How can an intelligent health ecosystem create a smarter health experience?

Three essential shifts to build and elevate a smarter health experience

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Three essential shifts to build and elevate a smarter health experience

The most important conversation around the future of health care is not about the shift to digital. It is about people.

Accustomed to on-demand and self-directed experiences in other areas of their digital lives, consumers and clinicians expect something more from health care.

In combination, smart health technology, along with empathetic human touch, will transform how care is organized and experienced. Optimizing experience will be a key differentiator in terms of long-term value for the health industry.

If the experience of care is elevated, you can truly drive execution to reach the full potential of the quadruple aim: improved patient care experience, better outcomes, improved clinical experience and lower costs.[1]

A UNIFIED, INTELLIGENT AND DATA-OPTIMIZED SYSTEM OF CARE

The future of health is smart.

The point at which health becomes smart is where people, the environment and the infrastructure connect as a unified, intelligent and data-optimized system of care.

As the physical and virtual care worlds converge, an intelligent health system means that a highly personalized and precisely targeted care experience becomes possible.

The world is fast becoming smart — smart cities, cars, utilities and homes leverage the internet of things, data and intelligent connected systems to support economic, social and environmental sustainability. So, we should expect nothing less than health systems that are adaptive, intelligent and interconnected.

To move into the future, health care must push beyond digital, beyond connected, to fully leveraging the world of big data, artificial intelligence (AI) and smart technologies. And yet, innovative health technologies are just one part of the solution; the other is systematically paying attention to get the health care experience right.

So, what makes for a good health experience? Health and care are highly personal, and experience is what a person wants it to be — to feel better, be listened to, be treated with warmth and empathy, and be actively engaged — to the extent that they wish, in decisions regarding their care. Simply put, a good experience aligns with care that brings a thoughtful human touch and has the consumers' best interests at heart. For clinicians, experience relates to a safe, positive, and modernized work environment and a profound sense of purpose.[2]

We need to ask consumers and clinicians what matters to them and deeply understand the benefits to be gained from improving the end-to-end experience in the health care journey. Research suggests that paying attention to the customer makes sound clinical and commercial sense. Failure to do so risks disintermediation as others see opportunities to enter the space with platforms and smart ecosystems that make the health care experience simpler and more accessible.

This report further expands upon and updates previously published EY materials on participatory health. (Refer to the featured insight, "Participatory health.") Here, EY articulates the expectation that optimizing consumer and clinician experience will be a transformative element of a smart health system of the future.

To understand the contemporary market perspective, EY professionals spoke with a number of health industry executives in the United States, Europe and Southeast Asia. Executives from academic institutions, providers, payers and entrepreneurs were interviewed in February 2021. These conversations were illuminating, covering views and real-world experiences of exploring better customer engagement and the creation of value. The interviews were augmented with a review of academic and industry literature, as well as conversations with global health industry professionals.

Companion EY publications delve into other aspects of the theme of smart health, including smart hospitals and the vital role data play in a connected health ecosystem. Visit ey.com/smarthealth.

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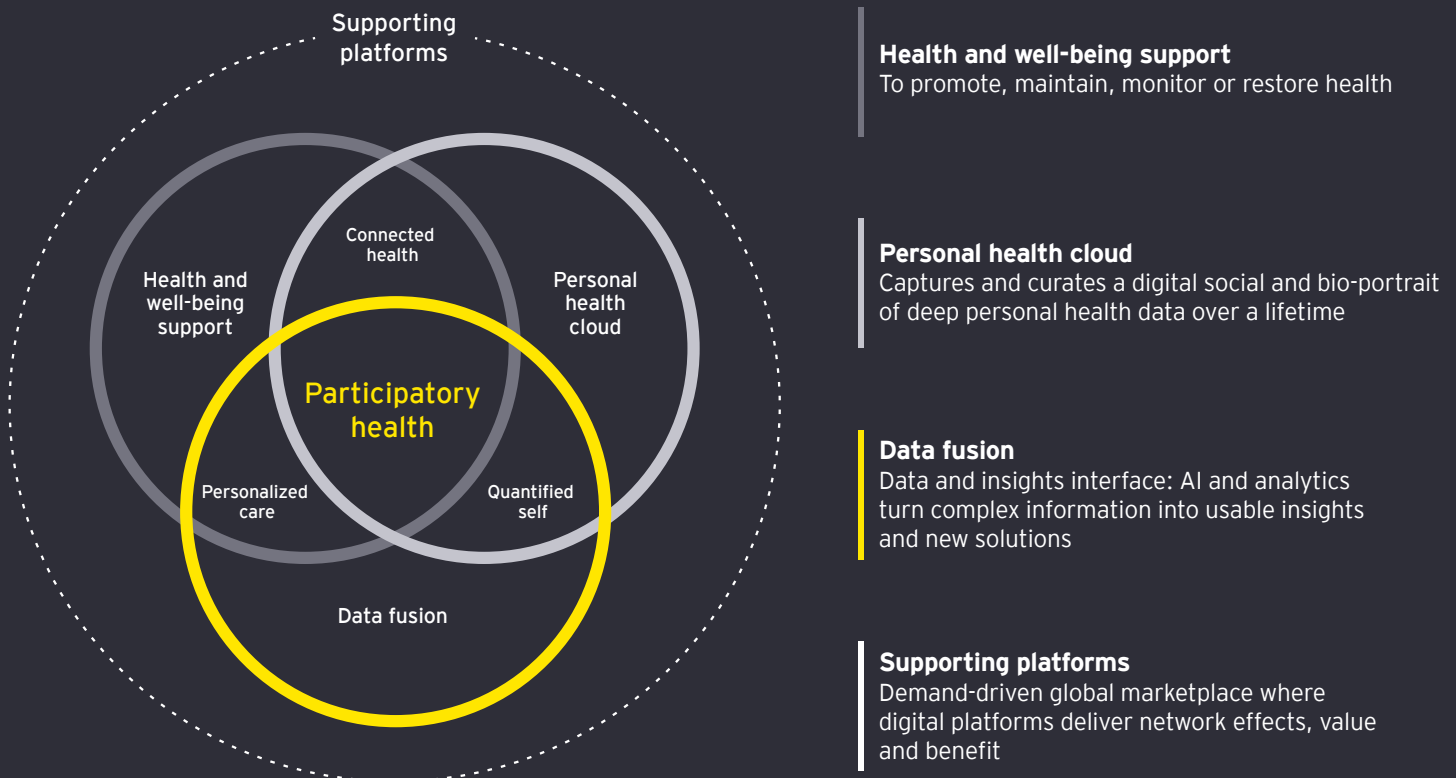
Participatory health

EY has been researching and writing about emerging health ecosystems for a number of years. Starting with participatory health, EY proposed that an engaged and participatory patient or consumer acting as an equal partner in his or her care experience was a significant catalyst for change. More recently, smart health and smart hospitals were examined, outlining the new information architecture necessary to create a smart health ecosystem (visit ey.com/smarthealth).

Participatory health is a shift in the way we view and think about health and care. A simple concept with powerful implications, participatory health is firmly grounded in patient engagement, shared decision-making, patient activation, patient-centered care and consumer-directed care. Participatory health is reflective of a deep and profound shift in perspective toward well-being and wellness, convenience, flexibility, self-direction and personalized experiences. This goes beyond "sick care" to "healthfulness" inspiring, encouraging and teaching individuals to make positive care and lifestyle choices and be engaged in, and accountable for, lifelong health. This shift posits a vastly different perspective of health care — one where an individual navigates his or her health and care as an equal partner, or at least a better partner, with the health professional.

In earlier reports, EY explored how technology fashions health care as continual and participatory, occurring anywhere and at any time. First, **Health reimagined: a new participatory health paradigm** (see How patient participation is changing the health care industry | EY — Global), presented a vision for what the health system of the future could be like in a new virtual health world. This means not just incremental additions to the current system, but also how digital health technologies will raise the health system to another level — to one that really does engage patients and health professionals in a more seamless way.

Second, **Health care: the cross-currents of convergence deliver participatory health** (How the cross-currents of convergence can deliver participatory health | EY — Global), EY put forward a model of industry transformation. Participation is the underlying premise as the notion of health transitions from reactive to proactive care systems focused on wellness, chronic care and population health management. Eventually, global platform-based health ecosystems will drive innovative solutions to some of the intractable problems in health care.

