Ever-ready for every opportunity

How to unleash competitiveness on the Cloud Continuum

Voices of Change

From insights to action, the path to extraordinary value starts here.

accenture

Contents

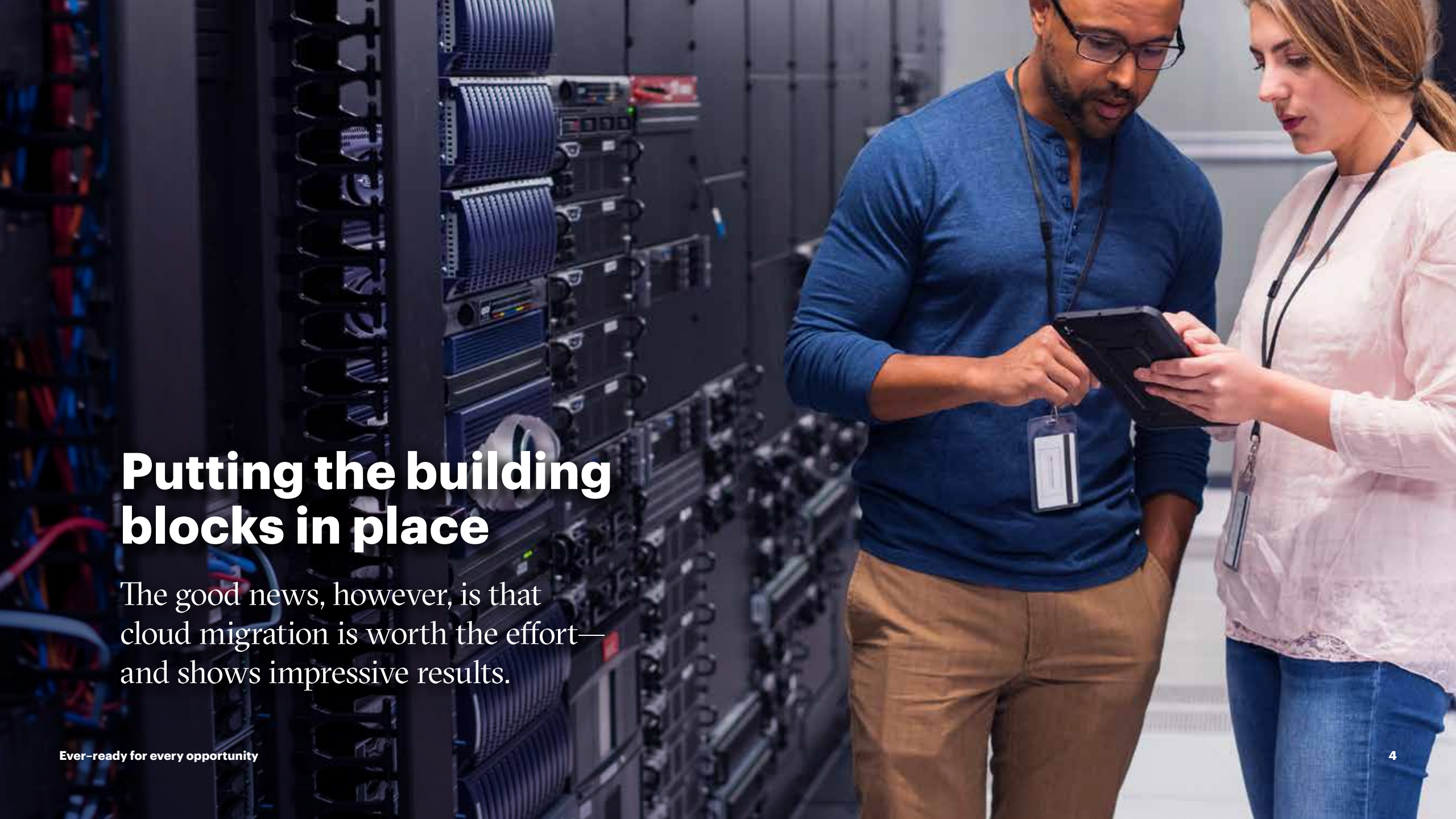
Full speed ahead

Organizations are reimagining their futures with cloud in extraordinary circumstances

Organizations' resilience has been tested like no other time in recent history, as the pandemic has changed how we live, consume and work. Transformation is the new normal.

That's why many organizations are reimagining their businesses by migrating systems and applications to the cloud. Some want to automate processes, scale capacity and create new growth opportunities. Others are migrating simply for cost savings and greater efficiency.

Regardless of the reason, everyone is migrating while their industries and businesses are in flux—with key functions such as customer service and supply chains facing new demands every day. It's akin to a ship rebuilding its engine and retraining its crew, while somehow trying to maintain its speed and course through a ferocious storm.



Putting the building blocks in place

The good news, however, is that cloud migration is worth the effort—and shows impressive results.

Viewing cloud as a Continuum

New operating models can support the ever-changing needs of business

Our global survey of about 4,000 respondents found nearly 65 percent saw up to 10 percent in cost savings from cloud migration, on average. We also found the pandemic has led many organizations to undergo compressed transformation. That is, they're accelerating the migration of their workloads to the cloud in months, not years. Over the next three to five years, more than two-thirds of workloads will shift to the cloud, with about a third of organizations moving more than 75 percent into the cloud across most regions of the world.

Almost all organizations in our survey have some presence in the cloud today. But a small subset of them—about 12-15 percent of respondents depending on region—are seeing substantial gains from their continued cloud engagement. They're benefitting even amidst global disruptions.

For them, cloud isn't just about on-demand compute, storage and network, as it was 10 years ago. Even five years ago, cloud mostly involved choosing public shared data centers. This subset of organizations recognizes the cloud as a launchpad for innovating and new ways of operating.

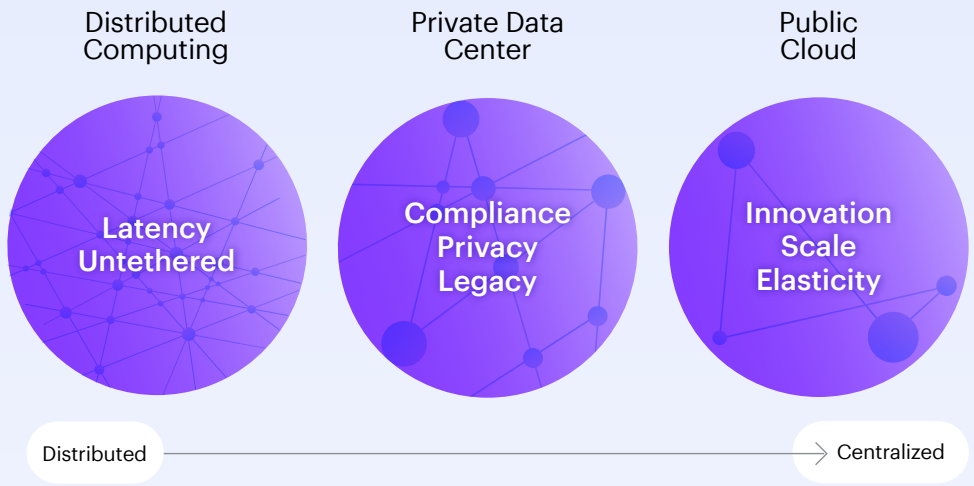
They understand that the cloud is a continuum of capabilities that span from public to edge—and everything in between. This Cloud Continuum includes different types of ownership and location (from public to private or hybrid to co-location to multi-cloud and edge), all dynamically supported by next-generation connectivity such as 5G and software-defined networks.

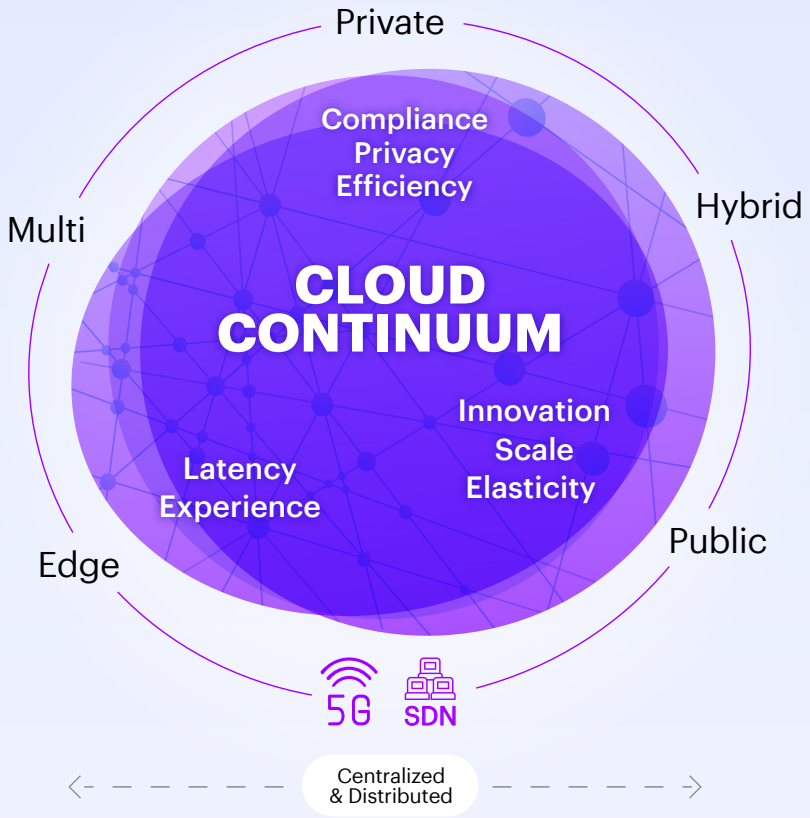
This subset of organizations harnesses the Cloud Continuum to envision a continuum in their journey—from on premises to cloud migration to growing and innovating with the cloud.

They are able to extend the Continuum vision to their entire technology stack, from infrastructure, to network, to their applications, and beyond.

> Continuum Competitors make choices from across the Cloud Continuum to create a seamless technology and capability foundation that supports the ever-changing needs of the business.

