MANAGING AND USING INFORMATION SYSTEMS

A STRATEGIC APPROACH

Keri E. Pearlson
MIT Sloan School of Management and KP Partners

Carol S. Saunders
Muma College of Business
University of South Florida

Dennis F. Galletta
Katz Graduate School of Business
University of Pittsburgh, Pittsburgh, PA

WILEY

Introduction

Why do managers need to understand and participate in the information systems (IS) decisions of their organizations? After all, most corporations maintain entire departments dedicated to the management of IS. These departments are staffed with highly skilled professionals devoted to the field of technology. Shouldn't managers rely on experts to analyze all aspects of IS and to make the best decisions for the organization? The answer to that question is an emphatic "no."

Managing information is a critical skill for success in today's business environment. While in the past, making better management decisions was the sole focus of information technology (IT), today every business has to go further and develop a digital business strategy. For example, it is no longer an issue for organizations to decide *whether* they want to collect and manage large amounts of information, develop websites, and engage social networks, but *how* to initiate, manage, and nurture all those channels. A successful manager continuously re-evaluates a company's vision in light of new opportunities and threats from IT. A successful process begins with the realization that customers, colleagues, and trading partners have ubiquitous access to sophisticated technologies, and all perhaps unreasonably expect nearly instant responses in a business world that is more dynamic than ever before.

Most importantly, change can come from unforeseen directions. New information-based products have emerged that have endangered businesses that were managed as if they were going to last forever. One need to only examine how Uber and Lyft suddenly led to sharp reductions in taxicab use, how Amazon has shrunk the number of brick-and-mortar stores such as Sears and K-Mart, how music streaming has all but eliminated music stores, and how on-line video streaming has challenged cable television companies.[1] Hence, understanding how to manage and use IS is no longer a luxury; it is a necessity to understand how to take advantage of IT, rather than to become a victim of IT.

The disruption from Uber and Lyft are most remarkable. In 2018, Forbes reported that between the first quarter of 2014 and the same time period in 2018, the share enjoyed by taxicabs shrank from 37% to 6% of the business traveler ground transportation market. Rental cars also suffered, declining from 55% to 23.5%. However, ride-hailing rose from 8% to 70.5% of the market between 2014 and 2018.[2]

The business traveler ground transportation market is an excellent illustration of market disruption afforded by creative uses of IT, especially when providing connections between a firm's IT and customers' smartphones. The vast majority of U.S. adults today own a smart phone and access online apps. According to the Pew Research Center, in 2018, 95% of U.S. adults had a cell phone of some kind, and, from 2011 to 2018, the percent of U.S. adults who own a smartphone rose from 31% to 77%,[3] which now has surpassed the percent of Americans who use computers. Computer usage diminished from a high of 78% in 2012 to 73% in 2018.[4] Pew also noted that 90% of American adults use the Internet, and about 75% have high speed (broadband) access at home.[5]

The use of these types of devices implies that individuals now manage a "personal IS" and make decisions about usage, data, and applications. Many even manage their own wireless network at home. Doesn't

[1] Robert Hof, "How Amazon Cleared the Profitability Hurdle," February 4, 2002, http://www.bloomberg.com/bw/stories/2002-02-03/how-amazon-cleared-the-profitability-hurdle (accessed October 29, 2015).

[2] M. Goldstein, "Dislocation and Its Discontents: Ride-Sharing's Impact on the Taxi Industry," Forbes.com, June 8, 2018, https://www.forbes.com/sites/michaelgoldstein/2018/06/08/uber-lyft-taxi-drivers/#454cd99259f0 (accessed January 10, 2019).

[3] Pew Research Center, "Mobile Fact Sheet," February 5, 2018, http://www.pewinternet.org/fact-sheet/mobile/ (accessed January 10, 2019).

[4] Pew Research Center, "Internet, Social Media Use and Device Ownership in U.S. Have Plateaued After Years of Growth," September 28, 2018, http://www.pewresearch.org/fact-tank/2018/09/28/internet-social-media-use-and-device-ownership-in-u-s-have-plateaued-after-years-of-growth/ (accessed January 10, 2019).