A participatory health paradigm

Health and well-being support
To promote, maintain, monitor or restore health

Personal health cloud
Captures and curates a digital social and bio-portrait of deep personal health data over a lifetime

Data fusion
Data and insights interface: AI and analytics turn complex information into usable insights and new solutions

Supporting platforms
Demand-driven global marketplace where digital platforms deliver network effects, value and benefit

The pace of technological change has been breathtaking.

Previous EY reports explored a vision for the future of an expanding and participatory health ecosystem based around the individual. Since then, the pace of technological change has been breathtaking. Many of what were considered emerging technologies are now highly sophisticated and have moved from proof-of-concept into the core business of health. The growth and maturation of AI, natural language processing (NLP) and robotic process automation (RPA) have been instrumental in innovations for safer clinical care, automation of clinical and back-office operations, and personalized care and prevention.

Reorienting to the smart health experience
A key premise that underlies this report is that, as the health system becomes smart, the defining narrative of the industry will shift to that of optimizing experience for both consumers and clinicians. Organizations will reorient around concern for delivering not only clinical sick care, but also end-to-end well care that is personal and empathetic. Digital technology will provide the tools.

At the heart of this shift lies underlying assumptions on what shapes the production of health and whether the current model of health care is suited to modern-day needs. (Refer to the featured insight, "The model of health care is changing profoundly.") The supply model of health is generally a waterfall model and is siloed, which delivers poor experiences. The new world of experience is driven by an agile, digitally-enabled and demand-led model of health care. Discussions with industry executives touched upon fundamental tensions within health care. Systemic elements get in the way, such as the friction between traditional models of fee for service and contemporary health policy that targets three essential shifts from volume to value,[3] digitally-driven patient-centricity[4] and a shift in the organizational structures of delivery.[5]

The model of health is changing profoundly
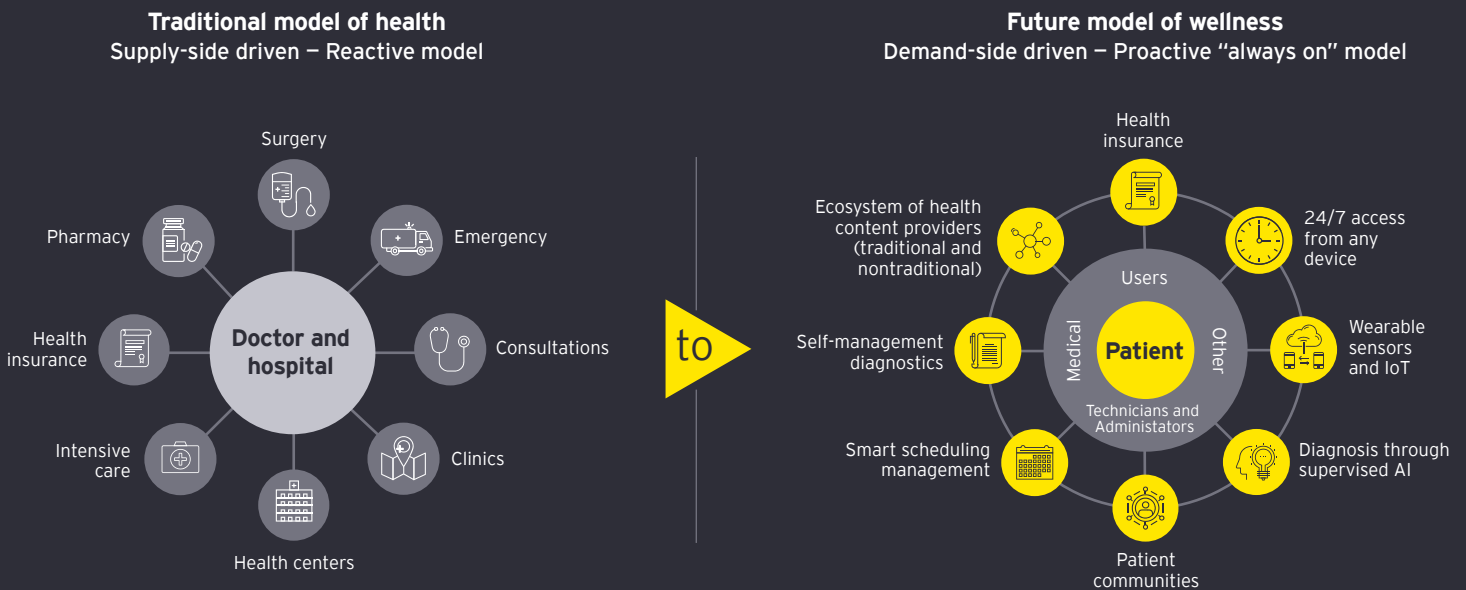
The impact of COVID-19

COVID-19 has accelerated the modernization of health care. The pandemic exposed health systems' reliance on in-person care delivery and sparked a deep vein of innovation. In particular, it triggered a re-evaluation of what it takes to "become digital" and an emphasis on the need for a digital-first approach to care.

Rising consumerism

Demanding a vastly different way of thinking about health and how care is delivered, consumers are coming to expect health care to deliver what they have in other areas of their lives: connectivity, mobility, agility, immediacy and the tools for self-direction.

Advanced technology and communications

Legacy systems are insufficiently agile to respond to a rising demand, an aging population and costs. However, advanced technology and 5G-powered communications are making it easier to engage with the health system in completely different ways and support a suite of new solutions around well-being, remote care, smart homes and communities.

Traditional model of health
Supply-side driven – Reactive model

Future model of wellness
Demand-side driven – Proactive "always on" model

Traditional model: Doctor and hospital at center, surrounded by Surgery, Emergency, Consultations, Clinics, Health centers, Intensive care, Health insurance, Pharmacy.

to

Future model: Patient at center (Users, Medical, Other, Technicians and Administrators), surrounded by Health insurance, 24/7 access from any device, Wearable sensors and IoT, Diagnosis through supervised AI, Patient communities, Smart scheduling management, Self-management diagnostics, Ecosystem of health content providers (traditional and nontraditional).

Constant reinvention to meet consumer and clinician needs means finding the balance between what has worked in the past and what needs to be done for the future. As Kristi Henderson, DNP, SVP at Center for Digital Health & Innovation, Optum, United Health Group, says, "We have to keep listening to our customers and keep evolving our platforms, products, processes, tools and services to match those needs. And we'll never be done." Daniel Kraft, MD, Founder and Chair of Exponential Medicine, points out that just digitizing analog processes is not the answer, saying, "A digital fax machine does not move the needle; rather, it entrenches the old way of doing things."

As in other sectors, consumerism is the driving force on the demand side of the health equation, shaping the health industry toward providing every person with the right care at the right time and price. For organizations, this means having clarity around the value proposition and the role to be played in the health care system.

To remain relevant in a fast-changing environment, health care organizations will need to tackle the duality of growth: taking care of the business of today while innovating to build the health system of tomorrow. (Figure 1, The duality of growth) Those in leadership and governance roles face hard decisions around what to pursue, what to repurpose or divest, and where to invest. In the context of this report, this means being clear about how value is created through balancing innovation and exploring improving experiences with the need for operational effectiveness. For many organizations, this shift toward engagement and optimizing experience may be highly disruptive to a status quo built around utilization and volume.

This report delves into the consumer and clinician experience:

‣ First, what makes for a superior health care experience is examined.

‣ Then, EY addresses how this may look in a complicated system of industry players and discuss what makes for a smart health ecosystem.

‣ Finally, how this might come about by bringing users alongside is explored.

In conclusion, this report considers implications for organizations as the health industry reorients around a smarter health experience.

Figure 1: The duality of growth

Continue to optimize the business of today

Duality of growth

Innovate and grow the business of tomorrow

1
PAYING ATTENTION TO WHAT MATTERS

Essential shift #1:

Getting the health experience right means moving beyond just delighting in the moment to systematically paying attention to what matters.

What constitutes good health care experiences, how to achieve them and why they are important is not widely shared or clearly understood. And yet, these are some of the most important strategy questions facing health systems today. How an individual perceives health is unique and intensely personal, and health outcomes are shaped by many nonmedical factors, including education, income and cultural perspectives

Industry executives interviewed were confident that, in the future, the health industry will be built upon a deep understanding of benefit arising from improving the end-to-end health and wellness care experience.

