POINT *of* VIEW
Deeper on Digital

2014

SpencerStuart

contents

"Digital" is garnering a lot of attention lately, and, not surprisingly, most companies say it's a priority to become more digital. Yet, this simple word belies a disparate set of interpretations and assumptions. Some use the term digital narrowly — typically as shorthand for social media or digital marketing — while others are talking about broader business disruption. How digital is defined has important consequences for leaders' ability to evaluate accurately the real opportunities and threats digital presents.

In our view, digital encompasses a breadth of potentially game-changing technologies and platforms, including e-commerce, social media, big data, mobile computing and payments, Internet of things, cyber security, and cloud computing and storage, which have varying implications for different businesses. Depending on the company, digital may represent new marketing opportunities or it may represent a significant business model disruption from growing price and performance transparency, changing customer expectations, new competitors, channel expansion or the opportunity to gain efficiencies from automation. And the pace of change is intense: new business models and ways of doing business are emerging in months and years with immediate market response.

As they consider their strategies for digital, companies must embrace this complexity and ask the right questions: Where will investments have the most impact on the business? What new expertise do we need on the management team and board? How do we attract the digital leaders we need? What elements of our culture are helping or hindering us from becoming a more digital business?

In light of its broad importance to our clients, we have decided to make digital the entire focus of this issue of *Point of View*. Digital transformation is a complex undertaking, requiring a dynamic, collective effort at the executive and board levels, and a culture that is innovative, flexible and willing to learn and adapt. We hope this issue is helpful for your organization's digital journey.

On behalf of all of us at Spencer Stuart, I hope you enjoy this issue of *Point of View* and welcome your comments.

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Digital expertise in the boardroom

Delivering the right impact

As "digital" grows as a business imperative, corporate boards are grappling with how to ensure that the threats and opportunities emerging from a diverse set of digital forces — social networking, mobile, e-commerce and omnichannel retail, data and analytics, and IT virtualization — are adequately reflected in and woven into the overall business strategy. For the past several years, many boards have concluded that an important way to prepare themselves for the kinds of decisions they will need to make is to have a director with experience in digital around the board table. As a result, demand for so-called digital directors has accelerated.

Yet, as many boards have discovered, simply recruiting a digital expert does not necessarily solve digital for the business. Hastily made additions to a board can result in frustrations on both sides: a disillusioned director unhappy with the pace of change and what they view as a lack of urgency around digital transformation, and a board and executive team concerned about a director's overreaching on issues more appropriately left to management or not having the full governance tool kit to contribute holistically as a director.

So, what makes a good match? What conditions are necessary for effectively recruiting and getting the most valuable contributions from a digital expert? Do all boards even need a digital expert? Drawing on the lessons learned from the past several years of digital director appointments as well as conversations with nearly a dozen CEOs, chairmen and directors, we explore the value of digital expertise on the board and the considerations for recruiting and effectively engaging directors with these specialized skills.

An advocate for digital in and out of the boardroom

A digitally savvy director can make a significant contribution to the board and the company's digital initiatives — in and out of the boardroom. Outside of the boardroom, a digital expert can be a unique partner to the executive team, serving alternatively as a sounding board, a translator and, potentially, a coach. Digital directors may be asked to take on additional projects for the CEO, such as advising on acquisition targets or critical new hires, and frequently make introductions to cutting-edge digital and technology companies.

"As a Silicon Valley tech entrepreneur who serves as a 'digital director,' one of the areas of value I can provide is serving as a bridge to connect traditional enterprises with the culture of innovation that abounds here," said Clara Shih, CEO of Hearsay Social and non-executive director of Starbucks Corporation. "A large part of my role is to expose senior management and my fellow board members to the radical new ideas and emerging business models to see what might make sense for our various businesses."

In the boardroom, executives with the appropriate digital expertise can demystify digital, help management and the board clarify the specific digital forces impacting the business and provide insight into the ways customer behavior is changing and other important trends — all of which can advance the broader board's understanding of the issues at play for the business. As a result, the executive team can spend less time educating the board and more time in strategic discussions.

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"If I were asked how the additional board members have changed the dynamic in the boardroom, I would say it's a much richer, deeper, more advanced conversation today, better decision-making for the shareholders, and greater velocity," said GameStop Corporation CEO Paul Raines. "A challenge for any board is whether it can move with as much velocity as management needs it to move or, on the flip side, whether management is moving with as much velocity as the board is. Those two things can get out of alignment. In our case, we're thinking three moves out because we've got a board member who has been there and helps educate the other board members."

Because they typically have hands-on experience in an area of digital and are still active executives, directors with these profiles also can bring an operational lens to discussions about digital, particularly in relation to capital investments, cultural change and the relevancy of existing technology systems to M&A. While boards may have traditionally been more hands off on such operational issues, today they are seen as critical to the success of digital transformation.

"When we talk about digital, we're not just talking about websites, mobile sites or data, what we're actually talking about are the tools and mindset and culture that digital brings, and that's the transformation piece," observed Rebecca Miskin, digital strategy director for Hearst Magazines UK and a non-executive director of Centaur Media. Pascal Cagni, former vice president and EMEA general manager for Apple who serves on the boards of Vivendi and Kingfisher, agreed that many boards make the mistake of assuming the company is digital once it has a digital director or digital strategy, underestimating the cultural aspects of digital. "Digital needs to become part of the DNA."

Capital spending is an area where the experience of digital directors can be particularly valuable, especially for boards more accustomed to large capital investments on physical stores or operations than the long-lead technology investments required for digital. "If you're a retailer, for example, you're pretty sensitive to quarterly results and so if you're talking about spending $20 million a year or more on 'digital initiatives' that aren't going to show a material return for several years, that's a pretty tough challenge for the management, directors and shareholders," said Shane Kim, former vice president of strategy and business development for Microsoft's interactive entertainment business and now a GameStop director. "By the same token, if you're not paying attention to that side of the equation and addressing those long-term threats that can completely turn your business upside down, you might find yourself a $5 billion business instead of a $10 billion business in three to five years because it all went digital."

While they often find themselves serving as an advocate for the executive team in the boardroom, digital experts also are in the position to lead the board in more effectively challenging management assumptions and plans, when appropriate. "Companies often talk

about the 'what' versus first asking themselves the question of 'why': Why do we need to go digital versus worrying first about what we need to do. Our role as board members is to make sure the company is tackling the real subject," said Carlo d'Asaro Biondo, vice president of Southern and Eastern Europe, Middle East and Africa for Google, and a non-executive director for Darty and Manutan.

Through their work with the executive team, these directors often have unique insight into the talent gaps and organizational impediments to change, and tend to be more confident than traditional directors asking tough questions about technology investments. When the board lacks this insight, it can be harder to determine the degree of progress the business is making and the readiness of the organization to make necessary changes.

"The fact that we are engaged with the management team and others down the line does mean that we're able to challenge the view of the executive directors with far greater confidence and certainty of our view," observes Patrick Taylor, non-executive chairman of Centaur Media.

Recruiting a digital director for show or to check a box is unlikely to be productive for the board or satisfying for the director. Achieving the benefits from the addition of digital expertise to the board requires thoughtful planning and analysis.

Considerations for the digital director

Corporate board service can provide many personal and professional benefits to executives. Many find that a non-executive director assignment enhances their ability to interact with their own boards, broadens their professional networks, and exposes them to different leadership styles, corporate cultures and business models. But board service can demand a significant time commitment, and the time commitment can be much greater for a director with digital expertise, who may be asked to consult regularly on digital issues with members of the executive team or take on special projects.

Given the demands of a board assignment, prospective directors should make sure that the experience will be valuable by defining their own objectives for a board assignment. "When joining a board, craft a role for yourself that is well-defined and in line with the knowledge and expertise you bring," advised Carlo d'Asaro Biondo. For some, a non-executive directorship may provide a platform for enhancing their personal reputation or their employer's brand in the marketplace. Others may view a board role as an opportunity to add to their network of contacts in a specific industry or geography or to be exposed to a different kind of business.

Being comfortable with the CEO and current board is critical to a satisfying board experience, so directors should conduct due diligence on the board dynamics, the engagement of the board on strategic issues and the interaction between the board and the CEO.

If they are to be seen as respected contributors to the board, new directors also need to understand their role as board members. Seek out governance education if it's not offered and a formal or informal mentor to help clarify the expectations. "One of the lessons that I've learned, thankfully without making too many mistakes, is that as an operator I'm used to things happening really fast. I'm used to being able to go talk to the person who is responsible for something and watch them change it," said Gina Bianchini, founder of Mightybell. "When you're sitting on a board, in nine out of 10 cases the last thing the rest of the board or the CEO really wants is for you to get down into the weeds of the organization and 'help out.'"

The tone and timing of contributions also can affect a digital director's ability to be heard and be effective. "You need to know when you need to raise your voice in the boardroom, when the environment is right," advised Pascal Cagni. If a company is struggling with losses in an important region or is in the midst of a major acquisition, the board may be less able to focus on digital issues. "If you try to align yourself with the business and respect what they have accomplished, touch by touch you will make your points. You can't come in and say everything is all wrong."

Are you ready for a digital director?

Digital is on the agenda of an ever-widening set of companies in one form or another and to a greater or lesser extent, but do all boards need a digital director? Not necessarily, according to many of the directors we spoke with. In some industries, the impact of digital so far is minimal — limited to digital marketing, for example — so, for companies in these industries, board-level expertise may be unnecessary, or perspective can be gained from consultants.

For companies that must undergo a transformation, however, a digital expert on the board may be essential for underscoring the urgency of change and ensuring the board is appropriately involved in digital strategy. Boards may even consider recruiting two directors with a digital profile, which can compound their influence and impact on the digital agenda.

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"If the company is involved in any kind of consumer marketing today and not dealing in this area with considerable skill, it is in danger of not optimizing the company's performance over the long term," argues David Tyler, chairman of J Sainsbury and Hammerson. "If you do not have someone with the right expertise, then the right kind of challenge might not get created at the board level, or worse still, the answer to a major digital initiative may be 'no.' There are a number of markets where the move from off-line to online is very fast. The board's ability to understand these shifts early can make the difference between existence and nonexistence of the business."

