The Future of the CIO in a Digital Economy

CIO activities are expanding from providing IT services to including external customer responsibilities, working with non-IT colleagues and managing enterprise processes. We identify key activities for four types of CIOs and how CIOs spend their time across these activities, as well as their most important governance mechanisms. We also provide case examples of top-performing CIOs and ideas for how CIOs can migrate to more non-traditional activities.1,2

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A Digital Economy Changes Everything

When Procter & Gamble’s CEO Bob McDonald set a strategic goal announcing “We want to be the first company that digitizes from end to end” he turned to CIO and head of Global Business Services Filippo Passerini to lead the transformation. Many CIOs tell us their jobs are expanding and many CEOs tell us they would like their CIOs to do more. In addition to providing high-quality and cost-effective IT services, today’s CIO often has other, and growing, responsibilities. These include helping with revenue generation, delivering shared services, optimizing enterprise business processes, improving the customer experience, overseeing business operations and digitizing the entire firm.

We think these new responsibilities, and the pressures they place on CIOs, are a symptom of one of the biggest opportunities and challenges enterprises face today—the ever-increasing digitization of business as part of the move toward a more digital economy.3

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2 The authors gratefully acknowledge the support and contributions of the Research Patrons and Sponsors of the MIT Center for Information Systems Research (CISR), the helpful input to this research from our MIT CISR colleagues, and the many helpful suggestions from the MISQE editors.
3 Arthur, W. B. “The Second Economy,” McKinsey Quarterly, October 2011; this article discusses the changes that digitization will create in business.
employees in a business and between a government and a business is becoming more and more digital. IT spending, whether in the IT unit’s budget or elsewhere, will continue to rise in most enterprises. Business processes—everything from “order to cash,” “search to hire” or “idea to launch”—are becoming increasingly digitized.

A digital economy compels a company’s business processes to run flawlessly, 24 hours a day. Information is pervasive and sometimes overwhelming. Markets are electronic, and matching buyers and sellers is easier. Search is effective and fast, allowing customers to more easily compare offerings from different companies. Many new products and offerings can be tested online and scaled quickly if successful. Social networks help people connect across the globe to share not only their lives but also their views on a particular company’s products and services. A company has to worry about cybercrime, privacy and the risk of system failures temporarily shutting it down. And then there is the threat to business models—most banks we talk to worry less about other traditional banks than new competitors like retailers or online search firms that have great relationships with the bank’s customers and can offer them financial services. A business’s CIO is key to help leading it through these massive changes. It’s not business as usual for CIOs or their companies. A digital economy means the responsibilities of the CIO are changing.

To understand the future of the CIO we conducted a multi-year, multi-method study on how CIOs spend their time and how their senior management peers would actually like them to spend their time (the research is described in the Appendix). Based on their activities, we found CIOs can be classified into four types:

1. **IT Services CIOs**
2. **External Customer CIOs**
3. **Embedded CIOs**
4. **Enterprise Process CIOs**

In this article, we describe how CIOs of each type allocate their time and relate this to different business strategies, enterprise performance and other factors to learn how CIOs in top-performing firms operate and where they are heading. We also present case examples of CIOs of each type in top-performing companies to better understand how they work.

In response to the challenges of the digital economy, most CIOs tell us they want to move from the more traditional IT Services type to one of the other types. The empirical evidence supports this intuition, showing that the companies with CIOs types other than IT Services have better performance. In this article, we explore how CIOs can perform more value-adding activities to help their companies thrive in the digital economy.

### How CIOs Spend Their Time

To better understand how the CIO role is evolving, we initially interviewed 12 CIOs about how they spend their time. Four major CIO activities (see Figure 1) emerged from our analysis and a review of the literature:

- **IT Services activities**: Managing the IT organization and its people and external partners to ensure delivery of IT infrastructure, applications, projects and related services across the enterprise at the desired cost, risk and service levels.
- **Embedded activities**: Working with non-IT colleagues, both enterprise wide and within business units, addressing issues such as business strategy, business process optimization, new product or service development, regulatory compliance and risk, and IT investment prioritization.
- **External Customer activities**: Meeting with the company’s external customers, partners and colleagues as part of the sales or service delivery process, including electronic linkages with customers.
- **Enterprise Process activities**: Managing enterprise processes and the associated digital platform, including shared services, product development, operations, corporate responsibility, green issues and a range of special projects.
Each of these CIO activities fulfills a different objective for the enterprise.\(^4\) The first two echo activities discussed in earlier debates about how the CIO role should evolve from an internal utility focus to a more strategic business partner.\(^5\)

