ViewPoints

FOR THE AUDIT COMMITTEE LEADERSHIP SUMMIT

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Digitalization, disruptive innovation and the board

On 28–29 June 2016, members of the North American and European Audit Committee Leadership Networks (ACLN and EACLN) met in Zürich for their 11th summit meeting. In one session, members discussed how companies address the opportunities and risks of digital transformation. They were joined by Laurence Buchanan, Partner at Ernst & Young LLP and EMEIA Digital Advisory Leader, and Paul Willmott, Director at McKinsey. For biographies of the guests, see Appendix 1 on page 10. For a full list of participants, see Appendix 2, on page 11.

Executive summary

In conversations before, during and after the meeting, guests and members touched on various aspects of the following topics:[1]

- **Disruptive digital technologies and their impact on industries** *(page 2)*

  Members and guests identified emerging digital technologies that are already changing industries, though their evolution and impact are in the early stages and will only increase in magnitude. These technologies include artificial intelligence, pervasive internet connectivity, and additive manufacturing. They represent a fundamentally new level of disruption characterized by unprecedented speed and scale and rapidly evolving customer expectations. Combinatorial innovation, where one innovation leads to or amplifies another, creates new and unexpected sources of competition.

- **Crafting a digital transformation strategy** *(page 4)*

  Digital transformation presents a range of strategic choices for incumbents, particularly those in industries that have not yet been disrupted. Underscoring the need to address both the opportunities and risks of digitalization, members and guests discussed imperatives such as focusing on the customer as the driver of change and finding the right balance between new ventures and established revenue streams. They also addressed the timing of digital transformations, the organizational options for implementing them and the role of judicious acquisitions in building capabilities.

- **The board's role in digital transformation** *(page 6)*

  The board's role in overseeing digital transformation is to ask the right questions of management, taking a longer-term view than management might be inclined to take. The board should ensure that the company recruits the right executives, and it should monitor progress carefully. In terms of its own capabilities, it should weigh the benefits and costs of adding members with technical expertise – serving perhaps on a technology committee – and it should learn about digital issues from both company employees and outside advisers.

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[1] *ViewPoints* reflects the network's use of a modified version of the Chatham House Rule whereby names of members and their company affiliations are a matter of public record, but comments are not attributed to individuals or corporations. Italicized quotations reflect comments made in connection with the meeting by network members and other meeting participants.

For a list of discussion questions for audit committees, see Appendix 3 on page 12.

Disruptive digital technologies and their impact on industries

Technological advances portend important changes for large, global companies. Mr Buchanan writes that while digitalization is a megatrend that has been around for decades, it is still in its early stages as many new technologies are still just hitting their critical inflection points: "Digital has already disrupted some sectors, for example media and retail … However, it hasn't fully impacted every industry yet, and that's the challenge on the horizon that many companies are facing."[2] At the meeting, he made a similar point: *"Despite the exponential growth in technologies like mobile, social media, e-commerce and cloud computing, there is so much further to go. Technologies in many diverse fields – including the 'internet of things,' blockchain, advanced robotics, 3D printing and genomics – are still at quite a nascent stage in relative terms. We have only reached 1% of the potential internet of things connectivity that we will see in the next decade. The so-called fourth industrial revolution is about the collisions and combinations of these new technologies and the explosive impacts they will have to every company's value chain."*

Trends in digital technology

Network members, guests and other experts identified examples of technological advances that have transformed – or could transform – their industries:

- **Artificial intelligence (AI).** Digitalization has made it possible for machines to do many things that were once the exclusive domain of humans. Earlier this year, a Google AI machine was declared to be a legal driver under US law.[3] The US Defense Department is developing an onboard, artificial co-pilot that can speak, listen, be "visually aware" and operate cockpit controls.[4] Robots are also revolutionizing the healthcare industry, from participating in surgery to transforming the capabilities of prosthetic limbs.[5] One member said, *"For a company that employs a lot of people, the developments in AI and robotics are a big question. How will that disrupt our business operations and processes? There are serious implications for the board to think about."* Digital innovation has the potential to reach the boardroom in another way. In a 2015 World Economic Forum survey of more than 800 executives and experts from the information and communications technology sector, 45% of respondents said they expect that an AI machine will serve on a corporate board of directors by 2025.[6]
- **Connectivity.** The current wave of digital innovation has featured major advances in internet connectivity. It is no longer just computers and mobile devices that are connected to the internet; it is now also common for things like refrigerators, automobiles, light bulbs

