A Consumer Products Perspective

Tech Trends 2014

Inspiring Disruption

Deloitte University Press

Contents

Introduction

WELCOME to Deloitte's fifth annual *Technology Trends* report. Each year, we study the ever evolving technology landscape, focusing on disruptive trends that are transforming business, government, and society. Once again, we've selected 10 topics that have the opportunity to impact organizations across industries, geographies, and sizes over the next 18 to 24 months. The theme of this year's report is *Inspiring Disruption*.

In it, we discuss 10 trends that exemplify the unprecedented potential for emerging technologies to reshape how work gets done, how businesses grow, and how markets and industries evolve. These disruptive technologies challenge CIOs to anticipate their potential organizational impacts. And while today's demands are by no means trivial, the trends we describe offer CIOs the opportunity to shape tomorrow—to inspire others, to create value, and to transform "business as usual."

The list of trends is developed using an ongoing process of primary and secondary research that involves:

- Feedback from client executives on current and future priorities
- Perspectives from industry and academic luminaries
- Research by alliance partners, industry analysts, and competitor positioning
- Crowdsourced ideas and examples from our global network of practitioners

As in prior years, we've organized the trends into two categories. Disruptors are areas that can create sustainable positive disruption in IT capabilities, business operations, and sometimes even business models. Enablers are technologies in which many CIOs have already invested time and effort, but that warrant another look because of new developments, new capabilities, or new potential use cases. Each trend is presented with multiple examples of adoption to show the trend at work. This year, we've added a longer-form *Lesson from the front lines* to each chapter to offer a more detailed look at an early use case. Also, each chapter includes a personal point of view in the *My take* section.

Information technology continues to be dominated by five forces: analytics, mobile, social, cloud, and cyber. Their continuing impact is highlighted in chapters dedicated to wearables, cloud orchestration, social activation, and cognitive analytics. Cyber is a recurring thread throughout the report: more important than ever, but embedded into thinking about how to be secure, vigilant, and resilient in approaching disruptive technologies.

For the first time, we've added a section dedicated to exponential technologies, working with Singularity University to highlight five innovative technologies that may take longer than our standard 24-month time horizon for businesses to harness them—but whose eventual impact may be profound. Examples include artificial intelligence, robotics, and additive manufacturing (3-D printing). The research, experimentation, and invention behind these "exponentials" are the building blocks for many of our technology trends. Our goal is to provide a high-level introduction to each exponential—a snapshot of what it is, where it comes from, and where it's going.

From a Consumer Products lens, we provided industry sector specific perspective on majority of the topics including CIO as a venture capitalist (how to leverage brand categories perspective for portfolio planning), crowdsourcing (specific strategies including crowdfunding, flexible workforce and data analysis contests), wearables (discussing the Empowered Employee and the Persistently Connected Consumer) and digital engagement (Omnichannel Brand Engagement, Ubiquitous Sensors and other topics).

Each of the 2014 trends is relevant today. Each has significant momentum and potential to make a business impact. And each warrants timely consideration—even if the strategy is to wait and see. But whatever you do, don't be caught unaware—or unprepared. Use these forces to inspire, to transform. And to disrupt.

We welcome your comments, questions, and feedback. And a sincere "thank you" to the many executives and organizations that have helped provide input for Tech Trends 2014; your time and insights were invaluable. We look forward to your continued innovation, impact, and inspiration.

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Disruptors

CIO as venture capitalist

Trading on IT's assets, talent, risk, and results

CIOs who want to help drive business growth and innovation will likely need to develop a new mindset and new capabilities. Like venture capitalists, CIOs should actively manage their IT portfolio in a way that drives enterprise value and evaluate portfolio performance in terms that business leaders understand—value, risk, and time horizon to reward. CIOs who can combine this with agility and align the desired talent can reshape how they run the business of IT.

CIOs have historically focused on core delivery and operations with a budget and operating model built around low risk—buying enterprise-class software, building a talent base that could support a well-defined future state, driving for efficiencies in light of constant cost pressures. More and more CIOs, faced with disruptive forces such as crowdsourcing,[1] mobile only,[2] big data,[3] and cybersecurity,[4] are shifting from a world of known problems into one filled with unknowns. To make matters worse, organizational governance has become more complex as barriers for other parts of the business to enter the technical arena have fallen.