Getting the experience right means valuing people for who they are and understanding each person's unique set of needs. For consumers, what makes for a good experience is highly personalized, proactive and engaging care, tailored to them, as an "N of 1." For clinicians, it is meaningful engagement with their work in a low-friction, modernized and inspirational environment. (Refer to the featured insight, "What positive experiences deliver.")

A good health care experience is highly nuanced. The strategic challenge is creating an emotional connection between patient and organization over the health journey. Interviewees emphasized the creation of trust as a fundamental pillar of this relationship. A seamless digital experience can make the

difference in consumer loyalty and retention, and the future lies in building digital services that add value. Rachel Dunscombe, CEO, NHS Digital Academy, stresses the importance of a strategy-led approach, saying, "It's a wider context than just delighting in the moment. We need a systematic approach to getting it right. A nuanced and subtle focus on continual optimization of experience will ensure ongoing patient engagement and create optimal health care."

Those interviewed clearly saw that there is no one "best" experience. Rather, an optimal experience aligns consumer need with the right resources, in the right setting. As Daniel Kraft observes, today's health care system is designed as one-size-fits-all. Health systems need to "pay attention to matching the consumer, just like we do in precision medicine – right drug, right dose, right combination. When you think about it, it is precision engagement, in a sense to 'get it right' – there's no one-size-fits-all. Ideally, this will lead to precision digital health that matches

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When you think about it, it is precision engagement, in a sense to 'get it right' — there's no one-size-fits-all.

Daniel Kraft, MD, Founder and Chair of Exponential Medicine

What positive experiences deliver

Positive consumer experiences can build the foundations of long-term partnership between the consumer, the clinician and the health enterprise. In so doing, this creates the foundations of the shift in focus from "sick care" to wellness and engagement for lifelong health. Positive experiences can improve care outcomes, consolidate an ongoing relationship with the health care provider and increase the likelihood of adhering to treatment, as well as seeking care proactively in the future.[1, 2, 3]

Introducing smarter technology-enabled care pathways makes it easier for consumers to engage with health for prevention, rather than just when sick. This includes facilitating low-effort data gathering, including the integration of social determinants data with the clinical, for better outcomes.

For clinicians, the digitization and automation of existing processes can reduce repetitive, low value tasks, freeing staff time and energy for patient engagement and clinical care;[4] lower staff burden; and reduce burnout and turnover.[5] Clinical productivity can be enhanced because the rapid dissemination of best practices and evidence-based medicine can change deep-seated habits, reduce variability and waste, and improve patient outcomes.[6]

the patient's age, culture, language, education, personality and incentives." To this end, data and analytics are important tools of discovery and for crafting personalized responses. This includes known information about an individual's health, but also information on diet, activity levels and lifestyle factors. 'Omics data should be added as it comes onstream so that treatment and predictive health behaviors are tailored to the N of 1.

Eric Bricker, MD, Chief Medical Officer, AHealthcareZ, believes that the three things necessary for good patient experiences are the matching of clinical expertise and patient need, sufficient time to deal with the issue and clinicians with access to the right tools. As he says, "It takes time … if you've ever tried to fix a faucet in your house, it takes time. So, if you're only spending seven minutes a visit … it doesn't matter if you have all the expertise in the world, it still takes time."

This mismatch problem of expertise, time and tools, or the capacity to tailor personalized care, is one of the key problems in the pathway to becoming truly consumer-centric. Patient journeys can be complex, and even more so as dual streams of offline and online services come into play. Orienting around the consumer calls for decoupling care from location and making it feel seamless and unified for the patients. (Figure 2, A smarter health experience) The task is one of designing the system to meet the needs of the consumer rather than bending the consumer to the system. As one executive notes, "At the end of the day, good health care provision is not fully online or fully offline; it is a seamless experience that we need to provide."

1   George Loewenstein, Troyen Brennan and Kevin G. Volpp. "Asymmetric Paternalism to Improve Health Behaviors." JAMA, 2007. 298(20): p. 2415-2417. Epub November 28.

2   Jessica Greene, Judith H. Hibbard, Rebecca Sacks, Valerie Overton and Carmen D. Parrotta. "When Patient Activation Levels Change, Health Outcomes and Costs Change, Too." Health Affairs, 2015. 34(3): p. 431-437.

3   Jared Conley, Colin W. O'Brien, Bryce A. Leff, Shari Bolen and Donna Zulman. "Alternative strategies to inpatient hospitalization for acute medical conditions. A systematic review." JAMA Intern Med. 2016;176(11):1693-1702, published online October 3, 2016.

4   Peter Pronovost, Adam Sapirstein and Alan Ravitz, "Improving hospital productivity as a means to reducing costs," Health Affairs blog, March 26, 2019.

5   Edward R. Melnick, Liselotte N. Dyrbye, Christine A. Sinsky, Mickey Trockel, Colin P. West, Laurence Nedelec, Michael A. Tutty and Tait Shanafelt. "The Association Between Perceived Electronic Health Record Usability and Professional Burnout Among US Physicians." Mayo Clinic Proc. March 2020; 95(3):476-487.

6   Peter Pronovost, Jill A. Marsteller and Christine A. Goeschel, "Preventing bloodstream infections: a measurable national success story in quality improvement," Health Affairs, April 2011.

How can health care organizations transform into truly consumer-centric organizations?

Consumers are bringing to health care expectations of digitally enabled solutions that they enjoy in other industries, such as travel, transportation, financial services and retail. To become consumer-centric and experience-led requires a re-thinking of vision and strategic intent of the enterprise. Neil Sorrentino, PhD, Chief Global Strategist, Bumrungrad Hospital, Thailand suggests that this demands being clear about the principal value proposition of the organization, and focusing resources and energy around consolidating and extending brand equity and brand visibility.

At Bumrungrad Hospital, pursuing the vision of Ms. Linda Lisahapanya, Managing Director, the organization has worked through a process of re-thinking how it looks at patients, pivoting from being internally oriented to becoming outwardly focused. This has meant homing in on the experience the customer is looking for and using technology to remove

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You have to be thinking differently, how to distinguish yourself and how you get patients' attention.

Neil Sorrentino, PhD, Chief Global Strategist, Bumrungrad Hospital, Bangkok, Thailand

irritants to customers to make the health experience better. Turning thinking around has sparked a raft of new initiatives around social and digital connectivity with patients; the creation of new services in the wellness and lifestyle domains; attuning communications to generational preferences; and

Figure 2: A smarter health experience
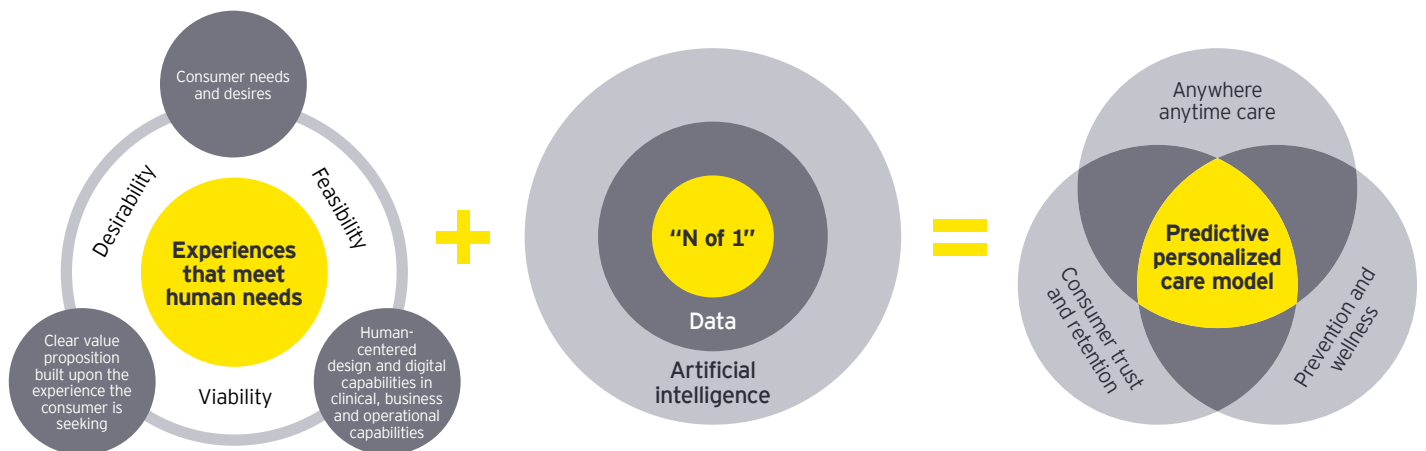
Creating experiences that meet human needs

Care organized around each individual consumer

Experiences and personalization through data create capacity to look after the individual consumer in a predictive personalized care model resulting in improved outcomes

reaching new markets through co-branding with unorthodox partners, such as with a large retailer's loyalty program.