[5] Pew Research Center, "Internet Use and Cell Phone Demographics," http://www.pewinternet.org/data-trend/internet-use/internet-use-over-time (accessed June 22, 2019).

that give them insight into managing IS in corporations? Students often think they are experts in corporate IS because of their personal experience with technology. Although there is a glimmer of truth in that perspective, it's a very dangerous perspective for managers to take. Certainly knowing about interesting apps, being able to use a variety of technologies for different personal purposes, and being familiar with the ups and downs of networking for their personal IS provide some experience that is useful in the corporate setting. But in a corporate setting, IS must be ready for use by an enterprise and beyond. These systems must be scalable for a large number of employees and customers, often simultaneously; they must be delivered in an appropriate manner for the enterprise; and they must be managed with corporate guidelines and appropriate governmental regulations in mind. Issues such as security, privacy, risk, support, and architecture take on new meaning within an enterprise, and someone has to manage them. Enterprise-level management and use of IS require a unique perspective and a different skill set.

Consider the now-historic rise of the so-called FANG group of companies (Facebook, Amazon.com, Netflix, and Google). All began as small startups only two decades ago, and now each occupies a position in the Fortune 500 list of largest companies, while two have reached Fortune's top 25 with ranks of 8 (Amazon) and 22 (Google/Alphabet).[5] Amazon.com's rise is meteoric. It began as an online bookseller and expanded rapidly by leveraging its business model into other marketplaces, such as music, electronics, health and beauty products, lawn and garden products, auctions, tools and hardware, groceries, and more. It succeeded by achieving a good mix of IS and business basics: capitalizing on operational efficiencies derived from inventory software and smarter storage, cost cutting, and effectively partnering with companies ranging from suppliers (such as the U.S. Postal Service) to competitors (such as Target) to customers (who can sell their used goods on its platform).

More recently, Amazon.com changed the basis of competition in another market, but this time it was the web services business. Amazon.com web services offer clients the extensive technology platform used for Amazon.com but in an on-demand fashion for developing and running the client's own applications.

Likewise, Google (now listed as its holding company "Alphabet") built a business that has revolutionized the way information is found. Google began in 1999 as a basic search company but its managers quickly learned that its unique business model could be leveraged for future success in seemingly unrelated areas. The company changed the way people think about web content by making it available in a searchable format with incredibly fast response time and in a host of languages. Further, Google's keyword-targeted advertising program and Google Analytics revolutionized the way companies advertise and track their progress in reaching customers. Then Google expanded, offering a suite of web-based applications, such as calendaring, office tools, e-mail, collaboration, shopping, and maps. Google Drive is one of the most popular file-sharing tools and Gmail one of the most popular e-mail services. As of January 2019, in 19 cities it offered its customers very inexpensive fiber connections.[7] In so doing, Google has further expanded into infrastructure and on-demand services and shows no signs of slowing its progress.[8]

These and other online businesses are able to succeed where traditional companies have not, in part because their management understood the power of information, IS, and the web. These exemplary online businesses aren't succeeding because their managers could build web pages or assemble an IS network. Rather, the executives in these new businesses understand the fundamentals of managing and using information and can marry that knowledge with a sound, unique business vision to dominate their intended market spaces.

The goal of this book is to provide the foundation to help the general business manager become a knowledgeable participant in IS decisions because any IS decision in which the manager doesn't participate can greatly affect the organization's ability to succeed in the future. This introduction outlines the fundamental reasons for taking the initiative to participate in IS decisions. Moreover, because effective participation requires a unique set of managerial skills, this introduction identifies the most important ones. These skills are helpful for making both IS decisions and all business decisions. We describe how managers should participate in the decision-making process. Finally, this introduction presents relevant

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[5] List, Fortune.com, 2019, http://fortune.com/fortune500/list (accessed January 10, 2019).

[7] Google.com, "Our Cities," January 10, 2019, https://fiber.google.com/ourcities/ (accessed January 10, 2019).