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[2] Laurence Buchanan, *Keeping Pace with Digital* (Criticaleye, 2015), page 2.
[3] Kirsten Korosec, "The Artificial Intelligence in Google's Self-Driving Cars Now Qualifies as Legal Driver," *Fortune*, 10 February 2016.
[4] John Markoff, "Planes Without Pilots," *New York Times,* 6 April 2015.
[5] Peter Nichol, "How Medical Robots Will Change Healthcare," *CIO*, 23 March 2016.
[6] Klaus Schwab, *The Fourth Industrial Revolution* (Geneva: World Economic Forum, 2016), pp 25-26.

and thermostats to be connected – a trend referred to as the internet of things.[7] Amazon.com customers can reorder more than 100 different products by touching the internet-connected "Dash Buttons" that they place strategically around their homes.[8] The internet of things is not limited to consumer applications; it plays a critical and growing role in managing supply chains, tracking inventory levels, improving transportation and logistics and even sensing the appropriate staffing levels for factories.[9]

- **Additive manufacturing.** Technology is also transforming manufacturing. Companies are using 3-D printers to mass-produce customized, complex objects by layering ultra-thin materials on top of each other. GE uses this method to build a part for jet engines: "Conventional techniques would require welding about 20 small pieces together … Instead, the part will be built from a bed of cobalt-chromium powder. A computer-controlled laser shoots pinpoint beams onto the bed to melt the metal alloy in the desired areas, creating 20-micrometer-thick layers one by one."[10] The process is faster and uses less material, thus reducing GE's production costs, and because the parts are lighter, it will also result in significant fuel savings for airlines. More than three-quarters of respondents to the World Economic Forum survey expect the first transplant of a 3-D printed liver to occur by 2025.[11]

A different kind of disruption

Noting that digital disruption is fundamentally different than other forms of industry transformation that they have experienced over the course of their careers, members and guests identified characteristics that make digitalization unique:

- **Greater speed and scale.** Mr Willmott said, *"The pace of change today is exponential, driven by increasingly cheap and accessible computing power. The ability to put multiple parts of a device or production line constantly online creates opportunities for transformational innovation. A company that makes and sells industrial products could shift to selling software."* Similarly, Mr Buchanan noted, *"The world is moving so fast that the whole process of assessing risks and opportunities has to happen more in real time. A sense-and-respond mechanism must be going on continuously. A new technology can hit 50 million users in 35 days."* Moreover, scale can be achieved without the capital expense that was once required, because digitalization enables automation and sharply lower marginal costs.[12]

- **Combinatorial innovation.** A key dimension of digitalization is the interaction of technologies. Mr Willmott explained, *"We are witnessing combinatorial innovation – innovations building on innovations – such as the development of Google Maps enabling businesses like Uber, which in turn promise to create new direct-to-consumer distribution capabilities. New disruptors, often start-up companies, are driving new business models with very different economics. Few disruptors are taking market share, but these*

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[7] Nicole Kobie, "The Internet of Things: Convenience at a Price," *Guardian*, 30 March 2015.
[8] Nick Wingfield, "More Brands Mean Many More Buttons for Quirky Amazon Service," *New York Times,* 31 March 2016.
[9] Gail Dutton, "Balancing the Internet of Things (IoT) in the Supply Chain," *Forbes*, 27 July 2015.
[10] Martin LaMonica, "Additive Manufacturing," *MIT Technology Review,* 2013.
[11] Schwab, *The Fourth Industrial Revolution,* page 26.
[12] Ibid.

