

Government Intervention: A Necessary Evil to Increase HIT Adoption?

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Abstract

Implementation of Health Information Technology (HIT) is becoming a necessary evil faster than anticipated. The adoption of HIT from traditional paper records is in a transition stage in the US and other countries, with more and more physicians and practices migrating into the digital world. The rewards take longer than the hurdles faced.

What is the role of the federal government in speeding up the adoption process? Are there other examples that the US can turn to? Private initiatives in several states have reached a 'tipping' point where they look up to the government to provide legislative and standards framework along with a roadmap mandating or providing incentives to increase adoption. HIT can add value and improve outcomes through technology, innovation and leadership, but unless the right priorities are set and the key stake holders are engaged, these initiatives will remain a long drawn out process without a closed ending.

The Federal Government has the unique distinction of being the largest market player and regulator. Therefore the logical first place to start would be the Center for Medicare and Medicaid Services.

This paper looks at the evolution of HIT in the United States and the pivotal role the Federal Government has to play to significantly increase adoption. Its role which arguably may seem as a mandate or interference remains necessary simply because in key areas such as interoperability and standards, there is no other entity that can have a national level impact and enforce compliance. The most effective way as seen in other countries, is a combination of mandates and incentives along with an organized framework of Public Private Partnerships where the government would lead the way and the private sector would engage. The paper also touches upon comparisons made to other countries at certain points. In most countries in which rates of adoption are high, the government has heavily subsidized the acquisition of health IT systems by providers.

Current Status of HIT in the United States

As of 2006 the adoption of HIT such as Computer Physician Order Entry (CPOE) has been minimal. According to a 2006 survey by the Commonwealth Fund, electronic medical record (HIT) use by U.S. primary care physicians is just 28%, compared with 79% in Australia, 89% in the United Kingdom, 92% in New Zealand, and 98% in the Netherlands. Use is even higher in Denmark, whose highly evolved national system launched in 1994 has nearly 100% participation by primary care providers^[1]

Adoption of electronic medical records by US doctors is increasing slowly. The latest data from the National Ambulatory Medical Care Survey (NAMCS) indicate that in 2005, one-quarter of office-based physicians report using full or partial HIT systems, a 31% increase from the 18.2 percent reported in the 2001 survey.^[2] However, the survey also states that just 9.3% of these physicians actually have a "complete HIT system", with all four basic functions deemed minimally necessary for a full HIT: computerized orders for prescriptions, computerized orders for tests, reporting of test results, and physician notes.^[3] Barriers to adopting an HIT system include training, costs and complexity, as well as the lack of a national standard for interoperability among competing software options.^[4] Advocates of electronic health records hope that product certification will provide US physicians and hospitals with the assurance they need to justify significant investments in new systems. The Certification Commission for Healthcare Information Technology (CCHIT), a private nonprofit group, was funded in 2005 by the U.S. Department of Health and Human Services to develop a set of standards and certify vendors who provide HIT to the industry. On July 18 2006, CCHIT released its first list of 20 certified ambulatory HIT and EHR products.^[5] On July 31 2006, CCHIT additionally announced that two further HIT and EHR products had achieved certification.^[6]

In the United States, the Department of Veterans Affairs (VA) has the largest enterprise-wide health information system that includes an electronic medical record, known as the Veterans Health Information Systems and Technology Architecture or VistA. A graphical user interface known as the Computerized Patient Record System (CPRS) allows health care providers to review and update a patient's electronic medical record at any of the VA's over 1,000 healthcare facilities. CPRS includes the ability to place orders, including medications, special procedures, x-rays, patient care nursing orders, diets, and laboratory tests.