CIOs are seeing this divergent behavior—and realizing that their current tools for managing risk and leveraging assets may not work in this new world. Instead, many are beginning to manage their technology portfolios in ways that drive enterprise value, actively monitor the performance of the portfolios, and communicate the portfolios' positions in language the business can grasp. To do this, CIOs are borrowing from the playbook of today's leading venture capitalists (VCs). As a result, they are reshaping how they run the business of IT.[5]

Thinking like a VC

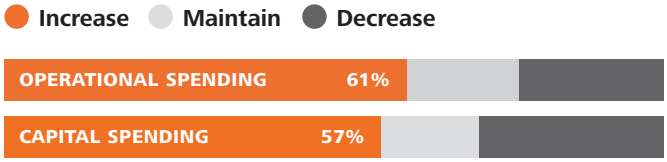
Effective VCs are often shrewd businesspeople who operate across a range of intertwined capabilities. They manage portfolios of investments, continually evaluating individual and aggregate performance in terms of value, risk, and reward. They deliberately attract entrepreneurial talent with technical skills and business savvy—as well as vision, passion, and the intangible spark of leadership. And they cultivate agile organizations to anticipate and respond to changing market conditions—open to decisions to exit, take public, reinvest, or divest. These capabilities are closely related to the CIO's leadership role in today's growth-oriented organization.

Portfolio investment strategy. CIOs today juggle an ever-growing portfolio of projects, ranging from long-term strategic initiatives to keeping the lights on. CIOs need clear lines of sight across their portfolio of programs and projects—the objectives, dependencies, status, finances, associated resources, and risk profiles. But in-flight initiatives are only one piece of their balance sheet. CIOs should also understand their assets—hardware, software, facilities, delivery model (the way work gets

Capabilities map for CIOs

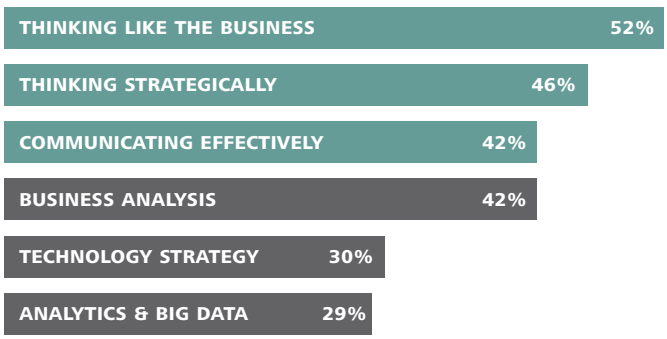
Portfolio management[1]

As IT budgets continue to increase, it is more important to manage them closely. In 2013, 38% of organizations created a portfolio approach to IT.[2]



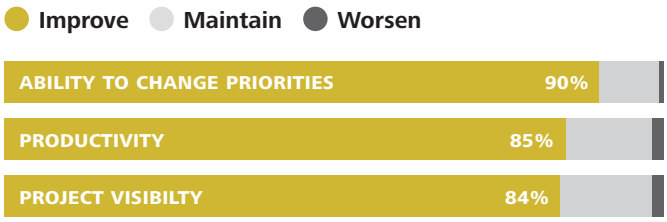
Talent alignment[3]

IT needs the right skillset to maintain systems and innovate.



Agile[4]

CIOs are adopting agile methods to expedite delivery times and improve business alignment. Organizations using agile have seen promising results:



83% of businesses have future plans to implement agile, an increase from 59% last year.

done), contracts, vendors, and people. The portfolio of IT is a complex one. But that complexity is no excuse for flying blind.

Valuation. An effective portfolio view enables the CIO to continually evaluate the strategic performance of each asset, project, and vendor in terms that business leaders understand. A CIO with a VC mindset doesn't just report on the organization's to-do list or inventory of assets; the CIO communicates the quantitative and qualitative value the IT organization contributes to the business. This means delineating the strategic importance of programs, projects, and assets. What initiatives are mission-critical for the business? What is the confidence level around on-time, on-budget delivery? How deliberately are business case results tracked? Which hardware and software assets are identified for growth? For sunsetting? For active retirement? How "heavy" a balance sheet do you want to carry?

Handicap. In many emerging areas, there are no clearly identifiable winners. How much do you know about the product roadmap of your existing providers? Are you actively scanning small and emergent players? No part of your portfolio should be off-limits—software, hardware, services, talent, data, methods, and tools. Do you have the skills and the discipline to evaluate and predict how the landscape will evolve—not only in the market but, more importantly, for your company, for your customers, and for your business partners? Make sure you are getting what you need in order to provide what the business wants from IT. And be ready to reevaluate in light of market shifts, M&A events, or leadership transitions.

