

Building the Necessary Skills and Relationships



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Key IT Skills to Have

Life is like a dog-sled team. If you ain't the lead dog, the scenery never changes.

—LEWIS GRIZZARD¹

Before I jump into a discussion on why technology skills matter for technology executives today, I thought that it would be helpful to first clarify the difference between a chief information officer (CIO) and a chief technology officer (CTO) and provide a summary of both the recent evolution of the CIO role and the current state of the CIO profession.

THE CIO AND THE CTO—WHAT'S THE DIFFERENCE?

In general, the CIO is responsible for managing the information technology and investments that effectively align the use of technology with the goals of the business. Today, the CIO is a key executive in most organizations with oversight of the IT infrastructure, messaging systems, information assets, database repositories, and policies and procedures that ensure that the systems and information within are reliable, available, secure, and effective. The CTO, in contrast, has evolved as a right-hand technical executive, usually reporting directly to the CIO with oversight of designing and implementing complex technical solutions in support of the CIO's strategies and direction. The CTO is usually more concerned with *how* to implement

complex solutions or products, is typically technically savvy, and is less experienced with dealing directly with the business units. In the late 1990s, the CTO title was the buzz among IT recruiters and CEOs. There were even mild predictions that the CTO role would rise up and become the lead IT executive position and cause the demise of the CIO as the shift toward a strategic focus for CIOs left a technical void at many organizations during the Internet boom. An executive search firm described the difference between the two CXO positions: “The CIO is 99.9 percent leadership, applying technology to solve business problems. The CTO focuses on technology more than strategy and vision.”² Thus, the CTO to the rescue! According to a senior technology practice leader at Korn Ferry, the majority of IT executive job searches being conducted in May of 2000 were for a CTO with the majority of positions in startups and dot-coms.³

It all started about a year and a half ago, when the rest of corporate America realized that the Amazon.com phenomenon was real and that the web had to be dealt with. Many CEOs just don’t think that the CIO can handle it all—and so they are seeking CTOs to round out their IT leadership. What this says is that CIOs need to roll up their sleeves and start getting that Internet experience.⁴

The rise of the CTO typically came through one of a few paths in the 1990s. Organizations that produced technology products or services often hired a CTO to focus on product development and engineering. Also, firms that were large enough to support multiple IT executives carved out the CTO role to focus on *emerging technologies* and implement complex technical solutions, freeing CIOs to focus more of their attention on strategic issues associated with delivering solutions to the business units. In many companies today, the CIO and CTO work effectively together, usually with the CTO reporting directly to the CIO. In 2000, the CIO of CVS.com, who also worked with the CTO of CVS.com as well as the CIO of the parent CVS corporation, summed up the need for an external focus on customers, regardless of title:

The world is changing. I know some CIOs who fear being replaced by CTOs. But the point is that you have to become more customer-centric—more externally focused—no matter what your title is, or else you will be pushed to the back office.⁵

Fast forward to today. What is the role of the CIO and CTO in companies today? The lines are sometimes blurred, but one thing is for sure—the CIO role is still the dominant IT leadership role in organizations, and the prophecy of the 1990s that the CTO would usurp the role of CIO has not been fulfilled. Some organizations have a CIO or CTO only, while others have both, but with clearly defined roles and separation of duties. According to a technology director quoted in a *Computing.com* article,

There are definitely two functions occurring in technology. [One is] to make sure the business runs correctly, for the administration, control and management of information, [for which] you require a CIO. The CTO, on the other hand, should focus on technology development.⁶

The typical CTO has a background in IT, consulting, research and development, or engineering, an average head count of 47 IT staff, and 73 percent of CTOs work for smaller companies with \$100 million or less in annual revenue.⁷ In contrast, most CIOs have IT and consulting backgrounds, a larger IT staff (an average of 93), and 59 percent of them work for larger companies.⁸ As far as titles go, the CTO title and role has yet to replace the CIO and take off in general. In the 2002 *CIO* magazine State of the CIO survey of 500 respondents, the majority (63 percent) of IT heads used the title of CIO, while only 13 percent indicated that their role and title was that of a CTO.⁹

The challenge for organizations today is to decide whether they need a CIO, CTO, both, or neither. In reality, many small to midsize organizations that are not engineering-based or product-centric will likely adopt a CIO as the top IT executive and usually can't afford multiple IT executives on the payroll. Larger organizations with ample IT budgets, diverse business offerings, higher levels of technology integration with suppliers and partners, and more complex requirements will likely continue to use both. Thus, it's often a hard sell for most companies to create a spot for the CTO unless there is a specific technical focus. However, there is usually great value for organizations that do carve out a niche for the more technical executive, as long as the role is complimentary to that of the CIO and there is synergy between the two.

