THE CONFERENCE BOARD

Realizing the Full Potential of Digital Transformation

Realizing the Full Potential of Digital Transformation

Three Areas of Focus

By Janet Hao, Sean Hicks, Charles Popper, and Chander Velu

Foreword

As we publish this research report on *Realizing the Full Potential of Digital Transformation*, companies, governments, and individuals around the world are fixated on the COVID-19 pandemic and its aftermath. We need to restore the global and national economies as we continue to protect the health of citizens. Some companies are laser focused on averting failure and bankruptcy; others are looking ahead to and planning for the post-COVID "new normal." Individuals are trying to understand how to balance their health and economic well-being.

So, why are we writing about digital transformation? Simply, because staying afloat during the pandemic, getting back to some semblance of normality, and thriving as the world finds a new equilibrium all depend heavily on the utilization of digital technologies. This global catastrophe is unique in many respects, but in one important respect it is quite fortuitous that digital technologies are in place to help us through it.

The Conference Board member companies have an urgent need to make critical adjustments and to reinvent themselves in order to not only survive but also to flourish in the post-COVID world. And so understanding the potential of digital transformation has become a very important prerequisite of corporate planning. The research we describe in this report was all conducted before the novel coronavirus emerged, but the learnings you will glean from it can help you navigate successfully through the tangle of issues you will face.

The fundamental issue relates to the expected behavioral changes of people: the enterprise's customers and workforce. These changes will determine the consumer expectations that the enterprise's products and services must satisfy, as well as the enterprise's ability to properly deploy the workforce to produce and deliver the products and services. There is no doubt that digital technologies will be necessary to first understand these changes and then to respond effectively. New business models will also be necessary. These are key themes of our research, and this paper describes how the companies that we studied successfully applied digital technologies to solve these very issues.

Dr. Charles Popper
May 13, 2020

Executive Summary

"Going digital" has become somewhat of a mantra in the 21st century; many incumbent firms have watched profits and market share erode as digital start-ups like Amazon, Netflix, and Uber disrupt long-standing business models and woo away customers. Yet most established firms have not realized the full potential of digital transformation to improve business outcomes. This research aims to help businesses efficiently and effectively adopt digital technologies to achieve superior outcomes from digital transformation. Toward this end, we interviewed executives from 14 companies across the US and Europe. Our interviewees have diverse job titles, such as chief digital officer, chief IT officer, and R&D director, reflecting the reality that digital transformation occurs across a multitude of functions. The 14 companies cover 10 industries, providing a vantage point into common success factors across industries.

Top 3 Insights from Our Research

1. **Digital transformation must be integrated within the business strategy.** From the companies we interviewed, it was clear that those with a digital strategy closely derived from the overarching corporate or business unit strategy saw superior results from their digital transformations. Effectively, these companies were not "going digital" merely for the sake of "going digital." Rather, they were implementing digital technologies as part of their overall business strategy.

2. **Digital transformation is most impactful when it leads to business model innovation, fully leveraging the opportunities the new digital economy introduces.** New digital technologies can help firms realize revenue growth, market share gains, and operational efficiencies through tactical improvements such as upgrading customer experience by offering new digital channels. But they can be more powerfully leveraged to create entirely new business models. For example, a leading US publishing company digitizes its textbooks and develops different subscription models for students, professors, and institutions, allowing for innovative product bundles, deeper collaboration with professors and students in product development, and new profit channels.

3. **Measuring and managing digital transformation requires a multifaceted approach.** Most companies do not measure digital transformation because they lack a comprehensive way of doing so. We present a multifaceted measurement system that comprises: *inputs*, to gauge digital transformation readiness; *throughputs*, to evolve the business model and to take stock of digital transformation initiatives; and *outputs*, to measure business results. By not measuring digital transformation, firms risk being in the dark as to the readiness for and returns on their digital investments.

Sidestepping Failure on the Road to Digital Transformation

- **When digital strategy is not derived from business strategy, digital transformation often lacks support from top executives and other key business functions.** As a result, "bold bets" on digital initiatives often fail if they are not integrated within a firm's strategy. Moreover, it is difficult to design trial-and-error experiments because the CEO and other executives may consider such experiments failures instead of learning opportunities. One company we spoke with started a digital transformation initiative that failed, despite having a CEO who was a known digital transformation champion, because other leaders did not perceive the initiative as core to the overall business strategy.
- **A new digital product may fail to realize its potential if the business model is not adjusted accordingly.** For example, if the leading US publishing company we interviewed had merely created digital versions of hard copy textbooks, it would have sacrificed new opportunities to profit in the digitally disrupted publishing industry. Rather, the company breaks down bundled content of textbooks and sells products directly to customers rather than via distributors.

About the research

This report is primarily based on 14 interviews with digital transformation leaders and executives from 14 companies across the US and Europe. Our interviewees had diverse job titles, such as chief digital officer, chief IT officer, and R&D director, reflecting the reality that digital transformation occurs across a multitude of functions. The 14 companies cover 10 industries, including technology, manufacturing, financial services, chemicals, retail, health care, consumer products, and government, providing a vantage point into common success factors across industries.

In addition, the report draws on other sources of information including conversations within The Conference Board Councils on innovation and digital transformation, the Advisory Board of the Innovation & Digital Transformation Institute of The Conference Board, and research cited herein on digital transformation, innovation, and business models.

Digital Transformation **5 Practices That Work**

1. **Customer centricity** Ultimately, customers must be at the center of a firm's strategy and thus are the key drivers of digital transformation. For example, a leading US software company we interviewed monitors how new product features drive customer engagement. A large US health care company uses data analytics to map the patient journey and drive the redesign of its patient-facing processes, according to our interviewee.

2. **Agility** Digital transformation requires agility to accommodate rapid technology development and changes to the ecosystem generated by other players. At BBVA, the Spanish multinational financial services firm, the corporate strategy is set "soup to nuts" every three years and reviewed annually. The company devises operating plans for businesses and functions annually, but plans can be significantly revised each quarter. Further, BBVA uses Agile methodologies to implement its strategic investment agenda.

3. **Cross-functional teams** When business strategy guides digital transformation, a major benefit is support and participation from multiple business functions, making effective cross-functional teaming possible. Such cross-functional teams are especially essential to enabling business model innovation. For example, at a US-based semiconductor manufacturer we spoke with, a digital initiative could involve as many as 12 distinct business functions working in concert to enable digital transformation.

4. **External partnerships** Some companies rely on external partners to accelerate digital transformation. A large European personal care company generally tries to work with outside partners to introduce new digital technologies and drive transformation, while retaining some internal experts. To work effectively with external partners, it is important to have internal experts in areas of core digital transformation competence such as IT, according to our interviewee.

