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Promoting an overdue digital transformation in healthcare

Research from over 30 countries offers insight into providing digital healthcare, including practical steps for key stakeholders.

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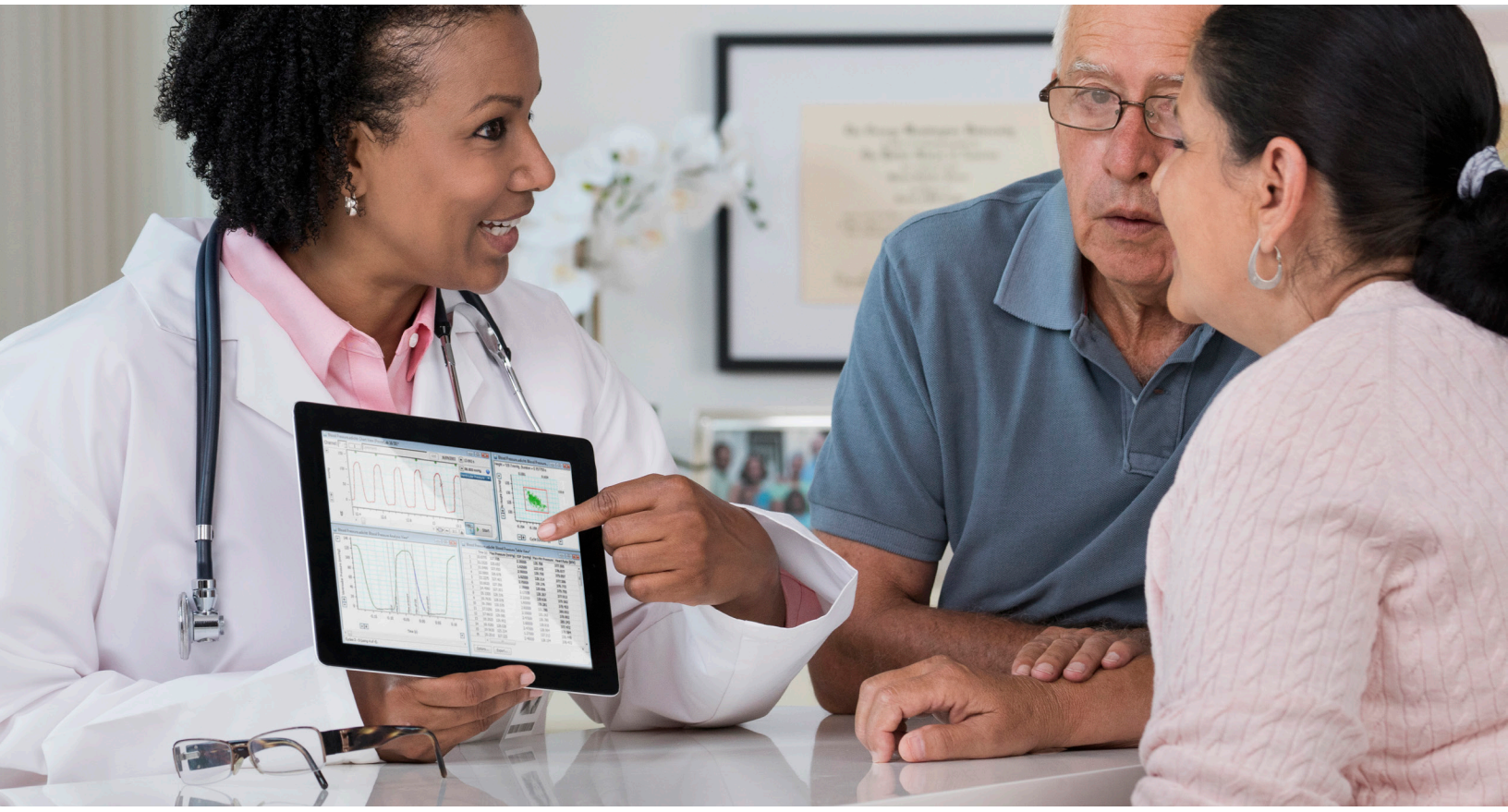

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For all the ways that technology is transforming the way people shop, bank, and travel, it has yet to make major inroads into how they receive healthcare. The adoption of digitally enabled tools for diagnosis, treatment, and management, for example, has been modest. Electronic medical records are still not a part of routine care. According to the Electronic Medical Record Adoption model, adoption ranges from just 3 percent in Europe to 35 percent in the United States.[1]