We next used a survey to validate our initial findings, as well as to explore the relationships between CIO types, their most effective governance mechanisms and firm performance. Mintzberg’s research on CEO roles, using a diary methodology,\(^6\) encompassed the richness and complication of the type of work our interviewees described and provided the model for our identification of CIO activities.\(^7\) We asked CIOs to estimate the time they spent on various activities and collected their assessments of the effectiveness of a variety of IT governance mechanisms. We added publicly available firm performance data to the dataset.

We surveyed 1,508 CIOs in 60 countries and found that on average, they spent the following percentages of their time on the four CIO activities:

- IT Services activities: 44%
- Embedded activities: 36%
- External Customer activities: 10%
- Enterprise Process activities: 10%.

We found that most CIOs allocate some of their time to each of these activities. We also found no significant differences in the time allocations of

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\(^4\) This finding is common in other studies of CIO activities. For instance, Peppard, Edwards and Lambert describe five CIO types: Utility IT Director, Evangelist CIO, Innovator CIO, Facilitator CIO and Agility IT Director/CIO—with an organization’s CIO fulfilling one of these at any given time—and highlight the ambiguities inherent when these types overlap. See Peppard, J., Edwards, C. and Lambert, R. “Clarifying the Ambiguous Role of the CIO,” MIS Quarterly Executive (10:1), 2011, pp. 31-44.


\(^7\) Other studies on CIOs have also used a diary methodology. An example is Stephens, C. S. “Five CIOs at work: Folklore and facts revisited,” Journal of Systems Management (44:3), 1993, p. 34.
enterprise CIOs and business unit CIOs, and few differences between U.S. and non-U.S. CIOs.

**The Four Types of CIO**

The average time allocations from our multi-country survey mask a lot of individual variation. We therefore next categorized each CIO into four types—IT Services, Embedded, External Customer and Enterprise Process—determined by which activity he or she spent the most time on compared with the averages reported above.

For example, the CIO at Commonwealth Bank of Australia (whom we profile later in this article) reported spending 20% of his time on External Customer activities and 30% on Enterprise Process activities, both of which were well above the survey averages. We classified this CIO as an Enterprise Process CIO because his time allocation for this activity in 2010 was the highest percentage above the average CIO time allocations.

The table in Figure 2 describes the key activity for each CIO type (row 2), the IT governance mechanisms rated as “most effective” by each type of CIO (row 3) and the performance of enterprises with the different types of CIO (row 4).

Below, we expand the descriptions in Figure 2 and also provide case examples (in text boxes) of CIOs of each type from top-performing firms.

**IT Services CIO**

The primary focus of the IT Services CIO is to provide all the IT services the firm needs to operate in a digital economy. The services include delivery of IT infrastructure, applications and projects, as well as enabling collaboration and on-line services across the enterprise for its employees and customers at the desired cost, risk and service levels. The IT Services CIO manages his or her IT unit and partners to provide world-class IT services.

**Embedded CIO**

The Embedded CIO’s primary focus is being part of the senior leadership team participating daily in strategic conversations and overseeing enterprise-wide business operations. This type of CIO deals with all the key issues facing the firm, including hiring, culture and capabilities, external partnerships, budgets, acquisitions, product development, globalization, risk management and compliance. The Embedded CIO certainly wears an IT hat but is embedded in the overall management of the company.
Example of IT Services CIO: Chris Perretta, State Street Corporation

U.S.-based State Street Corporation is a world leader in financial services, providing investment services, investment management, trading and research to investment managers, corporations, funds, non-profit organizations and individuals. State Street’s 29,700 employees work in 29 countries, serving clients in over 100 markets, and the company has over $21 trillion in assets under management. 2012 revenues were $10.1 billion, with a net profit margin of 20.9%, above the industry median of 19.4%. Its net income of $2.1 billion represented a compounded annual growth rate of 11.3% over 10 years.