In 2004, President Bush created the Office of the National Coordinator for Health Information Technology (ONC), in order to address interoperability issues and to establish a National Health Information Network (NHIN). In the US Government the efforts in HIT are coordinated by the office of the ONC who provides counsel to the Secretary of Health and Human Services and Departmental leadership for the development and implementation of an interoperable health information technology

infrastructure. The ONC also provides management of and logistical support for the American Health Information Community (AHIC). The AHIC is a federally-chartered advisory committee that makes recommendations to the Secretary of HHS on how to make health records digital and interoperable, encourage market-led adoption and ensure that the privacy and security of those records are protected at all times.^[7]

The National Coordinator for Health Information Technology (ONC)^[7]

- Serves as the Secretary's principal advisor on the development, application, and use of health information technology;
- Coordinates the Department of Health and Human Services' (HHS) health information technology policies and programs internally and with other relevant executive branch agencies;
- Develops, maintains, and directs the implementation of HHS' strategic plan to guide the nationwide implementation of interoperable health information technology in both the public and private health care sectors, to the extent permitted by law; and
- Provides comments and advice at the request of Office of Management and Budget regarding specific Federal health information technology programs.

The role of the ONC and thereby the federal government is that of a coordinator and facilitator who do not exercise any direct mandate to increase the adoption of HIT or provide direct funding for HIT projects

The two foremost areas where government intervention is critical are interoperability and the need for standards that help systems and software, to seamlessly communicate with each other.

1. Interoperability

In healthcare, interoperability is the ability of different information technology systems and software applications to communicate, to exchange data accurately, effectively, and consistently, and to use the information that has been exchanged.^[8] Interoperability describes the capacity of one health IT application to share information with another in a computable format (that is, for example, not simply by sharing a PDF [portable document format] file)^[1].

In the United States, the development of standards for HIT interoperability is at the forefront of the national health care agenda.^[9] Without interoperable HIT systems, practicing physicians, pharmacies and hospitals cannot share patient information, which is necessary for timely, patient-centered and portable care. There are currently multiple competing vendors of HIT systems, each selling a software suite that in many cases is not compatible with those of their competitors. Only counting the outpatient vendors, there are more than 25 major brands currently on the market. Under the ONC, Regional Health Information Organizations (RHIO) are established in many states in order to promote the sharing of health information. Congress is currently working on legislation to increase funding to these and similar programs.

The Center for Information Technology Leadership described four different categories (“levels”) of data structuring at which health care data exchange can take place.^[10] While it can be achieved at any level, each has different technical requirements and offers different potential for benefits realization.

The four levels are^[11]:

- Level 1: Non-electronic data. Examples include paper, mail, and phone call.
- Level 2: Machine transportable data. Examples include fax, email, and un-indexed documents.
- Level 3: Machine organizable data (structured messages, unstructured content). Examples include indexed (labeled) documents, images, and objects.
- Level 4: Machine interpretable data (structured messages, standardized content). Examples include the automated transfer from an external lab of coded results into a provider's EHR. Data can be transmitted (or accessed without transmission) by HIT systems without need for further semantic interpretation or translation.

Progress has been reported in the interoperability efforts between the HIT systems of the Department of Defense (DOD) and the Department of Veteran Affairs. The two now have software upgrades in place which will allow clinical staffers to review each

both agencies' clinical encounter data, medical procedures and lists of problems on shared patients. The two already share pharmacy, allergy, microbiology, chemistry/hematology data and radiology reports. This is achieved through the Clinical Data Repository/Health Data Repository software, which synchronizes data between VA and DOD patient records

All that being said, the DOD and VA still seem to be short of their goal, and running out of time. By law, the two agencies are required to implement fully-interoperable HIT systems by September 30, 2009^[12].

The Office of the National Coordinator of Health Information Technology (ONC) manages the federal government's activities in two main areas: the development of standards necessary to achieve the interoperability of the large number of varying applications of health information technology (health IT) and the facilitation of information exchange^[13].