Figure 1: What is the Cloud Continuum?





From

Historically, cloud meant public cloud and shared data centers. Today, most organizations deploy some mix of public, private and edge clouds based on their needs – with very little integration among them. As a result, innovation, data and best practices realized in one part of the organization doesn't benefit others, impeding value.

Note: Bubble sizes are illustrative only and do not indicate degree of adoption

To

The Cloud Continuum includes a spectrum of capabilities and services from public through edge and everything in between, seamlessly connected by cloud-first networks, and supported by advanced, Cloud Continuum practices. The array of technologies that makes up the Cloud Continuum varies by ownership and location, from close to the enterprise to completely off-premise. Cloud-first 5G and software-defined networks unify the Continuum, allowing access to the cloud from virtually anywhere and ensuring that there are no silos among private, public, hybrid, edge or multi-clouds.

Meet the Continuum Competitors

We call these organizations Continuum Competitors because they are using the cloud not just as a single, static destination, but as a future operating model.

They're transforming how they interact with customers, partners and employees; how they make and market their products, services and experiences; how they build and operate their IT systems; and they're reimagining the role of data and compute. Critically, this approach allows them to outpace their peers on many fronts.

Continuum Competitors are:

- **Two to three times more likely to innovate and re-engineer knowledge work**
- **Achieving between 1.2x (North America) to 2.7x (Europe) greater cost reduction than migration players**
- **Up to three times more likely to use the cloud for at least two sustainability goals, such as using green energy sources, architecting for lower power consumption and utilizing servers better for a lower energy footprint**

They also aim to achieve more operational and financial goals, targeting up to 50 percent more business measures such as increasing customers and going to market faster than their peers.

Our complementary research on technology Leaders and Laggards documents a similar digital achievement gap. While technology Leaders were growing revenue at 2X that of Laggards in the years before the pandemic, they have grown at 5X that of Laggards in the past three years. For more see Make the Leap, Take the Lead

Creating the future you choose

Continuum Competitors secure their enviable position through a combination of 1) choosing the right type of cloud and cloud-based services across the Continuum to address business needs, and 2) implementing advanced practices to leverage those technologies, which allows them to use the cloud to propel innovation and business growth (Figure 2).

This enables them to reimagine and reinvent their business altogether through continuous innovation, powered by various types of cloud capabilities that operate seamlessly across the Continuum. In other words, Continuum Competitors take advantage of cloud capabilities and develop the mindset of applying them across their business, to create a unique market position.

Wherever you are on your cloud journey, it's important to understand the Cloud Continuum—and this report shows the opportunities available if you leverage it. The choices you make, along with the speed and proficiency of execution, will dictate whether you lead or follow in the next three to five years, accelerating growth during less tumultuous times and better positioned to withstand unexpected future shocks.

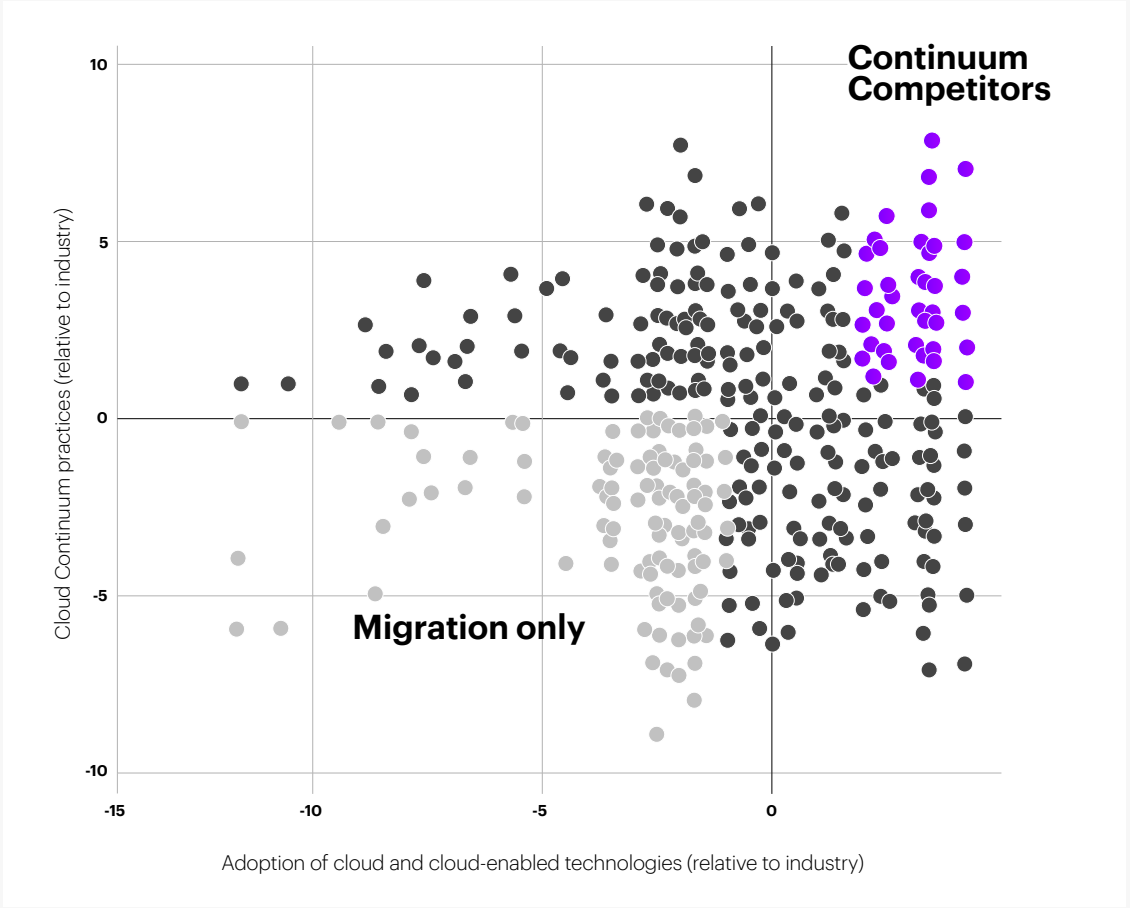


Figure 2: Finding Continuum Competitors
Continuum Competitors (purple dots) distinguish themselves from beginners on the Continuum (black dots) and those still in migration (grey dots) by getting two things right: Choosing the right type of cloud and complementary technologies from across the Continuum, and implementing advanced, Cloud Continuum practices to leverage those technologies. These decisions enable them to quickly adapt to changes by capturing feedback on products and services on an on-going basis.

25 technologies

enabled by the Cloud Continuum

A spectrum capabilities and services from public through edge and everything in between (see horizontal axis in figure 2)

Cloud

- Cloud SaaS
- Cloud IaaS
- Cloud PaaS
- Hybrid Cloud (mixed computing, storage, and services environment made up of on-premises infrastrcture, private cloud services, and a public cloud)
- Serverless Computing
- Cloud Native Applications
- Containers
- Microservice Architectures
- Multi-cloud

Real-time Data Capture and Analysis

- Data Lakes (data repository)
- Streaming/real-time data
- Big data analytics

AI and Automation

- Deep Learning
- Physical Robots
- Vision Systems
- Natural Language Systems
- Tiny ML
- Federated Learning
- RPA (Robotic Process Automation)

Security

- Cyber Threat Intelligence (CTI)/Active Defense
- Endpoint Detection and Response:
- SIEM (Security Information and Event Management):
- Trust-based Architectures

Internet of Things

- Internet of Things (IOT)
- Edge/Fog Computing

Six practices

for the Cloud Continuum

Advanced cloud practices that support permanent reinvention (see vertical axis in figure 2)

Feed-it-forward Agility: Speed time to future markets, again and again

Continuous Goals: Alignment is continuous, not episodic

Cloud-first Apps: Cloud's the developers' default

Talent Transformation: Compress transformation continuously

IT Experimentation: Unremittingly upgrade experiences

Scale Awareness: Predict the power requirements for new generation of Cloud-AI Services

Overcoming the obstacles

What are the challenges holding organizations back?

There are many reasons why migration itself can be difficult and slow (Figure 3). It's challenging enough to navigate complex legacy systems; change business and operating models; evolve architectures, applications and data; reskill your workforce; and comply with regulations.

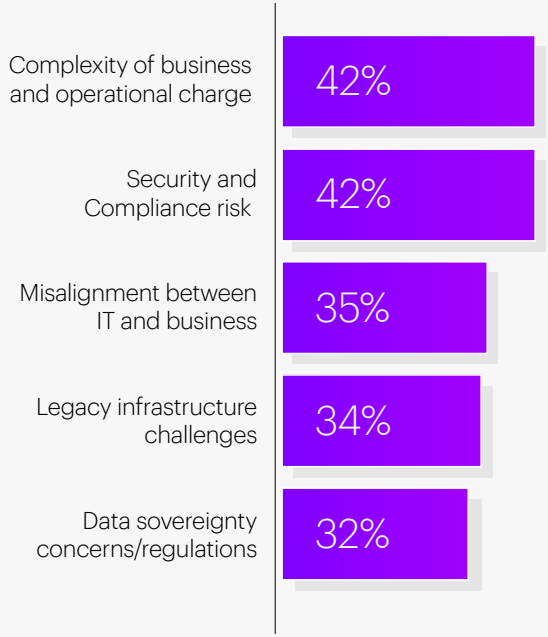
Then there's cyber-risk. Cyber-security management is getting better all the time to the extent that cloud providers are much better at providing hardened security than what's achievable on-premises, but many organizations still worry about lost or compromised data. And they are even more sensitive when it comes to migrating employee and customer data to the cloud.

But there's also widespread misunderstanding of the long-term value of being in the cloud. Some look at the cloud simply as a cheaper data center.

Others have the notion that leveraging cloud for next-generation technologies is too experimental and just not for them.

Figure 3:
Top pain points of cloud adoption

Expanding operations in the cloud is not easy. The sheer complexity of managing the business and operational change that goes along with the cloud, finding the right level of security to match your operating environment, and aligning IT and business emerge as top challenges. These challenges keep organizations from rapidly expanding cloud adoption and leveraging the Continuum.