In the long run, many of the interviewees expect that health organizations will come to recognize the value of an unwavering focus on consumer experience. To achieve this means building next-generation operating models applying digital capabilities to clinical, business and operational processes. One executive described how using AI-driven analytics effectively dealt with a costly back-office problem achieving operational efficiencies and improving customer satisfaction, saying, "So this use of the data, while it's not as sexy as using radiology data or things like that, it's a very programmatic use of data [that] helps out operations, as well as patient satisfaction."

However, many mitigating factors exist, including the challenges of organizations that have grown by acquisition and thus have federated operations of considerable complexity. Other factors noted included multisite networks with differing levels of digital maturity, the vast variations in physician employment and compensation models, the extent to which the organization "owns" the full spectrum of the patient journey and the thorny question of "who pays" for the experience. These all influence the ability to achieve the scale, scope and sustainability necessary to consistently deliver exceptional patient and clinician experiences.

Central to this shift

Trust is the biggest prerequisite for harnessing the power of digital transformation in health care. Trust and loyalty drive experience, and, while many in the health industry work to improve a patient's health, the bond of trust that forms between patient and provider is central. The technologies that will get health care to an anywhere-anytime system already exist. Patient engagement tools, virtual care, smart homes and AI-powered analytics will give people the means to manage their health, lifestyle choices and chronic conditions in vastly different ways.

Trust, however, has to be earned. The patient experience is the starting point, and the design intent is to transform the look and feel of services for a better care experience and sustained loyalty, or "stickiness."

Smart health technology, along with the human touch, offers opportunities to change care delivery in ways that matter to both consumers and clinicians. And from an enterprise perspective, automation and system process redesign will streamline middle- and back-office workflows so that clinicians can spend more time caring for patients.

This shift sees health care reorganize around experience optimization in a technologically advanced environment.

As a result, health systems deeply understand the utility gained from improving the end-to-end health care experience for both consumers and clinicians.

Based upon this, new business archetypes and paradigms will emerge that will be based upon an organization's proficiency in leveraging ecosystems, technology and data. In a highly competitive market, customer stickiness is key, and the depth of engagement will be built upon great experiences.

2

ALL ELEMENTS OF A HEALTH ECOSYSTEM MUST WORK IN CONCERT

How can an intelligent health ecosystem create a smarter health experience?

Essential shift #2:

To realize a smart future, all elements of a health ecosystem must work in concert

Delivering smarter health care and well-being at scale is immensely complex, especially in an industry with multiple players and one that, until COVID-19, was notoriously slow to change. As digital transformation within the health care system gathers pace, smart ecosystems will need to emerge and create new pathways by which to organize and deliver health care.

Recognizing the complexity of having all elements work together in an ecosystem, several interviewees stressed the need for co-creation with users and a willingness to iterate rather than to get it right the first time. Systemic design and architecting for expected future changes in health care, such as being able to incorporate emerging fields of 'omics data, are important. As Daniel Kraft notes, "If we build a platform in 2021, it may not be the platform that's going to work in 2030, but we need to architect it so that it's somewhat future-proofed." (Refer to the featured insight, "Ecosystems and platforms.")

The health system needs to evolve from the current situation of siloed point solutions. Apps, wearables, devices and portals bring multiple digital touchpoints that can create even more noise in an already complex patient journey. Sam Marwaha, Chief Commercial Officer, Evidation Health, points out that, "A world in which there are thousands of apps is not friendly to

an individual. The answer to engagement lies in building better platform environments that support the individual's health journey." He suggests that a better solution for the industry overall is for something like a "Spotify for health care" to emerge as an enabler of the underlying platform, explaining, "It's a clearing house, to a certain extent, for generating evidence incorporating measures that matter to patients, validating it in the right sort of way, and then making that evidence actionable at the point of intersection between the clinician and patient." This requires the health industry to move away from facility-centric models to evidence-supported management plans based on person-generated health data. By transforming how individuals interact with the health ecosystem, Sam foresees that a Spotify type of platform may well close the existing gap between the research and care delivery communities and accelerate the translation of research learnings into practice.

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A solution for the health industry overall is something like a Spotify for health care.

Sam Marwaha, Chief Commercial Officer, Evidation Health

Ecosystems and platforms

An ecosystem is variously described as being connected, demand-driven, complex and networked. EY views a smart health ecosystem as one that connects the traditional and non traditional players: payers, providers, regulators, banking, consumer products, grocers, transportation companies and others. The ecosystem will vary based on the position and mission of the organization, but it should be brought together by the advanced architectural integration of data and advanced analytics on top of that data to create informed insights to change care.

Platforms act as the "glue" that holds the ecosystem together, bridging the information and communication gap between different stakeholders and care settings. The idea of a platform is a familiar one: a connected network that leverages intelligent technologies to organize, scale and automate the bringing together of parties for the exchange of goods and services, information and interactions. Network effects drive mutual value: the more users, the greater the benefits.

Catching sight of the future
Over the past two decades, large technology companies in China have entered the health care market, emerging as integrated, mega-platform providers. Building complex digital ecosystems in just a few years, these companies have powered ahead, re-shaping the institutional landscape of China's health care system, as well as extending across the end-to-end patient value chain.[1] Positioning as a trusted health guardian, through closed-loop ecosystems, these entities seek to pull all key parties together into a network (online and offline) to efficiently provide high-value consumer services and enhance customer loyalty. And while the leading companies have all pursued different pathways to better serve and disrupt the market, lessons learned may well suggest directional shifts in the future of health in countries where demand for health care exceeds available resources.[2]

▸ According to Ping An, a leading internet health care services platform in China, its ecosystem strategy is not intended to resolve isolated concerns, but rather to build whole health system solutions that deliver outcomes for all stakeholders.[3] Through a combined online and offline approach, Ping An's health care ecosystem looks to achieve both horizontal and vertical integration through an effective digital infrastructure, cloud and blockchain technologies, AI and data management systems.[4] The company is creating a highly integrated ecosystem to improve population health, and to resolve access problems, resources shortages and efficiency issues by bringing more care online and connecting different data sources.[5] The ecosystem strategy extends beyond health care, linking with, and creating synergies across, the group's five ecosystems (financial, health care, auto, real estate and smart city services).[6] Ping An has focused upon addressing service gaps, such as primary health care and partnerships with offline hospitals to expand into online hospitals, as well as health and wellness e-commerce platform and international research partnerships.[7]

▸ Similarly, Tencent, one of the largest tech companies in China, connects patients with doctors through a health portal and runs AI-assisted solutions behind the scenes. Patients access the system via the messaging app WeChat, which they can use for chat purposes and e-commerce health product purchases, and to pay their medical bills. Health insurance can be obtained via partnerships held with insurance companies.[8]

▸ In pursuit of becoming a one-stop shop for health care, e-commerce giants Alibaba and JD.com have spun off health entities that capitalize upon their deep logistics expertise and e-commerce platforms' large user bases. Both Alibaba Health and JD Health are pursuing direct-to-consumer sales in addition to creating the business-to-consumer market to penetrate the health industry. Areas of activity include drug sales, home delivery of medicines, online doctor consultations, digital solutions for hospitals, online diagnostics and sale of consumer health services.[9,10]

1   Soon Chen Kang and Jiayue Huang. "China's big tech to continue disruption of healthcare sector despite crackdown." S&P Global Market Intelligence. January 7, 2021. [cited 2021 April]. Available from https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/china-s-big-tech-to-continue-disruption-of-healthcare-sector-despite-crackdown-61610882

2   Craig Mellow. "China's Healthcare Companies are the Next Big Thing. Where Investors Should Look." Barrons. March 19, 2021. [cited 2021 April]. Available from https://www.barrons.com/articles/chinas-healthcare-companies-are-the-next-big-thing-51616148903

3   Ping An. "An ecosystem to overhaul China's health care." MIT Technology Review, March 30, 2021. [cited 2021 April]. Available from https://www.technologyreview.com/2021/03/30/1021421/an-ecosystem-to-overhaul-chinas-health-care/

4   Ibid.

5   Ibid.

6   PRNewswire. "Ping An Unveils Health Care Ecosystem Strategy." September 23, 2020. [cited 2021 April]. Available from https://www.prnewswire.com/news-releases/ping-an-unveils-health-care-ecosystem-strategy-301136665.html

7   Alexander Braun and Niklas Häusle. "China's tech giants delivering smart health services. Chapter 3 in Healthcare transformation." Credit Suisse Research Institute Report, June 2019. [cited 2021 April]. Available from www.credit-suisse.com/researchinstitute.