Sources: [1] Computer Economics, *IT spending and staffing benchmarks 2013/2014*, chapter 1, http://www.computereconomics.com/page.cfm?name=it%20spending%20and%20staffing%20study, accessed January 3, 2014. [2] CIO Magazine, *2013 state of the CIO survey*, January 2, 2013, http://www.cio.com/slideshow/detail/79671, accessed January 3, 2014. [3] Deloitte MCS Limited, *The Deloitte CIO Survey 2013. Reconnect. Rebuild. Reimagine. Redeliver.*, 2013. [4] VersionOne, *Seventh annual state of agile development survey*, 2013, http://www.versionone.com/state-of-agile-survey-results, accessed January 3, 2014.

Hedge. What emerging investments are you making, whether in broad technologies or with specific entities? At what stage are you getting involved? How will you incubate, invest, divest? If you build dependencies on start-ups or niche players, you will need to evaluate not only the technology but the founders and their business models. Build a concession architecture that allows you to port assets to different players or to shutter underperforming investments or partnerships in order to move on to the next opportunity.

Promotion. The brand of IT is maligned in some organizations, with the CIO viewed as the operator of the company's technology assets but not as a strategist or catalyst for innovation.[6] Rethinking the role as a VC gives the CIO a backdrop for the business to elevate the understanding—and appreciation—of his or her function. There's no overnight fix. Understand your current brand permission, then build awareness about IT's mission, effectiveness, and vision. Internally, this is important in order to enhance IT's charter. IT should be a board-level topic—recognized as one of the crown jewels of the company. Externally, it's important to attract talent—and attention. Even some leading VCs have launched PR and marketing efforts.[7] Don't assume that once it's built, they will come.

Talent brokering. The portfolio mindset extends to talent management as well. Talent scarcity is a universal concern, but it has a particular impact on IT. Consider the skills and capabilities that will be needed to deliver on strategic initiatives, as well as those required to maintain existing systems and processes. Where are the gaps? Which capabilities can be grown from existing staff? Which should be acquired? How can top talent be identified, developed, and hoarded—regardless of title or tenure? How can external talent be tapped? Think beyond consultants, agencies, and contractors. Can you leverage the crowd—either transactionally[8] or by finding a way to activate customers and hobbyists?[9] CIOs need doers and thinkers just like VCs, but they also need leaders. Use this age of innovation as a means to launch initiatives to reward (and retain) demonstrated talent with the curiosity and horsepower to help lead growth areas. Demand for talent is outstripping supply in many shops—and expected time to value is shrinking.

Agility. Disruption is a given in technology today, and is extending into many aspects of the business. The balancing act is delicate—driving for more nimble, responsive delivery while maintaining architectural integrity and making solutions built to run.

In this new world, the CIO's role should expand from enabling operations with technical services to building a technology footprint that fuels, and can be responsive to, the executive team's growth and investment strategy. Integration, data, and architecture capabilities should be developed into disciplines, serving as the core pillars of business agility.

Consumer Products Perspective

There has been a recent resurgence of interest by Consumer Product (CP) CIOs on the topic of IT portfolio management strategy. While it certainly helps that most CP business stakeholders are attuned to thinking in terms of brand categories and portfolios of brands, another recent contributing factor has been the emergence of innovative technologies spurring interest from CP business executives in the complex business of IT. CP CIOs may want to adopt some of the nomenclatures, practices, and discipline of venture capitalists. The following are some key tenets that CP CIOs should review and consider adopting:

- **Think in terms of investment portfolios** - CP CIOs and IT professionals should constantly guard against the prevailing mindset within many IT organizations that the value from IT projects and programs is hard to quantify or measure. Extolling the success of the organization in reaping value from the "marketing and branding strategy process," could be one way to encourage IT managers to adopt value measurement and tracking practices.

- **Identify the right portfolio buckets** – it is certainly critical to figure out the right portfolio buckets that would be relevant for the organization. For some, the brand categories might make sense; while for others, geographies may be more important to use within their portfolio strategy. Additionally, using "tiers of portfolios," such as Tier 1 for Brand Categories and Tier 2 for Geographies, can provide a flexible way for IT organizations to group and measure their IT spend.