Shaping the future

Strategic leaders are discovering how to capitalize on the Cloud Continuum

The result is a gap between action and opportunity: Although a majority of organizations are migrating, they are not exploiting the cloud to its full extent. Those that are advancing their cloud engagements, however, are leading—and even shaping—their industry transformations and pulling farther ahead of their competitors.

What's more, our research shows that organizations don't have to be so-called digital natives to move quickly and effectively in this space. For instance, 3M, Starbucks and Roche all are Continuum Competitors.

Right now, true Continuum Competitors (purple dots in Figure 2) are few and geographically scattered. When we studied their perspectives and actions regarding the cloud, as well as those that have started to move beyond a migration mindset (grey dots in Figure 2), four key approaches emerged.

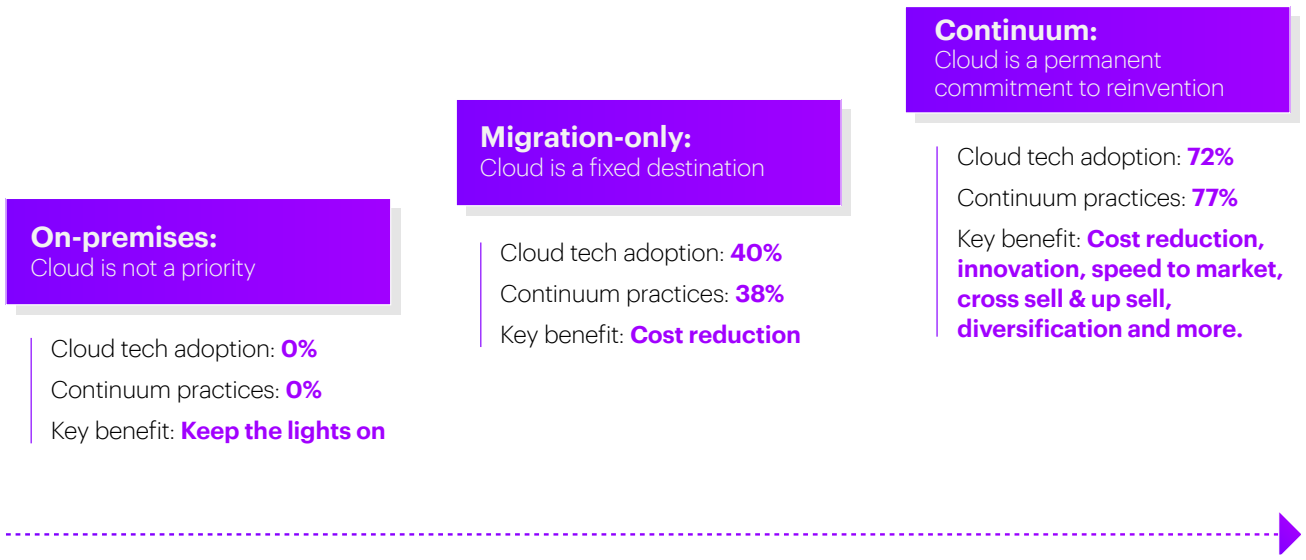
These approaches are applicable to any organization in the cloud, whether they've just started their journey or are well on their way.

Four keys to unlocking the potential of the Cloud Continuum

No matter your industry or geographic location, migrating your systems and applications to the cloud is the first step toward gaining a competitive advantage. Cost savings are often a primary driver, but it is ultimately a limiting, competitive disadvantage to look at cloud simply as a cheaper, more efficient data center. There is more to the cloud than savings (Figure 4).

Figure 4. Benefits of Expanding on the Continuum

For organizations that are leveraging the Continuum by using cloud and cloud-based technologies in more significant ways, the benefits include bottom-line savings such as cost reduction and increased speed to market, and top-line growth in sales via cross-sell and/or up-sell. The percentages are based on responses regarding adoption of 25 technologies enabled by the Cloud Continuum and six Continuum practices.



What propels your journey beyond?

Some steps toward becoming a Continuum Competitor are clear-cut. Others less so, but our global survey and in-depth executive interviews clearly demonstrate the Continuum potential and mindsets of those that recognize and exploit it.

Before you get started, however, the first step is to understand the nature of the Cloud Continuum: Speed and change are its fundamental facets. Continuum practices that can harness the continual improvements and expansion of cloud capabilities are crucial.

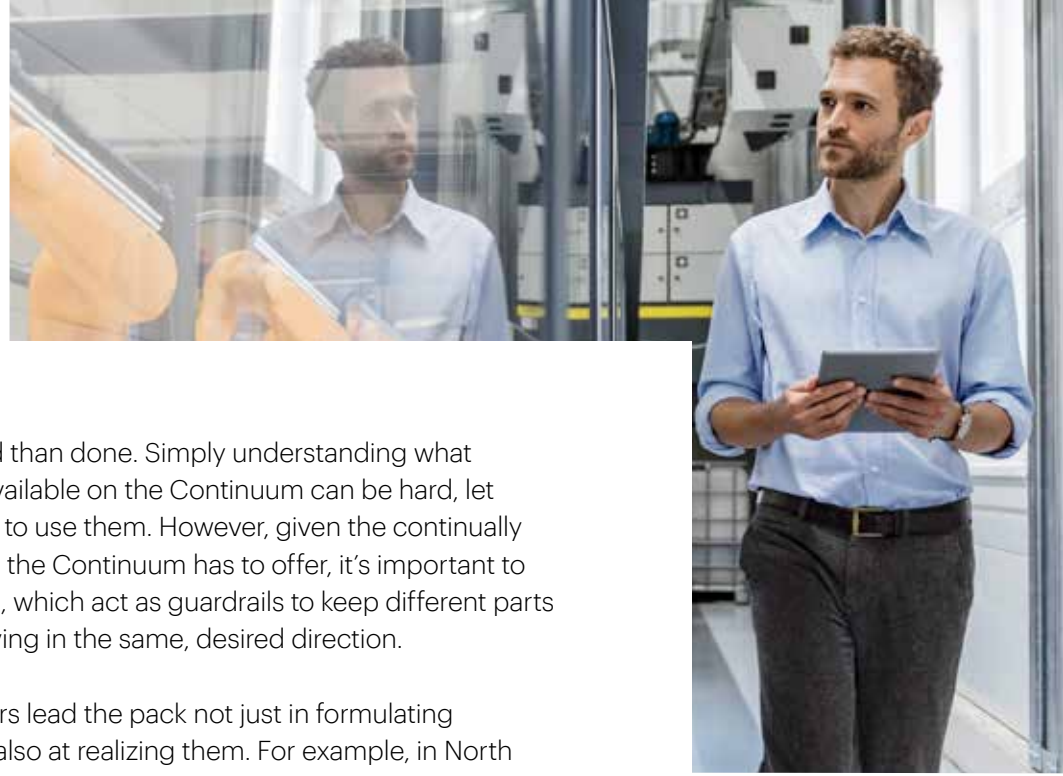
Here are the four keys to Continuum success

01

Know where you want the Continuum to take you

The greatest danger for most of us is not that our aim is too high, and we miss it, but that it is too low, and we reach it.

Michelangelo



Your vision made real

Your Cloud Continuum strategy can help you realize your business potential

In order to achieve the full potential of your enterprise in the cloud, it's important to develop a Continuum strategy that gets three things right:

- **A vision that clearly states the core values and future aspirations**
- **An identification of competitive vulnerabilities and shortcomings**
- **A clear classification of capabilities, relative to where your organization is today versus its future aspirations, leveraging the full extent of the Continuum**

To start, draw up a Continuum strategy. The Continuum is not just one technology, but many—each with its own strengths and limits. Some organizations may be oriented toward hybrid cloud with some core systems operating in a private cloud environment, but with AI, ML and natural language processing (NLP) leveraged in the public cloud for improved user experience. Others may leverage edge computing on 5G networks to reduce manufacturing defects at remote factories.

But all that's easier said than done. Simply understanding what capabilities are even available on the Continuum can be hard, let alone figuring out how to use them. However, given the continually expanding possibilities the Continuum has to offer, it's important to draw up clear priorities, which act as guardrails to keep different parts of an organization moving in the same, desired direction.

Continuum Competitors lead the pack not just in formulating ambitious visions, but also at realizing them. For example, in North America, Asia and the Latin Americas, Continuum Competitors aim for more ambitious financial and operational goals (e.g. faster time to market, increased cross sell or up sell, and increased number of customers). And, they are more likely to have realized greater levels of tech adoption, such as more widespread use of AI in knowledge work. Continuum Competitors are:

3.3x

more likely to have adopted AI-augmented knowledge work.

Siemens makes the right connections

That's the situation at Siemens AG. The 174-year-old company's rapid pivot to Industry 4.0 and becoming a highly advanced industrial manufacturer a few years ago was largely enabled by the Cloud Continuum.

Siemens made the decision to help engineering and manufacturing companies use vast amounts of data from their factories, equipment and production processes to operate more efficiently—all in alignment with the company's Industry 4.0 vision. To do so, it recognized those companies would need to embrace digital transformation—driven by automation, edge and cloud computing. It also understood those companies use a diverse landscape of different platforms, so offering cross-platform interoperability with innovation would be important.

Siemens chose to proceed with a multi-cloud, best-of-breed approach, working with multiple cloud providers to broaden the choice of platforms offered to companies, as well as investing in an advanced set of capabilities across those providers to continually optimize and improve manufacturing.

> Siemens chose to proceed with a multi-cloud, best-of-breed approach.

In depth: Siemens' smarter manufacturing

Siemens entered a strategic collaboration with Amazon Web Services in 2012 and followed up with a series of other investments, resulting in the development of MindSphere in 2017. MindSphere is a cloud-based operating system built on native AWS technologies. It can process data, in real-time, from thousands or even millions of devices and sensors in plants, systems, machinery and products dispersed throughout production processes and supply chains. All this is possible due to an architecture where edge and cloud computing are working seamlessly to deliver this business outcome.

