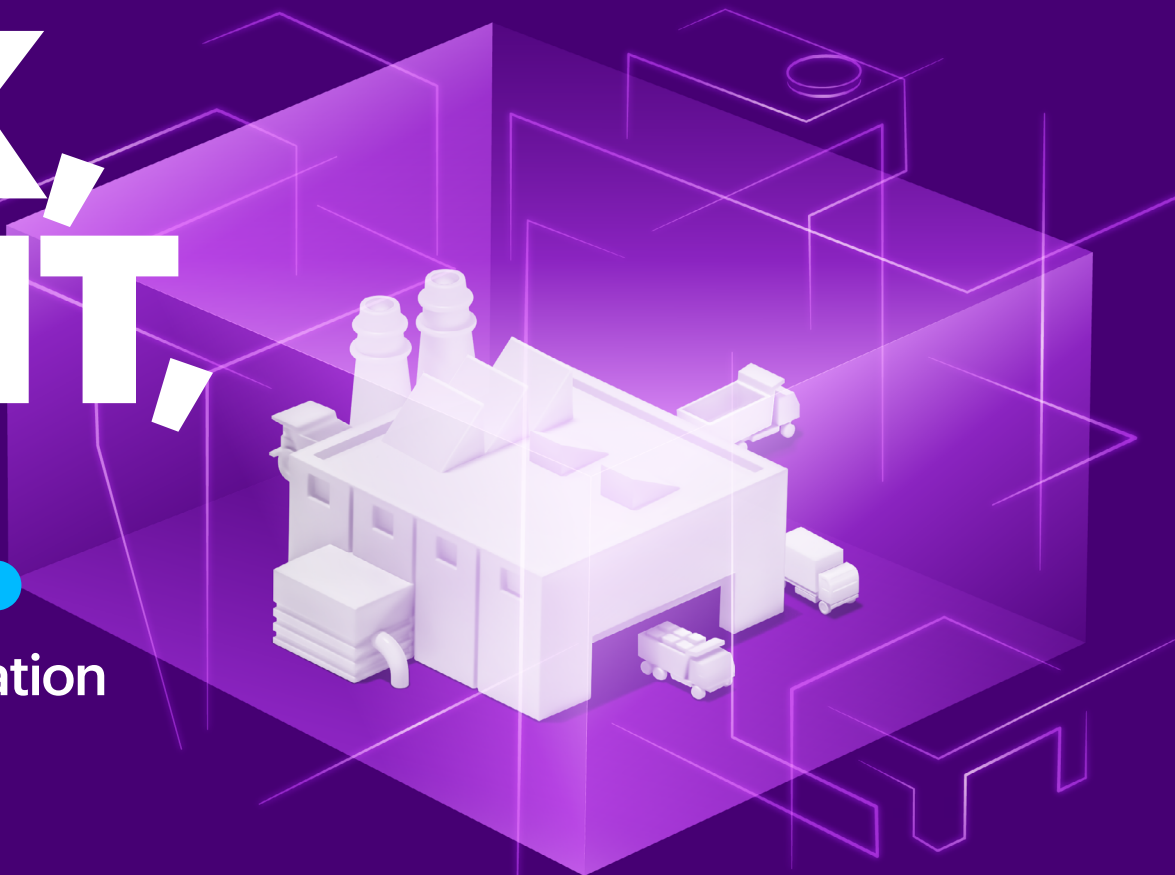


RETHINK, REINVENT, REALIZE.

How to successfully scale digital innovation
to drive growth



Driving growth by scaling innovation: How leaders manage digital transformation

Every company leader knows that to succeed, innovation must be at the core of their business. But reimagining the way products and services are made—at scale—is easier said than done.

Take a global sportswear manufacturer. With ever-growing consumer demand for hyper-personalization, executives were facing a major challenge: how to create customized sneakers that were both comfortable and durable, with fast turnarounds on a global scale.

To meet the challenge, the company opened a manufacturing facility that accelerated production using robotics, machine learning and 3D printing. But implementing emerging technologies wasn't enough. The fully automated production line couldn't ramp up fast enough. The manufacturing facility couldn't adapt operations to support its automation system. With financial losses that stumped shareholders, production was terminated at that facility three years into the project. The otherwise successful brand couldn't scale design and innovation profitably.

The truth is, they're not alone.



Today, large industrial companies need to deploy digital technologies for wide-ranging aims. To stand out among competitors and maintain customer relevance, they need to apply innovation to not only existing and new operations, but also in the products and services they develop. But when it comes to their return on digital investments (RODI), only a select few companies emerge on top.

To find out why, we zeroed in on a critical transitional phase for large, innovative organizations: when and how they move from a successful digital proof of concept (PoC) to scaling that pilot innovation for growth and profit.

From surveying 1,350 global senior executives in key industrial sectors, we learned that few companies win, most struggle and some are left with complete disappointment. This rings true especially as companies shift from improving the efficiency of their operations to generating new value for customers. Between 2016 and 2018, industrial companies in our survey spent a little over \$100 billion on scaling digital innovations to drive new experiences and efficiencies. Yet, 78 percent of industrial companies in our sample struggled to reach expected earnings as a result.

So who's doing it right? Only 22 percent of industrial companies researched achieved a return on their digital investments that exceeded their expectations. This small breed of industrial companies, which we call "Champions," are nailing the transition to digital and rising above the rest.

Our findings show that these companies approach the organizational challenges associated with innovation very differently to their peers. They are more strategic in their approach, identifying the value they want to achieve and recognizing how their innovation efforts will affect their organization. For Champions, it's not about scaling more PoCs (even though they do). It's about earning more by scaling better.

**For Champions,
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Eyes on the prize: What Champions stand to gain

A growing number of industrial companies are embracing a range of digital technologies, from AI to robotics, across key business functions. Our research shows that Champions achieve higher than average returns on their digital investments, compared with their industry peers. Their digital returns even beat the industry average for returns on *overall* invested capital (ROIC). What's more, they are able to scale more than 50 percent of their digital PoCs.

The other 78 percent of companies? Here's how they fare (see Figure 1):

- The companies trailing Champions—the second group (“Contenders”)—earn RODI lower than industry ROIC and lower than industry RODI, but scale more than 50 percent of their digital PoCs.
- The companies in the third and last group (“Cadets”) earn RODI lower than industry ROIC and lower than industry RODI and scale less than 50 percent of their digital PoCs.