5. **Data proficiency** Among the primary inputs for digital transformation are accurate, consistent, and complete data, as well as mature policies and processes for data governance, privacy, and management. A top performer in this case is a leading US technology company, which uses a system of scorecards across different levels of the company. Metrics at different levels are easy to act on and are readily calculated from real-time user data. Further, companies must ensure that digital offerings safeguard customer information—a control point not usually associated with analog offerings.

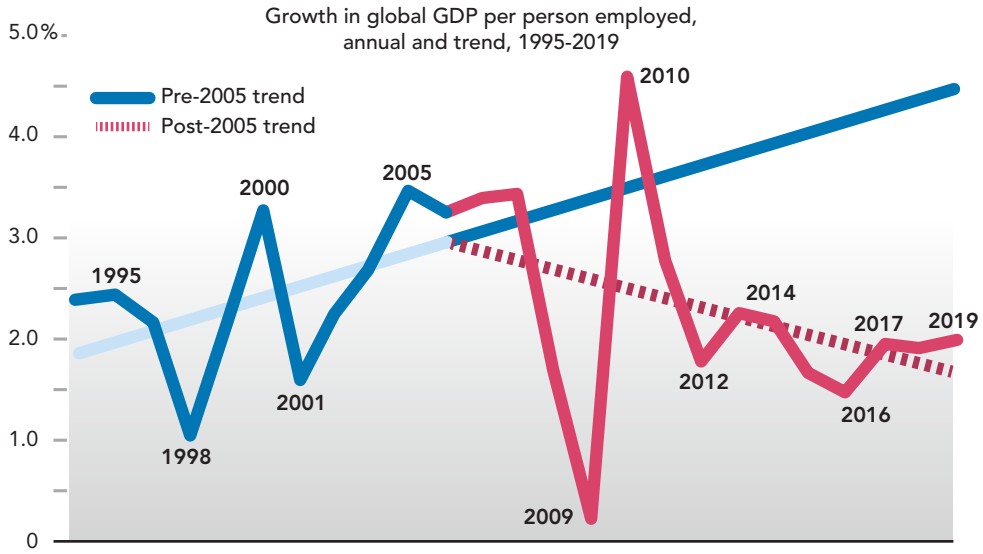
Introduction

Although some traditional companies, including Walmart and Disney, are at the forefront of digital transformation, most large established firms have not experienced the desired improvement in profitability and other business outcomes from adopting digital technologies. Executives from The Conference Board member companies identify with the problem and perceive it as one of strategy and organizational alignment rather than technology adoption.

At The Conference Board, we have observed the global economic implications of this phenomenon, referred to as the "productivity paradox" (Figure 1). Despite the ubiquity of digital technologies, global productivity growth has tapered since 2005. Further, industries that rely heavily on information and communication technologies (ICT) appear to be the primary contributors to this slowdown.[1] There are several possible explanations for this troubling trend, including weak investment following the global financial crisis of 2008, emerging markets running out of catch-up potential, and slow adaptation of employee and management skills to the requirements of new technology. There is also evidence that the paradox is the result of business model development lagging behind technological improvements.[2]

FIGURE 1

Despite the ubiquity of digital technologies, global productivity growth has tapered since 2005



Source: The Conference Board *Total Economy Database*™, April 2019
https://www.conference-board.org/data/economydatabase/

1 Bart van Ark, "The Productivity Paradox of the New Digital Economy," *International Productivity Monitor* 31 (Fall 2016): 3–18.

2 Chander Velu, "Business Model Cohesiveness Scorecard: Implications of Digitization for Business Model Innovation," in Satish Nambisan et al., eds., *Handbook of Digital Innovation* (UK: Edward Elgar, 2020).

This report aims to help businesses efficiently and effectively adopt digital technologies to achieve superior digital transformation outcomes. We interviewed executives from 14 companies across 10 industries in the US and Europe. Our interviewees had diverse job titles, such as chief digital officer, chief IT officer, and R&D director, reflecting the reality that digital transformation occurs across a multitude of functions.

We observed that companies that have successfully executed digital transformation share two common traits: 1) they have the discipline to undertake digital initiatives only if they are aligned with the overarching corporate or business unit strategy, and 2) they carry through the adoption of new digital technologies to create new business models, leading to new sources of competitive advantage.

We offer a way for companies to build on The Conference Board Signposts of Innovation framework for innovation measurement to also manage and measure digital transformation. By doing so, companies can assess their readiness to execute digital transformation, prioritize the components to maximize effectiveness, and ultimately improve outcomes.

What is **digital transformation?**

Digital transformation is the use of digital technologies (such as ubiquitous broadband, cloud storage, mobile technologies, data analytics, machine learning/ artificial intelligence, and emerging production technologies such as additive manufacturing) and the data they produce to connect organizations, people, physical assets, and processes to generate better business outcomes, including capitalizing on customer needs, realizing efficiencies and productivity growth, improving the effectiveness of decision making across the organization, and enabling new business models. Digital transformation is thus distinct from digitization, which refers to adding digital elements to existing processes and strategies.

Digital transformation strategy must be integrated within the business strategy

The importance of having a sound strategy is lost on few executives today; however, where many go wrong in the digital age is in adopting digital transformation as a stand-alone strategy. It was clear from the companies we interviewed that those with a digital strategy derived from a corporate or business unit strategy saw superior results from digital transformation compared with those that implemented digital transformation as its own strategic objective.

Effectively, the successful firms did not "go digital" merely for the sake of "going digital." They focused on implementing digital technologies and corresponding business models as part of an overarching business strategy. Accordingly, these firms did not view digital innovation as a onetime event, but rather a continuous process closely tied to strategic planning. It is equally true that the opportunities and threats created by digital technologies can and should be integral to the strategic planning process. Indeed, the diffusion of digital technologies often inspires a pivot in an existing strategy or a shift to an entirely new strategy, but such a transition must be grounded in a disciplined strategic planning process. That planning process must include deep understanding of how digital technologies are changing most industries and how they can change your industry. The process can then result in formulating a business strategy that best leverages the potential of the new digital technologies.

A US-based rental car holding company understands this distinction well. The company has long invested in connected car technology as part of its strategy around autonomous vehicles, within which fleet management as a service is a dedicated substrategy. The company has recognized that intensifying trends toward shared vehicles and autonomous vehicles will lead to increased demand for these services. For example, e-commerce and logistics companies could use autonomous vehicles to lower delivery costs and improve efficiency. To maximize profits in their autonomous vehicle endeavors, these companies will need expertise in fleet management, a core competency unique to rental car firms like our interviewee. The advent of digital technologies has created a need for a new business model, which leverages this competency as a revenue-generating opportunity that the company can use to differentiate its services from those of competitors.