MindSphere was deployed that same year at Siemens's own factory in Monterrey, Mexico, which manufactures more than 28 million circuit breakers and switches every year for the US market. The factory was finding it difficult to monitor the overall efficiency of equipment, including unplanned downtimes and uneven quality of production.

By connecting the factory to the cloud, workers were able to view problems such as a malfunctioning machine, in real-time, and make immediate improvements. By 2018, Siemens made MindSphere available on Microsoft Azure, which enabled a bigger base of customers to achieve quick time-to-value and scale across the enterprise.

In 2019, Siemens announced a new cooperation with Google Cloud to optimize factory processes and improve productivity on the shop floor. By combining Google Cloud's data cloud and AI/machine learning capabilities with Siemens' Digital Industries Factory Automation portfolio, manufacturers visually inspect products or predict wear-and-tear of machines on the assembly line. Another solution from its digital enterprise portfolio, Industrial Edge, allows manufacturers to collect local data from IoT devices, which can be preprocessed and sent to the cloud in small packages.

This saves both time and money, as central management of edge devices and apps reduces deployment and maintenance expenditures.

Today, Siemens' multi-cloud strategy allows it to offer offers a range of cloud-based solutions to customers in many other industries, including healthcare and infrastructure, to bring greater efficiency and cost savings from their machines and processes.

Carlsberg brews up future growth

Tech companies aren't the only ones accelerating and innovating through the cloud, however. Danish brewer Carlsberg's Sail '22 project—a strategy to cut operational costs by one-third and invest those savings in future growth—illustrates how to advance on the Continuum, with clear priorities, unwavering commitment to migration and heavy involvement of top leaders.

Carlsberg was struggling to grow amid rising costs and evolving tastes. Consumers were shifting consumption from beer to wine, spirits and craft beers—or moving away from alcoholic beverages altogether. Leaders recognized Carlsberg would need to transform into a digital business enabled by the cloud to deal with disruption and position the company for future growth. Launched in 2016, Sail '22 prompted Carlsberg to transition 100 percent of its global process workloads to the cloud, choosing Microsoft Azure as a partner.

Many organizations may not have the appetite for ambitious visions or the scale and scope of resources as Siemens and Carlsberg do. But they do set goals that can be achieved by leveraging the Continuum.

Launched in 2016, Sail '22 prompted Carlsberg to transition 100 percent of its global process workloads to the cloud.

In depth: Cheers to Carlsberg's better brewing business

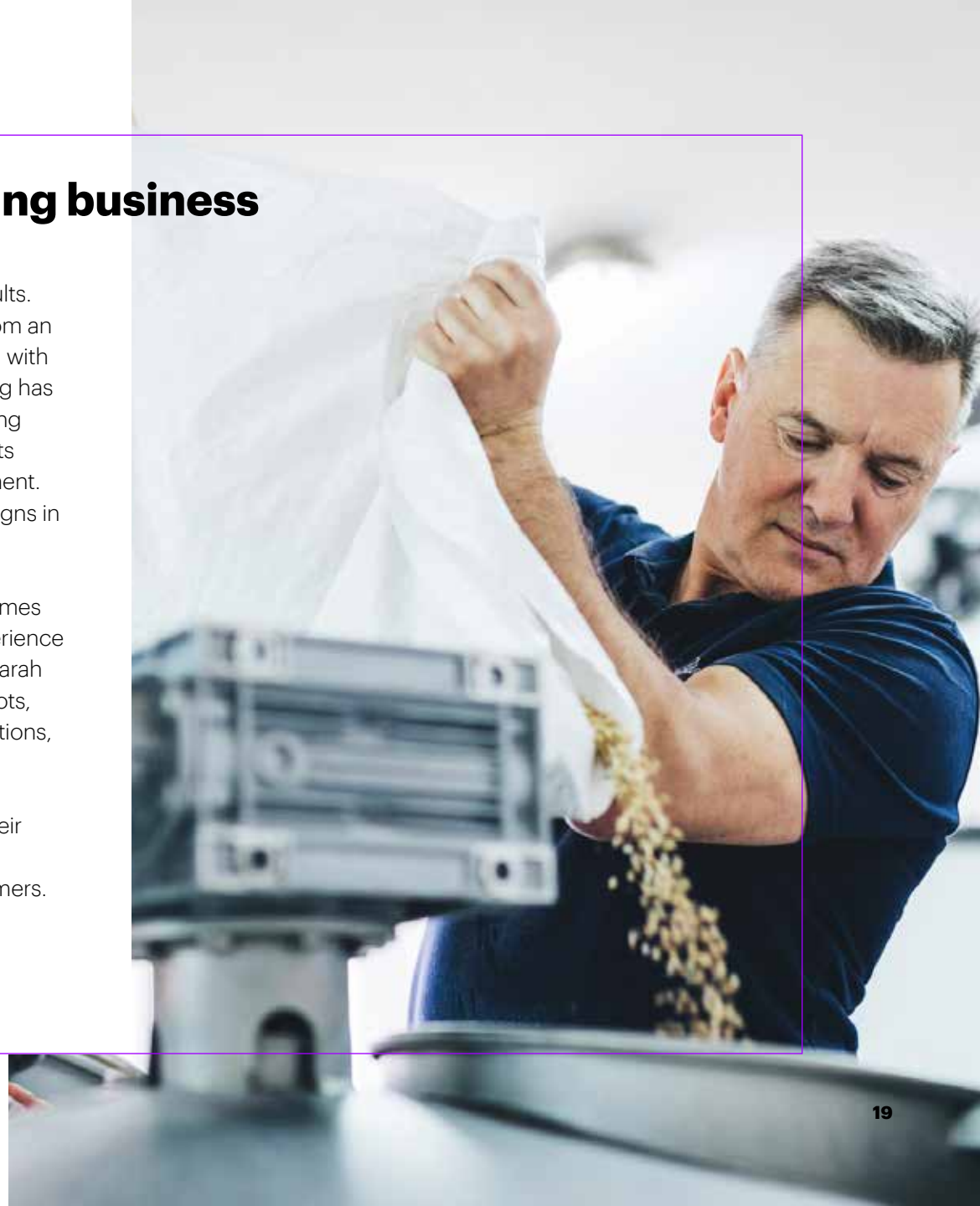
Carlsberg's cloud–enabled innovations include:

- **A "connected bar" introduced a new, sustainable, lighter-weight beer keg outfitted with IoT sensors to gauge real-time consumption and link consumption directly with marketing campaigns—a first for the company**
- **A "smart brewery" uses IoT sensors to identify problems during the production process and automatically issue maintenance requests (in development)**
- **A service delivery transformation that included setting up a new service desk, standardizing processes, applying intelligent tools, and optimizing team configurations**

Carlsberg's efforts are showing solid results. Major system incidents have dropped from an average of 13 per month to just five. Also, with the cloud's variable cost model, Carlsberg has been able to significantly reduce operating costs. Another key advantage has been its freedom to quickly innovate and experiment. It is launching new initiatives and campaigns in hours, rather than months.

"With cloud, our network capacity is 10 times what it was, which means our users experience much less latency," says Carlsberg CIO Sarah Haywood. "The use of self-service and bots, which respond to natural-language questions, is far beyond what we had before.

All this means our people get to focus their brainpower on those things that make a difference for our customers and consumers. And that is closing the gap between our technology and our business."



IKEA makes a better way

Take IKEA, a name synonymous with ready-to-assemble furniture globally. Responding to the pandemic-fueled online shopping frenzy, Barbara Martin Coppola, Chief Digital Officer, Ikea Retail says, “Imagine having orders through ecommerce that correspond to a Black Friday every single day. We have more than double the [ecommerce] volume in a very short time.”

Thankfully, IKEA had started laying the groundwork for its own digital transformation efforts several years ago, with the help of the Google Cloud team. Firmly a Continuum Competitor, IKEA was able to instantly transform their technology infrastructure, convert closed stores into fulfilment centers, and enable contactless ‘Click & Collect’ services whilst increasing the capacity to manage large web traffic volumes and online orders.

By using Google Cloud, among other key serverless technologies, they achieved within weeks and days things that would normally take years or months.

Going forward, the company has a permanent commitment to reinvention using the cloud. “Thanks to cloud, we’re able to have a real data analytics and AI revolution. This is only possible through cloud [because it’s] just not possible, capacity and computing-wise [with on-premise]. That has been a very important evolution into starting to embed algorithms across everything we do.” says Barbara Martin Coppola, Chief Digital Officer, Ikea Retail.

02

Establish cloud practices to support and augment your technologies

Being agile helps you thrive and grow

In a world where roughly one-third of workloads are in the cloud, migrating and sitting back to enjoy the ride is not a winning strategy. For instance, it's smart to build on cloud with edge, leverage PaaS services to assemble and consume newer capabilities, and adopt and apply AI/ML technologies on your data and processes. If you don't take those extra steps, you simply won't see the boost in growth, revenue and innovation that your competitors enjoy.

The key is to couple technology adoption with practices that bring discipline and help you change your non-technology areas at the pace of computational improvements. As evidence, look at Continuum Competitors, who temper their high technology adoption by following at least four out of six practices (referenced in figure 5). They adopt 25 to 80 percent more technologies (depending on industry and region), while delivering far better outcomes.

The mindset that supersedes these practices and distinguishes Continuum Competitors from up-and-comers is one of agility. During the pandemic, agility in the cloud has helped organizations not only survive, but thrive and grow.

Genie Solutions solves for telehealth

Genie Solutions, for example, is an Australian software company that helps medical professionals tackle the complexity of running a successful practice. Due to the sudden uptick in demand for virtual health visits, providers had to quickly come up with a solution. Enter TeleConsult, an end-to-end telehealth workflow solution for medical specialists. With much of their IT infrastructure already on AWS, setting up the tool with Amazon Chime was a quick process—taking less than two weeks to create the first iteration.

> Since its launch, TeleConsult has helped several hundred medical professionals each conduct thousands of virtual visits.

Research rethink at Roche

Pharma has seen similar agility-driven, time-and cost-saving advancements that led to better outcomes—and not just in response to the pandemic.

