

Redefining Connections

Insights from the Global C-suite Study – The CIO perspective

This report draws on input from the 5,247 C-suite executives (CxOs) who participated in our latest C-suite Study – the eighteenth in the ongoing series of CxO studies conducted by the IBM Institute for Business Value. We now have data from more than 28,000 interviews stretching back to 2003.

Here, we focus on the perspectives of Chief Information Officers (CIOs).

Total number of CIOs interviewed	1,805
North America	150
Central and South America	296
Western Europe	478
Central and Eastern Europe	110
Middle East and Africa	293
Asia Pacific	298
Japan	180

In the midst of mayhem

Technological advances are transforming the way we connect, disrupting the status quo and creating huge turbulence. Industries are converging, and new opportunities and threats are emerging, as never before. So how are CIOs managing their way through the mayhem?

In the first installment of our latest C-suite Study, we interviewed 5,247 top executives to find out what they think the future holds and how they're positioning their organizations to prosper in the "age of disruption." This report delves more deeply into the views of the 1,805 CIOs who contributed to our research – and what the IT gurus of the most successful enterprises do differently.

We identified a small group of organizations that have both a strong reputation as leading innovators and a superb financial track record. The Torchbearers, as we call them, comprise 4 percent of all enterprises represented by our CIO respondents. We also identified a group of organizations that lag behind the rest. Market Followers have a much lower market profile in the opinion of the CIOs who speak for them, and almost all are far less financially successful. They account for 35 percent of our sample.

Comparing the two groups reveals pronounced variations in the way Torchbearer CIOs and Market Follower CIOs behave.¹ Torchbearer CIOs are creating intelligent, agile cultures; wising up to the needs of customers; and rewiring the way their organizations reason.

“New business models are disrupting the industry. Is that a business problem or a technology problem?”

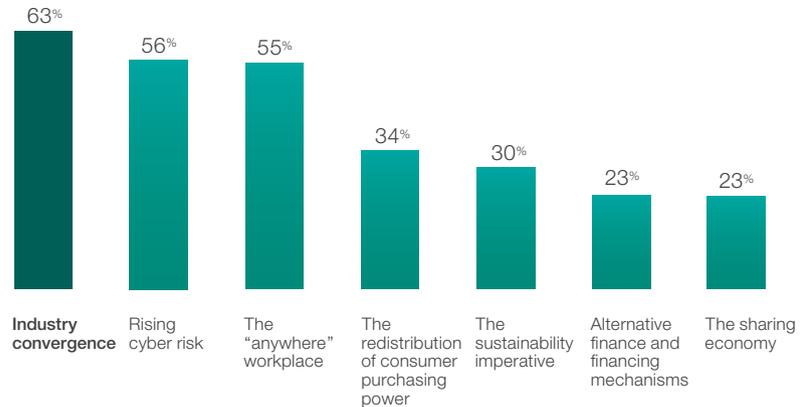
CIO, Banking and Financial Markets, Singapore

Disruptive trends, dangerous times

CIOs everywhere realize the barriers between formerly distinct industries are collapsing, as companies in one sector apply their expertise to others – producing new hybrids and erasing traditional industry classifications in the process. They believe this is the single biggest trend transforming the business arena (see Figure 1). Torchbearer CIOs are particularly attuned to the shift: a full 79 percent expect industry convergence to have a huge impact on their enterprises, compared with just 62 percent of Market Follower CIOs.

Figure 1

Blurring boundaries: CIOs believe industry convergence is the biggest trend on the horizon



But CIOs – like other CxOs – see industry convergence as a double-edged sword. On the upside, it's creating completely new opportunities for growth by shifting the focus from standalone products and services to cross-sector experiences that meld the digital and physical realms. On the downside, it's exacerbating competition, because rival enterprises can threaten an organization's core business as they expand into adjacent spaces.

CIOs are increasingly aware of the danger. Fifty percent are steeling themselves for an influx of new entrants from other industries, up from 42 percent in 2013. "These competitors – and they're not all online social apps – will destroy the conventional way of thinking," the CIO of a Japanese telecom provider commented.

CIOs also concur with most of their C-suite colleagues on the root cause of the forces reshaping the business landscape: 77 percent point to the disruptive influence of new technologies. But they're surprisingly short-term in their outlook. They believe mobile solutions, cloud computing and the Internet of Things will have the most significant effect on their organizations over the next three to five years, even though these technologies have been available for a while.

"New competitors from other sectors are usually small, so it's difficult to recognize them in time."