There's plenty of room for multiple IT executives in today's complex business world as well as multiple paths to get there. One can take the

traditional path of starting from an IT specialist/technician position, moving to line manager, and then eventually to the CIO as more supervisory responsibility kicks in along with additional tasks and projects that involve less direct technology involvement.¹⁰ A health-care technology consulting firm CIO summed up the CTO career path:

Now, with the creation of the CTO, a career path has emerged that precludes the dwindling of one's involvement with the technology. Whereas the line manager (IT manager) would move into the role of the CIO, the lead engineer is now well suited to assume the role of the CTO—the glue between the CIO and line management on technology issues.¹¹

In conclusion, if a CIO is less technical and being asked to develop and deliver more complex engineering or product-based solutions, he or she should consider adding a CTO role to the organization. If the CIO serves in a more traditional organization that uses technology to meet demands of the business, then he or she should press ahead and take a seat at the IT throne and focus on delivery.

THE CHANGING ROLE OF THE CIO

The role of the CIO has evolved greatly over the past two decades. Large organizations have had CIOs for some time, but more small to midsize firms have recently created the new role for IT executives in their organizations. A recent *CIO* magazine article described the changing role of CIOs:

In the early and late 1980s and early 1990s, the CIO position was much more tactical than strategic, and the CIO position was definitely more technical. [The executive committee] would tell you, “Don’t worry—we’ll figure out the strategic direction and you just make it run.”¹²

Over the past 10 to 15 years, a few key technologies have had a direct impact on the shift toward strategic thinking for CIOs.

Client/Server Computing

The introduction and adoption of client/server computing in the 1980s and early 1990s combined with the rapid adoption of local area networks (LANs) pushed new technology and exciting graphical user interfaces (GUIs) into the hands of business users and consumers. This shift toward a

decentralized computing model also increased the complexity of technology by having more components involved in system solutions supported by the IT staff and was a dramatic move away from the traditional centralized *IT glass house* model of hardware and services in the past. I often refer to this period in the evolution of computing models as the birth of *commoditized computing*, where access to business systems and information is made up of many different hardware devices (personal computers [PCs], file servers, centralized disk solutions, database servers, etc.), software components (local PC operating systems, browsers, application software, device drivers, etc.), and networking equipment (routers, firewalls, switches, etc.) interacting on a variety of levels.

The World Wide Web

Second was the birth of the World Wide Web (www) in the mid-1990s, which leveraged the client/server computing model and expanded it via the Internet. This shift toward Internet-enabled applications and information greatly expanded access to business customers via the web and radically changed the way that organizations thought about engaging with their customers and working with their vendors. This shift required most CIOs to change their planning approach from tactical, or short-range, to strategic with a longer planning outlook, typically three to five years. The shift in planning approach, along with new technologies and delivery mechanisms, improved the frequency of interaction with other senior members of the management team (see Exhibit 1.1) and resulted in a more *connected and engaged* CIO. Salem State's CIO defined strategic planning in 2002 as "trying to predict where an industry and business will be three to five years down the road and the technology that will get a company

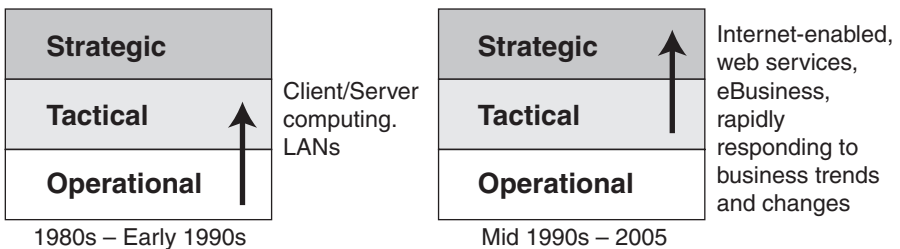


EXHIBIT 1.1 CIO Planning Focus—Past and Today

there.”¹³ Dell Inc. was one of the first companies to take advantage of the Internet boom and technologies by selling computers over the Internet. Their success in the direct-to-consumer sales approach has been copied by more companies in the last decade and has solidified Dell as one of the premier PC manufacturers in the world.

The Telecommunications Boom

The third key technological advance to impact the role of the CIO was the telecommunications boom of the 1990s. The rapid expansion of companies and telecommunications technologies provided tremendous amounts of bandwidth to businesses via point-to-point private leased lines as well as increased capacity over the public Internet aided by the rapid growth of Internet service providers (ISPs). What followed shortly thereafter in the late 1990s was a rapid expansion of broadband access to the Internet for consumers. According to Forrester Research, U.S. business and residential digital subscriber lines (DSL) by major providers grew by more than 70 percent while cable modem subscribers increased 50 percent from 2000 to 2001.¹⁴

These three key technologies and capabilities had a dramatic impact on how the CIO interacts with other business lines and plans for growth strategies to support them and is likely to continue for the foreseeable future. According to a *CIO* magazine research article, successful CIOs in the early 1990s possessed four significant qualities: (1) They were vision builders who could deliver results or gain a competitive advantage via the use of technology; (2) they were good relationship builders; (3) they had sound tactical judgment and knew to not plan too far ahead of the business; and (4) they had the ability to detect when a change in business direction would impact IT.¹⁵ Today's CIOs, however, will also have to adapt to the rapidly changing business environment. They'll need to understand the business, be technically savvy, have excellent communications skills, and think strategically and deliver operationally. *CIO* magazine sums up the transition nicely:

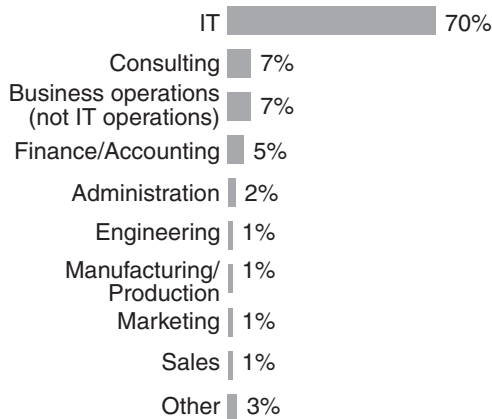
The era of the information superhighways and e-commerce has changed the business perception of the importance of IT. Some executives see in it both business threats and opportunities, so IT has to define what systems are needed to support business strategy and how IT might change

it. CIOs are being asked to be *strategists*. There's never been a more exciting time to be a CIO. Hardly anybody in business doubts that we've entered the information age and that IT is driving it. And once businesspeople realize that technology needs to be scalable, diversifiable and robust, they will know they need professional help. This is perhaps the biggest opportunity that's come along for CIOs to show they're business strategists.¹⁶

STATE OF THE CIO

Today's CIOs are predominantly men (87 percent) and more experienced in a variety of skills beyond just core technology.¹⁷ Information technology backgrounds tend to be the primary background for CIOs today, but a great many of them also have experience in consulting, business operations, administration, and finance. According to a *CIO* magazine State of the CIO 2004 survey, nearly 70 percent of CIOs have information technology as the primary job experience background, trailed by 7 percent for consulting, 7 percent business operations (non-IT), 5 percent finance and accounting, 2 percent administration, and 1 percent engineering¹⁸ (see Exhibit 1.2).

Additional non-IT job experience includes consulting (62 percent), business operations (45 percent), administration (34 percent), customer service



NOTE: There were no responses for customer service, logistics or R&D.

EXHIBIT 1.2 Primary Job Experience in Your Career

Source: Adapted from "State of the CIO 2004," *CIO* magazine, October 1, 2004.

(26 percent), engineering (25 percent), finance and accounting (24 percent), and sales (21 percent).¹⁹ Thus, today's CIOs need to be more savvy about other facets of the business than just technology. Preparation for such a responsibility should not be taken lightly and needs to be carefully planned out and coordinated.

A *CIO* magazine 2004 survey also reported that the majority of CIOs carry the title of just CIO or CIO and vice president.²⁰ A recent Forrester Research report that surveyed 1,300 technology decision makers indicated that the approximately 50 percent of CIOs in North America and Europe reported to either the CEO, chief operating officer (COO) or president, while 27 percent reported directly to the CFO.²¹ Larger organizations typically have a higher percentage of CIOs reporting to the CEO than smaller ones.²² Interestingly, companies in the survey where the CIO reported directly to the CFO had the lowest percentage (3.3 percent) of their annual revenue spent on IT²³ (see Exhibits 1.3 and 1.4).

There is a lot of pressure on today's CIOs to innovate in support of their businesses and to help drive new product development, increase operational efficiencies, and deliver clear and measurable results. According to the *CIO* magazine State of the CIO5 survey of 85 *global* CIOs, the majority (42 percent) of respondents indicated that they along with their business leaders and other CXOs are accountable for innovation results.²⁴ In addition, 65 percent of the CIOs surveyed indicated that bringing ideas for IT-enabled *business innovation* was a significant function of their role as the

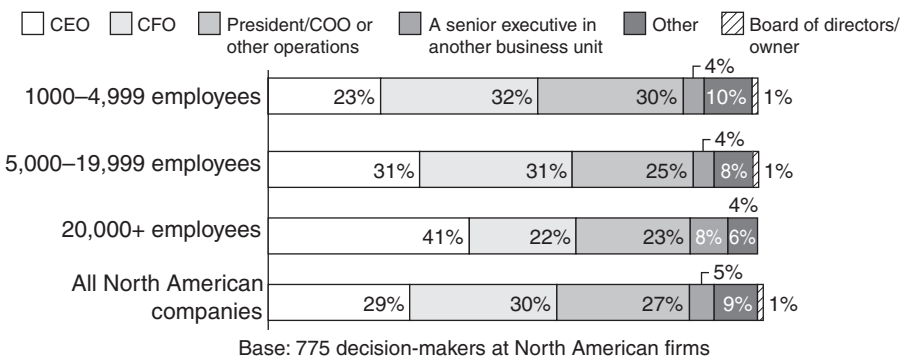


EXHIBIT 1.3 Who does the CIO, or senior-most IT decision-maker, report to?

Source: Adapted from "Where Should the CIO Report," Forrester Research Inc., February 28, 2005.