Technology itself isn't the problem. Many healthcare tasks have been automated or digitally enhanced for decades. And evidence of further potential is compelling. This includes, for example, preventing up to 95 percent of adverse drug events,[2] saving lives by improving compliance with care recommendations, and reducing the number of duplicate diagnostic tests and reducing costs by 7 to 11 percent.[3]

Instead, the barriers to a digital transformation in healthcare are often decidedly nontechnological. In a recent interview, Harold F. Wolf, president and CEO of the Healthcare Information and Management Systems Society (HIMSS), considers a change of culture to be the biggest hurdle in the industry's digital transformation. Similarly, our McKinsey colleagues found that the three barriers to digital most mentioned by leaders in the pharmaceutical and medical-technology industry were culture and mind-set, organizational structure, and governance.[4]

It will likely take a concerted effort among stakeholders to get past those barriers. To draw attention to the characteristics of health systems that best support adoption of digital tools, we conducted a high-level review of more than 30 countries. We followed that with a deeper look at a dozen countries with digitally advanced health economies—where they either have managed to implement digital solutions at scale or have disrupted the market with their innovation. In this article, we have deconstructed their journeys and distilled a set of six conditions that can smooth the path toward a successful systemwide digital transformation in healthcare—no matter where a country is in its digital health journey. A sidebar summarizes each stakeholder's potential roles (see sidebar, "Stakeholders have various roles in digital transformation").

1. Governments have a role to play in instigating digital transformation in healthcare systems

Governments tend to have unique relationships to their systems of healthcare, whether at the local, regional, or national level. One exception appears to be about promoting the use of technology. Among the countries we looked at, whether the prevailing system was government run or market oriented, those with the most digitally advanced healthcare played an active role in promoting digital transformation.

In fact, our research indicates that governments have often played a key role in instigating systemwide digital health projects. For example, Australia developed the National Digital Health Strategy and set up the My Health Record as an opt-out medical record for all Australians.[5] England established national bodies, like NHS Digital[6] and NHSX,[7]

[1] Cross-regional EMRAM score distribution, Q3 2016, Healthcare Information and Management Systems Society, himms.eu. The Electronic Medical Record (EMR) Adoption Model (EMRAM) is an eight-stage model that measures the adoption and utilization of EMR functions required to achieve a paperless environment and harnesses technology to support patient care. The model allows healthcare organizations to benchmark progress globally. Scores are for stages 6 and 7.

[2] Such as medication errors, adverse drug reactions, allergic reactions, and overdoses in hospitals, long-term-care facilities, and outpatient settings.

[3] Jessica S. Ancker et al., "Associations between healthcare quality and use of electronic health record functions in ambulatory care," *Journal of the American Medical Informatics Association*, July 2015, Volume 22, Issue 4, pp. 864–71, academic.oup.com; Gerardo Aue, Stefan Biesdorf, and Nicolaus Henke, *ehealth 2.0: How health systems can gain a leadership role in digital health*, January 2016, McKinsey.com; "Reducing and preventing adverse drug events to decrease hospital costs," *Research in Action*, March 2001, Issue 1; Jack V. Tu, John J. You, and Lingsong Yun, "Impact of picture archiving communication systems on rates of duplicate imaging: a before–after study," *BMC Health Services Research*, November 2008, Volume 8, Number 234, bmchealthservres.biomedcentral.com.

[4] Stefan Biesdorf, Manuel Möller, and Franziska Thomas, "Barriers to Digital@Scale: Shifting the focus from tech to culture," October 2018, McKinsey.com.

[5] "Australia's National Digital Health Strategy," Australian Digital Health Agency, conversation.digitalhealth.gov.au.

[6] NHS Digital, digital.nhs.uk.