State Street’s products and services are highly IT-enabled, so the firm regularly allocates between 20% and 25% of operating expenses to IT. Chris Perretta, State Street’s CIO, joined from GE as an IT Services CIO and spends about 75% of his time on services activities to ensure world-class service levels. Perretta restructured IT into three building blocks: corporate (including IT leadership, IT portfolio management and IT security), shared services (including strategic sourcing, offshore services, data services and infrastructure) and business-aligned services (including new initiatives, business IT relationship management and client integration).

Perretta and his colleagues have designed IT governance (i.e., decision rights and accountability) for each building block to achieve the right balance between local business innovation and global economies of scale. The governance mechanisms rated “highly effective” used by Perretta to optimize value creation include:

- An IT steering committee and IT leadership committee
- Senior-level business relationship managers
- Architects on project teams
- Chargeback of IT services to business units
- IT performance metrics.

Together with COO Jim Phalen, Perretta and his colleagues are currently leading a transformation to optimize a shared and standard platform of digitized business processes to be broadly shared across the firm. As this platform rolls out, Perretta’s responsibilities will likely shift more toward the Enterprise Process CIO.

Example of Embedded CIO: Kathy Pepper, ExxonMobil

ExxonMobil is one of the world’s largest companies, with 2012 revenues of $482.3 billion and net income of $44.9 billion; its ROIC (return on capital invested) is 24.6% compared with an industry median of 12.2%. The company operates globally, in many remote locations, with three major business units: Upstream (exploration), Downstream (refining, distribution and retail) and Chemicals. Kathy Pepper, the former global CIO, was responsible for virtually everything digital at ExxonMobil. Although ExxonMobil sells physical commodities, it is extensively digitized internally partly because the business is so data intensive. The IT unit is responsible for the budget of everything digital, except for plant process control, which is a relatively small percentage of IT expenditure. Pepper has a line of business background within the company, with previous positions including North Sea Production Manager and Director of ExxonMobil Norway.

As an Embedded CIO, Pepper spent 70% of her time on Embedded activities and 25% on IT Services activities. To allow her to spend most of her time on Embedded activities, she had a strong team of senior IT leaders and well-articulated and implemented IT governance. One of the best indicators of effective IT governance is the percentage of senior executives who can describe how the key IT decisions are made. At ExxonMobil, it is 90%, compared with 45% in the average company. Effective governance is part of the corporate DNA at ExxonMobil, and its IT governance mechanisms rated “highly effective” include:

- An IT leadership committee
- Senior-level business relationship managers
- A business case process
- Architects on project teams
- A formal project methodology
- A risk assessment process
- Chargeback.

Enterprise Process CIO

The primary focus of an Enterprise Process CIO is overseeing and operating key enterprise business processes as well as IT. For example, this type of CIO also has responsibility for banking operations at Commonwealth Bank of Australia, for product development at e-Bay and for shared services at Procter & Gamble. The Enterprise Process CIO is a natural extension of the IT Services CIO, broadened to include other business processes. The key difference is that the Enterprise Process CIO has accountability for the delivery and optimization of some enterprise

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8 Company information and industry median figures from www.hoovers.com.

business processes that were traditionally outside IT. Enterprise Process CIOs are often found in companies where processes are increasingly digitized, such as financial services or online businesses, or where IT is part of shared services.

External Customer CIO

The primary focus of the External Customer CIO is to strengthen the company’s relationships with its customers and to help sell and deliver products and services. This role is especially common among IT firms. For example, Sanjay Mirchandani, former CIO at EMC (a leading provider of enterprise information solutions) spent about 35% of his time meeting with external customers, often sharing experiences and best practices with peer CIOs on how to maximize business value from IT and EMC products, and how to continuously innovate and run global operations. In non-IT firms, however, External Customer CIOs are interacting with business-to-business customers for electronic linkages, business services or innovation.

Example of Enterprise Process CIO: Filippo Passerini, Procter & Gamble

Procter & Gamble is a 170-year old consumer goods company operating globally. 2012 revenues were $83.7 billion, generating a net profit margin of 15.5% compared with the industry median of 10.4%. A reason for this industry-leading performance is Global Business Services (GBS), one of the four pillars of P&G’s organizational structure. GBS is led by CIO Filippo Passerini and provides more than 170 shared services and solutions, from six hubs to the more than 300 P&G brands globally, as well as leading business transformation and building digital capabilities for P&G. GBS helps drive both lower cost and faster time to market; in its 13 years of operation it has reduced the cost of shared services by 33% and halved the time to market. GBS helps deliver P&G’s simultaneous need for global and local focus. The brands determine the choice of services to meet the business needs while GBS designs and implements solutions and processes to deliver business goals. At P&G, the IT governance mechanisms rated “highly effective” include:

- Business/IT relationship managers
- Centralized outsourcing
- Shared services for infrastructure and new applications
- Collaboration tools
- Service-level agreements (SLAs).

