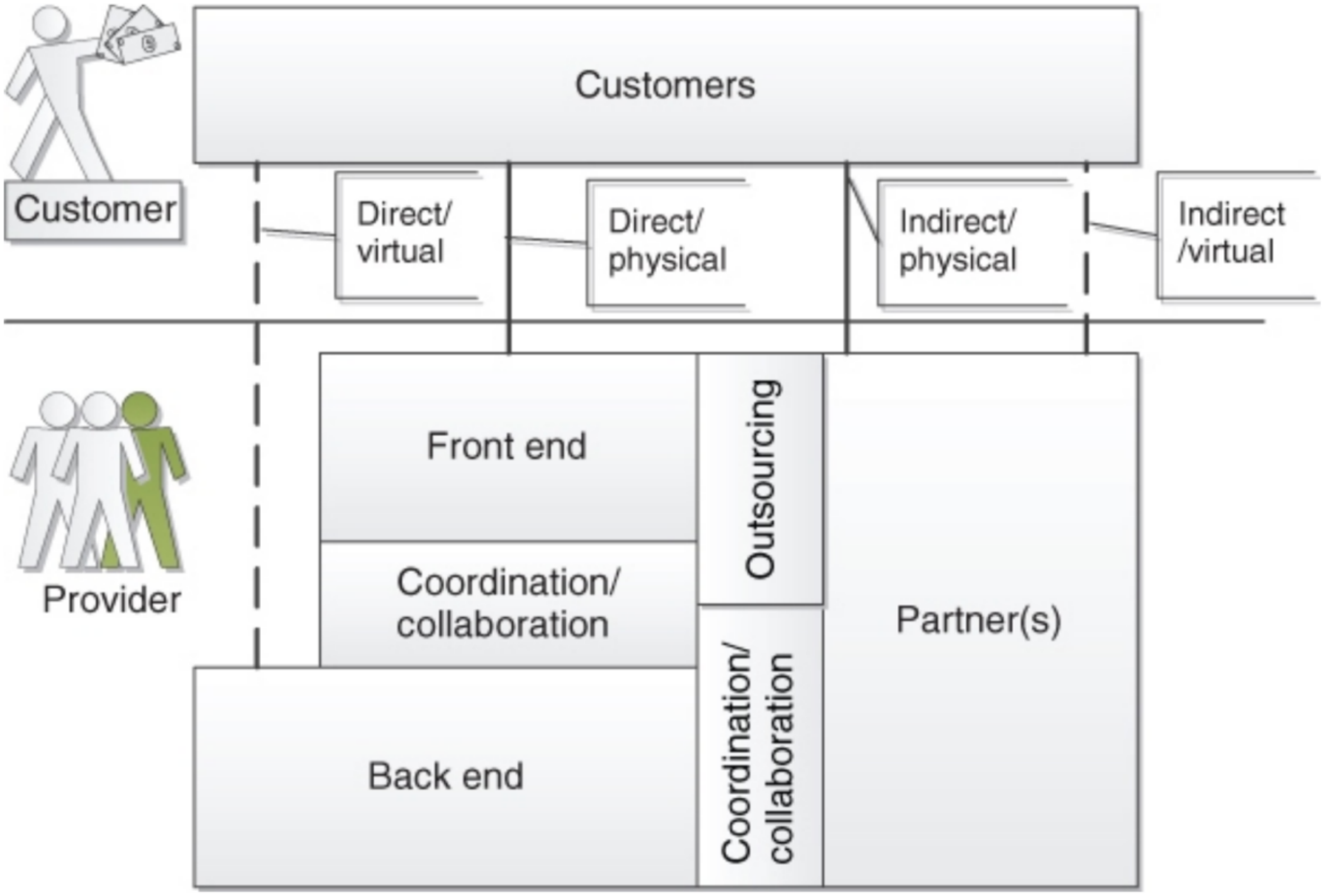

Figure 1.8 An organizational view of service encounters.

1.5 The Economic Globalization

Globalization is the phenomenon that highlights the process of integrating nations. Essentially, globalization refers to the exchange of world views, products, services, and cultures around the world (Deardorff and Stern, (2002). The world economy has indeed made extraordinary improvement since World War II. It has been largely credited to the fast advancement in science, engineering, and technology, such as material science, electronics, computers, networks, transportations, and telecommunication technologies over the past half century or so. In particular, the role and power of IT has been exceedingly increased, consequently transforming the ways the business works and people live around the world. Accordingly, people, production systems, computing resources, and information are effectively linked, resulting in the accelerated globalization that has precipitated today's indispensable interdependence of economic and cultural activities.

According to Deardorff and Stern (2002), “At the most basic level, globalization is growth of international trade. But it is also the expansion of much else, including foreign direct investment (FDI), multinational corporations (MNCs), integration of world capital markets, and resulting financial capital flows, extraterritorial reach of government policies, attention by (nongovernmental organizations) NGOs to issues that span the globe, and the constraints on government policies imposed by international institutions.” On the basis of the data published by (the World Trade Organization) WTO, the fast growth of international trade has indeed occurred since the 1980s. The international trade growth keeps its fast pace in this new millennium. Figure 1.9 shows the worldwide (gross domestic product) GDP from 2000 to 2011 in US dollars.

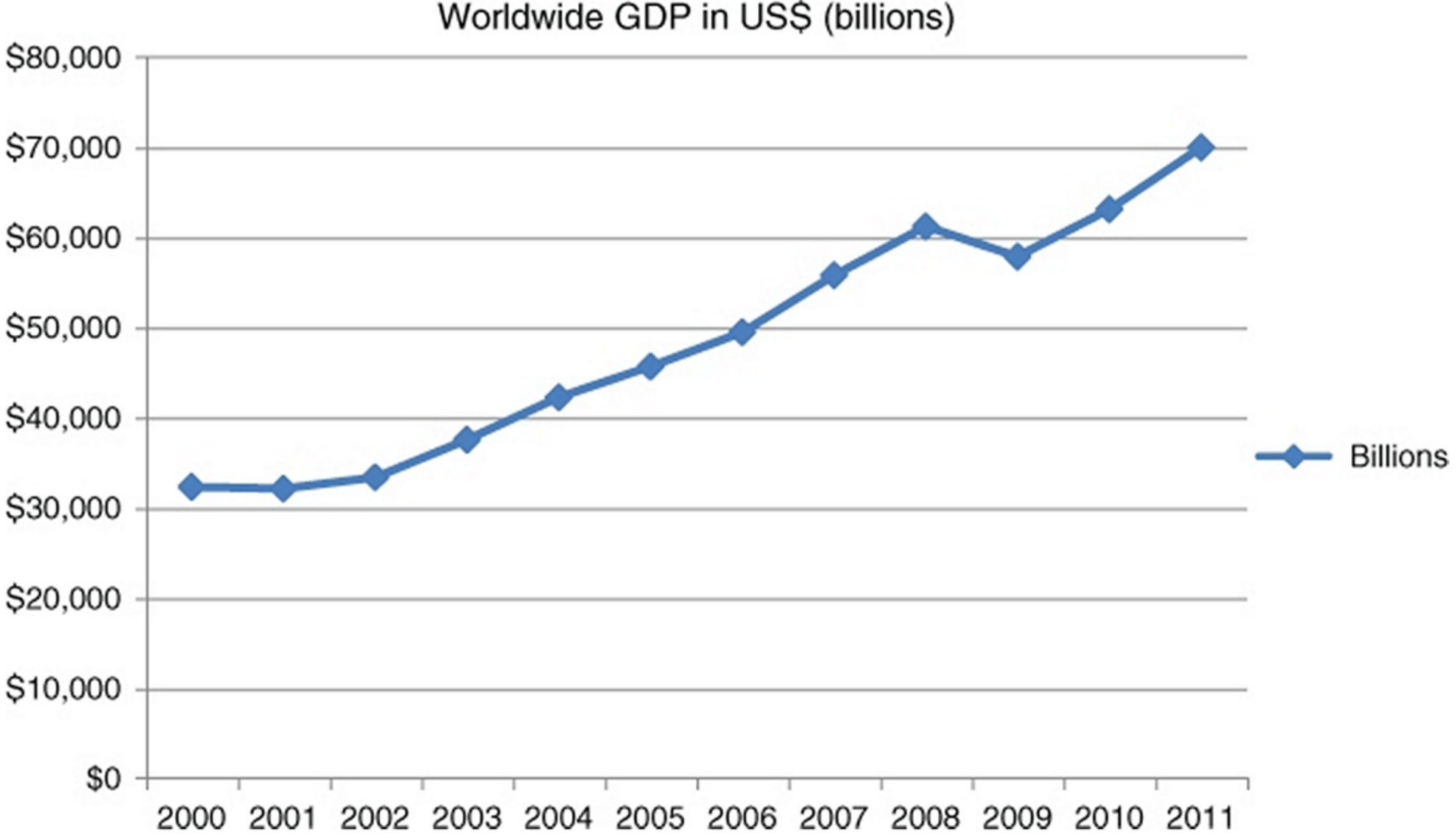

Figure 1.9 World GDP data from 2000 to 2011.

(Source: http://www.wto.org).

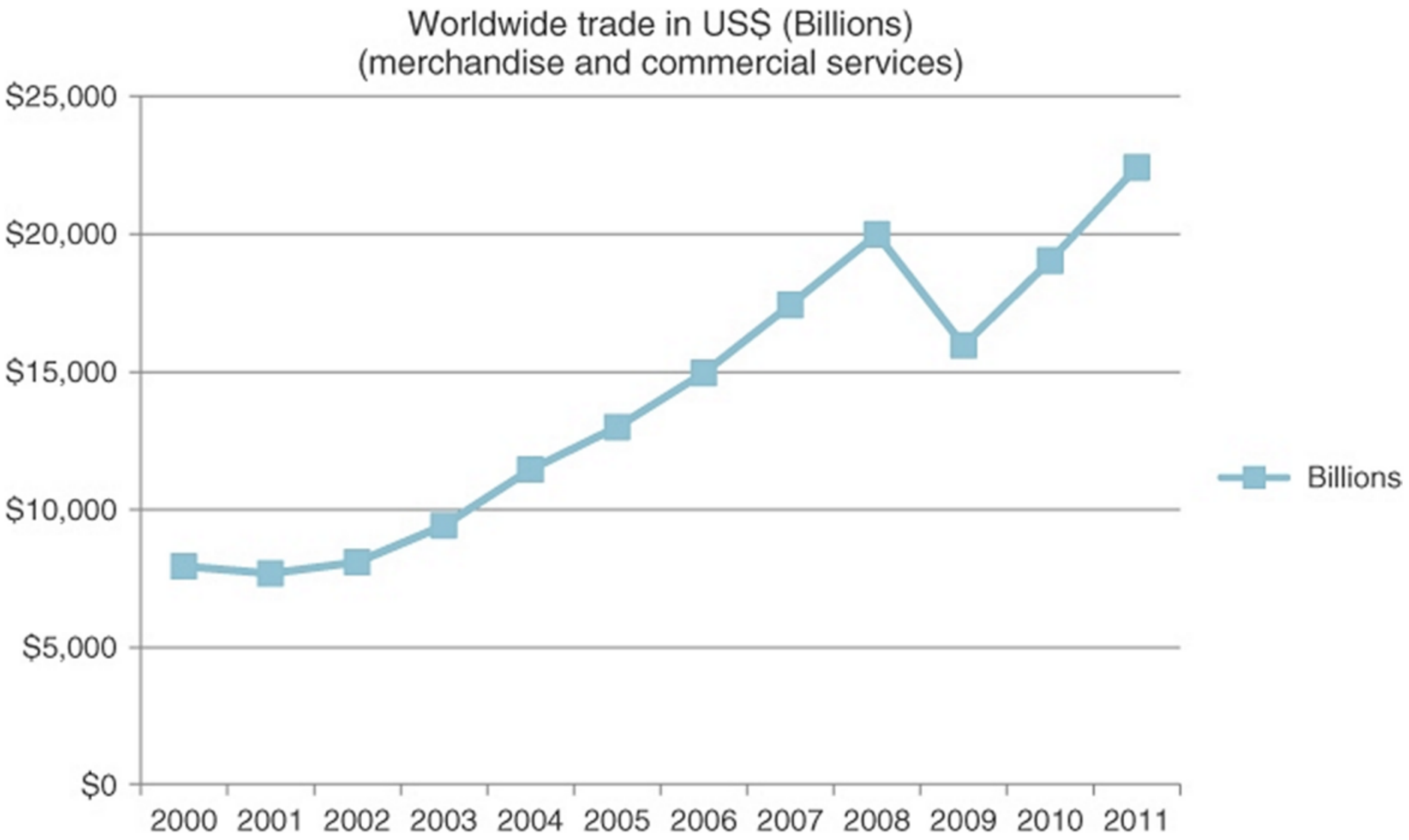

Figure 1.10 World trade data from 2000 to 2011.

(Source: http://www.wto.org).