Strategy-led digital transformation creates organizational buy-in. Executing digital transformation often entails changing internal processes that affect multiple functions, so support from the CEO and key stakeholders is critical. When a digital transformation strategy is developed to implement an agreed-upon business strategy, it is more likely to be supported by top executives and other business functions, counterbalancing organizational resistance to the change.

One interviewee from Covestro, a German specialty chemical company, confirmed the need for support from the top.

> "You can do all you want with digital transformation…but without the support from CEO, it is very difficult as digitalization (more often than not) involves process and cultural redesign across various parts of the organization…. This only works only if there is support, willingness to try, and putting some money into trying from the top."

But backing from the CEO alone is not enough if other business functions do not support digital transformation. One company we spoke with started a digital transformation initiative that failed, despite having a CEO who was a known digital transformation champion, because it was not perceived by other leaders as core to the overall business strategy.

How to integrate digital transformation strategy into business strategy: **5 different approaches**

1. At a **large European personal care company**, the business strategy is formulated before the digital strategy and is set at the senior executive level. Part of the company's business strategy is to pursue a digital strategy that helps customers visualize and personalize their beauty products. Now that the strategy has been set, IT validates that it is achievable and brings forward feasible, cost-effective digital solutions. Cross-functional teams, including IT, marketing, and business leaders, ensure that the company gets maximum value from new digital technologies to accomplish that digital strategy.

2. One **US-based semiconductor manufacturer** we interviewed has no digital transformation initiative per se. Instead, digital transformation is "baked into" a set of 13 competencies, such as demand creation, product information management, and order fulfillment, composed by the CEO and his direct reports as a way to grow market share and profitability in line with the current strategy. While none of the competencies explicitly call out digital technologies, they include digital solutions or components about 90 percent of the time. Each competency is led by a cross-functional team, which typically meets virtually and reports progress to the executive leadership team three times each year.

3. **BBVA**, the Spanish multinational financial services firm, has established a venture fund–like organization to explore, develop, and invest in fintech start-ups that effectively leverage digital technologies that are directionally consistent with the bank's business strategy. As these ventures mature and succeed, their business models can be introduced and integrated into the bank's core operations. In parallel, the core operating units also explore how digital technologies can enable them to better execute their business strategy and operations.

4 **De Beers Group**, the international diamond exploration, mining, and marketing company, identified strategic opportunities in areas such as branding, asset optimization, and integrated supply chain that all have digital components. To drive the strategy forward, De Beers has identified multiple technology domains—from digital exploration of diamonds to omnichannel opportunities—where they need to build capability. Cross-functional and multidisciplinary teams are essential to executing on the domains.

5 Develop trends bottom-up: at **3M**, business unit leaders are able to address digital "megatrends." For example, a strategic plan for a business unit must address how megatrends—such as big data analytics and machine learning—are expected to affect the business. According to the head of the corporate research lab for digital technologies, "it is now expected that each business define their digital strategy— how are they taking advantage of these technologies that are so widely available."

Digital transformation is most impactful when it leads to business model innovation

Amid further technological disruption, business model innovation will grow in strategic importance to firms. This trend was verified in the 2020 ***C-Suite Challenge***™ of The Conference Board, in which the 740 global CEOs surveyed ranked *create new business models because of disruptive technologies* as the second most-critical internal hot-button issue.[3] Further, according to the Boston Consulting Group, the average life span of business models has decreased from 15 years to less than five years in the past 50 years, making business model innovation a required capability for growing and defending market share in the new digital economy.[4]

What is a business model?

A business model is an activity system that connects the internal perspective of the firm, such as resources and routines, with the external perspective, such as partners, markets, and customers, and therefore articulates how the firm goes to market to implement the strategy. In doing so, the business model articulates the customer value proposition, how value is created, the means of value capture, and the partners in the value network. Hence, the business model is the "architecture" that provides the bridge between the value created for customers and the value captured by the business in terms of profit.[5]

3 Charles Mitchell et al., *C-Suite Challenge™ 2020: Risks, Opportunities, and Hot-Button Issues*, The Conference Board, January 2020.

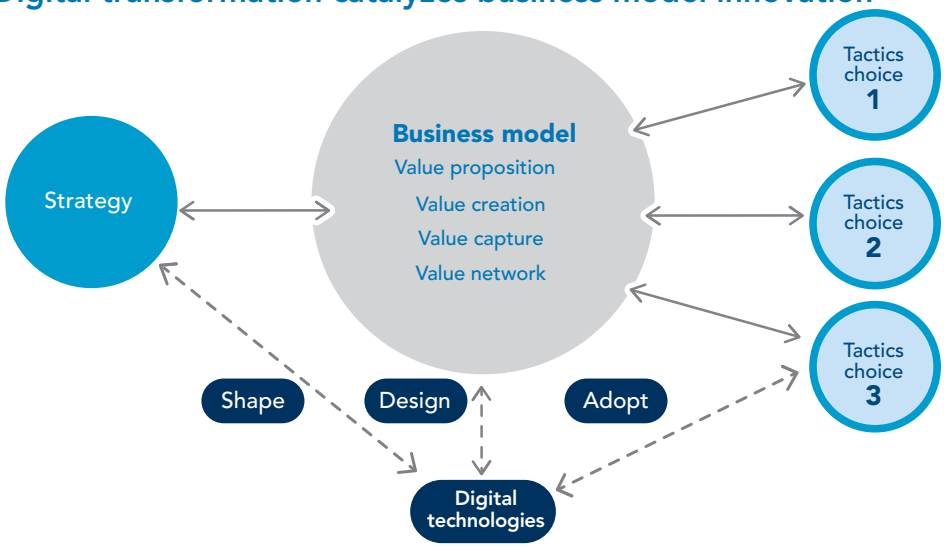
4 "Business Model Innovation," Boston Consulting Group, 2020.

5 Velu, "Business Model Cohesiveness Scorecard"; Christoph Zott and Raphael Amit, "Business Model Design: An Activity System Perspective," *Long Range Planning* 43, nos. 2–3 (April 2010): 216–226.

Business model innovation is a way to reap the full benefits of digital transformation. Digital transformation helps firms **adopt** operational efficiencies by making tactical improvements such as improving customer experience through digital channels or implementing artificial intelligence (AI) technologies to eliminate waste in manufacturing operations. It also allows organizations to **design** new business models by servitizing and connecting products, repositioning transactions from the world of things (atoms) to the world of information (bits), and elevating direct and in-depth relationships with consumers. These new models then **shape** the business strategy (Figure 2).

