Digital Health: Promise, Perils, and Perspective

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By Stephanie Crabb, MA

The age of digital transformation across many industry sectors is in full swing. While healthcare often paces behind others when it comes to technology innovation and adoption, this is not the case with digital health—start-ups in this sector raised a record $14.6 billion in 2018.[1] But what does digital transformation encompass in healthcare? This article explores the current state of digital health—the business case, the digital health landscape, and the various barriers to its adoption and sustainability.

Digital Health Defined

There are many different definitions of digital health that contribute to the functional definition employed for this article: digital health is the convergence of digital technologies with health, healthcare, and living to enhance healthcare delivery and make approaches to health and wellness more personalized and precise.

Digital Transformation and Digital Health Investment

There are several drivers that underpin the investments the industry is seeing—in digital transformation, generally, and in digital health, specifically. Enabling more efficient clinical practice, delivering products and services more quickly while accelerating innovation, and the empowerment of consumers are all high priorities in the industry.

Four of the principal business drivers spurring investment and implementation in digital health include:

1. Consumerism
2. Healthcare reform
3. Efficiency (cost and process)
4. Patient-clinician-caregiver relationship

PwC has conducted research on the "digital IQ" of companies worldwide since 2007. When asked about the anticipated values expected from digital technology investment in PwC's most recent study published in 2017, healthcare, pharma, and life sciences leaders offered the responses summarized in Figure 1 on page 33.[2]

What's striking about these responses is the increased focus and expectation on revenues, profits, and cost reduction over better outcomes and innovation. The survey notes that respondents believe there is an opportunity to achieve immediate return on investment in digital transformation, yet acknowledges that the barriers to success are significant. The most common obstacles to digital technology adoption and transformation generally are lack of properly skilled teams, outdated technologies, and lack of technology and data integration.

As provider organizations look to improve patient engagement and experience, they may seek to get closer to their patients (and prospective patients) with targeted products and services. An increasingly prominent source of value is to participate successfully in new types of contracts and risk-sharing models associated with value-based care. The sources of value answer the "why" of digital transformation and also offer perspective on the "what" from the digital health toolkit an organization might implement.

Figure 1: Anticipated Value from Digital Technology Investments

A PwC survey asked healthcare, pharmaceuticals, and life sciences leaders what anticipated value they expect from digital technology investment.

Source: PwC. "2017 Global Digital IQ Survey: 10th Anniversary Edition—A Decade of Digital." 2017. www.pwc.ru/en/publications/digital-iq.html.

Consumerism is a Business Driver

Research suggests that people want to use digital services for healthcare. The only reason they are slow to opt for digital healthcare is primarily because existing services do not meet their needs or because they are of poor quality. What people want is surprisingly mundane: efficiency, better access to information, integration with other channels, and access to a real person if the digital service fails. The majority of people expect to use digital health services now or in the future, and age is not a factor. In fact, 70 percent of consumers prefer using digital health solutions compared to the phone or in-person for many healthcare interactions, according to a study by McKinsey and Company.[3]

Healthcare Reform is a Business Driver

Digital health may be critical to achieving the Quadruple Aim by promising to:

1. **Improve the bottom line.** Does the solution help the organization cut costs and reduce expenses (i.e., administrative burdens)?
2. **Increase the top line.** Does the solution help the organization increase revenue (i.e., increase member enrollment, introduce new products and services, generate other new revenue streams)?
3. **Do both.** Does the solution enable the organization to increase margins by both growing revenue and decreasing expenses?

Efficiency is a Business Driver

The digital health tools most critically linked to the reform agenda include at-home patient management solutions, healthcare consumer engagement solutions, and telemedicine solutions.

The inefficiencies in healthcare, both cost and process, are well-documented and longstanding. Many might argue that the digitization of the patient health record has done little to make healthcare operations or care delivery more efficient. There is optimism that digital investments in population health, personalized medicine, and hospital and payer administration will positively impact both cost and process inefficiency.

Patient-Clinician-Caregiver Relationship is a Business Driver

There is mutual interest on the part of patients and caregivers to engage digitally. A 2018 report published by the consulting firm EY found that:[4]

- 50 percent of consumers surveyed indicated comfort with their physicians using digital communications
- 56 percent would use some form of technology to interact with their care providers

- 36 percent would use an at-home diagnostic test kit and send that information to their physicians
- 21 percent would use video consultation with their care providers

In the same EY report, 71 percent of physicians believe that personal sensor-based technology will have a positive impact on wellness and more than 67 percent believe at-home diagnostic testing and smartphone apps that record health and fitness data will deliver better outcomes.

And as the population ages, the wants and needs of caregivers becomes increasingly important. Studies suggest that caregivers are increasingly interested in the role that digital health can play in supporting caregiving tasks. As a growing number of Americans prefer to "age in place," enabling digital health technologies will be foundational and have significant impact on quality of life.