Example of External Customer CIO: Tony Scott, Microsoft

All of Microsoft’s products are digital, serving a broad spectrum of market segments—both enterprises and consumers—with software, search, services, phones and entertainment. 2012 revenues were $73.7 billion, with an ROIC of 18.6% compared with the industry median of 17.9%. Microsoft’s IT group has the same responsibilities of running a global business as in any other Fortune 100 company, including managing a complex infrastructure of desktops, servers, enterprise systems, data centers and mobile devices that generate massive amounts of information, while achieving a balance of scale with local responsiveness.

Tony Scott joined Microsoft as CIO in 2008 after being CIO at Disney. When reflecting on additional areas of his responsibility at Microsoft, he observed:

“[Microsoft] IT is the first and best customer of Microsoft and we are the first users of all Microsoft products in the beta test phase. We also showcase the full range of Microsoft products for our external customers. We host and lead many customer visits, and speak at lots of conferences and customer meetings. Each of our senior IT leaders also has executive responsibility for one or more of our major customers.”

Scott juggles his schedule to incorporate all four of the CIO activities:

- 36% of his time on IT Services activities, developing and running the systems that keep Microsoft’s business thriving
- 24% of his time is spent on Embedded activities, engaging with his senior management colleagues on the business of Microsoft and the role of IT
- 5% of his time is spent on Enterprise Process activities, running enterprise processes like trialing new Microsoft products
- 35% of his time is spent on meeting with external customers

To achieve this allocation of his time, Scott relies on his IT leadership team to carry out many of the IT Services and Embedded activities.

In addition, Microsoft has crafted governance mechanisms rated as “highly effective” that provide transparency and maximize value from IT, including:

- Strategy on a Page
- CIO scorecards
- A pro forma invoice for IT services provided to business units.

How Top-Performing CIOs Spend Their Time

To understand top performers, we carried out a statistical analysis of how the CIOs of top-performing firms spend their time (see Figure
CIOs are shown in Figure 2.11 For example, having governance mechanisms reported by Embedded him or her to do other things. The most effective the CIO being involved in every decision, freeing the organization govern IT effectively, but without as an Embedded CIO requires that the CIO help strategy and managing the enterprise. To succeed Embedded CIO activities, helping with day-to-day measure had CIOs who spent more time on returns from capital (i.e., ROIC) decisions.

IT executives who help make and implement IT IT organization and the expertise of the non-CIO's time allocation, but the capabilities of the and reflect not only the potential impact of the 11 CIOs who spent more time on each of the four CIO activities and several 10 The results described here and in Figure 2 are statistically significant coefficients of time spent in each CIO activity and several measures of financial performance in regressions controlling for industry.

For example, enterprises that led their industries on the returns from capital (i.e., ROIC) measure had CIOs who spent more time on Embedded CIO activities, helping with day-to-day strategy and managing the enterprise. To succeed as an Embedded CIO requires that the CIO help the organization govern IT effectively, but without the CIO being involved in every decision, freeing him or her to do other things. The most effective governance mechanisms reported by Embedded CIOs are shown in Figure 2.11 For example, having an effective governance process for creating business cases (driven by non-IT colleagues) frees up the CIO and the IT organization from having to review and second-guess the value and costs of each proposed IT project.

In contrast, enterprises that led their industry in innovation—measured by sales from new products introduced in the last three years—had CIOs spending more time on External Customer activities. In these enterprises, an important governance mechanism was to have an effective centrally managed outsourcing capability with a chargeback process to the business units. This capability allows the CIO and the IT unit to free up time from direct IT services delivery so the CIO can spend more time working with external customers. Nevertheless, the IT unit still manages the outsourcing process, ensuring delivery of quality IT services.