FIGURE 2

Digital transformation catalyzes business model innovation



Source: Adapted from Ramon Casadesus-Masanell and Joan Enric Ricart, "From Strategy to Business Models and onto Tactics," *Long Range Planning* 43 (2010): 195-215; Chander Velu, "Coopetition and Business Models," in *Routledge Companion to Coopetition Strategies*, Anne-Sophie Fernandez et al., eds. (London: Routledge, 2018).

For instance, before the digital revolution, the primary function of a textbook was to disseminate information to students. Today, a leading US publishing company we interviewed uses electronic textbooks not only to disseminate information but also to collect information on use patterns, which can be used to predict student success. The digital model has also allowed the company to explore new ways of doing business, such as selling products directly to customers rather than via distributors and developing different subscription models for students, professors, and institutions.

Companies need to continuously reassess and revise business models when implementing new digital technology. When companies invest in building digital capabilities, they change the alignment of existing capabilities. Some capabilities are not as important as before, while others need to get stronger to match the new digital capabilities. For example, before 3D printing, planning and distributing spare parts (to replace broken parts in use by customers) was an important capability of a manufacturing company. With 3D printing, local customer service can quickly make spare parts. As such, the new important capability is a large data file of designs for spare parts, and the old capability of planning and distributing spare parts is no longer important.

Price, value, productivity, and convenience must factor into the decision to adopt a new business model. Digital technologies often enhance value, productivity, and convenience, and pricing must reflect the new value proposition. In the case of digital books, for example, the provider could recommend sections of the books to read to improve exam performance based on use data from other well-performing students. Hence, the student might pay more for the digital version compared to the physical counterpart for the added productivity. However, consumers often expect digital products and services to be priced no higher, and usually lower, than their analog counterparts. The key to balancing added functionality and price expectation is differentiated value. For highly differentiated, highly customized digital products and services, customers may be willing to pay any price. For others, not so much.

Some companies may feel an urgency to adopt new business models—especially if their industry is being digitally disrupted—while others are more reluctant to change. 3M is striving to embrace business model innovation. While the company is regarded as a leader in technology and innovation, its business model remains centered around manufacturing prowess—much like it was 100 years ago. Customers are the key reason 3M is embracing more digital offerings. Company leaders see the need to evolve the business model to get ahead of customer demand for digital solutions.

Quite often, companies fail to see the need for new business models, partly because of executive "piecemeal syndrome." An incremental change in process is easier to achieve than a radical change in business model. As a result, executives are more inclined to improve processes without improving whole systems. This tendency is sometimes referred to as the "piecemeal syndrome." For example, companies first adopted personal computers to replace their mainframe computers. But because PCs had architecture similar to mainframe computers, the promised benefits of variety in the software (word processing and manufacturing operations control) did not materialize immediately. In fact, PCs did not increase firm productivity until the advent of email and the internet, which leveraged desktop and laptop computing to change the pace of work and remove geographic restrictions. Such a broad example also sheds light on how a lack of business model development can lead to the "productivity paradox" discussed in the introduction.

Companies still face the piecemeal syndrome today. It's often fueled by internal conflicts and misalignment in go-to-market-strategies across functions. 3M sold furnace filters through the same business model for decades. In the original model, a higher volume of filters sold led to higher profits. Recently, the company discovered that it could monitor the performance of the filters by installing digital sensors directly in a new line of "smart filters." This begins to enable 3M to shift from selling filters to selling clean air (i.e., servitization). The profit equation of this new business model could be disruptive for customers and internally. Producing fewer filters while maintaining clean air with more revenue is a new model. This clearly impacts the current go-to-market equation because the manufacturing model today is based primarily on the volume of filters produced and sold. This example shows that without a new business model, a new digitally enhanced product may fail due to the changes required across business functions. To succeed, 3M continues to focus on driving executive consensus.

There are different ways to build new business models in response to digital transformation. Some companies have a culture of constantly adjusting and revising business models, while others make a targeted effort. Companies can choose to:

- **Formulate an outside-in perspective to identify new models.** BBVA created an internal venture capital function, known as New Digital Business (NDB), to develop new business models within the company. This function identifies new markets, new customers, and new ways of doing business. In effect, BBVA has reacted to the disruptive innovations of the fintech world by joining that world and seeking alternative ways to deliver the bank's core financial services. NDB runs a portfolio of companies as well as a couple of venture capital funds that invest in, build, and buy digital businesses. Once a new digital business matures and is ready to scale—and will not significantly disrupt the operations of the main company business—BBVA transfers the new product to the core business.
- **Experiment with new business models by implementing customer solutions incrementally.** A US-based rental car holding company has acquired a start-up and leveraged its technological capabilities to improve customer experience through self-service kiosks in lieu of traditional local branch offices. This strategy shift born from acquired capabilities is complementary to the company's ongoing strategic response to autonomous vehicles and has ultimately enabled the company to experiment with new business models in fleet management services for autonomous vehicles.
- **Use improvement targets as a driver to evolve new models.** Over the last decade, a military branch we interviewed has doubled its purchases of high-end aircraft, with a target of 80 percent deployability; yet the proportion of aircraft capable of being deployed remained flat at 50 percent over the same time period. The military branch turned to data analytics to thoroughly understand the root cause of the problem. Its analytical models showed that aircraft maintainer training was a more crucial factor in deployability than aircraft age. After noticing a dip in the level of training for maintainers, the military branch directed resources to more training instead of more supplies, thus meeting its deployability target. This example shows how a well-established organization such as a military branch can employ new technologies, such as big data analytics, to evolve its traditional business or decision-making model.
- **Create standardized business architecture to incubate and support new models.** De Beers created a "business model innovation" framework to establish common languages, processes, and systems to incubate and support new business models. The company also deconstructed and segmented its existing business models and potential new business models into an "optimize frame" and an "explore frame" in an effort to bring focus to the construction of new business models. For example, De Beers is working on a new "explore" business model to build an industry platform that will create a digital architecture for the diamond industry. This platform, combining distributed ledger technology with internet of things, AI, and cryptography, will allow the company and its partners to trace their product across the value chain from mines to end consumers, providing provenance, authenticity, and traceability.

5 Do's for Digital Transformation

1 **Be customer centric.** Many of our interviewees emphasized the significant impact customers have on the digital transformation of products and services and the ways their companies do business. For example, a top US technology company monitors how new product features drive customer engagement. A large US health care company uses data analytics to map the patient journey and thus drive the redesign of its patient-facing processes. A large European personal care company's CEO repeatedly emphasizes evolving the company into a digitally centered business whose strategy adjusts as consumer demand for its products evolves in a digital world.