Figure 1a:

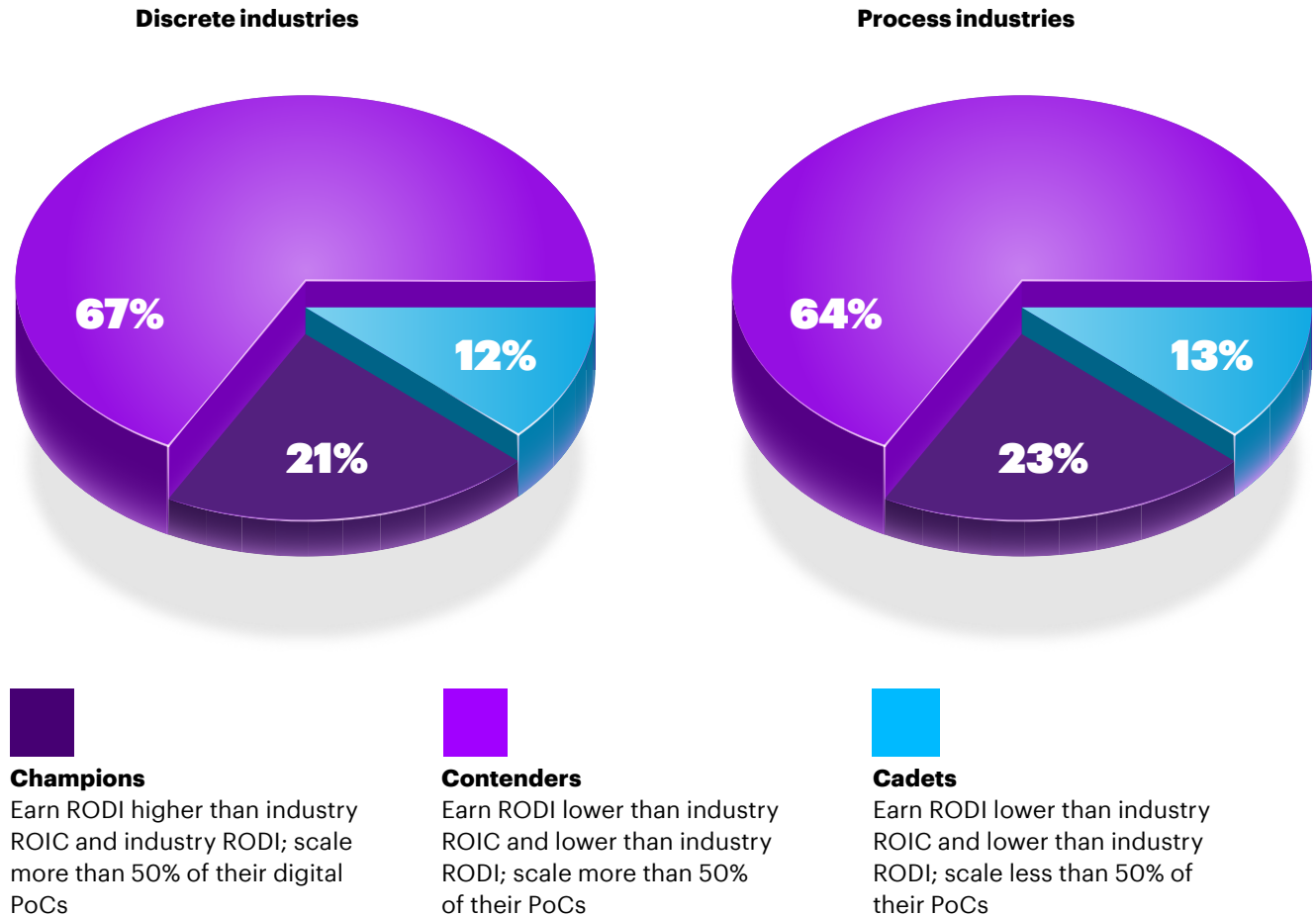
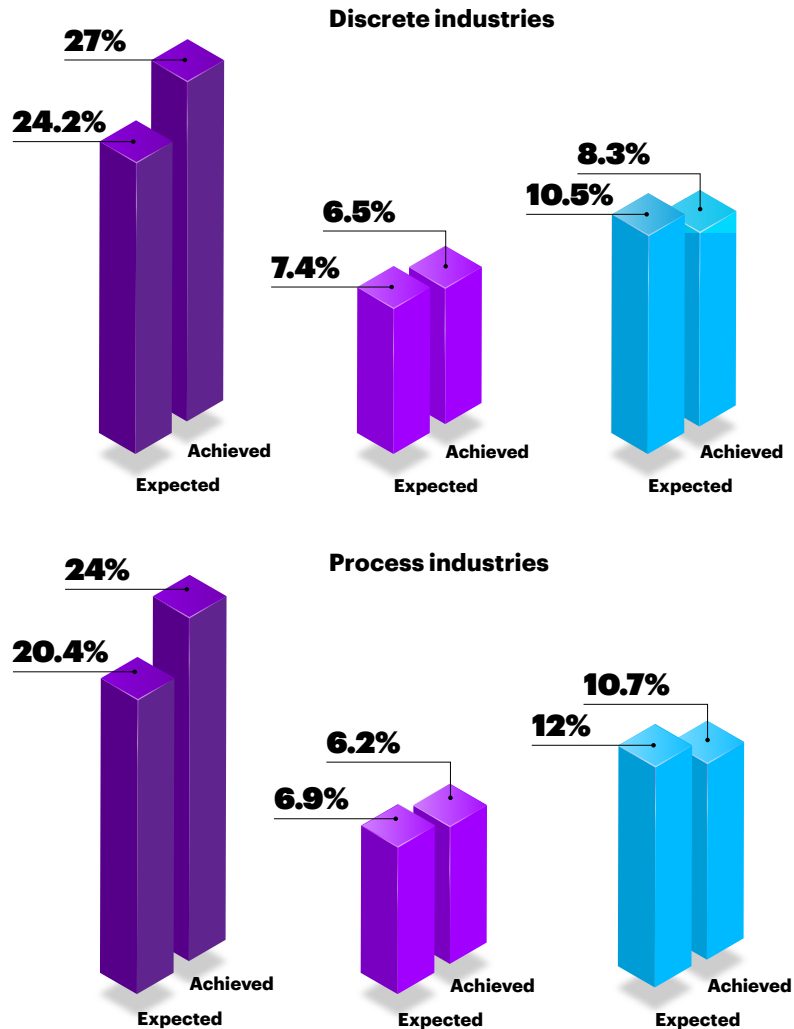


Figure 1b: Expected vs. achieved RODI



- Champions**
 Earn RODI higher than industry ROIC and industry RODI; scale more than 50% of their digital PoCs
- Contenders**
 Earn RODI lower than industry ROIC and lower than industry RODI; scale more than 50% of their PoCs
- Cadets**
 Earn RODI lower than industry ROIC and lower than industry RODI; scale less than 50% of their PoCs

Only
22%
of industrial companies achieved a return on their digital investments that exceeded expectations.