Valerio Cortese, CIO, Finiper, Italy

“The next wave will be all about connecting dots and correlating data to produce actionable insights.”

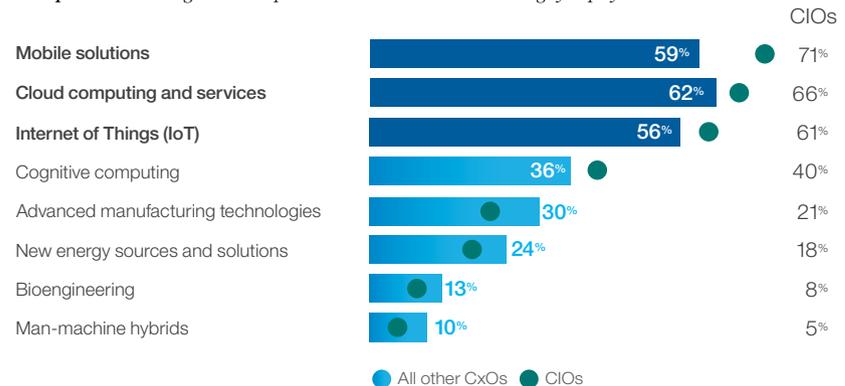
CIO, Retail, United States

That said, CIOs place more weight on all three technologies than other CxOs (see Figure 2). They think mobile solutions will prove especially important in the future. “Mobile will have a major impact on our business because it’s pervasive, and it’s how the younger generation primarily chooses to engage,” the CIO of a U.S. insurer explained.

Many CIOs think cognitive computing – a new class of systems inspired by the way the human brain processes information, draws conclusions and codifies experience – could revolutionize business, too. But relatively few CIOs are placing their bets on advanced manufacturing systems, alternative energy solutions or other such developments, possibly because these are technologies that usually reside outside the IT function’s domain.

Figure 2

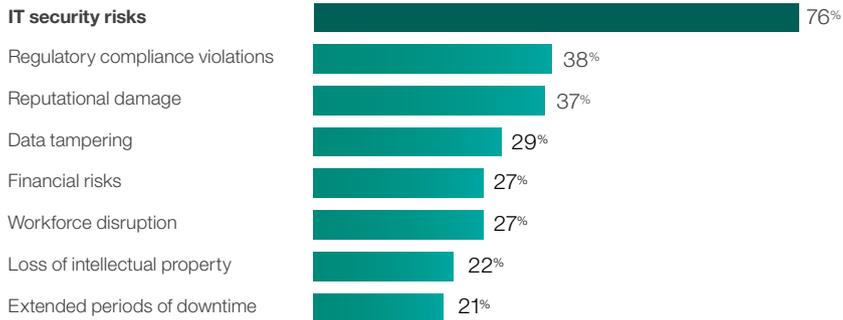
Tech spec: The technologies CIOs expect to revolutionize business are largely in play



No matter which technologies they're focusing on, though, CIOs worry greatly about IT security (see Figure 3). By contrast, only 67 percent of other CxOs are anxious on this score, and CIOs are clearly frustrated by those who don't appreciate the danger. "I want to get people in the business to understand the real ramifications and focus on security," the CIO of a U.S. energy producer said.

Figure 3

Red alert: IT security is by far and away the biggest risk in the opinion of CIOs



“Creating a well-constructed and well-managed IT environment is like ‘circling the wagons.’”

CIO, Banking and Financial Markets, United States

“We need insight or foresight, but today’s dashboards only provide hindsight.”

CIO, Government and Public Services, Canada

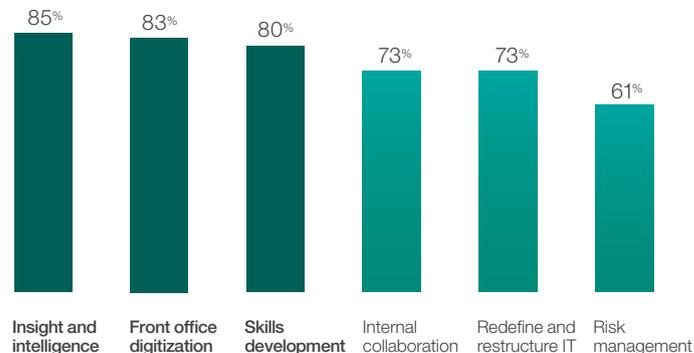
What to do: Forge an intelligent, agile enterprise to deliver at scale

So how are CIOs preparing for a world of converging industries, intensifying competition and hyper-speed innovation? They’re certainly not ignoring risk management. Nevertheless, they have a number of more immediate priorities. They’re focusing on three goals, in particular: enhancing their organizations’ intelligence and insight, digitizing the front office and strengthening the IT department’s skills (see Figure 4).