Researchers at Roche used specialized NLP systems in a particularly novel way: To mine social media conversations to better understand symptoms that impact Parkinson's patients. It was a new approach to data sourcing and analysis—both of which are native to the cloud—to rethink a traditional research process.

This was possible because of the exponential improvements in NLP tools such as GPT-3. This technology lives and grows only on the cloud; the field of NLP in the past three years has seen an increase of 15,000x in parameters supported and a proportional jump in compute power. Previously, GPT-3 had been used mostly to produce press releases, technical manuals and even computer code, but had yet to be commonly integrated into business processes.

Roche's project might have normally cost $150,000 and taken six months, but with the reimagined cloud process, it only cost $10,000 and was completed in just 11 days.

Starbucks serves up exceptional experiences

Agility is critical to being a Continuum Competitor. It is one of the six key practices we analyzed, but also underpins the other five. Embed agility into the development of new processes, and those processes will repay you by allowing for ever-more agility in the future—unleashing financial and human capital for transformation. Starbucks scores high on this kind of feed-it-forward agility and the other five practices detailed in figure 5.

It's no wonder that Starbucks hits high on agility given the company's progressive mindset, with a laser focus on exceptional experience and personalization.

After the shock of the 2008 recession, Starbucks introduced Wifi in stores, as well as mobile payment options and loyalty programs.

By 2018, 23.4 million people used the Starbucks app at least once every six months to make a purchase. Because so much of Starbucks' business has been cloud-ready for so many years, they're well positioned in the Continuum to continue to innovate and grow, even through economic and social uncertainties.

> 23.4 million people used the Starbucks app at least once every six months.

Figure 5. Cloud Practices for Continuum Success
To expand successfully on the Cloud Continuum, organizations must embrace six important practices.

Current state of practices	Continuum practices—advanced cloud practices that support permanent reinvention
Disconnected Agility: Some parts of business are agile, but others are a bottleneck	**Feed-it-forward Agility:** Speed time to future markets, again and again
Waterfall Goals: Waterfall approach to IT estate—big changes done infrequently	**Continuous Goals:** Alignment is continuous, not episodic
Cloud-last Apps: Cloud only when developing new apps, but core stays legacy	**Cloud-first Apps:** Cloud's the developers' default
Makeshift Talent Strategy: Tactical use of cloud in digital transformation, fills in gaps	**Talent Transformation:** Compress transformation continuously
IT Conservation: Keeping the lights on, no new cases	**IT Experimentation:** Unremittingly upgrade experiences
Scale Inflexibility: Perpetually underutilized or overwhelmed servers	**Scale Awareness:** Predict the power requirements for new generation of Cloud-AI Services

Agility-plus: How Starbucks perfectly blends practices and technology

1/ Continuous Goals

The cloud enables organizations to capture incremental feedback, helping them adapt their goals continuously to achieve maximum outcome.

Starbucks uses the cloud to align its business with its growing and innovative IT division. "As an engineering and technology organization," says Martin Flickinger, EVP and CTO, "one of the areas we are incredibly excited to be pursuing is using data to continuously improve the experience for our customers and partners."

2/ Cloud-first Apps

Customer experience can become exceptional with appropriate cloud-based apps.

As customer experience is the most frequently tested metric for a business like Starbucks, the company created an AI-driven recommendation platform called Deep Brew, on Microsoft Azure cloud infrastructure, that is improved continuously. This platform supports more than 100 million weekly customers, with the potential to offer in-store and drive-through recommendations that can be personalized—effectively turning every Starbucks menu into a smart, cloud-enabled edge device.

3/ Talent Transformation

Work looks different when cloud-based technologies can help you do your job more efficiently and effectively.

Starbucks is testing NLP for heads-up ordering so baristas can maintain eye contact with customers. AI-driven espresso machines allow baristas to focus on personalized crafting of the coffee. And predictive maintenance of espresso machines reduces downtime and facilitates repairs.

4/ IT Experimentation

Organizations need to be willing to experiment with the innumerable services and options the cloud offers.

Starbucks demonstrates its commitment to experimentation by fostering hackathon-styled app development. The goal is to churn out as many ideas as quickly as possible. Among those ideas is digital traceability from bean to cup via blockchain, an in-app feature for customers and suppliers alike.

5/ Scale Awareness

Starbucks' reach is far and growing, serving 80 markets with more than 30,000 stores.

This sort of scale requires clear understanding of compute power and its ability to accommodate next-generation products and services across varying locations with near simultaneous results. Working with Microsoft, the company updates new flavors of coffee instantaneously to edge-enabled espresso machines around the world.

Scale Awareness is one of the practices that points most directly to the extreme nature of technology improvements on the cloud. Organizations need to learn about the limitations in compute, performance, latency and how the Cloud Continuum can solve these issues.

The Cloud Continuum allows organizations to tap into expansive and distributed compute power, which itself is constantly improving.

03

Accelerate innovation to deliver exceptional experiences

Continuum Competitors prioritize their investments in one area: Experience.

Experience is everything

Our research found they use a combination of human-centered design and cloud-based technologies to rethink experience and disseminate throughout the entire organization, including:

- **Products and Services**
- **Employee Experience**
- **Delivery Models**

To them, experience-obsessed reimagination of their business is a competitive differentiator, which is enabled only by advancing on the Cloud Continuum. And they make their investments visible and accessible to both employees and customers.

In fact, these organizations go beyond the traditional notions of optimizing customer and employee touchpoints to innovate and deliver on exceptional experience.

Almost 90 percent of Continuum Competitors in North America, for example, used the cloud to enhance collaboration among employees and encouraged ambitious projects that cut across business functions and geographies.

They used the cloud to make work more interesting and data-driven by reducing rote tasks and manual maintenance work, or used cloud-based tools to make technology approachable. In short, they give employees human-centric experiences natively, aggregating them across different applications to reduce cognitive load.

> ...they give employees human-centric experiences.

Beautiful attractions at Sephora

Exceptional experience is a guiding principle at beauty retailer Sephora. Since 2015, its innovation lab has been using unique digital experiences to attract customers. Now it employs a wide range of AI technology across its app and in-store to make the shopping experience seamless and inviting, especially for a younger clientele.

Consider this:

- **Sephora Visual Artist: A 3D live experience enables customers to try on product virtually via Sephora's app and in-store. Sephora partnered with AI and AR app provider ModiFace to launch both its mobile app and in-store 3D augmented-reality mirror.**

- **Color IQ: A device scans the surface of your skin and assigns it a Color IQ number, which reveals scientifically precise foundation matches—an inclusive design for traditionally under-represented skin tones.**

Sephora is committed to stocking 15 percent of its products from Black-owned businesses, which helps the company stock a wider range of foundations and other cosmetics, and delivers a personalized user experience to diverse customers.

In tandem with customer-facing initiatives, Sephora also is redesigning in-house jobs, merging its digital and physical retail teams. Sephora can now look at customers from a 360-degree perspective and better use AI to target the individual shoppers.

Similarly, retail giant IKEA is embracing employee care and human-centric experiences with the cloud. The company considers caring for co-workers as a top priority – modifying ways of working, empowering employees with data and digital tools, automating routine tasks, and building advanced algorithms to solve complex problems. Using the Cloud Continuum, it has developed data models that assist co-workers, creating more efficient transportation routes, which in turn enrich customer experience.

Samsung elevates customer experiences

Customers are also the focal point at Samsung, the South Korean electronics behemoth. Take Samsung NEXT Ventures, the investment arm of Samsung NEXT—an innovation group within Samsung dedicated to identifying new growth opportunities. It is looking to provide an exceptional customer experience by getting close to where customers are—with edge computing. As such, it is developing innovative approaches to offset the lower compute power and lower data processing capabilities of edge devices. Imagine a future in which every device in your vicinity draws on the resources of every other device around you to form a system stronger than the sum of its parts—an ecosystem of connected doorbells, smart speakers and TVs, all within the same neighborhood. The resulting mini clouds—formed of edge devices owned by multiple people or even companies—could combine the low-latency benefits of computing on the edge, with some of the brute computing power of the cloud, bringing us the best of both worlds.

Meanwhile, at Samsung Research, experts are exploring AI to make customer interactions with devices and appliances hassle-free and natural. It's what the company calls "multimodal interactions," where devices and appliances can offer multiple modes of interaction, including speech, sight and touch. For a customer, this could mean giving sign-language directions to vacuum cleaners or voice commands to turn on or off air-conditioners. Today, AI systems use deep learning to achieve this type of elevated user experience.

Getting creative with coffee

Then there's Starbucks again. On the customer-facing side, the company is trying to figure out how their baristas can better serve regular patrons. Achieving that kind of personalization at a global scale can be daunting.

The company is approaching the challenge by using cloud-based analytics on the edge to let customers opt-in to personalized drive-through menus that feature their regular brews as well as recommendations based on past purchases.

It is deploying augmented reality so customers can use their phones to get the behind-the-scenes story of the coffee, from sourcing to roasting to how their cup is brewed right in front of them.

On the business side, the company regularly conducts cohort-based learning journeys on the cloud, where 20 to 30 partners come together and focus not on learning esoteric technologies, but on building hackathon-style applications. This illustrates how cloud capabilities are enabling a new kind of creative freedom for organizations willing to invest.