That means the 78 percent of companies who aren't succeeding like the Champions have considerable room for improvement. We collected data on 23 different challenges in six areas that organizations face while innovating (see Appendix: Research Methodology). We estimated the correlation between critical organizational challenges and return on digital investment. Our analysis reveals how much incremental value, by percentage, in return on digital investment could be achieved by overcoming these challenges, across industries. While discrete industries—which produce and assemble products made of distinct parts, such as aerospace or automobile companies—generally stand to gain the most from addressing these issues, even process industries that formulate complete offerings, like pharmaceuticals or chemicals, can significantly improve their returns as well. In short, billions of investment dollars are at stake.

Figure 2:
Increase in Return on Digital Investments (RODI)

Categories of organizational challenges	Industry-wide RODI achieved despite organizational challenges (a)	Industry-wide RODI opportunity by overcoming organizational challenges (b)	Industry-wide incremental RODI at stake $c=(b-a)$
Alignment Deficit	9.4%	17.8%	8.4%
Infrastructure Deficit	8.8%	17.2%	8.4%
Skills Deficit	9.7%	16.2%	6.5%
Partnership Deficit	9.7%	15.7%	6.0%
Measurement Deficit	10.6%	14.7%	4.1%
Cultural Deficit	10.8%	14.5%	3.7%

While discrete industries generally stand to gain the most from addressing these issues, process industries can significantly improve their returns as well.

Figure 3:
Increase in Return on Digital Investments (RODI) by industry

Categories of organizational challenges	Industry-wide incremental RODI at stake	Incremental RODI at stake for discrete industries	Incremental RODI at stake for process industries
Alignment Deficit	8.4%	6.1%	10.3%
Infrastructure Deficit	8.4%	10.3%	7.7%
Skills Deficit	6.5%	8.2%	4.8%
Partnership Deficit	6.0%	6.4%	5.6%
Measurement Deficit	4.1%	5.7%	2.3%
Cultural Deficit	3.7%	- *	6.7%

* Results not statistically significant

The categories of organizational challenges, explained:

Alignment deficit: lack of alignment between top and middle management on the definition of digital value, and on the right ways to leverage talent, assets and ecosystems to create the same.

Infrastructure deficit: inadequacies in technology architecture which hinder collaborative innovation or make it hard to manage complex integrations of services with products.

Skills deficit: lack of the skills required to identify, articulate, and innovate value through digital technologies and platforms at scale.

Partnership deficit: lack of a shared view on how to build and scale data-driven, digital value among partners.

Measurement deficit: the absence of processes and metrics to systematically track returns on digital investments and inform innovation decisions.

Cultural deficit: the absence of a culture which would nourish the design and development of monetizable digital customer experiences.

By overcoming alignment challenges and inadequacies in technology architecture, for instance, companies can unlock the most value—with a chance of almost doubling their returns. The incremental return on investments when companies close digital skills and partnership deficits is slightly lower. And finally, there is measurable value associated with conquering issues of organizational culture.

And while Champions have proven their ability to achieve significant returns, even they can unlock an additional 3.5 percent after addressing lingering organizational challenges. For others, the value at stake is much higher—almost three times as much—at 9.9 percent (see Figure 4).

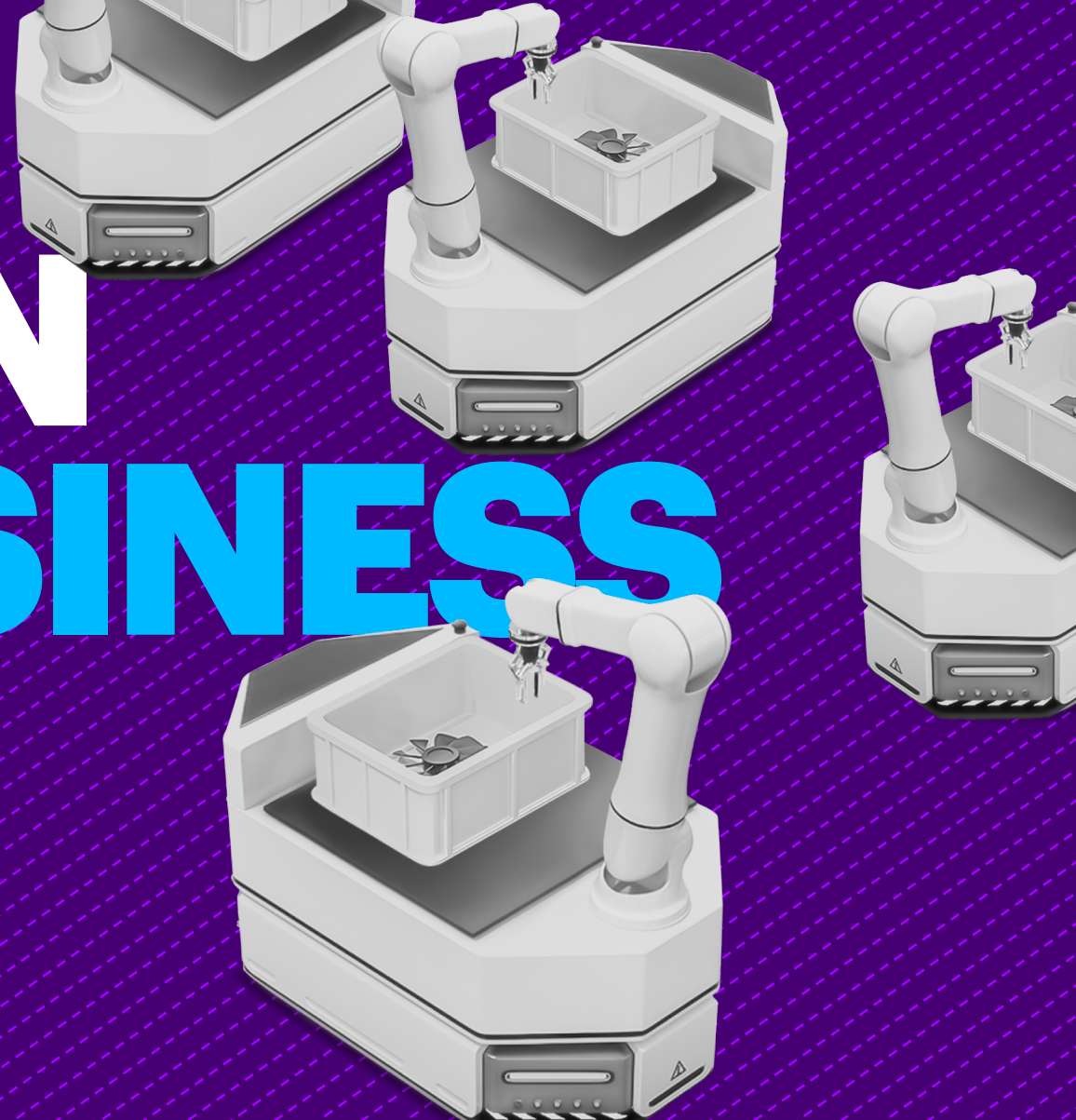
Figure 4:
Potential increase in Return on Digital Investment (RODI) for Champions vs. others

