DIGITAL HEALTH TECHNOLOGY VISION 2017

TECHNOLOGY FOR PEOPLE
Technology for People shows the way to an exciting future where healthcare technology is designed by humans, for humans, to create positive change that can transform healthcare organisations and society.

Digital breakthroughs are enabling healthcare enterprises to improve labor productivity, clinical outcomes and human experiences. This unprecedented era of technology innovation is allowing clinicians and service workers to broadly apply their knowledge, freeing up more face time to spend delivering a human touch. And, as technology affords greater opportunities for self-management, it’s empowering people to consume healthcare on their own terms. It is no longer about what technology can do for people, it’s what people can do with technology.


These trends demonstrate the fact that while technology is all around us, we are at the center. When we adapt technology to the people that use it in healthcare—health insurers, providers and consumers—we will define the future of healthcare.
One company that exemplifies technology for people is **CVS Health**. The healthcare company has transformed from the corner store that fills prescriptions to a provider of affordable basic healthcare services, deeply embedded in their customers’ lives. CVS Health is taking a comprehensive approach to healthcare to enable this shift, deploying technology to put the individual’s health at the center of their focus. With the company’s smartwatch-compatible mobile app, customers can set personalized reminders for taking their medication, snap pictures of their prescriptions to expedite refills, and scan their insurance card so that shop clerks are prepared with up-to-date information.

At the CVS Health-operated Minute Clinics, customers can receive treatment for minor illnesses, flu shots, cholesterol screenings, and more than a dozen other medical services – all of which can be booked and paid for online. For people who can’t make it to a physical location, CVS Health is also partnering with various telemedicine services like Teladoc, so patients can receive care via phone or video chat. And CVS Health is even moving into preventative care: the company is partnering with IBM’s Watson for data analysis to predict when a patient will need urgent care.

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(2) Forbes, “CVS and IBM’s Watson Cloud Pursue Ways to Predict Patient Health,” July 30, 2015
Artificial intelligence is taking on more sophisticated roles within technology experiences with the potential to make every interface both simple and smart – setting a high bar for how future interactions work.

Robots are working alongside people. Smart machines are performing triage to augment clinician decision making. Contextual intelligence and deep learning algorithms are raising the bar for transactions and interactions in healthcare. The relationships between healthcare organisations and people will never go away. But AI will play a primary role in making those relationships stronger through new AI-driven services that help curate, advise and orchestrate lifestyle and care for people.

**AI HAS MANY ROLES TO PLAY IN HEALTHCARE**

1. **CURATOR**
   - **HEALTH INSURANCE PLANS & CARE MANAGEMENT PLANS**
   - Suggesting relevant options based on previous user behaviour or patterns.

2. **ADVISOR**
   - **PATIENTS & PHYSICIANS**
   - Learning from, but also taking action or guiding the user toward an optimal outcome.

3. **ORCHESTRATOR**
   - **CARE, LIFESTYLE & HEALTH BENEFITS**
   - Learning from past action and collaboration tasks across multiple channels to achieve desired outcomes.
SIMPLIFYING NATURAL INTERACTIONS

People will direct and control artificial intelligence to fit their lifestyle and healthcare needs and goals.

A barrier to healthcare self-service has been that people don’t know where to look for information, leading to difficult and discouraging interactions. Or, they get no personal guidance outside the four walls of a doctor’s office. As technology becomes simpler, smarter and interfaces are more usable to consumers, it improves the customer experience. Systems that have the right rules, algorithms and intelligence behind them will know about the healthcare consumers— their medical history, allergies, past procedures and lifestyle behaviors—and use that information to guide personalised experiences.

Information will be brought to users in context, and tailored to the individual patient. Imagine easily knowing: “This is what your procedure will cost,” “Here are your medical benefits” or “Contact your doctor when you experience this symptom.” No more hunting for answers; they will be pushed to you or you can simply ask Amazon Alexa for information at the point of need.

AUGMENTING THE HEALTHCARE WORKFORCE

When AI is the engine fueling the back end of the enterprise, it can guide employees to better advise consumers.