Enterprises that led their industries on profitability (as measured by net margin percentage) had CIOs who spend more time on Enterprise Process activities. Important governance mechanisms in organizations with this type of CIO included business/IT relationship managers and rewards for IT employees when enterprise-wide financial goals were achieved. This combination ensured that IT services were responsive to the needs of the business units and that IT personnel were motivated to contribute to the performance of the whole enterprise, rather than the performance of only the IT unit.

Enterprises whose IT leaders spent most time on IT Services had mixed performance relative to other firms in their industry: lower returns (measured by ROE) but more sales from existing products. One interpretation is that good IT service delivery in these firms helped to deliver current products, but this did not result in higher profitability due to price competition for those existing products. In other words, the focus on existing IT services didn't allow the CIO and the IT organization to facilitate innovation with new products and services. To be successful as an IT Services CIO requires a variety of governance mechanisms rated as “highly effective,” including having enterprise architects on project teams to maximize reuse and to ensure that new systems comply with enterprise standards.

How Other CxOs Would Like CIOs to Spend Their Time

We now have evidence of how enterprise performance correlates with different types of CIOs. To better understand what non-CIO senior executives want from their CIOs, we surveyed 282 senior non-IT executives about how they thought CIOs should apportion their time to each of the four major CIO activities. We also interviewed eight senior executives (CxOs) to whom a CIO reported or was a peer (typically CEOs, CFOs, EVP, Head of Sales and COOs).12 These enterprises varied in their focus and maturity in the use of IT, which of course affected the CxOs’ assessment of their own CIO’s effectiveness and how they wanted their CIO to allocate time. For example, if the IT basics were not working well, then system stability, IT budget management and project completion were important, and these CxOs wanted their CIO to spend more time on IT Services activities.

CxOs would like to see their CIOs first move from a traditional “order taker” IT Services CIO to an Embedded CIO, spending time working with non-IT colleagues. More specifically, CIOs should contribute to strategy conversations and participate in all the other issues facing the firm,
such as acquisitions and compliance. In addition, the CIO is expected to set up governance mechanisms to help the enterprise maximize value from IT, including activities such as prioritizing IT investments, optimizing business processes and conducting post-implementation reviews.

However, once these activities are part of the enterprise’s management processes, CxOs wanted their CIOs to spend more time on other activities. For example, in high-agility firms, CxOs wanted their CIOs to increase the time spent outside the enterprise on External Customer CIO activities to 20%—compared to the average of 10% (as reported earlier in our survey findings). Specifically, CxOs wanted time spent with external customers to “help sell,” “strengthen customer relationships peer-to-peer with CIOs of those customers” and “help deliver the enterprise services digitally.”

How Today’s CIOs Want to Spend Their Time

Based on the workshops for CIOs that we presented in seven cities on five different continents (see the Appendix), most CIOs want to move from being IT Services CIOs to other CIO types more suitable for a digital economy. For example, the overwhelming majority of participants (e.g., 70% of the 150 CIOs who participated in the Seattle workshop) described themselves as an IT Services CIO. When asked “Based on what would be the best for your company, which CIO type would you like to be in three to five years?,” 75% of the Seattle CIOs wanted to move to an Embedded CIO role, 13% to an Enterprise Process CIO role and 11% to an External Customer CIO role.13

Given the enterprise performance data in Figure 2 and our findings that CIOs and their senior colleagues want CIOs to make these moves, we next address how CIOs can shift from concentrating on IT Services activities to those more suitable for a digital economy. We do this by describing an example of a CIO who has made this shift.

Case Example: Evolving from an IT Services CIO

The Commonwealth Bank of Australia (CBA) is the largest and usually most profitable bank in Australia and was the ninth-top-performing bank in the world from 2005 to 2009 (measured on total shareholder return), in the top 10 by market capitalization in 2010 and the twelfth-safest bank in the world in 2012 with revenues of A$48 billion.14 When Michael Harte joined CBA as CIO in 2006, the bank had a variety of fragmented technology platforms, duplicated systems, relatively high spending on IT and a worrying level of systems outages. Harte was hired by former CEO Ralph Norris to join the bank’s Executive Committee and help implement CBA’s bold strategy of being both number one in customer service and having the lowest costs in class. In 2010, CBA achieved that goal with a top ranking in customer service in many areas and a cost-to-income ratio of 40%.15

In his first year at CBA, Harte and his IT leadership team launched the “Creating the Finest” program to build a world-class technology base and professionalize IT. At the end of the first year, they had reduced annual IT costs by more than A$200 million and over subsequent years, continuously improved IT processes such as project methodology, architecture governance and prioritization. The bank completed and drove value from an industry-leading, customer-facing, multi-channel digitized platform that included customer, product and channel data serving multiple parts of the business. CBA has now completed the implementation of a new core retail banking

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13 In some workshops, there was a higher percentage of CIOs who wanted to become External Customer CIOs.