	Potential increase in RODI for Champions	Potential increase in RODI for others
Alignment Deficit	3.5%	9.9%
Infrastructure Deficit	8.4%	8.4%
Skills Deficit	4.8%	7.0%
Partnership Deficit	6.0%	6.0%
Measurement Deficit	1.3%	4.9%
Cultural Deficit	3.7%	3.7%

By overcoming alignment challenges and inadequacies in technology architecture, for instance, companies can unlock the most value—with a chance of almost doubling their returns.

REALIGN THE BUSINESS

The four alignment challenges every
Champion must overcome



Struggling to scale: What's getting in the way?

“Innovation is well known to impact much more than the direct bottom line of the product in which it is implemented,” Jorge Guzman, Assistant Professor of Business at Columbia Business School, told us. “Innovative work also changes the capabilities of a company to tackle the future and helps companies try new ideas that could be risky, but potentially highly profitable. If a company hopes to find the truly innovative ideas that give a clear competitive advantage, it also needs to risk enough so that not all investments work out.”

New innovations require companies to reimagine how they work, to digitally transform their operations and to exceed their customers' ever-evolving needs. Each of these tasks comes with a unique set of challenges.

The executives we surveyed, representing discrete producers and process industries, repeatedly ranked four issues as the top barriers to successfully scaling proof of concept projects:

01. Digital value driven down from the top

The first challenge is aligning top management's views on the definition of digital value. Whether it's using technology to improve the customer experience or create an entirely new product, digital value can mean different things to different people. When a company's top leaders disagree on the desired outcomes for a proof of concept, uncertainty and hesitation may follow throughout the organization, effectively sabotaging the project before it begins.

Without addressing deficits in skills and culture, the result is too often putting “digital lipstick” on legacy IT.

02. Innovation that's stuck in the middle

In an organization that lacks alignment at the top, middle managers are likely to be similarly confused about how to build, execute and scale pilots and innovate efficiently, exacerbating deficits in alignment and success measurement. A company may introduce a digitally driven experience quickly, but that offering will likely be an incremental improvement. What's more, it probably won't meet either company or customer expectations—or justify the investment made.

One COO of an industrial machinery company said that the inability of top management to agree on a digital value proposition has caused many ambitious digital products to stall in the middle ranks. In one instance, senior managers opted to attach sensors on machines deployed at client locations to collect data. But as of yet, the COO told us, they have no firm understanding of how any data they collect may help them.

03. Future-focused talent and legacy technology architecture

Manufacturers often fail to align talent pools and technology assets across key business functions. Many mechanized products manufacturers are burdened with legacy IT tools and solutions, which rising digital experts may find cumbersome and ill-suited to designing, developing and scaling digital offerings. At the same time, middle and senior managers often struggle to leverage new IT and digital technologies. As one senior executive put it, without addressing these deficits in skills and culture, the result is too often putting “digital lipstick” on legacy IT.

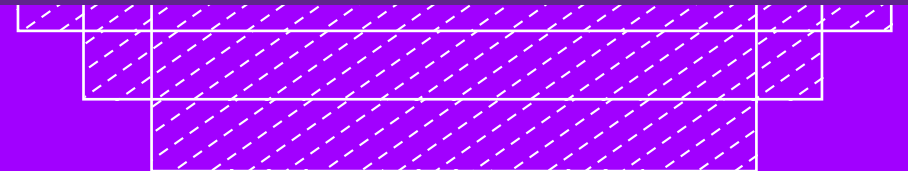
“New information systems have always induced major changes to business processes, requiring investments in both organizational change and the technology,” says Nicolas van Zeebroeck, Professor of Innovation & Digital Business, Solvay Brussels School of Economics & Management, Université libre de Bruxelles. Digital technology today goes one step further by not only imposing new work structures but also requiring new business models and rapid adjustments to accelerating innovation.

“The new work, delivery and business models require a new mix of skills, culture and governance that will deeply change existing organizations,” van Zeebroeck tells us. **“Without those complementary investments in organizational change, the technology simply cannot deliver tangible results.”**

Sasol

Sasol, the energy and chemical company, is accelerating digital transformation through cultural change and a focus on value, embracing digital at scale to stay competitive. The company has taken significant steps to transform its culture: it formed a “digital information management and hedging committee” to better leverage new technologies to support its strategy.¹ It also developed a digital roadmap to guide the company’s evolution² and launched LEAD Sasol, a leadership program that trains managers to create an atmosphere that encourages innovation.³ Sasol expects to achieve \$300 million in value by 2022 with its digitalization journey.⁴

Sasol also runs microbattles in which internal teams use data science to discover optimal ways to tackle problems and projects in equipment maintenance, finance, HR, supply chain management and energy efficiency.⁵ These efforts complement the company’s Digital Catalyst Program, an initiative designed to improve customer experience by automating key processes such as order and warehouse management.⁶ They also reinforce Sasol’s collaboration with Honeywell on a Connected Plant project developed to improve the reliability of its refining operations.⁷ Finally, its Digital Well program, in partnership with AGR Software, brings the latest time and cost modeling techniques to improve screening, analytics, planning and performance tracking for well operations.⁸



04. In-house struggles with outside agility

Manufacturers often have difficulty aligning innovations designed in-house with the agile, digital ecosystems on the outside. Failure to address this partnership deficit effectively can trigger mid-level manager and employee fears. They may wonder whether they are equipped to support the innovation or whether engineers and innovators from the ecosystem will ultimately replace them. In truth, the concept of agility all too often mystifies top management, van Zeebroeck says.