[8] For more information on the latest services by these two companies, see http://aws.amazon.com/ec2 and http://www.google.com/enterprise/cloud/.

Internet availability through the web. Therefore, digital natives are completely fluent in the use of personal technologies and the web, whereas "**digital immigrants**," or people born before the 1990s, weren't always around computers when they were young. Even today, innovative uses of the Internet produce new types of online businesses that keep every manager and executive on alert. New business opportunities spring up with little advance warning. The manager's role is to frame these opportunities so that others can understand them, evaluate them against existing business needs and choices, and then pursue those that fit with an articulated business strategy. The quality of the information at hand affects the quality of both decisions and their implementation. Managers must develop an understanding of what information is crucial to the decisions, how to get it, and how to use it. They must lead the changes driven by IS.

Competitive Challenges

Competitors come from both expected and unexpected places. General managers are in the best position to see the emerging threats and utilize IS effectively to combat ever-changing competitive challenges. Further, general managers are often called on to demonstrate a clear understanding of how their own technology programs and products compare with those of their competitors. A deep understanding of the capabilities of the organization coupled with existing IS can create competitive advantages and change the competitive landscape for the entire industry.

Customer Pull

With the emergence of social networks such as Facebook, microblogs such as Twitter, and other web applications such as Yelp, businesses have had to redesign their existing business models to account for the change in power now wielded by customers and others in their communities. **Social media** and other web apps have given powerful voices to customers and communities, and businesses must listen. Redesigning the customer experience when interacting with a company is paramount for many managers and the key driver is IS. Social IT enables new and often deeper relationships with a large number of customers, and companies are learning how to integrate and leverage this capability into existing and new business models.

Data-Driven Decision Making

Managers are increasingly using evidence-based management to make decisions based on data gathered from experiments, internal files, and other relevant sources. Data-driven decision making, based on new techniques for analytics, data management, and business intelligence, has taken on increased importance. Social media and the sensors associated with the Internet of Things (IoT) have created rich streams of real-time data that give managers increased insights to the impact of decisions much faster than traditional systems. Mid-course corrections are much easier to make. Predictive and prescriptive analytics give suggestions that are eerily close to what eventually happens. Big data stores can be mined for insights that were unavailable with traditional IS, creating competitive advantage for companies with the right tools and techniques.

Securing Key Assets

As the use of the Internet grows, so does the opportunity for new and unforeseen threats to company assets. Taking measures to ensure the security of these assets is increasingly important. But decisions about security measures also impact the way IS can be used. It's possible to put so much security around IT assets that they are locked down in a manner that gets in the way of business. At the same time, too little security opens up the possibility of theft, hacking, phishing, and other web-based mischief that can disrupt business. Managers must be involved in decisions about risk and security to ensure that business operations are in sync with the resulting security measures.

What If a Manager Doesn't Participate?

Decisions about IS directly affect the profits of a business. The basic formula Profit = Revenue – Expenses can be used to evaluate the impact of these decisions, from the purchase of large-scale software to the adoption of a new digital business model. Choosing the wrong digital business model can cause a company to miss business opportunities and any revenues those opportunities would generate. Inadequate IS can cause a breakdown in servicing customers, which hurts sales. Poorly deployed social IT resources can badly damage the reputation of a strong brand. On the expense side, a miscalculated investment in technology can lead to overspending and excess capacity or underspending and restricted opportunity. Inefficient business processes sustained by ill-fitting IS also increase expenses. Lags in implementation or poor process adaptation reduces profits and therefore growth. All of these situations demonstrate that IS decisions can dramatically affect the bottom line.

Failure to consider IS strategy when planning business strategy and organizational strategy leads to one of three business consequences: (1) IS that fail to support business goals, (2) IS that fail to support organizational systems, and (3) a misalignment between business goals and organizational capabilities. These consequences are discussed briefly in the following section and in more detail in later chapters. The driving questions to consider are the potential effects on an organization's ability to achieve its business goals. How will the consequences impact the way people work? Will the organization still be able to implement its business strategy?