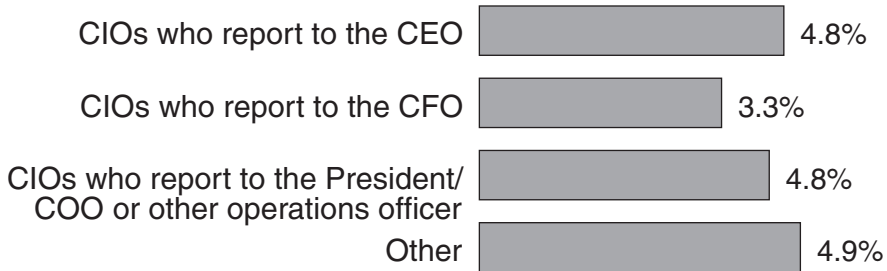


EXHIBIT 1.4 What Percentage of Your Company's Revenue is Spent on IT?

Source: Adapted from "Where Should the CIO Report," Forrester Research Inc., February 28, 2005.

IT executive.²⁵ So who are the main beneficiaries of IT-led innovation and what are the goals? According to the *CIO* magazine survey, customer service (70 percent), administration and finance (51 percent), sales and marketing (42 percent), and IT operations (39 percent) round out the top four business beneficiaries, whereas the top three goals of innovation were reported as reducing costs/improving productivity (81 percent), improving customer satisfaction (71 percent), and creating a competitive advantage (66 percent).²⁶ Thus, today's CIO must integrate well with other CXOs and understand the business needs in order to be able to lead IT-enabled innovation to help them.

HOW IMPORTANT ARE CORE TECHNOLOGY SKILLS?

Are solid IT skills important today to be successful as a CIO? Absolutely! Most of the research out in the market today, however, indicates that technology skills for CIOs ranks at a much lower priority and that business acumen and communication skills are at the top of the list of *must have* skills. Many CIOs that I've spoken with over the years and encountered via peer meetings and conference calls do not appear to have sufficient knowledge of information technology and appear to rely heavily on their trusted subordinates to give them advice and help them make the right decisions. This can be a dangerous road, because these subordinates will in many ways determine how successful the CIO is. As a CIO, I can't imagine leading a team of IT professionals without solid technical skills. Today's CIOs need to have core technology skills in addition to many other soft skills; they

need to be the *whole package*. The days are gone when IT leaders are just IT experts or from other non-IT disciplines running the IT department. CIOs today can't properly lead a technical staff and department if they don't have solid technical knowledge—bottom line. Would you trust and follow a CFO that didn't have a strong financial and accounting background? Then why should companies settle for CIOs that don't have a solid grasp of IT fundamentals? The following sections take a look at some recent research and discuss how several world-class CIOs view the importance of technology skills and how to obtain them.

Key IT Skills and Knowledge for CIOs Today

In a recent *CIO* magazine research poll of 400 IT professionals (see Exhibit 1.5), slightly over half of the survey respondents (55 percent) believed that their CIOs have an appropriate understanding of the company's current technology.²⁷ While the numbers seem flattering on the surface, they are just over 50 percent, revealing that as many as 45 percent of IT staffers believe that their CIOs are not technically savvy. In the same survey, IT staffers indicated that their CIOs were doing a good job setting IT strategy and steering the IT organization, but fell short on staff development and were out of touch with stress levels and morale in their department.²⁸

What do practicing CIOs think are important IT skills and backgrounds to have today? As part of the research for this book, I surveyed a diverse group of CIOs on a variety of topics. The survey results and quotes that follow throughout the book under the heading of "CIO Survey Question" are their answers, insights, and recommendations.

Given today's complex systems, interfaces, and the continuing need to

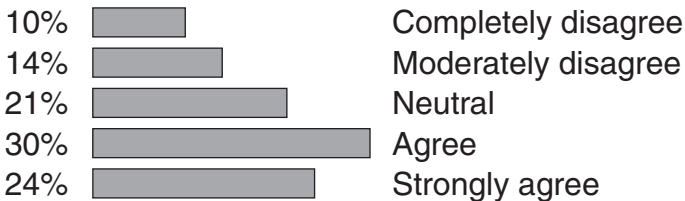


EXHIBIT 1.5 IT Staff Survey: My CIO Has an Appropriate Understanding of the Company's Current Technology

Source: Adapted from "What Do You Think of Your CIO," *CIO Research Reports*, September 15, 2003.

CIO SURVEY

What are the most important *IT skills/knowledge* needed for a CIO position today?

- The most common response was for the need to have general technology skills. Knowledge of IT architectures was also important.
- Coming in second was the ability to translate business and IT needs into an easy-to-understand IT vision and strategy.

What technology areas do you rely on subordinates the most for guidance and recommendations?" In other words, which technology topics are you weakest in?