companies are putting huge pressure on prices." As a result of this dynamism, incumbents are less able to predict their sources of competition. New competitors could be start-ups but also could be large incumbents in other industries, who can leverage their customer base, infrastructure or technology.[13] One example is the race to develop and market self-driving cars, where software companies, hardware companies, automobile manufacturers, automotive parts suppliers and venture-backed start-ups are all competing or cooperating with each other.[14] One member said that this trend, coupled with the speed of innovation, puts companies in a difficult spot: *"The pace of change with digital is not linear – it is exponential. A new competitor might arrive very quickly, and you might not see them coming."*

- **Changing customer expectations and relationships.** Mr Willmott and his colleague Shahar Markovitch write that digitalization has fundamentally altered customers' expectations: "Intuitive interfaces, around-the-clock availability, real-time fulfillment, personalized treatment, global consistency, and zero errors – this is the world to which customers have become increasingly accustomed."[15] He echoed the point at the meeting in Zürich: *"Consumer expectations are changing – everything needs to be real time, fully electronic and personalized."* This era has also seen a disaggregation of the customer relationship from the goods and services supplied, which has shifted control over the relationship. A member said, *"The most significant way we talk about this at the board is regarding how we interface with our customers. The issues of the channel you use, and whether you control it, are a big deal."* As one expert points out, "Uber, the world's largest taxi company, owns no vehicles. Facebook, the world's most popular media owner, creates no content. Alibaba, the most valuable retailer, has no inventory. And Airbnb, the world's largest accommodation provider, owns no real estate."[16]

Crafting a digital transformation strategy

Digital transformation presents a range of strategic choices for incumbents, particularly those in industries that have not yet been disrupted. Members and guests said that companies should look at digitalization as a strategic opportunity, not just a risk. As one member put it, *"We want to be thinking about both offensive questions and defensive questions. Defense tends to get the most focus, but there are also opportunities to develop new lines of business and new sources of revenue."* Members and guests outlined several strategic considerations:

- **Balancing new ventures and established revenue streams.** EY CEO Mark Weinberger says that adapting to digital can be a balancing act for a successful company: "Innovation is a challenge that often becomes more difficult with success. The bigger a company gets, the more day-to-day, short-term concerns arise. That means if you want to innovate, you ultimately need to disrupt your own business model while you're making it work day-to-

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[13] Ibid., page 52.
[14] "30 Corporations Working on Autonomous Vehicles," *CB Insights Blog*, 18 April 2016.
[15] Shahar Markovitch and Paul Willmott, "Accelerating the Digitization of Business Processes," *McKinsey Quarterly*, May 2014.
[16] Tom Goodwin, "The Battle Is for the Customer Interface," *TechCrunch*, 3 March 2015.

day."[17] This can be a particular challenge for an incumbent competing with a start-up. According to a *McKinsey Quarterly* article, "The vague longer-term threat doesn't seem as dangerous as the immediate hardship. After all, incumbents have existing revenue streams to protect – start-ups only have upside to capture."[18] At the meeting, a member said that companies need to be selective about where transformation efforts are invested: *"We shouldn't be overwhelmed by the places where technology can affect us. We need to rank order the needs. It is on the supply-chain side and go-to-market side. The other stuff is great to think about, but if we spread the resources across too many needs, we will get nothing done."*