2 **Keep digital transformation agile.** Digital transformation requires agility to accommodate rapid technology development. For example, roughly 40 percent of BBVA's resources for programs are allocated fluidly, meaning they're not earmarked for specific programs. While BBVA's corporate strategy is reviewed annually and set "soup to nuts" every three years, resource allocations are reviewed quarterly. This flexibility has helped the bank succeed in its digital transformation. The BBVA banking app was ranked the top global banking mobile app in *The Forrester Banking Wave: Global Mobile Apps Summary, 2018*, partly because consumers indicated the app provides an excellent user experience. This example is just one of many in the literature that show the relationship between the early adoption of digital technologies and better business outcomes.

3 **Build cross-functional teams with support across the company.** The success stories we saw almost always involved cross-functional teams. For example, the semiconductor manufacturer we interviewed recently launched a new version of its online store with a team spanning 13 to 14 functions (sales, planning, manufacturing, support, logistics, IT, etc.). The team defined the scope of the new business model; talked to distributors, suppliers, and customers; and brought different outside partners on board. Covestro provides another sound example. The company leverages its business and digital experts to pursue digital transformation of its existing business model and also to explore new business models. Within its existing business model, Covestro works on digitalizing all processes like R&D, manufacturing, and the supply chain. Also, efforts are underway to digitalize the customer experience.

   When digital transformation strategy is derived from business strategy, a major benefit is support and participation from multiple business functions, making effective cross-functional teams possible. That support is critical as digital transformation can lead to process changes, including how customers are served and how work is done internally, thus affecting multiple functions.

   Lastly, effective cross-functional teams require the right company culture. How team and team member performance is measured is critical, as is teams' ability to speak on behalf of their home functions. All this must be carefully thought through in advance of establishing the team.

4 **Work with external partners.** Some companies rely on external partners as accelerators of digital transformation; however, this still requires some degree of internal expertise to work effectively. A large European personal care company takes this approach, retaining some internal experts while relying on external partners to do the "meat of the work." At BBVA, the New Digital Business (NDB) team has two types of members: the 60 BBVA employees who constitute the core team, and the employees of businesses NDB acquired or created, whose CEOs report to the head of NDB. Some of those businesses are not wholly owned by BBVA.

A US publishing company we interviewed has responded to digital disruption in the publishing industry by introducing a product-management mentality across its business, using Agile methodologies to test and iterate new products and processes before launching them. Key to the success of this new mentality has been getting input on new products and business models from external partners, such as professors. The company also partners with higher education institutions through its education services division to provide online learning solutions to these institutions, helping them better serve the diverse learning needs of their customers.

5 **Develop data proficiency.** One of the primary inputs for digital transformation is the quality and maturity of data, including the accuracy, consistency, and completeness of data as well as the maturity of data governance, privacy, and management policies and processes. We interviewed a top US technology company that uses real-time scorecards throughout different levels of the company. Metrics at different levels are easy to act on and are immediately calculated from company data. (See "Real-Time Scorecard System Makes a Big Difference for Digital Transformation" on page 23.)

In the health care industry, a US regional company we interviewed uses completely digital records to get performance and cost metrics at the individual patient and provider level for each sequence of care. One benefit of digital records is that the company can show the quality of outcomes from the same diagnosis across physicians, providing a comprehensive understanding of physician performance. It can also analyze the potential impact of different reimbursement regimes upon its quality of care and financial results. (See "Digital Records Make Better Service and Better Pricing Available" on page 25.)

Further, companies must ensure that their digital offerings safeguard customer's information—a control point not usually associated with analog offerings. While the importance of data privacy continues to rise, organizational preparedness still lags. More than 70 percent of global CEOs who responded to the 2020 C-Suite Challenge survey plan to increase their cybersecurity budget in the next year, but almost 40 percent say their organizations lack a clear strategy to deal with the financial and reputational impact of a cybersecurity attack or data breach.[6]

6 Mitchell et al., *C-Suite Challenge™ 2020*.

Solutions for 5 Digital Transformation Problems

1. Some divisions are digitally transformed, others are not

In many companies, certain divisions may be more digitally mature than others. At one multinational industrial company we spoke with, less than one-third of its business divisions use digital technologies to create value for customers. This disparity shows that digital transformation is not always an enterprise-wide initiative, which leads to "piecemeal syndrome," the practice of improving processes without improving whole systems.

Solution 1.1: "Going digital is not difficult"

3M uses the message that "going digital is not difficult" to alleviate organizational resistance to change. That is, adopting a new technology does not take as much time as some may think. In organizations that have past scars from lengthy technology implementation projects, it is important to show people that you can use cloud in a week, not a year, for example. 3M actively reiterates the message that "going digital is not difficult" with activities such as poster sessions, tech sessions, case studies, and innovating with customers.

Solution 1.2: Learn from a digital crisis

After a crisis, there is a tendency to reflect on how it could have been prevented. As such, an internal digital crisis is an opportunity to persuade employees to adopt new technologies. For example, an internal server failure "proved" that the cloud provided superior data storage services.

Solution 1.3: Spend time on internal communication

According to one interviewee, digital transformation is unlikely to contribute to company performance before business functions are aligned on the importance of digital transformation. How do you know if your company is aligned? One potential metric is time spent talking to colleagues about digital transformation rather than working on it.

2. The impact of digital transformation on business is unpredictable

Digital transformation may radically change the way an organization does business. Change management is needed to avoid counterproductive turbulence.

Solution 2.1: Use change management tactics

For a US-based car rental holding company, organizational resistance has been the biggest obstacle to digital transformation, according to our interview. To overcome it, the company established a dedicated change management lab and assembled a team of change agents to roll out the change globally. The lab not only taught these change agents about the new business model, but also better acquainted them with the old model.

3. Lack of support from top executives

Support from the top of the organization is critical for digital transformation. As one of our interviewees explained, "You can do all you want with digital transformation… but without the support from CEO, it is very difficult as digitalization (more often than not) involves process and cultural redesign across various parts of the organization…. This only works only if there is support, willingness to try, and putting some money into trying from the top."

Solution 3.1: Show, don't tell
Senior leaders at a large European personal care company visited 10 major companies, including Accenture and Microsoft, to learn what digital transformation means and which emerging technologies it can apply to its business. The tours were effective in educating senior leaders about digital transformation.

Solution 3.2: Learn from a digital crisis
See Solution 1.2

4. When building a team for digital transformation, technical employees may lack business acumen, customer empathy, and other "soft skills."

Conversely, many nontechnical employees have difficulty understanding important details of digital technologies.

Solution 4.1: Train in technical competencies
At a leading US publishing company we interviewed, members of content teams may have a background in the humanities and lack the quantitative skills required for digital transformation. The company has created programs that bring in experts to teach data analysis to content teams via tools such as R, SQL, Excel, and machine learning techniques.