8   Ibid.

9   Rita Liao. "How Alibaba and JD.com compare in their healthcare endeavors." TechCrunch. December 7, 2020. [cited 2021 April 22]. Available from https://techcrunch.com/2020/12/06/china-digital-healthcare/

10   Soon Chen Kang and Jiayue Huang. "China's big tech to continue disruption of healthcare sector despite crackdown." S&P Global Market Intelligence. January 7, 2021. [cited 2021 April]. Available from https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/china-s-big-tech-to-continue-disruption-of-healthcare-sector-despite-crackdown-61610882

Different types of platforms are emerging in response to key areas of demand, such as convenience care, specific condition management, virtual telehealth, integrated virtual and physical care, and retail health. (Figure 3, Network orchestration) The digital front door, or one-touch digital entry points between a consumer and a health system, is a natural fit with platforms orchestrating a network around the person. Digital front doors present a gateway to connect and stay with the patient throughout his or her journey. They also enable a more flexible clinical model − one that shifts care to the right type of provider at the right time, as organizations use AI to adjust clinical staffing models based upon need and demand surges.

Industry executives saw that orchestrators of smart ecosystems may well come from outside the health industry (e.g., global brands running digital platform businesses).

Partnerships are already emerging between consumer, tech or electronics companies and leading health industry players that blend the technical capabilities of one partner with the service and health care expertise of another. Daniel Kraft drew an analogy with an orchestra, saying that the challenge was to, "create an orchestra with interchangeable bits … and get the big players and small players to tune up in the same key."

Governance systems that deliver trust are seen as a critical success factor. In particular, good governance around how platforms capture, store and give access to data is necessary to establish user trust (both consumer and clinician) and for privacy and security to be maintained.

As the focus of health systems moves toward supporting wellness − anytime, anywhere − an open platform environment is required to connect and share permissioned data, at scale,

Figure 3: Network orchestration. All elements relevant to a person's health work in concert to create an intelligent ecosystem.
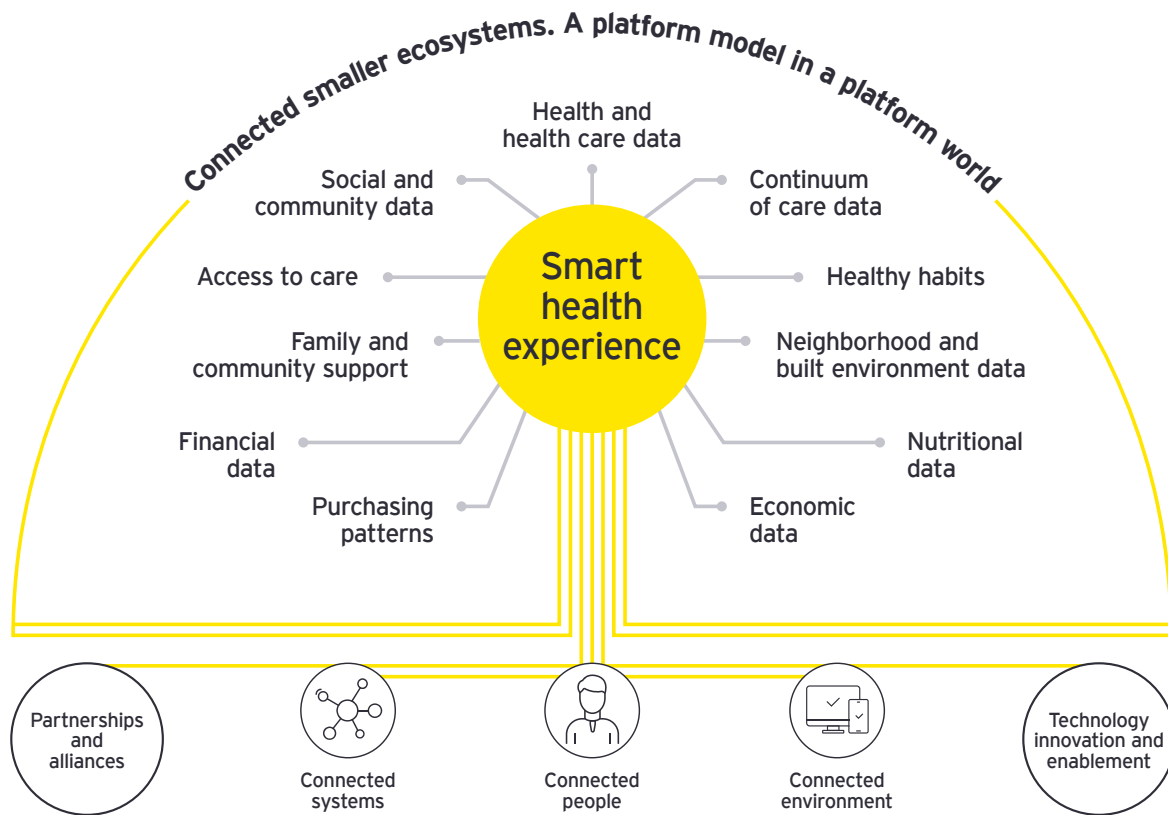
within and among enterprises and systems. An open platform is one that "separates content and technology and is vendor neutral, distributed and modular."[6] Types of platforms that are likely to become dominant in the future will include several key features of a technology architectural infrastructure, an analytics and intelligence layer, and a user engagement interface (Figure 4, Transition toward the health platform enabling the health ecosystems of the future). The patient experience moves from siloed systems with little ability to share information to a cohesive technology stack and a networked infrastructure that delivers a unified experience.

Rachel Dunscombe addressed the difficult problem of the quality and availability of health data, arguing that a balanced scorecard approach is necessary to balance the need for data longevity with the more immediate demands of usability for clinicians and the broader health care system. Open data, minimum data sets and standards around data nomenclature, collection and user experience standards are all essential to move toward an ecosystem where health and social data are better connected, combined and shared.

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When I think about a super-platform that supports care for life … it must have contextual intelligence to meet the customers' expectations and care needs. How we use the data and the AI applied to it must be balanced and masterfully orchestrated with human interaction and skillfully placed automation to build a trusted relationship with ongoing engagement.

