CHAPTER

3

LEADERSHIP: THE CASE OF THE HEALTHCARE CHIEF INFORMATION OFFICER

Learning Objectives

1. List job duties and analyze functional responsibilities of senior healthcare leadership and the chief information officer (CIO).
2. Identify key knowledge, skills, and attributes of the CIO position.
3. Describe the typical priorities of contemporary CIOs.
4. Prepare and assess an organizational chart for the health information technology department or area of a healthcare organization.
5. Illustrate future challenges faced by healthcare CIOs.

Overview

This chapter discusses the leadership, human resources, and management expertise required to make effective use of information and the health information technology (HIT) infrastructure in healthcare organizations. Senior management of HIT departments must plan for and implement HIT to meet today's information needs (which have administrative, clinical, and operational applications), anticipate tomorrow's information needs, and ensure a smooth transition between current and future HIT. While doing so, these leaders confront rapidly evolving hardware and software capabilities and ever-changing government interventions—both of which shift the rules that influence the collection, transmission, storage, retrieval, and dissemination of healthcare information. Furthermore, the network interconnectedness of biomedical equipment and devices brings further complexity and need for effective HIT leadership.

While it is difficult to master all or even most of these complex HIT tasks, senior HIT leadership must, however, understand the associated challenges in sufficient detail to effectively manage technology experts as well as clinical and business operational content experts. Consequently, this chapter details the functional responsibilities of chief information officers (CIOs); the organization, staffing, and budgeting of the HIT department; and the

organizational challenge of outsourcing or multisourcing HIT functions. It concludes with a brief examination of future trends related to the role of the CIO and the HIT leadership team.

Today's Health Information Technology Management

Determining what area of leadership is responsible for the management of information technology (IT) in the healthcare organization has always been a key responsibility of the CEO and the governing board. In the early years of IT in healthcare, many organizations assigned information management responsibility to the chief financial officer (CFO), reflecting the high priority the organization reserved for accurate and timely financial information generally and patient billing particularly.

Because of the increasing importance of clinical information systems, the need to integrate those with administrative and financial information systems, regulatory reporting requirements, and the use of information in strategic planning and decision support, most healthcare organizations have, for many decades now, assigned HIT to a separate executive-level position—the CIO. This shift has led to the publication of a host of books concentrating on the CIO and their evolving role (e.g., Broadbent and Kitzis 2005; DuBois 2017; Heller 2013; Smaltz et al. 2005).

The Senior Management Role

A discussion of the roles that HIT management play begins with the active engagement of the senior executives in the organization. In the literature of organizations that successfully manage information technologies (Alreemy et al. 2016; Blitstein 2012; Ellis 2018), some common characteristics emerge and are summarized in exhibit 3.1.

Many of the characteristics on this list contribute to the success of organizational IT endeavors, and this list reinforces the important role of the CIO

EXHIBIT 3.1 Characteristics of Organizations That Successfully Manage IT

1. Effective IT governance with active stakeholder involvement and active management support
2. Adequate financial support
3. Organizational culture that embraces enterprise governance of IT
4. Strategic alignment between IT and the business/clinical enterprise
5. Effective IT staffing management
6. An effective IT organizational structure
7. Conformity with external/regulatory compliance requirements
8. Effective IT project management
9. IT organization focused on business and clinical benefits

and other senior leaders. In order for HIT governance to be effective (item 1), the focus of governance must be on overall organizational objectives and performance goals rather than simply on considerations of HIT's internal operations. Senior executives must actively design, lead, and regularly review HIT governance. Similarly, in effective organizations, senior management creates culture that expects active management involvement (item 3) not only in strategic decisions but also in technology decisions that have strategic implications (item 4). Conflicting goals have become the norm in complex organizations and, if not handled appropriately, may lead to various problems in the institution.