- 60 percent responded with architecture and infrastructure.
- 25 percent indicated systems management.
- 25 percent responded with security and/or regulations.

show the value of IT, my personal experience as well as my research indicates that it is paramount for CIOs to have a solid understanding of the following:

- Applications and architecture alternatives
- Database management systems
- Networking concepts and wireless technologies
- Security

Applications, whether developed internally or purchased from a vendor as a COTS (commercial off-the-shelf) solution, bring IT staff closest to the business units since they must understand their requirements in order to implement a solution. At the World Wildlife Fund (WWF), our donor enterprise resource planning (ERP) system brings together IT, development, marketing, and finance professionals to build a cohesive and integrated team that is focused on getting results. To properly provide support for enterprise applications, the IT team and CIO need to understand these applications, integration between related applications, and the variety of technical architecture choices that they run on to properly deploy and deliver reliable system solutions. Today's inventory of applications used in

businesses are large, with many purchased directly from vendors, while others may be custom developed to meet specific needs not usually met with commercial software or to gain a competitive advantage. Either way, software applications are the heart of most organizations. Today's applications can reside on something as simple as a networked computer or PC, to a complex and integrated set of servers and software combinations that can include many different options, including terminal emulation, client/server or two-tier computing, n-tier application server technology, and load balanced web-based solutions. While most CIOs rely heavily on IT architects and network professionals for the bulk of these architecture options, they still need to understand the basic technologies along with the pros and cons of each architecture option before deciding on a solution and set of IT standards. Several powerful and new technologies like Java applications, Java J2EE application services, web services, and service-oriented architectures (SOA) are adding additional IT complexity, while providing the framework for scalable and reliable architectures for the future. CIOs need to spend time with their staff and vendors to properly understand these technologies. Once understood, CIOs can begin to develop IT standards to help lower overall costs, limit the number of diverse technologies in their organization, and build an effective support organization with the right set of skills to support it.

Database management systems are usually at the heart of most applications and store the organization's gold—both raw data and meaningful information. Almost every organization has a database and application package that stores the following information: human resource information system (HRIS), financial expense and revenue, customer relationship management (CRM), and budgeting. There are a number of commercial database offerings on the market today to choose from, including free or near-free solutions from PostgreSQL and MySQL, midpriced solutions from Microsoft SQL Server, to more expensive offerings from Oracle, Informix, and DB2. Database technology today is both mature and robust, but still requires the right skills to manage and administer the database repositories, which is usually left to database administrators (DBAs). However, CIOs today who understand the fundamentals of database technology can use it to their advantage in a number of ways. They can provide guidance and standards to their staff in the selection and standardization on one or more products as well as help drive operating efficiencies by integrating different

data throughout the organization via *smart* online database links and interfaces. Business users are continually looking to IT to present different views and reports of their organization's data. All of this information usually sits in one or more databases in an organization. Putting in place the right architecture is key to being able to capture data entry and provide for efficient and timely analysis and reporting to key decision makers (see Exhibit 1.6). Thus, CIOs need to pay attention to this function of their organization and get up to speed. Don't forget, the "I" in the CIO title is synonymous with the *information* that resides in most corporate databases.

Networking concepts and wireless technologies are important to understand since these are the mediums in which all application access and database content is delivered to users. Key topics to understand in this area include networking protocols and topologies, evaluating vendor solutions and equipment, telecommunication and bandwidth options for site

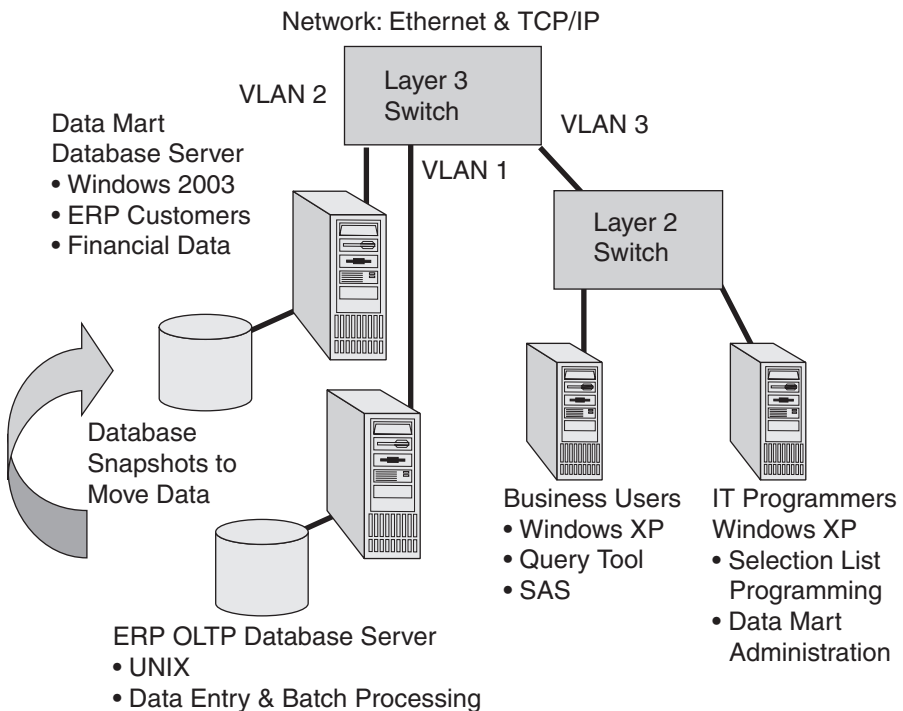


EXHIBIT 1.6 Sample IT Online Transaction Processing (OLTP) to Decision Support Architecture

interconnectivity, voice-over Internet protocol (VOIP), storage and backup solutions, and wireless technologies. The networking professionals that support this area usually run the infrastructure for their organization and are highly relied upon by the CIO for delivery of content and information throughout the organization. However, the CIO needs to be engaged with the networking folks in the IT department in order to make key decisions on IT standards, vendor products, solutions, and security. Without an understanding of the applications and the network on which they ride, the CIO can't possibly be effective as a business partner and IT leader for which to deliver services and information.

