Accenture Digital Health Technology Vision 2021

Leaders Wanted

Change Experts at a Moment of Truth

Voices of **Change**

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

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Preface

We are pleased to share with you the 2021 version of our technology vision series for the healthcare industry. As every year, the Digital Health Technology Vision report is based not only on Accenture's views, but also on health industry leaders' views on the impact of technology in our world. This year, we surveyed 399 healthcare executives across six countries to learn from their perspectives. We are grateful for the opportunity to blend their views with our recommendations.

Amid the challenges of 2020, two truths became evident: More healthcare organizations have come to terms with the notion that every business is a digital business. This year also accelerated exponential transformation as technology continuously reshapes industries and the human experience. Now, as we begin reimagining our post-pandemic reality, the healthcare industry must learn to become skillful at change and recognize that there is no leadership without technology leadership. **For instance, 66% of healthcare executives say they will be in the cloud within the next year, 96% within three years.**

Healthcare has been digitally transforming, but now it's happening at speed and at scale. **Among healthcare executives we surveyed, 81% say the pace of digital transformation for their organization is accelerating.** In just a few weeks at the beginning of the pandemic, the UK's National Health Service rolled Microsoft Teams out to 1.2 million employees to communicate with each other and with patients at a distance.[1] Overnight, health organizations no longer had walls and care at a distance became the norm. Companies like Amwell scaled up virtual care offerings—and infrastructure—at unimaginable speed to get help to people where and how they needed it.

Digital achievement lags came to the fore as healthcare organizations began to compress their decade-long transformation agendas into two- to three-year plans. With tech transformation happening so quickly, there was no longer time to wait and see or scale incrementally. **Healthcare executives (93%) report that their organization is innovating with an urgency and call to action this year.**

Healthcare is hungry for a new kind of leadership

100%

of healthcare executives say the COVID-19 pandemic created an unprecedented stress test for their organizations. Top stressors?
1. Technology architecture
2. Strategy
3. Workforce
4. Processes

The gap between healthcare's digital leaders and laggards grows by the day and waiting it out will only put some further behind. Today's leaders will prioritize technology innovation in response to a radically changing world marked by virtual care needs, rapidly changing healthcare consumer expectations and a rise in new ecosystem partnerships.

To be successful, the healthcare C-suite must adopt a digital-first, people-centric approach across all areas of the organization. They will architect the future and recognize that business and technology strategies are increasingly indistinguishable. This is a unique moment to rebuild the world better than it was before the pandemic.

Kaveh Safavi
Senior Managing Director – Global Health

Andy Thompson
Managing Director – Technology

Brian Kalis
Managing Director – Digital Health

Jenica McHugh
Managing Director – Technology Strategy

Will you watch the world change around you?

Or be the one leading it?

Geisinger Health System accelerated its investments in API modernization and microservices, gaining the agility and scalability it needed to seamlessly move to remote visits, double their remote workforce, and build a digital screening system and dashboard to let administrators do things like view real-time patient population data, reduce waits and ensure social distancing.[2]

LET THERE BE CHANGE

Accenture Digital Health Technology Vision 2021

Completing the Picture

This year's Accenture Digital Health Tech Vision identifies five emerging trends that healthcare companies will need to address over the next three to five years to accelerate and become skillful at change in all parts of their organization:

Stack Strategically

A new era of industry competition is dawning—one where healthcare organizations compete on their technology architecture.

Mirrored World

Growing investments in digital twin technologies (e.g. IoT, data streaming and 5G) are giving rise to a new generation of business and intelligence: the mirrored world.

I, Technologist

Natural language processing, low-code platforms, robotic process automation and more are democratizing technology, putting powerful capabilities into the hands of people across the organization.
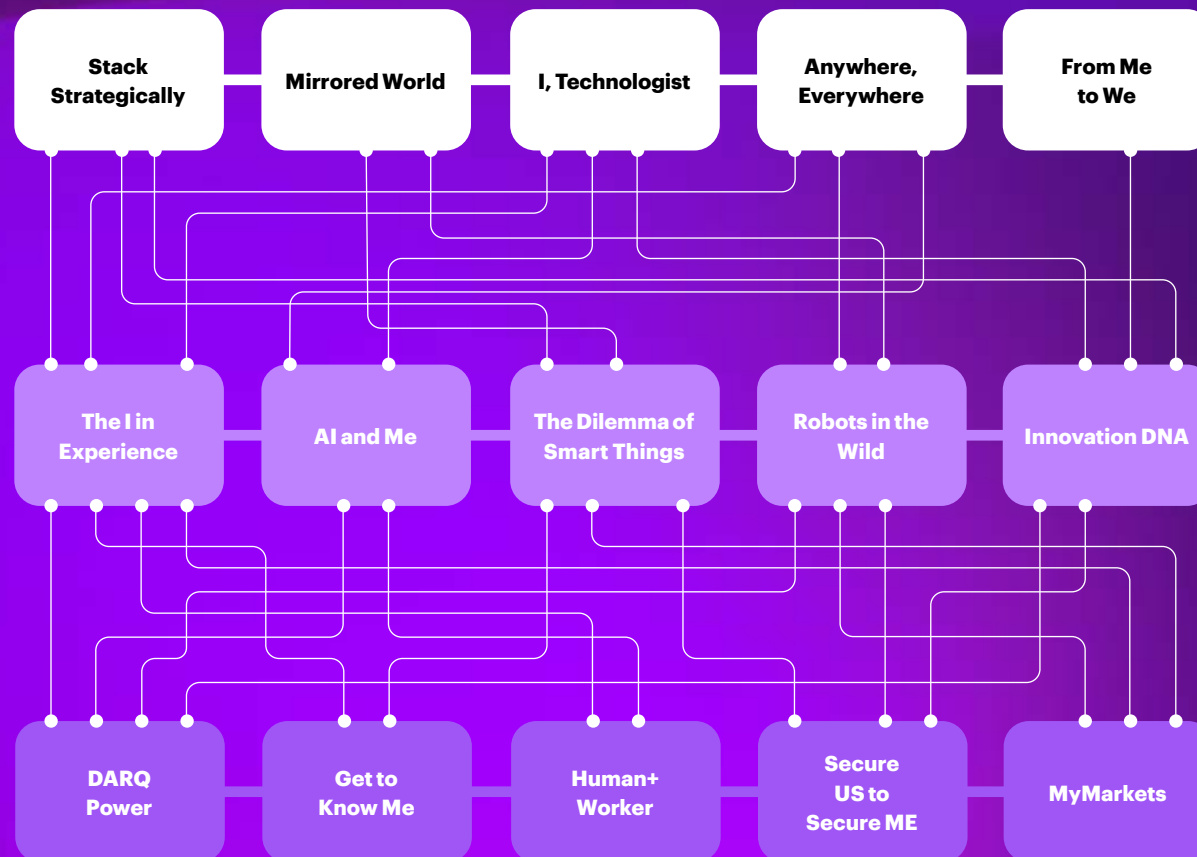
Anywhere, Everywhere

It's time for organizations to transform remote work from an accommodation to an advantage.

From Me to We

Global disruption ignited a scramble to reimagine partnerships—and multiparty systems gained newfound attention.

Accenture's Digital Health Technology Vision report is released on an annual basis and comprises a three-year set of technology trends, currently including trends from 2020 and 2019. It's important to recognize that each year's trends are part of a bigger picture. Tracking how they evolve over time offers a glimpse into how they may continue to grow in the future.

2021 Trends

- Stack Strategically
- Mirrored World
- I, Technologist
- Anywhere, Everywhere
- From Me to We

2020 Trends

- The I in Experience
- AI and Me
- The Dilemma of Smart Things
- Robots in the Wild
- Innovation DNA

2019 Trends

- DARQ Power
- Get to Know Me
- Human+ Worker
- Secure US to Secure ME
- MyMarkets

Trend 1

Stack Strategically:

Architecting a better healthcare future

Eighty-seven percent of healthcare executives agree that their organization's business and technology strategies are becoming inseparable—even indistinguishable. However, few healthcare organizations approached it this way prior to the pandemic. Now they have to. Technology is reshaping industries and accordingly, healthcare leadership demands technology leadership. In today's world with a rapid influx of new technologies, architecture matters more than ever.