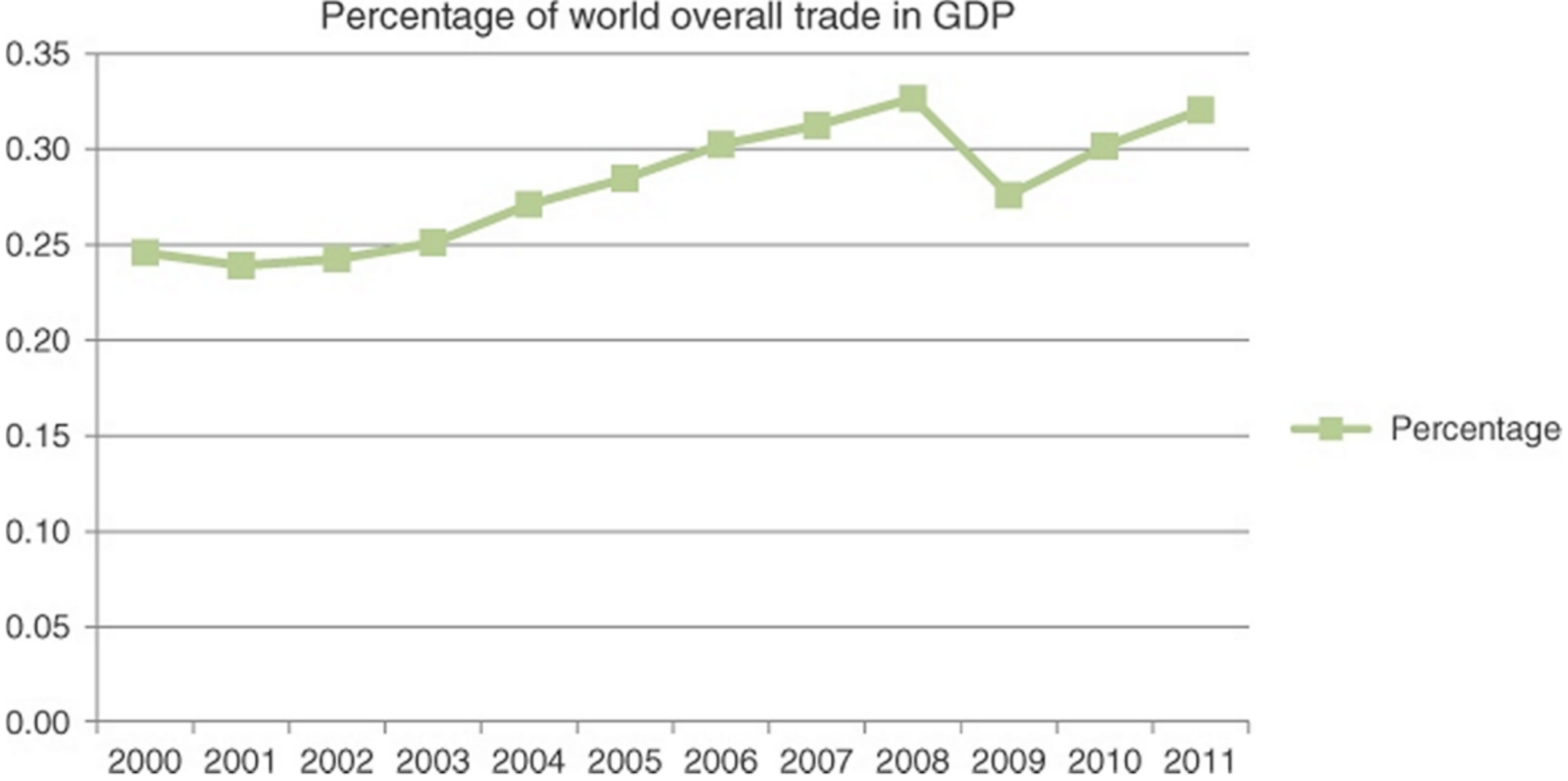

Figure 1.11 The percentage of world overall trade in GDP from 2000 to 2011.

(Source: http://www.wto.org).

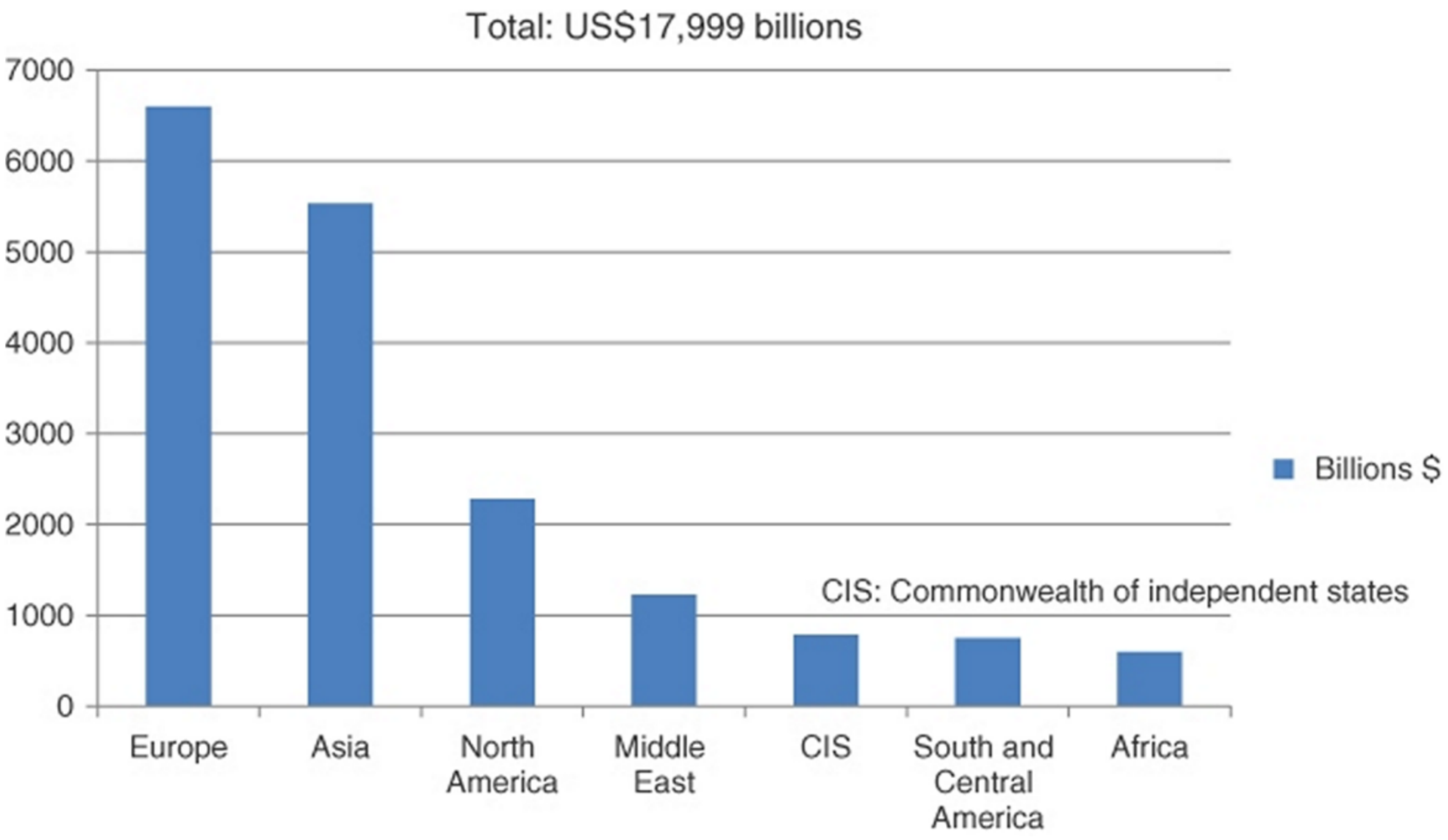

Figure 1.12 2011 world merchandise trade by region: export value.

(Source: http://www.wto.org).

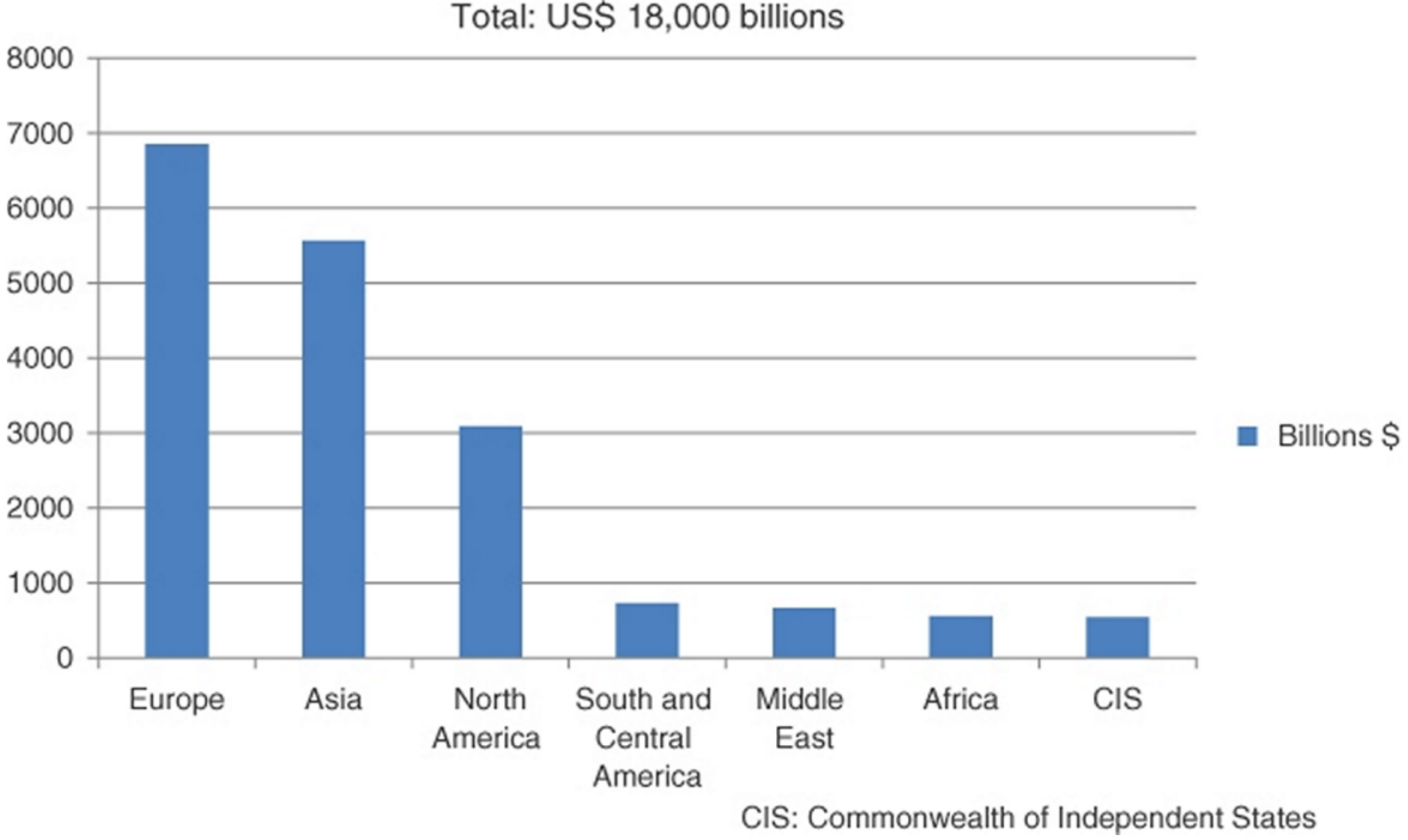

Figure 1.13 2011 world merchandise trade by region: import value.

Although the worldwide GDP dropped in 2009 because of the worldwide financial crisis, the GDP growth in general is the trend. The worldwide economy in 2011 doubled the size of the economy in 2000, appropriately growing 116% in numbers. The international trade had been tripled over the same period, growing from 7687 billion US dollars to 22,424 billion US dollars (Figure 1.10). The percentage of the overall international trade in the worldwide GDP grew at a relatively moderate speed, appropriately from 25% to 32% that resulted in about 28% growth from 2010 to 2011 (Figure 1.11).

The direct effect of the growing international trade will be surely a more integrated global market. Regardless of where physical products are made, they are made readily available for customers around the world. Because of the accelerated globalization, it is well understood that a typical consumer with an average income in the developing economies would have the increasing opportunity and affordability of purchasing products and services that are traded internationally. Figures 1.12 and 1.13 provide the world merchandise trade in 2011 by region using export value and import value, respectively. Figures 1.14 and 1.15 show the world commercial service trade in 2011 by region using export value and import value, respectively. Overall, people, who live not only in the developed countries but also in the developing countries, are better off with international trades than without (Deardorff and Stern, (2002).

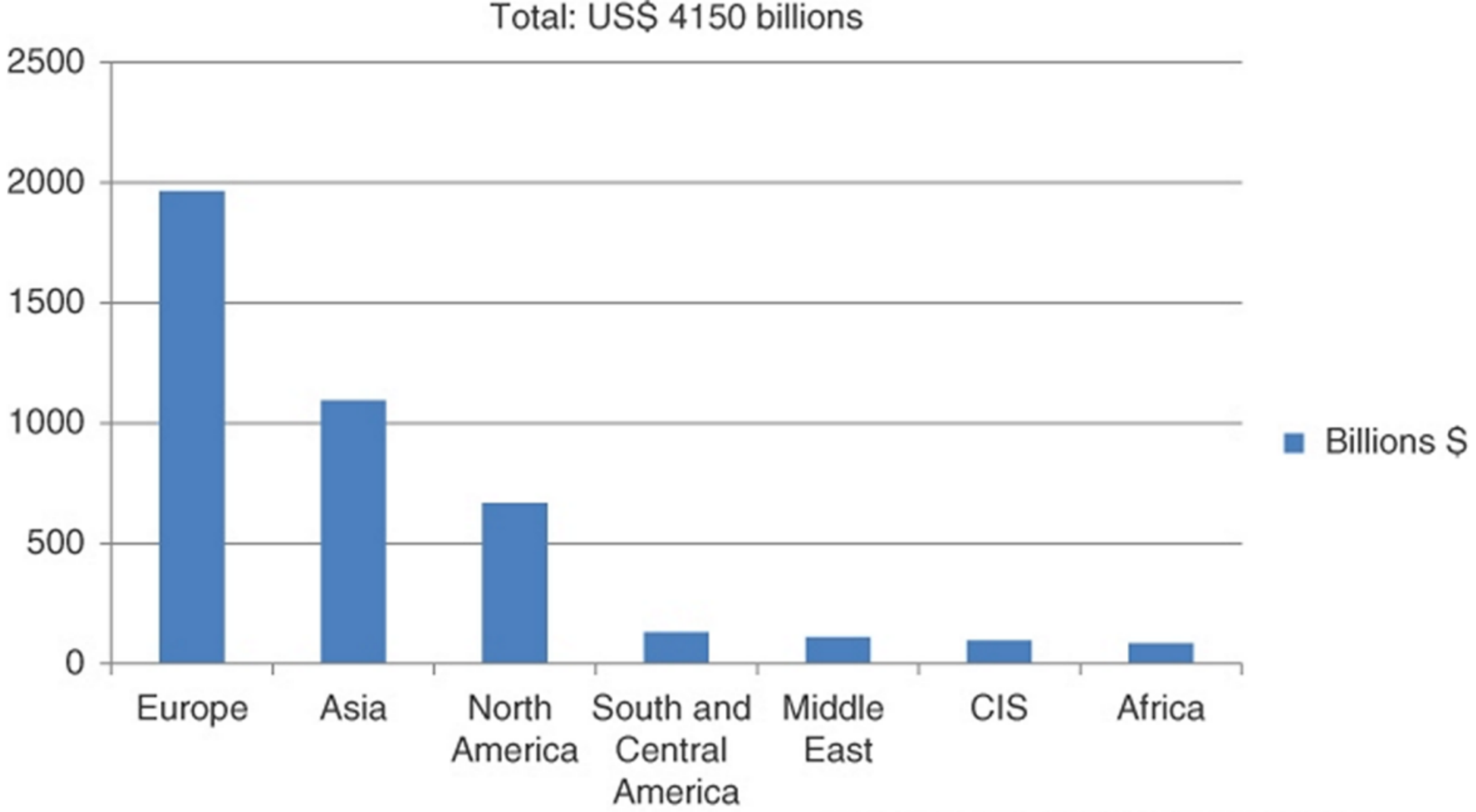

Figure 1.14 2011 world trade in commercial services by region: export value.