“Many large businesses in the EU are going after agility, sometimes obsessively so, to prepare their organizations for an ever more digital future,” van Zeebroeck said. **“The first step is often to set up some agile team or digital office that springs new ideas or solutions. But most of them have a very hard time scaling these initiatives internally, that is, diffusing agile capabilities across the organization, and externally, i.e., scaling up the new products or services. In many firms, agility remains an abstract concept that should apply to teams, but it’s not entirely integrated and applied by the top management itself where it should start.”**

Hewlett Packard Enterprise

Hewlett Packard Enterprise’s HPE Next initiative is tasked with overhauling the company’s operations, supply chain, manufacturing, IT and offerings to make it more agile and competitive.¹ In that spirit, HPE revamped its internal compensation, reducing the number of sales-driven compensation plans from 400 to 25.² It reorganized IT systems and processes, moving from 1,000 business processes supported by 10 ERPs to 100 business processes with a single global ERP.³ And it reduced manufacturing locations from 17 to 7 and workforce locations from 100+ to 8 central hubs.⁴

In order to grow its core businesses, HPE also launched a program called Pathfinder that allocates \$100 million per year for venture investment and partnerships.⁵ Since 2016, HPE has completed 10 targeted acquisitions, including SimpliVity, which provided an IT infrastructure platform for the company’s Hybrid IT business.⁶

The company is committed to investing \$4 billion over the next four years to create new products and services across domains such as security, AI, machine learning, automation and edge computing.⁷ In May 2017, HPE achieved a significant prototype milestone for The Machine—a research project that represents the largest R&D program in the company’s history. The Memory-Driven Computing project seeks to create the blueprint for computing in an era of big data where single-memory storing of data enables faster retrieval.⁸

REINVENT READINESS

The four actions Champions consistently take to maximize scale-up



Four ways to scale innovation like a Champion

Companies that derive the most from their digital investments handle the challenges associated with innovation differently from others. For them, it's not about making one-off decisions for an individual proof of concept. Instead, their success comes from positioning themselves to make the right calls out of habit. To maximize their scaling efforts, they have developed a muscle memory reflected and supported by their structure and organization.

By performing the following actions, companies can better address innovation-related challenges and join the ranks of Champions:

Action #1: Define the value that will guide innovation efforts

More so than their peers, Champions consistently define the value they want to capture before they set their organization to the task. They know that if their goal is not clear, they are more likely to end up trying to scale digital pilots that do not have the organizational backbone they need to succeed. They assess the opportunities before them, and, at the senior-most levels, narrow in on the market problems they want to pursue. They then use that clarity to communicate with middle management, addressing two key challenges—"Digital value driven from the top down" and "Innovation that's stuck in the middle"—and direct their innovation efforts to secure expected returns.

Consider the mining company Rio Tinto. It was able to define a value proposition when it launched a program called Mine of the Future™.¹ The goal? Finding advanced ways to extract minerals located deep within the earth while reducing environmental impacts and further improving safety.

Once they defined the value to guide their innovation efforts, Rio Tinto could realize the necessary organizational change by establishing an operations center in Perth. By doing so, it could operate its mines, ports and rail systems from a single location, greatly increasing opportunities for shared experience and overall system improvement. It also readily adopts and deploys the latest in digital technologies to collect and analyze data.

The center recently added control of the company's rock-crushing process to its responsibilities. When rocks arrive at the mine that are too big to go through the crushing stations, staff from the operations center are called to pilot the rock-breaking arms by remote control. This approach is not only making the company a safer workplace, but also delivering significant efficiencies. These range from reducing human error and maintenance cost to cutting travel time for staff.²

Action #2: Focus on internal organizational change and external digital value

Too often, there is a divide between what a company is trying to scale for customers and the technologies deployed internally to support scaling efforts. This gap can cause delays, or unexpected bursts of internal change, which can lead to the challenge of managing future-focused talent and legacy IT.

On the other hand, Champions across discrete and process industries prefer to blend organizational change and digital transformation initiatives, creating what we call an ambidextrous organization.³ Through this approach, managers and employees are less likely to feel blindsided by a learning curve that is too steep. Instead, they become accustomed to the climb and to the collaboration and flexibility it demands. The difference in willingness to embrace this approach is almost 10 percentage points higher in Champions vs. other manufacturers.

DISCRETE MANUFACTURERS:

62.2 percent of Champions are keen to embrace this ambidextrous approach, versus 52.9 percent of other discrete manufacturers.

PROCESS INDUSTRIES:

63.5 percent of Champions are keen to embrace an ambidextrous approach, while 54.8 percent of other process industries are.

For Champions, ambidexterity translates into an organization that continuously uses rapidly maturing digital technologies to grow its core and taps emerging technologies to develop and scale new endeavors.

Faurecia is a prime example. The automotive parts manufacturer is focusing on developing growth opportunities for its Smart Life on Board initiative: an enhanced, personalized driving experience for occupants within autonomous vehicles. At the same time, it's used acquisitions to bridge digital capability gaps (see case study for more details).

62.9%
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initiatives in an
ambidextrous
approach.

Action #3: Build in-house innovation factories with targeted influence

Champions recognize the enormity of integrating rapidly advancing technologies, along with talent and assets, back into their larger organization. In line with their ambidextrous approach, they want to minimize the challenges of integrating new approaches and positioning in-house innovations to succeed in digital ecosystems—the fourth challenge. So, they take the vital step to re-rig the engine of the tanker inside their own organizations, seeding and growing new digital innovations organically within organizational boundaries.