These are all logical – and related – objectives. Creating the differentiated experiences customers demand entails listening to their input and incorporating it into new products and services. Helping the marketing and sales functions to make sense of what customers say and to form closer relationships with those customers involves providing the right analytical, digital and social tools. And building an IT function that fosters innovation requires a combination of deep technical expertise and business intelligence.

Figure 4

Triple play: CIOs have three key strategic priorities for transforming their organizations



What's disconcerting is the fact that only 57 percent of all CIOs are reassessing their strategic direction in light of the advances they expect. Many of the infrastructure decisions the IT department makes are no longer purely technological; they're core components of an organization's business strategy – essential elements in the scramble for market advantage.²

Torchbearer CIOs understand this: 71 percent are considering the strategic implications of new technologies. They know they still have to keep the lights on, as economically as possible. But they're also looking for opportunities to create a competitive lead and boost the bottom line. "We're spending less time cutting costs and more time stimulating innovation," the CIO of a Japanese insurer explained.

Torchbearer CIOs also place far more emphasis on building an agile culture – one that supports rapid experimentation and prototyping – to help their organizations reach the market first with new offerings (see Figure 5). Breaking a large development task into a series of smaller, iterative steps and setting up self-directed teams to tackle them enables an enterprise to innovate much more quickly. The most proactive CIOs also regularly rotate their staff to give them experience as project managers and business analysts, thus erasing the barriers between software developers and line managers, and reducing bureaucracy within the organization.

"I want to include a discussion about technology in every strategic decision. How can it be a disruptor that destabilizes the status-quo thinking?"

CIO, Government and Public Services, Canada

Figure 5

Nimble working: Torchbearer CIOs are far more intent on supporting agile innovation

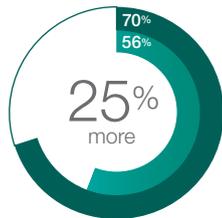


“We’ve been charged with speeding up time-to-market, both for the products we sell and for our own internal tools. We need to operate more like a start-up.”

Kalev Reiljan, CTO, TeliaSonera, Finland

Figure 6

Joint cause: Torchbearer CIOs are more aware of the need to form partnerships to exploit new technologies



Reassessing partnerships

● Torchbearer CIOs ● Market Follower CIOs

The biggest advantage of this approach is its power to drive innovation at scale. No business can remain relevant by making “tweaks.” The only way to stay ahead of disruptive change is to embrace it, which means being able to develop and release new products and services within weeks or even days.

In addition, Torchbearer CIOs are more aware of the need to form partnerships to exploit the full potential of technological improvements (see Figure 6). They recognize that few enterprises can singlehandedly provide the full array of products, services and experiences customers want. But what organizations can’t do alone, they *can* do together. Collectively, they can innovate more rapidly and extend both their reach and range, without assuming the entire burden of risk themselves.³

This has major consequences for CIOs, since the success of their enterprises now hinges on being able to connect with other entities as much as it does on possessing a strong suite of in-house IT capabilities. The members of an ecosystem may use different operating platforms, all of which must be integrated. The kinds and amount of data they share must be clearly stipulated, with rigorous controls put in place to ensure the confidentiality of key data. And much of the demand on the infrastructure will originate from sources outside an organization’s firewalls. Assessing and managing the needs of many hundreds or thousands of external users can be very challenging indeed.

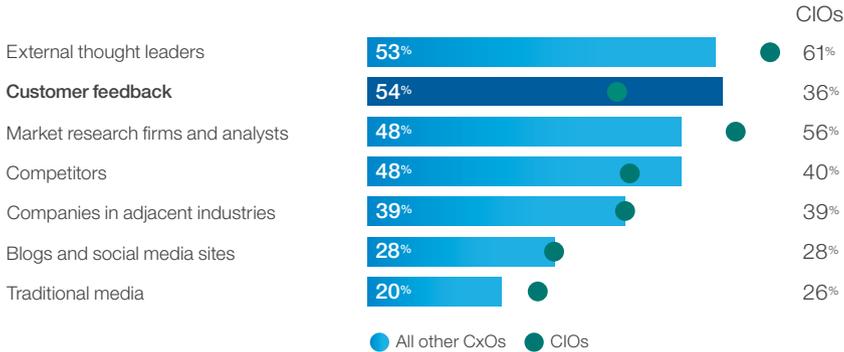
How to do it: Wise up to what customers want

Yet even though CIOs claim they're focusing on acquiring deeper insights, many of them are still ignoring one vital source of intelligence: the external customer. When they're trying to identify and explore new trends, they put their faith primarily in thought leaders and market research firms. Customers are further down the list (see Figure 7).