Facilitating Health Information Exchange to ease the electronic exchange of health-related information, HHS funded the creation of prototypes for organizing the components of the National Health Information Network (NHIN). ONC describes the NHIN as a "network of networks," built out of state and regional health information exchanges (and other networks) to link those various networks and the systems they in turn connect. The NHIN's mission is to develop a national capability to exchange standards-based health care data in a secure computer environment.^[14] The federal government should also proffer funds to coordinate infrastructure development for and implementation of HIT systems in primary care. The "Crossing the Quality Chasm" report recommended \$1 billion for developing a National Information Infrastructure.^[14]

Two studies, one by the RAND Corporation and one by the Center for Information Technology Leadership (CITL), estimated annual net savings to the health care sector of about \$80 billion (in 2005 dollars), relative to total spending for health care of about \$2 trillion per year. The RAND research focused primarily on savings that the use of health IT could generate by reducing costs in physicians' practices and hospitals, whereas the CITL focused its study on savings from achieving full interoperability of health IT, explicitly excluding potential improvements in efficiency within practices and hospitals. The CITL study estimated that the administrative cost of a laboratory test (encompassing both the provider's and the lab's expenses) was about \$40 and that widespread interoperability could save about \$38 per test—producing estimated national savings on lab tests of about \$25 billion annually. However, the results of another analysis raise doubts that the administrative cost of a lab test could possibly be as high as \$40 to begin with. The CITL researchers assumed that fully interoperable health IT systems would eliminate 95 percent of avoidable tests, resting that assumption on the belief that physicians would choose to override the system's warnings on such tests only 5 percent of the time.^[12]

The final solution to solving the interoperability puzzle is the establishment of a National Health Information Technology Network (NHITNET). This has to be a federally managed program to which the state governments and private healthcare organizations have to 'buy in'. Different from other industries that have embraced IT fully e.g. financial services or banking, there is an imperative need and necessity for interoperability in the healthcare industry due to the nature of the data e.g. clinical information including past histories, allergies and chronic conditions that need to be captured as part of a patient record. NHITNET cannot be an overnight solution and has to be done in strategic phases through a "bottom-up- integration" approach. Empowerment of ONCHIT with a funded mandate towards increasing interoperability between CMS and VA is a step in the right direction. The formation of an HIT corridor for the CMS and VA where the largest market players could pioneer a huge first step toward national interoperability.

2. Standards

To establish processes for identifying standards with which health IT systems must comply and for certifying that the standards are being met, the Department of Health and Human Services (HHS), through ONC, set up the Health Information Technology Standards Panel (HITSP). The panel's overarching task is to promote interoperability in health care. In 2005 the US Federal Government awarded a contract to Certification Commission for Healthcare Information Technology (CCHIT) to develop certification criteria for HIT. Starting in early 2007, vendors began to utilize these certification criteria for their HIT systems. Developing Standards to Ensure Interoperability^[13]

As the standards process is currently set up, the HITSP develops industry wide health IT standards and recommends them to the Secretary of Health and Human Services, who first "accepts" them and then one year later officially "recognizes" them for use in federal health IT applications. (Such applications include those used by the federal government—for example, in the Veterans Health Administration— and by federal contractors.) The panel uses the one year period to refine the instructions given to vendors for complying with the standards. The standard-setting process is designed to minimize the number of unworkable standards that are issued rather than to maximize the speed with which standards are set. Private-sector health IT users are not required to comply with the federal standards; nevertheless, the federal standards have become the de facto industry measure for achieving interoperability. Health IT vendors who wish to have their products certified as compliant with new federal standards 5

can submit those products for examination by CCHIT. Certified electronic health record products should be able to communicate and operate with other similarly certified systems.^[13]

Are standards important in this industry? Standardization is essential to this industry at this stage and the need for standards is an enabling force towards adoption. CCHIT and Health Information Technology Standardization Panel (HITSP) are initiatives in this direction. However it is very important as to who sets the criteria for these standards. For e.g. if the large vendors in the Electronic Medical Records constitute the panel, it can simply end up being an 'economic capture'

Although there are few standards for modern day HIT systems as a whole, there are many standards relating to specific aspects of HIT. These include:

- ASTM International Continuity of Care Record - a patient health summary standard based upon XML, the CCR can be created, read and interpreted by various HIT or HIT systems, allowing easy interoperability between otherwise disparate entities.^[15]
- ANSI X12 (EDI) - A set of transaction protocols used for transmitting virtually any aspect of patient data has become popular in the United States for transmitting billing information because several of the transactions became required by the Health Insurance Portability and Accountability Act (HIPAA) for transmitting data to Medicare.
- CEN - CONTSYS (EN 13940), a system of concepts to support continuity of care.
- CEN - HITcom (EN 13606), the European standard for the communication of information from HIT systems.
- CEN - HISA (EN 12967), a services standard for inter-system communication in a clinical information environment.
- DICOM - a heavily used standard for representing and communicating radiology images and reporting
- HL7 - HL7 messages are used for interchange between hospital and physician record systems and between HIT systems and practice management systems; HL7 Clinical Document Architecture (CDA) documents are used to communicate documents such as physician notes and other material.
- ISO - ISO TC 215 has defined and produced a technical specification ISO 18308 describing the requirements for EMR architectures in addition to setting specific standards like ISO/TR 16056-1:2004 and ISO/TR 16056-2:2004 for Interoperability of telehealth systems and networks.
- openHIT - next generation public specifications and implementations for HIT systems and communication, based on a complete separation of software and clinical models.

Various factors involving the timing the right players and governance pay a key role in the overall development and maturity of the standardization program. Though these bring in some homogeneity in HIT development, they do not guarantee their sustainability within an overarching system in the long run^[16]

Though HITSP and CCHIT are necessary first steps they may not be enough to meet the requirements at hand. There needs to be a mandated set of standards that are drawn up with not only national criteria but adhering to internationally accepted set of standards. Or even better the US can be the leader in setting these standards for other countries to follow. There are agencies like the Agency for Healthcare research and Quality (AHRQ) that can very well take on this responsibility and administer it effectively. Finally, do we rely on independent organizations like CCHIT or will internationally reputed organizations like the International Standards Organization (ISO) set the standards like ISO/TR 16056-1 and ISO/TR 16056-2 for interoperability among US HIT vendors. Some even argue the rationale for standards and advocate a more open structure which will be detrimental to protecting privacy of medical records.

There are other areas where government intervention may be necessary and they are briefly outlined below purely to provide a comprehensive picture.

3. Privacy

A major concern is adequate confidentiality of the individual records being managed electronically. According to the *LA Times*, roughly 150 people (from doctors and nurses to technicians and billing clerks) have access to at least part of a patient's records during a hospitalization, and 600,000 payers, providers and other entities that handle providers' billing data have some access.^[16] Multiple access points over an open network like the Internet increases possible unauthorized patient data interception. In the United States, this class of information is referred to as Protected Health Information (PHI) and its management is addressed under the Health Insurance Portability and Accountability Act (HIPAA) as well as many local laws.^[18] In the European Union (EU), several Directives of the European Parliament and of the Council protect the processing and free movement of personal data, including for purposes of health care.^[19] The organizations and individuals charged with the management of this

information are required to ensure adequate protection is provided and that access to the information is only by authorized parties. The growth of HIT creates new issues, since electronic data may be physically much more difficult to secure, as reported lapses in data security are on the rise.^[20] Information security practices have been established for computer networks, but technologies like wireless computer networks offer new challenges as well.

4. Mandates and Incentives

Governments and policy makers need to step in to assist and provide a road map for private initiatives in HIT implementation and adoption. Governments in various countries have adopted different strategies to increase adoption with varying results. Both Australia and England have implemented highly successful national programs to promote the use of electronic medical records in primary care. Other countries, including New Zealand and the Netherlands, have also achieved substantial success.⁵³ In terms of speed; Australia's results have been most dramatic. In May 2000, 70% of general practices stated that the majority of physicians in their practice were using a computer in their consulting room to generate most of their prescriptions, compared with only 15% of general practitioners reporting computer use for any purpose in October 1997. Australia achieved this remarkable transition by providing general practitioners with financial support to help purchase a computer, supporting system implementation for those who needed it, and offering incentives for providers to submit claims electronically. England has made greater progress, albeit more slowly. Currently, 98% of general practitioners have access to an HIT on their desktop. Nearly all use it for prescription refills, and 30% report that their practices are paperless). Just three vendors supply these records; accreditation is required for the sale of systems. An application called Prodigy interacts with these applications and provides evidence based decision support; the plan is to distribute this application to all primary care clinicians. Each of these countries made a national investment in a coordinating group to develop a strategic framework and identify standards. Development of the actual records has been carried out by private vendors, who have benefited from having a common set of goals and standards. In addition, each country developed incentives for providers to make the transition from paper to electronic records.^[14]