While it has always been important to appropriately staff and structure the IT function (items 5 and 6), the convergence of social media, mobile applications, analytics, and cloud computing have created an intensely complex operating environment for HIT departments. New roles such as chief analytics officer and chief digital officer are emerging at some healthcare organizations, creating potentially fragmented HIT management and oversight, as well as possible conflicting organizational goals. Contemporary healthcare organizations that have created these roles must pay particular attention to ensuring that clear charters and explicitly articulated roles and responsibilities are established under a single governance framework to increase alignment and produce desired outcomes. At a fundamental level, successful HIT governance must provide the right incentives and rewards in the organization and assign ownership and accountability for each function. In healthcare, incentives are important to foster synergy between and among operating units. Likewise, accountability for HIT design, implementation, and performance must be firmly assigned at the CEO, CIO, or board committee level (Information Systems Audit and Control Association 2017; Zahreddine 2019). With these considerations, the selection of the CIO leader is vital. Because excellent HIT performance depends on all organizational components working together smoothly, those who are accountable for these components must possess a broad view of the organization; that is, no leader can protect their turf. Organizational leaders (other than the CIO) must be aware that they, too, contribute to IT governance, and all must understand the symbiotic relationship between HIT and the organization's overall strategic direction (item 3).

Building on these ideas is a practice-oriented book aimed at helping CIO leaders achieve success—*The CIO Edge: Seven Leadership Skills You Need to Drive Results* (Waller, Rubenstrunk, and Hallenbeck 2010). The book identifies seven leadership skills that support the need for CIOs to have management skills as opposed to purely technical skills; these leaders do the following:

1. *Commit to leadership*. Success depends on the ability of the CIO to fully embody the role people play in success. Consequently, the CIO does not just "talk" the leadership mantra but "walks" or adopts behaviors consistent with leadership.

2. *Lead differently.* The point of this characteristic is to not abandon the core analytical approach to problem solving but to make sure that the current processes are collaborative in nature.
3. *Embrace the "softer" side.* This tired rhetoric has a grain of truth in that leaders should become open and caring, acting as mentors for others. This approach may involve empowering those around you to grow professionally. Key to this are not just words but also actions.
4. *Forge the right relationships.* Because HIT is still largely a people, not a technology, function, the leader must devote time and effort on managing relationships. As discussed later in this chapter, those relationships connect you not just with direct reports but also with other leaders inside the organization, as well as vendors and suppliers outside the organization.
5. *Communicate effectively.* What a successful leader says and does are constantly being watched for signs of commitment and direction. The ability to effectively communicate at all times and in all manners is essential.
6. *Inspire others.* Getting people to go the extra mile to meet goals requires more than reminding them to do a good job. A leader must learn to inspire employees and convince them to believe firmly that they are working on something grander than their immediate set of tasks. Working for a greater good is inspiring and often is vital to success.
7. *Build people.* Professional development for your employees serves as the greatest success for the organization. It breeds high performance in the short run and helps to generate the future leaders of the organization.

To make these traits a reality, a solid and mutually supportive relationship between the CEO and the CIO is essential. The gap between these institutional leaders pervades a host of environments. The challenges arise from poor communication as well as misaligned goals between the organization and IT, diverse education and training, and basic lack of understanding of the environment each leader faces (Hütter, Arnitz, and Riedl 2017).

Functional Responsibilities of the Chief Information Officer

Information systems can be useful to management, provided the process for planning, designing, installing, and operating such systems is itself well managed. The CEO, CIO, and other senior managers of a healthcare organization must assume the responsibility for planning and controlling the development of effective information systems to serve their needs. These tasks cannot be delegated to technical personnel if information processes are to be truly supportive of high-quality patient care and managerial decision-making. In today's competitive environment, information is essential for

strategic planning, cost and productivity management, continuous quality improvement, innovation, and program evaluation purposes. Important senior management responsibilities are summarized in exhibit 3.2.