Torchbearer CIOs take a very different stance. Nearly half turn to external customers for pointers on the "next wave," compared with only a third of Market Follower CIOs. Torchbearer CIOs are also much more likely to be involved in reassessing the customer segments their organizations target, as emerging technologies make it possible to engage with new customers in new ways (see Figure 8).

Figure 7

Blind spot: Many CIOs still pay little heed to feedback from external customers

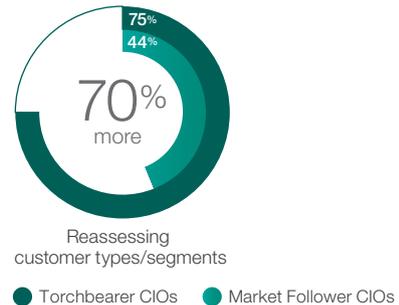


“We’ve been asked to focus more on the front end: on using CRM and analytics to produce data that can be used to drive smarter selling, not just the ‘sales report for March.’”

CIO, Electronics, Denmark

Figure 8

Top target: Torchbearer CIOs are more likely to be involved in identifying new customer segments



“We’ll generate value by tuning our portfolio, creating niche segments and customizing our products.”

David Gámez, CIO, Honda Mexico

Figure 9

Customer conduit: Torchbearer CIOs are investing more effort in exploring new delivery channels



Similarly, Torchbearer CIOs are actively helping their organizations explore new delivery channels, as technological advances provide the tools to engage with customers more individually and contextually (see Figure 9). Various companies are going mobile. Zalora, a Singapore-based online fashion retailer with operations across Southeast Asia, is a good example. In 2013, all its revenues came from consumers using desktop computers. This year, it estimates that about 50 percent of its revenues will come from mobile commerce.⁴

Other organizations – a number of government agencies among them – are digitizing analog services. The Estonian government leads the way, with the most comprehensive digital citizenship program to date. Estonia’s residents can vote, file their income tax returns, sign legally binding contracts, register a new business, apply for child benefits and even check their medical records – on the road or sitting comfortably at home.⁵

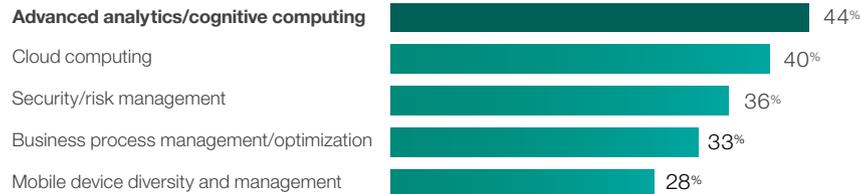
However, establishing a new delivery channel has major IT implications. The entire infrastructure must be coordinated to provide a seamless customer experience, which means synchronizing everything – including marketing and sales, suppliers and logistics providers – to get the right product or service to the right customer at the right time. Security is another paramount consideration; an organization now has to worry about the security processes of its suppliers in addition to its own.

What you need to do it: Rewire your tools and talent

Securing the technologies to analyze data effectively – and the people with the skills to implement those technologies – is pivotal to the success of most enterprises, as CIOs recognize. More than two-fifths of respondents plan to invest in advanced analytics, including established techniques like predictive analytics and new techniques like cognitive computing (see Figure 10). These represent fundamentally different ways of going about the same task.

Figure 10

Crunch time: CIOs are planning to invest in advanced analytics to leverage the next wave



“We’re uncertain of what the future will bring... Do we have the right tools and skills to be able to keep up in another three or four years?”

Frank De Saer, CIO, Eandis, Belgium

“We’re supporting the shift from intuitive decision-making to fact-based management using analytics.”

Pedro Praxedes, CIO, Farmácias Pague Menos, Brazil

Most analytical systems are explicitly programmed and deterministic. They can only solve problems they’ve been designed to solve, and they can only provide yes/no answers. Cognitive systems, by contrast, learn from their interactions with humans and from their experiences with their environments. They are probabilistic: capable of generating hypotheses and reasoned arguments about complex bodies of data. And they can make sense of the 80 percent of the world’s data that’s unstructured.⁶ So while cognitive computing is a subset of advanced analytics, the relationship is like that of a jet engine to an old Ford Model T.

