

PERSPECTIVE

How To Succeed In Health Information Technology

Involving a broad community of users at the development stage is likely to result in usable, durable, and deployable health IT products.

by **Jonathan C. Javitt**

ABSTRACT: The United States is poised to move the debate over electronic information systems for health care beyond the question of whether to computerize to how to computerize. Developers should heed the experiences of those who have already attempted similar efforts in vertically integrated environments. A key lesson is that the expertise and design perspectives of IT professionals should be supplemented with practical input from the caregivers and administrators who will actually use these systems. The paper by Douglas Bell and colleagues offers a ray of hope, as these authors have begun their process by asking the user community exactly what it needs.

THE TIMELY AND INCISIVE paper on electronic prescribing by Douglas Bell and colleagues coincides with the start of a new era in computerizing the U.S. health care system.¹ The United States has seen two decades of scholarly publications, meetings, and calls to action around the themes of health information technology (IT), medical errors, and patient safety. Until spring 2004 the primary goal of those activities was to document for broad action in the hopes of convincing policymakers, payers, and providers to take action. Many talked about a “tipping point,” at which there would be no further need to talk about whether to computerize and the focus would finally shift to the question of how to computerize.

I believe that we have reached that tipping

point. The imperative of computerizing the U.S. health care system has gone from the academic discussions of a dedicated few to a presidential priority.² Now we turn to the much more challenging task of exactly how to implement electronic health records, computerized order entry (including e-prescribing), computer-aided decision support, and secure electronic health information exchange among caregivers.

From the perspective of one who has been involved in implementing health IT initiatives for more than twenty years and more recently involved in policy formulation surrounding health IT, the goals are obvious, but a multitude of questions remain unresolved. These must be answered as we develop a national strategy to implement health IT. The recently

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released draft recommendations of the President's Information Technology Advisory Committee (PITAC) sets out some broad research and development issues that must be addressed if we are to have the seamless national health information infrastructure to which we are committed.³

In posing those questions, PITAC does what advisory committees are best able to do: poses questions and challenges that must be answered in a practical and societally acceptable manner. It is critical, however, that we look beyond the conclusions of advisory committees for those broadly based societal answers. Bell and colleagues have gone a step further in beginning to assemble the community of users who will have to function within the implementation policy we develop. They have not yet gone the next step of testing their conclusions against a broad national audience, but they are clearly headed down the right path.

■ **Context for health IT.** The simplest way to appreciate the importance of this approach is by examining past and current efforts to introduce health IT systems into existing systems of care. Since the only broadly based initiatives that have been mounted in the United States thus far have occurred within integrated delivery systems, that is our only point of reference for real-world experience. Clearly, the myriad of competing incentives and priorities in the rest of the U.S. health care system will add considerable complexity that is only beginning to become clear.

One might assume that the development and deployment challenges associated with health IT are reasonably straightforward in a vertically integrated health care system, when payer and provider are one and the same and when caregivers are employed by a single entity. Top-down planning by IT professionals with a modicum of input from front-line caregivers should result in an efficient and effective

implementation, since both the health care system and the system's providers should be similarly motivated to make it work. While the logic of this statement may be obvious, in practice it has been devastatingly wrong.

The most broadly implemented health IT system in the world today is that of the Veterans Health Administration (VHA). This system, known as VISTA/CPRS, covers more than 1,200 sites of care, including acute care hospitals, ambulatory facilities, skilled nursing facilities, and pharmacies. While the admiring visitor might imagine that he or she is looking at the result of a brilliantly executed, centrally conceived plan, nothing could be further from the truth. The original plan to computerize the VHA was specified and contracted in typical government fashion. It failed spectacularly. The successful system that is apparent today in every VA hospital is the result

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of the teaming together of physicians, nurses, and other caregivers to develop a system that works in real practice, every day. Naturally, a system as large as that of the VHA requires central management, but management has learned its lesson. The development sites are decentralized and as close as possible to front-line caregivers. Every year the entire VA caregiver community sends representatives to “Camp CPRS,” where challenges and opportunities are discussed. Innovators are encouraged to bring developmental applications and “market” them to the broader audience of consumers. In fact, the much-discussed bar-coding application for administration of medication was brought in this fashion by a front-line nurse who witnessed her rental car being checked in via a bar-code system at the Minneapolis airport.

The result of this decentralized development environment is an extremely practical system that works for the people who must actually use it. I have visited three VA hospitals in three different geographic locations. In each

one I have spoken with medical students and residents who rotate from nearby academic medical centers (AMCs), asking them about their experiences in learning to practice in a computerized environment. Consistently, they have told me that after a one-to-two-day learning curve, they would never choose to go back to pen and paper, and they return to the manual systems in their home hospitals with regret. Ironically, many of those home hospitals are AMCs across campus from the affiliated VA hospital. I can empathize with the sentiments of those students and residents, since that was my experience when I began carrying a portable computer on rounds as an intern in 1982.