EXHIBIT 3.2
Senior Management Responsibilities

- Management must insist on a careful, governance-guided planning process that precedes all major decisions related to the installation of HIT. A master plan for HIT development should be created and updated at least once a year. The master plan should be dynamically linked to the strategic plan of the healthcare organization and should guide all specific implementation decisions.
- Management must employ a user-driven focus throughout the development process. Active involvement of personnel from all segments of the healthcare organization is essential. This participation should begin with a definition of information requirements before the organization considers acquisition of hardware and software. It should continue through all phases of analysis, design, HIT evaluation and selection, and implementation.
- Management must take the responsibility for recruiting competent personnel for the design and operation of HIT. Consideration should be given to recruitment of a CIO to serve as a member of the senior management team. When outsourcing is used, careful selection of vendors and contract negotiations with the assistance of legal counsel should precede the awarding of contracts for software, equipment, or services.
- Managers at the corporate level must establish policies and procedures to ensure integration of data files or interfacing among individual information systems for tracking patient flows, consolidating cost and financial data, monitoring quality of care, and evaluating individual products and services. Interoperability of data among individual systems is an absolute necessity in complex healthcare organizations, particularly those involving subsidiary units and central corporate management.
- Management personnel at all levels must adhere to legal and ethical obligations to maintain security of HIT and to protect the confidentiality of patients, human resources, and other sensitive information.
- The design of individual computer applications must be carried out by an interdisciplinary project team. HIT personnel will take the lead on technical analysis and design activities. Representatives of user departments should help guide the specification of system requirements and evaluate the technical design plans of the HIT analysts.
- Management should be involved in all major design projects to ensure congruence with organizational goals and objectives, and it should insist on a user-driven system focus rather than a technology-driven focus.
- Once a project team has been organized, careful systems analysis should precede any implementation decisions. Shortcuts in the systems analysis phase will inevitably lead to problems later in the process.
- Managers must ensure that the preliminary design specifications for individual computer applications are in harmony with the master plan for information systems.

(continued)

EXHIBIT 3.2 Senior Management Responsibilities *(continued)*

- Detailed system specifications must be established before any implementation activities take place. These specifications should be reviewed formally and approved by all relevant user departments and by management before proceeding with the next steps in system development.
- Throughout the analysis, design, and implementation phases of a project, management must require careful scheduling of all activities and should receive periodic progress reports as the project proceeds.
- Managers must ensure thorough training of all personnel involved in the implementation phase of the new HIT.
- No computer application should be put into operation without first carrying out a comprehensive system test. The testing should cover all phases of system operation, including computer programs and procedures, personnel training, user satisfaction, ability of the system to meet original objectives, information security, and accuracy of the initial cost estimates.
- Provisions must always be made for adequate maintenance after an application is operational. Maintenance procedures are essential to correct operational errors, to make system improvements, and to facilitate changes necessitated by shifts in organizational needs.
- Management must make certain that HIT is periodically audited and that all systems are formally evaluated once they are installed and operating normally.

The person assuming these responsibilities, the CIO, must have broad corporate and system understanding and also must have the ability to lead teams of technical experts responsible for complex IT. Typically reporting directly to the CEO (or chief operating officer [COO] in some large organizations), the CIO has two important duties: (1) to assist the senior management team and governing board in using information effectively to support strategic planning and management and (2) to provide management oversight and coordination of information processing and telecommunications systems throughout the organization.

The range and scope of specific CIO job responsibilities flow from the senior management duties. The scope can be defined in a number of ways, but the job's common parameters are synthesized from job descriptions and from leading healthcare search firms (including hrVillage.com, Community Clinics Initiative, WittKeifer, Healthcare Recruiters International, Heidrick & Struggles, Korn Ferry International, and Tyler & Company). The range and scope generally include the following:

- Enterprise-wide planning
- Leadership
- Management oversight
- Human resources management
- Financial management

Notice from this list that technical expertise is not mentioned as a separate responsibility. While the successful CIO cannot be ignorant of healthcare information systems and communication systems, they do not generally become directly involved in the details of software development or hardware design. At the same time, some degree of technical competence is crucial for the CIO to manage an organization's HIT functions effectively. Generally, the CIO must provide a vision for healthcare technology for the organization and leadership for developing and implementing HIT initiatives throughout the institution—from the boardroom to the clinical suites and in between. Many HIT initiatives are often designed to improve the cost-effectiveness of clinical and administrative functions, enhance the quality of healthcare services, and support business development. All initiatives assist the organization in navigating the constantly changing, competitive marketplace.

