How healthcare systems can become digital-health leaders

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The potential of digitization is well understood, yet healthcare systems are struggling to convert ambition into reality. Here’s what we recommend.

Health systems around the world clearly recognize the potential of digital health: over the past decade, they have invested heavily in national e-health programs. Yet most have delivered only modest returns when measured by higher care quality, greater efficiency, or better patient outcomes. And in some cases, e-health projects have been cancelled due to significant cost overruns and delays, such as the National Program for IT in the United Kingdom’s National Health Service (NHS). That’s because such ambitious information-technology initiatives—with a clear focus on IT support for clinical professionals—are typically beyond the core mission of healthcare systems, which also often struggle with legacy systems that impede data integration.

At the same time, the advent of smartphones, cloud computing, and global connectivity has created a universe of consumers accustomed to everything from checking bank balances, making purchases, and watching movies on mobile devices. Increasingly, those consumers wonder why health systems cannot provide similar service innovations. In that respect, digital-health companies would appear to be best positioned: innovation is in their DNA, they have attracted billions of dollars in venture capital, and they have the flexibility to design applications that cater directly to patient groups. Yet digital-health companies have been impeded by a lack of access to health data along with uncertainty about how to distribute the economic benefits generated by smartphone apps.

As system leaders struggle to unlock the full potential of technology in healthcare, they must answer the following three fundamental questions:

- Who should pay for digital-health applications and services?
- What evidence of effectiveness should be required to justify reimbursement?
- What conditions must be in place to provide start-ups that develop successful health applications with a sustainable business model?

We believe the solution is to promote collaboration among providers and digital-health companies by enabling the exchange of health data—a vital enabler of more efficient care delivery. To drive technology advancement and adoption, each national or federal health system should consider an open innovation platform that holds healthcare data (beginning with highly standardized claims...
records), and provides data access that is enabled for application programming interfaces as well as common technical IT services such as identity, access, or consent management. This platform would serve as the basis for an ecosystem of digital-health-services innovation by certified third parties and could be steered by the respective health system.

Such a data platform could revolutionize health-service use and delivery and also help health systems bend the cost curve.\(^2\) To pave the way for this development, stakeholders must address how benefits are distributed and keep four foundational principles in mind.

### The potential impact of technology on healthcare systems

High-quality, sustainable healthcare depends on IT-enabled services and a digital platform, but healthcare systems are still unclear on where to focus investment, what technologies provide the greatest benefits for patients and healthcare providers, and the return on investment. In 2014, we did considerable research into the economic value of digital technologies in healthcare and found that implementing technologies such as patient self-services, using digital channels rather than direct physician interaction, or patient self-management solutions can produce net economic benefits of 7 to 11 percent of total healthcare spending. Over this past year, our work on the ground has confirmed this original analysis. However, after reviewing the evidence, including successful cases of IT implementation in the most advanced healthcare systems, we believe an even greater impact can be achieved through coordinated joint effort. This would involve the interconnection of all digital-health stakeholders through an open innovation platform.

This recommendation may seem radical given the failure of so many public e-health projects. Yet we believe it is the necessary precondition for the digital-health market to work. We also recognize that creating such an open innovation platform won’t be easy from either a technical or regulatory standpoint, and it will require close cooperation among a range of stakeholders. However, the potential benefits justify this effort. For example, the NHS England’s director of patients and information, Tim Kelsey, has said that investment in electronic health records, digital services, and data could save the NHS up to £13.7 billion out of a £127 billion forecasted healthcare budget by 2020–21, or as much as 10.8 percent of total healthcare spending.\(^3\)

### The promise of apps

Digital-health applications are mobile applications that enable people to track, manage, and improve their health, achieve wellness goals, and interact with their health system. Most are quite sophisticated technologically, easy to use, and smartly designed, creating a compelling user experience. Consumer demand for digital-health applications also appears to be strong: for example, our latest research has found that 70 percent of patients aged 18 to 65 would be interested in digitally monitoring their health data; another cross-country survey reveals that 71 percent of consumers are interested in quantifying their health and lifestyle behavior.\(^4\) The problem is that, to date, individual digital-health players have gone their own way in developing solutions. Numerous start-ups—7,600 worldwide, by one estimate, most supported by venture capital\(^5\)—have been developing smartphone apps, wearable devices, and other digital

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\(^2\) Thomas Meek, “IT could save NHS £13.7bn a year: Kelsey,” Digital Health, June 18, 2015, digitalhealth.net.

\(^3\) Thomas Meek, “NHS IT needs £8 billion - McKinsey,” Digital Health, November 12, 2015, digitalhealth.net.


applications to better manage and measure health. Venture-capital firms invested $6.9 billion globally in digital health in 2014 and are set to spend at a similar level in 2015.

Who should pay?
Although the technology is available, most companies developing today’s digital-health applications lack proof that their apps produce a long-term improvement in user health that leads to economic benefits to health systems. The absence of such evidence complicates a fundamental question: who should pay for the applications?

One option would be to have users pay. This option may seem unreasonable in a world where many mobile apps are free or extremely inexpensive. But most inexpensive apps have “premium” versions that require users to pay considerably more to access the most desirable features. Yet many wearable devices are pricey, and asking users to pay more for applications could restrict the market to those willing and able to do so—a segment that may not include those users who would benefit most. Another option would be to provide the applications for free if users share data with the developer. This approach, however, raises privacy concerns and other data-sharing issues. Some successful examples include patients who share data with companies, making a conscious contribution to research and discovery of new life-saving treatments and drugs.