For example, health plans have a wealth of structured and unstructured data that can be used as a training set to improve business decision making and create a continuous loop of learning. Insurers can use advanced economic models and data science to predict a consumer’s future healthcare usage and determine the best plans to meet their needs. AI also has potential to alleviate the burden of time-consuming processes, such as prior authorisation and underwriting.

As AI becomes more sophisticated, it will increasingly become a partner to clinicians, helping automate encounters and support diagnoses, thus improving labor productivity and diagnostic decision making. FDA-approved 

Arterys Cardio DL™ uses AI imaging to complement the work of clinicians and assist with diagnosing heart problems. The software delivers editable automated contours, providing precise ventricular function in seconds to help clinicians determine the right path forward for a patient.
AI is also more readily able to help clinicians, as it has become more intuitive and easier to use. Interfaces are now conversational and speech recognition has gotten closer to natural language, simplifying the capture of key interactions and allowing EHR data entry to happen behind the scenes.

AI is like a smart sponge—the more data it absorbs, the more intelligent it gets. As data from personal health devices, internet of health things solutions, DNA testing, genome sequencing, electronic medical records and more informs AI tools, clinicians will have keener ability to offer predictive recommendations based on a holistic view of the patient that learns over time. For instance, having insights to inform tailored guidance on the right diet and exercise plan to minimise chronic conditions, or suggestions for preventative screening to pursue, such as early testing for Alzheimer’s Disease.

AI will not substitute for clinical judgment. However, it equips providers with information and answers at speed, so that they may spend more time on activities that add value to the patient experience—high-touch interactions that a machine could never replace. These interactions will continue to improve as technology becomes more embedded in our environment, patients navigate their doctor’s treatment plan with greater ease and there is broader adoption of digital experiences.
TAPPING THE BENEFITS OF AI

HealthTap, a World Economic Forum Technology Pioneer, is the world’s first global health practice delivering immediate, world-class healthcare 24/7 from query-to-cure. Through video, voice, and text chat on any mobile device or personal computer, HealthTap connects hundreds of millions of people in 174 countries with the most trusted and compassionate health advice from a network of more than 107,000 top doctors. HealthTap’s proprietary, robust, and secure Health Operating System (HOPES™) and proprietary triaging technology enable hospital systems, insurance companies, employers and governments to deliver the right care at the right time at the right price.

In 2016, HealthTap launched Dr. A.I., a personal AI-powered “physician” that instantaneously translates a person’s symptoms into personalised, doctor-recommended courses of action. Dr. A.I. uses advanced deep learning algorithms and HealthTap’s vast repository of doctor knowledge and data to apply clinical expertise and guide patients to the right level of doctor-recommended care.
ECOSYSTEM POWER PLAYS

Beyond Health Platforms

Healthcare enterprises are increasingly integrating their core business functionalities with third parties & their platforms.

But rather than treat them like partnerships of old, forward-thinking healthcare leaders use these relationships to build their role in new digital ecosystems – unlocking their next waves of future growth. As they do, they’re designing future healthcare value chains that will transform their organisations, services, and even the market itself.

Healthcare is the sum of many parts. There are systems that pay for, coordinate and deliver care. There are also systems that help people self-manage a lifestyle goal or healthcare condition. Platforms provide the connected infrastructure that enables service providers and consumers to exchange value, but it’s not enough. Today, healthcare enterprises also need a rich and robust portfolio of digital partners to form their future business ecosystems.

These new ecosystems will extend beyond technology to connect the capabilities, expertise and services that touch healthcare organisations, consumers and clinicians. Healthcare organisations that take a leadership role in transformation realize that the strategic platform and ecosystem decisions they make today determine their future success – or lack thereof.

Service Providers seek access to customers.
Platforms combine services and add value.
Customers look for simplified decision making.
Healthcare organisations have begun to realise that healthcare should be organised around the patient, not the enterprise.

Therefore, currently fragmented ecosystem participants should figure out how to work together to meet rising expectations. Historically, independent entities, such as hospitals and doctors, focused on the functions within their control. Now, ecosystem players realise that they are in many ways dependent on those who provide services before and after they do, independent of physical location.

Collaboration can improve loyalty and market share at a time when there is increasing pressure to drive down the cost of care. What’s more, ecosystem collaboration will maximise productivity across the continuum of care—from admission to post-acute care.