[7] "NHSX: New joint organisation for digital, data and technology," Department of Health and Social Care, February 19, 2019, gov.uk.

to support and transform NHS and social care.[8] Meanwhile, the Danish government has announced investment into an app-based platform known as the World-Class Digital Service (WCDS); it can be used to access all publicly held data on Danish citizens and is jointly financed with local authorities via the country's Technology Investment Fund.[9]

Among more market-oriented countries, the US government introduced financial incentives to physicians and hospitals in the American Recovery and Reinvestment Act of 2009 to encourage the adoption of electronic health records.[10] Israel's government, too, aims to promote the country's foothold in digital health through grants and investment. It has announced a $33 million grant specifically in biotech and medicine, as well as a planned $275 million investment to digitize every citizen's personal health records.[11]

Moreover, sharing IT infrastructure with other public services, such as citizen-ID and consent-management systems, can accelerate progress, creating a platform that encourages patients to adopt digital services. For example, the Estonian Electronic Health Record is part of the country's Health Information Exchange platform and is credited with helping to simplify the implementation of healthcare interconnectivity.[12]

2. Payers and standards bodies can accelerate and sustain technological advancement by adapting reimbursement guidelines

As with any market, healthcare systems operate most efficiently when the incentives of each part are mutually reinforcing. As digital technology changes, payers and health-standards boards may frequently need to adapt their models of reimbursement and accreditation. This might include, for example, evaluating new digital-first providers for quality care, adding some measure of digital adoption to accreditation, and assessing new software products that might be classified as medical devices. It can also include promulgating guidelines for sharing and protecting data among stakeholders and developing a reimbursement tariff for digital services.

Many countries are already pursuing efforts to modernize digital-related regulations. For example, recent regulation from the Centers for Medicare & Medicaid Services in the United States proposed several policy changes.[13] These would make more information accessible to patients through an open application programming interface (API). Similarly, NHS Digital in England has developed a first set of standards on the interoperability of clinical IT systems.[14] To meet its gold-standard qualification, England requires that health apps receive regulatory approval from three bodies[15]: approval from the Medicines and Healthcare products Regulatory Agency (MHRA),[16] along with a Care Quality Commission registration, followed by an assessment from NICE (National Institute for Health and Care Excellence).[17] France also introduced a new reimbursement system for providers of telemedicine. Under the new rules, the system reimburses telemedicine consultations at the same per-visit level as physical primary care.

In many health systems, digital services and innovation can cause a shift in how payers and providers earn returns. That may explain why some of the most integrated systems, including in the United States, have been at the forefront of digital adoption. The advantage of being an integrated organization is in the embedded internal incentive

[8] NHS Digital, digital.nhs.uk; "NHSX: New joint organisation for digital, data and technology," Department of Health and Social Care, February 19, 2019, gov.uk.
[9] Gerard O'Dwyer, "Danish government launches wide-ranging digital services project," *Computer Weekly*, November 29, 2018, computerweekly.com.
[10] Chantal Worzala, "Policy update: Federal incentives for the adoption of electronic health records," *Journal of Oncology Practice*, September 2009; Volume 5, Number 5, pp. 262–3, ascopubs.org.
[11] Laura Lovett, "Israeli government dips into digital health with $33M grant," *MobiHealthNews*, July 18, 2018, mobihealthnews.com.
[12] e-Estonia, e-estonia.com.
[13] The Centers for Medicare & Medicaid Services (CMS) has issued a new proposed regulation that would require all health plans subject to CMS authority to make certain clinical, claims, and coverage information available to patients and their personal representative, cms.gov.
[14] "Interoperability," NHS England, england.nhs.uk.
[15] "Criteria for health app assessment," Public Health England, October 9, 2017, gov.uk.
[16] Medicines and Healthcare products Regulatory Agency, gov.uk.
[17] NICE, nice.org.uk.

to be efficient. That, in turn, encourages the use of digital technologies that promote efficiency. For example, health-maintenance organizations (HMOs) in Israel that want to prevent patients from needing high-cost hospital care have a strong economic incentive to manage their covered populations more effectively. Digital tools can help them focus on prevention and earlier intervention in primary care. For example, Maccabi Healthcare Services, an HMO, operates a community-focused integrated-care platform that connects multidisciplinary care providers and allows them to manage patients' health through comprehensive health promotion and prevention activities.[18]

Healthcare regulations serve an important role in protecting patient safety. But to improve the productivity of healthcare delivery, some older regulations may need to be updated, while others may best be phased out. In a few cases, new regulations may warrant consideration to accommodate industry evolution.[19] Moreover, proactive changes may be necessary to encourage providers to adopt digital services and to prevent unforeseen consequences. In Sweden, for example, mobile primary-care teleconsultations providers, like KRY, Min Doktor, and Doktor24, are serving patients across the country using a reimbursement framework designed to help patients find care when they fall ill while visiting other regions. Setting up one physical teleconsultation hub with health practitioners allows a digital player to serve the whole country remotely, allowing patients to receive care in areas where they do not pay taxes.