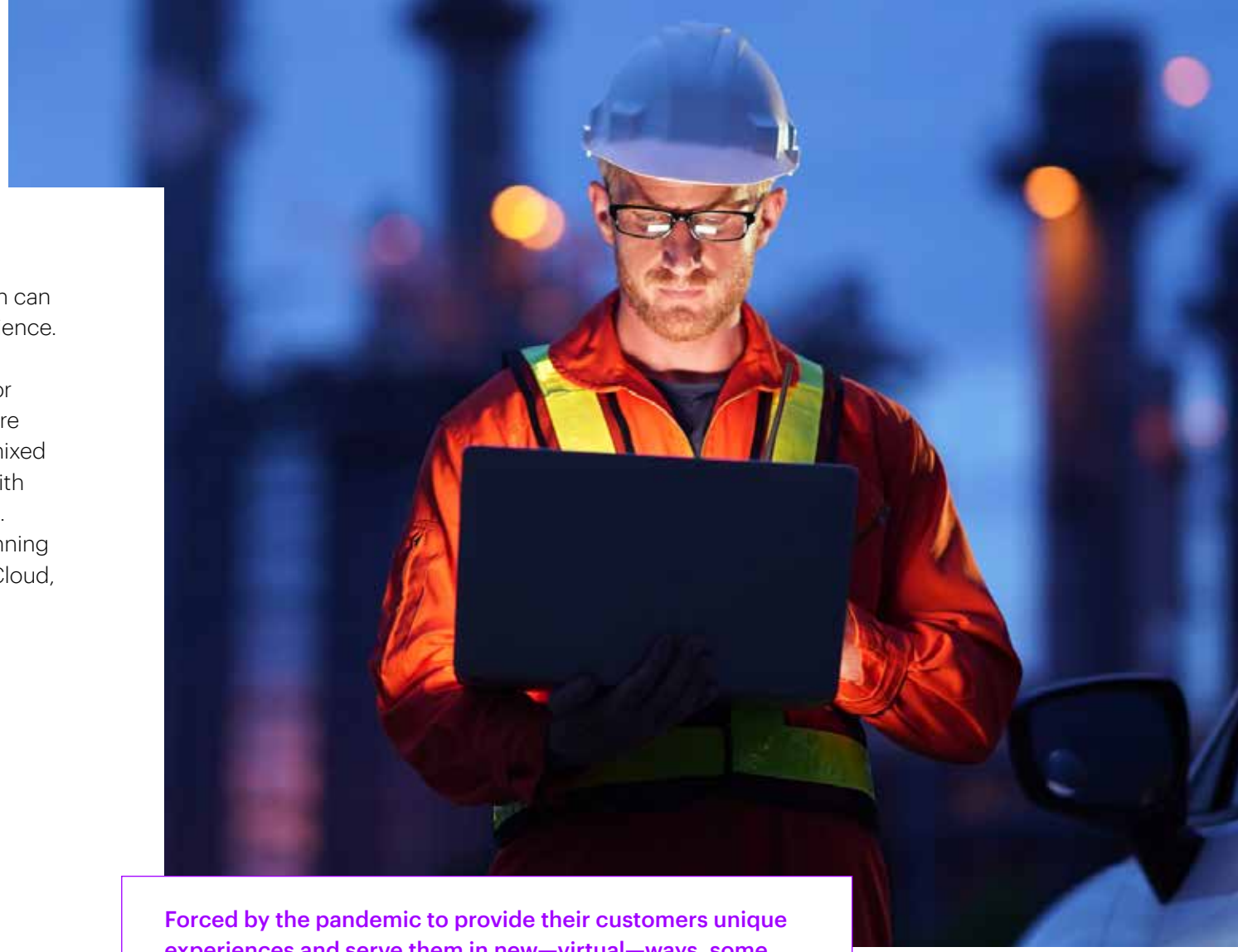
> Mini clouds of edge devices combine the best of both worlds—the low-latency benefits of computing on the edge, with the brute computing power of the cloud.

Mixing it up at Munters

Munters is another organization that illustrates how an organization can use the Continuum to reimagine and reinvent the employee experience.

The maker of energy-efficient air treatment and cooling systems for industrial and agricultural applications found onsite client visits were difficult during the pandemic. So, they enabled engineers to use mixed reality, powered by Vuzix Smart Glasses, to collaborate remotely with clients via real-time video, images, gestures, real objects and more. These glasses could be plugged into their enterprise resource planning (ERP) and asset management systems by technology partner IFS Cloud, powered by Azure.

> Today, this experience is used by more than 200 of Munters' engineers worldwide.



Forced by the pandemic to provide their customers unique experiences and serve them in new—virtual—ways, some companies compressed their digital transformation during the pandemic and Leapfrogged to higher performance level. To learn more, read about the Leapfroggers here.

04

Provide continuous strategic commitment

Today's cloud offers the chance to move from a scarcity mentality—where simply cutting costs is the goal—to a mindset of abundance where experimentation, innovation and growth can flourish.

Build your own reality

Put your customized business plan into action with the Cloud Continuum

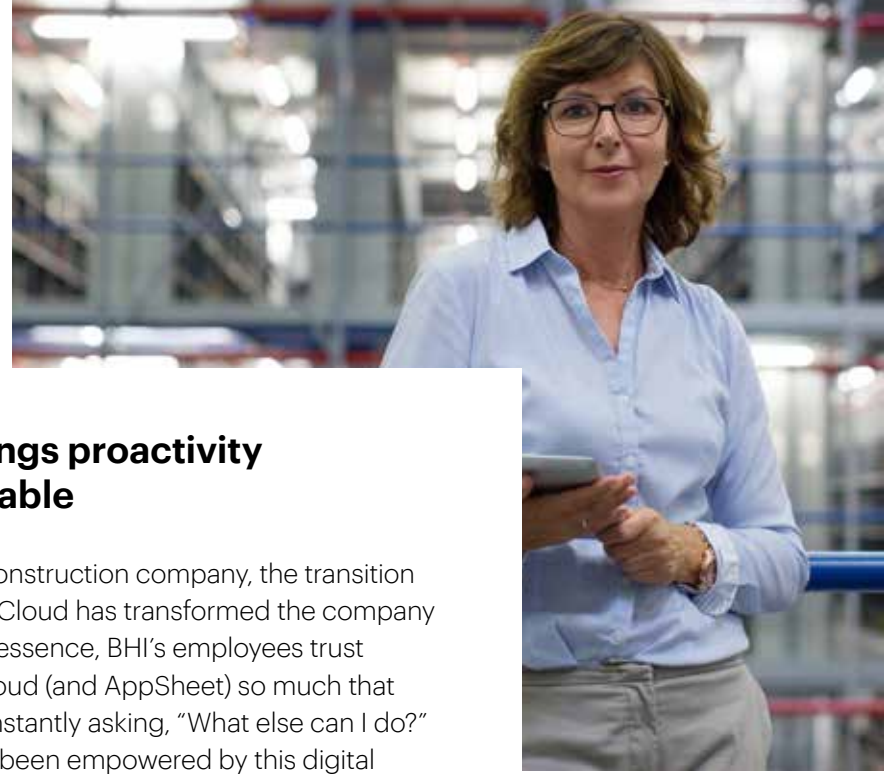
With abundance comes opportunity, a sense of limitlessness and true blue-sky thinking. But abundance can also lead to paralysis—too many choices and concern for how to integrate them into existing and future goals. Therefore, it's critical that leaders understand how to balance their own Continuum ambitions with strategic priorities that will keep the business focused.

Specifically, leadership needs to establish business objectives, appropriate levels of risk-taking, and evangelize a culture for agility and growth. This is easy enough to say, but in practice, there can be complexities around budgeting mentality, how business interacts with IT, risks and incentives, how success is measured and the project-versus-product mindset. This is why the call to action needs to come from the top—and with as much clarity and focus as possible.

But organizations also must recognize the "all-hands" nature of the challenge—everyone across the organization needs to be aware of the cloud's potential and best practices. Innovation can come from anywhere, and when more people with varying perspectives and skillsets are invited into the conversation, more possibilities abound.

To that end, we see that leadership is responsible for not only setting ambitious yet attainable goals and touting an exciting vision, but also organization-wide education and evangelism.

Leadership should intentionally go through the enterprise and ask, "What awareness are we building?" "How well do employees at all levels understand the goals and the potential of the Cloud Continuum?"



BHI brings proactivity to the table

At BHI, a construction company, the transition to Google Cloud has transformed the company culture. In essence, BHI's employees trust Google Cloud (and AppSheet) so much that they're constantly asking, "What else can I do?" They have been empowered by this digital transformation and are constantly trying to find innovative solutions using the technologies at hand. According to their Director of IT, "In just three years of using these technologies, IT has gone from being support overhead to being proactively brought to the table to take part in the business strategy."

BHI isn't alone in putting technology at the center of its strategy. Across industries we see that every company is becoming a technology company. This is possible because of the democratization of technology that has accelerated in recent years—empowering every business to build their realities with tech. Explore more in Tech Vision 2021.

Increased IT visibility and accountability has helped solve business problems and led to increased profitability.