Directors caution strongly against overestimating the impact a single director with this expertise can have on the transformation of the business. Digital transformation is a complex undertaking, requiring a dynamic, collective effort at both the board and executive levels.

"It is nowhere near sufficient simply to appoint a director with digital skills," explains Matt Brittin, vice president of Northern and Central Europe for Google and a member of the Sainsbury board. "A board has to understand what digital means for the business and commit to make a range of changes to the business and the organization's skills and the processes. Having somebody on the board with some of those skills is definitely helpful and a sign of commitment, but it's obviously not sufficient by any means."

Defining the capabilities the board needs

The effectiveness of any director depends in large part on the relevance of the expertise he or she is bringing to the board, and this is especially true in the case of digital expertise. There are many different kinds of digital expertise — e-commerce, digital marketing, mobile payments, analytics and data — as well as pure technology experience. Boards that carefully define what digital means for the company, including the specific digital forces that are likely to impact the business over time, will be better positioned to identify the director profile and digital expertise that will be most valuable in the boardroom.

> *When we talk about digital, we're not just talking about websites, mobile sites or data, what we're actually talking about are the tools and mindset and culture that digital brings, and that's the transformation piece.*

"Recruiting experts, no matter how brilliant they are, isn't worth anything if these experts aren't capable of extrapolating what is applicable from their ideas or past experiences to the specific context of the company and board they are serving. Cutting and pasting digital expertise in

my experience doesn't work," said the e-commerce director of a French retailer who serves on the boards of several private companies.

Beyond the relevant digital expertise, a director bringing broad-based business acumen and preferably hands-on commercial experience at a profitable company is likely to be much more effective in the boardroom. A pure technologist, product or strategy expert or chief digital officer may be helpful in pushing the company to leverage social networks or to move quickly into digital content, for example, but may lack the business experience to really translate these initiatives into the broader strategy of the business. Without that perspective, they may lack the weight and influence with other directors, limiting their effectiveness in board-level debates about strategy and capital spending. Furthermore, joining a public company board from a small private or venture-backed company with few requirements about financial reporting or governance can intensify the culture shock.

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Align expectations

Some digital directors relish the opportunity to serve on the audit or remuneration committee and gain new experience. Miskin likens her experience on the Centaur Media board to getting an MBA, where she is learning PLC language, board dynamics, in-depth financial reporting, and risk and liability issues. "I'm a better manager and thinker today than I was before I took on the board role. I've learned so much at meetings and in between meetings in conversations with my fellow non-executive directors," she said. Other digital experts, however, believe serving on the audit or compensation committee is a waste of their time — and less valuable for the board, which already has more relevant experts on those committees.

Misaligned expectations on committee assignments, the overall time commitment, the degree of transformation that is needed and supported, and a whole range of other issues can be major sources of tension between the board or management and the digitally savvy director. When recruiting a digital director, carefully define the role the new director is expected to play. Will the director be expected to serve on or chair a standing committee, such as audit? Will the new director have a special function on the board, for example, meeting regularly with members of the executive team engaged in digital activities? Given the individual's knowledge of the business and previous exposure to corporate boards, what coaching or governance education might be beneficial as part of an induction program? Would it be valuable to assign a mentor for the first six months or year?

Boards also can help new digital directors understand their role on the board by being very direct with a candidate upfront about the board culture and expectations for director involvement and behavior.

Pay attention to onboarding

Onboarding can be a formal or informal process, but digital experts say as new directors they benefitted from an induction program that includes meetings with the corporate secretary and key members of the executive team, as well as on-site visits to company locations that give new directors the opportunity to learn much more about the business and current digital initiatives. Directors also say they benefit from formal governance education, which can provide context about activities in the boardroom, committee assignments and relevant governance requirements. New directors also may be encouraged to meet with compensation experts or the external auditor, especially if assigned to one of those committees.

> *"Cutting and pasting digital expertise in my experience doesn't work."*

It is not unusual for digital directors to feel intimidated during their first few meetings and decide to "hang back" from board discussion. The chairman can smooth the transition by taking an active interest in putting the new director at ease and encouraging

participation in board discussion, for example, by specifically asking the new director's opinion on a subject where he or she has significant expertise.

An assigned or informal mentor who is willing to provide perspective on boardroom activities and feedback about the new director's performance also can be extremely helpful. "It is so valuable to have someone to go to where it is safe to ask questions about board dynamics or why something happened in a meeting. Being explicit that it is okay to ask those questions can accelerate the learning curve, which is ultimately the goal," said Gina Bianchini, founder of Mightybell and a director of Scripps Networks Interactive.

Find ways to tap director's expertise outside the boardroom

Directors with digital expertise want to be impactful and tend to be eager to engage with the business at a deeper level. When they have opportunities to dig deeper — through special projects for the CEO or regular meetings with digital leaders in the business, for example — digital directors are more likely to feel they are making a difference for the business and find the opportunity more rewarding. For a business undergoing a transformation, leveraging a director's expertise and connections can produce real benefits when interactions are well-planned and meaningful.

As the interface between the board and the company, the CEO should manage interactions between the digital director and members of the broader management team to ensure that they are worthwhile for the company and the director. "We look for opportunities to engage the board on select missions that are well-defined and tightly scoped, but where the board member can really have an impact," said Raines.

Boards have an important role to play in ensuring that the management team is examining the threats and opportunities digital presents and devoting appropriate resources to digital initiatives. In embracing this role, many boards have concluded that they need to add digital expertise to the boardroom. Boards who successfully recruit a digitally savvy director and get the most from their contributions will carefully define what digital means for the business and the specific capabilities the board needs. A true digital transformation requires a sustained commitment by the board and executive team to address the talent, process and system changes needed for change.

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Designing the organization for digital

Why you may be asking the wrong questions

Digital is everywhere, it seems, threatening traditional ways of operating and presenting new business opportunities for those able to seize them. With so much at stake, companies are feeling the pressure to determine how digital fits into their business model and the right way to organize to leverage the possibilities. All too often, however, discussions about digital devolve into overly simplistic debates about whether to hire a chief digital officer, recruit a digitally savvy director or create a separate digital team. In our view, many executives are debating the wrong questions, and we see three main reasons for this:

- When people from different parts of the business talk about "digital," they are referring to a disparate set of forces — the growth of e-commerce, the influence of social media, the promise of big data, the proliferation of mobile devices, the new reality of cyber security, the potential of cloud computing and storage — each of which has different implications for the business. Lack of a shared vocabulary among the key players in an organization is often an obstacle to finding solutions and defining a strategy: If half of the senior team thinks of digital as social media, and the other half thinks of digital as mobile or big data, it will be difficult to find agreement on priorities and plans.

  Organizations often are discussing digital without identifying which specific digital technologies or platforms are affecting their businesses and industries — and how. For some, the impact of digital may be focused narrowly, for example, on digital marketing. For others, the digital forces impacting the company may represent a significant business model disruption. Meanwhile, for other businesses, digital may represent a tremendous opportunity to gain efficiencies and cost savings from the automation of formerly manual processes. Most companies will face opportunities and threats from multiple digital platforms and in a variety of ways.

When implementing digital plans, companies often overlook the importance of a broad range of other issues that impact the success of digital initiatives, such as the organization's current degree of technology sophistication, cultural dynamics, the speed and transparency of decision-making and the availability of talent.

The consequence of a simplistic approach to "solving digital" is that the organizational and talent decisions made in the absence of a clear, guiding framework will influence the direction of a digital strategy, which may not align with the real threats or opportunities facing the business. Companies that will be successful in an increasingly digital world will invest time upfront and in a regular, frequent cycle to define what digital means for them in their market and for their assets. From this analysis, a clear digital strategy and strategic priorities can be developed, which may potentially spark the need for new advisers, partners, board members, executives and organizational approaches.

Defining a digital agenda

The strategic, leadership, cultural and organizational decisions a business must make related to digital require a sound understanding of the digital forces that are buffeting the business and the specific effects they are having. These could include price and performance transparency, changing customer expectations, new competitive threats from market-disrupting or emerging global competitors, channel expansion or the threat of disintermediation. To avoid missing important opportunities, business leaders should evaluate the impact of digital from the following lenses:

- **Business:** The threats and opportunities at the core, such as changing demand for existing products or services and the opportunity to innovate new products and services

- **Channel:** The potential impact on marketing, sales and service channels, such as the opportunity to use data to deepen customer relationships or the threat of increased price transparency

- **Organization:** The implications for the speed of decision-making, risk assessment, automation, security and collaboration, for example, using analytic tools to drive process improvements or to automate certain operational decisions

- **Ecosystem:** The potential to integrate customers and partners into the organization, for example, engaging customers through social media to share ideas for new products or product enhancements

We frequently see organizations focus the digital conversation mostly on channel questions, when the real opportunity may be bringing products to market faster or introducing a new operating model enabled by digital technologies. Does the growth of mobile devices, for example, represent a new tool for customer acquisition or more efficient customer service or a threat to the very way the company does business? In many cases, a specific digital technology or platform is likely to impact the business in multiple ways.

Data and analytics, for example, will have broad implications for most businesses. Certainly, the use of analytic tools is transforming the practice of marketing and customer acquisition, as digital platforms allow businesses to know much more about their customers and move marketers closer to a time when they can provide personalized offers and experiences in real time. As one media executive explained, "One of the things we will be doing differently than in the past is to engage with the people formerly known as 'the audience.' This means we will be much more cognizant of who you are and what your relationship is with us throughout the day and the week and as you move from one digital device to another. We know who you are. We will know what your usage patterns are and then we will start to tailor our services around you and bring you the best of what we have available across TV, radio and online. That means we can be much more user-centric."