15 Cost-to-income ratio is a common measure of bank efficiency. Historically, the average has been around 50%. Today, some top-performing banks are achieving cost-to-income ratios of below 45% while poorer performing banks often struggle with ratios above 65%. For a recent listing of cost-to-income ratios, see Hancock, M.”Emerging economies lead in cost-to-income ranking,” July 1, 2012, thebanker.com (http://www.thebanker.com/Top-1000-World-Banks/Emerging-economies-lead-in-cost-to-income-ranking).
platform, enabling flexible pricing, customer bundles and other innovations.

In 2008, CBA created an Enterprise Services unit that brought together operations and IT under the CIO, which changed the IT focus from a more technical orientation to business services. The transformation was enabled by relentless attention to six strategic pillars: customer delight, group impact, agility and growth, risk management, service enablement and people and culture. A series of projects and metrics were associated with each pillar, and together, the pillars helped transform the bank.

In the first few years of Harte's tenure, he operated as an IT Services CIO. During this period, as much as 75% of his time was allocated to IT Services activities, with the majority of his remaining time spent on Embedded activities. By 2010, his time allocation had shifted dramatically, with only 20% spent on IT Services activities. As shown in Figure 3, by 2010, he was spending 30% of his time on Enterprise Process activities—providing key enterprise process operations (like mortgages)—and 20% on External Customer activities.

Harte believes banking is entering a period where “our customers will co-create unique products and services on our world-class and flexible digital platforms using any device they prefer.” The Enterprise Services unit will provide the digitized platforms for the whole bank, enabling a big increase in its ability to do rapid test-and-learn. Amazon and other firms have demonstrated that it’s possible for large enterprises like CBA to create new offers, test them in targeted markets and scale them to all applicable customers, in days, not the months it takes most banks today.

### How CIOs Free Up Time from IT Services Activities

To move to another CIO type, an IT Services CIO has to free up time currently spent on services activities while still maintaining service effectiveness. We saw three effective approaches to freeing up time, which work in concert.

1. **Mentoring: Mentor Your Team to Take on More of Your Activities.** The average CIO spends a paltry 4.6% of his or her time managing and mentoring the IT team. For the CIO to spend more time on activities other than IT services, the IT team needs to step up and take on some of the tasks the CIO is doing now. The CIO needs to help by mentoring, reviewing, encouraging and helping team members move out of their comfort zones.

2. **Governance: Mature the Governance Processes.** Mature enterprise IT governance
processes operate effectively without taking up a great deal of the CIO’s time and are critical to freeing up the CIO to work on other activities. Effective mechanisms help provide predictability in the delivery of IT services and clearly define who has decision rights and accountability. Governance mechanisms on the demand side of IT services (e.g., prioritization) work best with joint participation and responsibility of IT and line-of-business leaders. Governance mechanisms on the supply side of IT (e.g., service-level design and assessment) work best when led by the IT group leadership with participation from external partners.

3. **Partnering: Develop the Use of Your Partner Ecosystem.** As the global market for IT service provision matures, there are increasing opportunities to use the partner ecosystem to provide IT services, thus freeing up the CIO and his or her team. Too often, enterprises buy technology rather than services and therefore don’t free up the time of the CIO and the IT unit.

**Guidelines for Transitioning Away from an IT Services CIO**

We expect to see the number of IT Services CIOs markedly diminish over the next 10 years as CIOs move to one of the three other types, depending on the firm’s strategy and perhaps the personality and skills of the CIO. Below we provide three suggestions for how current IT Services CIOs can make these transitions:

1. **Assess Your Current Time Allocations and the Changes Required.** Take a look at your diary over the last 12 months and work out what proportions of your time were spent on the four CIO activities described above. This will determine what type of CIO you are today. What type of CIO would be best for your enterprise three years from now?