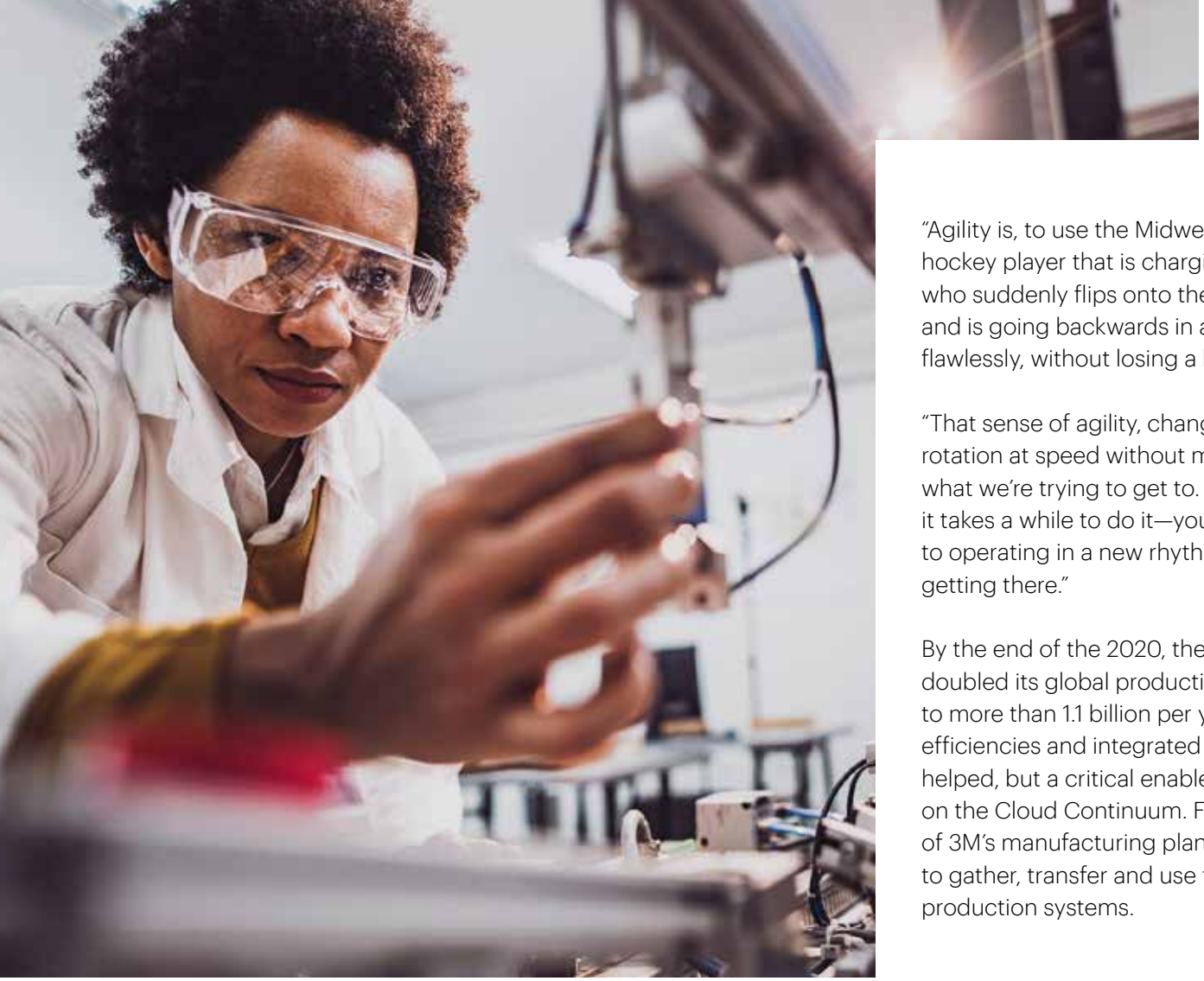
AppSheet is simple to use and produces quick results. As AppSheet is a no-code platform, and it's easier to learn how to build and maintain apps on it than with traditional platforms. In less than two years, BHI has built and deployed more than 115 AppSheet applications. This self-sufficiency with in-house, no-code app development has enabled BHI to reduce its dependence on third-party software products and freed up 10 percent of current IT spend.

> In less than two years, BHI has built and deployed more than 115 AppSheet applications.

3M scales up to double down

Similarly, at 3M, Michael G. Vale, EVP of the company's Safety & Industrial Business Group, talks about "a very strong mentality of empowerment in the organization—shared goals, shared directions, shared framework and guardrails, all empowering people to act as they see fit. With that combination of alignment and empowerment, things happen a lot more quickly and more powerfully than before."

3M started its cloud journey in 2016, selecting AWS as a partner. It started with several important applications, gradually moving more to the cloud. Then the COVID-19 pandemic struck. As hospitals across the country were in desperate need of protective gear to prevent healthcare workers from contracting the virus, 3M saw unprecedented demand for its respirators and PPE. How was it able to scale up?



"Agility is, to use the Midwestern phrase, the hockey player that is charging across the center who suddenly flips onto the back of his skates and is going backwards in a different direction, flawlessly, without losing a beat," says Vale.

"That sense of agility, changing direction in your rotation at speed without missing a beat, is what we're trying to get to. As with all changes it takes a while to do it—you have to get used to operating in a new rhythm. But I think we're getting there."

By the end of the 2020, the company had doubled its global production of N95 respirators to more than 1.1 billion per year. Supply-chain efficiencies and integrated business planning helped, but a critical enabler was 3M practices on the Cloud Continuum. For instance, at one of 3M's manufacturing plants, it was difficult to gather, transfer and use the data from the production systems.

The company decided to process and analyze big data locally—at the edge, using Microsoft Azure SQL Edge. The goal was to push data from the plant's on-premises SQL Server to Azure SQL Edge, enable downstream applications to use the data stored in the SQL Edge device and then upload it to the cloud for further use.

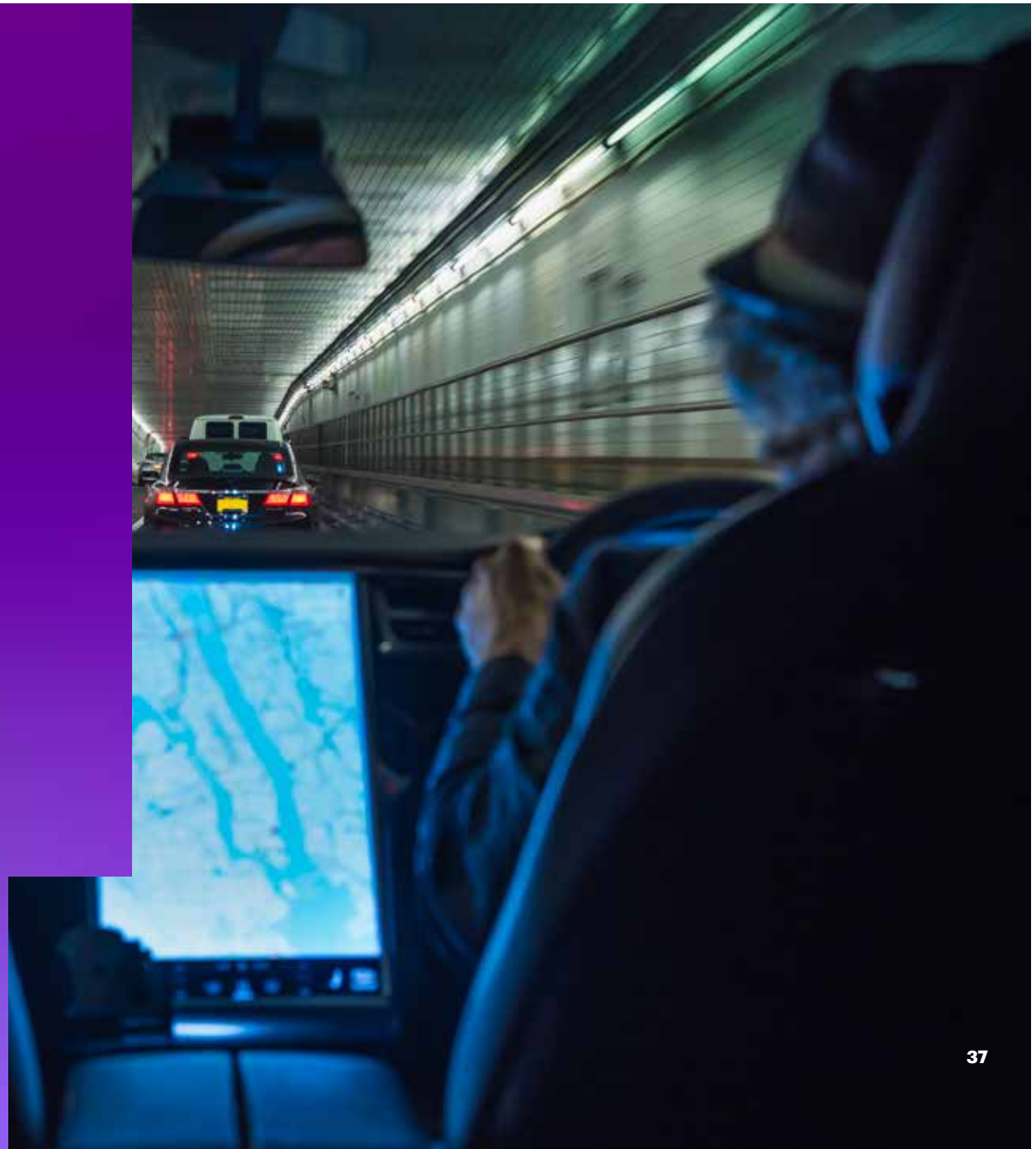
With this new edge capability deployed, the resulting faster and more streamlined processes allowed 3M to predict a manufacturing line's problems in advance, thus providing both operational efficiency, cost savings benefits and solving a novel manufacturing problem with a novel approach.

> 3M had doubled its global production of N95 respirators to more than 1.1 billion per year.

Reinventing on the Continuum

Migration of core systems and data is the foundation of a successful cloud journey—but it's just table stakes. From there, organizations must ask themselves how they can use the cloud to position themselves for sustained growth in the next three to five years.

That's why we follow the Continuum Competitors and their progress so closely. The more we research their advancements, the better we're able to chart a course for every organization looking to advance on the Cloud Continuum.



Plug into future potential

Be ready for every opportunity that comes your way with the Cloud Continuum

Continuum Competitors are ahead of the pack. They're building smart factories, efficient and resilient supply chains, sustainable products and thriving organizations using cloud-based technologies such as AI/ML, private cloud, edge, 5G and PaaS, among others. And they are finding new ways to shape the transformation of their industries by leveraging cloud-based solutions to solve industry-specific problems.

For example, life sciences companies are using solutions such as Microsoft Genomics for genome sequencing, Google DeepMind to accelerate protein folding and drug discovery, and AWS HealthLake for storing and analyzing healthcare data using NLP, AI models, visualizations and predictive insights. They're also using end-to-end systems such as AWS Monitron that use machine learning to detect abnormal behavior in industrial machinery.

Similarly, retailers are using Alibaba Cloud's e-commerce solutions leveraging intelligent chatbots, livestreaming, and personalized content recommendation.

All of this allows these organizations to meet and surpass customer expectations, retain top talent and give back to the planet as well as their investors.

This kind of success isn't guaranteed or industry specific. Achieving similar gains requires first understanding the power of the Cloud Continuum and what it can do for your organization. Equally important, your leadership must adopt and infuse a cloud-first culture throughout the organization.

Change hearts, change minds, change the way you work—and unlocking the full potential of your enterprise in the cloud will result in substantial, sustained payoffs.