But data and analytics have the potential to affect every part of the business. One consumer products company executive told us that his organization will incorporate new and external sources of data, such as weather data, into supply chain and order planning systems to improve forecasting in a notoriously fragmented retail market. Cable television companies, meanwhile, are monitoring the stream of data from cable set-top boxes about customers' use — what they watch, search for and download — to inform marketing decisions and to alert them about service outages. Similarly, the so-called Internet of things — which leverages mobile connectivity, Internet-connected devices, analytics and software to enable remote monitoring, automation and control — is expected to generate business-altering applications for a wide range of activities. For example, cable and phone operators are selling services allowing customers to unlock

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doors and control temperature settings from a smart phone; and the healthcare industry is abuzz with the possibilities of new services that will allow doctors to monitor patients' vital signs or adherence to a medication plan remotely so that potential problems can be flagged before they lead to expensive trips to the hospital.

Mobile is another digital platform with the potential for broad impact. As customers increasingly connect with businesses using mobile devices, companies must reorient their sales and customer service organizations for these channels. Already, more than half of same-day hotel reservations and 30 percent of all hotel reservations on one travel site are made via mobile smart phone or tablet, compared to just 5 percent two years ago. At the same time, this has changed the ability of guests to book en route and use novel platforms such as TripAdvisor and Airbnb to influence their choices. Other mobile technologies, including mobile payments, may be even more transformative. Retailers and others are preparing for a future when more financial transactions are completed via the phone; technology systems will recognize customers as they walk in the door, allow customers to scan an item by themselves and walk out of the store with the merchandise — without ever opening a purse or wallet.

The marketing uses of social media are well-documented, but many companies are beginning to adopt social media applications for internal communications, such as private social networks like Yammer, to improve collaboration and engagement. For other companies, media businesses, in particular, the growth of YouTube and other video-sharing sites have created a new ecosystem of people who are interested in creating their own content and sharing it with their community, creating both new competitors for viewers' time and new opportunities for engaging.

By defining which of these forces are affecting the business and the ways in which they are — whether it is marketing, customer service, productivity and efficiency improvements or the very business model itself — business leaders will be able to develop a comprehensive digital strategy that supports the core strategic drivers of the business, positioning the organization to identify and prioritize new business opportunities and build the teams to respond.

When e-commerce was really small, you almost had to separate it from the rest of the business so it didn't get swallowed up and you could really focus on getting things right for e-commerce.

Evaluating organizational needs

A solid digital strategy is just part of the equation. Businesses must take into account a wide range of other considerations when evaluating the right organizational approach, among these: the urgency for change; the technical and digital sophistication of the organization; the current level of investment in technology and tools; the knowledge base and capabilities that are available for digital efforts; the readiness of business processes and systems to support digital; and the facets of the culture that are likely to hinder or support change or the ability to attract and retain top talent.

Ultimately, the way companies organize for digital should be viewed as a function of the strategy and the analysis of these issues. Some organizations will choose to establish separate digital units to jump-start an initiative. In order to quickly develop a capability in analytics, for example, some companies are building dedicated analytics teams in a completely separate location where the expertise can be found. Other companies will create "virtual business units" that draw in cross-functional resources and provide both structure

Designing the organization for digital: The questions you should be asking

How is digital affecting the business?

? What are the different digital forces affecting my organization?
? In what ways are they likely to affect the business and how we do what we do?
? Is my business vulnerable to new competitors or an erosion of revenues and profits from new customer behavior?
? Do my customers want to engage with the business in different ways than in the past?

Do we have the right strategy?

? Do we have the analysis we need to shape strategy?
? What's the level of urgency? What's the time frame we're working in?
? Does the degree of urgency and required transformation suggest a need for a board director with experience in certain facet of digital or in business transformation?
? Which functions are most impacted by business model shifts?
? Do existing functions and business units have a game plan for the digital impact we have identified?

Do we have the right resources?

? Are the people in key leadership roles prepared and able to develop strategy and make the necessary operational changes?
? Are we able to shift the focus of existing people, investments and agendas, or do we need new capabilities, higher levels of investment?
? Based on the nature of the changes and the urgency, to what extent can we make the necessary changes with internal resources (versus external resources, such as management consultant)? Do we have the expertise to identify the strategic and operational changes that need to be made?
? Do we know how to assess for the capabilities we need?
? Do we know how to find the talent we need?
? What leadership development and training do we need?
? If digital capability is dispersed, does it have the depth and resources to be effective? Do they work across functions and business units to share best practices and ideas?

What are our legacy challenges?

? Are our business processes and systems getting in the way of the changes we need to make?
? What facets of our culture need to be evolved?
? Are information, functional or business silos likely to be hurdles as we strive to become more digital?
? Do we have an incentive structure that promotes collaboration?
? Are our information processes and systems compatible with each other and the technologies enabling digital?
? Do we have a culture, benefits, etc. to attract and retain top talent?

and creative freedom to pursue digital opportunities. The BBC iPlayer, for example, was developed by establishing a special project team segregated from the rest of the organization, which effectively became a cross-functional virtual company within the larger organization with access to the necessary resources and the freedom to explore game-changing delivery models. A centralized digital team also may enable an organization to attract and retain more experienced leaders and ensure a coordinated and strategic approach to digital initiatives.

By contrast, when digital needs to be part of everyday business operations or when it has matured sufficiently, companies are more likely to integrate digital capabilities into existing functions and business units. To succeed in a multichannel environment where it has to deliver both print and online content, the *Financial Times*' FT.com decided fairly early on to build teams combining people with traditional print and digital skills. By establishing cross-functional teams, FT.com set out to tackle the critical cultural challenge of integrating "digital natives" with people who worked in established media businesses their entire careers, with the goal of creating a collaborative environment.

And as consumer demand for a seamless omnichannel experience has grown, many retailers that originally established separate e-commerce units with distinct leadership and resources are now reconsidering whether to integrate digital into the overall business. "When e-commerce was really small, you almost had to separate it from the rest of the business so it didn't get swallowed up and you could really focus on getting things right for e-commerce. That meant it was essentially a separate silo that eventually built its own functional groups," observed the North American e-commerce leader of a luxury retailer. "E-commerce has become so big and influential in driving the company's performance, it now makes sense, particularly for the consumer, to integrate it into a more seamless shopping experience." Such integration has encouraged the broader use of digital marketing techniques to drive customers

to the stores, experimentation with geo-targeting and SMS messaging for store events, and the creation of apps for in-store associates to place orders for online inventory in stores.

But, there are risks of integrating digital, especially if it spreads digital expertise too thinly across the organization or knowledge isn't shared across teams. One U.S.-based drug store company recently brought together the digital experts formerly housed in individual business units and consolidated them into single enterprise digital team. "Each business unit essentially had an underdeveloped digital capability. They weren't sharing best practices, and they were creating very different experiences for the consumer depending on the business unit," said the executive. By bringing the team together under a new leader, the company has been able to quickly leverage good ideas from different parts of the business.

For many companies, organizing around digital is initially less about whether or not to establish a separate digital business unit or even whether to add specific digital capabilities than about building a culture that thinks and behaves differently — one that is flexible enough to take advantage of the digital forces that matter to the business over time. As a global consumer products company executive explained, "We could spend a lot of time chasing the latest shiny object and miss something much more fundamental, and that is the need to develop a set of behaviors that makes digital part of our culture. The number-one priority around digital technology is actually being digital — moving quickly, adapting and integrating; innovating; becoming competent with the collection and analysis of data — making digital part of the culture." Organizations can begin to shift the culture by seeding teams with digital evangelists who can model and teach these attributes or by encouraging senior leaders to participate in "boot camps" that help them understand digital trends and the impact on the business. The most successful digital enterprises embed disruptive ideation into regular business planning.

Finally, it is important to recognize that this process of reviewing the digital forces that are meaningful for the business, refining the strategy and evaluating the organizational challenges is an ongoing process. Organizational approaches cannot be static, and must evolve as strategic priorities change. "Every organizational structure is temporary because we have to constantly match our organization against what we believe tomorrow's opportunity will be, and tomorrow's opportunity changes as we learn," argued one consumer products company CMO.

Too many companies assume that once they hire a chief digital officer, add a digitally savvy director to the board or set up a digital team, they are prepared to tackle digital. In fact, the desire for easy answers amid so much complexity is understandable, especially for companies that are behind the curve. As one executive told us, "These things go through phases. The first phase is, "Oh my gosh, digital is big, and the board is asking about digital, I better do a big buy on Google or sign a partnership with YouTube.' Then you realize it's a tactic looking for a strategy. You then take a step back and say, 'How is digital going to impact my business?'" We encourage businesses to resist the temptation to act first and then reflect on this question.

There is no one single right answer for how to organize for digital: The right approach will be highly specific to a business' industry, which digital platforms it is prioritizing and its digital strategy and readiness for change. Organizational structure is determined by the broader commercial strategy and business model, competition, objectives for digital investment, nature of the product or service being offered, the intended market, physical footprint of the business, dominance of other channels, and how advanced the current digital effort and capabilities are. By making leadership and talent decisions within this complete context, companies are more likely to unlock their full potential in a digital world.

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Works well with others
The digital imperative that's not technology-related

Even in recent years, a singular focus on function was well-entrenched at many organizations, with functional leaders fighting to protect their individual budgets and competing for resources. That worked well for many companies, as each function was able to deliver results with its hard-won share of the pie. Meanwhile, technology was a force for change, but its impact and integration with other functions was limited, primarily as an enabler of individual functions to move ahead on their own insular tracks.

Fast forward a few years and collaboration within organizations looks very different, driven by the rise of digital — big data and analytics, mobile, e-commerce, digital marketing and social media — that requires functions and business units to work together as never before to plan and execute programs and remove barriers to information- and data-sharing.

Perhaps the earliest and most visible example of this new model of collaboration is the relationship between the chief marketing officer and the chief information officer. As digital has expanded and technology has become more advanced and integral to an organization's success, the CIO has become a true partner to the CMO, and today many CMOs and CIOs work hand in hand on everything from strategy to budgeting, as their missions — and their mutual success — have become increasingly intertwined. Yet, the impact of digital extends beyond marketing and technology, and success in digital initiatives over time will require the engagement of leaders and teams across the organization.