3. Healthcare organizations that promote open innovation will help spur digital transformation

A number of countries are following the route of creating an open innovation platform—or ecosystem—around patient healthcare data that allows providers to develop their own interfaces to access the data.

For example, a partnership of several organizations, led by the government-run Social Insurance Institution of Finland, has built a set of digital healthcare services for the social and healthcare sector. Called Kanta, these services include personal electronic health records, a prescription service, a pharmaceutical database, a patient-data repository, and archives. The latest set of services, My Kanta Pages, is a national data repository in which citizens may enter information on their own health and well-being. The system's architecture is open, allowing software suppliers to develop their own interfaces for Kanta's content.

Similarly, NHS England has developed an open API architecture policy and supporting guidance.[20] This policy sets out the key expectations for healthcare organizations when developing, upgrading, or procuring their systems in the move to open architecture. Indeed, health systems that had already embarked on a digital transformation reported in our interviews that if they were to rerun the process again, the major change they would make would be to set clear standards for interoperability from the start.

Several other countries have developed open platforms. Denmark's OpenTeleHealth, for example, encourages the development of new applications by third-party vendors.[21] In China, Alibaba Holding's AliGenie[22] and Tencent's artificial-

[18] Maccabi Healthcare Services, DECI Fondazione Politecnico di Milano, deci-europe.eu.
[19] Pooja Kumar, Edward Levine, Nikhil Sahni, and Shubham Singhal, *The productivity imperative for healthcare delivery in the United States*, February 2019, McKinsey.com.
[20] NHS England leads the National Health Service in England and supports the commissioning of health services.
[21] Martin Benedict, Werner Esswein, and Hanno Herrmann, "eHealth-platforms: The case of Europe," in Adrien Ugon et al., *Building Continents of Knowledge in Oceans of Data: The Future of Co-Created eHealth*, Amsterdam, Netherlands: IOS Press, 2018.
[22] "Alibaba debuts AliGenie open voice platform," October 16, 2017, hangzhou.gov.cn.

intelligence (AI) open platform[23] allow different manufacturers to work on the systems and add them to third-party products.

4. Healthcare providers can improve adoption and expedite benefits by focusing on tangible value to consumers

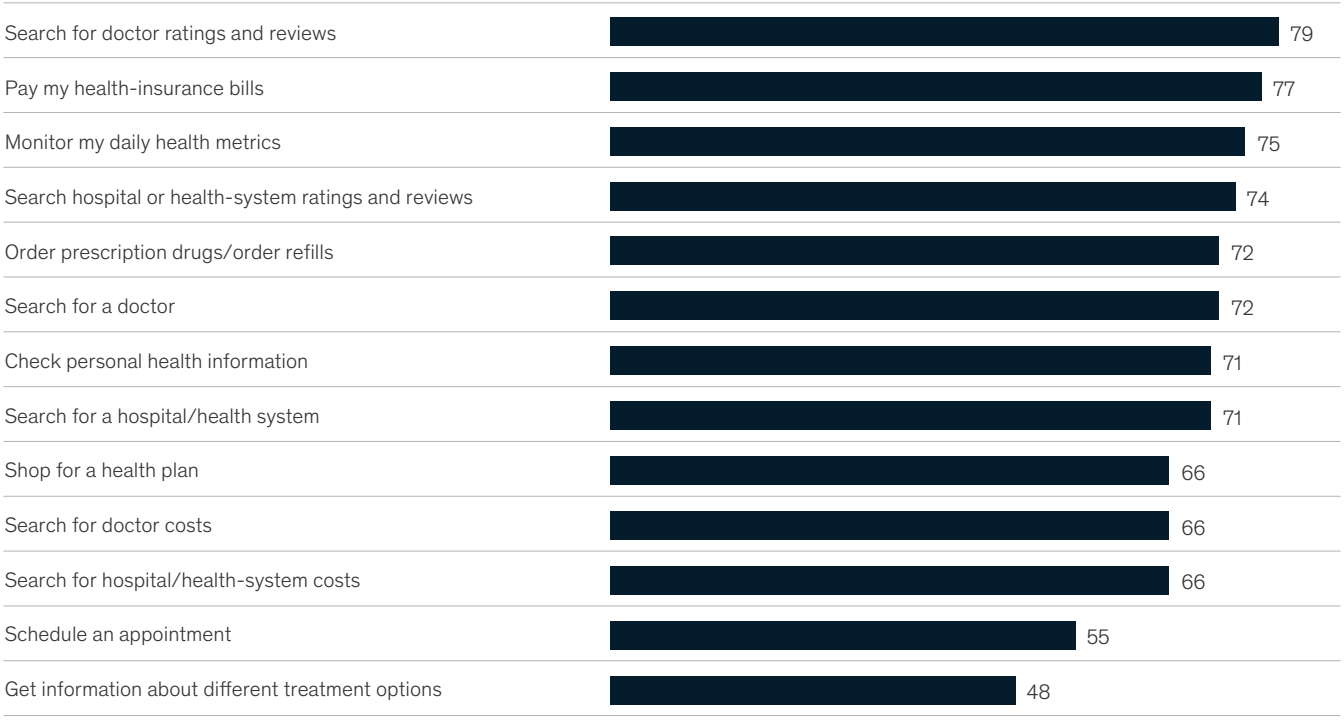
Some industries have digitized their processes—travel, banking, and entertainment, for example—so that consumers have now come to expect digital service delivery. Multiple surveys, including McKinsey's, show that people are open to the use of technology in healthcare (exhibit) and even expect that it should be modern and convenient, consistent with their experience elsewhere.