They bring in new talent, but they also integrate and develop existing talent as they go. They keep the new group linked to, and accountable to, the company's profit and losses. In this way, they can preview the effect of scaling a proof of concept on the larger organization before the scaling process begins in earnest; the larger organization is there all along. They can also integrate the new products, services and ways of working into the tanker more easily at a suitable stage.

Consider Schneider Electric's Digital Services Factory (DSF). An in-house development unit, DSF builds upon Schneider Electric's core expertise to develop innovative digital offerings and new business models. Working across Schneider Electric businesses, DSF engineers and

Accenture teams generate and incubate new ideas for digital service offerings, such as predictive maintenance services or asset-monitoring suites.

With a specific request in mind, Schneider Electric recently sought a new way to monitor the heat and humidity of its electrical distribution equipment, from transmission lines to circuit breakers. The team needed to develop a solution that would use small wireless thermal sensor technology for sensing the temperature of these assets, coupled with a specific wireless protocol for communication.

Previously it might have taken three years to go from an ideation process to scaling innovation. With the Digital Services Factory on task, Schneider Electric developed and industrialized the offering—along with an operating model to operate it at scale—within eight months. This agility and responsiveness translated into rapid-fire digital innovation in connected products and services; control at the edge of the network; and analytics, apps and services.⁴

**Executives
can preview
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Action #4: Find out what enables innovation in each business function

In the end, how do you make innovation work? It turns out that are enablers that help facilitate the process. These could be anything from using certain software applications to support operations to leveraging platforms to capture and analyze data to reveal relevant insights. We found organizations from the second group (Contenders)—and even the third (Cadets)—select the same types of enablers as their Champion peers, hoping to tackle a range of challenges, like alignment deficits or cultural obstacles. However, Champions alone are masters at matching the support to the function that needs it most and will use it best (see Figures 5a and 5b).

For example, one key enabler for Champions is to redefine ecosystem partnerships by adding new partners or rethinking existing relationships. This approach ensures Champions have access to the digital talent they need in the product design and development function. Addressing the challenges of syncing talent pools with IT assets and positioning innovations to win in digital ecosystems, these partnerships and platforms help bridge the talent, technology and data deficit required to build and scale an appropriate pilot.

Haier—the global appliances manufacturer—has been able to encourage cross-functional collaboration, and tap the strengths of a digital services platform, to deliver successful innovation at scale.

In 2005, with the foresight displayed by other Champions, Haier CEO Zhang Ruimin divided the organization into hundreds of microenterprises which join on a broad delivery platform of domestic appliances. The result is an environment with very little hierarchy. In each unit, leaders plan and communicate directly across different functions, pushing swift innovation. Direct interaction between these microenterprises and their end-user communities—unencumbered by the bureaucracy of the larger organization—feeds the innovation process as well. At the same time, the broad platform focuses on the big picture and the minutiae, gathering and analyzing big data and small, in real time, and pushing that information out to the microenterprises.⁵

Like Haier, many Chinese organizations are adept at this kind of “iterative innovation,” said Zhu Hengyuan, Associate Professor and Vice Chair at Department of Innovation, Entrepreneurship and Strategy, School of Economics & Management, Tsinghua University.

One key enabler for Champions is to redefine ecosystem partnerships by adding new partners or rethinking existing relationships.



Figure 5a:
Top enablers for discrete industries, by function

CHAMPIONS (CH), CONTENDERS (CT), CADETS (CA)	Product & Service Design			Production & Operations			Supply Chain & Logistics			Sales, After Sales Service			Digital/ Physical Security			Continuous Customer Engagement		
	CH	CT	CA	CH	CT	CA	CH	CT	CA	CH	CT	CA	CH	CT	CA	CH	CT	CA
Ecosystem partnerships redefined to secure digital talent	■									■							■	
A Digital Services Platform to collect and analyze 360-degree data in real-time				■							■	■						
Software applications and hardware orchestration to support operations														■				
Flexible engineering/design teams to build software-led hardware					■													
Systems engineers and UX designers together build smart products and services																		■
New models of functional collaboration and co-innovation to achieve on-time innovation													■			■		
Intelligent new measurement techniques		■					■											
Design Thinking driven vision and digital roadmap			■					■										
General purpose + specialized IT hardware backbone						■												
Cloud-based platforms to drive open innovation															■			
Digitized processes for new savings to drive new growth									■									

■ Enabler for Champions
 ■ Enabler for Others

Figure 5b:
Top enablers for process industries, by function

CHAMPIONS (CH), CONTENDERS (CT), CADETS (CA)	Product & Service Design			Production & Operations			Supply Chain & Logistics			Sales, After sales Service			Digital/ Physical Security			Continuous Customer Engagement		
	CH	CT	CA	CH	CT	CA	CH	CT	CA	CH	CT	CA	CH	CT	CA	CH	CT	CA
A Digital Services Platform to collect and analyze 360-degree data in real-time		CH					CH				CH							
Systems engineers and UX designers together build smart products and services				CH									CH					
Digital platforms to support opensource development																CH		
As -a-service operations and offering model																		CH
Software applications and hardware orchestration to support operations	CH																	
Digitized processes for new savings to drive new growth					CH	CH												
Humans and machine collaborate for optimal digital adoption											CH							
Engage ecosystems to co-innovate customer-relevant offerings			CH					CH					CH				CH	
Ongoing digital learning									CH									
Pervasive and preemptive security architecture														CH				
New models of functional collaboration and co-innovation to achieve on-time innovation										CH								

 Enabler for Champions
 Enabler for Others

“To begin with, they introduce a minimum viable product or service into smaller markets,” Zhu says. “They gather feedback from customers and partners in the innovation value chain. Based on this feedback they initiate the next round of product innovation—many times with stakeholders in the innovation ecosystem. In this way, they evolve the product or service very quickly and sustainably.”

“They focus on innovating at a speed that can help them roll out products and services relevant to that context,” Zhu says, whether it’s internal to the company, such as the manufacturing context or supply chain context, or external, such as the emergence of new markets.