- **Don't do it alone** – Finding the right business stakeholders and executives, who agree to act as stewards of these different portfolios, will be critical to the success of thinking as VCs. Influential executives, up and coming stars, and geography leaders may be good choices, but think about the portfolio design before finding the right portfolio leaders who can partner with IT.

- **Strengthen and align IT strategic planning processes with these portfolio buckets** – As most portfolios are relevant for at least 3-4 years, it is important that the IT projects and programs within the portfolios are well thought through and aligned to strategic business drivers such as revenue lift, cost reduction, and risk reduction. It is important that during the strategic planning process CP CIOs align the right portfolios with the right IT-enabled efforts.

- **Develop portfolio managers** – A critical element of thinking like venture capitalists for CP CIOs is to attract and retain talent that is attuned to the agile, new way of thinking about IT investment. It takes time and effort to develop good IT portfolio managers who can help CIOs maintain their portfolios in top shape. Making a conscious effort during IT organizational redesign efforts is critical to developing a valuable niche and space for these portfolio managers.

- **Make some noise!** – And certainly make some noise, as successes within the portfolios start to emerge. This can beget more support for this process – a virtuous cycle.

Lessons from the front lines

Growth and change

Cisco's IT organization uses a three-tiered model to drive its mission: Run the business—focusing on efficiency, quality, and optimization of cost performance; grow the business—helping to drive investments that impact business performance; and change the business—transforming how the organization operates and the markets in which it competes. At Cisco, line-of-business CIOs are encouraged to drive more of their investment portfolio towards growth and change. This doesn't mean that total cost of ownership isn't emphasized, but the "better, faster, cheaper" mindset is not just applied to the business of IT—it's just as important to the business of the business. Technology spend is anchored in running or changing the business—which requires not just bilateral commitment, but ongoing education and teaming between IT and the business.

Line-of-business CIOs look at initiatives as vehicles for tech-enabled business growth and see their roles as orchestrators and shapers. At the financial level, this means actively managing a portfolio of assets with an understanding of cost, return, risk, and strategic importance. More than just inventorying and reporting, it means helping to set priorities, translating the potential of disruptive technologies and making them meaningful, and setting up the organization for speed and agility. Traditional waterfall methodologies have given way to agile—fast, iterative deployments where the business is fully engaged. At the technology level, orchestration is about creating a seamless experience across a technology landscape that is growing more diverse and complex, bringing together a mix of on- and off-premises solutions—and making sure employees, customers, and business partners aren't exposed to behind-the-scenes complexity. Integration and architecture have been established as key disciplines fueling immediate investments in sales effectiveness, digital marketing across devices/channels, and the technical backbone behind the Internet of Everything.

Cisco has also started to engage more directly with the venture capital and start-up communities. Corporate CIO Rebecca Jacoby has established a company-wide reference architecture covering business, operational, systems, and technology aspects. Emerging solutions that comply with the reference architecture are actively pursued—often in response to specific problems or opportunities the company is trying to address. Like other IT investments, though, an assessment of the solution is made not just on its ability to change the business, but on the ongoing impact on running the business. Like a venture capitalist, the IT organization measures the portfolio in absolute terms—potential value weighed against total cost of service. Cisco emphasizes measurement of vision, strategy, and execution according to the needs of the business. Because of these approaches, Cisco is prepared to deal with whatever the future brings—acquisitions, product innovation, and investments in adjacent services and solutions.

A view from the Valley[10]

Founded in 1989, Hummer Winblad Venture Partners (HWVP) was the first venture capital fund to invest exclusively in software companies. HWVP has deployed over $1 billion of cumulative capital in software investments starting at the first venture round of over 100 enterprise software companies. As such, HWVP has a singular perspective into not just what it takes to effectively manage an investment portfolio, but also into how Fortune 100 companies are responding to this seminal time in the history of technology. Unlike those who see innovation as a crescendo steadily building over time, HWVP sees a different, bumpier reality—defined by periods of disproportionate change, embodied by today's era of technology disruption.

Historically, large enterprises have encouraged new software vendors to focus on "embracing and extending" in-place software infrastructure. This approach can work if innovation is gradual, but can break down if innovation impacts overall business strategies. We are at a major disruption point where legacy systems likely cannot be extended. The digitization of the customer experience across industries—driven by mobile, social, cloud, and big data—is changing the nature of data itself, as businesses shift their focus from products to customers. Siloed systems aren't equipped to handle behavioral data, sentiment, and largely unstructured context. Digital requires a different horizontal stack.