New opportunities for collaboration are giving rise to non-traditional partnerships. Major health systems are joining forces with consumer technology companies to receive “breaking news” alerts about patients. Providers are working with mobile app providers to create app stores of evidence-based applications. Telemedicine startups are working with major health systems to build platforms that help solve clinical and administrative challenges. Life sciences giants, pharmacy benefit managers and technology companies are collaborating to meet the needs of the under-insured.

Healthcare enterprises can integrate their core functionality with digital platforms through application programming interfaces (APIs), making it easier for all to plug into and play in the broader ecosystem, facilitating patient-centered care.
Fragmentation leads to poor outcomes. Therefore, ecosystem participants will increasingly work together to meet objectives and make progress. Today, governments and private sector companies are working together on major genome and biome initiatives to better understand, and ultimately treat, various diseases and conditions—from autoimmune disorders to obesity. Partnering can be a differentiator when collaborators work together to provide a service that addresses an unmet need.

By pooling resources and information, companies can deliver differentiated joint offerings. For instance, health plans are collaborating with providers to deliver virtual care services and integrated care delivery models to market. Health plans are also collaborating with consumer technology platforms to bring simple, convenient services to people on mobile platforms. Some are even going the extra mile, working with ride sharing services to provide patients with reliable transportation to and from their healthcare appointment.
GIVING CARE A LIFT

The CareMore Health System, the integrated health plan and delivery system, has partnered with Lyft to provide non-emergency medical transportation for Medicare Advantage and duals beneficiaries. Based on data published in JAMA, individuals using the service wait less than nine minutes to be taken to their medical appointment—that’s a 30 percent reduction in wait times. Costs have also dropped from about $31 per ride to $21.

By working together, CareMore and Lyft are addressing a major problem in healthcare: lack of access to consistent, affordable transportation. An estimated 3.6 million Americans miss or delay receiving nonemergency care each year due to transportation challenges. Individuals with the highest burden of chronic disease are often those with the greatest transportation barriers.

INTEGRATED DISEASE MANAGEMENT

Onduo is a platform that connects multiple stakeholders involved in diabetes management—clinicians, payers and healthcare professionals—to help develop comprehensive diabetes solutions that allow people with diabetes to lead full, healthy lives.

A joint venture of Sanofi and Verily, Onduo is positioned to deliver precision care management by leveraging the deep experience of Sanofi and rapid iterative testing and analytics of Verily.
The future of work has already arrived and is entering the healthcare enterprise.

Healthcare’s digital leaders are beginning to shape strategies to fundamentally reinvent their workforces. Driven by a surge in on-demand labor platforms and online work management solutions, legacy models and hierarchies are starting to dissolve and be replaced with open talent marketplaces.

This is beginning in the back-office of the healthcare enterprise in corporate functions like technology, finance, human resources, and research and development where there are lower regulatory barriers on the workforce.

However, workforce marketplaces are also emerging in select areas of care delivery where open talent platforms connect providers and consumers while confirming regulatory compliance and quality.
The talent marketplace is opening up for the front and back offices of a health enterprise.

Crowdsourcing, labor platforms and virtual care platforms will change the way work is sourced, shared and delivered. Companies now can access more talent from sources outside of traditional employment to get specialised skills when needed. For instance, through online talent platforms, organisations can find people to support technology design and development, finance, human resources and administrative functions.

Online platforms make it easier to rapidly match supply and demand of skills to get work done on demand in a decentralised way. This is in contrast with rigid functional hierarchies of traditional healthcare enterprises. When organisations have greater flexibility to adapt as skillset needs change, they will be relevant, competitive and reduce labour expenses. Without a rigid hierarchy, in-house workers will be free to fill roles throughout the enterprise. Supply will be matched with demand like never before.

There are some possibilities for clinical work to be sourced online, but it is more challenging than for back office roles given regulatory barriers from labour laws in healthcare designed to ensure safety. The possibilities for efficiency and productivity are great, but questions remain: How can platforms have market-clearing functions that ensure clinicians are certified, qualified and will deliver quality? How will governance and safety measures work in a digital landscape? How soon will regulatory models evolve to suit a virtual model of care, especially when licensure is local? The rules must catch up because the workforce marketplace is evolving at speed.
NEW WAYS OF WORKING

While clinical labour is in the early stages of moving to a virtual model, clinical interactions may transition more quickly.