Haier calls its operating model “rendanheyi”—ren, in Chinese, refers to the employees, dan means user value, and heyi indicates unity and an awareness of the whole system.⁶

Faurecia

The automotive interiors manufacturer Faurecia is transforming itself from a company that supports mobility solutions to one that contributes to a highly connected experience for consumers. It has implemented a smart factory initiative to improve process efficiency in tooling automation, manufacturing and logistics, quality control and management processes. It also created the role of Chief Digital Officer (CDO), whose mandate is to achieve better results from digital initiatives.¹ From 2015 to 2017, savings from efficiency gains deployed to fund innovation have increased from €57 million to €160 million.²

In 2016, Faurecia launched a Digital Enterprise Strategy with an eye towards reinventing legacy functions. As a result, the company has deployed automated guided vehicles for in-factory parts transport, connected machinery for predictive maintenance and co-bots for assisting machine operators on repetitive tasks.³ Faurecia has leveraged acquisitions including Parrot, Clarion and Coagent Electronics to build out its Cockpit of the Future and Cockpit Intelligence Platform.⁴ Through its Cockpit Intelligence Platform alone, Faurecia anticipates capturing 20-30 percent of the SUV/CUV/ Premium segment and a 60-80 percent share of new electric vehicle customers in 2025 as compared to 5 percent and 20 percent respectively in 2017.⁵ Finally, the company has established a unique network of scholars in academic research institutions and startups in key innovation clusters such as Silicon Valley, Toronto, Tel-Aviv, Shanghai and Paris to accelerate prototyping and industrialization of emerging technologies in the space of health and wellness, cybersecurity and zero emissions.⁶

REALIZE YOUR POTENTIAL

Step towards becoming a Champion



Begin your journey to becoming a champion now

In the new era of tech-driven innovation, many manufacturers are still grappling with transitioning to digital. To survive and thrive, they must catch up and quickly. They will need the right tools and teams to get up to speed at all levels throughout their organizations, from the top down.

The good news? While most of the Champions in our research made decisions years ago that positioned them where they are today, other companies can still become Champions. The four actions provide them with a game plan. In particular, would-be Champions will likely benefit almost immediately from identifying and articulating the value spaces or market opportunities they want to capture. Senior managers can also move forward by identifying a team, under the leadership of a C-suite executive. This coach and team have the critical role of assessing how well the company is equipped to support scaling successful pilots.

Like the global manufacturer that couldn't ramp up production fast enough, companies can't afford to wait to bridge the digital gaps and then innovate at scale. They must unify around testing and scaling across the board, at all organizational levels, from the inside out. Achieving success will depend on the commitment to develop and sustain an organization that is as innovative internally as it aspires to be for customers.

Companies can begin their assessment by asking:

- How much support can we provide to scaling efforts without jeopardizing legacy products and services?
- How do we think about deploying platforms, technologies, skills and ecosystem partners?
- Do we focus on key organizational levers as Champions do?

Authors:



David Abood

Growth and Strategy lead, Resources operating group, Accenture

Dave helps set our growth aspirations and the strategy to get there for Accenture's Resources operating group. The group serves clients from the energy, chemicals, natural resources, and utility industries—all of which are being disrupted by the energy transition, digital, and the rise of the circular economy. Dave and his colleagues help companies master these challenges by leveraging digital capabilities to optimize core business operations while rotating to the New.

Dave brings over 25 years of experience in defining and executing complex business transformation efforts in process industries to help clients unlock their value potential. When he's not working with clients, he is helping to shape the strategy for Accenture's Resources operating group—setting the group's offerings and talent agenda, prioritizing investments, driving acquisitions, and building strategic relationships. Besides that, Dave is also a lead sponsor of Accenture's Industry X.O initiatives.

A champion for sustainability, circular economy strategies and new energy efforts, Dave served on the United Nations Sustainable Energy for All advisory board and co-invented a method for managing energy in the household. He also volunteers with the Cleveland Hearing and Speech Center, where he has served as a president and board member.

Dave holds a Bachelor of Science in Electrical Engineering from Columbia University in the City of New York.

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Aidan Quilligan

Global lead of Accenture's Industry X.O practice

An expert in the digital reinvention of industrial businesses, Aidan leads teams that help Accenture's industrial clients to digitize their core operations to drive end-to-end business transformation.

Aidan not only brings extensive strategy, change management, and delivery experience from working with some of Accenture's largest clients from the high-tech, oil and gas, and utilities industries, but also from changing Accenture. He spent several years leading both capability-building programs and a series of mergers and acquisitions to build up the Accenture Mobility practice. Now, he's bringing his skills to do the very same things for the firm's Industry X.O organization.

By shaping the practice's strategy, capabilities, organization and culture, and by managing its ecosystem of partners, Aidan makes sure that the Industry X.O practice is fit for its purpose: helping clients master the digital reinvention of industry also known as the Fourth Industrial Revolution.

Aidan holds a Bachelor of Science in Engineering from the University of Dublin.

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Raghav Narsalay

Global research lead for Accenture's Industry X.O organization

Raghav Narsalay leads the group that creates Accenture's data models, key insights, and thought leadership for the Fourth Industrial Revolution and the shift to Industry X.O.

A highly experienced researcher with a 23-year track record in creating new-to-market thought leadership, Raghav focuses on driving high-impact research programs for both Accenture and Accenture's clients. His results have been published in the Harvard Business Review, Stanford Social Innovation Review, European Business Review and many other business and research publications around the world, and have earned him several awards and nominations.

Once named one of the youngest influential policy thinkers in India by Financial Express, Raghav continues to work with a range of Indian business and social stakeholders to promote policies that nurture both business and social welfare. He was a part of India's Insurance Regulatory Advisory Council and a member of the Skills and Employment Sub-committee of the Indian Planning Commission for the 12th Five Year Plan. At present, he is a Member of the Management Council of The Forum of Free Enterprise—an organization set up to promote entrepreneurship and freedom of speech and expression.

Raghav holds a Bachelor's degree in Statistics and Master's degree Economics from the University of Mumbai, as well as an European Masters in Law & Economics from Erasmus University.

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Aaroohi Sen works with Accenture's Industry X.O practice where he's responsible for both the ideation and delivery of the group's thought leadership research.

In his role of thought leadership principal, Aaroohi helps shape and drive Accenture's Industry X.O thought leadership agenda. With over 12 years of research experience, he is a key contributor to many of the group's key ideas, models, insights and pieces around themes like digital reinvention, inclusive innovation, operational flexibility, the future of IT and skills development. Aaroohi's models, diagnostics solutions and insights help both Accenture and client teams make better, more prudent decisions; his writing has been published by business and academic periodicals like the Harvard Business Review, Fortune, and the European Business Review.