The need to keep pace with new business and technological realities could be a great backdrop for CIOs to shift focus from cost, compliance, and maintenance to being in the business of "new." CIOs should be a strategy anchor for big companies: a board-level position that doesn't just enable but is a catalyst for growth.

HWVP doesn't have a "VC handbook" that guides its investments. And neither will CIOs. HWVP co-founder Ann Winblad believes we are entering an era where companies should take risks: They should swim in the river of innovation and be prepared to make multiple bets to discover what innovation really means for their company. It could lead to near-term competitive disadvantage—especially as large organizations react to the exploding population of small vendors that are defining tomorrow. Firms that CIOs may not have heard of with a small operating footprint may become essential partners.

Large companies should not wait for new market leaders to emerge. That means performing your own market analysis and increasing the value of existing partners and alliances—asking them to broker introductions or co-invest in early prototyping. Instead of asking small players to go through qualifying paces, create low-cost, low-risk prototypes and pilots to experiment with their technologies to solve business problems. Many CIOs of large companies use start-ups to enable lines of businesses—and help jointly own the investment in tomorrow.

HWVP is in the business of identifying—and sometimes provoking—patterns. It's the "venture" part of venture capital. With the customer as the business's new cerebral cortex and growth moving at the speed of digital, CIOs should act more like VCs. Not every bet will be a winner, but by keeping a portfolio of investments, moving ahead of tested (and sometimes stale) market trends, and keeping a mindset towards engagement, big companies can be poised to compete in these unprecedentedly exciting times.

My take

Charles Weston, SVP and chief information officer (retired), Bloomin' Brands

There are multiple drivers for why CIOs need to think like a venture capitalist. The first is the incredible pace of technological change. CIOs need to place bets—like VCs do—that a given product or service is going to hit the market at the right time and fill a niche that others don't. It's often no longer acceptable to use one vendor for all your technology needs. Second, given all the information now accessible to everyone, it's hard to gain a competitive advantage. VCs try to create a competitive advantage by investing in companies to make a profit— and CIOs try to create a competitive advantage by investing in services and capabilities to reap the benefits before competitors can. And third, to avoid trailing your competitors, CIOs need to take risks. VCs take balanced risks, conducting market research, and being thoughtful about selection and the company's fit with the team. Taking risks is the hardest part for CIOs; we've all seen the damage failed projects can do to the IT department's reputation. But taking risks means accepting not just the potential, but the inevitability of failure. In my judgment, if you're too afraid of that, your company will likely always trail your competitors. The key is to work with the rest of the C-suite to recognize that some level of risk is part of the ground rules. And if you're going to fail, fail fast— cutting your losses and moving on to the next bet.

In addition to my role as CIO of Bloomin' Brands, I also serve on the CIO advisory board for Sierra Ventures, a venture capital firm. Having that exposure into a VC firm has influenced my behavior as a CIO. When I first joined Bloomin' Brands, one of my priorities was to focus on where the market was going to be three years out and find something that would allow us to get out in front. At that time, we weren't yet a

cloud organization, but I knew we eventually would be, and invested in a cloud-based integration product. Some in my IT organization were nervous at the time, knowing the integration would be challenging, but we knew it would also be challenging for our competitors—and we were able to be an early adopter and gain the advantage.

I have also adapted my approach to vendor and talent management. The current landscape changes how you deal with vendors. You're working with both large, established companies and the new set of entrants, many of whom are entrepreneurs who sometimes have never done an enterprise contract before. On the talent side, we increasingly hire for agility. We look for people who can be nimble and move at the same pace as the business. We recruit those who learn based on principle rather than by rote syntax and command so they can more easily move from one product to another.

As much as there are similarities between VCs and today's CIOs, there are also some tenets of venture capitalism that don't necessarily make sense for a CIO to adopt. The first is the size of your investment portfolio. While the VC can have 15–25 investments at once, the CIO may be able to balance only a handful. The second is the breadth of the portfolio. The VC can afford to go after multiple spaces, but the CIO's lens is rightfully constrained by the company's industry and the needs of the business. There may be some interesting capabilities you need to turn down because they just aren't the right fit.