2. **Develop Leadership Strategies to Free Up Time from IT Services Activities.** Identify ways to allocate more time to other activities appropriate for a digital economy, including the three suggestions above (mentoring, governance, ecosystem partnering). Most IT Services CIOs will first evolve to become Embedded CIOs.

3. **Look to the Future.** It’s possible that Embedded CIOs could choose to remain as that type for many years, but we don’t think this is sustainable. Having mastered being an Embedded CIO—which involves streamlining governance and entrenching other capabilities into the enterprise—we think high-performing CIOs will move to one of the two other types. In enterprises where digitization is the core of the business, like financial services, hi-tech, media and perhaps retail, CIOs will likely evolve toward External Customer CIOs, helping to ensure a brilliant customer experience. In enterprises where non-IT technologies are critical, such as manufacturing, telecom and pharmaceuticals, CIOs are likely to evolve toward Enterprise Process CIOs to focus on running business processes, perhaps in the shared services organization. In fact, this trend has already begun: Shawn Banerji, Managing Director of Russell Reynolds Associates (an executive search firm specializing in finding talent for the digital age), estimates that only 25% of CIO job listings in 2012 were for IT Services CIOs, the same proportion as demand for the Embedded, External Customer and Enterprise Process CIO types. This is a dramatic change from 2009, when demand for IT Services CIOs was dominant.

**Concluding Comments**

CIOs and business leaders expect, at a minimum, that the job of an effective CIO is to provide excellent IT services at a competitive cost. However, CEOs, current CIOs and other CxOs expect an effective CIO to do much more to ensure the success of the enterprise in a digital economy. This means CIOs need to spend less time managing IT services and more time delivering broader business value. If they don’t, CEOs may appoint other executives to drive that value. For example, we are seeing some firms (e.g., Starbucks Coffee Company, CVS Caremark Corporation and the New York Stock Exchange) appoint CDOs—chief digital officers—to lead the prioritization (and socialization) of the changes digitization are having on the enterprise.
Appendix: About the Research

This article is based on three research projects conducted by the MIT Center for Information Systems Research (CISR) between 2007 and 2012. In the first study, we interviewed more than a dozen CIOs in companies with annual revenues ranging from $1.5 billion to $80 billion, asking them to describe their jobs and highlight their key governance practices. The four major activities of the CIO shown in Figure 1 emerged from our analysis of these interviews.

In the second study in 2007, MIT CISR—working with Howard Rubin (Professor Emeritus of Computer Science at Hunter College of the City University of New York and MIT CISR Research Affiliate)—conducted a survey of 1,508 IT Leaders in 60 countries; 53% of firms were in the U.S. As part of that survey, we asked questions about the time spent on various activities, as well as asking the respondents to evaluate the use and the effectiveness of 24 IT governance mechanisms. We supplemented the survey data with firm performance data from WRDS COMPUSTAT and carried out several types of statistical analyses.

In the third study, we surveyed 282 senior non-IT executives attending the MIT Sloan course “IT for the Non-IT Executive” about how they thought CIOs should spend their time, using the same activities from the 2007 survey (typical titles of respondents were President, CEO, CFO, COO, EVP, CIO and Head of Sales). We chose eight CxOs from this group, based on the patterns of their results, to interview in more detail about how they wanted their CIOs to spend their time.

We have also presented the results from our research at CIO workshops in seven cities: Barcelona, Boston, Copenhagen, Seattle, Sao Paulo, Singapore and Sydney. We found that CIOs could readily identify which type of CIO they currently are (e.g., IT Services), based on their major activities, and which type they would like to be in three to five years. The results were remarkably consistent across the workshops, and we used their feedback to refine our arguments. Finally, we have held annual discussions with Shawn Banerji, Managing Director at Russell Reynolds Associates, to help us understand the changing marketplace for CIOs.

About the Authors

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Stephanie L. Woerner (woerner@mit.edu) is a Research Scientist at MIT Sloan Center for Information Systems Research (CISR). She studies how companies manage organizational change caused by the digitization of the economy. Her research centers on enterprise digitization and the associated governance and strategy implications. Two current studies include the amount, allocation and impact of enterprise-wide digital investments and how digitization is influencing the shape of the next-generation enterprise.