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Appendix: Research Methodology

We surveyed 1,350 executives across a range of discrete and process producers with annual sales exceeding \$1 billion.

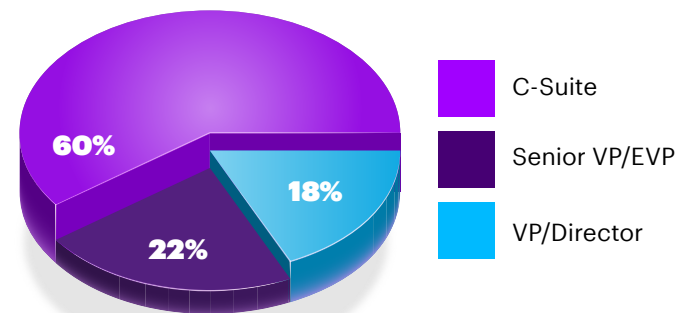
INDUSTRY % OF SAMPLE

Aerospace & Defense	5%
Automotive –	
Auto-ancillary/Auto-parts	8%
Automotive – OEM	7%
Chemicals	9%
Consumer Goods & Services	11%
Consumer/Enterprise Technology	9%
Industrial Equipment	10%
Life Sciences	
(Pharmaceuticals/Biotech)	8%
Medical Technologies	7%
Metals & Mining	5%
Oil & Gas	7%
Other Natural Resources	
(Building Materials/Forest Products)	3%
Utilities	
(Electricity/Gas/Water/Renewables)	10%

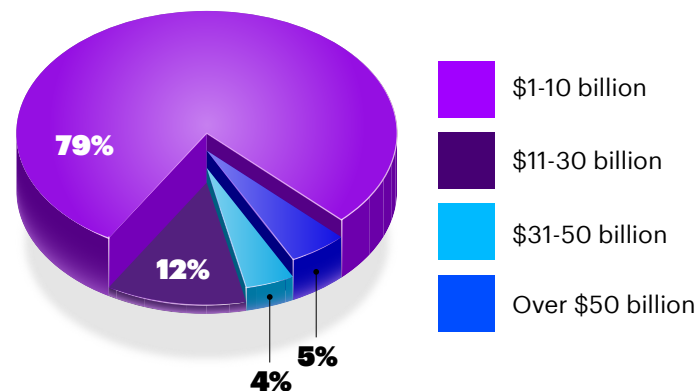
COUNTRY % OF SAMPLE

Australia	5.0%
Brazil	3.6%
Canada	1.7%
China	26.1%
Finland	0.4%
France	3.9%
Germany	5.3%
India	3.7%
Italy	3.3%
Japan	6.1%
Norway	0.4%
Spain	1.6%
Sweden	0.4%
Switzerland	2.7%
The Netherlands	1.0%
United Kingdom	5.7%
United States	29.1%

EXEC PROFILE



ANNUAL REVENUE



Appendix: Research Methodology

In our survey, companies were asked to report their names and spend on scaling digital innovations driving new experiences and efficiencies over the period 2016-18.

The consistent and clean survey data set was utilized to arrive at the set of Champions, Contenders and Cadets.

- **Champions** are companies scaling more than 50 percent of their digital PoCs and achieving a RODI higher than the average-RODI being clocked by their industry peers in the sample and their industry-level ROIC.
- **Contenders** are companies scaling more than 50 percent of their digital PoCs and achieving a RODI lower than the average-RODI being clocked by their industry peers in the sample, as well as, their industry-level ROIC.
- **Cadets** are companies scaling less than 50 percent of their digital PoCs and achieving a RODI lower than the average-RODI being clocked by their industry peers in the sample, as well as, their industry-level ROIC.

Lastly, specific questions in the survey were utilized to understand the link between organizational challenges and digital ROI. Additionally, key differences and drivers that generate higher ROI for Champions were compared to other companies.

The clean survey data was utilized to build an econometric model towards estimating the correlation between the critical level of organizational challenges and the RODI achieved.

$$\text{RODI} = \mathbf{B}_1 * \text{OrgChallenges} + \mathbf{B}_2 * \text{OtherVariables} + \epsilon$$

where:

B1 is a vector of six coefficients to capture the correlation between each organizational challenge and RODI.

OrgChallenges is a matrix that includes the data information about the six challenges groups described below. We included a single variable for each of the six challenge groups to capture the impact, challenges have on the digital ROI.

B2 is a vector of three coefficients to estimate the impact of the variables included in the OtherVariable matrix; and

OtherVariable is matrix that includes a set of control variables consisting: company size (measured by employment), level of safety measure deployed to build and scale PoC and capabilities to drive digital reinvention.

The six challenge groups on which responses were sought from the survey are:

Alignment deficit: Inability to align:

- The top management view on digital value.
- Legacy/Existing IT architecture with requirements of digital talent and asset pools.
- In-house innovation systems/architecture with agile digital ecosystems.
- Top and middle management to build teams capable of efficiently innovating customer relevant experiences.

Skills deficit: Lack of adequate skills to:

- Understand how the value chain they are supporting is being disrupted.
- Identify and articulate business case for digital.
- Innovate with digital technologies and platforms.
- Integrate customer insight into proofs of concept.

Infrastructure deficit: Inadequate technology architecture to:

- Combine multiple digital technologies.
- Innovate relevant digital value with speed.
- Manage complex integration of services channels and products to drive experiences in the New.
- Promote collaborative innovation between the business and the enterprise.

Appendix: Research Methodology

Cultural deficit: Absence of culture to:

- Identify and realize digital technology quick-wins.
- Design, develop and deliver digital business models.
- Stimulate technology driven cross-functional innovations.
- Drive on-time innovation of monetizable customer-relevant experiences.

Partnership deficit: Lack of partnerships (with suppliers, academia, startups, etc.) to:

- Handle deep data towards building a high-quality unified view of the customer and their needs.
- Bridge digital gaps across processes and operations impacting the bottom line.
- Co-innovate offerings impacting the top line with agility
- Bridge digital talent shortfalls.

Measurement deficits: Insufficient processes and metrics to:

- Systematically track digital technology investments.
- Assess the ROI on digital technology investments.
- Drive in relevant lessons from applications of digital technologies.

Correlation results from our economic model were used to inform a scenario analyses based on the key relations between organizational challenges and RODI.

About Accenture

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