The unifying force behind digital transformation is not ever-evolving technology — it's the customer. Digital has quickly been woven into the fabric of daily life and there is an insatiable demand for faster, easier, better. Customers want seamless, immediate

and effortless experiences across all channels and devices. Paradoxically, providing this level of ease for the customer requires significant coordination on the back end. Digital at its core not only enables enhanced connectivity between customer and company, but also requires robust connectivity between functions within an organization, and not just marketing and IT. Data, expertise and contributions from across the organization — customer insight, innovation, product development, logistics, financial investment, customer relationship management — will be critical to truly maximizing the strategic power of digital.

This opportunity will require that functional leaders work differently than their predecessors and collaborate in ways they never may have before. For instance, without data about customer purchase history, predictive analysis about consumer behavior and the appropriate IT infrastructure in place, customers will not get the most integrated, robust digital experience on their mobile devices, and companies may miss out on opportunities to boost sales. Companies win competitive advantage today when they provide the best customer experience and continuous innovation, impossible feats without collaboration across an organization's functions.

Nevertheless, barriers to collaboration remain: cultural resistance, turf battles, narrow function-focused mindsets, past perceptions of other departments, lingering bad habits, and the lack of CEO support for collaboration or incentives for achieving shared goals. Also, surprising to some leaders and counterintuitive in a fast-paced technological age, cross-functional collaboration around digital can be significantly more time-consuming than a more singular approach because it requires that multiple parties — not just a few key members within the same function — meet, discuss and agree upon a course of action. However, as collaboration becomes more engrained across functions, organizations will be better able to mobilize resources quickly in response to the speed of new developments.

Despite myriad obstacles to collaboration, some senior executives have already taken steps to overcome them for the greater good. Senior leaders today share how they have navigated challenges and are successfully fostering better collaboration across the functions of their organizations in the name of digital.

The power of collaboration around digital

United Airlines recognizes the immense opportunity digital presents for both its customer experience and its bottom line, and knows the only way to stay ahead is by bringing its different functions together. More than 12 million people use United.com and United's other digital channels every week, which already generate more than $10 billion in annual revenue. The airline's top-rated mobile app, which boasts more than 7 million users, is a textbook example of successful cross-functional collaboration. While the mobile app is the responsibility of the e-commerce group, its development and successful use are the direct results of ongoing collaboration among multiple functions: IT development and infrastructure enabling the app's operation; customer data flowing to and from the app; revenue systems for fares and inventory availability; flight updates from operations; loyalty program status and account information from MileagePlus; and much more. "A main consequence of digital is that it requires much more integration and collaboration between conventionally separate business functions," said Thomas O'Toole, senior vice president of marketing and loyalty, and president of MileagePlus for United Airlines. "Collaboration is no longer an aspirational, nice-to-have quality; it is required."

With the dramatic and real-time nature of change today, organizations need farther-reaching and deeper collaboration among their functions in order to respond — not just to succeed, but simply to survive. The rapid shift from print to digital for Dex One, a marketing services provider and publisher of phone directories, was a do-or-die one to ensure the continuity of the business, and it quickly changed the relationships of the company's functions and strengthened others.

"Product management and the engineering functions developed a new set of relationships because of the transition from print to digital," said Atish Banerjea, former chief technology officer of Dex One and current executive vice president and global CIO of NBCUniversal. "Before, product management was figuring out what type of double truck ads would go into the Yellow Pages book and suddenly, they became the product team that was required to develop new digital products. Marketing and sales became very close partners to IT and that relationship was used to transform the products we were building from print to digital." This collaboration also seeped into the sales force, which evolved from a team carrying hard copies of the *Yellow Pages* in satchels into sleek professionals with iPads showcasing the new digital products and services.

The key to success will be collaborating upfront about the goals for digital initiatives. Facebook CMO Gary Briggs acknowledges that while big data presents enormous potential to understand customers at unprecedented levels and to target marketing activities with

astonishing precision, many companies lack a clear direction about what specific conclusions they are trying to draw and what course of action to take.

"You have to start at the outset and ask, 'What question are we trying to answer and what pieces of information are needed to answer that question?'" Briggs said. "For example, when you advertise on Facebook, you can look at the behavior changes of users. My concern about a lot of the big push on big data is that the people who are talking about it are not very clear about what it is they're trying to answer and what outcomes are going to change based upon that amount of information." These big questions about big data cannot be answered by one function alone. CIOs and their teams must be able to explain what is possible with big data and colleagues from other functions must help decide collectively what information is the most relevant and what shared results they hope to achieve.

How to build better collaboration around digital

In order to realize strategic objectives around digital, leaders throughout an organization must all consider themselves chief collaboration officers. Collaboration can be instilled across functions in a variety of ways, from developing shared enterprise goals to evolving individual mindsets about collaboration.

> My concern about a lot of the big push on big data is that the people who are talking about it are not very clear about what it is they're trying to answer and what outcomes are going to change based upon that amount of information.

Develop a collaborative mindset and shared focus on the customer: Improving the organization's ability to collaborate can begin with one or two functional leaders embracing a new mindset — that digital is a long-term priority whose success hinges upon challenging oneself to work with others in new ways — and can then spread across functions. "Good collaboration for me goes beyond having a cordial relationship," said Alexis Nasard, CMO and president of Western Europe for Heineken. "You can have a respectful, friendly, cordial relationship without having collaboration. Collaboration is the step where you cross your comfort zone and go out of your way to understand your counterparts' needs."

Collaboration between functions can be uncomfortable when turf lines have been clearly drawn in the past. Breaking down established barriers or entrenched practices can necessitate what one executive calls "painful tradeoffs." For example, marketing groups at some companies established specialized technology teams over time within the function in response to digital. Today, however, as digital capabilities are increasingly a business-wide need, some marketing leaders are finding they have to relinquish control of some of their digital platforms to IT. When functional leaders trust that their shared agenda will be supported as technology continues to advance, they are less likely to struggle with handing off control of resources.

"From a CIO standpoint, the old way of thinking was, 'What's my budget? How do I protect my budget? What's the next upgrade in X, Y, Z?' Those kinds of things don't have to be No. 1 on your list," said Matt Carey, executive vice president and CIO of Home Depot. "It has to be how to help enable some capability that my business needs that will give us a competitive advantage. A lot of our projects before were what I call domain-area projects. When we talk about interconnected retail, these things are very complex with multiple business heads. You'll have the supply chain person, an operations person and a merchandising person all in the operating group of a project to get it completed. A lot of our projects have gone from independent work to a very matrixed, cross-functional approach."

Cross-functional collaboration is made vastly easier when leaders share the same focus: the customer. For retailers and consumer goods companies in particular, creating a seamless omnichannel experience for the customer has become a priority. In order to create a holistic approach to the customer, it must be mirrored in the internal organization. Each function brings its own specialized

knowledge and data that, when combined, can culminate into a more unified digital customer experience. Marketing, finance, product development and other functions all need to be well-versed in the language of digital, from page views to the ROI of a mobile app, so that everyone has a common vocabulary when talking about the impact on the customer and the business.

Building digital capabilities across the organization also creates a competitive advantage, and companies such as Unilever are bolstering their in-house teams in order to protect it. "The relationship with the customer is core and, today, that relationship is based in digital," said Marc Mathieu, senior vice president of marketing for Unilever. "You don't want to outsource it to an external agency because it's such a core competency. You want to be the one communicating with the customer directly in whichever channels they use."

Beyond the focus on the consumer, the truly collaborative leader prioritizes the company, not his or her individual function. "It's important to focus on the success of the company rather than just on your own personal stake in the game. The people who have the best interests of the overall business at heart excel in collaboration and are better for business," noted Banerjea. "The ability and desire to collaborate across functions is one of the most critical characteristics that I look for when I hire people on my team. The people who are just focused on their own domains tend to hinder the spirit of collaboration that is critical for organizations to succeed in today's digital world."

Set the tone for collaboration and accountability from the top: Every leader we spoke with pointed to the CEO as the primary driver of collaboration in an organization. Typically, the CEO must take the first step in breaking down cross-functional barriers, beginning with difficult conversations with shareholders and the board about the greater investment needed for digital — sometimes at the expense of other legacy priorities — and mandating collaboration among functional leaders in order to maximize the return on that investment.

You can have a respectful, friendly, cordial relationship without having collaboration. Collaboration is the step where you cross your comfort zone and go out of your way to understand your counterparts' needs.

Following the example of United Chairman, CEO and President Jeff Smisek, O'Toole has adopted an approach to collaboration he calls "proactive transparency." He has found that sharing information and gathering input from colleagues in areas such as revenue management and IT creates the phenomenon of collaborative reciprocity. "I try to engage not because we have to," said O'Toole, who previously served as both CMO and CIO for Global Hyatt Corporation (now Hyatt Hotels Corporation.) "I invite other functions' participation and try to be totally open about what we're doing, and people pick up on that. They appreciate it and it creates mutual engagement. Most importantly, I have an extremely low tolerance for functions being parochial. I don't think that we can indulge in functional parochialism in today's business environment."

Yet a spirit of collaboration from an organization's top leadership is not enough — it has to be tied to accountability. Some leaders use key performance indicators around digital, such as mobile readership, customer satisfaction and conversion rates, in order to measure and articulate the success of certain initiatives, thus reinforcing the collaborative behavior behind positive results or exposing collaborative roadblocks behind negative ones. At Home Depot, functional leaders have weekly meetings to discuss progress on the CEO's imperatives. Tying compensation to shared goals across functions and even to promotion opportunities has also proven effective. O'Toole says that at United, collaboration is an implicit criterion for advancement. "The people who are becoming officers are excellent collaborators," he said. "You need to demonstrate and practice the culture. And culture here is largely synonymous with collaboration."

Unilever has also committed to a "boundary-less" approach to digital — tearing down both philosophical and literal divisions — that is continually reinforced by positive results. "We have a vice president of IT who is on the marketing leadership team and that relationship has grown over time not only because so much more of marketing today is digital, but also because the entire IT function does what they do so well," said Mathieu. "The IT team sits on the same floor as marketing, so technology is embedded in everything we do. Any time we go to the Consumer Electronics Show or to Silicon Valley, someone from the CIO's group goes with us."