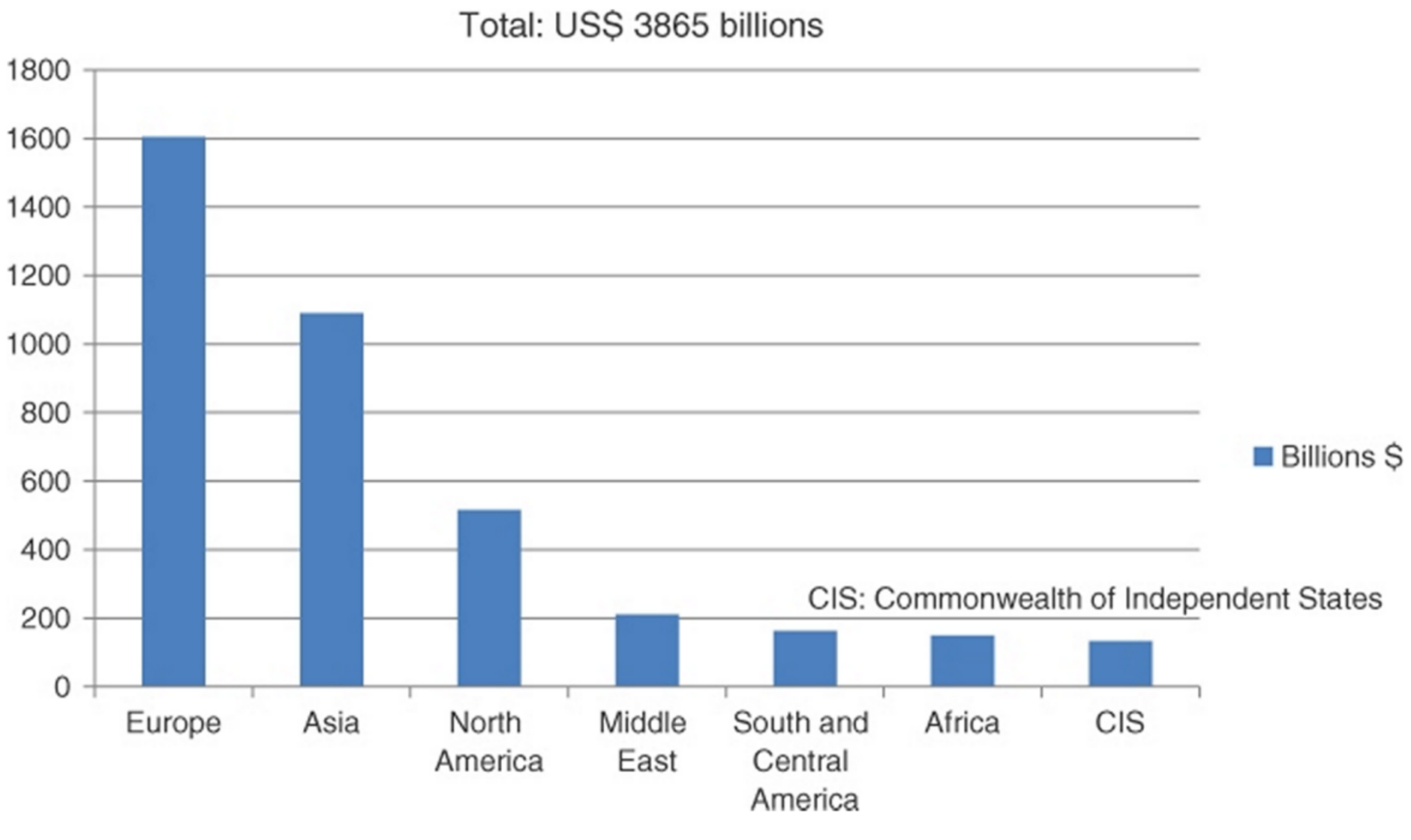

Figure 1.15 2011 world trade in commercial services by region: import value.

On the basis of the Bureau of Labor Statistics of the United States, excluding the goods-producing industries—agriculture, mining, construction, and manufacturing, the service industry, in general, spans all other areas from travel, transportations, logistics, communications, utilities, wholesale and retail, trade, education, finance, insurance, real estate, health care, postal operations, governmental supports, to many other public services. Indeed, the service industry has grown to dominate the developed economies while continuing to develop extremely fast in the developing countries. As an illustrative example, Table 1.1 provides the employment data of the US workforce in July 2012.

Table 1.1 Employment Data of the US Workforce in July 2012

Industries	Employment (In Millions)
	Percentage (%)
Trade, transportation and utilities (wholesale trade, retail trade, transportation and warehousing, utilities)	21.483
	18.6
Professional and business services	14.824
	12.8
Education and health services	17.828
	15.4
Leisure and hospitality	11.996
	10.4
Government	21.666
	18.7
Financial activities	5.954
	5.1
Information	2.134
	1.8
Other	4.495
	3.9
Services sector	100.38
	86.7[a]
Manufacturing	8.444
	7.3
Construction	4.133
	3.6
Agriculture	2.200
	1.9
Mining	0.630
	0.5
Goods sector	15.407
	13.3
Total	115.787
	100.0

[a] The percentage is increased from 82.1% in 2006 to 86.7% in 2012.

Source: http://www.bls.gov/ces/.

Table 1.1 clearly shows that it is the service industry that employed the majority of

workforce in the United States in 2012. Indeed, the percentage of service employees has kept growing over the years. When compared to the growth of GDPs, the US workforce change is well reflected and matched by the similar change pattern in GDPs over the years. Figures 1.16 and 1.17 provide the changes and comparisons among the agriculture, goods, and service industries. At present, the US economy is surely service-led, so are the other developed countries.

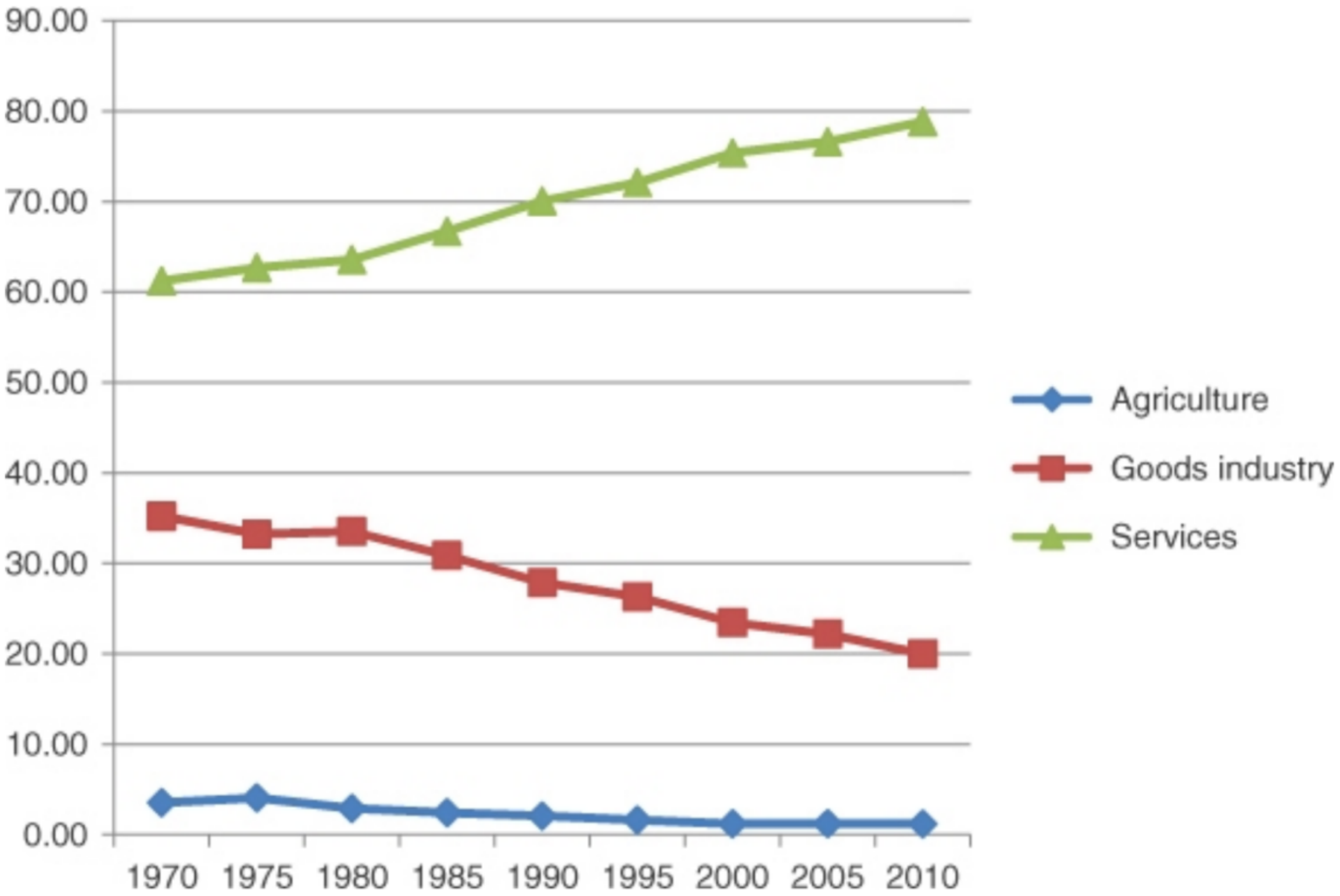

Figure 1.16 US GDP percentage data from 1970 to 2010, where industry includes manufacturing and manufacturing services.

(Source: http://www.worldbank.org/).

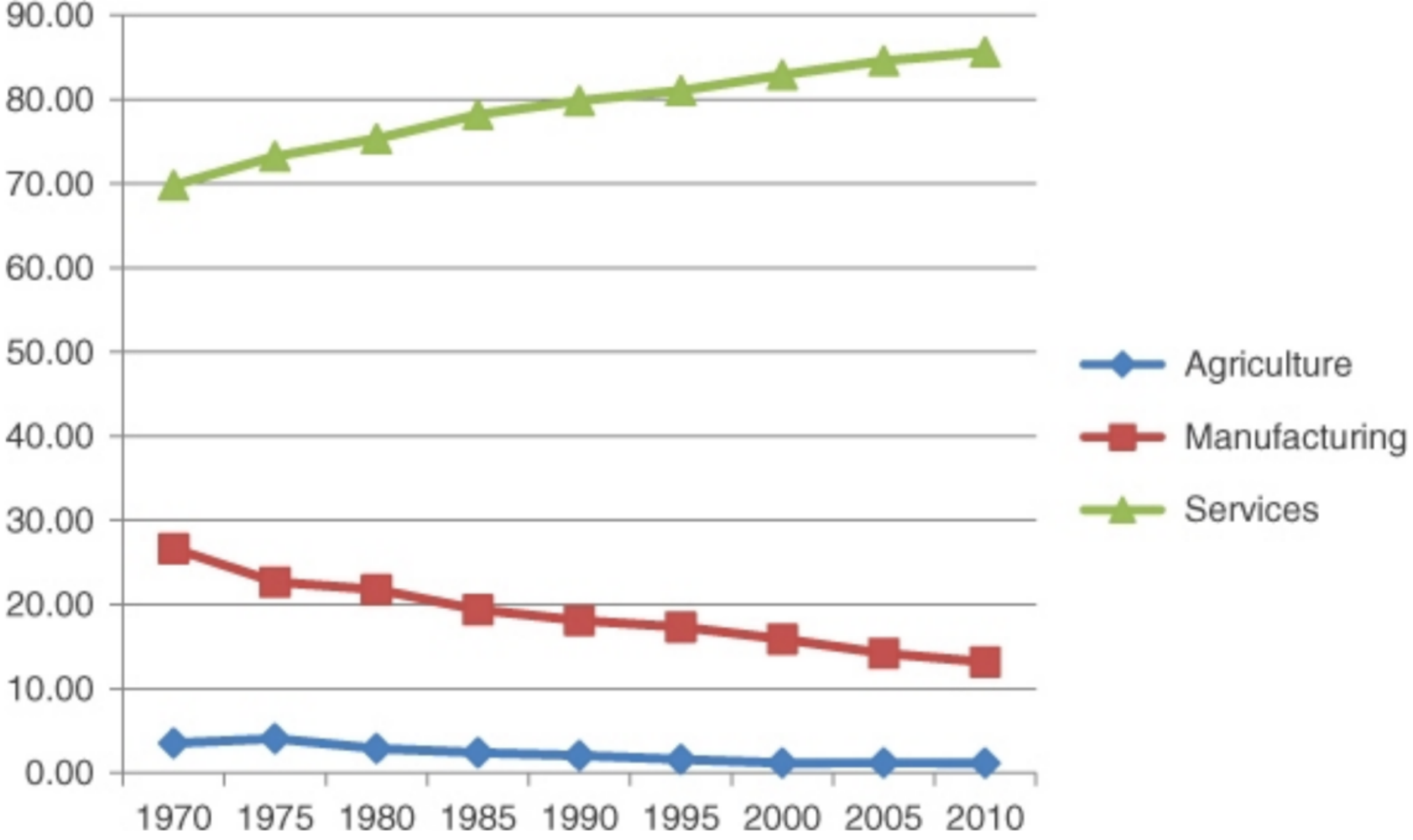

Figure 1.17 US GDP percentage data from 1970 to 2010, where services include commercial services and manufacturing services.