Information Systems Must Support Business Goals and Organizational Systems

IS represent a major investment for any firm in today's business environment. Yet poorly chosen IS can actually become an obstacle to achieving business goals. The results can be disastrous if the systems do not align IS with business goals and organizational systems. When IS lack the capacity needed to collect, store, and transfer critical information for the business, decisions can be impacted and options limited. Customers will be dissatisfied or even lost. Production costs may be excessive. Worst of all, management may not be able to pursue desired business directions that are blocked by inappropriate IS. Victoria's Secret experienced this problem when a Superbowl ad promoting an online fashion show generated so many inquiries to its website that the website crashed. Spending large amounts of money on the advertisement was wasted when potential customers could not access the site. Recently, after a 31% year over year increase in Black Friday sales in 2018, website failures struck several retailers such as Walmart, J. Crew, and Lowe's. J. Crew alone was estimated to have lost over three-quarters of a million dollars in sales due to the outage.[12]

Organizational systems represent the fundamental elements of a business—its people, work processes, tasks, structure, and control systems—and the plan that enables them to work efficiently to achieve business goals. It might seem odd to think that a manager might add functionality to a corporate website without providing the training employees need to use the tool effectively. Yet, this mistake—and many more costly ones—occur in businesses every day. Managers make major IS decisions without informing all the staff of resulting changes in their daily work. Deploying technology, from an individual's desktop to enterprise-wide systems, requires careful planning about how it actually will be used in the organization—who will use it, how they will use it, and how to make sure the applications chosen will actually accomplish what is intended.

The general manager, who, after all, is charged with ensuring that company resources are used effectively, must guarantee that the company's IS support its organizational systems and that changes made in one system are reflected in the other. For example, a company with traveling employees needs an information system strategy compatible with its organizational strategy. Purchasing smartphones and/or connected tablets would only be a superficial solution. Those employees need a careful analysis of information needs while on the road. Factors that make it difficult to close a sale should be anticipated and apps

[12] Kara Driscoll, "Retail Websites Crash on Black Friday: What to Expect Today," *Dayton Daily News* (November 26, 2018), https://www.daytondailynews.com/business/retail-websites-crash-black-friday-what-expect-today/GE04DSFuxL1hUFdQf1YoiN/ (accessed January 26, 2019).

on their smartphones or connected tablets need to be able to respond to those information needs in real time. Sometimes it would involve pulling up product comparisons that highlight their strengths. In other situations, it requires displaying seasonal fluctuations in local, regional, national, or international sales. Analyses of impacts of product improvements on customer satisfaction might be just what is needed. If the organization tries to adopt traditional information retrieval systems that mirror those used in the past, the technologies are doomed to fail.

Skills Needed to Participate Effectively in Information Technology Decisions

Participating in IT decisions means bringing a clear set of skills to the table. All managers are asked to take on tasks that require different skills at different times. Those tasks can be divided into three types: visionary tasks that provide leadership and direction for the group; informational/interpersonal tasks that provide information and knowledge the group needs to be successful; and structural tasks that organize the group. Figure I-2 lists basic skills required of managers who wish to participate successfully in key IT decisions. Not only does this list emphasize understanding, organizing, planning, and solving the business needs of the organization but also it is an excellent checklist for all managers' professional growth.

These skills may not look much different from those required of any successful manager, which is the main point of this book: General managers can be successful participants in IS decisions without an extensive technical background. General managers who understand a basic set of IS concepts and who have outstanding managerial skills, such as those listed in Figure I-2, are ready for the digital economy.

How to Participate in Information Systems Decisions

Technical wizardry isn't required to become a knowledgeable participant in the IS decisions of a business. Managers need curiosity, creativity, and the confidence to ask questions in order to learn and understand. A solid framework that identifies key management issues and relates them to aspects of IS provides the background needed to participate in business IS decisions.