Certain clinical interactions will become virtual interactions that eliminate the need for an in-person visit. Care will no longer be just based on physical location. Specialists will be called upon to treat a condition, regardless of geography.

With virtual care platforms, the patient and clinician might not even see each other in person—which is appealing to many consumers. Our virtual care research revealed that people are interested in a wide range of virtual health and care services.

When asked which of 16 services they would like to receive virtually, more than half of the services were of interest to 70 percent or more of respondents; all of the services were of interest to at least 50 percent of respondents.

Consumers will access specialised expertise right through their smartphones and book a telehealth consultation within seconds. Health systems, too, will use technology to amplify their access to qualified clinicians. First, healthcare organisations tapped into on-demand labour platforms for specialties such as radiology, that often do not require in-person interaction. Increasingly, they will use labour platforms to source nursing triage assistance, call center help—even enterprise labor, such as data scientists, designers and developers.
American Well’s Exchange uses mobile and virtual technology to lift virtual barriers among health plans, doctors, consumer, employers and care delivery networks. This robust technology platform and sophisticated brokerage engine benefits both patients and clinicians. Consumers have convenient and immediate access to a range of board-certified physicians for telehealth consultations.

Doctors can “clock in” at any time, making themselves available to patients. They can increase demand for their services to grow their practice and even access resources, such as telehealth training, clinical guidelines, peer support and billing.
What if health technology adapted to consumers, clinicians and administrators?

The new frontier of digital experience is technology specifically designed for individual human behaviour. Healthcare leaders recognise that as technology shrinks the gap between effective human and machine cooperation, accounting for unique human behaviour expands not only the quality of the experience, but also the effectiveness of technology solutions. This shift is transforming traditional personalised relationships into something more valuable: partnerships that span beyond a physical lifestyle or care setting.

Healthcare technology will become more human-centered. When technology is designed to account for the human experience, it benefits consumers, clinicians and administrators. Healthcare organisations have an unprecedented opportunity to transform their relationships with all these stakeholders when they consider and respond to human behaviour. And, consumers will have a better opportunity to interact with technology to access care how and when they want to.
PUTTING PEOPLE FIRST

From depositing checks via your smartphone to making dinner reservations online, people want to use self-service to take care of business.

Healthcare is yet another industry using design thinking to create tech-enabled services that are simple, intuitive and make it easy for people to achieve an outcome.

What began as telemedicine has evolved into a broader array of digital healthcare services. For starters, people can book appointments on their own. The options will only expand as technology interfaces become more sophisticated and offer more choices. What type of appointment – during or after hours? Virtual consult or in-person? See the doctor now, or communicate asynchronously? Even payment for care will be simpler as more plans will allow you to pay for healthcare services online, using a variety of payment methods.

Technology also empowers consumers to meet their health goals from home or on the go—places outside of a clinical setting. Services designed for people will learn from their behaviours and adapt accordingly. For instance, if someone has a weight loss goal, a health app can suggest foods to eat or offer motivation to exercise. Data can be shared with the person’s doctor so that they are informed of health changes. Clinicians can augment the service, as needed, to help encourage the weight loss.
Healthcare organisations will be able to design a service around spoken and unspoken needs, because human-centered design has problem-solving ability at its core. Smart technology is always watching and learning with every interaction. Through observation, systems will develop a keener understanding of what people want and need. For consumers, it makes self-care easier. Digital therapeutics is a good example. The technology understands a person’s unique condition or disease and can customise interactions based on behavioural economics principles to provide nudges to take medications, schedule follow-up visits or modify diet.

In current form, the often poor usability of technology for clinicians is a considerable factor in physician burnout. The future is an exciting new frontier for experiences. Technologies today are being designed so that they adapt to how humans behave, thereby improving the clinician experience. This is a huge shift away from the current paradigm where clinicians have had to learn technology and adapt to it. Now, technologies are taught to be adaptive, responsive and aligned to goals that will enhance the clinician experience.