Digital Health Tools

While the industry wrestles with a common definition of digital health, the majority of consumer-oriented and digital-diagnostic digital health implementation is showing up in numous ways. According to the IQVIA Institute, some of these manifestations include:[5]

- Consumer mobile apps
- Consumer wearables
- Connected biometric sensors
- Smartphone camera
- Clinical trial patient information collection tools
- In-home connected virtual assistants
- Telemedicine and virtual physician visits
- Personal health records
- Web-based interactive programs
- Text messaging or email
- Health system disease management apps

Health Condition and Wellness Management

The most common category of digital health solutions comprises consumer mobile apps, health system disease management apps, web-based interactive programs, and connected care solutions aimed to:

1. Facilitate the tracking and modification of various behaviors such as lifestyle, fitness, stress, diet
2. Supply information on conditions and disease states to clinicians
3. Enable access to care
4. Enable (and encourage compliance with) treatment protocols such as medication reminders

Wellness management apps account for 60 percent of available apps and health condition management apps account for 40 percent of available apps but are the fastest growing segment of apps with a focus on specific diseases and health conditions, according to the IQVIA Institute.

The challenge in this space is significant in that there are so many apps to choose from, and so little evidence of efficacy because the solutions are in their infancy. Further, studies show that many health apps are abandoned after just one week of use. Yet the prevailing sentiment about these solutions is optimistic.

Consumer Wearables and Connected Biometric Sensors

There is a lot of enthusiasm around wearables and biometric sensors because they are largely non-invasive and passive. In other words, individuals do not need to "interact" with these solutions for them to work and collect/transmit valuable data. This makes them less susceptible to the abandonment and fatigue factors associated with healthcare collection and wellness management solutions.

There is a growing body of evidence of the positive impact of wearables and sensors. Digital sensors are transforming analog medical devices like asthma inhalers and injectable insulin pens into "smart" medical devices able to track usage and encourage patient adherence.

Telemedicine and Virtual Clinician Visits

Though adoption has been slow because reimbursement for these services has been slow to materialize, telemedicine and virtual clinician visits are now on the rise. They are critical components of the digital health landscape because these solutions expand access to care, improve clinical workflows, and support communication across the care continuum. These solutions are quickly filling the gaps that have disconnected patients from their care teams and enable the right level of care, by the right clinician, and at the right time to align utilization, cost, and convenience.

Artificial Intelligence and Extended Reality

A discussion regarding digital health would be incomplete without delving into augmented reality (AR), virtual reality (VR), and mixed reality (MR). The power of artificial intelligence (AI) in healthcare is both awesome and alarming, considering the potential implications of one bad decision. But the promise is driving significant investment and exploration despite the perils.

Much like clinical research, organizations engaging in AI should be able to communicate both the inputs and the outputs of their efforts in terms that patients and caregivers can understand, with an emphasis on how one's personal health data may be used and the implications on their treatment plans when AI is employed.

Extended reality, while limited in its implementation, offers some of the most fascinating advances that can be associated with digital health. Surgical residents can practice surgery in a virtual setting instead of operating on cadavers. War veterans are being treated for PTSD through cognitive therapy in a virtual environment. Virtual reality modeling allows clinicians, patients, and families to see human anatomy in detail never available before that allows them to better understand their conditions and, hopefully, support better treatment planning.

Barriers and Perils Associated with Digital Health Adoption and Scalability

There are a host of barriers often associated with the adoption and scalability of digital heath:

- Conflicts in reimbursement models (fee-for-service and value-based care)
- Outdated technology and data infrastructure
- Limited evidence of effectiveness and/or return on investment
- Lack of budget to scale digital health initiatives
- Resistance to change within health systems and physician population
- Lack of effective patient and clinician engagement in design and implementation of solutions
- Impact of digital health data on healthcare's overall data ecosystem
- Data privacy and protection concerns

These are all legitimate and central to organizations' decision-making when it comes to digital health strategy. Most significant is the lack of evidence and data protection concerns. Both of these issues should be explored fully at the front end, but should also continue to be explored on an ongoing basis as organizations implement digital health initiatives.

Accelerating Adoption and Delivering Value

There seems to be a universal belief in the industry that digital health is paramount in transforming a person's health and wellness journey and their experience with the healthcare system. There are some common experiences that define a person's health and wellness journey, such as wellness and prevention, system onset, finding care, diagnosis, treatment, and condition monitoring.

And while there are digital health solutions that support each of these experiences, digital health is not necessarily being implemented or utilized broadly to support each of them. Organizations that make an effort to focus on the healthcare

consumer and to design digital health strategy around the consumer—taking into account consumer input—will likely accelerate adoption and realize greater value as a result.

Clinician adoption is also critical. The factors that clinicians care about most include:

- Usability
- Access
- Efficacy
- Safety
- Privacy/security
- Mitigation of malpractice risk
- Acceptable financial incentives
- Acceptable workflow and usability

Finally, the alignment of financial incentives and payer reimbursement for digital health, as with all healthcare innovation, is critical to adoption and value. The sooner that enabling financial models can be developed for digital health—even experimental models—the sooner the impact on adoption and value can be explored and measured.

Notes

1. StartUp Health. "Global Digital Health Funding Report: 2018 Year End Review." https://hq.startuphealth.com/posts/startup-healths-2018-insights-funding-report-a-record-year-for-digital-health.
2. PwC. "2017 Global Digital IQ Survey: 10th Anniversary Edition—A Decade of Digital." 2017. www.pwc.ru/en/publications/digital-iq.html.
3. Cordina, Jenny et al. "Healthcare consumerism 2018: An update on the journey." McKinsey and Company. July 2018. www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/healthcare-consumerism-2018.
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