Use digital technology tools yourself: Digital is a dominating force in business and life; thus, all functional leaders and their teams need a common understanding about digital and their roles in achieving shared business objectives around it. Everyone in the organization — not just the IT team — needs to "own" digital and become an active user of mobile, social media and other technologies. Individuals and functional teams can educate themselves by experimenting with new ideas and regularly joining another department's meetings to share learnings and insights.

Most importantly, I have an extremely low tolerance for functions being parochial. I don't think that we can indulge in functional parochialism in today's business environment.

Beyond creating connections among its users and clients, Facebook uses its own product to connect its people internally. "It's a very open culture," said Briggs. "We use the Facebook product heavily: Lots of groups, lots of very open sharing of information and opinion, which then leads to collaboration. I remember that Sheryl [Sandberg] was interviewed recently and the joke was, 'Do you get in trouble for using Facebook at Facebook?' And the answer is, 'Absolutely not,' because we use it pretty heavily to collaborate."

Being an active user of digital technology helps various functional leaders understand the perspective of the end customers and can help spark ideas for further innovation. "Companies that seem to really get it right are largely users of these services themselves," Briggs observed. "You have to be a user of the product to understand the creative ways to get your message across and to drive change in your organization. So if you're not curious about the user and how the user is actually interacting with these products and that isn't driving you to use the products yourself, then I think it becomes very hard for you to create a course of action."

None of today's digital technologies or the ones yet to come would exist without that sense of curiosity, without someone asking, "What if?" The onus is now on every leader, from marketing to supply chain, to ask that same question about the potential of digital for their organizations and customers — and then work together to find the answer.

Digital cannot deliver on its full potential without one very human element: connection. Advances in digital require similar advances in how functional leaders work together. Cross-functional collaboration around digital is vital for producing more integrated experiences for the customer, as well as improved operations and streamlined processes for the organization as a whole. Digital is larger than any single function and its success relies upon CEOs, functional leaders and team members who embrace the fact that collaboration is a part of everyone's job description.

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Lessons from the big data frontier

What HR needs to know about building a more data-savvy organization

Data is fast becoming the currency for success in today's technology-driven world, thanks to an explosion in the availability of data generated from traditional and non-traditional sources, as well as advancements in the tools to collect, store, analyze and draw business insights from that data. The businesses that ultimately will be most successful will be those best able to apply those insights to the most critical business challenges: staking out a distinctive market strategy; improving customer service; developing more relevant products; and recognizing and responding to emerging competitive and market threats.

If "big data" is to live up to its promise, however, companies will have to build new capabilities and cultivate a culture that embraces the use of new analytic tools and sources of data at all levels of the organization:

- Senior management and functional leaders will be expected to encourage the use of data and analytic approaches in decision-making, and to define the opportunities where data can have the biggest impact on the business.

- Data experts — including data scientists and senior data leaders — will be critical for their use of sophisticated analytics tools to distill actionable information from data.

- Employees across the organization will need the skills to interpret and use data and analytics-generated insights in their work.

For human resources leaders charged with driving the talent agenda of the business, the emergence of big data and sophisticated analytics tools raises a variety of questions: What are some of the hard and soft skills the organization needs to develop to support big data initiatives? How can we position our business to attract the data-savvy talent we need? How do we overcome cultural resistance to new processes and ways of decision-making? What sort of training do we need to provide? Is data literacy an explicit prerequisite for hiring or promoting executives now, or should it be?

Improving data literacy in an organization is a journey, one along which a small number of digital and technology-based companies have traveled furthest to date. To help HR leaders whose organizations are confronting these questions today, we turned to human resources leaders from some of the most advanced users of data and analytics — including Akamai, Google, Groupon and Yahoo! — to see how they approach hiring and assessing data-savvy individuals and promoting a data-literate culture.

Improving data literacy

Data literacy is generally defined as a comfort with data and the tools for analyzing data as well as a willingness to rely on evidence and data analysis as the basis for decision-making. At the most advanced data organizations, data literacy is deeply engrained in the culture and is considered a standard capability.

"We don't view data literacy as a discrete skill-set," said Laszlo Bock, senior vice president of people operations for Google. "It's analogous to asking whether you would hire someone who can't write coherently. The presumption is that to be successful in this environment, there has to be a baseline level of analytic capability."

In many companies, the most data-literate talent is likely to be found in the finance and marketing functions, which are using data to understand the performance of the business or marketing programs. As proficiency with data becomes an increasingly important capability for business performance, data fluency will need to spread beyond these traditionally data-rich functions.

"Data literacy is always important in credit and risk and finance. It's important in marketing and consumer insights. But the hallmark of a truly data literate organization is when HR and facilities and other kinds of functions adopt data as the go-to deciding factor," said Marcella Butler, who held HR and operational roles at Google. "That's not to say there is not a role for intuition, but when you start to measure the effectiveness and the return on your HR investments the same way you would a capital investment or marketing campaign, then you really know the organization is living and breathing it. And you start to think differently. Instead of guessing what policy is best, you say, 'Let me survey my employees and find out what they think. Let me do a test. Let me pilot.'"

> Data literacy is always important in credit and risk and finance. It's important in marketing and consumer insights. But the hallmark of a truly data literate organization is when HR and facilities and other kinds of functions adopt data as the go-to deciding factor.

Sandy Gould, senior vice president of talent acquisition for Yahoo!, argues that we are approaching a time when most organizations will expect their people to have some degree of proficiency in analyzing and using data. "We live in an age when information and data have become pervasive, global and integrated into the way we do everything. That means, suddenly, it's a core capability, like using the phone, using a computer, reading," he said.

How can organizations raise their data literacy? We offer six recommendations drawn from the experience of these advanced data organizations.

Create a culture that embraces data. At companies that are the leaders in big data, analytics and scientific methods are engrained in business processes, the culture and the ways decisions are made. There is a willingness to challenge assumptions and trust data and facts, even when they conflict with past practice or intuition.

"We're a very data-oriented culture, so for us data is the common language. You don't go into a meeting at Akamai and say, 'Gee, I'm sensing this,' or 'my intuition tells me this.' It really needs to be backed up by an appropriate set of rigorous constructs that are backed

by data," said James "Jim" Gemmell, the company's chief human resources officer. "But I will say there is a danger of groupthink if companies don't also incorporate that sensing, intuitive side into decision-making. You want balance. You achieve that by pulling in those perspectives early in the process of setting up the construct: Define the set of outcomes you're trying to go after and pull in those perspectives as well."

Companies that are building their analytics capabilities will need to adopt new behaviors and approaches to solving business problems and become comfortable relying on data to drive decisions. The executive team must set the tone. Senior leaders should be passionate advocates for the use of data in decision-making, encourage experimentation and continuous learning as well as tolerance for the mistakes that may be made along the way.

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Appoint an executive champion for change. Another consideration for companies that want to accelerate their adoption of analytics tools and data-driven decision-making is whether they have the right leadership for embedding data and analytics into the business. For many, it may be helpful to have an executive-level leader who can manage a data or analytics center of excellence or competency and can serve as an evangelist for the potential of big data. This executive can help set the big data strategy for the business, identify operational or cultural obstacles to change and be a champion for the change that is required, which includes making sure the organization has the infrastructure to organize, analyze and interpret valuable data.

Define the skills that are required at each level of the organization and incorporate data literacy into assessments. At Akamai Technologies, data literacy is a "baseline foundational expectation" for senior leadership, said Gemmell. Senior leaders do not necessarily have to be "data junkies," he said, but, "By the time you move into a senior leadership level, there is an expectation that you're data literate — that you know how to access data and even do some analysis on your own."

Yahoo! has developed "job guides" that define a set of disciplines that individuals need to master to be successful in each role. "Analytics is key on many of those job guides today and eventually will be key on all," Gould said. "When we measure performance, we look at who uses analytics as a differentiator, who uses it really well and who doesn't, both as individuals and teams."

Advanced data businesses also devote resources to training employees to improve their use of analytic tools and database systems, and incorporate analytics into leadership development programs. "We drive analytics development and rigor as part of our accelerated development programs for emerging talent and high performers as well as our next generation of leaders," Gould said.

> By the time you move into a senior leadership level, there is an expectation that you're data literate — that you know how to access data and even do some analysis on your own.

Screen for data literacy when hiring. Organizations that want to improve their overall data literacy and numeracy must start by consciously hiring executive talent with these competencies, and this may require organizations to adapt their interviewing process to look specifically for these skills. Human resources leaders say they assess for data literacy and an analytic mindset through rich interviews that examine the degree to which individuals' successes have been driven by or aided by analytic techniques. They listen

closely for evidence that candidates have incorporated data and analytics into their work, and then follow up with detailed referencing to determine whether data was a differentiator for them.

"You really have to crawl through the details," said Brian "Skip" Schipper, former senior vice president of human resources for Groupon and now head of HR for Twitter. "You want candidates to walk through how they approached solving a large-scale problem. What steps did they take? What role did they play? What did they personally do? How did they get the insights they got about the problem-set that they were dealing with? How did the issue first manifest itself in the organization? If you don't deconstruct the work, you'll never know if somebody is analytically minded and data-driven in their orientation."

Candidate interviews also should assess individuals' fit with the culture and ability to contribute to the organization's understanding of these techniques. If the goal is to imbue analytic capability throughout the business, new hires must be able to share their expertise and model analytic thinking for others.

Know how to hire and retain specialized talent. The demand for data scientists and senior data leaders, such as a chief data officer, head of analytics or head of marketing analytics, far outpaces the supply today. This specialized talent wants to work at organizations where data is valued, even by the CEO, and where they will have a seat at the table with the leadership team. They want to work where they will be able to be innovative, disruptive and creative.

"They want you to listen to their outputs," said Butler. "These are people who want to be heard. This is not a group of people who you're going to retain by giving them a nicer office and a bigger title. They want us to use what they do because we believe in it."

While many data scientists are drawn to environments where analytics is practiced at a very sophisticated level, others want to make their mark by helping a less advanced business build a big data capability. Companies that want to attract and retain these experts should demonstrate their commitment to the effort. "They should declare in their strategy that analytics is a super power they want to acquire, and they should back that up with something they are going to do or deliver. And there should be a commitment about the level of resources and investment," said Gould.