(Source: http://www.worldbank.org/).

Historically, according to US Department of Commerce (1996), most of the G-7 countries began to see a steady growth in the service industry in the 1960s when the output growth of goods started to slow down. Consequently, the world economy gradually made its structural change. Since the 1980s, the service industry has grown to dominate the developed economies. We have also witnessed that the service industry has been developing extremely fast in the developing countries. Indeed, today's global economy essentially becomes service-led instead of goods-dominant. On the basis of the report published by International Monetary Fund (IMF) (IMF, (2012), the service sector around the world contributed about 63.4% GDP worldwide in 2011. Therefore, the world economy surely became service-led. Along with the economic shift from manufacture to service, the changes in business operations and management are significant. Goods-dominant thinking should be replaced with service-dominant thinking in service engineering, operations, and management. With great detail in discussing the shift from manufacturing to service in the developed economy, we will advocate such a mindset change in practice in Chapter 2.

In summary, the customers worldwide are happily enjoying the exuberant markets to fulfill their daily life needs with the support of home and abroad goods and services. Although the economic globalization is unceasingly accelerated, the world service trade is currently about a quarter of the world goods trade (Figures 1.12–1.15). The world service trade must play a quick catchup as the world economy becomes truly service-led. Therefore, service engineering, operations, and management require new and creative thinking and approaches that can be well applied in practice to help service organizations further leverage the cultural strengths and workforce talents across regions and continents.

1.6 The Evolving and Holistic View of Service

At the end of the day, the realized value of delivered products or services lies in their

abilities to satisfy the needs of individuals or businesses. Regardless of what type of products or services we are manufacturing or offering, we must always take significant efforts to ensure that our business operations are cost-effective and efficient and our quality products or services are delivered on time. A competitive organizational structure and its corresponding managerial and operational practices should be well defined and executed. Unless it is a small workshop, a service organization is typically developed and organized based on different while necessary business domain functions in pursuit of common business goals and objectives. Although units are separately operated and managed through their well-defined business domains, they must be collaboratively coordinated across the organization in support of daily business operations to accomplish the defined business objectives (Figure 1.18). For a given organization, surely its business models, organizational structures, and accordingly adopted business domain functions, operations, and management all vary with its unique business nature, size, complexity, and regional and global presence.

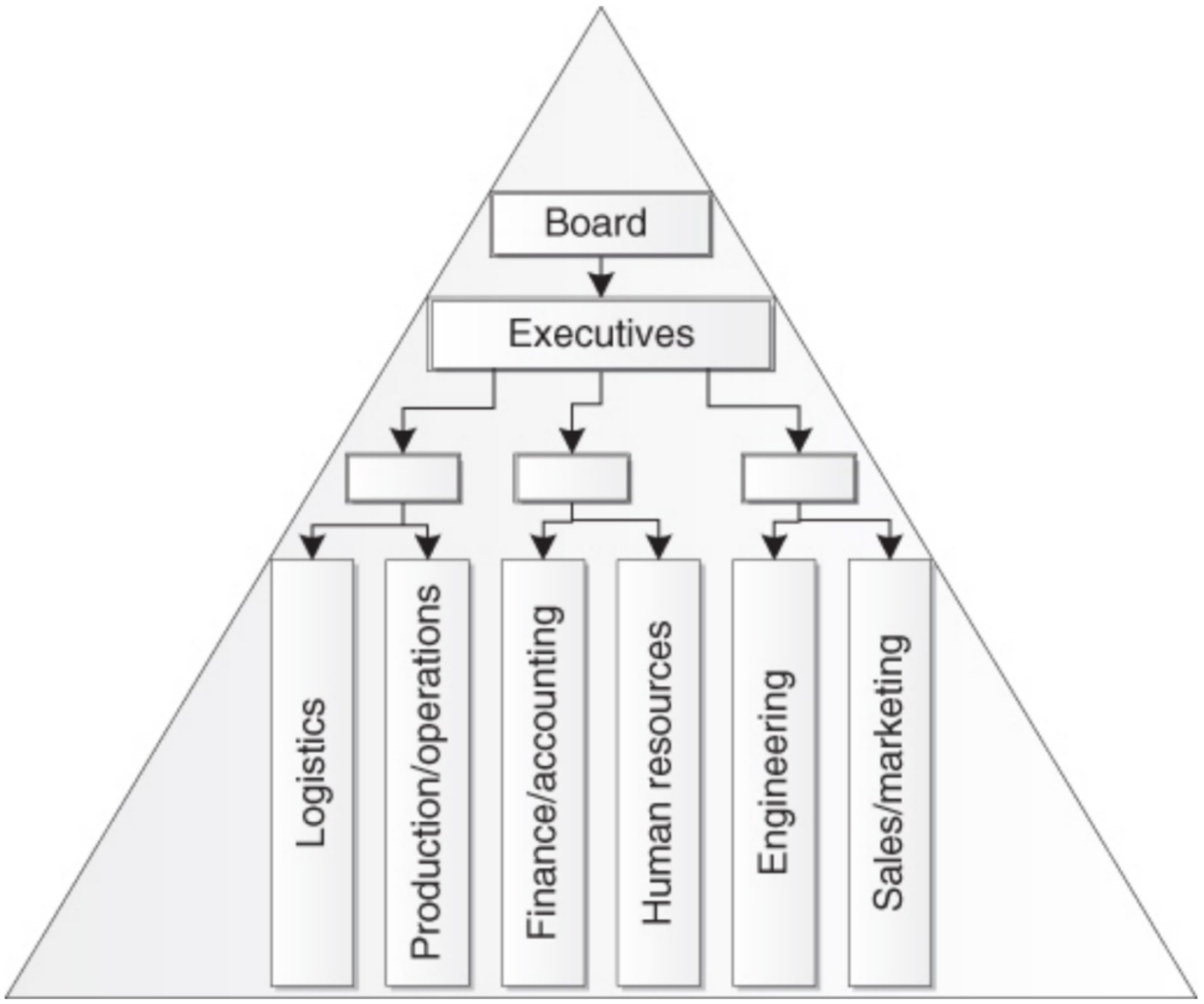

Figure 1.18 A typical organizational structure.

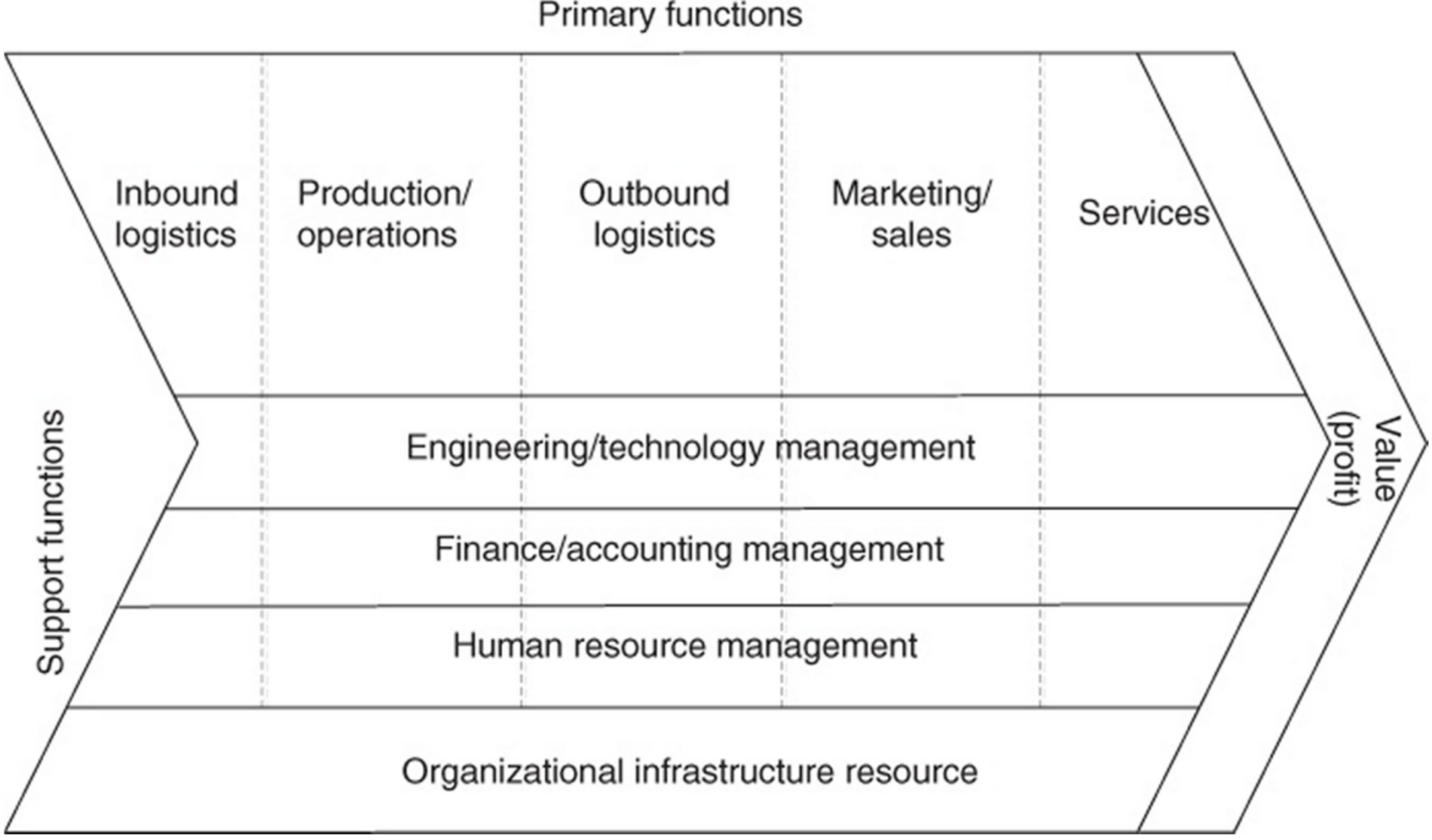

Figure 1.19 The manufacturing organizational value chain (Porter, (1985); Weske, (2007).

As illustrated in Figure 1.18, a typical organization would have numerous business domains, most likely including sales and marketing, engineering, logistics, production, finance and accounting, and human resource, in order to fully function in delivering the organization's business promise that has been made to its customers. Figure 1.19 then shows how a typical manufacturing business successfully generates a value (e.g., profit) throughout the strategically synchronized organizational value chain (Porter, (1985); Weske, (2007). The profit margin depends on the efficiency and cost-effectiveness of underlying business operations and management to produce quality products, satisfying the needs of its end users that can be individual and/or business customers.

It is typical that the technical characteristics and physical attributes of manufactured products largely present their brands in the market. As compared to the outcomes of manufactured goods, the highlights of services are not simply and strictly seen in the functions of the services and the physical attributes of the associated products that are included in the services, but the abilities of services to satisfy end users' functional and socioemotional needs (Chase and Erikson, (1989); Dietrich and Harrison, (2006); Chase and Dasu, (2008). The competitiveness of services in the market thus largely relies on the efficacy and quality of service encounters. In addition, the focus shift from supply to customer has confirmed that organizations understand the increasing importance of inclusion of customers in business management and operations over the past decade or so. Hence, a service organization cannot well perform services to satisfy customers if service encounters that directly impact service quality and satisfaction are not included and considerably integrated in a gradual and spiral manner on its value chain. Figure 1.20 clearly indicates the substantive change by not only including but emphasizing service encounters on the service organizational value chain. Over the years, the service value chain has essentially evolved from the manufacturing organizational value chain. Nevertheless, the service value chain must continue to evolve by bearing total service encounters in mind to meet the needs of the dynamic marketplaces in the service-led economy (Heskett et al., (1994); Karmarkar, (2004).