The CIO leads in planning and implementing enterprise information systems to support all aspects of both distributed and centralized clinical and business operations. Exhibit 3.3 provides a select list of knowledge, skills, and abilities of CIOs. Notice that a significant portion of the skill set and demonstrated abilities extends beyond the traditional HIT domain. This breadth does not imply that those with significant technical expertise cannot become the next CIO. Many paths lead to a leadership position in IT, and technical expertise provides as good a path as any other. However, moving to the C-suite, as the CIO title implies, does require a skill set beyond technical expertise.

Recently, Healthcare Information and Management Systems Society (HIMSS) released a report on the priorities of IT leaders in healthcare provider organizations, information garnered from responses to HIMSS's comprehensive survey. Exhibit 3.4 displays the ten key priorities for the next two years identified in the survey (HIMSS 2019).

EXHIBIT 3.3 Select Knowledge, Skills, and Abilities of CIOs

- Collaboration
- Understanding the nature of the health system
- Formulation of HIT components of the health system strategic plan
- HIT strategic business and market planning
- HIT needs analysis
- Organization's HIT strengths and weaknesses
- HIT culture
- State-of-the-field assessment
- Technology assessment
- Evaluation, adoption, and implementation standards
- HIT policy development

Source: Data from Applied Health Informatics Learning and Assessment (2020).

EXHIBIT 3.4 Ten Key Priorities of HIT Leaders: HIMSS Survey

Priority*	Hospital	Non-acute	All Providers
1. Cybersecurity, privacy, and security	5.81	5.43	5.69
2. Improving quality outcomes through health information and technology	5.28	5.13	5.23
3. Clinical informatics and clinician engagement	5.24	4.90	5.14
4. Culture of care and care coordination	4.92	4.94	4.93
5. Process improvement, workflow, change management	5.03	4.61	4.90
6. User experience, usability, and user-centered design	4.86	4.94	4.88
7. Data science/analytics/clinical and business intelligence	4.91	4.33	4.73
8. Leadership, governance, strategic planning	4.90	4.18	4.68
9. Safe information and technology practices for patient care	4.62	4.67	4.63
10. Health information exchange, interoperability, data integration and standards	4.62	4.22	4.50
N = 232 healthcare provider information and technology leaders			

* Based on a 1-to-7 scale, where 1 = "not a priority" and 7 = "essential priority."

Source: Data from HIMSS (2019).

Interestingly, digital health—or, more precisely, consumer and patient engagement and digital health—did not make the top ten list. However, via their various consulting engagements, the authors have observed a marked increase in interest in healthcare provider organizations' desire to enhance their relationships with their patients via mobile and digital applications that patients can access from their personal mobile devices. We suspect that in future HIMSS surveys, digital health will become a higher priority.

Characteristics of a Successful Chief Information Officer

The CIO must possess a good understanding of the healthcare environment and clinical care processes, be an experienced manager, and have sufficient understanding of IT to ensure that HIT is properly planned and implemented. Consider the following complex elements of the role:

- As discussed in chapters 1 and 2, the external environment and government policy have a direct impact on HIT. The CIO must monitor these activities, understand their implications, and prepare IT and organizational structures to respond to these trends.
- As part of the executive team, the CIO must understand the business of healthcare (i.e., the clinical, business, and administrative operations) and how they interact in order to intelligently discuss issues with the organization's leadership.
- The HIT function involves an array of individuals with diverse backgrounds. The CIO must be adept at communicating with and motivating this heterogeneous group.
- Technical knowledge is important for a CIO because the staff responsible for the technical aspects may have limited respect for a leader who is not conversant with actual and potential technical challenges.