Solution 4.2: Hire for unit not individual performance
In lieu of reskilling the entire workforce, hire certain employees who can bridge the divide between digital experts and the rest of the company. For example, the publishing company we interviewed looks for people with the requisite analytical and quantitative mindset to ask data scientists the right questions.

A US regional health care company we interviewed struggles to find candidates who are strong on both IT systems and clinical knowledge. Accordingly, the EVP & chief information officer looks for a collection of skills hired in a team approach. For example, if he hires five roles for a team, two will have more robust technical knowledge than clinical knowledge, and the other three will have more robust clinical knowledge than technical knowledge. Such an approach further necessitates the effective use of cross-functional teams.

5. IT becomes the scapegoat

In some organizations, IT is mostly a facilitator and order taker for other functions. When employees perceive digital challenges to be an IT problem rather than a business problem, IT is often made the scapegoat for failed digital initiatives.

Solution 5.1: Seek credibility from outside
One company we spoke with conducted an external IT audit as a way to gain buy-in for digital solutions. The audit would not have had nearly as much credibility had it been conducted internally, although it confirmed many of the problems the CIO already knew existed.

Measuring Digital Transformation

When it comes to metrics, Peter Drucker's adage "what gets measured gets managed" rings in the ears of many executives. Yet according to a 2017 Gartner survey, about half of CEOs have no metrics to measure the success of digital transformation.[7] Given the prevalence of metrics within most corporations, we believe this is a result of uncertainty as to what to measure. To help organizations measure digital transformation, we recommend a three-pronged approach—inputs, throughputs, and outputs.

Inputs

> How prepared is your organization to execute digital transformation?

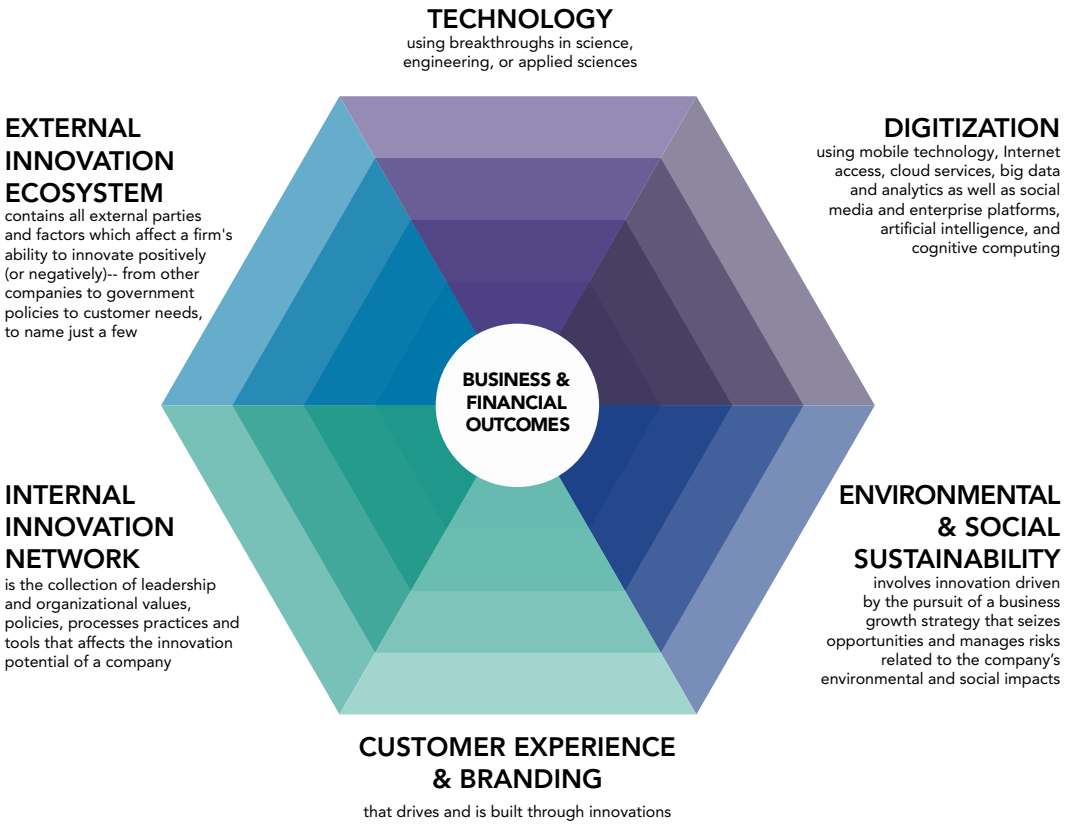
To assess organizational readiness for digital transformation, we recommend an approach that covers multiple business functions due to the cross-functional nature of digital transformation. For example, Covestro uses a new e-commerce platform (digital function) as an additional channel to market its products. The organization needs to learn how to run the business via multiple channels and to learn about customer needs more directly.

To measure the inputs most critical to digital transformation, companies can use the Signposts of Innovation framework (Figure 3 on page 19). In 2017, The Conference Board introduced Signposts of Innovation to promote a holistic view of innovation, reflecting the fact that innovation tends to involve multiple functions. The six "signposts" are: Research & Development, Digitization, Environmental & Social Sustainability, Brand & Customer Experience, Internal Innovation Culture, and External Innovation Ecosystem.

7 "Gartner Survey Shows 42 Percent of CEOs Have Begun Digital Business Transformation," Gartner (press release), April 2017.

FIGURE 3

Use Signposts of Innovation to measure readiness for digital transformation



Source: The Conference Board

Although this framework was created for innovation, the holistic approach applies to digital transformation in a world where innovation is increasingly digital. Companies have used the Signposts framework as a basis for organizing various innovation metrics, as a communication device to start a conversation and educate all levels of the organization about innovation, and as an approach to exploring why some initiatives fail. A list of metrics innovation practitioners use is available for each signpost, as detailed in *Metrics for Innovation Leaders: Using Metrics to Drive Better Outcomes*.[8] Several of the practices that facilitate digital transformation align with the Signposts framework (see "5 Do's for Digital Transformation," page 14).

8 Rita Shor et al., *Metrics for Innovation Leaders: Using Metrics to Drive Better Outcomes*, The Conference Board, April 2019.