To improve the quality of their assessment of these candidates, Bock recommends that organizations tap the individuals in the organization who are the most data savvy and train them to interview. "Identify people who are the exemplars of those skill-sets today — whoever is the best analyst or computer scientist, whoever represents a distinctive level of ability in those sets of attributes — and allow them to take some time out of their day jobs to interview. I would argue that's an incredibly valuable investment, because if you're improving the quality of the people you're hiring, you can change the trajectory of your company."

A great way for an organization to put data to work and to have a direct impact on employees is a well-designed employee survey, where you are able to measure success and measure changes year over year.

When establishing a dedicated analytics function, organizations may need to focus their recruiting efforts in locations where the talent pool exists, in Silicon Valley or Seattle, for example. This may mean that the team is physically separate from the rest of the organization. While some may not consider this approach to be ideal, it can better position the company to attract this specialized talent.

Model big data techniques. The HR function can and should be a leader in improving data literacy in the organization, both through talent management initiatives and by becoming a role model in the use of data. The function already has access to a wealth of employee data — resumes, promotion histories, performance histories — that can be drawn on to tease out answers to important questions for the business: Are some managers more effective than others? Are some people progressing more quickly than others? Are high performers working on the biggest business challenges? How does retention compare by manager or by function?

In addition, HR leaders can apply test-and-learn approaches to talent initiatives and generate additional data through tools such as an employee survey.

"A great way for an organization to put data to work and to have a direct impact on employees is a well-designed employee survey, where you are able to measure success and measure changes year over year," said Butler. "When you develop a survey that incorporates management priorities and then go back and measure it the next year, it's a very powerful way to generate credibility and to show that HR added value and is aligned with the organization."

HR leaders also should be willing to use data to challenge assumptions about talent and talent management. "Too often in organizations, people will not challenge assumptions that are made based on anecdotal information. They simply accept it. I've seen HR people start with a leader's assertion that something is true or not true, and then start to do work against that assumption, versus first testing whether that assumption is true and understanding it at a greater level of granularity," said Schipper.

The data that organizations relied on in the past tended to be found in formal reports generated from structured data sets, such as sales transactions and expenses. The emergence of new sources of data and the tools to collect and analyze that data allow for much more fluid and creative approaches to using data. Machine learning, data visualization, predictive analytics and other new approaches to distilling actionable insights from data have the potential to drive enormous benefits for businesses able to leverage them. Human resources leaders can play a critical role in improving their organizations' ability to take advantage of these tools by embracing analytics techniques in the practice of HR and evolving talent management programs to instill data literacy as an institutional capability.

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The Executive Guide

The Internet of Things

What's at stake for business leaders?

Emerging as a broad yet transformational phenomenon, the so-called "Internet of Things" (IoT) is gaining attention from businesses, consumers and even governments as they envision IoT's potential for driving efficiency, unlocking new business opportunities, and providing insights about how and when things work and advanced warning when they don't. Also known as machine-to-machine (M2M) communication, IoT is quietly extending the same types of opportunities — and disruptions — the Internet brought to the analog world.
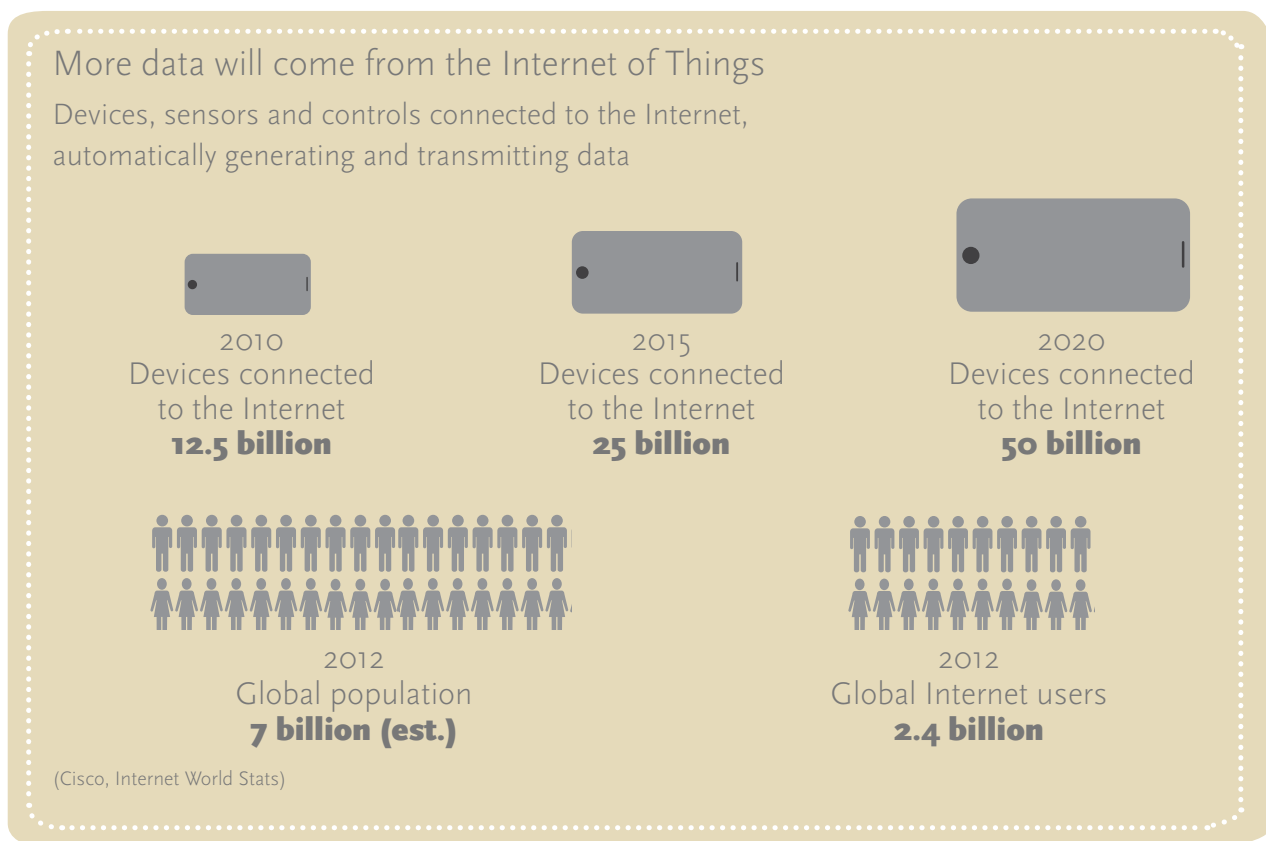
To truly grasp IoT's potential, look around your office and make a mental note of all you see: the desks, the chairs, the lights, the clocks, the vending machine, the refrigerator, the coffee maker, the toaster, the microwave, your watch and your wallet. Then, glance out your window and study what's there: pedestrians, cars, vans, trucks, cabs, trains, subway stations, billboards, traffic lights, satellite dishes, radio antennas, retail stores, restaurants and other businesses. Now consider this: In the IoT world, everything you just saw — and many other things you didn't — may soon have the ability to interact and wirelessly communicate with each other.

At the core of IoT is the staggering proliferation of "smart things," typically former analog devices and objects transformed into digital ones as the result of increasingly smaller and cheaper sensors and chips. Smart things have enabled entirely new ways of capturing and sharing information. This new data — connected to an increasingly pervasive and often wireless network infrastructure and then linked to the power (and cost) of cloud storage and computing — represents IoT's vast potential.

The new data generated through IoT can be analyzed to drive new insights, efficiency and automation, giving life to ideas that were pure science fiction not so long ago. Often described as "the next technology revolution," IoT is poised to dramatically change the way companies do business, how government services and utilities are provided, and how people go about their daily lives.

To capture IoT's benefits, some industries will require large-scale capital investments and massive change programs. Others will see transformation by simply adapting commonplace technology.

What follows is a short primer about the Internet of Things and key questions for leaders.

More data will come from the Internet of Things
Devices, sensors and controls connected to the Internet, automatically generating and transmitting data

2010	2015	2020
Devices connected to the Internet	Devices connected to the Internet	Devices connected to the Internet
12.5 billion	**25 billion**	**50 billion**

2012	2012
Global population	Global Internet users
7 billion (est.)	**2.4 billion**

(Cisco, Internet World Stats)

What are the opportunities for the Internet of Things?

In a word: enormous. Cisco predicts IoT will have an economic impact of over $14 trillion by 2022, GE forecasts IoT will add $15 trillion to the world economy over the next 20 years, and the McKinsey Global Institute believes IoT has the potential to create an economic impact between $2.7 trillion and $6.2 trillion annually by 2025.

Labeling IoT as a "disruptive technology," McKinsey believes its largest economic impacts will occur in the healthcare and manufacturing industries.

More specifically, the firm predicts:

- IoT could have an economic impact of $1.1 trillion to $2.5 trillion per year in healthcare by 2025. For example, by using smart devices that remotely monitor patients with chronic diseases — and eliminating the need for them to come into a healthcare center for a checkup — treatment costs, estimated at $15.5 trillion annually, could be slashed by as much as 20 percent a year.

- The manufacturing industry could realize an economic impact of $0.9 trillion to $2.3 trillion annually by 2025 through IoT, primarily by using low-cost sensors to drive process automation and, as a result, reducing operating costs.

Other industries poised to gain exponentially from IoT include the automotive, agriculture, electric, retail and resource extraction urban infrastructure sectors.

How much of a game-changer is the Internet of Things?

Traditionally, information-sharing and decision-making have been seen as primarily human-to-human endeavors, but as more and more data is collected and automatically shared by devices or from sensors in the world around us, humans do not necessarily need to be part of many decisions.

This fundamental shift in how data is collected, shared and analyzed is a recent phenomenon. Yet, the capabilities associated with IoT have already made a notable, if relatively small, impact on almost every industry. For example:

- When power goes down in a remote community, smart grid technology can alert an electric company and direct its repair crews to the trouble spot just as residents are beginning to notice the blackout.