**Kristi Henderson, DNP, SVP at Center for Digital Health & Innovation, Optum, United Health Group**
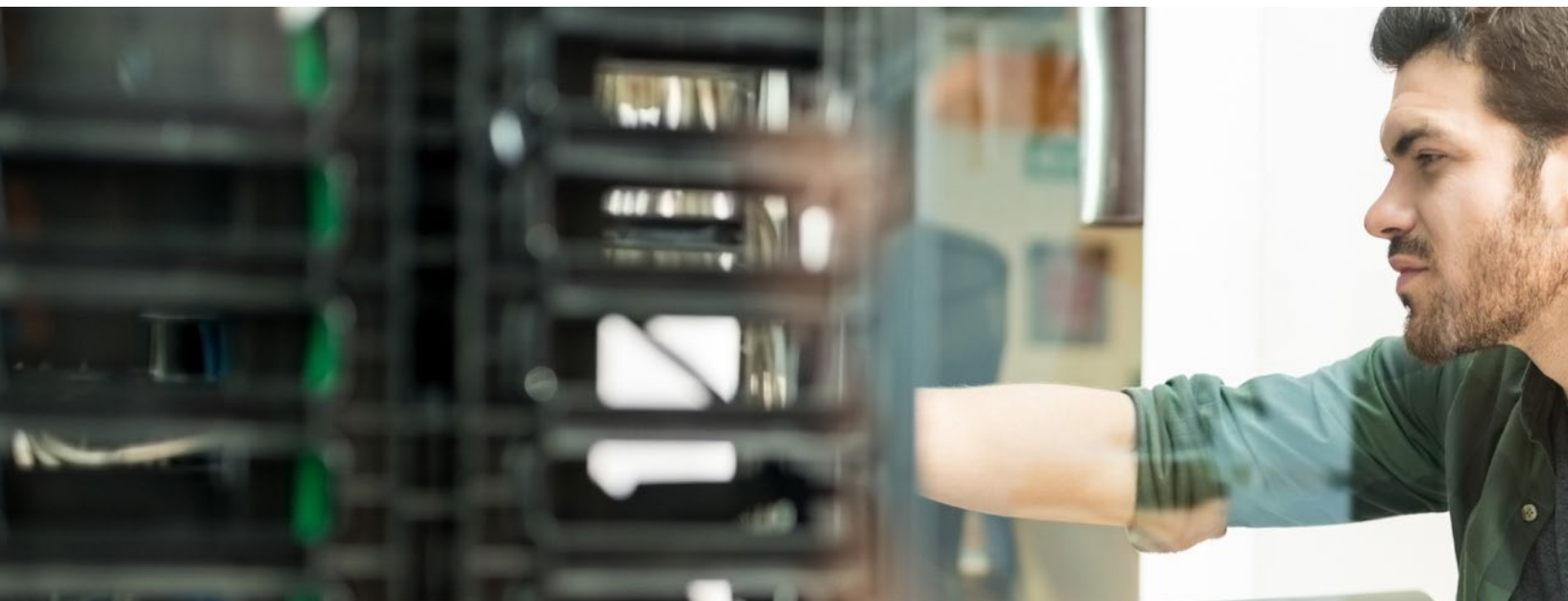
Figure 4: Transition towards the health platform enabling the health ecosystems of the future
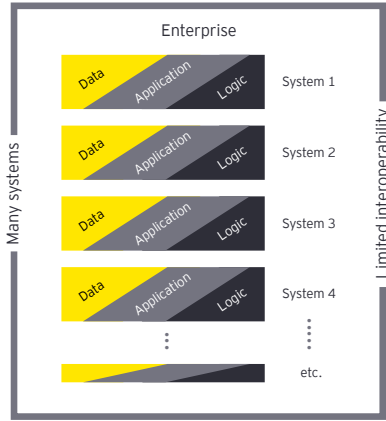

Present-day enterprise systems

Many systems all with intimately bound data logic and applications. Within one enterprise, 200–400 systems can exist made up of several different vendors (many of which are not complementary) and where logic is bundled with the application.
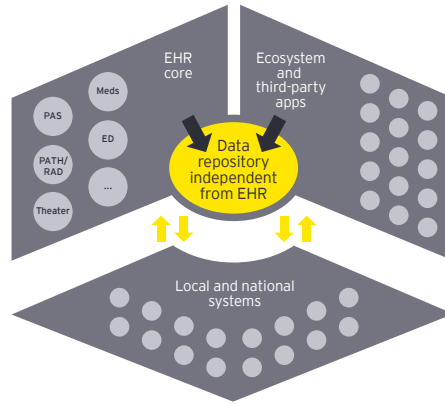
Intermediate-state platform

A more flexible, dynamic infrastructure will be built around existing systems, communicating through modern APIs. In the near term, platform-based systems and legacy EHRs will coexist by maintaining basic functionality in legacy systems while building and innovating in a platform-based environment.
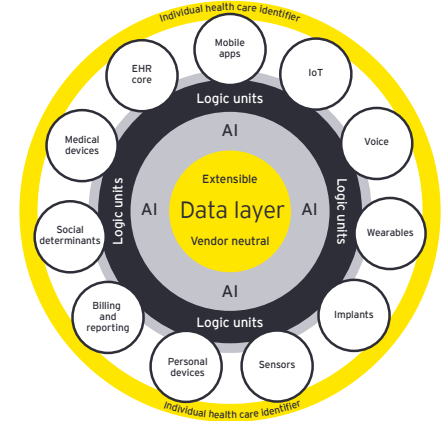
Future-state platform

A cohesive technology stack, giving a unified experience for patients, professionals and consumers; unique data at the center accessed by applications in real time by microsystems.

Today — **1 year** — **2+ years**

Central to this shift

As health care becomes smarter, the industry will transition from siloed and transactional to one where all elements of the health care ecosystem work in concert. Technology in all of its various forms will create common platforms to provide advanced support across all tasks and insights relevant to a clinical encounter or patient journey. Ecosystems that connect all players of relevance to a patient are built upon advanced architectural integration of data and intelligent analytics of that data to create informed insights to manage care. The intuitive nature of data supports the application of AI and machine learning to truly predict the right treatment protocols, what keeps people healthy and what will nudge healthier behaviors.

Policy and regulation deliver the essential checks and balances of good governance necessary to underpin a connected ecosystem. As connectivity becomes more central to health care, regulators will continue to take a strong stance on the need for interoperable yet secure data, including ensuring that consumers have control over their health information. Gaining consumer and clinician trust is critical, particularly when it comes to the safety, validity and integrity of the data generated.

This shift means that platforms form functional ecosystems to deliver network effects, value and benefit in new combinations of the growing web of industry stakeholders: providers, payers, new entrants and others, such as financial institutions, housing, employment and social support services.

As a result, a highly interconnected health ecosystem provides a superior user experience that accommodates individual preferences, uplifts the end-to-end experience and connects across the care continuum. Health, wellness and prevention are optimized through personalized therapy that is data driven.

"

And so actually, platforms are really, really, really important. But they'll fail without having the right governance.

Rachel Dunscombe, CEO NHS Digital Academy

3

CREATE LONG-TERM TRUST AND ELEVATE THE EMPATHETIC HUMAN TOUCH

Essential shift #3:

Smarter health experiences create long-term trust and elevate the empathetic human touch

As the health care model changes from siloed to one that is patient-centered, digitally enabled and demand-led, there will be growing pains: persuading consumers, clinicians and those charged with governance to adjust business and clinical processes to get the right care delivered at the right time, all of the time, in ways valued by the consumer.

Kristi Henderson spoke of the importance of long-term trusted relationships that are the foundations of personalized care. Drawing upon a care team's shared knowledge of an individual and their personal network is how N of 1 interactions can become scalable. However, as she says, "It's common sense, but it's not done because it's hard and takes a lot of work. It's an intentionality that's not built into our operating model, which is based upon appointments 15 minutes apart."

Knowing the unique customer and enabling them to define preferences heightens the importance of design thinking in improving the clinician and consumer user experience across health care settings. Daniel Kraft emphasizes the importance of simplification, saying, "People don't always want to be reminded of their health or be bugged" and that, for clinicians, "No one wants to jump through a bunch of hoops to collect data … the clinician wants insights and actionable information, not just raw sleep data."

Several people spoke of issues with user experience in health care, especially about complex health IT systems. Transforming the experience is not just an issue of end-user satisfaction. It is achieving the right balance between users customizing how they consume information and the safety net

of standards. (Refer to the featured insight, "What health care can learn from aviation.")

Rachel Dunscombe describes this well,

"We can't infinitely personalize and remain safe. What I'm asking for is both standardization and variation at the same time. Standardization to a set of ways of working, for example, how blood pressure or renal function are displayed. But then personalization for the clinician to match their operating practices such as how they arrange the widgets on the screen to consume that experience. It's that combination of warranted variation that gives a great experience and standardization that brings safety."

Knowing the unique customer and enabling them to define preferences heightens the importance of design thinking in improving the clinician and consumer user experience across health care settings.

To this end, co-design with clinicians, patient and consumer groups is a hallmark of human-centered design, designing with and for people. The best outcomes arise through a participatory co-design process, where health care consumers and workers imagine what a better experience could look like for everyone.[7] For example, co-design can focus on elements of education, access to data, interpretation of results and predictive insights to improve well care. In addition, agile design of smart buildings and virtual services, including modular facilities, hardware, software and networks, is required to meet future demand as new technologies, innovative new care models and different ways of working come into play.