VOIP is a networking-related technology that CIOs need to be up on today, since it offers the capability of delivering high-quality voice conversations over data networks, thus integrating typically diverse technologies (voice and data) over a single medium. While the market is still emerging and technology standards are evolving, VOIP promises to be one of the more interesting technology areas to watch in the coming years that will likely have a dramatic impact on how organizations communicate within offices and to remote locations, potentially across the globe. WWF is currently experimenting with VOIP over the public Internet in an effort to use the technology to expand our voice capacity to our international field offices, while dramatically lowering costs.

Wireless networks and applications are exploding across the globe and forcing IT professionals to keep pace in order to provide timely and wire-free access to systems and information. The adoption of wireless technology by consumers and business is a foregone conclusion and fact. Millions of people are using the technology to stay connected to their systems, friends, and family wherever they are. According to ABI, a technology research firm in Oyster Bay, New York, that was recently quoted in a *New York Times* article: "More than 10 million homes in the United States now have a Wi-Fi base station providing a wireless Internet connection. There were essentially none as recently as 2000."²⁹ Road warrior business travelers are also demanding wireless technologies including always-on personal digital assistants (PDAs) to keep pace in a competitive environment. Businesses are using wireless fidelity (Wi-Fi) and other wireless technologies as a method of staying connected with their customers. Worldwide interoperability for microwave access (WiMax), with signal ranges of up to 30 miles, is on the

near horizon and will likely usher in the next wave of affordable wireless Internet access among businesses and consumers. In short, wireless technologies are here to stay, and CIOs need to get up to speed quickly, while understanding the risks associated with them in order to provide secure solutions and protect their systems and information.

Security is the final area that CIOs need to pay particular attention to today. There are many threats, externally and internally, that can put an organization's data and systems at risk today. IT organizations around the globe are spending enormous amounts of money to protect their data and networks from prying eyes. Areas of focus in this category include intrusion detection and prevention, anti-virus, anti-spyware, anti-SPAM, database and information security, and network security. If the data network is impacted in a negative way that prevents business customers from accessing their applications and data, the CIO will usually hear about it quickly. Bottom line, the CIO is accountable for system availability and data security. CIOs today can no longer just rely on network professionals, the chief security officer (CSO), or outsource providers to secure their systems and information. They must take an active role in establishing a security presence within their IT organization and take the time to work with the various professionals to understand the risks, review options for mitigating them, and make the final call on how to protect against the threats. According to a recent *CIO* magazine research survey of IT professionals, less than half of them believe that CIOs are paying enough attention to security issues.³⁰

On March 5, 2005, the *Washington Post* reported that ChoicePoint Inc., one of the largest information services vendors in the United States, fell victim to an identity theft scam that resulted in the theft of confidential data for 145,000 people.³¹ Ten days later, the *Washington Post* reported that identity thieves had penetrated LexisNexis, a world-wide provider of legal and business data, and that 32,000 consumers were affected.³² The *Wall Street Journal* followed up with an article in May 2005 that ChoicePoint was struggling with how to identify which records were stolen. Lieutenant Robert Costa, head of the Los Angeles County Sheriff's office, said "They [ChoicePoint] said it was a huge task and they didn't have the staff to do it."³³ Lieutenant Costa continued that "apparently their technology wasn't built so you were able to find the electronic footsteps these guys left."³⁴

Worrisome indeed, but bottom line—CIOs that don't pay attention to system security run the risk of getting their systems hacked or information compromised, lost, or stolen. At the end of the day, the CIO is accountable and his or her job may be on the line.

Finally, disaster recovery (DR) planning falls into this chapter since it encompasses several key IT skills to have, while planning for the *right* recovery solution. CIOs must appropriately plan to preserve their organization's data, develop a recovery model and plan that works for their budget and organizational risk profile, build a solution, and test it. The DR plan includes *application* recovery, including *database* management content, *network* design to ensure delivery of content, and *secure infrastructures* to ward off external and internal threats. Thus, the DR plan is essentially the recovery capacity and risk mitigation strategy of an organization's key systems and information assets that are usually owned by key business units and made up of the key areas of skills that I believe CIOs need to have to properly lead an IT team of professionals effectively and with respect.

Follow the Money . . .