At the same time, emerging disruptive providers facilitate transformation by presenting new opportunities to the market and generating demand for innovative models of care delivery. For instance, Europe's subscription health-service provider Babylon Health's *GP At Hand* service has pioneered NHS-funded teleconsultations in London, complete with an interactive, AI-supported symptom checker. The practice has increased the number of subscribers tenfold by addressing unmet needs and delivering value to consumers. The key lesson here is that the power of consumer choice can lead other stakeholders to innovate.

Exhibit

Most consumers are open to the use of digital in healthcare.

Top reasons why healthcare consumers prefer digital, 2018, % of respondents[1]



[1] Includes those who strongly or somewhat prefer digital or online, n = 2,809.

Source: McKinsey Consumer Health Insights Survey, 2018

[23] Iris Deng, "Tencent releases open platform to help drive AI projects at other companies," *South China Morning Post*, September 19, 2018, scmp.com.

5. Stakeholders who invest in the right mix of skills can help accelerate and sustain long-term digital transformation

In the 1990s, Estonia tapped into transferable skills among former aerospace engineers to build its first eGovernment system and later the X-road system, a solution that ensures secure transfers of health information and other digital infrastructure for public services.[24] This allowed the country to leapfrog its neighbors in terms of their level of digital maturity by providing a basic interconnectivity infrastructure.

Elsewhere, Babylon Health has announced an additional $100 million investment to double its research workforce to develop the next generation of AI-powered healthcare technology. The United Kingdom's NHS Digital has launched Digital Academy, a countrywide, digital upskilling program for hospital chief information officers.[25] The UK secretary of state for health and social care has also commissioned a publication—the *Topol Review*—to explore how to prepare the healthcare workforce, through education and training, for a digital future.[26]

It's clear that digital leaders that make strategic investments in the right workforce-skill mix can spur on technology breakthroughs. This is especially important in the health sector, where healthcare professionals are the key influencers of patients. For example, if providers are to encourage electronic prescribing and broad adoption of digital therapeutics, then physicians must have the skill set needed to understand the benefits and drawbacks of novel technologies. Accordingly, healthcare payers may need to consider additional investment in workforce-education and -communication programs to encourage a mind-set shift toward digital.

6. Payers and providers can start with near-term initiatives—but still need long-term investment

Healthcare organizations and systems that achieved recognizable improvement in clinical-care delivery, patient outcomes, or population health, such as the winners of the HIMSS Nicholas E. Davies Award of Excellence,[27] illustrate the need to start with a high-value, low-cost innovation.