In addition, the CIO must ensure that all HIT internal systems work properly. As a simple example, pharmacy systems (whether stand-alone or integrated) must operate continuously; otherwise, the organization will be unable to control dangerous drugs (particularly narcotics) or to manage drug ordering and inventory, drug distribution to patients, storage and retrieval of drug information, construction of patient drug profiles, the organization's formulary, and the generation of charges for billing (see chapters 8 and 9).

CIO success depends on many factors that are both internal and external to the leader's areas of influence. According to HIMSS (2012), six key factors are the responsibility of IT executives. These are not success factors per se, but they are factors that the CIO must be capable of handling or supporting:

- Delivering the value of HIT investments
- Alignment with overall business strategy
- Assistance in optimizing business and clinical processes
- Organizational performance management improvement
- HIT department management improvement
- Process change management improvement

Each factor received 83 percent or higher positive responses from HIMSS's survey respondents.

Organization of the Health Information Technology Department

The organizational structure of the HIT department should be guided by the institution's strategic objectives or plans and HIT strategic plan. Thus, the CIO must be aware of where they fit into the broader organizational framework and how best to structure internal operating responsibilities. With respect to reporting relations, the pervasive nature of HIT management and the key role that HIT leaders and managers play in achieving the organization's strategic initiatives suggest that the CIO should report directly to the CEO. Whereas at the turn of the century only about 37 percent of CIOs reported to the CEO, by 2018, 51 percent of CIOs reported to the CEO, 28 percent reported to the CFO, 17 percent reported to the COO, and the remaining 4 percent to others (Kark, Shaikh and Brown, 2018). In a recent survey of 44 life sciences and healthcare CIOs, 50 percent of CIO respondents said they report to the CEO, while 30 percent report to the COO, and 9 percent report to the CFO. The remaining 11 percent report to the board of directors. A recent College of Healthcare Information Management Executives (CHIME 2013) survey of 91 healthcare IT leaders found similar reporting relationships, with 51.6 percent of CIOs reporting to the CEO, 23.1 percent reporting to the CFO, and 16.5 percent reporting to the COO.

Irrespective of the CIO's reporting relationship, Smaltz and colleagues (2006) found that when the CIO is a formal member of the senior executive team (e.g., the executive committee of the organization)—and thereby is constantly engaged in discussions, dialogue, and strategic direction setting (Hütter, Arnitz, and Riedl 2017)—they are perceived by their C-suite peers as being more effective than CIOs who have no formal placement in the senior executive team.

As mentioned, the CIO oversees a broad range of functions, so the organizational chart must be sufficiently complex to capture that scope of responsibility fully. Organizations have not standardized the range of services reporting to the CIO; thus, organizational charts look different from one institution to the next. The size and complexity of tasks to be carried out by a central HIT department are affected by a number of factors, including the following:

- Degree of centralization or distribution of HIT throughout the organization
- Use of applications developed in-house
- Use of packaged software or contracts with application service providers
- Extent to which functions and tasks are outsourced to contractors

Despite this variety in organizational approaches, a fairly typical HIT department organizational chart for a hospital or health system can be presented along with typical functions (see exhibit 3.5). Often the complexity of contemporary hospitals or health systems necessitates a chief medical information officer (CMIO) taking responsibility for the structured relations between HIT and the clinical staff. In 2012, 36 percent of survey respondents indicated that they employ a CMIO (HIMSS 2012). In smaller hospitals, these same functions in exhibit 3.5 exist but are often staffed with director-level roles with smaller overall staffs. In large healthcare organizations and systems, these division directors often have substantial staffs, whereas in midsize organizations, a single person might occupy two or three of these functional positions as well as fill other job responsibilities. In small facilities, one staffer might be responsible for all of these functions. No matter who fulfills the position, the CIO and related functions typically exist.