The goal of this book is to provide that framework. The way in which managers manage and use information is directly linked to business goals and the business strategy driving both organizational and IS decisions. Aligning business and IS decisions is critical. Business, organizational, and information strategies are fundamentally linked in what is called the *Information Systems Strategy Triangle*, discussed in the next chapter. Failing to understand this relationship is detrimental to a business. Failing to plan for

Managerial Role	Skills
Visionary	Creativity Curiosity Confidence Focus on business solutions Flexibility
Informational and interpersonal	Communication Listening Information gathering Interpersonal skills
Structural	Project management Analytical Organizational Planning Leading Controlling

FIGURE I-2 Skills for successful IT use by managerial role.

the consequences in all three areas can cost a manager his or her job. This book provides a foundation for understanding business issues related to IS from a managerial perspective.

Organization of the Book

To be knowledgeable participants, managers must know about both managing and using information. The first five chapters offer basic frameworks to make this understanding easier. Chapter 1 introduces the Information Systems Strategy Triangle framework to discuss alignment of IS and the business. This chapter also provides a brief overview of relevant frameworks for business strategy and organizational strategy. It is provided as background for those who have not formally studied organization theory or business strategy. For those who have studied these areas, this chapter is a brief refresher of major concepts used throughout the remaining chapters of the book. Subsequent chapters provide frameworks and sets of examples for understanding the links between IS and business strategy (Chapter 2), links between IS and organizational strategy (Chapter 3), collaboration and individual work (Chapter 4), and business processes (Chapter 5).

The rest of the text covers issues related to the business manager's role in managing IS itself. These chapters are the building blocks of an IS strategy. Chapter 6 provides a framework for understanding the four components of IS architecture: hardware, software, networks, and data. Chapter 7 discusses how managers might participate in decisions about IS security. Chapter 8 focuses on the business of IT with a look at the IS organization, funding models, portfolios, and monitoring options. Chapter 9 describes the governance of IS resources. Chapter 10 explores sourcing and how companies provision IS resources. Chapter 11 focuses on project and change management. Chapter 12 concerns business intelligence, knowledge management, and analytics and provides an overview of how companies manage knowledge and create a competitive advantage using business analytics. And finally, Chapter 13 discusses privacy and the ethical use of information.

Basic Assumptions

Every book is based on certain assumptions, and understanding those assumptions makes a difference in interpreting the text. The first assumption made by this text is that managers must be knowledgeable participants in the IS decisions made within and affecting their organizations. That means that the general manager must develop a basic understanding of the business and technology issues related to IS. Because technology changes rapidly, this text also assumes that today's technology is different from yesterday's technology. In fact, the technology available to readers of this text today might even differ significantly from that available when the text was being written. Therefore, this text focuses on generic concepts that are, to the extent possible, technology independent. It provides frameworks on which to hang more up-to-the-minute technological evolutions and revolutions, such as new uses of the web, big data, business analytics, new social tools, platform-based systems or new cloud-based services. We assume that the reader will supplement the discussions of this text with current case studies and up-to-date information about the latest technology.

A third, perhaps controversial, assumption is that the roles of a general manager and of an IS manager require different skill sets and levels of technical competency. General managers must have a basic understanding of IS in order to be a knowledgeable participant in business decisions. Without that level of understanding, their decisions may have serious negative implications for the business. On the other hand, IS managers must have more in-depth knowledge of technology so they can partner with general managers who will use the IS. As digital natives take on increasingly more managerial roles in corporations, this second assumption may change—all managers may need deeper technical understanding. But for this text, we assume a different, more technical skill set for the IS manager and we do not attempt to provide that here.