For example, one of the latest recipients of the award, UCLA Health, was recognized for three use cases covering reduction of denials of payment through automated notifications to case management, improving depression screening in primary care, and optimizing blood utilization using real-time clinical-decision support.[28] The organization has a history of innovating around care delivery using the latest digital technologies.[29] It established a Global Lab for Innovation with a major goal to create cost-effective results, emphasizing the need for a quick link to execution.[30]

Still, the adoption of value-adding innovation is not possible without investments that are substantial enough to achieve an organization's long-term performance goals.[31] Moreover, the decentralized departmental budgets that are common among healthcare providers often lead to considerable underinvestment in innovative technologies that create benefits across the entire cycle of care. Therefore, organizations that operate with a central innovation budget can create benefits systemwide.[32]

McKinsey research also suggests that the companies with a long-term view outperform their peers.[33] Therefore, a central long-term investment into technologies transforming care across the

[24] The tool can write to multiple information systems, transmit large data sets, and perform searches across several information systems simultaneously. For more, see e-estonia.com.
[25] NHS Digital Academy, england.nhs.uk.
[26] *Topol Review*, topol.hee.nhs.uk.
[27] The HIMSS Nicholas E. Davies Award of Excellence recognizes the thoughtful application of health information and technology to substantially improve clinical-care delivery, patient outcomes, and population health, himss.org .
[28] UCLA Health was named a 2018 HIMSS Davies Enterprise Award recipient for leveraging the value of health information and technology to improve outcomes, himss.org.
[29] "UCLA biodesign innovation fellowship opportunity drives transformative innovation," UCLA Clinical and Translational Science Institute, ctsi.ucla.edu.
[30] Mark Hagland, "Peter Kung: UCLA Health will be an incubator of healthcare innovation," *Healthcare Innovation*, August 23, 2014, hcinnovationgroup.com.
[31] Marc de Jong, Nathan Marston, Erik Roth, and Peet van Biljon, *The eight essentials of innovation performance*, December 2013.
[32] Derek A. Haas, Michael S. Jellinek, and Robert S. Kaplan, "Hospital budget systems are holding back innovation," *Harvard Business Review*, March 29, 2018, hbr.org.
[33] "Where companies with a long-term view outperform their peers," McKinsey Global Institute, February 2017, McKinsey.com.

Sidebar

Stakeholders have various roles in digital transformation

It will likely take a concerted effort among stakeholders to get past the barriers to digital healthcare most cited by industry leaders—and each stakeholder has a role to play in a digital transformation in healthcare (exhibit).

Exhibit

Stakeholders have a variety of potential roles in digital transformation.

Stakeholder	Potential roles
Government	• Consider how best to accelerate adoption of digital and analytical innovations • Support underpinning infrastructure (patient and physician digital IDs, cybersecurity, and/or ecosystems) and defining standards (including for data exchange) • Encourage smart regulations that are well aligned with current healthcare-delivery needs • Encourage education for healthcare and medical personnel to plan for and develop digital and analytical therapy skills
Payer	• Use advanced analytics and big data insights to promote quality of care and transition to value-based reimbursement • Look to see how alternative providers and new market entrants can provide services to customers • Invest in IT infrastructure to develop ecosystems and platforms on which third-party providers can innovate
Healthcare provider	• Design and follow a clear strategy to deploy solutions for prioritized use cases that will add most value to patients, clinicians, and their staff • Provide sufficient staff education and training to develop appropriate digital capabilities • Continuously adopt digital innovations, internally or in partnership with solution providers, that promote both quality of care and productivity • Consider expanding resources for existing pilot projects, rather than starting new ones, when timing is out of sync with budget cycles • Introduce culture-changing initiatives that promote uptake of innovations
Solution provider	• Partner with healthcare providers, payers, and academia to establish a precedent for innovative ways to provide safe, effective care and demonstrate potential value at stake • Offer flexible, clinically validated solutions as part of a tailored solution to targeted payer or provider while recognizing and understanding its incentives and appetite for disruptive change

whole care cycle is necessary to achieve the ambition of digital transformation.

Although a number of countries have achieved promising digital-adoption rates in healthcare, the full value of a digital transformation of the sector remains elusive. Health systems have been unable to close quality, access, and financial gaps, even as their budgets continue to grow. More thought and effort are needed—and success is most likely for systems where all stakeholders are working collaboratively.

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