In this new era for healthcare, technology is no longer one-size-fits-all. There are more technology choices than ever and the selections that an organization makes can define its value proposition today and tomorrow. It's a battle of technology stacks. From the distribution of cloud deployments, types of artificial intelligence (AI) models and wide range of edge devices, to the design, or even basic physics, of hardware and computation – each layer of the stack is expanding into new dimensions. There is ample room for ingenuity, but it will require dynamic, sustainable architectures that take advantage of the full spectrum of capabilities today.

The most dynamic, sustainable and competitive architectures will allow healthcare organizations to build unique solutions that evolve with the organization's goals. As such, **73% of healthcare executives say that their technology architecture is becoming critical to the overall success of their organization.**

Fortify:
Creating Technical Wealth

Stacking strategically includes investing in core digital technologies – social, mobile, analytics and cloud (SMAC) – which are the foundation of the post-digital healthcare organization. Many healthcare organizations have yet to invest in a strong foundation on which to build a competitive technology stack. They are bogged down by technical debt that accumulates as legacy solutions that were perhaps leading edge at the time become outdated and hinder the enterprise from realizing its strategy. For instance, hospitals making future-oriented technology choices need to shorten the horizon from decades to years. And health

plan core administration system choices are made with intent to last for decades, even though technology options change every year. Gone are the days where technology can be hardwired in the hospital or health insurer.

Instead, healthcare organizations can build technical wealth by moving away from static, unadaptable legacy systems and developing a future-adaptive, reusable approach to technology. Building tech wealth requires redesigning the technical foundation with modular, flexible building blocks that allow the organization to accommodate change in real time—not just cloud lift and shift. Building applications using microservices is one way to use composable elements that can be swapped in or out independently, scaled or repurposed over time.

The right cloud partner can bring the capabilities and talent to enable this digital transformation, but they all bring different attributes. Healthcare organizations can look for a partner that understands the industry nuances, but it is also important to think horizontally about the stack to solve for more than cloud. Those that excel at specific capabilities, such as data and analytics, can support differentiation and help create a competitive edge. So one strategic choice is to pick a partner that will accelerate how you go to market with cloud-based solutions that cover the whole vertical technology stack, versus those that only become skillful at a single horizontal capability. There is no one right answer who to pick, it all depends on the healthcare organization's business goals.

92%

of healthcare executives believe that their organization's ability to generate **business value** will increasingly be based on the limitations and opportunities of their **technology architecture**.

Extend:

Competing Through Tech

Healthcare enterprises need to reimagine the future of their services, operations, and more through the lens of what technology can make possible. The right stack can bring this future to life. During the pandemic, NVIDIA demonstrated the value of a holistic approach. The company launched Clara Guardian, a virtual patient assistant voice application that let hospitals rapidly respond to an unprecedented situation. With Clara Guardian, they could remotely monitor patient's vital signs, enforce the wearing of PPE, direct employees and visitors away from high-risk areas, have contactless interactions with patients via voice-powered AI and

more. Technology powered every layer of the stack: smart sensors, pre-trained data models, and edge AI chips and GPUs to support voice-powered assistance and dynamic wayfinding. These technologies helped hospitals reorient to everchanging needs and situations and will continue allowing them to do so after the pandemic.[3,4,5]

Having the right business and technology strategies, backed by a valuable combination of technologies across the stack, can give healthcare organizations the agility they need to keep up, no matter how the world changes next.
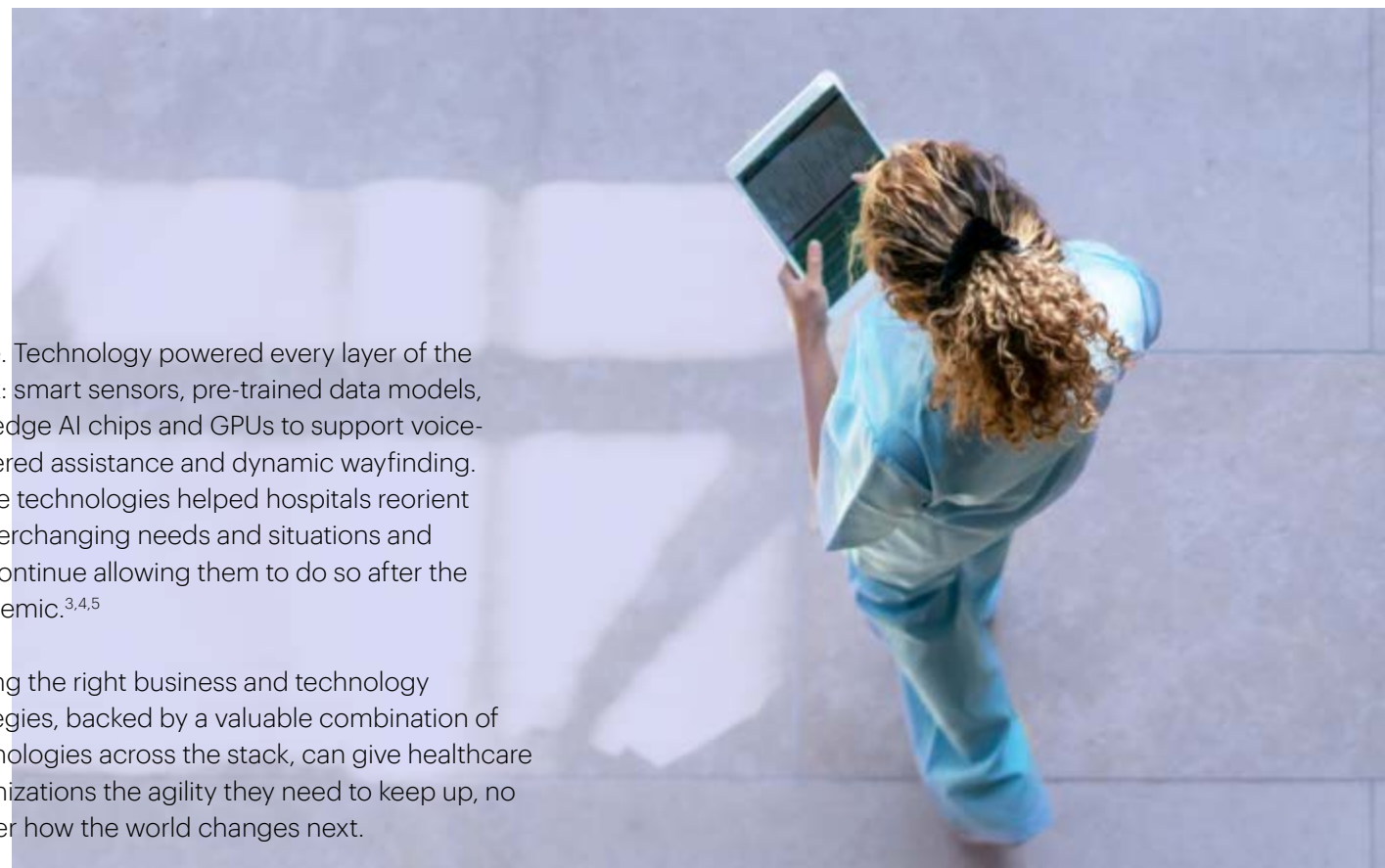
Reinvent:

A new generation of healthcare technology and business

Healthcare organizations that reimagine the possibilities of technology-powered products and services will soon find they are playing a more active role in the relationship between people and technology than they ever have before. The fusion of technology, business and human ingenuity can work wonders in healthcare, even enabling clothing to be a remote-sensing device. Nanowear—a nanotechnology-based connected-care and remote diagnostic platform—announced a remote diagnostic research alliance with Hackensack Meridian Health Systems and uses clinical-grade nanosensors in garments

to analyze multiple cardiac, pulmonary and circulatory biomarkers, creating a holistic personalized digital signature for each patient capturing 120 million data points per day. The smart garments send diagnostic signals to a mobile app and physician portal so providers can monitor conditions such as high blood pressure, diabetes and stress.[6] The solution enhances the patient/doctor experience and allows providers to deliver more personalized care.