- **Focusing on the customer.** Members said it is critical to think about transformation from the perspective of customer needs, rather than focusing on ways to digitize existing products or services. One explained, *"Looking at this from the perspective of your existing enterprise is not effective. You have to start with, who is your customer? How you interact with them will drive how you view your business."* Another member said, *"How quickly will consumers adapt? Can everybody be a leader if the mass market isn't ready to follow? The idea of the adoption curve is really important. You can't leave existing customers behind. They are going to be there. It is more about the pace of adoption."* Mr Willmott agreed: *"If you switch models too quickly, you'll alienate your existing customer base, which is as risky as acting slowly."* Mr Buchanan provides similar advice in a 2015 article on digital strategy: "Place the customer at the centre of your digital strategy. Simply digitising content and blasting it out to social networks and apps is a sure-fire way to waste your investment."[19]
- **Getting the timing right.** One of the biggest strategic questions that companies and boards face is the timing of a digital transformation. Members said that the speed with which disruption is occurring, coupled with the long-term nature of digital transformation, means that a company needs to focus on when its core business may be disrupted. They noted that even if disruption of the core business is not imminent, a company might still expedite digital projects to mitigate risks related to market share loss or margin compression. At the meeting, Mr Willmott said, *"It's hard to tell if disruption is coming – but you have more time than you think. Don't panic and chuck lots of money at it. Very different categories are disrupted at different paces. There are big differences between countries: 61% of banking sales in the UK are digital, but only 15% in the US. In other industries, you see different patterns."* He recommended that companies should *"build capacity to turn on the gas when [they] need to"* but noted *"that doesn't mean [they] have to fully scale it up."*
- **Organizing effectively.** Many companies, particularly those at the start of their digital journey, develop digital capabilities as independent projects under the leadership of a chief digital officer or someone with a similar mandate. Some members said that there are benefits to having a team that is focused on the company's future without the constraint of

[17] Mark Weinberger, "4 Ways to Stay Ahead as Digital Disrupts Your Business," *Global Agenda* (blog), World Economic Forum, 3 February 2016.
[18] Chris Bradley and Clayton O'Toole, "An Incumbent's Guide to Digital Disruption," *McKinsey Quarterly,* May 2016.
[19] Stephen Pritchard, "10 Digital Strategy Tips," *Raconteur,* 12 March 2015.

worrying about the legacy business. However, Mr Buchanan argued that the digital leader ultimately needs to be the CEO, and he cautioned against a separate digital team: *"You need a diversity of skill sets around the table, at every level of the company. There is the danger that digital people are separating themselves, turning up to work in trainers, working separately. That is not digital to me at all – digital needs to be part of everyone's role. If you don't have that diversity of skills together, you will get something wrong or you won't be able to respond quickly enough."*

- **Making judicious acquisitions.** An alternative to building digital capabilities internally is to acquire them. A member said, *"You work with young start-ups, and then you buy them, some of the time."* Some members cautioned that these deals, while often valuable and necessary, can create integration challenges: *"When you try to get these smaller companies to become part of the larger organization, it is not always successful. You pay a lot of money, but it is difficult to see positive results if you try to integrate people into a large organization if they don't like working in a large organization."* But practice can help, a member noted: *"The more you acquire, the better you get at it. You know how to keep the bright people and how to reward them."*

The board's role in digital transformation

Network members and guests also addressed the role of the board in overseeing digital strategy and transformation, including its interactions with management, its own composition and the ways in which it receives training and advice on digital issues.

Working with management

Members and guests made several points regarding the board's oversight activities and its interactions with management:

- **Focus on the key questions.** Given the breadth and complexity of the issue, members said that a major role of non-executive directors is to frame it properly and ask the right questions. A member highlighted one critical question: *"Who is the customer? In a world of combinatorial innovation, defining the customer is quite difficult."* Mr Buchanan added another: *"The right question to ask is, what business strategy is fit for purpose in a digital world? – not, what is our digital strategy?"* Members also mentioned other questions linked to strategic considerations, such as how to time digital transformations and how to build company capabilities.