- Aided by micro-cameras that move along a patient's digestive tract, surgeons can pinpoint the source of a patient's illness and provide treatment that is far less invasive, yet ultimately more effective, than traditional methodology.

- Equipped with facial-recognition technology, billboards are able to assess passersby — a group of teenagers, for example — and instantly change their messages to appeal to specific consumer profiles.

- With satellites delivering up-to-the-minute information on weather conditions, traffic patterns and vehicle locations, logistics managers for trucking companies can make routing decisions that steer drivers away from congestion, increasing fuel efficiency.

- Using networked sensors placed within the frames of their planes, airlines can view continuous, real-time data on aircraft wear and tear — and as result, make proactive and cost-effective decisions about maintenance while decreasing unplanned downtime.

What's driving the growth of IoT?

Several trends are converging to enable these developments. The explosive growth of Internet-connected devices — from smart phones and tablet PCs to lower-cost sensors embedded in everything from cars and refrigerators to industrial machinery — is one. As wireless technology continues to become smaller, cheaper and more sophisticated, it is increasingly possible to consider "waking up" every office, street and traffic light or every vehicle in a country.

Another force propelling IoT development is the growing sophistication and increasing capacity of wireless networks. Rapid advances in basic computing and storage capability and cost are enabling the capture and analysis of large volumes of data at an increasing velocity.

Where are we in the development and adoption of IoT?

Some IoT applications are familiar today. For example, on the way to the office, GPS satellites may have tracked your car's progress and displayed alternative routes on the dashboard monitor in heavy traffic. Or sensors may have automatically paid your toll, allowing you to breeze by collection booths. If you take public transportation, an app on your smart phone might have let you know when the bus or train was about to arrive at your stop.

Internet of Things in practice

Monitoring

Sensors in a car let car insurance company know where a car is driven and how well so insurance pricing can be tied to the risks of that particular customer.

Increased automation

Companies increasingly are able to continually monitor and make real-time decisions about inventory, forklift traffic, pallet configurations, delivery routes.

Early detection

Sensor detects a break down in the power grid: sends a message to the service team and the customer service system, which will alert affected customers.

Remote control

In homes, remote systems allow home owners to turn lights or other electronics off and on, adjust the temperature, unlock doors, arm security systems, view inside and outside the home through cameras remotely.

Meanwhile, cable and phone companies are offering a new set of services for the home, allowing customers to unlock the front door, adjust the temperature and keep an eye on things remotely. And businesses are using similar technologies to track vehicles and products to improve efficiency, and sensors on industrial machines to alert about maintenance needs.

Industry experts agree that things could — and probably will — change quickly as the world becomes increasingly connected. The Cisco Visual Networking Index Services Adoption Forecast predicts that by 2017 nearly half (48 percent) of the world population will have Internet access, and 73 percent of the global population will have mobile access. The number of mobile-only Internet users — increasing at a compound annual growth rate of nearly 22 percent — is growing nearly four times faster than the number of fixed Internet users, growing at 5.9 percent CAGR. By 2020, Ericsson and others predict that there will be 50 billion Internet-connected devices, or more than 6.5 per person, compared with about two per person today.

What are the challenges to broader adoption?

Many technical hurdles, as well as privacy and security issues, must be addressed before IoT can be universally adopted. On the technology front, network technologies must further evolve to the point where "ubiquitous access" is cheap, and moving huge volumes of data quickly between the point of collection and the point of storage and analysis is highly reliable and inexpensive. Relatively "simple" technology such as energy storage in batteries must evolve to be able to provide decades of power to unconnected devices. Standards will have to emerge so that systems and devices will be able to talk to each other. And massive amounts of software and code must be developed to make these applications come to life.

From a business perspective, companies will have to invest in the technology and human resources to identify and execute creative uses of these technologies. Because IoT represents such a broad opportunity, it's hard to identify comprehensive investment trends. In making their investment decisions, most companies will be watching the example of the early adopters to see which applications have resulted in meaningful and lasting value.

Finally, as these devices become increasingly embedded in the home, in businesses and in public services such as water and electricity utilities, security and privacy are enormous considerations. Governments are likely to closely watch the development of these applications, and create new policies and regulations regarding customer privacy and security. The U.S. Federal Trade Commission, for example, recently penalized a company that makes camera systems for home security after a security flaw allowed hackers access to live feeds inside people's homes. As businesses and governments try to keep pace with the advancements in technology, the challenge will be to find a balance that protects consumers but allows for innovation.

What questions should the CEO and boards be asking about their companies' capabilities in this area?

With development of IoT in relative infancy, now is an ideal time for business leaders to consider how they can utilize IoT to improve their businesses and gain a competitive advantage. Questions to raise might include:

- If our company today had ubiquitous and virtually free access to an Internet of Things, what new products services might we be able to offer?

- How might we modify our processes to reduce or eliminate manual data entry or other manual tasks?

- Looking at our analog assets (real estate, machinery, vehicles and other non-digital "things") what business advantages could we gain by enabling them to communicate wirelessly?

- What is the state of our IT infrastructure (both software and network) and our data-analytics foundation in terms of our ability to collect data through IoT?

- To gain the most benefits from IoT, how much of our capital and resources can we expect to invest?

- Which department or division of our business is best suited for a pilot project?

- What long-standing business issues that have vexed us in the past might finally be solved with the way that IoT collects and shares data?

What are the organizational implications of adopting IoT technology and applications?

The agile, multidisciplinary approach to product and business model development that characterizes most digital businesses is rooted in a culture of "test and learn." Learning how to capitalize on the opportunities that IoT will enable should come fairly naturally for these businesses. Although capital-intensive organizations — those most closely related to physical things — are arguably the organizations that could reap the greatest benefits from IoT, they tend to be the least prepared.

One way of discovering the opportunities enabled by IoT can be to think about it as a Kaizen model of "use cases" in which everyone in the organization, from the CEO to front-line employees, are empowered and expected to see opportunity not just for productivity gains but for creating new operating and business approaches based on new data and new ways to work with that data.

While experts may be required for implementation, the use cases should begin with the people most familiar with the business, allowing them to brainstorm the infinite possibilities for business transformation.

More broadly, IoT will likely require new business unit structures to grow new lines of business, new channels to monetize them and new expertise in technology and analytics. For CEOs and management teams, this means recruiting executives from more diverse industry backgrounds to spur innovation in areas less central to the core business, as well as to create and manage the newly imagined businesses.

Authors
Jason Baumgarten (Seattle) and Drew Keith (Milan)

Leading Voices

Looking ahead
Three views on the future of digital

Since the advent of the Internet, the growth of all things digital has had an exponential impact on business and society. Today, the evidence of digital's power to create connections, change lives and drive new business models is all around us. We have become used to things that were unthinkable barely a decade ago. Mobile, social media and big data have each been revolutionary in their own way, but what of the future? What new developments are in the pipeline or at a conceptual stage? What kind of initiatives have the potential to spark further social and economic change? How should leaders be preparing their businesses for future opportunities while protecting them from the next wave of disruption?

We invited three highly respected players in the digital world to consider what further developments we can expect to see in the coming years and suggest how leaders might think about the challenges around the corner.

Dr. Michael Chui
Principal, McKinsey Global Institute

■ Big data, open data

We believe that big data and data analytics are going to be incredibly important, certainly in the short to medium term. It is becoming a basis of competition in every industry. Companies that learn how to use data effectively are going to be more likely to win in the marketplace and those that don't are going to fall behind.

It's challenging because this isn't a capability that you build and then you're forever ahead of your competitors; it really is a run-faster business. Your competitors are always going to be trying to catch up with you or leapfrog in front of you, so you really have to become a learning organization in order to succeed at it.

We recently released a report on open data, which is data that becomes more liquid, shared amongst multiple organizations and consumers.[1] Open data can become an instrument for breaking down information gaps across industries, allowing companies to share benchmarks and spread best practices that raise productivity. Sometimes you have to pay for it and sometimes there are restrictions on its use, but it can give rise to novel, data-driven innovations benefitting both businesses and consumers.

■ The growing impact of mobile

Mobile will continue to be a big deal going forward. We sometimes describe it as increasing diversity of form factors because it's not limited to tablets or phones. Although many billions of mobile devices already exist, more than half the world has not yet been connected to the Internet. That's a huge amount of head room, in addition to all the innovation that will come from people who are already connected. Mobile also has tremendous implications for the enterprise in terms of where and how people do their work.

Mobile has numerous implications for our current business models in terms of improving efficiency and effectiveness. Simple things like being able to optimize where people go and what routes they take can make a big difference if you're managing a sales force or a team of maintenance or installation technicians. We have already seen new business opportunities unlocked by mobile devices; for example, services that allow you to summon a car to your location would not exist without smart phones, location sensors and so on. There is a whole industry developing around mobile advertising enabled by knowing where people are, how close they are to a store, and mobile payments are having an impact as well as creating new lines of business.

Another key concept is the Internet of Things: embedded sensor networks. This will lead to all kinds of new business models, new products and services as well as increasing the efficiency and effectiveness of the things that we already do.

■ How the board should address the digital question

Awareness is the first step. The board needs to learn about digital issues, including data, social, mobile and the Internet of Things. It is important for companies to invest in the capability to monitor potentially disruptive technology shifts that might affect the business in both a positive and negative way. Some amount of attention from senior leaders is essential. It's rarely the case that an existing company with a successful business model will just throw everything away and do something completely different. However, it is important to understand the implications of these trends and be prepared to experiment and scale up as the situation demands.

Business leaders need to be extremely cognizant of the fact that these types of disruptive shifts are frequently underpinned by technology trends. It's rarely the case that you can stop a technology trend. You might be able to slow it down a bit, but usually it is more helpful to either get ahead of it or be positioned to move quickly if and when the trend really accelerates.

1 *Open data: unlocking innovation and performance with liquid information*, McKinsey & Company, October 2013.

In my observation, organizations that are most successful at adapting to technological change have the courage to reallocate resources in a significant way; also, they just have the best people across a number of different dimensions, including intrinsic ability, knowledge, leadership and motivation.