A third option would be to have health systems (or the payors within them) reimburse the digital-health services provided by the applications and make them available to appropriate patients. Although this approach is congruent with the philosophies underpinning most European health systems, it is viable only if developers can prove that their applications achieve the desired goals. Are enough patients willing to use the application—and continue to use it regularly? Even more important, does using the applications result in better health outcomes? To gain this proof, developers need the support of the very health systems demanding it. Health systems—not application developers—have the expertise to measure patients’ health status and changes over time. Without this information, developers will find it difficult, if not impossible, to get the evidence needed to justify their application’s cost.

One solution could be to introduce a “value-based digital health” reimbursement model: since health systems hold the data needed to measure outcomes, why not use this information to measure the outcomes of digital-health services? If cost reductions or quality improvements can be found in the data, the benefits can be shared with the digital-health solution providers. This approach would resolve issues for both sides: digital-health service developers can create sustainable business models while payors avoid the risk of investing in innovations that don’t deliver tangible value.

Securing the right data
Given the poor results of most electronic-patient-records (EPR) projects, it’s unlikely that developers will be able to link their data directly to patient records any time soon. There is a viable alternative: claims data kept by payors. Admittedly, this data is less detailed than patient

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7 This is analogous to current practice in the pharmaceutical and medical-device industries. Companies must collaborate with health systems to conduct the clinical trials needed for approval of their products.
records, but they contain sufficient information to allow health systems to measure a digital application’s effectiveness—and the appropriate reimbursement. Consistency is another advantage. Even in countries with multiple payors, claims records are standardized enough that adapting them to a common form is far less complex than merging records from thousands of providers into a single EPR.

Linking application developers’ data with claims records would require an open but highly secure IT platform that both sides could use. The platform would have to restrict access to claims records to accredited digital-application developers—and limit that access to only the records developers really need. Payors would have access to the developers’ data about the frequency and duration of application use, as well as the results achieved. In all cases, patients would have to give consent regarding who could see and use their data.

**Four principles guiding platform design**

Creating an open innovation IT platform will require close cooperation from multiple stakeholders in each country. We believe that the likelihood of success will rise dramatically if each player focuses on what it does best. As health systems consider the best approach to building an open innovation platform, leaders must focus on the following four essential principles:

**Privacy of patient records**
The security of patient records must be a top priority. The IT platform must have strong data-protection measures in place to minimize the risk of a data breach and allow individuals to determine who can see their records. Many patients are concerned about the confidentiality of their medical records, and some may not want application developers to have access to those records. However, the popularity of online communities suggests that some patients are willing to share data if they believe it provides a near-term benefit.

**Regulatory changes**
In general, regulations have not caught up with today’s digital world, and this is particularly true in healthcare. Few countries other than the United States have passed laws governing the use and privacy of patient-identifiable data. Countries differ significantly in how they view such issues as online consultations with doctors and whether patients can voluntarily share data with their doctors through channels less secure than traditional EPR systems. National governments have yet to address such questions as whether the developers of a mobile app designed to increase medication adherence should be required to report side effects, as pharmaceutical companies are. Ideally, most European countries would agree on a similar set of rules.

**Reimbursement changes**
If health systems are to pay for successful digital applications, they should adopt innovative payment models based on the value delivered and not the activity provided. If, for example, a mobile app is shown to improve a patient’s ability to manage diabetes with less medication, the developers should be paid based on the system’s savings. However, changing the method

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8 The United States passed the Health Insurance Portability and Accountability Act (HIPAA) in 1996 and updated it in 2013. Among its other features, HIPAA contains clauses governing the privacy of individually identifiable health information and the security of electronic health information.
of reimbursement may require regulatory changes. Initially, it will be easier to prove the value of applications that produce immediate savings compared with ones that provide only long-term benefits. The appropriate reimbursement for this latter type of application may have to be approximated. Over time, however, as more data is contributed by payors and application developers and aggregated in the open IT platform, it will be easier for countries to perform scientifically robust, risk-adjusted measurements of outcomes achieved. And, as the platform proves its worth, providers may come to believe that they should not be left out of the effort.

Ownership of the platform
The owner of an open innovation platform such as the one we have described must be an organization that understands healthcare delivery and the need to protect sensitive patient data, is trusted by patients, can collaborate with regulators, and can drive payment innovation forward. For this reason, we believe that the owner should be the national health system or a national payor in each country. Our research shows that patients trust public institutions with their personal health data: our research shows that in the United Kingdom, 71 percent of people are more comfortable sharing personal health information with the National Health Service.

For the open innovation platform to succeed, however, the owner must fulfill the role of an ecosystem manager that is able to attract, certify, and manage a community of innovators and operate a technical platform loaded with sensitive data. This role would require a dramatic step up for most health systems, and new capabilities would be needed. However, examples exist of public institutions that have been able to take on this role successfully: the UK government has established a cloud-based marketplace between vendors and public-service buyers. The project is considered a full success.

Health systems must begin developing open innovation platforms to enable payors and digital-health application developers to share data. With appropriate patient privacy safeguards and regulatory changes, these platforms will enable health systems to offer patients innovative ways to improve their health while avoiding wasting money on ineffective applications. Many digital-health applications will no doubt fail, but time to market will be accelerated for applications that succeed, and their developers will enjoy a more sustainable business model. The ideal result would be a digital-health partnership in which the end result is better than anything the stakeholders could have developed separately. This approach would make digital-health innovation the first innovation in healthcare that is not leading to higher cost but to a more efficient and effective health system.

Gerardo Aue is an associate principal in McKinsey’s London office, Stefan Biesdorf is a principal in the Munich office, and Nicolaus Henke a director in the London office.