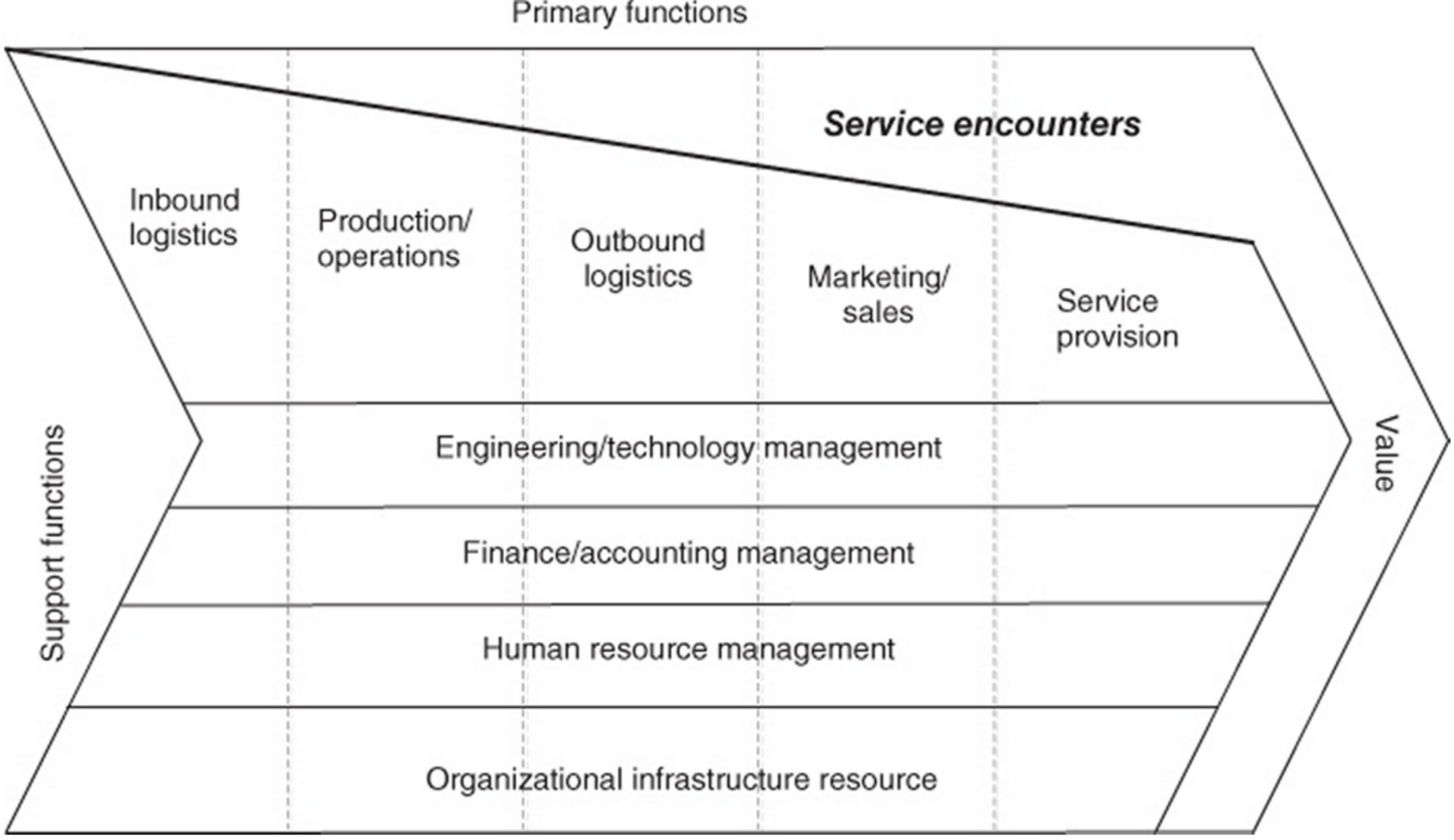

Figure 1.20 The service organizational value chain.

The traditional, empirical, or manufacturing-based goods-centric design, development, and delivery of services can be surely applied in practice and might continue to work under certain business circumstances today and in the future. However, we have witnessed that services have evolved substantially and substantively along with the fast development of technologies, societies, and the global economy. It becomes necessary for us to understand how the modern services have evolved from ones not too long ago. Surely, with the comprehensive exploration of service innovation and better understanding of people-centric services in today's information era, we can ensure that our service provision will spiral into the manifests of user experience excellence (IBM, (2004); Cambridge, (2007); Chesbrough, (2011).

Without delving into the details, let us briefly look at a list of core services we rely on at work or primarily in our daily life. Hence, we can capture and abstract the general characteristics of service encounters (Bitner et al., 1994) that are essential for the list of rudimentary services.

- *Restaurant Food Services*. We choose a recipe we like and then go to a restaurant that serves the recipe. We talk to a waiter/waitress and order dishes from a menu. We eat and then pay for the service. If the foods are delicious, the setting is comfortable, and the waiter/waitress is polite and helpful, we will eat there again. Typically, catering services are driven by the quality of foods and customers' perceived pleasure and service satisfaction. Intuitively, we consider that the catering services are act-based as direct and physical service encounters are necessary.
- *Car Services*. For a regular maintenance, we call a car service shop we choose and schedule an appropriate mileage-based service recommended by our car manufacturer. On the scheduled day, we bring the car that is scheduled for its regular maintenance service to the shop. After we confirm with a receptionist on the needed maintenances, we drop the car there and leave for work. A mechanics might call us if there would be something to discuss, such as different problems found during the service, the need for replacing extra parts, the final charge, and/or a different time to pick up. We pick up the car after we pay the due.

Again, we intuitively think that car services are generally act-based as direct and physical service encounters mainly occurs throughout the maintenance service process.

- *Residential Gas or Electricity Services*. We call a local office of a gas or an electricity service provider we choose and inform the service provider of the date we move in. When we move out, we simply do the same. We pay a bill based on the monthly usage of gas or electricity. As discussed earlier, unless there would be a problem with power lines, gas pipes, or a discrepancy in a monthly bill statement, we might not physically interact with the service provider at all. At first glance, we think the utilities services are supply-based. Indeed, indirect and virtual interaction types of service encounters dominate across the corresponding service process in the utility industry.
- *Resident Education*. We register a course that can be a required core course or a selective one for a degree or diploma. We go to school to attend instructor-led lectures or lab sessions. We listen to the lectures provided by an instructor. We frequently discuss with the instructor or classmates on a variety of topics related to the lessons. We surely complete assignments and take exams or finish projects in due course. Typically, we think resident instruction-based education services are act-based as direct and physical service encounters dominate in the whole educational service process.
- *Online Training*. We register a training course. No matter where we are, we can log on whenever we have time and an Internet connection. We read lecture notes and watch or listen to recorded lectures via a variety of online social media. We might discuss problems with other trainees who have registered the same training class. The discussions can be done synchronously or asynchronously. By leveraging a variety of online supports, we will complete assignments, take exams, or finish projects as needed. Without question, online training is quite different from resident instruction-based education. As this particular type of online training seems that the offered services are delivered using an on-demand model, it is extremely similar to a utility-type service. Intuitively, we think online training services are supply-based as indirect and virtual service encounters dominate in this type of training process.
- *Federal Bureaus or State Agencies*. We can use a driver license renewal service as a typical example of utilizing state-level governmental services. We fill in a renewal form online. A letter from the Department of Transportation of the state we live in will arrive in a few days, which informs us of the time and location to have our driver licenses renewed. We show up at the designated office on the date indicated in the appointment letter. A staff at the office will assist us in the whole renewal process. A photo will be taken, a signature is then required, and accordingly a new driver license will be issued. Service encounters seem to take a variety of possible social and transactional interactions. We typically perceive that the services provided by both federal and state agencies consist of a series of acts of public services.
- *Global Project Development*. Let us make up a fictional virtual project team first. A software project development team has six small groups of people, populating in six different geographic regions. Each group has certain unique skill sets of from 5 to 15 talent employees, including a software designer, a group architect, programmers, quality assurance staff, business analysts, and a group manager. A top-level management group, managing the entire virtual project team, consists of one team manager, one team architect, and one team business analyst. A

project draft specification might be brainstormed when the top-level management group meets with a group of customer representatives. The project specification might be revised and enriched as time goes. Unless the project is completed, it is typical that the specification will keep changing to some extent. Surely each revision will be the outcome of numerous onsite or virtual meetings. Customer representatives could be directly or indirectly contacted by group members if necessary. We surely understand that a project requiring a global virtual team is usually big and complex and its development process is frequently long and complicated. In general, we perceive that global project development services surely are act-based, requiring a series of interactions and coordination, physically and/or virtually. Service encounters throughout the development cycle of global project development services are collaborative in nature.

- *Health care Service Networks*. We use an outpatient, who has a small hand lump removed through a health care service network, to show how a typical US health care service is performed. Figure 1.21 illustrates the process and associated steps that are usually taken by the outpatient to complete his treatment and get fully cured and recovered. Step 1, the patient has to see his family physician (Dr. A) first. He is usually referred to an orthopedic or hand specialist. Step 2, we assume that the patient makes an appointment with the referred orthopedic specialist (Dr. B) and sees the orthopedic specialist accordingly. Dr. B diagnoses the hand lump and then schedules an operation for him. In order for Dr. B to do a hand surgery, Dr. B asks the patient to get his physical examination done by Dr. A before the scheduled operation. Step 3, the patient has to see Dr. A to get his physical exam. Step 4, Dr. A informs Dr. B's office of the result of his physical exam. Step 5, the patient shows up in the hospital where his hand operation will take place. Dr. B has the scheduled operation completed. Step 6, the patient gets some prescribed medicines by Dr. B from a pharmacy. Step 7, the removed neoplasm is sent to some labs for further diagnosis. Step 8, the lab result that shows the neoplasm is benign and is delivered to Dr. B's office. Step 9, Dr. B sends a final report of the treatment for the patient to Dr. A's office. Step 10, the patient sees Dr. B., Dr. B checks how the recovery from the surgery goes. The patient gets released once Dr. B determines that the neoplasm is completely removed and patient's hand gets fully cured and recovered from the surgery. Apparently, a health care service is act-based, which mainly requires a series of interactions and coordination, physically and directly. Service encounters throughout the whole process are indeed collaborative in nature. The involved health care personnel should be coordinated in a timely and collaborative manner; the patient must be also well collaborated in order to have the operation service and treatment completed in a quick, successful, and satisfactory manner.

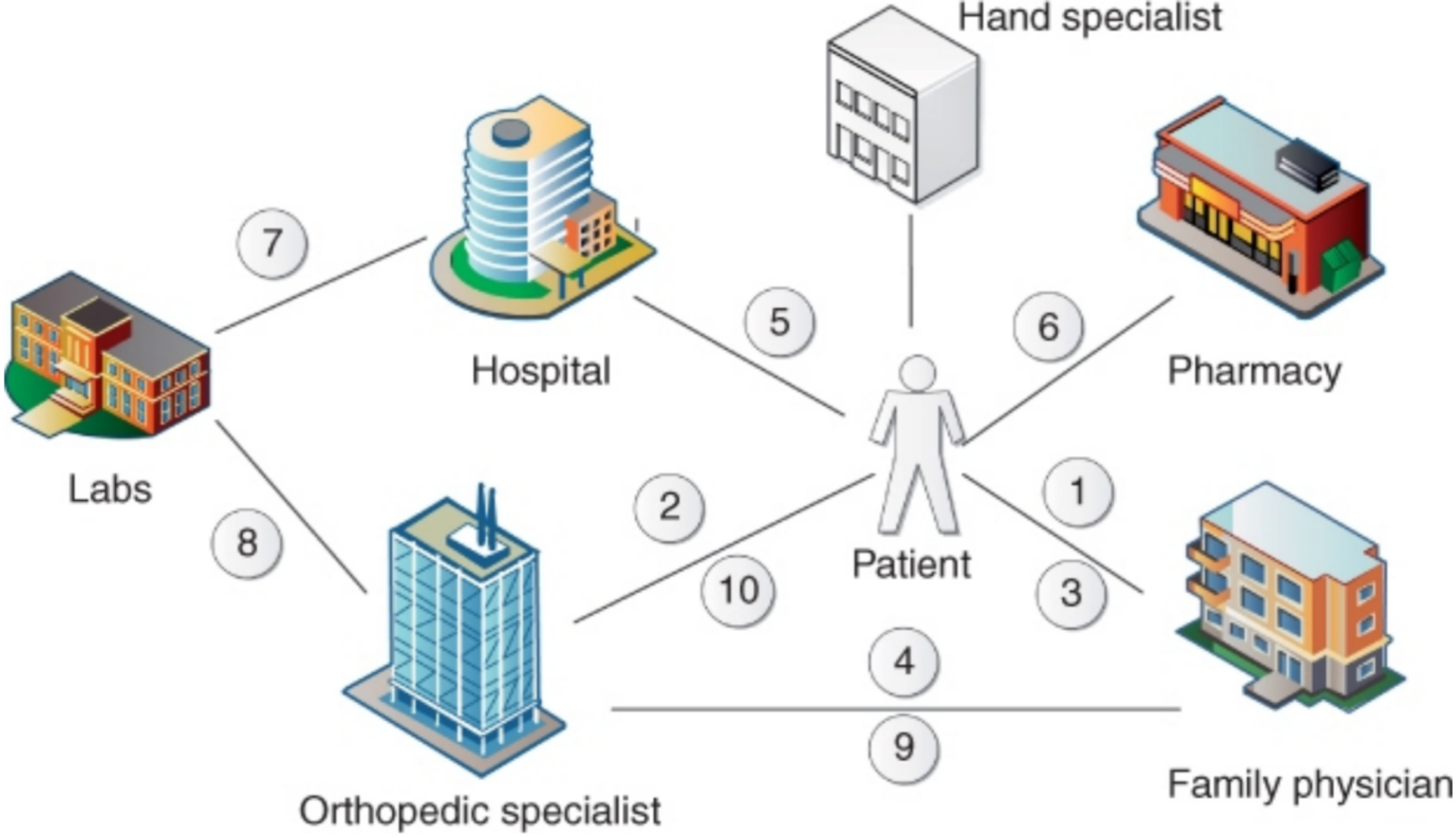

Figure 1.21 A typical US health care service network.

From the above brief discussion on service encounters that were derived from a list of selected core services at work or in our daily life, we can roughly provide a comparison table (Table 1.2) to list the key variations of different services by presenting what customers' general perceptions of these services would be and how a series of service encounters play a pivotal role in the noticeable evolution of the service organizational value chain (Figure 1.20). Banking, online banking, shopping, online shopping, tourism, and transportation services that well serve our daily life needs are also included in Table 1.2. Note that the differences perceived by customers are derived from their perceptions of services throughout the lifecycles of the consumed services.

As the perceptions of services are primarily subjective, the corresponding differences intuitively come from the differences acquired from service encounters by customers during the periods when they receive the offered services. We do not try

Table 1.2 Rough Comparisons of Customers' Service Perceptions Across Different Types of Services to present perfect and comprehensive understandings of service encounters in this introductory chapter. We use Table 1.2 to simply show a few of examples to provide some clarifications or explanations of the existence of different service definitions mentioned earlier while highlighting the pivotal role of service encounters in service. The readers should also understand that there surely exist other forms of service definitions in academia and practice.

From the approximate comparisons provided in Table 1.2, we can further confirm the three main definitions that have been radically formed from customers' general perceptions of services.

- When a service is performed, if its service encounters are largely physical, intensive, and direct from the customer's perspective, then a social and transactional performance is perceived as the centerpiece of the service. This entails that service is considered as a direct performance of beneficial activities.
- By contrast, when a service is performed, if its service encounters are mainly virtual, brief, and indirect from the customer's perspective, then the usage of a

service product or resource is perceived as the centerpiece of the service. Accordingly, service is quite often considered as the supplying of utilities, commodities, or digitalized media.