■ Embracing social

In our research, we found that there are some organizations that mostly gain impact from the use of social technologies within the organization and some that mostly gain impact from their connections outside the organization, whether it's with customers, business partners or suppliers. However, we found that companies with a significant use of these technologies both internally and externally had a higher level of impact across both arenas. That suggested to us that what companies learn about using social technologies externally helps them with their internal uses and vice versa. There is real value in being able to do both.

■ The socio-economic impact of disruptive technologies

McKinsey Global Institute recently published a report on the impact of economically disruptive technologies.[2] One of the big trends we looked at was the automation of knowledge work and a set of technologies which automate physical work, including self-driving cars, 3-D printing and advance robotics. What we're discovering is that there are a tremendous number of tasks which previously we thought only people could do effectively, whether it be physical work or knowledge work. This has great potential for improving productivity and improving quality, creating new products and services, but it also will be tremendously challenging on the labor management side.

Historically, whenever we've automated we've always found new jobs for people to do. I think there's a real question as to whether or not we're automating away tasks faster than we're creating new ones. This is arguably one of the most important public policy questions we will face in the future.

Dr. Michael Chui is a principal of the McKinsey Global Institute, McKinsey's business and economics research arm, where he leads research on the impact of information technologies and innovation on business, the economy and society. Michael has led McKinsey research in such areas as big data, Web 2.0 and collaboration technologies, and the Internet of Things.

Jeff Huber
Senior Vice President, Google X, Google

■ Machine learning

I think machine learning is the first one. There's a lot of talk in the industry today about big data, but I think that's looking at it too narrowly. If you're using a data warehouse today to get faster answers to the questions you have, that's a useful first step, but that's not where you need to be. You need to keep pushing beyond that. Instead of relying on human intuition and what people can imagine today, turn that over to the machines so they are proposing the questions and hypotheses, they are identifying the patterns and highlighting opportunities that are indiscernible to humans and bringing new insights that you wouldn't have imagined.

If you look behind the systems that Google is working on, these are all machine-learning based systems where it's the machine gaining insight, gaining understanding that is beyond human scope to propose in the first place.

2 *Disruptive technologies: Advances that will transform life, business, and the global economy*, McKinsey & Company, May 2013.

■ Continuous connection

The second trend is that there is enormous power in having not just ubiquitous broadband but, importantly, continuous connection — it changes how people learn, how people think about health and medicine, for example. It is probably the biggest factor changing the world. John Doerr's famous comment in the 1990s about the Internet being "under-hyped" is still true. We are just beginning to understand the implications of everything being continuously connected.

■ Precision medicine

The third area that is going to have enormous implications is personalized precision medicine. The gains being made in health today are dramatic and accelerating. It's mainly from computing meeting biology, with technologies like genome sequencing which have already yielded a new round of understanding in cancer drugs, for example, Genentech's development of Herceptin. The concept of computing being able to understand the next level of biology, not just in general or average terms, but specifically for you — that is a massive change.

■ Every business is an online business

Every business today has to recognize that it is an online business. Every industry and segment is going to become smart and continuously connected and transparent and probably will be marketplace priced. It's just a matter of time before every industry will get there, so you have a choice of taking the lead and making it happen or having it done to you. If you don't recognize what's happening, there's a good chance you'll be disrupted or disintermediated.

Bringing in the right digital skills and experience is only part of the answer. Cultural change has to pervade the organization and leadership must be fully committed. There are great leaders today who don't get it yet; they need to become infected, immersed. They have to believe in their soul that this is part of the business of the future and unless you bring the entire organization along, you're not going to get to where you need to be.

■ Innovation is key

You have to set the expectation of innovation everywhere and in everything that you do. No matter what your industry, the biggest danger is viewing your market, your business and your ecosystem as static because they never are. Companies either innovate or they die and if you're comfortable today in your static ecosystem, it's only a matter of time before somebody comes and kills you.

If you look at the kind of innovation around transportation and hospitality businesses like Uber and Airbnb, you can see what I think will be a very strong trend: businesses creating new marketplaces by providing aggregation and transparency. Another example would be Lending Club, where I recently joined the advisory board, which is creating a transparent marketplace to bring together borrowers and lenders/investors and has the potential to be extremely disruptive of the personal and small business lending space.

■ A return to insourcing

Another issue that is over-hyped is outsourcing, which is already starting to come down. Across manufacturing and IT, there is a real renaissance in doing those locally and thinking deeply about the intellectual properties embedded in those activities because they drive innovation. One of the perceived drivers of outsourcing was that it was cheaper to do in other places, but that's now being proven wrong due to the equalization of pricing across different geographies. In China and India, the cost of outsourcing is rising alongside the cost of living. Also, it's harder to innovate or to iterate rapidly in those models. So if I can do something locally, I can achieve faster iteration, faster innovation, faster cycle times and I can end up well ahead from an innovation perspective and close to an equivalent position in terms of cost.

Jeff Huber is senior vice president at Google X. During his 10 years at Google, he built Google's advertising systems and Google Apps. Most recently he ran Google Maps, which has over a billion users. Google X embodies a radical model of innovation where "moonshot" projects enable radical solutions powered by breakthrough technologies to solve huge problems affecting at least a billion or more people. Read related article, "The 10 Innovation Secrets of Google," on Spencer Stuart's web site.

Matthew Postgate
Controller, BBC Research & Development

■ The digital instrumentation of life

We are in the middle of a very broad change in society that will have an impact on everything from logistics to entertainment. I call it the digital instrumentation of life.

Increasingly, the activities of people and machines are going to be measured and the resulting information will be used to change the way in which these activities take place, whether it's shopping, healthcare or communication. People in local government have already decided it's a good idea to start machine-to-machine deployments by putting sensors in parking bays, so you know something is happening. When this sensing equipment starts to find its way into consumers' hands there will be the kind of explosion we've seen in the mobile app space. The broader access and application of design alongside technology will allow these processes to become human; that's when it's most interesting. These new processes will be built around information rather than capital equipment and, in many ways, this defines the difference between the Information Age and the Industrial Age.

Having said that, as more and more information becomes available, we're going to have to make some decisions about how it is used. The approach we take as we make this transition as a society will set the foundations for many years to come. At the moment there is a dominant model that trades privacy for indirect revenue. I think we will begin see the rise of paid-for digital services — business models that are subscription-based rather than advertising-funded — and long-term investments underwritten by large organizations and by governments which see the benefit somewhere else in their cost or revenue model.

■ Adapting to become competitive

With the accelerating pace of change, organizations have to be adaptable, but many leaders don't accept that empirical fact. In 10 to 15 years' time, the successful organizations are going to have a very different shape and a different set of activities if they are to continue the success they've had in the Industrial Age. Many organizations are trying to skill up in this area, but what they are avoiding is reskilling.

We've moved beyond the phase where you address the transition to digital by building another operating unit on the side of your existing enterprise. We're now at the stage where you have to look deep into your organization to find the right mix of skills to address this very different opportunity.

One way that organizations can cope with this transition in the near term is outsourcing and using a supplier-centric model. However, organizations need to stop thinking of technology as a homogenous activity. Instead, identify which elements are strategically important and ensure you have an internal capability to deliver them. You can then use the market to drive cost efficiency for other elements of your technology capability that are either less strategic or more commoditized. That isn't the sort of lens that is normally applied to those insource/outsource decisions, but it should be your starting point because your internal strategic technology capability is going to be the single most defining element of your competitiveness in the next 10 to 20 years.

■ Creating a distributed workforce

There's a significant competition for talent and companies need to look more globally for the talent they need. The U.S. has a huge advantage in terms of scale, the size of its domestic market and how vibrant it is and how open to new ideas. If you are a non-U.S. multinational without access to the U.S. labor market, it is very difficult for you to compete for that talent so you need to look at an alternative solution — in other words, look more broadly at a federated way of plugging the skills gaps.

You need to look further afield to the increasingly skilled workforces of China, India and Eastern Europe and develop a distributed network to help develop new technologies. Quite frankly, a non-U.S.-based company has got a better chance of doing that than trying to recruit technology staff from the West Coast who have the pick of the jobs. Understanding how you can develop and then integrate these distributed teams together is going to be critical.

■ The secret to managing smart, creative people

In my experience, there are three elements that motivate smart, technical people [in digital roles]: they need to have interesting problems to work on, fantastic people to work with and the tools that they want to do the job.

First, with a deft management style you have to keep people motivated, ensuring that the interesting jobs get passed around, while communicating the strategic importance of challenges that are seen as less interesting. For example, at the BBC, everybody wants to work with iPlayer, but we need some people to really focus on our B2B enterprise systems. If we want competitiveness, we need that competitiveness to start at the beginning of our production chain. We once set an ambition that we would never launch an internal-facing tool that we would not be prepared to put in front of our audiences. The reason this is important is because it directly translates into the kind of services that audiences consume. Nevertheless, it is still hard to deploy the same level of resources further away from where the value is most obviously created; a degree of pragmatism is inevitable.

Second, great people like working with other great people. They will come and work for you if they believe you're serious about this new way of operating and in turn they will attract other great people. Good people don't always stick around, but it's so important that they do, not least because they attract each other. You have to have a two- to three-year view and track whether you're getting more good people in than you're losing. Equally, one or two bad people can have a really corrosive effect, so you need to maintain a perspective about that mix. You also need to find a way of recognizing and rewarding the really great people as they are catalysts and have a disproportionate impact.

The final piece is giving people the right tools for the jobs. We are talking about a generation for whom domestic IT is more advanced than enterprise IT. It can be incredibly demotivating for this group; it's really important to balance enterprise prerogatives such as security and value for money with this reality. Having the best tools is absolutely critical, or you can quickly undo all the work that you put into the first two.

Matthew Postgate is controller, BBC Research & Development and also oversees the BBC's Online Technology Group. He is accountable for the BBC's R&D intellectual property, licensing and patenting. During his time as BBC's controller of mobile, he successfully led the relaunch of BBC Mobile to become the U.K.'s leading mobile site and led the delivery of BBC iPlayer on mobile. Previously, he was a key member of the team that launched BBC iPlayer.

Jason Baumgarten (Seattle) and Drew Keith (Milan) conducted interviews for this article.

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