By considering and responding to human behavior, businesses have the opportunity to create richer, more responsive journeys with customers, clinicians and administrators, transforming relationships into true partnerships that improve the health system for everyone.
One Medical strategically applies technology to offer the best primary care experience to patients. In addition to offering care visits and in-house lab testing at over 50 high-end care facilities—from San Francisco to Washington, D.C.—the company’s mobile app allows for booking same-day appointments and receiving virtual care. They even just added a digital dermatology service. Consumers can do everything from accessing vaccination records via their phone, to renewing prescriptions, to getting treatment for skin issues, allergies and the flu.

By providing on-demand service via its mobile app, the group has been able to deliver exceptional customer service while reducing labour costs. One Medical uses 1.5 full-time administrative employees per doctor, in contrast to the Medical Group Management Association (MGMA) benchmark of 4.5 administrative employees per physician.
Healthcare enterprises are not just creating new products and services; they’re shaping new digital industries.

From technology standards, to ethical norms, to government mandates, in an ecosystem-driven digital economy, one thing is clear: a wide scope of rules still needs to be defined, especially in a highly regulated industry. To fulfill their digital ambitions, healthcare enterprises must take on a leadership role to help shape the new rules of the game. Those who take the lead will find a place at or near the center of their new healthcare ecosystems, while those that don’t risk being left behind.

The entire future of healthcare’s digitally enabled transformation is, in many ways, uncharted. But to set the industry on the right course, healthcare organisations must take responsibility for shaping the future by shifting from market taker to market shaper—defining the rules, establishing the governance and determining how to protect all participants in the ecosystem – to shape the healthcare ecosystem of the future. By working collaboratively with regulators, standards bodies, and other ecosystem stakeholders, successful progress into the uncharted is possible.
Healthcare technology is advancing quickly as cloud, artificial intelligence, mobility, internet of health things and blockchain emerge to transform care delivery and health administration.

Consumer and clinician expectations are also changing at a rapid pace alongside technology change, creating a perfect storm of healthcare transformation. However, many regulatory frameworks have not evolved at the same speed.

Standards and policies related to digital technology use in healthcare will need to adapt along with new care and reimbursement models. For instance, virtual care allows clinicians to treat patients regardless of where they are. Yet aspects of licensure limit who can practice medicine in-state versus out of state. In fact, some states require patients to be in a physical clinical setting to conduct a virtual visit versus at home or on the go, minimising the impact of location independence.

Other industries are recognising that the rules need to be reshaped in the digital era. Financial services has long been an industry leader in adapting standards as technology change occurs. Healthcare must do the same. Industry leaders and consortiums will need to create new rules and regulations that strike the right balance between security, privacy and trust amid the high stakes of healthcare. The longer they wait, the more behind the industry will be.

Therefore, data must not only be secure where it is stored, it must be protected as it travels across the ecosystem. Companies participating in the ecosystem must all play a role in ensuring their technology is secure and that sensitive data is protected—wherever it may go.

Trust is also critical to keeping the ecosystem going. To build and maintain trust, healthcare organisations must work collaboratively to solve new challenges related to technology. In an era when technology can be trained to do what people want—good or bad—governance must guard the ecosystem against ill intentions and inappropriate use of resources. By working together, ecosystem participants will create a trusted environment where information is shared and used in the best interest of people.
Industry leaders from finance, banking, internet of things, supply chains, manufacturing and technology are coming together at Hyperledger, an open source collaboration developing cross-industry blockchain technologies.

Hyperledger has a working group dedicated to exploring appropriate applications for blockchain technology in the healthcare industry. By having business and technical conversations, this group intends to help the industry realise the full potential of open source blockchain technologies.
About Accenture Insight Driven Health

Insight driven health is the foundation of more effective, efficient and affordable healthcare. That’s why the world’s leading healthcare providers and health plans choose Accenture for a wide range of insight driven health services that help them use knowledge in new ways—from the back office to the doctor’s office. Our committed professionals combine real-world experience, business and clinical insights and innovative technologies to deliver the power of insight driven health. For more information, visit www.accenture.com/insightdrivenhealth.

About Accenture

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