- In addition, people receive many societal function types of services, such as societal function services that are provided by governmental agencies. People easily view the related service encounters to have a public service nature. Service is thus essentially considered as a performance of supporting the needs for the public.

Services	Service Encounters	Type		
		Product	Physical Versus Virtual	Direct Versus Indirect	Brief Versus Intensive	Process	Customers' General Perceptions of Services
Restaurant foods	Foods	Physical	Direct	Brief	Short and simple	Catering acts
Car services	Fixing or maintenance	Physical	Direct	Brief	Short and simple	Providing fixing acts
Gas or electricity	Utilities	Virtual	Combined	Brief	Long and simple	Supplying acts
Banking	Saving and checking accounts	Physical	Direct	Intensive	Long and	Supplying acts

		simple	
Online banking	Saving and checking accounts	Virtual	Supplying acts
		Combined	
		Brief	
		Long and simple	
Shopping	Merchandises	Physical	Selling acts
		Direct	
		Intensive	
		Short and simple	
Online shopping	Merchandises	Virtual	Selling acts
		Combined	
		Brief	
		Short and varying	
Transportation	Delivery	Physical	Supplying acts
		Combined	
		Brief	
		Short and simple	
Tourism	Tour planning	Varying	Providing tour acts
		Combined	
		Intensive	
		Short and complex	
Health care	Knowledge	Physical	Providing diagnostic, care, and treatment acts
		Direct	
		Intensive	
		Varying	
Resident education	Knowledge	Physical	Providing educational acts
		Direct	
		Intensive	
		Long and simple	
Online Education	Knowledge	Virtual	Providing educational Acts
		Combined	
		Brief	
		Long and	

		complex	
Federal bureaus or state agencies	Polices and, regulations compliances, or law enforcements	Varying Direct Brief Short and simple	Providing public supports acts
Global project development	Knowledge	Varying Combined Varying Varying	Providing knowledge acts

Overall, we can find that it is the “performance” or “act of performing” in service provision that creates benefits for both service providers and service consumers. As service providers, in addition to the service delivery-based interactions that are mainly perceived by customers, we know that the design, development, and preparation of service encounters must be included and well executed across the service value chain (Figure 1.20). Customers consume and perceive services through a list of service encounters that can be delivered, face-to-face or virtually, directly or indirectly. However, in a systemic perspective, customers are heavily involved in other phases of the service lifecycle including inputs to service design and feedback on consumed services. In other words, the real value of service is the total perceived value of the outcomes developed and accumulated from a series of service encounters that truly cross the lifecycle of service.

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Chapter *2*

Definition of Service

Today's business environments are characterized with advanced communications, accelerated economic globalization, and increased automation and open source innovations. As we have witnessed, the resultant vibrant but also complex service provision has created higher quality and healthier lives around the world. For a service organization to stay competitive, however, the unceasingly intensified competition demands that the organization must keep improving the efficiency and cost-effectiveness in service management, engineering, and operations across its service organizational value chain.

Over the years, service is typically considered as an application of specialized knowledge, skills, and experiences performed for the benefit of another (Vargo and Lusch, (2004); Spohrer et al., (2007). Quite often, services to customers are regarded as being perishable, heterogeneous, and intangible, commonly provided for either individuals or businesses to create desirable values to satisfy their needs (Sampson and Froehle, (2006); Qiu et al., (2007). Hence, to find an appropriate definition of service in a broad sense to cover a variety of service areas seems difficult and challenging.

Service as a word in economics is mainly defined as an act of helpful activity, the supplying of transportation, communication, and utilities or commodities, or the providing of assistance, accommodation, or leisure activities. Although its meaning might vary with circumstances, a given service substantively implies performing an action or a series of actions. Indeed, no matter what a service product is embedded as part of the offered service, the service is being executed only when the act of a designated service activity is performed. The value of the service thus largely depends on when, where, and how the process of relevant service activities gets executed.

From Chapter 1, we understand that a sound, solid, and holistic definition of service is essential for this book, regardless of the existence of many versions of service definition in academia and practice. Therefore, in order to find a sound, solid, and holistic definition of service we need, we must revisit and rethink the process of generating service values by exploring the following aspects of service:

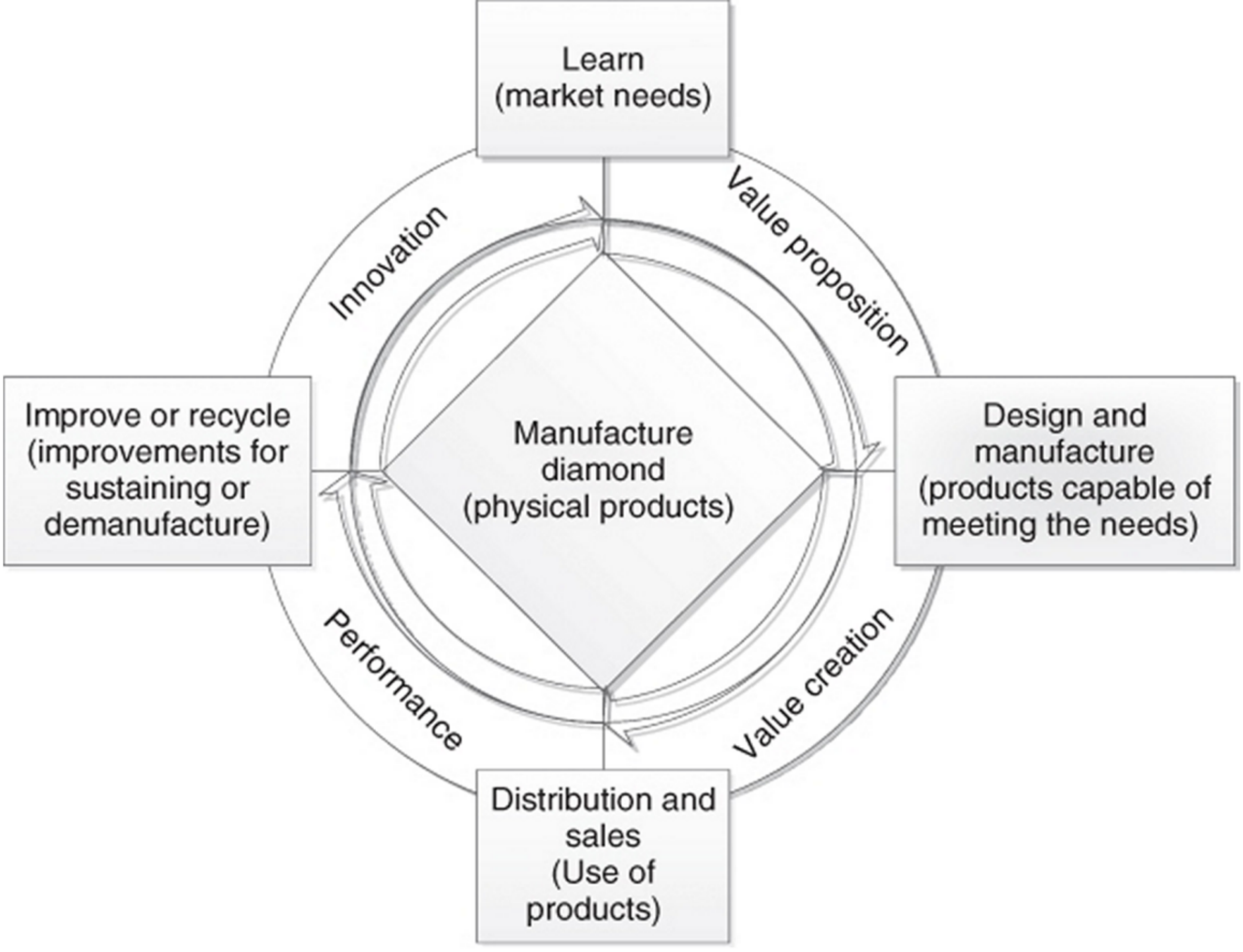

Figure 2.1 Priority shifts in operations and management in manufacturing.


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internally and externally. The lead time and cost of manufactured products in production and on the supply chain thus get cut further.

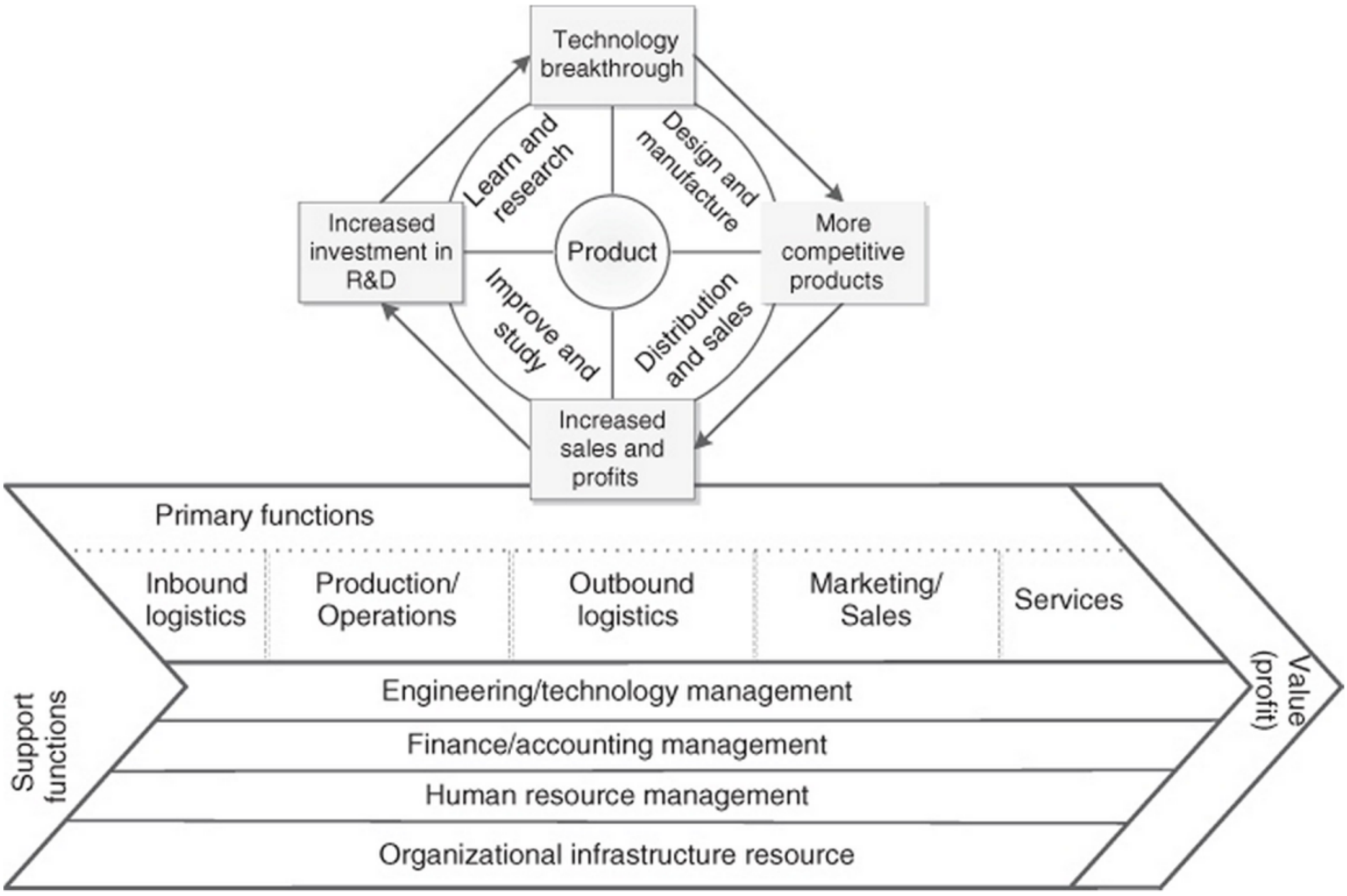

Figure 2.3 Competitive manufacturing driven by goods-oriented innovations.

Without a second thought, the innovation-based virtuous cycle must center and indeed has truly centered at physical products in manufacturing organizations.

In general, the value for an organization is the benefit provided for customers, employees, partners, and investors. The value recognized as a benefit indeed varies with the stakeholders and time. At a different time, the benefit for a different stakeholder might be realized in a different form. In manufacturing, the benefit is usually realized through product-centric business operations that seek to leverage prices over costs by means of organization, policies, management, operations, technology, finance, incentives, and other factors throughout the manufacturing value chain (Figure 2.3).

As the manufacturing productivity and quality of products have been significantly improved, the standard of living has been considerably improved. Although the means that are used in gauging the standard of living vary with political and economic societies and geographic areas, in the last quarter of the twentieth century, the world witnessed significant transformations in many aspects of well-being that were mainly driven by the long-established industrializations and well-improved productivities in the developed economies. As a result, the global economy gradually shifted its focus from manufacturing to services, aimed at further improving the quality of lives around the world. It has been well recognized that the dawn

of information era has accelerated the shift.

The quality of life currently takes into account not only the material standard of living but other intangible values of living that are service-oriented and largely subjective. Indeed, people are increasingly demanding supportive, pleasant, and value-added services. The social and perceptive concepts and measures, including success, happiness, satisfaction, and the like, are frequently applied and used to measure the outcomes of performed services. Thus, the measurements used for gauging consumed services are substantively different from the performance measurements such as physical features and technical functions that have been mainly used in manufacturing. Without identifying all the characteristics of manufacture and service, a brief comparison between manufacture and service using the simplified lifecycle phases in Figures 1.4 and 2.1 is provided in Table 2.1.