About the research

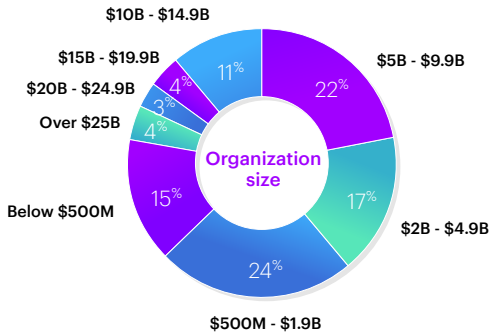
We employed a multi-method research approach. Specifically, the research program included surveys, interviews and case study research, and economic modelling. Our research, and that of our partners in our ecosystem, employs ethical and responsible research methods. Respondents reveal their identities voluntarily, we anonymize all data from organizations in our data set, and report results in aggregate. We commit to not using the data collected to personally identify the respondents and/or contact the respondents.

Organization size

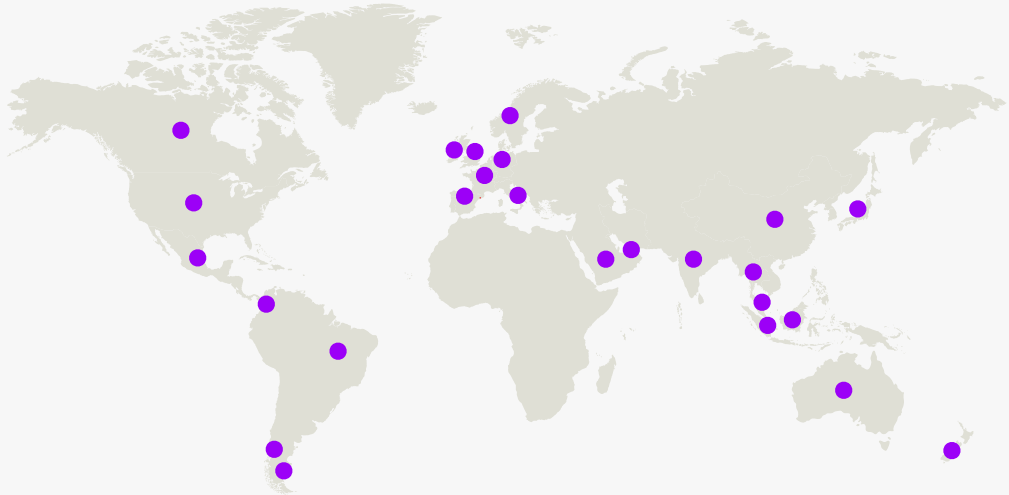
3,863 executives, global
50% of respondents with IT role
50% of respondents with non-IT role

C-level only

Our dataset contains a range of organizations from very high-growth **(16% +)** to those witnessing declining revenue and margins, and many in between.



Average margin growth: **-0.14%** Average employee growth: **1.38%**



16 Industries

Financial Services
Banking (357)
Insurance (252)

Communications, Media & Technology
High Tech (193)
Software and Platforms (326)

Resources
Utilities (295)
Energy (Oil and Gas included) (95)
Chemicals (188)
Metals and Mining (182)

Health & Public Services
Health (288)
Public Services (143)

Products
Retail (100)
Consumer Goods and Services (356)
Travel (299)
Industrial Equipment (334)
Life Sciences (277)
Automotive (178)

25 Countries

Argentina (67)
Australia (100)
Brazil (67)
Canada (200)
Chile (66)
China (200)
Colombia (25)
France (200)
Germany (200)
India (100)
Indonesia (50)
Ireland (51)
Italy (201)
Japan (200)
Malaysia (50)
Mexico (50)
New Zealamd (100)
Nordics (100)
Saudi Arabia (37)
Singapore (50)
Spain (201)
Thailand (50)
United Arab Emirates (38)
United Kingdom (200)
United States (1260)

1) Survey

The Accenture survey, completed between late 2020 and early 2021, collected data on: a) adoption and scaling of technologies associated with cloud, b) the organization's cloud journey, strategy, and goals, c) management practices around cloud, d) multiple measures of financial and operational performance, and e) the impact of cloud on innovation and sustainability outcomes.

The graphic above summarizes the survey demographics.

Inference Approach

First, we define and group organizations into those who are on the Cloud Continuum and those who view cloud with a migration perspective. That is, we identify organizations that are leading in terms of both technology adoption in the Cloud Continuum and in evolving practices and behaviors to use these technologies to their advantage. We then investigate if being on the Cloud Continuum is correlated to measures of performance.

Definition of Continuum Competitors and Migration Players:

We create an index score comprising two key elements of an organization's cloud journey: a) adoption of technologies on the continuum and b) embracing of practices that position organizations to take advantage of these technologies. Organizations in the top 30 percent of technology adoption and in the top 30 percent of adoption of practices were considered to be those on the continuum. Organizations in the bottom 50 percent of technology adoption and in the bottom 50 percent of practices were considered to be migration players.

Calculation of the Performance Difference

Using the definitions above, we compare the difference in performance between Continuum Competitors and migration players—with metrics such as cost savings, revenue growth, and innovation of supply chain/warehouse and how knowledge work is performed within the organization. We also compare organizations in terms of their ambitions and the number of operational and sustainability goals they target to achieve.

2) Interviews and Multiple Case Studies

We triangulate our findings from the large-scale primary data from the survey with multiple case studies. Overall, we collected through secondary research and interviews about 18 case studies focusing on issues organizations are facing on their cloud journey and the evolution of organizations toward the Cloud Continuum.

3) Economic Modelling

To look at how performance outcomes have changed for Continuum Competitors compared to migration players in our sample, we estimated the following equation for each of the performance outcomes for each region separately:

$$\text{Performance}_i=\sum_{j=1}^{3} \beta_{1,j}\,[\![\text{Category}]\!]_{ij}+[\![\sum_{k=1}^{n} \beta]\!]_k X_{i,k}+\varepsilon_i$$

where i is the index for organizations and j is the index for categories. Category represents whether an organization is identified as a continuum competitor, a migration player, or is somewhere in between the two. Xk is the vector of firm-specific controls such as size, industry and country.

Performance is measured as revenue growth, cost savings, number of operational goals and number of sustainability goals that organizations target.

25 technologies enabled by the Cloud Continuum

Cloud

- Cloud SaaS/Software as a service (i.e. Salesforce Sales Cloud, Workday)
- Cloud IaaS/Infrastructure as a service (i.e. Amazon Web Services EC2, Azure IaaS)
- Cloud PaaS/Platform as a service (Amazon Web Services Elastic Beanstalk, Force.com, Heroku)
- Hybrid Cloud (mixed computing, storage, and services environment made up of on-premises infrastructure, private cloud services, and a public cloud, i.e. Microsoft Azure Arc, Amazon Web Services Outpost)
- Serverless Computing (i.e. Amazon Web Services Lambda, Microsoft Azure Functions)
- Cloud Native Applications – custom (runs in cloud end-to-end, i.e. written, tested, and deployed in the cloud, using technologies and services that are cloud-based and not just rehosted)
- Containers (i.e. Running on Docker, Microsoft containers)
- Microservice Architectures (arranges an application as a collection of loosely coupled services)
- Multi-cloud (use of multiple cloud computing and storage services in a single heterogeneous architecture)

Real-time Data Capture and Analysis

- Data Lakes (data repository)
- Streaming/real-time data
- Big data analytics

AI and Automation

- Deep Learning
- Physical Robots
- Vision Systems
- Natural Language Systems
- Tiny ML
- Federated Learning
- RPA (Robotic Process Automation)

Internet of Things

- Internet of Things (IOT)
- Edge/Fog Computing

Security

- Cyber Threat Intelligence (CTI)/Active Defense: Systems that anticipate, detect, analyze and respond to external threats such as malware, hacks, sovereign threats, etc.
- Endpoint Detection and Response: Systems that monitor endpoints to detect threats to network and devices
- SIEM (Security Information and Event Management): Capabilities that allow for firms to collect logs from throughout the network, normalize that data, and analyze it for security events
- Trust-based Architectures: Architectures that allow for privacy-protecting ML models such as federated ML, tiny ML, secure multi-party computation, differential privacy, encrypted computation and others to happen at the edge

About the authors

Karthik Narain
@KarthikSNarain

Karthik Narain leads Accenture Cloud First, with responsibility for helping clients shape, move and operate their business in the cloud to accelerate innovation and achieve their digital transformation goals. In his role leading Accenture Cloud First, Karthik is focused on extending the company's leadership in cloud with Accenture's ecosystem partners and through investments in deep industry capabilities and solutions, cloud acquisitions, and talent. He is also a member of the company's Global Management Committee.

A technology industry veteran, Karthik most recently served as the lead for Accenture Technology in North America, helping guide Global 2000 brands in using the power of the cloud and other technologies to transform their businesses. Over his 20-year career, he has led many innovative technology programs for clients across a variety of industry sectors, including Financial Services, High Tech and Software and Platforms. Karthik also previously led Technology services for Accenture's Communications, Media and High-Tech industry segments.

H. James Wilson
@hjameswilson

H. James Wilson is global managing director of IT and Business Research at Accenture Research, where he leads global research programs on the impact of technology on enterprises and work. Wilson is co-author of the bestselling book "Human + Machine: Reimagining Work in the Age of AI" (Harvard Business Review Press). He is author or contributing author of eight books on the impact of technology on work and society, including most recently, "AI, Analytics, & The New Machine Age" (HBR Press 2019) and "How to Go Digital" (MIT Press 2019). Wilson wrote "The Jobs Artificial Intelligence Will Create," MIT Sloan Management Review's #1 Most-Read article of the year and is a longtime contributor to The Wall Street Journal and HBR. He is currently finalizing a new book on the future of enterprise technology with Paul Daugherty (HBR Press).

Acknowledgments

Research Lead

Surya Mukherjee

Project Team

Douglas Chandler
Gargi Chakrabarti
Jakub Wiatrak
Katherine Greene
Krish Jhaveri
Maria Francesca Mecca
Mark Klinge
Melina Viglino
Prashant Shukla, PhD
Shital Sharma
Thijs Deblaere

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