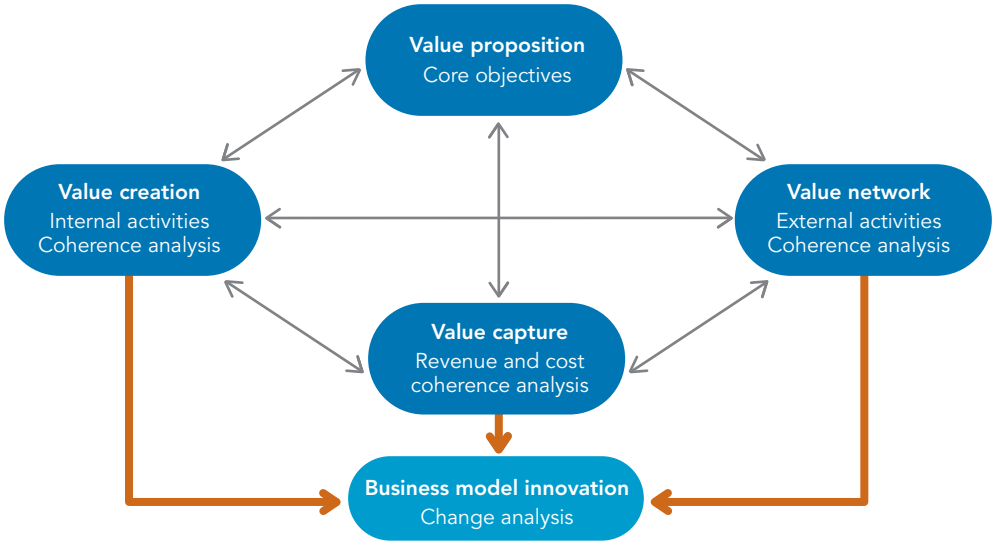
Throughputs

How is your organization's business model evolving, and how well are its digital transformation initiatives progressing?

Identifying and implementing new business models requires organizations to systematically report on how effectively and efficiently their business model delivers the right customer value. Chander Velu at Cambridge University recommends the Business Model Cohesiveness Scorecard (Figure 4), which aims to measure the degree of alignment between components of the business model to achieve the core objectives of the firm.

FIGURE 4

Use the Business Model Cohesiveness Scorecard (BMCS) to measure alignment in the business model



Source: Chander Velu, "Business Model Cohesiveness Scorecard: Implications of Digitization for Business Model Innovation," in Satish Nambisan et al., eds., *Handbook of Digital Innovation* (UK: Edward Elgar, 2020).

Primarily focusing on profitability can exacerbate the challenge of business model innovation following the adoption of digital technologies, according to Velu. Profitability reports, while valuable, do not adequately inform management about the interactions of the activity system that constitute the business model. To keep the old business model functioning and at the same time find opportunities for new models, it is essential to measure how the adoption of digital technologies affects the cohesiveness of the system of business activities, and especially to identify the enhancing and mitigating effects of one activity on other activities. To measure cohesiveness, firms need to consider the flow of information and material as well as the incentive systems and decision rights within and across firms in the ecosystem. Hence, the profitability reporting prevalent in most firms needs to be complemented with the BMCS to enable business model innovation while improving the efficiency of the existing business.

Our interviews show that companies use different approaches to measuring digital transformation initiatives.

- A top US technology company we interviewed uses real-time data to assess digital progress via a system of scorecards that cascade throughout the company, ultimately rolling up to the CEO. (See "Real-Time Scorecard System Makes a Big Difference for Digital Transformation," page 23, for more information.)
- One US-based semiconductor manufacturer uses stage-gate style metrics (financial and nonfinancial) to continuously measure progress on 13 competencies its CEO has established. While each competency is tied to a specific set of metrics, revenue generation and cost avoidance are the most common metrics across competencies. Notably, none of the competency-specific metrics are new to the manufacturer at the company level; rather, they are metrics the company already uses to measure strategic outcomes, such as lead time.
- BBVA, the Spanish multinational financial services firm, implements new digital business models—including some that are acquired and some that are developed internally—with a venture capital approach. Accordingly, the bank uses different metrics based on the expected payback period of the investments. For projects that aren't expected to make a return in the short term, BBVA evaluates progress using nonfinancial metrics such as percentage of self-service transactions and self-service-available products and services.
- An interesting metric considers the learnings developed during a project phase, regardless of whether the phase achieved its performance targets. As De Beers adopts digital technologies and designs new business models for mining and procuring diamonds, it develops hypotheses on the key elements of a new successful business model. To test those hypotheses, the company carries out experiments, based on iterations of a "minimum viable product" to extract learnings—regardless of success or failure. Once the experiment is complete, the learnings are implanted into new business models.
- Some companies do not measure digital transformation because they have just started their digital journey. One interviewee said that his company mimics competitor behavior in adopting digital technologies, and the company is less equipped with metrics.

Outputs

Is your organization seeing positive outcomes from digital transformation?

Because digital transformation should be integrated within the business strategy, the outcome metrics for the business strategy should be the primary metrics to gauge the ultimate success of digital transformation. These financial and nonfinancial outcome metrics are not significantly different from the innovation metrics we present in *Metrics for Innovation Leaders*.[9]

FIGURE 5

Examples of output metrics for digital transformation

Financial metrics	Nonfinancial metrics
Percentage of sales that come from new products	Customer engagement and use of the platforms
Incremental growth of revenue and profit from new digital technologies	Increased customer satisfaction
Margin expansion due to automation	Number of interactions with customers: How many are smart, and what level of smart? How value-additive are they?
Revenue by business model	Metrics for customer journey mapping
Market share	Number of deep learning sessions
Predicted cost saving	
Capital efficiency	
Development cost as a percentage of revenue	

Source: The Conference Board

9 Shor et al., *Metrics for Innovation Leaders*.

CASE STUDY: A US TECHNOLOGY COMPANY

Real-Time Scorecard System Makes a Big Difference for Digital Transformation

Ingredients of digital transformation success: 1) A comprehensive system of real-time metrics at different levels of the organization, 2) scorecard metrics that are automatically calculated and easy to act on, and 3) customer centricity for both internal and external customers

The company is a highly adaptive software development company competing against born-in-the-cloud competitors. Its approach to digital transformation is unique. As one of the purveyors of digital transformation, being a digital leader in all aspects is critical to its brand and a major influencer of its strategy. Many of its products, business models, and processes have already largely undergone digital transformation. Among the 14 companies we interviewed, this company is most advanced in using high-quality, mature data, which makes a big difference for digital transformation.

On the product side of its business, it uses a system of scorecards to evaluate success at different levels of the organization. According to our interviewee, the scorecards use an "as-small-as-possible set of metrics that tells the company how it is doing on critical initiatives." Moreover, the metrics in the scorecard vary across levels of organizations, business functions, and job responsibilities. The metrics are calculated in real time using high-quality big data. At the highest level, the scorecard is reviewed weekly by the CEO and his direct reports. These direct reports also use a scorecard for their teams, with a subset of those metrics rolling up to the CEO. This system cascades down through all layers of the organization. Sample metrics include daily and monthly active users on a subscription service platform and percentage of users that collaborate monthly on these platforms. The company relies heavily on the hierarchy of the cascading metrics to resolve conflicts that arise from changes in the business model.