To start on the path of CIO-as-venture-capitalist, try to open your mind to becoming more of a risk taker and to look at technology solutions that are less established. Work through your own risk profile—with the rest of your C-suite—and determine how much risk you are willing to take on. Then, align yourself with folks who can help you start to venture into this space and take advantage of some of the early-stage solutions.

Where do you start?

MASTERING VC capabilities may challenge many CIOs whose traditional role has been to meet business demands for reliable, cost-efficient technologies. And even if the capabilities could materialize overnight, earning the credibility that is required to become active participants in strategic leadership conversations will likely be a gradual process for many CIOs.

To complicate matters, new technology shifts—especially those powered by analytics, mobile, social, cloud, and cyber—intensify talent shortages and process constraints. These gaps make creating a balanced portfolio across traditional and emerging IT services even more difficult. As business users bypass IT to adopt cloud-based point solutions, organizational technology footprints are becoming more and more complex. Visibility into, and control of, the portfolio becomes harder to attain. CIOs have an imperative to get ahead of the curve.

This is especially true in M&A, where change is constantly disruptive. Many industries are rife with potential investments and divestitures. But few organizations can acquire, sell, or divest with surgical precision without reinventing the wheel with each transaction. Seventy percent of mergers and acquisitions fail to meet their expectations. The value from mergers, acquisitions, and divestitures is more directly linked to getting IT right than anything else.[11]

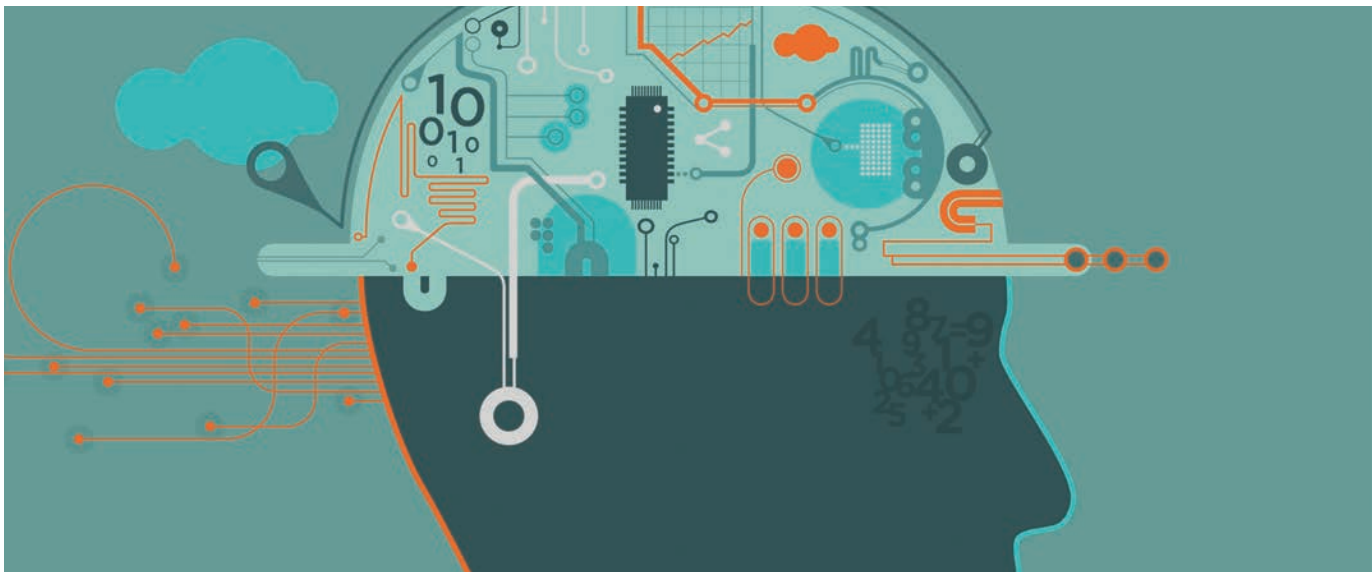
Transformation takes time, but small first steps can make a difference:

- **Inventory the technology portfolio.** What technologies does your organization deploy today? Focus on the full range, including solutions procured outside of IT. What projects are in play? What vendors do you depend on? What assets are in use, and where are they located? How does each asset contribute to the business mission, and what is its useful remaining life? It's not enough to rationalize your assets. Create a model to describe the categories of assets and investments, and use that to guide priorities. Many organizations use Gartner's Pace-Layered Application Strategy, breaking down their IT landscape into systems of record, systems of differentiation, and systems of innovation. Inventorying and classification is just an enabling step, though. What matters is how you use the visibility to direct focus and capital, balancing across the categories in a way that enables (and amplifies) your business strategy. Budgeting cycles typically run like *Shark Tank*—with funds allocated by the business based on its priorities.