- **Take the long view.** Mr Willmott noted that the board's unique, long-term view is well suited for disruption: *"Often an issue will exceed the term of the management team and requires disciplined intervention, sometime over decades."* A member said, *"At least annually, every board should hold an in-depth session looking into the future, where the whole board helps formulate a strategic way forward for the company. The duty of the board is to make management really think about this from a different perspective."* Another remarked, *"Things are changing a lot more rapidly than most people anticipated, but the time horizon for many of the things we are considering can be 10 to 20 years. These are the kind of issues the board should be thinking about."* At the same time, taking the long-term view does not entail complacency about the short term. Mr Willmott said, *"Engage more frequently on strategy. Move from an annual review to once every six or three months. [The right strategy] can be a fast-moving target."* One member had already implemented this change: *"We've gone from an annual strategy day to detailed reviews of existing and prospective competitors, including companies to partner with or acquire, at every meeting. It helps a great deal."*

- **Recruit and empower the right executives.** Mr Willmott said, *"Boards also have an important role in ensuring that the company has capabilities and talent in the executive team. Yesterday's executives won't be tomorrow's executives in terms of the right skills and talents."* One member described their company's efforts in this area: *"On the executive team, we hired people from start-ups, empowered them, gave them a lot of resources, and compensated them handsomely using a performance-based mechanism, sometimes paying them four or five times what the CEO got paid. We used a flexible compensation structure to create an entrepreneurial culture – not what you would expect from a company of our size."*
- **Monitor progress using multiple indicators.** Mr Willmott said that directors should consider how to measure success and mitigate execution risk. Mr Buchanan added that while it is difficult to develop metrics that capture the entire digital transformation picture, there are some leading indicators that boards can consider: *"You can measure things like digital transactions and the value received, the digital marketing spend and return, and the number of people hired to focus on digital issues and the training they receive. The more digitized the process becomes, the more data that is generated to evaluate it."* However, members said that a board's evaluation reaches beyond an assessment of quantitative metrics. One member explained, *"It comes down to what you are hearing from the top executive team. If they get it, they will be both excited and a bit worried, but they will understand there is a massive opportunity there. It is a good sign if the CEO is embracing the projects that are under way. If the CEO is not embracing them, you probably have the wrong CEO."*

Board composition

Many EACLN and ACLN members underscored that boards themselves need technological expertise or at least experience with technology. One member explained, *"You need a board member with some experience or it's almost impossible to ask the right questions … You need someone who has been in the tech world, in the app world, on your board these days. I keep my eye on things, but it is hard to keep up."* Other members echoed the point: *"Technology changes so fast – I can never have the same knowledge as the IT director. You have to have the right people on the board, the people who are able to ask the right questions."* A member extolled the benefits of adding a different kind of director to help with these issues: *"Sometimes the board needs a wild card. This person might not be able to contribute to every committee, but he or she is able to help with technology in a meaningful way."*

Members suggested that boards have a way to go in building up this knowledge. One said, *"We are undereducated when it comes to IT in general. There's too little IT knowledge on* *most boards, in my mind."* An oft-cited study by Russell Reynolds Associates found that 80% of 300 large, global companies did not have a single director with substantial digital experience.[20]

Nomination and governance committees may have to rethink their mind-set on board composition. One member said, *"As boards refresh themselves, they will have to break with tradition. Everybody wants a recently retired CEO; I want the 35-year-old guy running that big project at Google."* Similarly, one technology expert recently commented, "Some of these candidates won't necessarily possess the gravitas and gray hair of a typical board candidate. But a part of digital transformation is cultural change, and a board member with a ponytail and an attitude isn't necessarily a bad thing."[21] Mr Willmott agreed but noted that bringing such people on board can be a challenge: *"I've found that the right people tend to be cut from a slightly different cloth. They don't mesh well culturally. They like to be provocative in the way they communicate. You need the right process to integrate this talent into the board."*

Indeed, a few members wondered about the wisdom of bringing on board a director who is focused exclusively on technology, an approach sometimes referred to as appointing a "digital director." As one member explained in advance of the meeting, *"We have brought on business leaders that have experience as disrupters, but we didn't necessarily recruit a 'technology expert.' Our board has a broader range of skills across a lot of dimensions. Not one person singularly focuses on technology. Members may have some vertical expertise in the area, but they have a broader background than that one topic. I don't buy the philosophy that a digital board director is needed. I subscribe to the idea that boards need the broader perspective, not the specialty."* Another member noted that a technology expert can react *"like a deer in the headlights when it comes to other issues, like mergers and acquisitions."*