The second area in which CIOs intend to invest is cloud computing. But nearly half are still in the planning stages or haven’t even begun, despite the fact that this technology has been around for a decade. Some CIOs, it seems, may be fighting a rearguard action to defend their dwindling empires, as other members of the C-suite – especially Chief Marketing Officers (CMOs) – turn to external cloud providers to meet their needs.

The right technologies are essential; they’re not sufficient, though. The vast majority of CIOs know they’ll also have to beef up their talent. Indeed, other research by the IBM Institute for Business Value suggests 40 percent of enterprises don’t have enough data architects and engineers.⁷ More than four-fifths of respondents aim to make up the shortfall by working with contractors, consulting firms or specialist agencies. Three-quarters also want to hire new employees or partner with other enterprises to tap additional skills.

Again, however, Torchbearer CIOs are ahead of the pack. They're nearly twice as likely to be using analytics to generate business insights (see Figure 11). The healthcare sector has made particular progress in this respect. Take CaféWell Concierge, a health app that leverages cognitive computing to analyze people's health profiles from a variety of sources and provide personalized recommendations for staying healthy.⁸

Torchbearer CIOs are also putting more effort into developing the skills that will be needed to support the IT function of the future (see Figure 12). And these won't just be technical capabilities. Operating as part of an ecosystem requires people who can manage relationships as well as systems. Similarly, engaging in rapid, relevant innovation requires IT specialists who possess business acumen and can communicate effectively with less technically minded colleagues. The CIOs of the most successful enterprises "get" how business is evolving – and how the demands on the IT department are altering accordingly.

Figure 11

Model performers: Torchbearer CIOs are almost twice as likely to be using analytics to produce new insights

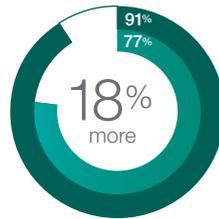


Providing business insights

● Torchbearer CIOs ● Market Follower CIOs

Figure 12

Smart push: Torchbearer CIOs invest more effort in developing the IT skills required for the future



Focus on transforming people skills

● Torchbearer CIOs ● Market Follower CIOs

“One of our goals is to create a ‘digitally savvy’ workforce.”

CIO, Energy and Utilities, United Kingdom

Seize the torch

CIOs know they need to prepare for a future in which disruption is pervasive: a future in which technological advances are blurring the distinctions between different industries and new competitors are emerging from left field. So how can they generate the insights their organizations will require to thrive in this tumult? The Torchbearer CIOs in our study provide lessons from which CIOs everywhere can profit.

What to do: Foster knowing, nimble innovation

Focus on disruptive innovation. Build an agile culture where rapid experimentation, informed by reliable intelligence, is the norm. Split big projects into smaller, more manageable chunks, allocate specific tasks to different teams and give them the freedom to get on with the job. Evaluate their progress regularly to foster accountability and share what works. Create a crowdsourcing platform to access new ideas and concentrate on helping the CMO release new products and services as fast as possible.

How to do it: Capture – and capitalize on – customer insight

Pay close attention to what your external customers say. They can help you identify new trends, pinpoint problems with a product or service, clarify what differentiates your offering and establish what really matters to them, not just what you think they value. Bear in mind the strengths and weaknesses of different feedback channels. Online surveys only provide

answers to the questions you actually ask, for example, whereas social media provides spontaneous input. Share customer and market data with the other members of your ecosystem. Liaise with the CMO to find out how customers are reacting and why.

What you need to do it: Ramp up your organization's analytical power and talent

Invest in technologies that will help you decipher the data you collect, and ramp up your organization's analytical power. Identify the sorts of skills you'll need to perform tomorrow's jobs, not just the talent you need today. Recruit for the future and collaborate with organizations that possess relevant expertise. Rotate existing employees every few months to help them develop an innovative, entrepreneurial spirit, strong business sense and the ability to communicate complex technological issues clearly.