- **Evaluate the portfolio.** Define the risk, value, and strategic importance of each portfolio item. Identify where costs/risks outweigh value. Pinpoint potential trouble spots, such as contracts with unclear service-level agreements or data ownership provisions. Understand each vendor's viability—not just in terms of capital and capacity, but also how well the vendor's roadmap aligns with your company's vision. Look for portfolio clusters: Is the proportion of investments in maintenance and upkeep appropriate when compared with investments in new strategic opportunities? Are there gaps that could hold the organization back? Strive for balance between extending legacy systems and investments in innovation. Aim for transparency, letting your business counterparts appreciate the exhaustive demand curve as well as the thinking that defines priorities.

- **Double down on winners.** And fold the losers. VCs expect some assets to underperform, and they are willing to cut their losses. CIOs should encourage intelligent risk-taking within the organization. Failure due to poor execution is unacceptable, but setbacks resulting from exploring innovative ideas are inevitable for organizations that want to compete in a high-growth environment. Borrow from the VC playbook—intentionally being conservative in initial funding to inspire creativity and creating more natural checkpoints. In either case, be prepared to recommend that the organization pull the plug when a project isn't delivering.

- **Direct line of sight to revenue.** Come up with an approach to vet technologies and their companies to better identify and evaluate winners and losers. Share your accomplishments and goals in terms that the business understands. Openly discuss the state of the projects and assets in which the business has invested. While few CIOs today have the sole power to initiate or withdraw substantial investments, many should develop the ability to evaluate the portfolio objectively. The first few wins can become the centerpiece of your campaign for change.



Bottom line

At first blush, comparisons between CIOs and venture capitalists may seem like a stretch. For example, CIOs can't shoot from the hip on risky investments. They provide critical services that the business simply can't do without, where the risk of getting it wrong could be catastrophic. At the same time, there's a lot to learn from the portfolio mindset that VCs bring to their work: balancing investments in legacy systems, innovation, and even bleeding-edge technologies; understanding—and communicating—business value; and aligning talent with the business mission. Venture capitalists operate in a high-stakes environment where extraordinary value creation and inevitable losses can coexist inside a portfolio of calculated investments. So do CIOs.

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Endnotes

1. Deloitte Consulting LLP, *Tech Trends 2014: Inspiring disruption*, 2014, chapter 3.
2. Deloitte Consulting LLP, *Tech Trends 2013: Elements of postdigital*, 2013, chapter 2.
3. Deloitte Consulting LLP, *Tech Trends 2013: Elements of postdigital*, 2013, chapter 6.
4. Deloitte Consulting LLP, *Tech Trends 2013: Elements of postdigital*, 2013, chapter 9.
5. Deloitte Consulting LLP, *Tech Trends 2013: Elements of postdigital*, 2013, chapter 10.
6. CIO Journal by Wall Street Journal, "The four faces of the CIO," October 28, 2013, http://deloitte.wsj.com/cio/2013/10/28/the-four-faces-of-the-cio/, accessed December 19, 2013.
7. Nicole Perlroth, "Venture capital firms, once discreet, learn the promotional game," *New York Times*, July 22, 2012, http://www.nytimes.com/2012/07/23/business/venture-capital-firms-once-discreet-learn-the-promotional-game.html?pagewanted=all&_r=1&, accessed December 19, 2013.
8. Deloitte Consulting LLP, *Tech Trends 2014: Inspiring disruption*, 2014, chapter 3.
9. Deloitte Consulting LLP, *Tech Trends 2014: Inspiring disruption*, 2014, chapter 7.
10. Ann Winblad (co-founder of Hummer Winblad Venture Partners), discussion with the author, January 9, 2014.
11. Janice M. Roehl-Anderson, *M&A Information Technology Best Practices* (New Jersey: Wiley, 2013).

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Disruptors

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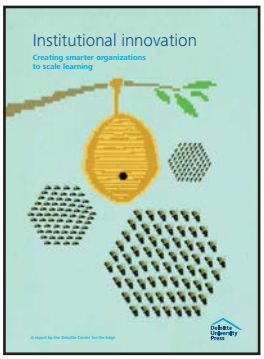

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