Scorecard metrics are automatically calculated and easy to act on. Metrics are easily calculated in real time from company data. Accordingly, the company avoids metrics requiring manual effort. Metrics on the number of users indicate the efficacy of the business model and can easily inform product innovation. For example, the company can use metrics on a small group of active users to evaluate the impact of a product change on customers. The company leverages these real-time metrics by using the scientific method for product development and enhancement (i.e., making hypotheses, adjusting product features, piloting to a test group, and iterating).

Although this practice is pervasive on the product side, the company is in the process of introducing it to the IT organization in service of its own employees.

It was essential for the new IT organization to look and feel like the product development team to better serve its external and internal customers. This meant attracting talent with competencies in new areas, such as end-to-end user experience, customer empathy, and technology strategy—competencies perhaps more in line with product development than traditional IT. To attract this new talent, the company sells a compelling vision around helping a traditional IT organization transform into a digital leader and touts enhanced learning opportunities for new hires.

CASE STUDY: A US REGIONAL HEALTH CARE COMPANY

Digital Records Make Better Service and Better Pricing Available

Ingredients of digital transformation success: High-quality digital records help to 1) achieve better patient care, 2) map the quality of service at every discrete step of the patient's journey, and 3) drive innovation in the pricing / cost components of the business model.

The company we interviewed is a regional health care delivery organization with 17 hospitals, 450 patient care locations, 7,000 physicians, and 33,000 employees across the network. It provides health care services across the value chain, from ambulatory primary-care physicians to leading-edge cancer care. Geographically, the organization covers an area of about 100 miles in length.

Digital transformation is baked into company strategy: it leads to better patient care both within and outside the system, and it rides the new trend of business model innovation in the health care industry.

The company aims to completely transfer patient records from paper to digital to better coordinate patient care. Full patient records will now be available at all locations within the network and will be readily sharable with other health care organizations across the US. As a result, patients are getting better care across the country in emergency situations, partly because physicians are able to make better judgments on how to deliver care using shared data. Both patients and providers have written letters to the company praising its digital record-sharing system.

Moreover, with high-quality digital records, it can map the quality of service at every discrete step of the patient's journey. With completely digital records, the company can get performance metrics, down to individual patient and provider, at each sequence of care. The company can then connect those metrics with what happened before the care and what happens after it. The company can also show the quality of outcomes from the same diagnosis across physicians, and thus compare the outcome and diagnosis across different physicians and processes.

Finally, digital patient records play a major role in business model innovation. A new trend in the health care industry is to transition from pay-per-visit to bundled payment. On the public side, government drives this trend via Medicare and Medicaid policy changes, and picks specific bundles. On the commercial payer side, a health care organization collaborates with payers on designing and applying bundled payment. Data analytics, driven by digital records, help develop bundles. For example, if a diabetic patient gets a total knee replacement, a health care organization relies on digital records to design the bundled payment of the knee replacement and the diabetes treatment. Determining which treatment applies to which bundled payment is not as straightforward as it seems, and a health care organization cannot optimize its financial outcome from bundled payments without the data analytics applied to digital records.

About the Authors

Janet Hao is a Senior Economist at The Conference Board. She specializes in research on innovation, intangible assets, and economic growth. In particular, she measures investment in innovations by commercial banks, investment banks, and insurance companies.

She assesses how intangible assets promote economic growth in Europe and emerging markets, and increase stock prices for US and German firms. In addition, she examines the effect of real estate investment on the rapid economic growth of China.

Prior to joining The Conference Board, Hao earned her PhD in economics in 2007 from the University of Maryland, College Park. Her dissertation examined how highways promote trade and development in US metropolitan areas.

Sean Hicks is a Consultant at Boston Consulting Group (BCG) and a former Research Associate, Innovation & Digital Transformation at The Conference Board, where his research focused on large-scale digital transformations and innovation culture. He is passionate about helping companies transform their organizations to become leading innovators in the digital age. He received BS and BA degrees from The Ohio State University as well as an MBA from the Kellogg School of Management, Northwestern University.

Charles Popper is a Program Director and Senior Fellow in the Innovation and Digital Transformation Institute at The Conference Board. In addition, he is a Founding Partner of TechPar Group (TPG), a strategic technology consultancy that has delivered services to 350 technology investor, vendor, and enterprise clients.

Prior to founding TPG, Popper served as vice chairman and chief technologist for Orama Partners, a boutique high-tech investment bank. Previously, he was global CIO at Merck, where he transformed the IT base and introduced formal IT governance and product/service management processes for Merck IT. Before working at Merck, Popper was a partner in the management consulting practice at Deloitte & Touche. Other roles include working as a mathematician for NSA; research scientist at Bell Laboratories, where he was recognized for leadership in the application of microprocessors and designed the first Bell Labs 8-bit microprocessor chip architecture; and leader of advanced technology (IT Innovation) for American Express (designed its image-based card-member billing system) and Lehman Brothers Kuhn Loeb (introduced Unix technology).

Popper received a BA and PhD from Harvard in applied mathematics and computer science.

Chander Velu is a Senior Fellow at The Conference Board and an Associate Professor at the Institute for Manufacturing (IfM) at the Department of Engineering, University of Cambridge, where he heads the Business Model Innovation Research Group. Chander has an interest in innovation and technology management with a specific focus on studying the implications of business model innovation. He holds an Engineering and Physical Sciences Research Council (EPSRC) Fellowship to study the implications of business model innovation on productivity following the adoption of digital technologies. Prior to joining the IfM, he was a member of the faculty at Cambridge Judge Business School. Chander has worked as a consultant with PricewaterhouseCoopers and Booz Allen & Hamilton in London.

Acknowledgments

This research project began in 2018 under the leadership of Charles Popper and Pete Davis, Senior Fellow. We thank Digital Transformation & Innovation Institute co-leaders Rita Shor and John Metselaar; Executive Director, Knowledge Content & Quality, Chuck Mitchell; and Human Capital researchers Amanda Popiela and Amy Ye for their many thoughtful contributions. In addition, Chander Velu would like to acknowledge funding from the Engineering and Physical Sciences Research Council (EPSRC - EP/R024367/1). Most of all, we are grateful to our 14 interviewees, whose candor and generosity made this project possible.

THE CONFERENCE BOARD is the member-driven think tank that delivers trusted insights for what's ahead. Founded in 1916, we are a nonpartisan, not-for-profit entity holding 501(c)(3) tax-exempt status in the United States.

THE CONFERENCE BOARD, INC. | www.conferenceboard.org

PUBLISHING TEAM
DESIGN Peter Drubin
GRAPHICS Ray Vella
EDITOR Sara Churchville

ISBN: 978-0-8237-0046-2