

PERSPECTIVE

Making Smart Investments In Health Information Technology: Core Principles

Five core principles that build on experience and expertise already gained in the fledgling U.S. health IT industry could help avoid the misspending of stimulus and recovery funds.

by **John D. Halamka**

ABSTRACT: Over the past five years, thousands of public- and private-sector employees, many volunteering their time, have worked to advance the cause of interoperable, certified, secure electronic health records. As new federal funds become available, should we invest right away or wait for technology and policy perfection? Do we leverage the accomplishments of existing national organizations, or do we start from scratch? The time to invest is now, building on the organizations we already have. To ensure wise investment, I suggest guiding principles assembled from the input of hundreds of providers, patients, payers, vendors, government employees, and standards-development organizations. [*Health Affairs* 28, no. 2 (2009): w385–w389 (published online 9 March 2009; 10.1377/hlthaff.28.2.w385)]

THE PAST FIVE YEARS have seen concerted efforts within the public and private sectors to advance the cause of interoperable, certified, secure electronic health records (EHRs). Now that billions of new federal dollars are likely to become available to speed these investments, many who have worked on these efforts are asking appropriately tough questions. Should we invest the money right away, or wait for the technology to advance and critical policy issues to be fully in place? Should we build on existing organizations, or start all over from scratch to forge new ones? It is critically important that we get the answers to these questions right. The entire U.S. health information technology (IT) industry had estimated revenues of \$27 billion in 2008.¹ Thus,

the designated amount for health IT in the stimulus/recovery package, at \$18–20 billion over several years, will amount to a huge expansion of that industry. The risks of misspending this money and having little to show for it later are immense.

The risks notwithstanding, I argue that we should invest now, expanding on work already in progress and successfully demonstrated in community pilots. However, as we allocate the stimulus and recovery dollars, we need a set of guiding principles. In this Perspective I outline a set of five core principles based on the input of hundreds of providers, patients, payers, vendors, government employees, and standards-development organizations.

■ **Principle one: establish regional implementation organizations.** A few years

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ago, I spoke with the chief information officer (CIO) of a health care system, who told me that his department copied accounting software onto servers, but, for some reason, no one was using it. In hindsight, this shouldn't be surprising. The vast majority of people don't want technology for the sake of technology. Rather, they have something that they want to do or are already doing, and they only want technology if it can help them do those things better, faster, or more cheaply. Unfortunately, new technology, like any change, is a hindrance in the short run, so potential users won't necessarily make the effort to reach out and grasp the latest new software or hardware, even if there are potential long-run benefits.

If we place the burden of responsibility for introducing new hardware and software on the users themselves, we're bound to fail. My experience is that more than three-quarters of the effort required to successfully implement technology goes into workflow redesign, change management, education, and training. Migrating clinicians' offices from a sea of paper to fully electronic processes will be traumatic. We need "SWAT" teams of practice transformation experts to assist providers on the journey to EHRs. Yes, the software and hardware matter—they must be reliable, secure, easy to use, and affordable. However, even the best products can fail in implementation unless they are complemented with a spectrum of project management services.

Why are these project management services so often overlooked? The challenge is that many clinicians and hospitals are struggling financially, and the cost of such services is too high. Fragmentation in the health care sector inhibits the economies of scale and scope that have spurred technological diffusion in other industries. Eighty percent of physician offices are solo or two-physician practices; almost 70 percent of hospitals are community hospitals.² It's very expensive for

any of these organizations to find and hire a "SWAT" team to provide these project management services. So they will tend to purchase hardware and software without appropriate investment in implementation support.

We need to have more of an "enterprise" approach to health IT implementation, but most of the health care industry isn't part of an enterprise. Stimulus and recovery funds can bridge this gap by funding the expertise to introduce the new technology in a controlled and standardized way. By creating regional implementation teams that engage stakeholders at the local level and ensure their buy-in via education, training, and support, we can maximize successful EHR implementations and their ongoing use.

We already have excellent examples of such organizations. The Massachusetts eHealth Collaborative (MAeHC) and the New York

City Primary Care Information Project (PCIP) have already implemented EHRs for hundreds of physicians, much more efficiently and effectively than could have been done if the groups had not provided the planning, project management, and implementation.³

How much staff will such organizations need? My experience is that about one-fifth of an employee is needed for each two-provider practice. Based on the task to automate the clinical records of all the paper-based ambulatory practices in the United States, we're likely to require 50,000 employees. When the impact on the health IT industry and the network effect of new businesses enabled by an EHR stimulus program are considered, the total number of jobs created is likely to number more than 200,000. This will strain the industry and existing IT educational programs to the breaking point.