A Robert Half Technology poll of more than 1,400 CIOs in 2005 found that IT spending in the next 12 months would focus on network security (35 percent), database upgrade/installation (16 percent), CRM systems (15 percent), data storage and backup (13 percent), and wireless communications (10 percent).³⁵ A February 2005 *CIO* magazine Tech Poll of 231 respondents revealed that the top three technology categories expecting an increase in spending were security software (58 percent), storage systems (53.9 percent), and computer hardware (48.9 percent), with an anticipated increase in spending also in the area of data networking equipment (44.2 percent).³⁶ Increased spending is often tied to hiring additional IT professionals. A recent article on IntranetJournal.com indicated that high-tech security professionals looking for jobs are in a good position going forward and that network security, intrusion detection, and penetration tests will be big for organizations in 2005.³⁷ Jeff Markham, branch manager for Robert Half Technology, summed up the network security risk and opportunity: "This was the biggest year ever for viruses and SPAM. A lot of the way we define security is on the database side—securing confidential

information like credit card numbers and the personal information of customers.”³⁸

Additional trends in IT spending point to a focus on areas that include applications development, database management systems, and networking. A recent Forrester Research report on IT spending found that IT spending by companies in the United States in 2005 will grow on average at 7 percent annually.³⁹ Specific areas for annual growth include computer hardware (9 percent), network and communications equipment slows after a flurry of purchasing in 2004 (4 percent), software grows slightly (5 percent), with a solid focus on systems management, storage software, custom built applications (19 percent), and security applications leading the way.⁴⁰ European Enterprise spending in 2005 is forecasted to trail the United States with an expected spending increase of 2.9 percent, with a strong interest in VOIP, VPN, security spending, and business intelligence platforms and applications.⁴¹

According to the *CIO* magazine State of the CIO survey, respondents indicated that the top technologies for innovation were redesigning IT architectures (73 percent), data access/warehousing (55 percent), and web services (49 percent).⁴² From a global CIO priority perspective, CIOs in the United States, Japan, South Korea, Southeast Asia, Germany, Australia, and Canada indicated that the top three technical priorities in 2005 were to integrate/enhance systems and processes, ensure data security and integrity, and focus on external customer service and relationship management.⁴³ In conclusion, CIOs will likely spend time staying current and abreast of the technologies that they are spending the most money on. Candidates aspiring to the role of the CIO should take notice of this trend and start developing the core technology skills now, while paying attention to what is on the current and future IT horizon.

Remaining Current on Key Technologies

Once a solid base of knowledge is established, remaining current on technology can be a challenge given the rapid pace of technological change and the lack of time to absorb key information. Most CIOs today employ a combination of efforts to remain current on the *right* technologies. Below are results from a recent CIO survey that asked a group of world-class CIOs how they stay current.

CIO SURVEY

As a CIO, how do you remain current on technologies that are important today in the marketplace?

The highest response was via reading publications and subscriptions. The second highest was by attending conferences and seminars. The third highest was by vendor demos, meetings, and reading product white papers. The fourth highest was by interacting with internal IT staff. The fifth highest was peer visits and conference calls via established networks.

What's the Best Academic and Experience Background?

I believe that investing in an academic background to launch your career is paramount. Given the high cost of an education, it may turn out to be one of the most important decisions that a person can make regarding his or her career. Competition for top IT jobs is tough and competitive. A degree alone will not ensure your rise to the top, but the *right degrees* may just give a candidate the necessary edge. In a recent *TechRepublic* article, two leading experts summarized the right CIO background as follows:

The duties of today's CIOs require a skill set that includes both a strong business background and a core technical background, such as a degree in computer science or another technology-oriented discipline. However, a CIO is not (or should not be) the lead engineer or programmer.⁴⁴

I asked a group of leading CIOs the following question to find out just how important an academic background is in today's environment.

CIO SURVEY

Is an academic background important for ascending to the role of the CIO today?

- 70 percent responded yes
- 20 percent responded no.
- 10 percent provided no response.

Several CIOs in the survey added their comments and advice below:

A formal education is neither a ticket for success nor a showstopper if you don't have a degree. It is not causative, but it appears to be coincidental that my most capable/deepest up 'n' comers also have the best degrees from the best universities.

—*John W. Von Stein, Executive Vice President
and CIO, The Options Clearing House,
CIO magazine CIO Executive Council Member*

Yes, mostly as a price of entry. It provides an unproven entity with poker chips for admittance to the game.

—*Martin Gombert, CTO, A&E Television Networks,
CIO magazine CIO Executive Council Member*

There are several options for professionals today to add knowledge and skills, ranging from undergraduate degrees to IT certifications to advanced graduate degrees. Which degrees are the most helpful in grooming for the CIO slot? Many universities and colleges have started to adapt to the rapidly changing business world that is so reliant on technology by creating programs that are designed to combine business and IT skills into a single program. Many colleges and universities offer advanced masters degrees with titles like an “MS in Business” or a “technical MBA.” One thing for sure is that IT skills alone won't typically get you the CIO role. According to a *Computenworld* article titled “Masters in Frustration,” the dean of Boston University's School of Management, which offers a dual-degree graduate program called the MS-MBA, summed up the need for a new program: “The next generation of CEOs is coming from IT, not from finance. What business problem do you know that isn't being solved by technology?”⁴⁵

Again, I asked a distinguished group of CIOs for their feedback.