Table 2.1 Highlights of the Operational and Managerial Priorities in the Service Industry

Lifecycle Phases	General Characteristics	Highlights of the Changes in		
Manufacture	Service			
	Manufacture			
	Service			
	Service Operations and Management			
Learn	Learn	Market analysis: physical features and functions	Market analysis: services to meet the customers' perceived values and their daily needs of service product features and functions	Customers' perceptions of services including service products
Design and	Develop	Physical	Resource	The capacity

manufacture		product realization: functionality, quality, automation, and cost	development: capability of delivering, quality assurance, and cost	of resources and capability enabled by the service providers
Distribution and sales	Deliver	Physical product distribution efficiency and price	Satisfactory acts of performing designated service deliveries and price	Service encounters
Improve or Recycle	Improve	New features and functions	New acts to increase customers' perceived values and more capable resources	Enhancements in support of service encounters

Many scholars and practitioners have attempted to differentiate service from goods on one or more dimensions ultimately arriving at a continuum (Bell, (1981); Bowen, (1990); goods are arrayed at one end and service on the other end. It is typically true that there is considerable overlap between the two (Solomon et al., (1985). In this book, we incline to have our main discussions by inclining to the service end. However, for a service, we must understand that goods are frequently the conduits of service provision. Therefore, the physical attributes and technical characteristics that specify the goods are surely indispensable to the service.

Let us look into two excellent examples to see how the discussions are reflected in real life. One is a typical car repairing service. The other is a purchase of a popular product, iPad, from the Apple online store.

- *Car Repairing Service*. When we know there is a problem with a car, we call a car service shop that we choose and schedule an appointment. On the scheduled day, we bring the car that is scheduled for a repair service to the shop. After we confirm with a receptionist on the needed repair service, we drop the car there and leave for work. A mechanic might call us if there would be something to discuss, including the severity of the identified problem, the misunderstanding or misinterpreting of the stated problem, or other problems found during the conducted diagnosis process, other necessary maintenances recommended by the mechanics, the final charge, and/or a different time to pick up. We pick up the car after we pay the due. Throughout the repair service process, we understand that a series of service encounters must occur. Indeed, the appropriate and timely occurrence of each interacting activity on the

service encounter chain ensures user experience excellence in an integrative manner, resulting in that the repair service gets executed in a satisfactory manner.

- *iPad Purchase and Delivery Service*. As a customer, I was amazed by how Apple Inc. can deliver millions of products to customers on time. It is nothing special these days that you can track the delivery process of an ordered product through the Internet, regardless of your choice of a transport organization. However, to deliver millions of products made overseas to customers on the promised dates is exceedingly fascinating. I still remember that the first generation of iPad officially became available for preorder on March 12, 2010. I ordered one on that day. The Apple online store provided several handy and optional shipment alert services that allowed customers to monitor their shipments through Apple's contracted delivery firms. I received my ordered iPad on April 3, 2010. April 3, 2010 was the date that Apple promised on March 12, 2010 that the first generation of iPads would be released and delivered to millions of US customers. Although I cannot get the order history information that is over 18 months old, Figures 2.4–2.6 show good examples of highly coordinated and collaborated processes of purchasing, manufacturing, customs, and shipments across countries that are managed in an effective and satisfactory manner. In addition to calling relevant customer service representatives, we can easily interact with the Apple online store, UPS, or FedEx websites to change orders, monitor the shipments, change how we want the ordered products to be delivered to fit into our busy daily schedules. Customer-centric and satisfaction-focused business operations and management have surely contributed to the success of Apple's business. It is the service that helps sell the product! More discussion on Apple's customer-centric and innovative approach will be further provided in later chapters.

Table 2.1 and the above-discussed two examples surely help us to get a better understanding of how certain priorities have been shifted in business operations and management in the industry. Service encounters play a fundamental role in service offerings, clearly indicating that people's social, physiological, and psychological traits are critical in services (Solomon et al., (1985); Surprenant and Solomon, (1987); Chase and Dasu, (2001). However, these traits are extremely challenging to measure, monitor, and control in service operations and management. Therefore, we understand that, substantively different from traditional manufacturers that have put products in focus, service organizations must put employees and customers at the center of concerns in business operations and management (Heskett et al., (1994); Loveman, (1998); Qiu et al., (2007); Schneider and Bowen, (2010).

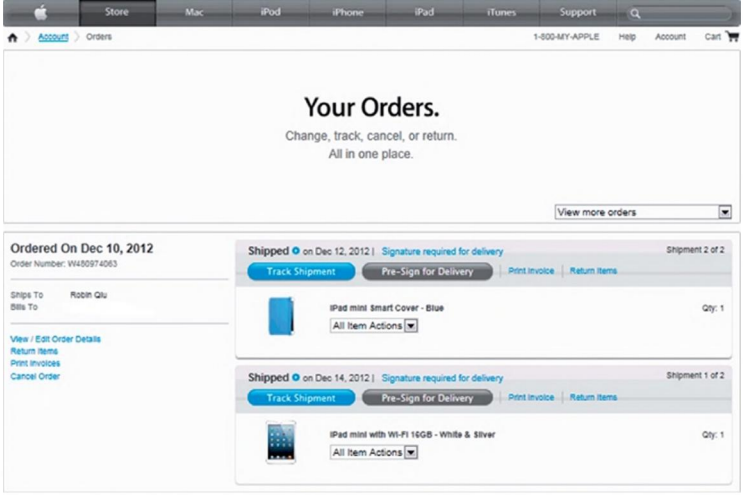

Figure 2.4 Online purchase services provided by Apple online store. (Source: Apple.com).

Internet-based marketplace. It is well recognized that business process automation, outsourcing, customization, offshore sourcing, business process transformation, and self-services by leveraging the ubiquitous and pervasive networks and wireless communications became another business wave in today's evolving global service-led economy.

Indeed, the twenty-first century's business environment is considerably enabled by advanced computing, networking, and telecommunications. Business operations are thus significantly impacted by not only the accelerated business globalization but also the increased environmental awareness in societies. By taking advantage of the complex while integrative service interactions involving both providers and customers, emphasis in the service industry has evolved to sources of open innovation, collaboration, integration, and value cocreation, so as to optimally and maximally provide the value (e.g., satisfaction, success, and profitability) for the stakeholders (Figure 2.7).

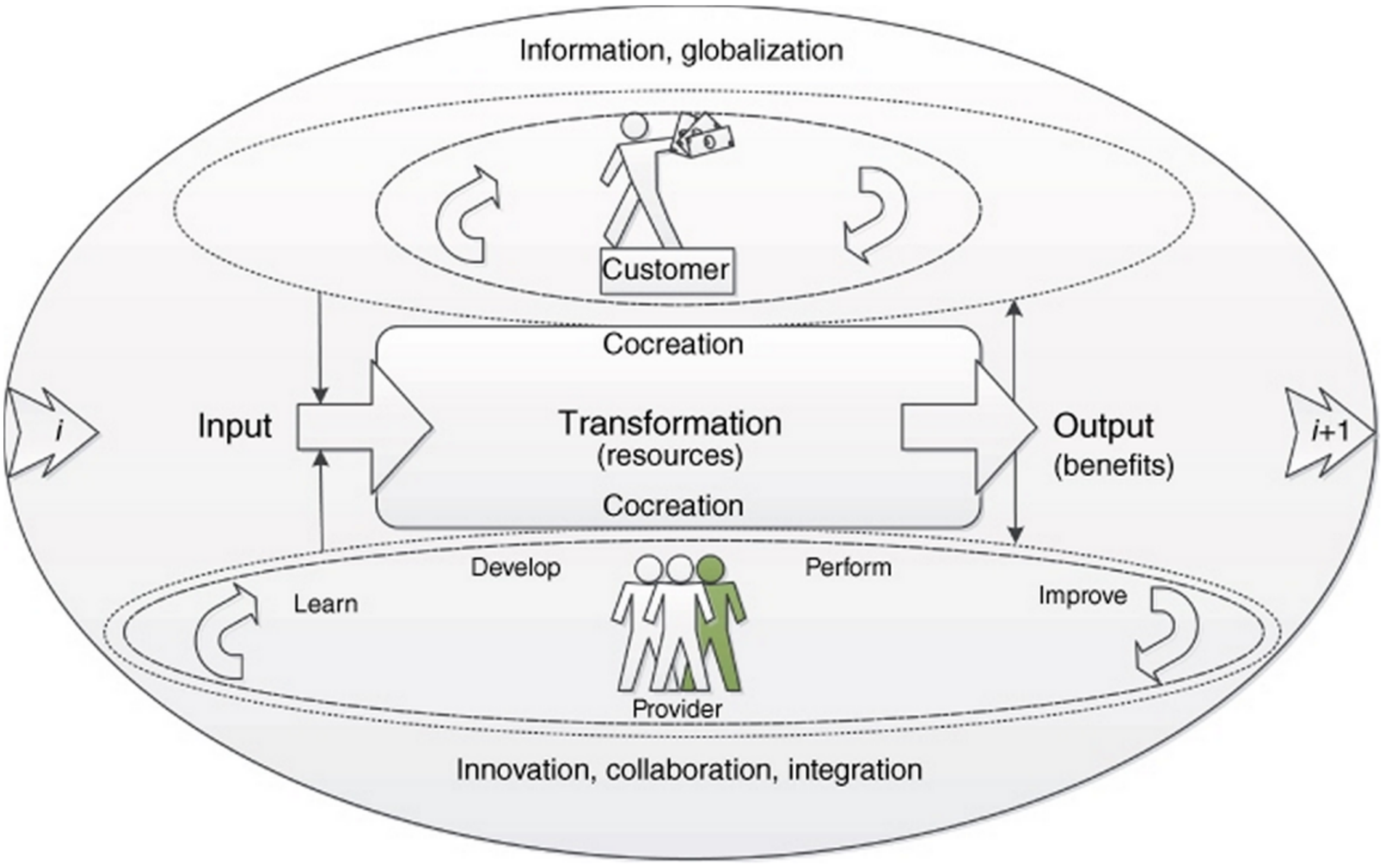

Figure 2.7 Value cocreation in focus in the service industry.

The discussions we had so far, including the introduction of service encounters throughout the service lifecycle in Chapter 1, clearly show the people-centric emphasis in phases throughout the lifecycle of service. In other words, we now understand that the value of service is the total perceived value of the outcomes cocreated from a series of service encounters by both providers and customers throughout the service lifecycle. This new round economic wave driven by globalization and services seems getting more sophisticated and dynamic than ever before; there is a need for higher efficiency and better cost-effectiveness in business operations and management across the geographically dispersed value chains.

More specifically, the service value (or profit) chain relies on the creation of lifetime customers' experience excellence from well-crafted and fostered service encounters. Figure 2.8 depicts the complex relationships between employee satisfaction, customer retention, and profitability (Heskett et al., (1994); Lovelock and Wirtz, (2007), emphasizing that we must rethink service encounters and find scientific ways to build and manage people-centric, information-enabled, cocreation-oriented, and innovative service organizations in the service-led economy.

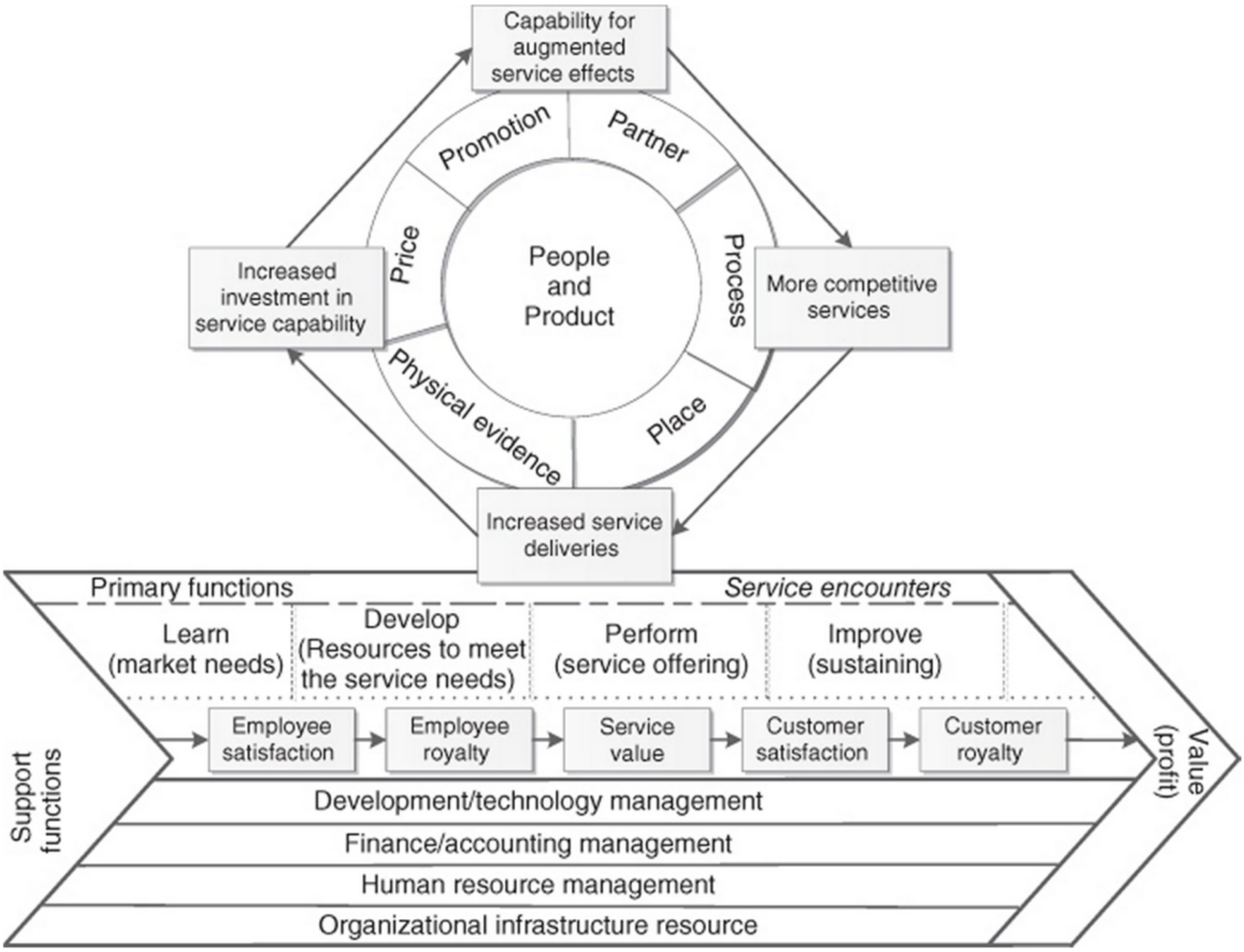

Figure 2.8 Competitive service business driven by service-oriented innovations.