Technology committees

A few members mentioned establishing technology committees on the board, though these are still rare; in a recent analysis, Russell Reynolds Associates found that only 33 Fortune 500 companies had a technology committee.[22] Mr Willmott saw a similar scarcity of technology committees and said that establishing one is *"a good step in the right direction."* A member described how the technology committee can work with employees at the company: *"To make us more intelligent, a subgroup of the board – the tech committee – sits down with people three or four levels down in the organization to talk with them and understand what they are creating."* Another member noted that technology committees can have benefits for management as well as the board: *"It provides managers working in the digital area with a conduit to the board, which strengthens their position in the company."*

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[20] Rhys Grossman, Tuck Rickards, and Nora Viskin, *2014 Digital Board Director Study* (Russell Reynolds Associates, 2015), page 5.

[21] Tom Davenport, "Why Boards of Directors Need a Digital Leader," *Wall Street Journal,* 22 February 2016.

[22] David Finke and Miki Carlton, *The Rise of the Qualified Technology Executive in the Boardroom* (Russell Reynolds Associates, 2016), page 6.

Education and outside input

In a pre-meeting conversation, Mr Buchanan commented on the quantity and variety of resources available for educating the board on technology: *"There's no shortage of information out there. It's easy to educate yourself. There's Singularity University or MIT, for example, and various other sources, like online community events, with brilliant content."* A member described how their entire board spent two days at a major university learning about various aspects of digital technology: *"It demonstrated to people in the company that we have to go beyond the usual efforts."* Mr Buchanan also mentioned personal instruction by experts within the company: *"You might call it upward mentoring, but it's not an age thing – it's pairing digitally illiterate people with literate ones."*

Bringing in outside advisers is another approach that some boards find helpful, and some companies have set up technology advisory boards of outside experts. However, as a recent Russell Reynolds reports suggests, such advisory boards need to be properly designed: "Most advisory boards tend to interact with management rather than with the board. Boards that take this approach should confirm that the advisory board's charter and composition adequately address the full range of technology governance and risk management issues required for the business."[23] Further, Mr Willmott underscored the importance of considering advisers' specific experience and relevance to the company: *"A lot of narrow advice is being given. Some boards assume that anyone who has run a start-up can give them advice."*

Conclusion

Members and guests agreed that the new digital world is requiring profound changes at most companies, changes that go to the core of their businesses. Mr Buchanan said, *"I hope that the terms 'digital' and 'disruption' will ultimately disappear – digital will be woven into the fabric of business. But the challenge is doing that."* Mr Willmott added that the board will be a key player in addressing this challenge, and it might even have to take the lead: *"You are better informed than most executives. That worries me, but it also strengthens my belief that the board has a critical role to play on this topic."*

About this document

The European Audit Committee Leadership Network (EACLN) and Audit Committee Leadership Network (ACLN) are groups of audit committee chairs drawn from leading European and North American companies committed to

[23] David Finke and Miki Carlton, *The Rise of the Qualified Technology Executive in the Boardroom* (Russell Reynolds Associates, 2016), page 5.

improving the performance of audit committees and enhancing trust in financial markets. The network is organized and led by Tapestry Networks with the support of EY as part of its continuing commitment to board effectiveness and good governance.

ViewPoints is produced by Tapestry Networks to stimulate timely, substantive board discussions about the choices confronting audit committee members, management, and their advisers as they endeavor to fulfill their respective responsibilities to the investing public. The ultimate value of *ViewPoints* lies in its power to help all constituencies develop their own informed points of view on these important issues. Those who receive *ViewPoints* are encouraged to share it with others in their own networks. The more board members, members of management, and advisers who become systematically engaged in this dialogue, the more value will be created for all.

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Appendix 1: Guest biographies

Laurence Buchanan

Mr Buchanan is a Partner at Ernst & Young LLP and leads digital for the EMEIA region. He works with clients to help them understand and respond to the opportunities and threats posed by digital disruption. With a decade of experience at SAP, where he was EMEA vice president for customer relationship management (CRM), and seven years in consulting, he is a recognized authority and evangelist on digital transformation, customer experience and CRM.