Spending stimulus dollars on hardware and software alone will be a recipe for disaster. We need to protect that investment with substantial investment in people factors to maximize

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our chances of success.

■ **Principle two: establish technology service organizations.** No other industry has had such a mismatch between the sophistication of the technology being introduced and the lack of technological sophistication on the part of those who are supposed to manage it. Placing servers in clinicians' offices and expecting office staff to back up, secure, and maintain technology is likely to be expensive, frustrating, and highly risky. Investments in EHRs should focus on achieving economies of scale through the funding of regional, hospital-based, or vendor-hosted "software as a service" providers that provide Web-based/remotely accessible solutions that require very minimal new technology in clinicians' offices.

These technology service organizations can also help orchestrate group purchasing plans, generate model contracts, and specify technology requirements (such as performance criteria for broadband support), which will transform the hardware/software acquisition task into an orderly process, analogous to the way a franchiser builds standardized locations from a repeatable project plan.

By removing the guesswork and variability from basic hardware/software acquisition, we can focus our efforts on the people and the use of EHRs. Where it makes sense, these technology service organizations might be combined with the regional implementation organizations described above, to get the maximum benefit of economies of scale and a seamless implementation approach, so that we make the best use of federal dollars.

■ **Principle three: establish minimum federal requirements but allow local variation.** Federal investment presents a unique opportunity to forge consistency in some key areas. Lawmakers should take advantage of this, but they should not overlook the fact that local variation should be allowed to flourish in some cases.

Areas where the federal government should insist on uniformity among stimulus-backed programs include requirements to use systems certified by the Certification Commission for Health Information Technology (CCHIT),

which include federally recognized interoperable data standards established by the Healthcare Information Technology Standards Panel (HITSP). Failure to do so will result in "silos" of data, isolating electronic records in providers' offices and eliminating many of the benefits of a connected health care system.

Additionally, health care providers should be required to participate in nationally prioritized health care data exchanges such as data sharing among clinicians, personal health record (PHR) interfaces, quality measurement, public health reporting, biosurveillance, home health device monitoring, and clinical research. Data exchange can enable health reform, such as paying for measurable quality rather than quantity of care, and is required to realize the full benefits of interoperable EHRs.

Some local variation should be accommodated in the area of enhancing the functioning of electronic systems to account for local rules and regulations. In some localities, security and privacy rules may be more rigorous than national guidelines. In some regions, differences in local capabilities and preferences may lead to different roles for regional implementation and technology service organizations, such as the hosting of community-based health information exchanges. Regional implementation organizations can be the vehicles for driving uniformity while at the same time accounting for local variations in policy and technology preferences.

■ **Principle four: establish funding sources and priorities.** The total cost of implementing EHRs, interoperability, hospital automation, and infrastructure will likely exceed \$100 billion, and we should anticipate that a combination of public and private investment will be needed to achieve our EHR adoption goals. The list of possible investment targets in health IT needs to be prioritized to get the most out of this investment and to direct resources to the areas of greatest need. In establishing priorities and allocating money wisely, policymakers must take account of at least three overlapping issues in determining appropriate allocations: (1) different levels of need in various functional areas, (2) the kinds

of organizations that will receive investment, and (3) activities that may be sustainable only through public support.

The American Recovery and Reinvestment Act of 2009 is a blueprint for pumping federal money into several different functional areas of health IT: building the technology infrastructure, such as acquiring EHR systems; achieving agreement on system interoperability and standards; research and development on new systems for clinical informatics; and so on. Before the act was passed and signed into law, the American College of Medical Informatics, a leading group representing health IT professionals, surveyed its members on how to divide up the monies into functional areas. I support its conclusions, which called for roughly one-quarter of the final allocation from the stimulus package to be devoted to infrastructure (actually paying for the EHRs and related systems); about one-fifth, to financing research and development on new clinical informatics systems and the best ways to adopt them; 15–20 percent, to education and training of those who will put in place health IT; and about 15 percent to finance further work on achieving interoperability and agreement on technology standards. Other areas of investment, all important but less than 10 percent each, include monitoring and evaluating the investment for fraud and abuse, funding the Office of the National Coordinator for Health Information Technology (ONC) and regulatory activities during the national stimulus investment period, and enhancing privacy and security safeguards.