Adopting a distinct approach to innovation helps turn innovation investments into value. Interviewees applied a range of innovation practices, including tapping into ecosystems of partners in areas that fall outside of core capabilities, such as acquisitions and forming collaborative partnerships with tech companies. Others try to keep ahead of the curve by sensing and addressing customers' changing needs through co-design and rapid user testing of services, products and processes. Some have formal structures that concentrate innovation capabilities in labs or centers with dedicated investment and a discrete structure of in-house development teams. Neil Sorrentino makes a key point that, if health organizations "don't have an innovation team that thinks independently, that has the support of leadership and a check book to go along with it, they're missing out on being able to think 3 to 5 years ahead."

> "
>
> Creating partnerships with consumers means being able to say, 'we're going to start something new — we think it's great but let us know if it's not and we'll change it.'
>
> Kristi Henderson, DNP, SVP at Center for Digital Health & Innovation, Optum, United Health Group
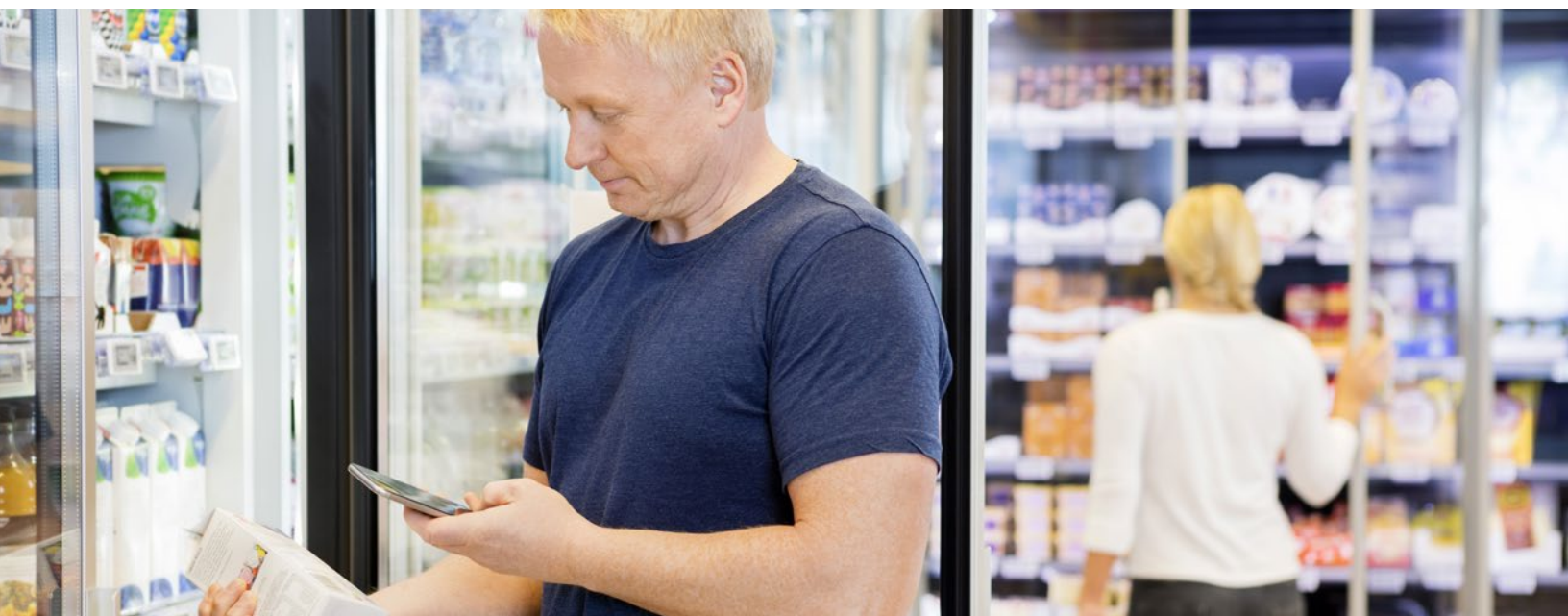
"There are bold pilots and old pilots, but no old bold pilots:"[1] what health care can learn from aviation.

In several interviews, the conversation turned to what health care can learn from the aviation industry (civil and military) – not unsurprising, given that one author of this report, Kenny O'Neill, is a former Royal Air Force pilot of eight years' standing, as well as having 13 years of experience consulting in health care systems around the world. The focus of conversations centered not so much on safety and quality through the use of such things as checklists, but rather on what health care can learn from aviation by better understanding the interfaces between humans, systems and machines.

As an advanced and complex mode of transportation, the aviation industry has directed considerable research and development toward making aircraft reliable and safer. This has been a long journey toward recognizing that accidents occur for reasons other than inadequate technical flying skills.[2] The introduction of modern aviation has led to increasing layers of complexity, with

cockpit displays and using a human-centered design process to determine system functionality and how information is consumed. Skills acquisition has been through extensive training and use of simulations. Ultimately, this means designing to incorporate the cognitive and social skills that support the technical flight skills for optimal safe and efficient aircraft operation. This has included automating the role of the flight engineer, reducing the number of flight crew in the cockpit.

If we think of health care now, it remains primarily a manual process. As we enter the age of virtual care and digitally supported health and wellness, avoiding the reliability and safety issues that aviation experienced in the early days of scattershot capabilities spread across the design continuum is preferable. For a digital-first care system to be effective across the ecosystem, consideration needs to be given to:

multiple switches and knobs being necessary to adjust performance parameters. What's more, the increasing use of technology has resulted in reduced manual handling skills, with fewer pilots having hands-on flying experience to fall back upon.[3] However, aviation learned from the past that the lack of human-centered design led to accidents and that aviation safety and design have been positively impacted by deeply understanding how human factors, such as situational awareness, interaction with technology, individual and team communications, and decision-making styles, influence human performance.

Complex flight management systems and automation, including advanced autopilots and instrumentation design and display, have all been built around better understanding human performance. One of the biggest improvements in aircraft over the last few decades has been in flight deck instrumentation. Manufacturers have integrated new technology into the flight deck, reducing pilot workload and improving situational awareness, for better and safer performance. The transition from analogue instrumentation to a digital cockpit display has been a journey of getting the design and process factors right – of observing and understanding pilots' interaction preferences and habits with new types of

- ▸ Developing universally shared design guardrails to make digitally based services effective across the ecosystem. The user interface between systems should be such that the 80/20 rule applies: 80% standardization for safety and 20% customization by users for enhanced experiences and safer care.

- ▸ Understanding the different health care consumer personas and how to design digital-first services to meet consumers' preferences, behaviors and propensity to participate for better outcomes. The digital twin approach, an example of where incorporating social determinants data arising from outside of health systems, allows for virtual models that support a holistic view of an individual.

- ▸ Enabling clinicians to work at the top of their license and, as in aviation, where automation removed the role of flight engineer, redeploying resources to where skills are needed. This includes introducing the concept of digital-first health care and the importance of experience in reimagined clinician education and training programs to better reflect the demands of the future digital-first market.

- ▸ Focusing upon clinician skills – upgrading through constant simulations and preservation through extensive hands-on experience.

- ▸ Using truly human-centered design to drive high reliability of outcomes and reduce costs. If we get digital right, it will create capacity to respond to access problems and take steps toward resolving health inequities.