Microsoft has spent years developing its HoloLens augmented reality device, primarily thinking about use cases where the information of the digital world could be visually mapped and blended onto a user's physical environment. But now with Project Tokyo, the company is using the HoloLens as an agile platform to create offerings that fill new roles in people's lives. A team at Microsoft has begun to refit the device to help the visually impaired engage with their environment. The team designed several new machine learning models that repurpose the

computer vision and hardware acceleration capabilities on the device. One model uses the device's spatial sensing to help users understand the layout of their environment. It detects people's poses and distances, and relates that information to the user through spatially tuned audio cues. Another model repurposes the machine vision capabilities for facial recognition, taking pictures of the environment and scanning faces to provide the wearer with people's names (if the scanned individual has opted in).[7]

Technology capabilities create limitless possibilities for improving care for people. As healthcare organizations accelerate their innovation strategies, they need to learn from lessons of the past and be strategic about the technology choices they make today as they will define the future.

Scaling up virtual health

Mercy and Humana are joining forces to expand access to virtual health services, with the help of an infrastructure that was positioned to scale. Humana Medicare Advantage Members who are patients of Mercy's more than 4,000 integrated primary and specialty care clinicians in Arkansas, Kansas, Missouri and Oklahoma now have convenient in-network access to Mercy's virtual services that offer the 24/7 help of more than 300 clinicians such as virtual primary care in the home.[8]

Decision Points

Fortify: Is your healthcare organization prepared to be a technology leader?

Revisit (or create) your vision for the future of technology in healthcare, looking at what has accelerated, what has lagged and what has changed forever. Accelerate investments in core, scalable, agile and composable technologies like cloud, microservice APIs and analytics to build competitive advantage.

Extend: How are you creating a competitive edge with your technology choices?

Focus on building technical wealth. Reimagine your approach to application development to take advantage of cloud capabilities, microservices and the flexibility they unlock. Begin testing or scaling efforts and investments in next-generation DARQ – distributed ledger, artificial intelligence, extended reality and quantum computing – technologies.

Reinvent: How will next-generation technology reshape your relationship with patients and members?

Business and technology strategies are becoming inseparable, even indistinguishable. Recognize that how you build your technology stack will have impact on the speed, scale and flexibility in which you face patients and members with new digital solutions. Invest in creating technology wealth in the technology that supports your digital channels as much as you invest in the customer-facing technologies themselves. Make trust a core design principle of new technology strategies. Prioritize data privacy, ethical design, continuous governance and mitigating embedded bias as you build.[9]

Trend 2

Mirrored World:

The Power of Massive,
Intelligent, Digital Twins

Supply chain and facility capacity breakdowns due to COVID-19 spurred the rapid adoption of digital twins that can monitor, simulate and streamline data from devices. Growing investments in digital twin technologies (e.g. IoT, data streaming, 5G) are introducing a new generation of intelligence and opportunities to help people: The mirrored world. Healthcare leaders are connecting massive networks of intelligent digital twins to create living models of facilities, supply chains, medical products—even body parts and organs. Digital twins provide answers to key questions that will soon be essential to every healthcare enterprise's digital strategy. **A quarter of healthcare executives report their organizations are experimenting with digital twins this year**.

With digital twins, you can model the physical world in a digital format. Digital twins can gather, visualize and contextualize data from across their physical assets and products, bridging their physical operations and digital capabilities. On the clinical side, digital twins can model future scenarios, such as surgical simulations, or help with medical education, research and care delivery. Boston Children's and Klick Health teamed up to help children voyage through their own "twinned" endoscopies, seeing polyps and inflammation along the way.[10]

On the business process side, digital twins can help improve operational efficiency, for instance, through modeling digital representations of healthcare facilities, healthcare workers in facilities and track and trace of supplies to better match supply and demand. They can optimize scheduling or identify bottlenecks in workflows. They can help to predict what types of patients will walk through the doors. By dynamically responding to real-time information and future scenarios, the digital twin can help design and simulate these scenarios long before constructing or changing a physical process, procedure or facility.

The mirrored world will allow healthcare leaders to bring data and intelligence together at unprecedented scales; ask and answer big-picture questions critical to their survival; and reimagine how they operate, collaborate and innovate.

66%

of healthcare executives expect their organization's investment in **intelligent digital twins** to increase over the next three years.

Fortify:

Unleash the Power of Data

To begin to prepare for the mirrored world, healthcare digital twins need to pull data from objects, people and physical spaces. As everything becomes "smart," it all becomes part of the digital twin environment. Healthcare organizations first need a strong and comprehensive data foundation to access the organizational insights and greater agility the mirrored world promises. Few have put in the effort and investment to ensure data is generated, captured, managed and reused consistently

at scale. Success will require a strategy for real-time data collection—whether investing in sensors and IoT devices to collect data, or the tools to prepare, analyze and visualize the massive amounts of information gathered through data streaming. And the data must be of good quality.

Incomplete or incorrect data will lead to false conclusions—which is especially risky in healthcare. For instance, if a mirrored hospital has bad data on where a crash cart is and what supplies it holds, this could lead to the inability to locate needed supplies in an emergency because the model is not an accurate representation of reality. High-quality historic data is critical for intelligent twins as it is how they monitor real-time machine performance, build models of healthcare consumer behavior to help design custom products and more. But COVID-19 has made historic data increasingly unreliable because machine learning models learn based on what's "normal." Last year was anything but. Every business will need to check and correct models as sudden or widespread changes occur.
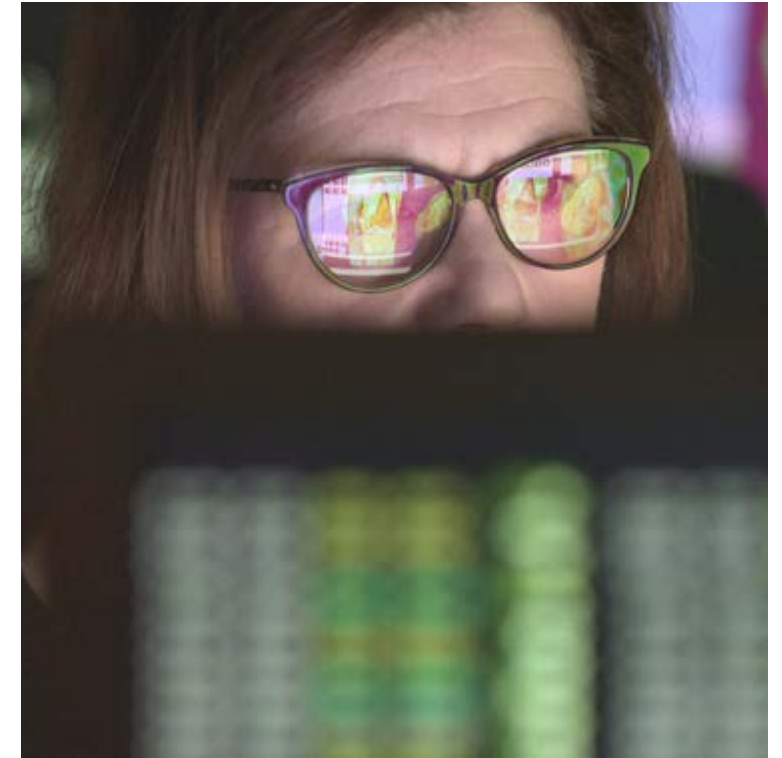
Extend:

A Risk-Free Playground for Innovation

Intelligent twins have powerful simulation capabilities that—with the right data foundation in place—can help healthcare organizations reimagine innovation processes. Digital twins offer a risk-free playground to explore innovations, strategize for many possible futures and test limitless "what-if" scenarios. For instance, Mater Private Hospital in Dublin used digital twins to solve issues related to overworked staff, increasing complexity and out-of-date equipment in its radiology department. With the help of a virtual copy of the department, engineers could test (and easily reverse) changes to procedures and scenarios without disrupting daily operations. By evaluating scenarios and implementing the most efficient, the hospital reported shorter wait times, tests that used to take months were completed in hours, MRI capacity rose by 32% and staffing costs dropped by more than $10,000 annually.[11]
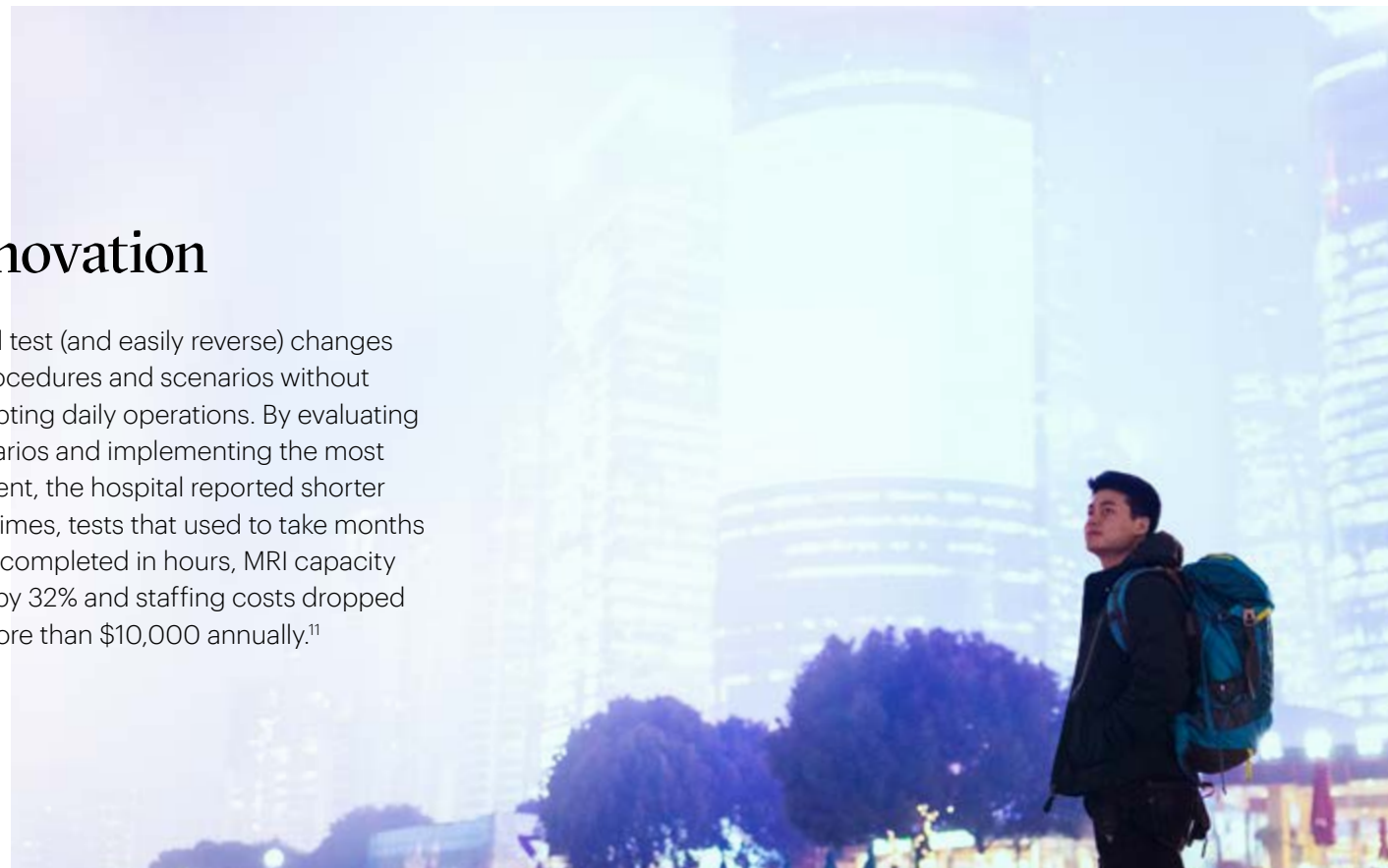
Digital twins can connect the right data, the right AI models and human workers to explore possibilities, futures and strategies in a safe place. Imagine the possibilities when it comes to surgical training and simulation of medical devices and treatments. Digital twins that mirror the heart, for example, and allow clinicians and machines to work together to pre-simulate optimal therapies and even avoid unnecessary interventions. Miniature sensors allow people to be monitored throughout their daily lives, sending data that allows clinicians to simulate heart function for a variety of circumstances, including walking, sleeping and climbing stairs. Data used to model and update a digital twin of the heart can help fill in the gaps for cardiologists who often don't have a complete picture from hospital tests or when patients describe their symptoms.[12]

While some healthcare organizations are experimenting with simulation today, they aren't doing it at scale. These capabilities will only become more valuable as using multiple twins in fully mirrored environments lends tremendous power to create innovations that help people.

Reinvent:

Build the Big Picture

Healthcare organizations do not operate in a vacuum; they rely on supply chain partners, digital collaborators and even the government. Gaining big picture visibility means reflecting what goes on outside of your own four walls. It's about mirroring what is inside—as well as outside—your organization. **In fact, 87% of healthcare executives say digital twins are becoming essential to their organization's ability to collaborate in strategic ecosystem partnerships.**

Some are pursuing twin-enabled visibility with select partners. Soon, the organizations building intelligent twins will be able to interact and collaborate within mirror environments in ways that organizations without twins will simply not be able to access.

These early examples foreshadow the mirrored world's coming role. Healthcare has an important opportunity to not only be part of it, but also lead the way. As more healthcare organizations digitize their physical operations and systems with intelligent twins, they will be able to share designs, information and insights easily across silos and across ecosystems, virtually test innovations and deliver care in ways that were not possible before.

Oklahoma State University (OSU) and Ansys explored using the power of digital twins to better target tumors.[13] Respiratory treatments for lung tumors can also damage healthy tissue, so it's important to make sure that as many of the drug particles as possible reach the tumor rather than other areas of the lung. OSU and Ansys developed digital twins of human lungs, then simulated drug delivery for different models of patients with different particle sizes, inhalation rates, and initial locations. By experimenting with these factors, they found a delivery method that may let doctors increase the accuracy of drug delivery to 90%—much higher than the 20% common for conventional aerosol methods.

Decision Points

Fortify: Is the business prepared for the Mirrored World?

Create a solid data foundation by auditing your data practices. Evaluate the tools and technologies you are using and deconstruct data silos. Digital twins will need a healthy data "supply chain" to be effective, so look for ways to capture data through IoT and build streaming analytics capabilities.

Extend: How can digital twins transform your innovation process?

Develop a list of key use cases for where digital twins will generate the most impact for people and for your organization. What are the clinical and operational opportunities to use digital twins to drive innovation and breakthroughs?

Reinvent: How will your organization engage wider ecosystems of digital twins?

Design digital twins from the outset with the intent to share them with the ecosystem. Make application programming interface strategy a priority and build a short list of potential digital twin-driven partnerships.

Trend 3

I, Technologist:

The Democratization of Technology

Democratization is breaking down traditional divisions between the technology and business sides of the healthcare organization. Powerful technology capabilities are being put into the hands of the workforce so that they may become agents of change, optimizing their work or remedying pain points on their own. Natural language processing, low-code platforms and robotic process automation (RPA) are just a few of the capabilities and services making technology more accessible.

When people across the business have the power to create technology solutions, those closest to day-to-day business can tackle them head-on. Everyone can be an innovator that sparks transformation. This doesn't mean turning everyone into an engineer, but rather giving them access to new tools and enabling them to think like technologists and solve problems with technology that is easy to understand and program. **Among healthcare executives we surveyed, 84% say they must train people to use and customize technology solutions at the individual level, but without highly technical skills.** Of course IT is still part of the equation, managing large implementations and injecting leading-edge technology into the healthcare organization.

This shift could not come at a more critical time in healthcare. As organizations compress digital transformation into a rapid timeframe, they can use these tools to empower all workers to help lead the way.

92%

of healthcare executives agree that for tools of technology democratization, organizations need to ensure that training strategies include a focus on security and data governance.

Fortify:

Bypass the Skills Gap

Healthcare traditionally lags other industries in digital transformation. Organizations may not be investing in the right areas to help them be future-ready, and they struggle to recruit and keep tech talent, as high performers prefer to work for leading tech companies. But even as specialized technical skills remain in high demand, healthcare organizations can lean on technology democratization to circumvent the skills gap in some areas. It's a parallel strategy that will further close the disconnect between workforces and the technologies needed to deliver the most creative solutions to benefit patients everywhere.