It is important to note that actual titles vary. For instance, the role of the chief technology officer (CTO) could alternatively have any of the following common titles depending on the healthcare organization's size, human resources titling norms, and culture:

- Deputy CIO, Technology
- Director, Technology
- Manager, Technology

Looking further into the organizational structure of the HIT department reveals that, beyond the first level of reporting relations, it has even more layers. Exhibit 3.6 depicts the chart of the chief technology officer division. Such a technology division typically consists of three major components:

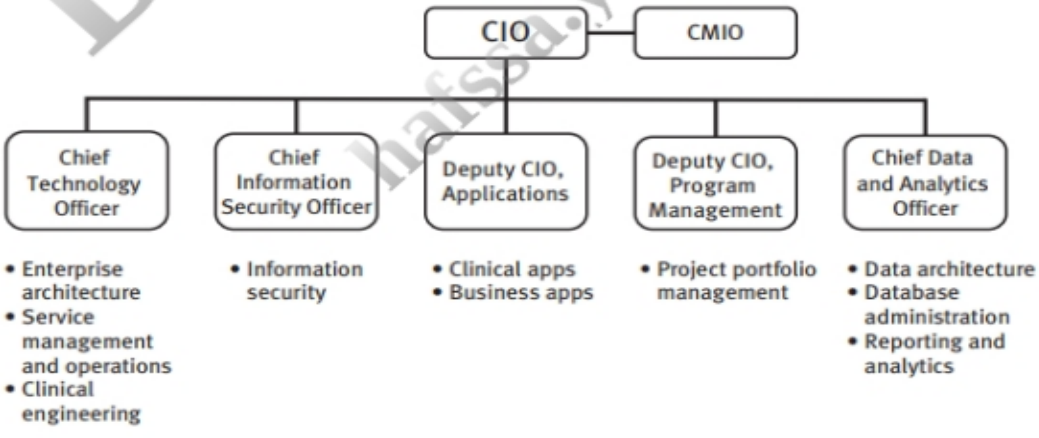
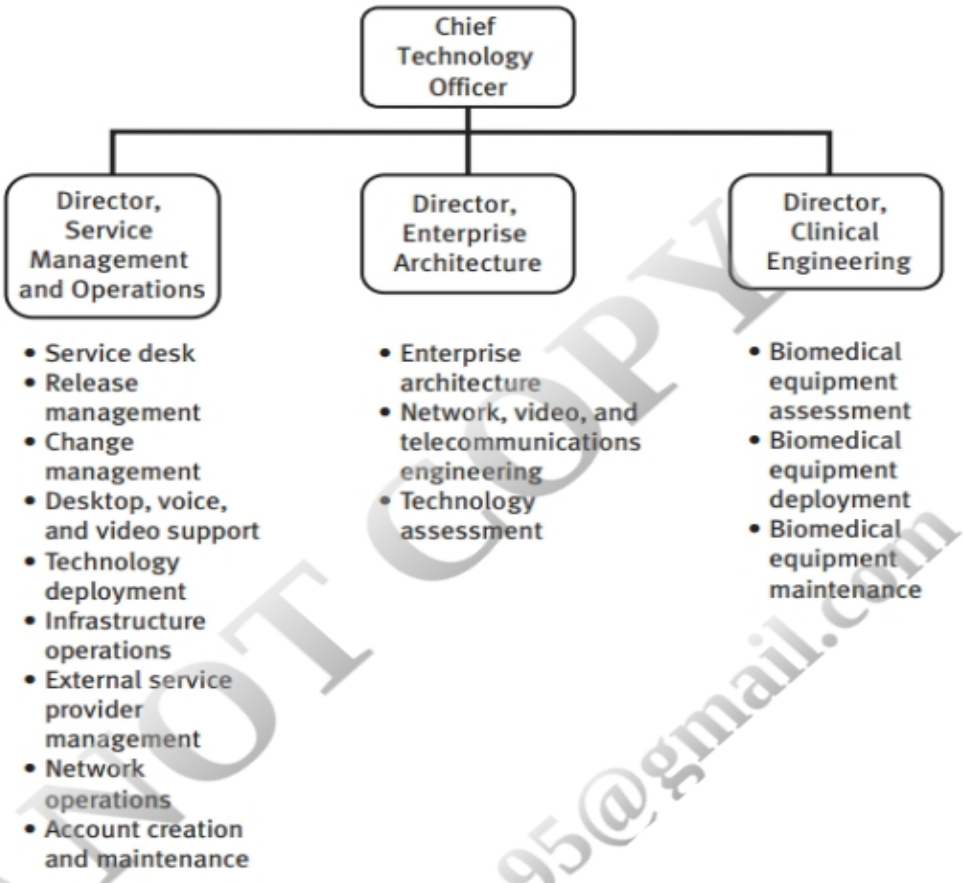