CIO SURVEY

What degree(s) would you recommend to professionals wanting to become a CIO and why?

Having a computer science background is a must for progressive CIOs to ensure that basic knowledge of what they are managing and responsible for is there. Additionally, it is beneficial to understand

and/or have a formal education in business management/finance to tie the benefits of technology to the business needs.

—*Shyam K. Dunna, CIO/Assistant General Manager,
MARTA (Metropolitan Atlanta Rapid Transit Authority),
CIO magazine CIO Executive Council Member*

Having an MBA provides a basis and background in the key components of business and the things that CXO types focus on, including finances, operations, legal issues, market positioning, etc. An MBA gives you more information about how technology can directly and positively affect the business. From a credibility perspective, having an MBA makes you more “equal” with other senior executives, as they often have an MBA degree as well.

—*Steven W. Agnoli, CIO, Kirkpatrick & Lockhart Nicholson
Graham LLP, CIO magazine CIO Executive Council Member*

In your opinion, what background (IT, administration, sales, accounting, etc.) is ideal for a candidate wanting to ascend to the role of the CIO today?

According to the 2004 State of the CIO by *CIO* magazine:

- 70 percent of the 544 CIO respondents indicated that their primary background was in IT.
- 45 percent said that they had also worked in business operations (45 percent), administration (34 percent), finance or accounting (24 percent), and sales (21 percent).⁴⁶

Highlighted quotes from other CIOs are below.

I firmly believe that having a background in IT is essential for a CIO. While it is very important for CIOs to interact with the business for process improvement and optimization, underlying this is an infrastructure that supports these applications that drive business growth. We must, first and foremost, deliver applications and services to our internal and external customers in a secure and reliable fashion or we put ourselves and our organization at risk. To attempt this without a solid background in technology is not a risk I would be willing to take.

—*Hans Keller, CTO, National Aquarium in Baltimore,
CIO magazine CIO Executive Council Member*

I would strongly recommend an IT background for anyone wanting to be a CIO. Developing the IT skills early in a career and gaining expe-

rience in other parts of a business throughout the career might be a pathway to success.

—Jerry B. Hale, CIO and Vice President of Information
Technology, Eastman Chemical Company, CIO magazine
CIO Executive Council Member

WHAT DID I DO TO PREPARE?

I started out my career by obtaining an undergraduate degree in computer science with a minor in business. After working several years as a programmer in a consulting firm, where I proactively shared knowledge with co-workers and worked toward being part of a team effort, I became a team leader, which gave me oversight over larger projects and consulting engagements. I enrolled in a graduate “technical MBA” degree program with a concentration on technology management to expand my business knowledge and gain additional skills for IT oversight and management. In the early 1990s, I moved to a large financial services Fortune 200 firm to expand my skills and work with larger, more complex systems, including financial systems, real-time trading applications, complex telecommunications delivery systems (terrestrial and satellite for financial feeds), Internet-enabled applications, database management systems, and decision support/business intelligence systems. In 1992, at the age of 29, I published my first article in *LAN Times*, which highlighted how to integrate Novell and Banyan Vines networks. This was the exciting start of my publishing aspirations.

RECOMMENDATIONS

To close this chapter out, I advise professionals aspiring to become CIOs to not lose focus on the core technology skills that are necessary to run a world-class IT shop. Individuals today are more in charge of their career and planning than ever before. Planning your career earlier, while setting clear, measured, and obtainable goals, can get you to where you want to

be if you are persistent and patient. The following recommendations are designed to help candidates prepare for an IT leadership role:

- Pursue educational degrees to compliment your background and strengthen your IT and business knowledge.
- Pursue certification programs that add hot IT skills and knowledge.
- Get some consulting experience. Consulting engagements offer a unique way to learn what businesses need and how to deliver value from an entirely different perspective.
- Map out a training plan to fill technology and business gaps and work with your supervisor to make it happen.
- Get engaged with vendors that you do business with (or may in the future) to learn new technologies and/or processes that can be applied to today's complex business challenges.
- Conduct brown bag sessions for training and information sharing of technology and business topics within your department and other IT staff and encourage others to do the same.
- Volunteer to join project teams where you can gain additional IT skills and business knowledge.
- Attend free vendor information and demo sessions on relevant technology topics.
- Read periodicals and publications to gain additional insights and perspectives.
- Get involved with the DR team and participate in a recovery test, which focuses on restoring mission critical applications, databases, networks, and security devices.
- Conduct research, where applicable, and review *best practices* and vendor solutions needed to solve real business problems.
- Start developing your peer network now to share ideas and best practices.

In closing, a CIO that has strong technical skills adds tremendous value to an organization and their technical staff by clearly understanding the interworkings, costs, and benefits of different technology solutions that enable them to more rapidly map the best strategy for solving technical and business challenges for their organization and business customers.

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