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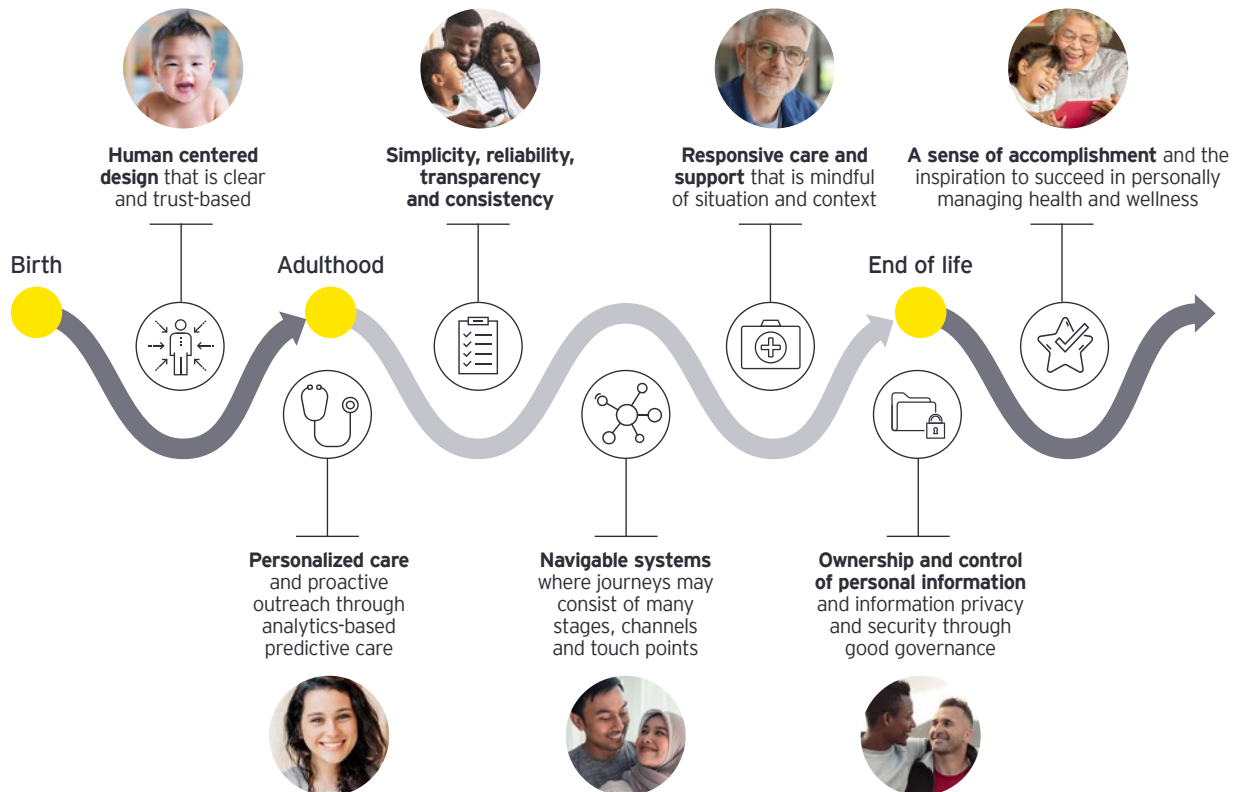
3   Ibid.

Measuring consumer centricity

Increasingly, patient experience is a central outcome for health care organizations alongside clinical effectiveness and safety. Measuring and improving patient experience are vital steps in understanding and improving the quality of care. Value for organizations arises through clinical processes, along with a robust business case that links patient experience to financial performance, brand and reputation, patient loyalty, and employee satisfaction and retention.[8, 9, 10, 11]

Industry executives hold a strong interest in understanding experiences in the moment, as well as customer trust and loyalty. The generation of trust is important for brand equity and reputation, and for how consumers make decisions on where to seek care. The customer experience metric, Net Promoter Score (NPS), is used by many interviewees; however, the NPS is only one measure used to gauge consumer experience. Other measures used included customer satisfaction surveys, mystery shopper research and benchmarking performance against peers. Some organizations

track whether patients are using the digital tools provided (e.g., hospital apps, remote monitoring or patient portals). This is important for clinical reasons, but also for future data mining of customer activity, customer preferences and creating more finely targeted experiences for patients. Looking outside of the health industry to see how others are evolving how they look at and measure trust (such as financial services) may be one way the health industry can continue to evolve how it understands and builds on improving patient trust.

The advent of digital health at scale raises the bar on consumer engagement and loyalty. Patients value the interpersonal aspects of their health care experiences and need a reason to stay, especially in a digital health ecosystem where switching becomes easier. Digital tools make it easier for consumers to find alternatives and switch to get what they want. This raises interesting issues around the cost of switching – to what extent does exceptional service counter the attraction of care that may be cheaper or easier to access?

What consumers want during their lifelong health journey

Human centered design that is clear and trust-based

Simplicity, reliability, transparency and consistency

Responsive care and support that is mindful of situation and context

A sense of accomplishment and the inspiration to succeed in personally managing health and wellness

Birth   Adulthood   End of life

Personalized care and proactive outreach through analytics-based predictive care

Navigable systems where journeys may consist of many stages, channels and touch points

Ownership and control of personal information and information privacy and security through good governance

Central to this shift

As health systems become highly digitized and connected, integral to this is the circle of care or the personal trusted network that keeps people healthy and well. Technology is an enabler rather than the end game. It is the experience component that ultimately makes it possible to deliver better, smarter care. If experience is not thought about up front, then pockets of success are likely, when what is needed is wholesale improvement.

Other factors demand attention, such as who pays for experience – the consumer, the payer, or should the provider regard it as a cost of doing business? Another key factor is finding the right blend of talent with the skills and capabilities to support a data driven, consumer centric smart ecosystem.

This shift highlights the central role that health and wellness plays in people's lives. The route to better health is through individualized and targeted treatments rather than a one-size-fits-all approach.

As a result, health systems invest time in bringing people together with the technologies and move from being digitally naïve to engaging and empowering consumers and clinicians through health and well-being as an everyday-lived experience.

A TRULY SHARED SENSE OF PURPOSE

Health care will reorient around trust and a truly shared sense of purpose

Listening to the leading industry executives speak about how the health industry can better engage with consumers and the health workforce has been enlightening. A strongly and mutually held vision is that, in the future, health care will reorient around a truly shared sense of purpose between the consumer and the health enterprise.

The EY view is that industry transformation will be built upon innovations and interconnected ecosystems that all work in concert to make health care simpler and seamless — especially those that succeed in gaining and sustaining consumer engagement with their health and wellness across their lifespan.

It is clear that what makes for a good health experience is highly nuanced, and the creation of trust between the consumer and health care organization is foundational. Trust has to be earned, through close and supportive relationships that drive deep engagement and are built upon great experiences. Rather than just delighting in the moment, a systematic approach to deeply understanding what matters to people is instrumental in getting the health experience right. To this end, measuring and innovating to improve the consumer and clinician experience are key to enhancing the quality of care and to capturing data for more finely targeted N of 1 care built upon activity, sentiment and preferences.

We are well on the way to creating a digital-first health experience and weaving digital into every aspect of an organization. As such, smart health ecosystems of networked platforms will level-set the health industry in a new space, completely recasting the connectivity between the consumer and health and social systems. For health care organizations, this means reimagining the value proposition around trust and experience-driven engagement in a technically advanced environment, building a future operating model around a digital-first approach to patient and clinician experience, and enablement of the back office.

Health care will not be transformed overnight. However, opportunities to initiate disruption abound through targeting areas where a focus on experience will make a big difference for the consumer and clinician. Most important is setting

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A systematic approach to deeply understanding what matters to people is instrumental in getting the health experience right.

sights on the far horizon. Future-proofing through design means avoiding being locked in by the constraints of the business of today. This has only been accelerated by the impact of the COVID-19 pandemic, taking years off the technology adoption timeline.

Internationally, steady progress is being made toward creating ecosystem-style infrastructures built around the timely and relevant exchange of health data. Steps are being taken toward more open and interoperable systems in Estonia,[12] the Nordic countries[13] and most recently in England.[14] While the health models vary, a commonly held vision is that of data that is sufficiently liquid to flow through the system. This data underpins integrated care platforms that incorporate social determinant, sensor and wearable data, along with health information into algorithms, making personalized, smart care experiences possible.

In closing, one of the most important conversations in health care today is about people. Smart health technology offers untold opportunities to connect and care for individuals in unique and highly personalized ways. To reorient and thrive in the smart health system of the future means systematically paying attention to get the health care experience right.

Five things to consider

In the smart health system of the future, a focus on improving the consumer and clinician experience will be a long-term differentiator of value. Executives and health care leaders should ask themselves five questions as they reimagine their smart health transformation:

1 Understanding and focusing on optimizing experience is key. If all in the industry aim to create an exceptional experience, how will what you're doing really differentiate experience to the N of 1?

2 What should health care consumers feel and experience in every moment throughout their health care journey that your organization can influence?

3 What external partners are most relevant to your organization's goals and ambitions and who in the broader ecosystem offers the best opportunities to partner?

4 Does your organization hold the technical and talent capabilities necessary to operate and thrive in the new environment of partnerships, alliances, new locations, and consumerist-orientation and to identify innovative ways to capture value?

5 How can the health industry more effectively measure consumer and workforce experience and garner long-term trust?

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Acknowledgments

Thank you

Endnotes

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Notes

How can an intelligent health ecosystem create a smarter health experience?

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