EXHIBIT 3.5 Organizational Chart of an HIT Department in a Large Organization

EXHIBIT 3.6 Sample Organizational Chart of the Chief Technology Officer



enterprise architecture; service management and operations; and, more recently, clinical engineering.

As the complexity of HIT has increased over the past two decades, the enterprise architect function has emerged with responsibility for creating and maintaining accurate architectural plans that are continually leveraged for planning and engineering any desired changes to existing HIT applications or service providers. Enterprise architects also plan and engineer the implementation of new HIT applications or service providers.

Service management and operations, which is covered in more detail in chapter 6, provides a host of support and operational services such as the service desk; desktop, voice, and video support; release management; change management; infrastructure and network operations; technology deployment; and account creation and maintenance. The service desk handles all incidents that end users report and tracks the incident through to resolution. Desktop, voice, and video support are specialized services to help end

users with any incidents related to their end user devices—their telephones or video teleconferencing and recording equipment. Release management plans and provides support services whenever new releases of any kind (e.g., applications, devices) are needed. Change management oversees the logistical planning for any refashioning of the various components of HIT infrastructure and applications. With the continued migration of on-premise data centers to external service providers, infrastructure operations have become more complex. They now often require continued support services to ensure that both on-premise and externally provided data center services are running optimally. Network operations are concerned with the secure and effective operation of the organization's internet services—hardwired and wireless. Technology deployment focuses on effectively implementing new HIT technologies (e.g., laptops, telephones, video monitors) and assisting with helping end-user departments in activities such as office relocation. Account creation and maintenance is a never-ending need, as new employees arrive and separating employees depart, to ensure that secure access to the HIT environment is effectively maintained.

The clinical engineering function is responsible for biomedical equipment implementation and maintenance. As a result of the increased network capabilities of most biomedical equipment, many hospitals and health systems have moved the clinical engineering function to operate within the CTO's division.

Aside from these typical organizational structures, two other characteristics are important to note:

1. Most organizations, as we cover in more detail in chapter 4, reported having an HIT steering committee. The role of this committee is to provide strategic direction for HIT decisions. Specifically, it tends to provide strategic approval for HIT decisions, be involved in budgetary decisions, and play a role in vendor selection. The committee is generally viewed as something that improves HIT operational and strategic effectiveness and that links the HIT department to potential and actual end users; small organizations are less likely to have this linkage function.
2. In many organizations, some HIT staff report to directors of other departments (outside of the HIT department) and not directly to the CIO. Typical examples are IT support staff that report to the primary ancillary department chiefs in radiology, pharmacy, and the laboratory. More recently, separate functions for analytics and digital health are emerging that dwell outside of the HIT department and may report to a chief analytics officer or chief digital officer, respectively. Mary Finlay, the program director of Harvard University's T. H. Chan