In terms of organizations or entities that might be the beneficiaries of this investment, public monies should be preferentially allocated to those organizations that do not have the resources to implement technology on their own, such as community health centers and Medicaid providers. Judicious and creative application of matching requirements

will be the key to striking this balance in the most effective and efficient way.

Finally, and related to the discussion above, policymakers should be mindful of activities that find broad support in name but often have difficulty attracting sufficient investment to be sustainable. An example of this is data exchange. Some types of data exchange, such as population health or coordination of care among competing organizations, might not be sustainable via market principles. In economic

terms, they could amount to the classic “public good”—everyone benefits from them, but no one party benefits so much that it is willing to foot the bill. These types of exchanges will nonetheless be an important part of the nationwide infrastructure and thus will require particular government financial assistance to get up and running—and stay that way.

■ **Principle five: protect privacy.**

A comprehensive approach to privacy is foundational to any information-sharing effort, whether through EHRs, PHRs, or health information exchange. This begins with a set of core privacy principles that ensure openness and transparency; individual participation and control; clear policies limiting how data will be collected, used, or shared; sound practices to keep data accurate and protected; and mechanisms for oversight and accountability with remedies in place if something goes wrong. Privacy is achieved by combining the right policies with privacy-enhancing technologies and architecture.

Successful health IT initiatives have used this type of framework to develop specific policies and technology approaches, tailored to local needs. The goal is to build trust among participants that information will be protected as it is shared. This trust enables and supports information-sharing efforts.

For example, in Massachusetts, MAeHC has implemented data sharing in three cities. The specific policies were developed by the lo-

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cal participants who will be sharing information. The communities have arrived at a model that is workable and understandable: patients can choose whether to share their personal information from each institution that has their data. Over time, it is likely that consent will become more granular—specific problems, medications, and notes shared based on provider, situation, or illness. However, as such functionality evolves, I believe that opt-in at the institution level is good enough for the health information exchange context in Massachusetts.

In a different context, PHRs such as Google Health and Microsoft Health Vault enable patients to be stewards of electronic copies of health information about them. They can gather the data; apply privacy controls; and share information with providers, family members, and others, according to their preferences.

I recently attended a meeting of leaders from the U.K. National Health Service (NHS), which has undertaken a huge and controversial investment to adopt EHRs throughout its system. I spoke to this group about the plans emerging to invest heavily in health IT in the United States through the economic stimulus package. The U.K. leaders in attendance grimaced, fresh from their own exhausting experiences in the trenches investing to automate the NHS. Their advice was to move forward with urgency but to plan carefully, embracing the lessons learned from U.S. pilots and work in other countries.

WE HAVE A SENSE of urgency unlike any other time in history to accelerate the use of health IT to coordinate care, improve quality, and improve health care value in the United States. My grandparents' generation was known as the "Greatest Generation." If we do this right, maybe someone will someday label us the "Greatest Health IT Generation." There are many far worse titles to aspire to—and, at the same time, few others that will make as big a difference to the health and health care of all Americans.

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NOTES

1. Gartner U.S. Healthcare, "Provider IT Spend Was \$27.2B in 2008 Growing to \$32.8B by 2012," in J.D. Lovelock, *Forecast: Healthcare Provider IT Spending, Worldwide, 2006–2012* (Stamford, Conn.: Gartner Group, 9 September 2008).
2. Regarding numbers of physicians, see C.R. Burt, E. Hing, and D. Woodwell, "Electronic Medical Record Use by Office-Based Physicians: United States, 2005," 15 October 2008, <http://www.cdc.gov/nchs/products/pubs/pubd/hestats/electronic/electronic.htm> (accessed 13 February 2009). Regarding numbers of hospitals, see U.S. Census Bureau, "Facts for Features," 29 April 2005, http://www.census.gov/Press-Release/www/releases/archives/facts_for_features_special_editions/004491.html (accessed 13 February 2009); and American Hospital Association, "Organizational Trends," chap. 2 in *Trendwatch Chartbook 2008: Trends Affecting Hospitals and Health Systems*, 2008, <http://www.aha.org/aha/trendwatch/chartbook/2008/08chapter2.ppt> (accessed 13 February 2009).
3. Two papers in the March/April 2009 issue of *Health Affairs* (forthcoming) discuss these two projects. See F. Mostashari, M. Tripathi, and M. Kendall, "A Tale of Two Large Community Electronic Health Record Extension Projects," *Health Affairs* 28, no. 2 (2009): 345–356; and M. Tripathi et al., "Engaging Patients for Health Information Exchange," *Health Affairs* 28, no. 2 (2009): 435–443.