As shown in Figures 2.7 and 2.8, both service providers and customers who are value-creating entities on a service value chain are interwoven in the process of service transformation. The highly correlated value-creating relationships between service providers and customers truly become the general characteristics of the modern services, indispensable for the successful completion of the lifecycle of service. By further examining the operational and managerial priority changes in response to the economic shift from manufacture and service (Table 2.1), we understand that the consistent sensing, interaction, and creativity from customers' feedbacks, participations, or consumptions throughout the lifecycle of service play a pivotal role in satisfactorily performing services that customers want (Ahlquist and Saagar, (2013):

- *Learn*. With the fast development of the Internet and the considerable

improvement of living standards and life qualities, our customers have become more knowledgeable and demanding than ever before. For instance, social marketing by leveraging Web 2.0 is crucial for service providers to demonstrate the value of offered services. More importantly, it helps to conceive the concepts of services, know the market trends, engage the prospective customers, and understand customers' changing perceptions in the to-be offered services. In the service industry, hence, discovering and capturing the real and changing needs in a timely manner is what this phase really is about.

- *Develop*. As compared to focusing on the development of main and unique features and technical functions of physical goods in the traditional manufacturing, the development of services in a competitive service organization must frequently involve customers as the customers might have perceived the needs differently and/or changed the needs as time goes. Quite often, in addition to the technical features and functions embodied in services, service providers' soft resources (i.e., operant resources) should be well developed in order to deliver the services successfully. The development of soft resources in the service organization radically relies on the consistent feedbacks from the customers so that the right soft resources can be developed and made readily available for service delivery. In the service industry, thus, developing competitive services cannot be effectively done if customers are not involved in the development of to-be offered services. Customers significantly contribute to the development of service products. In other words, the value of services is indeed cocreated by both service providers and customers.
- *Deliver*. This phase in services is substantively different from the one in manufacturing. As soon as physical goods are sold, customers utilize the provided features and functions supported by the physical goods. However, services are being most likely consumed at the same time when they are being delivered. Service encounters are the key delivery mechanisms in the service industry. Successful and satisfactory deliveries of services significantly depend on efficient and effective service interactions between service providers and customers. Once again, the benefits of services are consistently cocreated through collaborative service delivery processes involving both service providers and customers.
- *Improve*. As discussed earlier, the quality of services is largely influenced and determined by the customers' perceived value, including success, happiness, satisfaction, and the like. The addition of new features and functions mainly used in improving the manufacture of physical goods is insufficient in the service industry. Usually, customers' social, physiological, and psychological roles played throughout the service lifecycle must be analyzed, focusing on the improvement of the resources applied in services and/or the enrichment of service encounters to meet the needs of the customers with continuously

increased levels of satisfaction.

2.2 Total Service Lifecycle: The Service Provider's Perspective

Let us briefly recap what we have summarized in Chapter 1 on the general customers' perceptions of services. A service is essentially considered as the "act of performing," which is a mutually beneficial activity for its provider and customer. Quite often, a service evidently manifests itself as a series of service encounters in the marketplace. The resultant value of service is usually the total perceived value of the outcomes generated from the performance of the formed service encounters chain throughout the service lifecycle.

Simply put, this perceived service by customers clearly implies performing actions. No matter what kind of service product (i.e., in a physical, soft, or hybrid form) is offered, a service with its involved service product gets completely executed only after a series of service encounters are successfully conducted. The real value of the service thus largely depends on when, where, and how the process governing all the relevant service encounter activities are performed from beginning to end and particularly how both service providers and customers have participated in the process execution.

Except for sharing the common concept of service, surely, operating a contemporary and sizable food service business compared to the ancient food service example discussed in Chapter 1 is quite different and becomes extremely more challenging. The marketplace is full of competition in many aspects, including a variety of foods, much leisured and cozier catering settings, knowledgeable clients who have a variety of socioeconomic, social, and cultural backgrounds, and different and changing clients' expectations throughout corresponding catering service processes. Accordingly, the value becomes very challenging to measure as it varies with the service providers, consumers, and marketplaces. Thus, experience-based service business operations can hardly survive in the current and competitive marketplace.

Although the understandings of a service from both service providers and service customers should be the same, we must be aware that the lifecycle of services based on the general customers' perceptions of services are substantively different from one that is conceived, developed, and managed from the service provider's point of view. Figure 2.9 schematically compares the perspectives of service lifecycles from a service provider and a service customer. The lifecycle of service in customers' perspective essentially is just a service lifespan. We can clearly see that the life of a given service from a customer point of view is essentially part of the total service lifecycle operated and managed by the service provider. In a service organization, from the operational and managerial perspective, the lifecycle of service spans over all the phases defined in the service diamond

relationship. However, as indicated earlier, frequently a customer's service life mainly lies in the service delivery and operations phase.

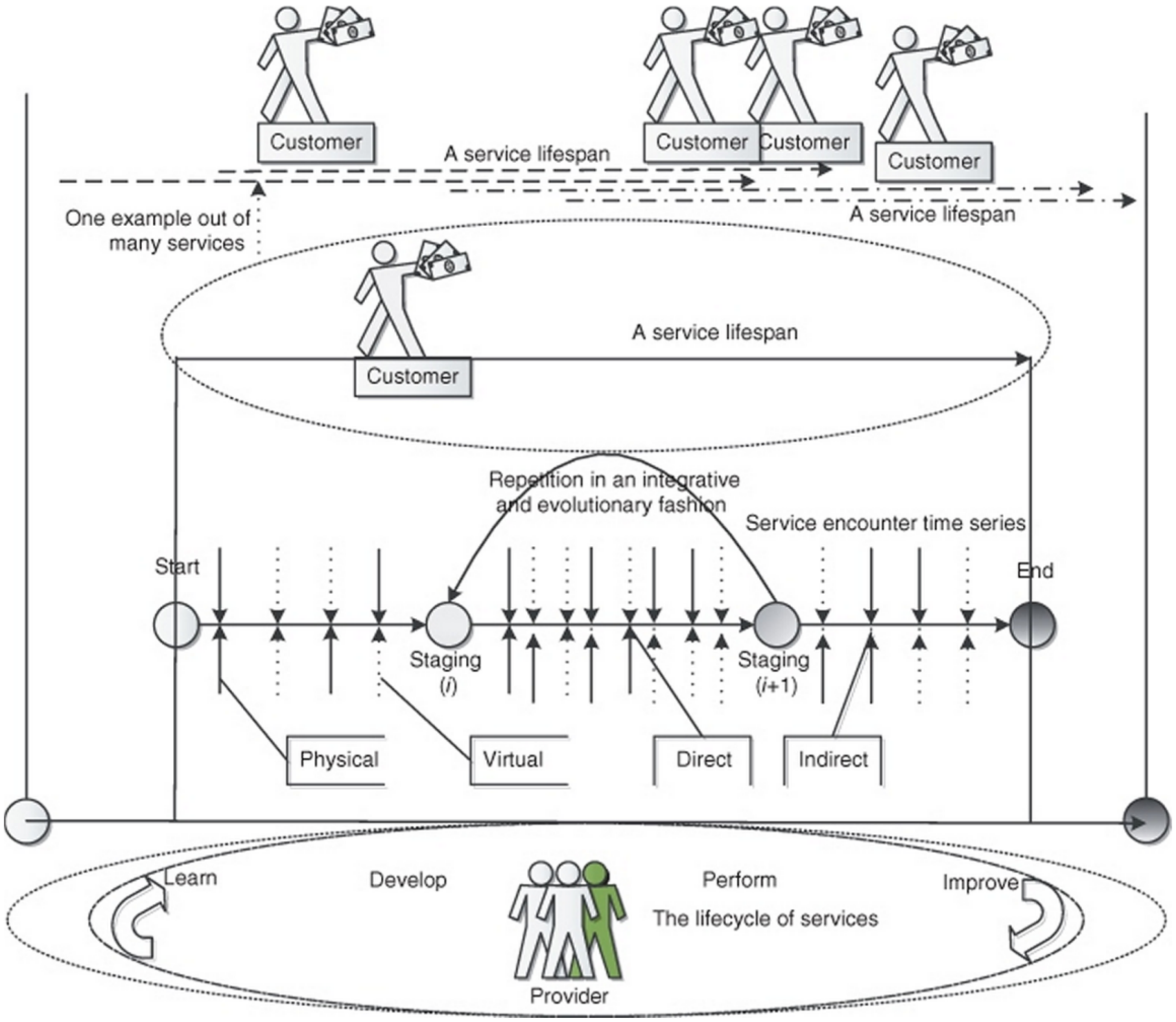

Figure 2.9 Perspectives of services: service providers versus service customers.

Let us recap what we just explored. To a typical customer of a service organization, the life of a service offered by the service organization starts when the service is requested and ends when the service is completely performed (Figure 2.9). The corresponding lifespan to the customer is simply a part of the total service lifecycle horizon covered by the service organization. Theoretically, a start point can be anywhere while its end point can also be anywhere as long as the corresponding service lifespan is a positive number. In practice, a start point could be a point after such a point at which the marketed service product is requested by a customer after it becomes ready to be offered by the service organization. Then, a corresponding end point will be the time when the service is completely performed and the specified or default contract period expires.

To a customer, the encounter of a service or “moment of truth” frequently is regarded as the service from the customer's perspective (Bitner et al., (1990); Bitner, (1992). However, a systemic view of service encounters throughout the service lifecycle is necessary for a service provider, which

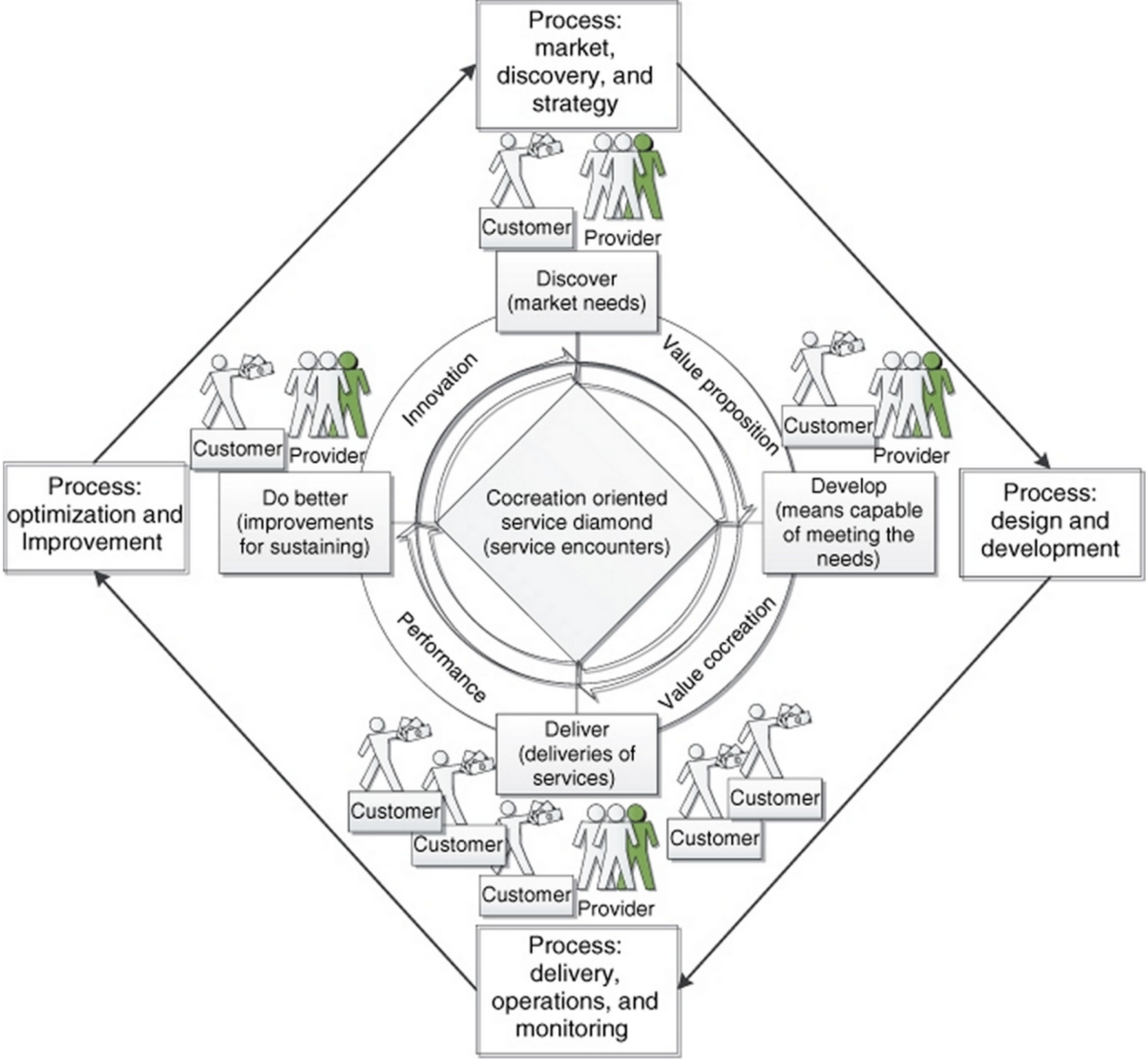

Figure 2.11 A 4Ds view of the cocreation-oriented service diamond and process.

Let us use the global project development example that was briefly mentioned in Chapter 1 to show what really consists of service encounters throughout the lifecycle of a given project development service and how varieties of service encounters play critical roles in the fulfillment of the needs of service providers and service customers.

Here comes the project background information. An international chemical company called ChemGlobalService has manufacturing facilities in Houston, United States; Beijing, China; and Prague, Czech across three countries in order to serve its customers across different continents. Each facility has its own warehouse. Each warehouse has its own management system application, which was deployed at different times and thus is unique and user-friendly to local employees (Figure 2.12). The products made at each facility are primarily for serving their individual regional markets to ensure that their business operations are responsive and cost-effective. However, different hazard components that are required by all three facilities are separately made by three facilities. This is due to the fact that some pieces of special equipment are extremely expensive, which