Unfortunately, the experience of the VHA has not yet been replicated in other centrally managed health care systems in this country. Our largest health maintenance organization (HMO) is attempting to implement its third electronic health record system, after finding the first two centrally specified systems not to be deployable in practice. The Armed Forces are struggling to implement a multibillion-dollar electronic health record system, also centrally specified by IT professionals rather than built in the field by trial and error. The most ambitious project of all is on the other side of the Atlantic, that of the English National Health System (NHS), which has contracted with multiple parties to assemble a seamless \$10 billion electronic health record to cover its forty million members. In each of those projects, there has been relatively little involvement, beyond some focus groups, of front-line doctors, nurses, and other caregivers.

As a professional “entrepreneur” in health IT, I have learned a consistent lesson, sometimes the hard way. That lesson is that one cannot ever spend too much time talking with the users, showing them prototypes, learning their preferences, and trying things out. Computerizing a health care system that serves

more than 260 million people via community-based doctors, hospitals, nursing homes, and other providers of care is far from straightforward. The local variations in way people do things are myriad. Recently, a major U.S. urban hospital unveiled a state-of-the-art electronic order entry system, only to have its medical staff rebel and shut it down within a month. Unless IT professionals learn to work with those who must care for patients, we will reach Mars before we computerize our health care system.

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That brings me back to Bell and colleagues’ outstanding paper. To begin to develop priorities for e-prescribing, a key component of our national health information infrastructure, they began by asking the users for guidance. Clearly, they didn’t ask all of the potential users (yet), and they have not yet begun to

show the users alternative solutions and interfaces. Nonetheless, they have begun their process in an all-too-unusual way: by asking doctors, nurses, and pharmacists what they need. In the process, they have highlighted some challenges that must be solved on a broader level for a national IT infrastructure to succeed. Some of those challenges were also highlighted in the recent PITAC report.

■ **The challenges.** Bell’s paper focuses on the challenges of unique patient identification. While Americans cherish the right to privacy, that cherished right has been invoked to block any means of centrally and unambiguously identifying patients. As a society, we will have to wrestle with this in the near future and arrive at a solution. My guess is that most people would be willing to have a centrally registered means of identification—assuming that their privacy was assured—rather than to risk receiving someone else’s medicine.

A second focus is the need for access to patients’ historical data, combined with real-time alerts on medication use. Without these data, decision-support systems cannot be implemented to identify errors of omission and

commission. Today most pharmaceutical error-checking systems are able to look only for drug-drug interactions. The more common area for error is the prescribing of medications that are incompatible with underlying diagnoses, such as beta-blockers in a patient with asthma. Even more common is the failure to prescribe medications that are indicated by underlying diagnoses, such as the failure to prescribe beta-blockers in patients with a history of myocardial infarction.

A third critical area that Bell and colleagues identified was the importance of current medication lists. Every doctor in practice is aware of the disconnect between the medications a doctor thinks the patient is taking, the medications the patient thinks he or she is taking, and the actual medications being administered. Without a current, verifiable medication list visible at the time of prescribing, there is little hope of making an impact on our endemic state of polypharmacy, not to mention the life-threatening errors that occur as the result of physicians' unawareness of the patient's other medications. For the past several years I have been involved in a venture that builds such lists after the fact from physician and pharmacy claims, to identify common errors. Despite the clearly printed black-box warnings mandated by the FDA, instances are identified of patients' being treated with both nitrate-containing afterload reducers and sildenafil citrate (Viagra). When physicians are contacted about this potentially life-threatening situation, the most common response is incredulity that a specialist has prescribed this medication without reviewing the full medication list or checking with the primary care physician.

■ **Highlighting user involvement.** Bell and colleagues have clearly brought important and actionable findings to the policy arena. More importantly, they have highlighted the importance of developing health IT systems through the process of asking the users. If this process is essential within an integrated health system, it is ever so much more critical in our highly diverse U.S. health care system, with its local variations and in which payers and pro-

viders, institutions and caregivers often face very different incentives. The initial approach to consultation introduced by Bell and colleagues must be followed by ever-broader solicitations for input, by extensive alpha and beta testing in which the broadest possible user base is included, and by an ongoing mechanism for actively watching for innovations from the field. For 3,000 years the practice of medicine has relied upon physicians' pooling their experiences to develop approaches that work for their patients. The challenge of computerizing our health care system should be no different.

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The opinions expressed are the author's own and do not reflect the findings or policy of any private or governmental entity.

NOTES

1. D.S. Bell et al., "Recommendations for Comparing Electronic Prescribing Systems: Results of an Expert Consensus Process," *Health Affairs*, 25 May 2004, content.healthaffairs.org/cgi/content/abstract/hlthaff.w4.305 (25 May 2004).
2. White House, "Promoting Innovation and Competitiveness," www.whitehouse.gov/infocus/technology/economic_policy200404/chap3.html (3 May 2004).
3. National Coordination Office for Information Technology Research and Development, "Your Federal Networking and R&D Resource," www.nitrld.gov (3 May 2004).