Assumptions about Management

Although many books have been written describing the activities of managers, organizational theorist Henry Mintzberg offers a view that works especially well with a perspective relevant to IS management. Mintzberg's model describes management in behavioral terms by categorizing the three major roles a manager fills: interpersonal, informational, and decisional (see Figure I-3). This model is useful because

Type of roles	Manager's roles	IS examples
Interpersonal	Figurehead	CIO greets touring dignitaries.
	Leader	IS manager puts in long hours to help motivate project team to complete project on schedule in an environment of heavy budget cuts.
	Liaison	CIO works with the marketing and human resource vice presidents to make sure that the reward and compensation system is changed to encourage use of the new IS supporting sales.
Informational	Monitor	Division manager compares progress on IS project for the division with milestones developed during the project's initiation and feasibility phase.
	Disseminator	CIO conveys organization's business strategy to IS department and demonstrates how IS strategy supports the business strategy.
	Spokesperson	IS manager represents IS department at organization's recruiting fair.
Decisional	Entrepreneur	IS division manager suggests an application of a new technology that improves the division's operational efficiency.
	Disturbance handler	IS division manager, as project team leader, helps resolve design disagreements between division personnel who will be using the system and systems analysts who are designing it.
	Resource allocator	CIO allocates additional personnel positions to various departments based upon the business strategy.
	Negotiator	IS manager negotiates for additional personnel needed to respond to recent user requests for enhanced functionality in a system that is being implemented.

FIGURE I-3 Managers' roles.

Source: Adapted from H. Mintzberg, *The Nature of Managerial Work* (New York: Harper & Row, 1973).

it considers the chaotic nature of the environment in which managers actually work. Managers rarely have time to be reflective in their approaches to problems. They work at an unrelenting pace, and their activities are brief and often interrupted. Thus, quality information becomes even more crucial to effective decision making. The classic view, described below, is often seen as a tactical approach to management, whereas some regard Mintzberg's view as more strategic.

Assumptions about Business

Everyone has an internal understanding of what constitutes a business, which is based on readings and experiences with different firms. This understanding forms a model that provides the basis for comprehending actions, interpreting decisions, and communicating ideas. Managers use their internal model to make sense of otherwise chaotic and random activities. This book uses several conceptual models of business. Some take a functional view and others take a process view.

Functional View

The classical view of a business is based on the functions that people perform, such as accounting, finance, marketing, operations, and human resources. The business organizes around these functions to coordinate them and to gain economies of scale within specialized sets of tasks. Information first flows vertically up and down between line positions and management; after analysis, it may be transmitted across other functions for use elsewhere in the company (see Figure I-4).

Process View

Michael Porter of Harvard Business School describes a business in terms of the primary and support activities that are performed to create, deliver, and support a product or service. The primary activities are not limited to specific functions, but rather are cross-functional processes (see Figure I-5). For example, an accounts payable process might involve steps taken by other departments that generate obligations, which

	Top management	Middle management	Supervisory and lower-level management
Time horizon	Long: years	Medium: weeks, months, years	Short: day to day
Level of detail	Highly aggregated Less accurate More predictive	Summarized Integrated Often financial	Very detailed Very accurate Often nonfinancial
Source	Primarily external	Primarily internal with limited external	Internal
Decision	Extremely judgmental Uses creativity and analytical skills	Relatively judgmental	Heavily reliant on rules

FIGURE I-7 Information characteristics across hierarchical levels.

Source: Adapted from Anthony Gorry and Michael S. Scott Morton, "A Framework for Management Information Systems," Sloan Management Review 13, no. 1 (1971), 55–70.

another thing to a potential buyer, and yet something else to an economist. It is richer and deeper than information and more valuable because someone thought deeply about that information and added his or her own unique experience and judgment. Knowledge also involves the synthesis of multiple sources of information over time.[16] The amount of human contribution increases along the continuum from data to information to knowledge. Computers work well for managing data but are less efficient at managing information and knowledge.

Some people think that there is a fourth level in the information hierarchy: wisdom. **Wisdom** is knowledge fused with intuition and judgment that facilitates making decisions. Wisdom is that level of the information hierarchy used by subject matter experts, gurus, and individuals with a high degree of experience who seem to "just know" what to do and how to apply the knowledge they gain. This is consistent with Aristotle's view of wisdom as the ability to balance different and conflicting elements together in ways that are only learned through experience.