The historic reluctance from some clinicians to work with a tech solution designed by their IT departments is due to the belief that it steals time from the patient. By making clinicians part of the technology innovation equation, they can tailor and build tools themselves. Some front-line clinicians may still push back regardless, as they are notoriously overworked and carried even more burdens during the pandemic, and may not be able to prioritize tech work items. Health insurers are discovering how digital and AI can have transformational power for their workforce. On average, AI and intelligent technologies could free up to 55% of a health insurer's workforce capacity, allowing them to work on more strategic tasks.[14]

With such benefits at hand, there isn't time to wait and hire someone tomorrow to build solutions needed today. Consider healthcare provider Geisinger. In the first months of the pandemic, they saw a 50% decline in outpatient visits and a sudden surge in in-patient and ICU needs.[15] The company faced a major challenge trying to get the right healthcare professionals to the right places at the right time, and they sprang to action with democratized tech. By using Quickbase low-code development, they were able to build an app to help coordinate and assign the thousands of healthcare workers in their network in just two days.

Leaders in the future will be the ones who rethink their approach to meeting their skills needs. It's no longer just "who can I hire?" but "how can I empower?"

Extend:

Activate Grassroots Transformation

Healthcare organizations must invest in their people to establish a grassroots layer for digital transformation. This includes upskilling your current technology workforce and leveraging technology democratization for all employees to circumvent the skills gap in some areas. You don't need to teach them how to become expert coders, but you do need to train them to think like technologists. This will require a two-pronged approach: teaching workers which tools are available to them and how/when to best deploy them, and also making a real investment in employees' technology literacy. It's also important to

teach technologists how to be business people who understand healthcare. When both sides are empowered with skills and knowledge, they can better collaborate to support the needs of the organization.

When it comes to sharing available tools, it's important for people to understand how to see technology not just as a tool, but as a solution. When workers think like technologists, they understand how to create the best solutions to solve a problem or address a need.

Training initiatives should elevate general technology know-how and tech literacy for all employees. Accenture has adopted this approach with our Technology Quotient (TQ) Training. Employees across the company are learning the basics of key technologies, such as AI, blockchain and cloud, to understand how these technologies work and how they can benefit client projects. Making these types of investments in the knowledge and thinking of your people can transform what they—and the organization itself—can do.

Reinvent:

Power Your New Innovation Engine

The value of technology democratization and wide-scale technology training will only grow over time in healthcare. Right now, leaders have a chance to reimagine the intersection of technology and the organization—and ultimately to reinvent how their IT and non-IT employees work together. Norms will be tested about who "owns" technology and business growth in the company, as it will, in some ways, be owned by all. Likewise, norms will be challenged about who owns business growth and patient outcome improvement.

With every employee empowered to contribute technological solutions to business needs, the pace of transformation will no longer be limited to how quickly IT teams can roll out new solutions. **In fact, 92% of healthcare executives believe technology democratization is becoming critical in their ability to ignite innovation across their organization.**

Overcoming the friction between IT and business

UnitedHealth Group, like many, has often struggled to align its business and IT sides.[16] When challenges arose with the company's claims-processing applications, UnitedHealth Group turned to low code from Pegasystems Inc. The company found that low code provided a useful bridge between business needs and IT support.

It created a common and intuitive platform for business stakeholders and developers to work together iteratively, allowing business users to have a hand in shaping solutions and giving developers a better idea of what needed to be built. It empowered the groups to work together more seamlessly and proactively than before.

Decision Points

Fortify: Is your organization poised to take advantage of technology's growing democratization?

Pick one area where you can begin experimenting with technology democratizing solutions – test this in non-critical environments, such as in back-office functions. Identify what tools your organization may already have access to, or what additional investments need to be made, to power grassroots innovation.

Extend: How are you training your workforce to think like technologists?

Invest in technology literacy and training programs to empower workers with new skills recognizing their varied time availability and prioritization possibilities. This includes upskilling your current technology workforce and teaching employees the "business of tech" by ensuring plans to adopt democratized technologies are accompanied by training for security, governance and more.

Reinvent: How can democratized technologies make IT groups more effective—and vice versa?

Establish voluntary teams to support and guide the use of democratized technologies across your organization. Try using technologies like low-code platforms to bridge the gap between the business and technical sides of your organization so that the workforce truly embraces tech innovation and makes it "theirs."

Trend 4

Anywhere, Everywhere:

Bring Your Own Environment

The pandemic shattered longstanding views about how work gets done—and from where. Healthcare was hit hard as organizations had to fortify the front lines while shifting some employees to remote work. Physical distance became a necessity, even for those delivering care in person. The industry responded immediately, standing up virtual collaboration and virtual care capabilities to meet demand that spiked overnight. Look at NHS Digital – the IT provider for social and health systems in England – which partnered with Microsoft and Accenture to make Microsoft Teams available to 1,275,000 NHS staff.[17] The platform let doctors conduct virtual appointments, allowed the NHS to host virtual "town hall" events, and made it easier for staff in isolation rooms to communicate and collaborate with colleagues outside.

Healthcare entities invested in digital collaboration tools (55%) and remote monitoring capabilities to support their remote workforce during COVID-19. While these were a necessity at the time, now we can look at how new digital services and remote work can extend the healthcare organization's mission and fuel a competitive advantage. We are moving into a new future where a large portion of work can be done from anywhere. Of course in healthcare, some work—such as surgical procedures—must be conducted in a clinical setting. However, there may be ways to increase productivity by having a dispersed workforce (remember, you can test it with a digital twin or empower them with democratized technologies).

No matter what the hybrid composition of the workforce, the technology implications will endure. Think back to the "bring your own device" (BYOD) movement, where companies allow employees to bring their laptops or smartphones into the office to perform their work. Now we've moved beyond BYOD to BYOE: employees are bringing entire environments to work. While they may be on an employer's laptop, that laptop is connected to a personal home network that also hosts smart speakers, security cameras and more.

Healthcare executives (82%) say that leading healthcare organizations will start shifting from a BYOD to a BYOE workforce approach. When done right, this new reality can empower employees to innovate from anywhere to help patients everywhere.

89%

of healthcare executives believe the remote workforce opens up the market for difficult to find talent and expands the competition for talent among organizations.

Fortify:

From Patchwork Solutions to Permanent Strategy

Healthcare organizations have adapted to half of the BYOE equation: Rapid rollouts of collaborative technology and expansions of existing solutions. Now that that the initial rush to step up virtual care and remote work is over, it's time for the other half of the equation. Making certain that BYOE work can be done seamlessly and securely because employees' environments have become a permanent part of the enterprise attack surface. For instance, workers' homes have become part of today's workspace, and they sit outside of an organization's secure architecture. Workers bring their own environments, further opening the door to cyber attackers that can cause complications for users of these devices and healthcare providers.