For more information

To learn more about this IBM Institute for Business Value study, please contact us at iibv@us.ibm.com. Follow @IBMIBV on Twitter and for a full catalog of our research or to subscribe to our monthly newsletter, visit: ibm.com/iibv

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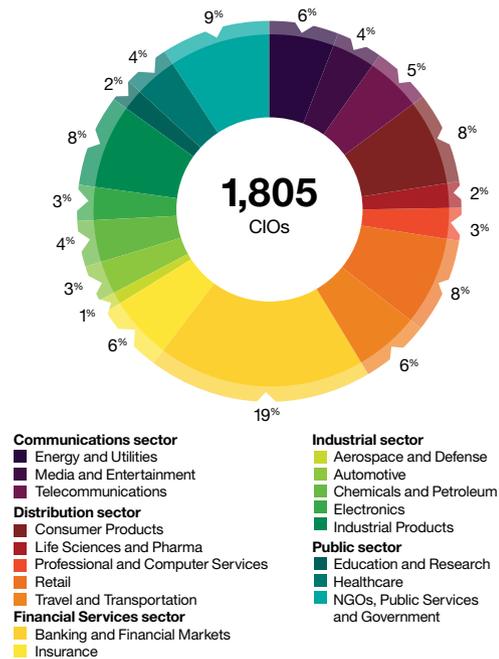
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IBM Institute for Business Value

The IBM Institute for Business Value, part of IBM Global Business Services, develops fact-based strategic insights for senior business executives around critical public and private sector issues.

Figure 13

Sector spread: We spoke with CIOs from 18 industries



How we conducted our research

In 2015, we surveyed 5,247 business leaders in more than 70 countries for our latest Global C-suite Study, the eighteenth IBM study to focus on the C-suite. This report explores the responses of the 1,805 CIOs who participated in our research (see Figure 13).

We used a two-dimensional rake weighting process to correct for oversampling issues arising from differences in the number of respondents in a given role or region. Our research also included an analysis of the traits that distinguish the most successful enterprises. We asked each CIO to rank his or her organization's position in the industry in which it operates on two dimensions: market perception of its innovativeness; and financial performance over the past three years, measured in terms of revenue growth and profitability (or budget growth and efficiency for enterprises in the public sector). We cross-validated the responses to our second criterion by comparing them with two objective financial measures – compound annual growth in revenue and profit before taxes between 2009 and 2014.

You can find “Redefining Boundaries,” the first installment of our latest Global C-suite Study, at ibm.com/csuitestudy, or via the IBV tablet apps on iOS and Android.

Notes and sources

- 1 For ease of reading, we have referred to CIOs in enterprises that are Torchbearers as Torchbearer CIOs, and to CIOs in enterprises that are Market Followers as Market Follower CIOs.
- 2 Brown, Doug, Justin Chua, Nate Dyer, Eric Lesser and Jacqueline Woods. "New technology, new mindset: Strategic IT infrastructure to compete in the digital economy." IBM Institute for Business Value. September 2015. <http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=XB&infotype=PM&htmlfid=GBE03698USEN&attachment=GBE03698USEN.PDF>
- 3 Davidson, Steven, Martin Harmer and Anthony Marshall. "The new age of ecosystems: Redefining partnering in an ecosystem environment: Healthcare ecosystem edition." IBM Institute for Business Value. July 2014. http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=XB&infotype=PM&appname=GBSE_GB_TI_USEN&htmlfid=GBE03657USEN&attachment=GBE03657USEN.PDF
- 4 "Asia's digital disruption: How technology is driving consumer engagement in the world's most exciting markets." *The Economist*. August 2015. http://ftp01.economist.com.hk/ECN_papers/digitalAsia
- 5 Shabbir, Nabeelah. "Estonia offers e-residency to foreigners." *The Guardian*. December 26, 2014. <http://www.theguardian.com/world/2014/dec/26/estonia-offers-e-residency-to-world-what-does-it-mean>
- 6 Kelly III, John E. "Computing, cognition and the future of knowing: How humans and machines are forging a new age of understanding." IBM. October 2015. http://www.research.ibm.com/software/IBMRResearch/multimedia/Computing_Cognition_WhitePaper.pdf
- 7 Finch, Glenn, Steven Davidson, Pierre Haren, Jerry Kutz and Rebecca Shockley. "Analytics: The upside of disruption: Reinventing business processes, organizations and industries in the wake of the digital revolution." IBM Institute for Business Value. October 2015. <http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=XB&infotype=PM&htmlfid=GBE03705USEN&attachment=GBE03705USEN.PDF>
- 8 "Welltok Raises \$22 Million in Series C Funding, Including IBM Investment to Fuel Watson-Powered Health App." IBM news release. February 12, 2014. <https://www-03.ibm.com/press/us/en/pressrelease/43189.wss>

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