Economics of Information versus Economics of Things

In their groundbreaking book, *Blown to Bits*, Evans and Wurster argued that every business is in the information business.[17] Even those businesses not typically considered information businesses have business strategies in which information plays a critical role. The physical world of manufacturing is shaped by information that dominates products as well as processes. For example, a conventional automobile contains as much computing power as a personal computer, with specialized processors and sensors alerting the driver of its health. Autonomous (self-driving) vehicles have extended that power to another order of magnitude, merging location awareness (through GPS data) with visual input (using cameras).

Several current manufacturers see a future market for automobiles as a "subscription" or "sharing" model rather than a "purchase" model. Made possible only by IT, such a model would eliminate the need to search, negotiate, own, and maintain a vehicle.[18] Perhaps in the future a user will be able to signal for a car on a watch or smartphone to autonomously drive to her location, ride to the proper destination, and then dismiss the car to return to its "home base." The car can make its own appointment at the repair shop when it senses that maintenance is needed, and then navigate to the facility by itself. Close coordination of manufacturers, software developers, mobile platform developers, and many other partners will each take an important role in the digital business model necessary to make this a reality.

As our world is reshaped by information-intensive industries, it becomes even more important for business strategies to differentiate the timeworn economics of things from the evolving economics of information. Things wear out; things can be replicated at the expense of the manufacturer; things exist in

[16] Thomas H. Davenport, *Information Ecology* (New York: Oxford University Press, 1997), 9–10.

[17] Philip Evans and Thomas Wurster, *Blown to Bits* (Boston, MA: Harvard Business School Press, 2000).

[18] Rhinehart, "Car Subscription Services Are the Future of Vehicle Ownership," MutualMobile.com, February 26, 2018, https://mutualmobile.com/resources/car-subscription-services-are-the-future-of-vehicle-ownership (accessed January 11, 2019).

Consumerization and Social Business

The explosion of consumer-based technologies, coupled with applications such as Facebook, Renren, Sina Weibo, WeChat, Twitter, LinkedIn, YouTube, Foursquare, Skype, Pinterest, and more, have brought into focus the concept of a social business. Some call this trend Information Technology (IT) consumerization. **IT consumerization** means that technologies such as social tools, smartphones, and web applications targeted at individual, personal users are creating pressures for companies in new and unexpected ways. At the same time, technologies initially intended for the corporation, such as cloud computing, are being retooled and "consumerized" to appeal to individuals outside the corporation.

In this text, we use the term **social business** to refer to an enterprise using social IT for business applications, activities, and processes. We sometimes say that social business has infused social capabilities into business processes.

Social business is permeating every facet of business. There are new business models based on a social IT platform that offer new ways of connecting with stakeholders in functions such as governing, collaborating, doing work, and measuring results. In this book, we are particular about the terminology we use. Social IT is the term we use for all technologies in this space. We define **social IT** as the technologies used for people to collaborate, network, and interact over the web. These include social networks and other applications that provide for interaction between people.

Many use the term social media as an overarching term for this space, but increasingly, social media refers to the marketing and sales applications of social IT, and we use it that way. **Social networks** are IT-enabled networks that link individuals together in ways that enable them to find experts, get to know colleagues, and see who has relevant experience for projects across traditional organizational lines. Social networking is the use of these types of social IT tools in a community. As of the writing of this text, the social space is still like the Wild West; there are no widely accepted conventions about the terms and their meanings or the uses and their impacts. But we have enough experience with social IT that we know it's a major force bursting on to the enterprise scene and it must be addressed in discussions of managing and using IS.

System Hierarchy

IS are composed of three main elements: technology, people, and process (see Figure I-9 and further discussion in Chapter 12). When most people use the term *information system*, they actually refer only to the technology element as defined by the organization's infrastructure. In this text, the term **infrastructure** refers to everything that supports the flow and processing of information in an organization, including hardware, software, data, and network components, whereas **architecture** refers to the blueprint that reflects strategy implicit in combining these components. **IS** are defined more broadly as the *combination* of technology (the "what"), people (the "who"), and process (the "how") that an organization uses to produce and manage information. In contrast, IT focuses only on the technical devices and tools used in the system. We define

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FIGURE I-9   System hierarchy.