When speed was of the essence, many have let down their guard. US regulators allowed use of consumer technologies such as FaceTime and Zoom and for virtual visits with safe harbors from HIPAA, for example, and other regulations.[18] Now that the shockwaves are settling and short-term solutions did their job, it's time to move to longer-term solutions with security at the center. By addressing your BYOE risks and pain points now, your organization can capitalize on new ways of working while doing so safely.
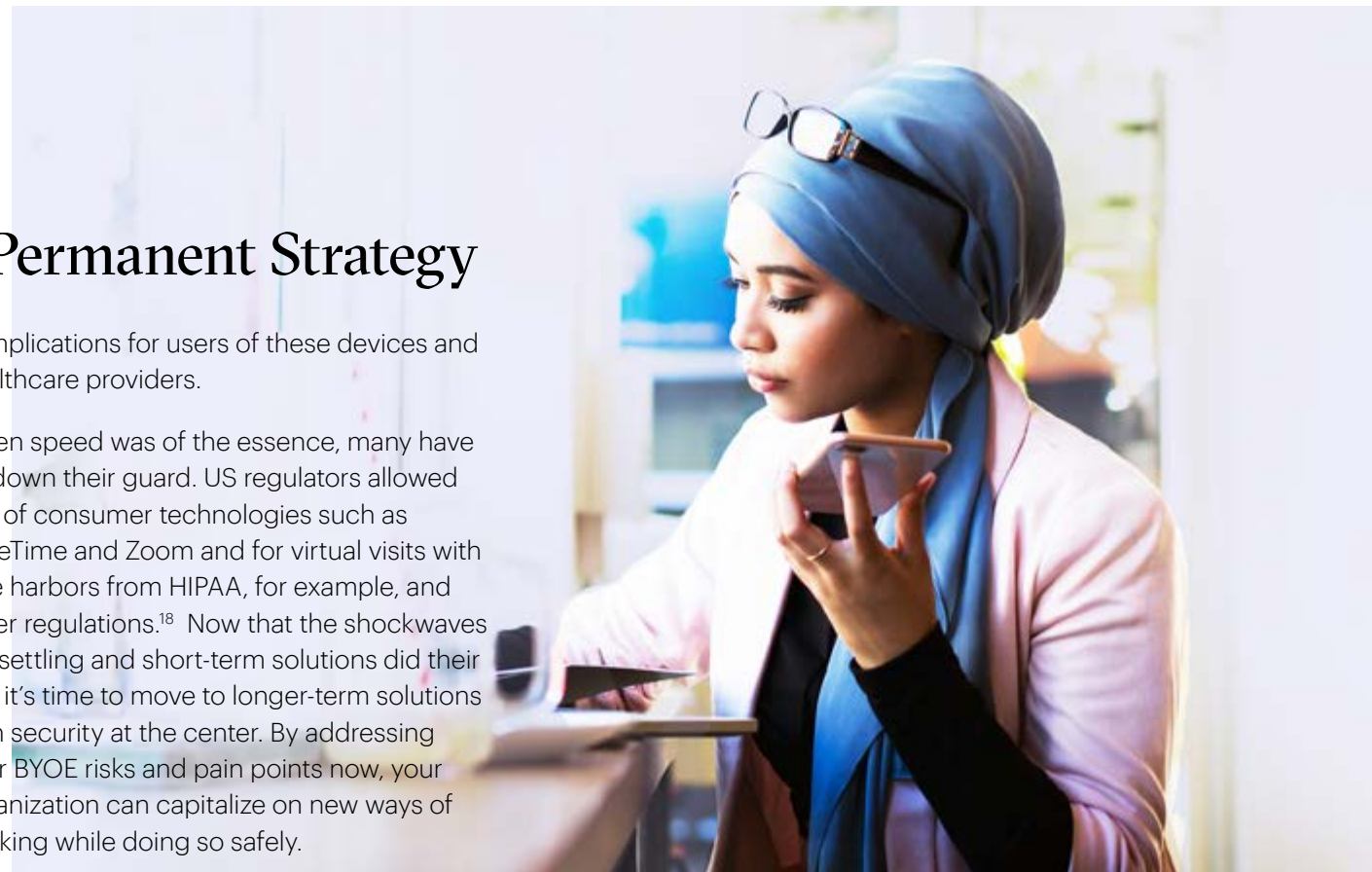
Extend:

New Workspace, New Opportunities

To fully capitalize on BYOE, most healthcare organizations may need to rethink their operating models—even if physical work remains essential. It's not just about accommodating a remote work benefit your people may have gotten used to, or even about increasing resilience against future disruptions. Today offers an opportunity to reimagine what you do and what you can offer to the employees who help you deliver it.

With a virtual-first approach, there are new opportunities to integrate emerging technologies into the workforce. Healthcare organizations can imagine the division of labor between humans and machines. Can robots perform physical work while offsite employees safely do the monitoring and strategy? Can the two work together to do certain work better? For instance, Henry Ford's germ-killing robots are part of the disinfecting team. They even have names. Zappy, Germin8or, Apollo, Brigitte, Ripley, Flash and Lamont send UV-C light rays that kill germs in microscopic areas that may have been missed during regular cleaning by humans.[19] It's not one or the other, but the best of both.

Reinvent:
Embrace the New Work Culture

The last piece of the BYOE puzzle may be the most unclear: culture. Consider the culture shift for the BYOE environment a work in progress, but commit to continued improvement. Raymond Lowe, Senior Vice President and CIO of AltaMed in Los Angeles, said that before COVID-19, large-scale remote work was not a consideration. Now, they are seeing benefits across many areas of the health system. "Even today, we continue to enhance our plans that include additional remote work enabling physicians

and nurses to work from anywhere. This work is part of our digital transformation and strategy of having 'flexible walls' for our patients, improving patient satisfaction, providing quality outcomes while lowering cost, and addressing provider burnout."[20]

Another focus area is the disconnect between in-person and remote workers. The future will be all about balance. Healthcare workers will become hybrid workers in different roles, and can benefit from the best work environment for their particular needs, having their "office in the bag," but without careful implementation, it could lead to a divided workforce. Clinical and non-clinical workers need to feel empowered to do the best job possible. They need the right tools to collaborate. And they need to feel valued for their contributions—no matter where they are made. Health insurers can use the power of AI to transform the role of call center representatives so that agents spend

less time on mundane transactions and more time offering deeper insights as they care for members, from wherever they may be working.

BYOE is the gateway to productivity anywhere, and healthcare leaders in the future will be the ones that lean into this opportunity and reimagine new ways of working to help people in this new model.

Virtual collaboration for a new hybrid workforce

Some companies have recognized the need to support workers in hybrid work environments that include remote and onsite work. CareFirst is working with technology partners to design an interactive platform that helps foster a fully integrated work experience. Workers will have access to resources including real-time communications, customized and interactive training, productivity and workday analytics and insights, and collaboration tools to support and optimize a blended workforce approach.[21]

Decision Points

Fortify: How is your organization making remote work sustainable, seamless and secure?

Identify the areas where your organization made rapid digital transformations and prioritize addressing outstanding security concerns in those areas. Re-evaluate your overall technology strategy to ensure you're maximizing the benefits of remote work.

Extend: How are your people responding to remote work?

Build a deeper understanding of how healthcare workers are responding to remote work—what benefits or challenges are they experiencing? Partner with your workforce to understand the new demands they face as their own environment and "office in a bag" becomes their new workplace.

Reinvent: How are you thinking about the purpose of place moving forward?

Reimagine how space is utilized and even explore creating XR capabilities and environments that will foster immersive digital collaboration. Revise recruiting and talent strategies to take advantage of talent pools outside your typical geographic markets. Consider the culture and ways to ensure information advantages of workplaces (e.g. watercooler conversations) can be virtualized.

From Me to We:

A Multiparty System's Path Through Chaos

The pandemic revealed enterprise fragility as organizations were cut off from business partners and were scrambling for answers. Despite widespread investments in digital transformation technologies, few changed the way they partner. While business partnerships are not new, we are now seeing adoption of multiparty systems that use a shared data platform to enable a resilient, adaptable and trustworthy foundation for existing and future partnerships. These shared platforms can help in the fight against future disruption.

Even at the height of the pandemic, Singapore introduced a blockchain-based medical record system.[22] The "Digital Health Passport" let individuals store medical documents in a secure digital wallet. The system allowed the government to easily track the levels of infection and eliminated the need for paper records—all while maintaining individuals' privacy. It also gave people verifiable test results and the hospital discharge papers they needed in order to be cleared for work. In other words, it put a clean and trusted bill of health right at everyone's fingertips—and was used more than 1.5 million times in its first four months alone.

From contact tracing to frictionless payments, applications for technologies that were once considered too complicated have now become desperately needed solutions. But the nature of these solutions is that they must be built by ecosystems and consortiums of collaborators—not independently. An ecosystem-forward approach can drive the most value for the healthcare ecosystem as a whole. As an example, costs associated with overwrought administrative complexity in the US healthcare industry are estimated at $265 billion— nearly five times the amount associated with fraud.[23] One study found that investment in creating industry data interoperability could result in administrative cost savings of $30 billion.[24] Another study found that the adoption of blockchain, and the subsequent data exchanges, fraud protection and ecosystems it would generate, could save the industry between $100–150 billion.[25]

When you're better able to transact, share data and shift between partners seamlessly and securely, you have an advantage in driving industry-level change that enables better care for people.