Mr Buchanan has worked across a wide variety of industry sectors and client projects, including a global life sciences company (developing a multichannel strategy), a UK on-demand streaming start-up (serving as interim head of CRM and digital marketing/sales/service), a FTSE-100 UK telco/media company (developing a customer experience and CRM strategy), and a global automotive company (using social media analytics).

Mr Buchanan writes regularly on his blog, the *Customer Revolution*, and he is a member of the CRM advisory board at the Rotman Centre for CRM excellence in Toronto. He was recently recognized as one of the leading CRM vendor influencers worldwide by ZDNet.

Paul Willmott

Mr Willmott is a Director in McKinsey & Company's London office, and global leader of McKinsey Digital. He works with senior executives on topics including digital strategy and organization, process automation and customer-experience design. In 2013, he led a major McKinsey research project on the economic impact of digitization. The project identified 70 distinct levers for digital value creation and destruction across sectors.

Mr Willmott has been instrumental in helping companies thrive in a digital world. For example, he worked with the board and executive team of a leading UK-based universal bank over a five-year period to digitize and transform the business. During this time, digital as a percentage of sales moved from 5% to 55%, and costs were reduced by 20%, largely due to automation. He also worked with the board and executive team of a leading global insurer to shape and execute a digital strategy, resulting in the creation of a new digital business unit.

Prior to joining McKinsey, Mr Willmott worked for six years as a software engineer at Accenture. He has published extensively on the topic of digital business, including articles in the *Financial Times, McKinsey Insight,* and *Harvard Business Review.*

Appendix 2: Meeting participants

Members participating in the summit sit on the boards of over 40 public companies:

- Les Brun, Audit Committee Chair, Merck
- Aldo Cardoso, Audit Committee Chair, ENGIE
- Mary Anne Citrino, Audit Committee Chair, HP Inc.
- Pam Daley, Audit Committee Chair, BlackRock
- Edgar Ernst, Audit Committee Chair, TUI AG
- Tim Flynn, Audit Committee Chair, Wal-Mart Stores
- Liz Hewitt, Audit Committee Chair, Novo Nordisk
- Lou Hughes, Audit Committee Chair, ABB
- Shonaid Jemmett-Page, Audit Committee Chair, GKN
- Blythe McGarvie, Audit Committee Chair, Viacom
- Hanne de Mora, Audit Committee Chair, Sandvik
- Nasser Munjee, Audit Committee Chair, Tata Motors
- David Vitale, Audit Committee Chair, United Continental

EY was represented in all or part of the meeting by the following:

- Andy Baldwin, EY EMEIA Area Managing Partner – elect
- Jean-Yves Jégourel, EY EMEIA Assurance Leader
- Frank Mahoney, EY Americas Vice Chair of Assurance Services
- Allister Wilson, Assurance Partner, Ernst & Young LLP

Appendix 3: Discussion questions for audit committees

- What makes digital transformation different from other large-scale industrial changes?
- How has digitalization changed the competitive landscape for your companies? Are the lines between industries being blurred?
- What are the opportunities and threats that digitalization creates for your companies?
- What are the most important questions for directors to ask about a company's digital strategy? What answers cause concern for directors?
- How integrated should a company's digital experts be with the existing business operations? What are the benefits to having a digital team that operates externally?
- What are the benefits of acquiring digital expertise through a transaction? How can the board help integrate an acquired asset with a different corporate culture?
- What metrics are most important for measuring the success of a company's digital innovation? What does a digital transformation dashboard look like?
- What has your board done to recruit technologically savvy directors? Does your board have a designated "digital director" who is focused on technology issues?
- What kind of education and training has your board or its members undertaken in the area of technology? What have you done personally in this area, and what would you recommend to your fellow directors?
- What kind of outside perspectives does your board receive? Does your company have a technology advisory board that interacts with the board?