Multiparty Systems

enable a shared data infrastructure between individuals and organizations that drives efficiency and builds new business and revenue models. They include blockchain, distributed ledger, distributed database, tokenization and a variety of other technologies and capabilities.

Fortify:

When Clouds Collide

Rapid digitization during the pandemic paved the way for healthcare enterprises to rethink partnerships. And now every organization is accelerating its cloud transformation at once. For instance, Kaiser Permanente is working with Microsoft and Accenture to expand its cloud environment and enable more nimble digital innovation. By scaling digital initiatives on the Azure-hosted platform, the health system is leveraging cloud computing power and expansive decision support analytics to help meet new patient expectations and new accountable-care imperatives.[26] Highmark Health is partnering with Google Cloud to power Highmark's Living Health model, which is designed to enable a more coordinated, personalized, technology-enabled healthcare
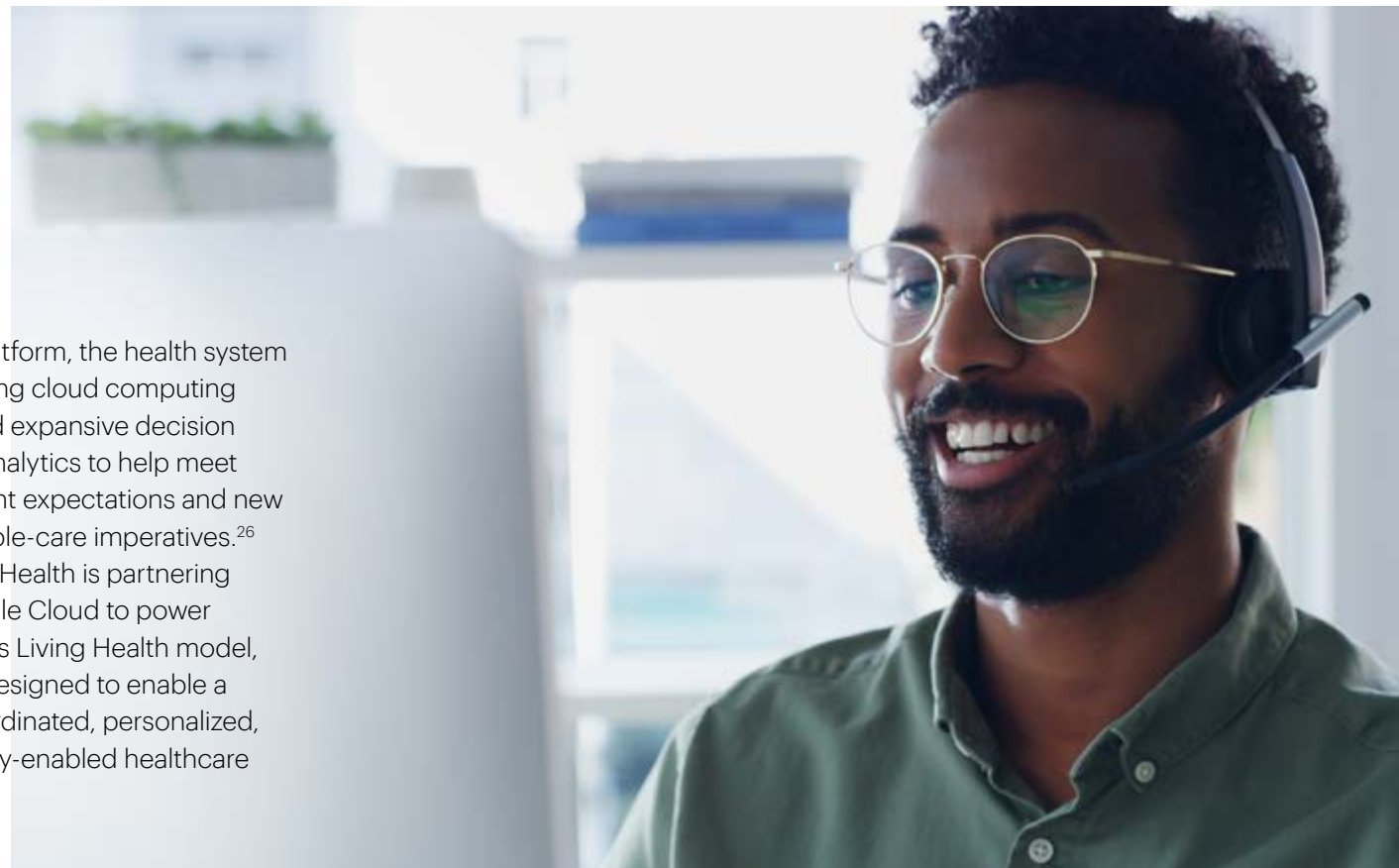
experience for consumers. Patient interactions will be simpler and smarter as clinicians gain access to timely data and actionable information, freeing them from time-consuming administrative tasks.[27]

New partnerships will form and industry boundaries blur as companies merge and combine their growing cloud capabilities in exciting new ways. This will continue to accelerate as health vertical cloud solutions continue to emerge in the market.[28] But you can't play the game if you don't have the right equipment. The most immediate step enterprises need to take is to make sure they have the foundation needed to participate in this ecosystem economy.

Extend:

Transform Partnerships with Multiparty Systems

Cloud is the cost of admission to digital health ecosystems, but multiparty systems are effectively deeply rooted transformation in the way businesses partner and how industries operate. Multiparty systems build on traditional business partnerships and take them a step further. They rebalance cooperation and benefits among participants, forge lines of transparency and establish trust in ways that other systems and business partnerships cannot. They generate equitable relationships amongst partners and lines of sight into previously masked areas of the value chain. This is why building a multiparty system requires more than a technology investment—healthcare organizations must also establish a consortium that governs the networks that are built to guarantee a trusted and secure common environment based on common technology standards.

As part of governance, healthcare organizations and the ecosystems they participate in must ensure the seamless transfer of data to drive the most value out of the partnerships. How well multiparty systems are architected will also determine if the ecosystem reaches its full potential. Even the most advanced multiparty systems can be rendered ancillary by rigid technology that keep data self-contained. Even worse, with bad data, it's stretching the old axiom of "garbage in, garbage out" to "garbage in, garbage forever."
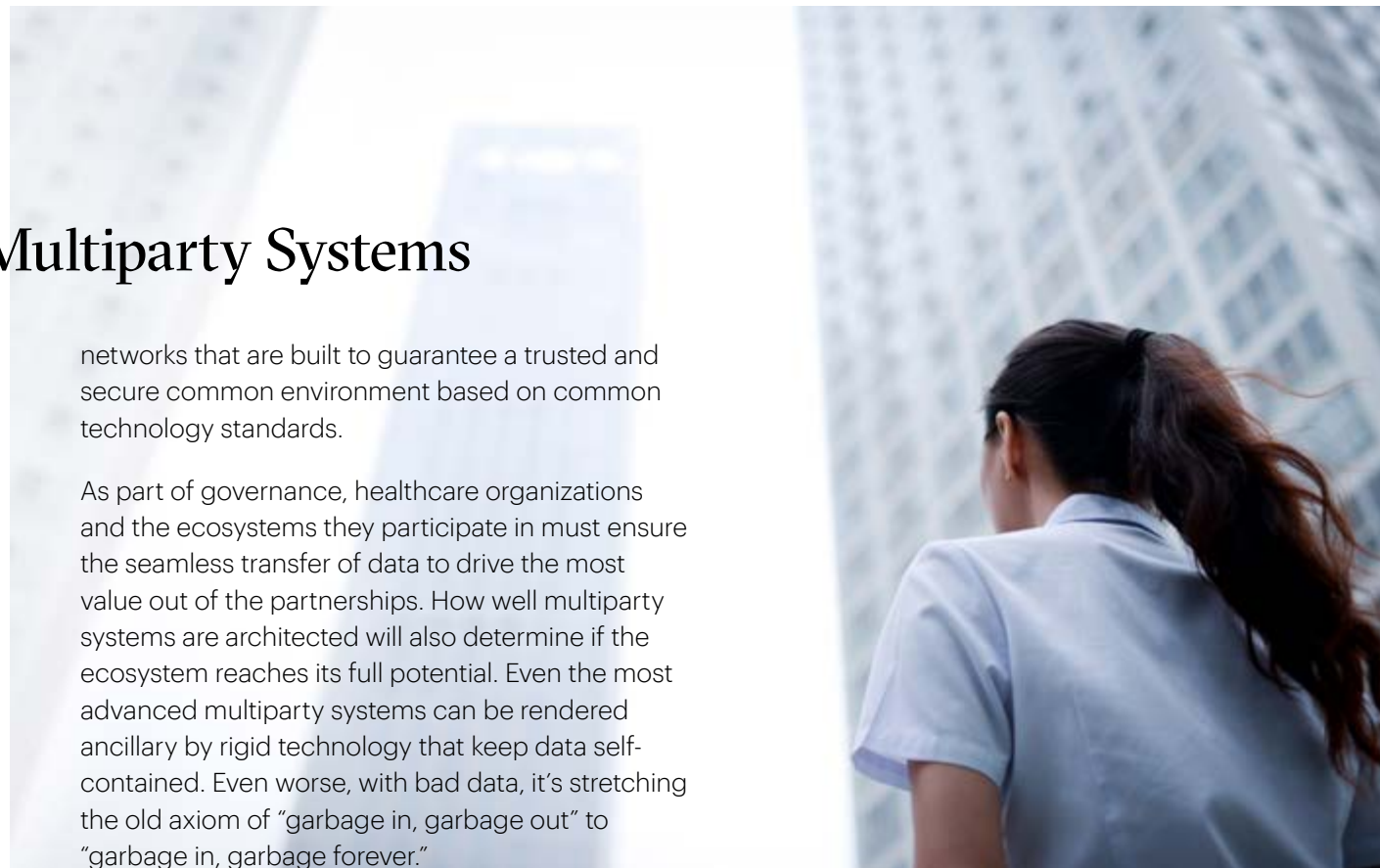
Reinvent:

A New Perspective on Value

Partnerships are taking center stage as healthcare organizations begin to set ground rules for the post-pandemic world, constructing new ecosystem-based business models. For instance, Express Scripts is adding new solutions to its digital health formulary. The Evernorth Digital Health Formulary will include platforms that address women's health needs, tobacco cessation, muscle and joint pain, caregiver care and COVID-19 workplace support.[29]

But just as multiparty systems drive benefit for everyone in the ecosystem, it's important that healthcare organizations embarking on these undertakings do it with a wider perspective of what value means. Truveta Inc. was launched to assemble and sell access to anonymized data on millions of patients for research and drug development, among other uses. The company's 14 backers include Providence, CommonSpirit Health, Advocate Aurora Health, Trinity Health and Tenet Healthcare Corp.—organizations that recognized that there is abundant opportunity in health data as technology companies, insurers and drug makers aim to develop new tools and treatments.[30]

There are ambitious ecosystem efforts underway right now, many spawned by the challenges of COVID-19 but designed to far outlast its impacts. At their zenith they will transform the world. If you've hesitated to explore a full ecosystem approach, now is the time to recognize the opportunity; if you've already been exploring, it's time to move beyond small-scale implementation and become a leading partner in shaping healthcare of tomorrow.

A shot at success

A coalition of leading technology companies, health organizations and nonprofit groups including Microsoft, Oracle, Salesforce, Cerner, Epic Systems, the Mitre Corporation and the Mayo Clinic are part of the Vaccine Credential Initiative (VCI™), which aims to develop technology standards to enable consumers to obtain and share their immunization records through health passport apps. VCI™ has a steering group that actively supports and oversees the implementation guide development process and ensures that members of VCI™ faithfully implement the standard and adhere to the guiding principles of VCI™.[31]

Decision Points

Fortify: How are digitally led partnerships driving value for your enterprise?

Review what platforms your organization—or healthcare consumers—leaned on most in the last year. Take advantage of cloud solutions and have a strategy for using these solutions to enhance ecosystem collaboration.

Extend: Is your organization ready to participate in multiparty systems?

Designate a team to scan prominent multiparty systems emerging in healthcare—the current and long-term impacts, and the organization's relative preparedness to engage them. Make understanding the technology, identifying technical partners and providers, and addressing skills gaps a priority. Evaluate the business case that will drive your participation.

Reinvent: Which business relationships will be transformed by the growth of multiparty systems?

Interview strategic partners to understand their exposure to multiparty systems. Consider running strategic foresight exercises with these partners to evaluate the need and impact of a multiparty system. Consider joining industry consortiums or establishing a working group of inter-enterprise partners.

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About the Authors

Kaveh Safavi
Senior Managing Director – Global Health

Lifelong Chicagoan Kaveh Safavi, M.D., J.D. has been a healthcare leader for more than 30 years. Kaveh's accomplishments include establishing one of the Midwest's first electronic health record-enabled primary care practices. He also earned the distinction of both medical and law degrees, an M.D. from Loyola University School of Medicine and a J.D. from DePaul University College of Law. Kaveh is board-certified in internal medicine and pediatrics.

Andy Thompson
Managing Director – Technology

Andy is the managing director of Accenture's health payer technology advisory practice, which helps clients understand and harness the power of disruption enabled by technology. He is known for working to improve the way modern healthcare is experienced for people at the intersection of business and technology. He earned a bachelor's degree in mechanical engineering from the University of Illinois.

Brian Kalis
Managing Director – Digital Health

Brian Kalis is a recognized digital health expert who combines business strategy and digital innovation in ways that improve health experiences for consumers across the globe. Brian earned his Bachelor of Arts degrees in Entrepreneurship and Computer Science from the University of St. Thomas in St. Paul, Minnesota and his Master of Business Administration degree from The Carlson School of Management in Minneapolis, Minnesota. Brian enjoys music, reading, running and spending time with his wife and three children.

Jenica McHugh
Managing Director – Technology Strategy

Jenica is a managing director in Accenture's Health and Public Service technology strategy practice. She has expertise in value targeting through mergers and acquisitions (M&A), digital strategy and operating model analysis and enjoys working on any project that involves developing a technology strategy to drive growth, operational efficiency and improved health outcomes.

Contributors

We thank the following colleagues and partners for contributing with subject matter expertise to this report:

Marko Rauhala
Managing Director – Health and Public Service Nordic

Marko leads Accenture Nordic's Health and Public Service practice which partners with leading government and healthcare organizations to innovate and deliver digital solutions to provide better citizen experience, increase efficiency and deliver better outcomes for citizens and patients. Marko is passionate about transforming health services through digital technologies and helping improve the quality of life for citizens and patients, at the same time, making services more affordable and accessible.

Sig Shirodkar
Managing Director – Talent & Organization

Sig is a managing director and Accenture's North America Talent & Organization/ Human Potential lead for healthcare. Sig has nearly 25 years of consulting experience serving payer, provider, life science and state/local health clients across varying transformation initiatives.

Harrison Lynch
Technology R&D Associate Principal

Elizabeth Naik
Health & Public Services Research Manager

Heather Parker
Principal of Parker Prose LLC

About the Digital Health Technology Vision

Every year, the Technology Vision team partners with Accenture Research to pinpoint the emerging IT developments that will have the greatest impact on companies, government agencies and other organizations in the coming years. These trends have significant impact across industries and are actionable for businesses today.

The research process begins by gathering input from the Technology Vision External Advisory Board, a group of more than two dozen experienced individuals from the public and private sectors, academia, venture capital and entrepreneurial companies. In addition, the Technology Vision team conducts interviews with technology luminaries and industry experts, as well as nearly 100 Accenture business leaders from across the organization.

The research process also includes a global survey of thousands of business and IT executives, to understand their perspectives on the impact of technology in business. Survey responses help to identify the technology strategies and priority investments of companies from across industries and geographies. Accenture Research interviewed

more than 6,241 executives from 31 countries and 14 industries, including 113 health insurance executives (US) and 286 health provider executives in the US (136), UK, Brazil, Finland, Norway and Australia (30 each). The survey was fielded from December 2020 through January 2021.

As soon as the global report is released, a team of experts across Accenture's health practice discusses the findings and interprets them to understand the specific impact of trends on healthcare organizations and systems. The health industry version of Accenture's Technology report has been published on an annual basis since 2016.

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