5. Funding

Unfunded mandates by governments are ineffective. Should the government provide funding? Does this necessarily mean that governments need to make budgetary appropriation for HIT projects in order for these initiatives to succeed? The answer is no. Money is not the problem and money alone will not solve the problem. However, it is useful to have government grants or resources allocated to HIT projects in order to bring in hesitant participants. Government funds can play a very key role in increasing adoption to primary care physicians or health centers.

6. Correcting market failure

Always a point of contention is that governments do not know when to stop interfering with market forces. Significantly different in this case there has long been an active non involvement of the government. HIT initiatives in several states have reached a critical point where government intervention is necessary. Government should look at the public good and the market failure aspect and intervene in a discrete surgical way to solve the market failure and then step back. All stake holders have to be involved in order to solve this problem of public good. For example, it may be useful to separate Electronic Medical Records from Health Information Exchange (HIE). HIE is the information collated that is shared between clinicians or institutions when patients are treated through interoperable systems and use of the internet. It may be useful for government to have a different strategy for each of these separately as HIE is more of a public goods problem than HIT. However these two areas remain interlinked in the overall solution of the public good problem and correcting the market failure should be the key function of the government.

7. Federal Government as the Regulator, Policy maker and Market Player

Federal government's role in the US is unique, not only as a policy maker but also as the largest market player. Medicare, Federal employees, military and other government healthcare spending is close to 60% of all US healthcare dollars. In Massachusetts the Group Insurance Commission purchases more than 1 billion worth of health insurance services for state employees. The power of the government as a market player is not leveraged to its full potential and if exercised effectively, could be the key driving force for any healthcare reform including increasing adoption rates in HIT. The federal government can influence the development and growth of health information technology (health IT) through its operation and management of federal programs that finance health care—in particular, Medicare, which accounts for about 20 percent of all third-party (insurance) payments in the United States, and Medicaid, a joint program with the states for which the federal government's share of spending accounts for 8 percent of third-party payments. In addition to those two programs, the federal government pays

for or provides health care through the Military Health System, the Veterans Health Administration, the Indian Health Service, and the Federal Employees Health Benefits Program^[21]

The Centers for Medicare and Medicaid Services (CMS), which runs Medicare, has undertaken a number of initiatives and programs that encourage the adoption of health IT:

- ◆ The Medicare Care Management Demonstration provides financial incentives to medical practices on the basis of their performance on 26 measures of clinical quality. Physicians who use an electronic health record (EHR) certified by the Certification Commission for Healthcare Information Technology and who submit performance data to CMS electronically receive additional payments.
- ◆ In another demonstration announced in October 2007, CMS will make bonus payments to small physician practices that use certified EHRs. All participating practices will be required to use a certified EHR to perform specific functions, such as clinical documentation and electronic ordering of prescriptions (e-prescribing) that can positively affect the quality of patients' care. The core incentive payment to the practices will be based on their performance on measures of quality, with an enhanced bonus based on how well integrated the EHR is in helping physicians manage care.
- ◆ In accordance with a recently passed law, CMS is implementing the Physicians Quality Reporting Initiative, through which physicians receive extra compensation for submitting data to CMS on the quality of the care they deliver. (Although physicians are not required to use health IT systems to prepare and transmit those reports, such systems facilitate that reporting.)
- ◆ CMS is working with Medicare Advantage plans, the program's managed care option, to encourage them to offer personal health records (described in the appendix) to their members.

In addition to creating payment incentives to encourage providers to adopt health IT, CMS is working—as are a number of private health insurance plans—to develop policies for the use of health IT and standards for the systems. For example, CMS is a member of the American Health Information Community (a federal advisory committee established by the Department of Health and Human Services, or HHS) and participates in many of its working groups. In 2007, CMS administered a total of \$98 million in grants to states for the Medicaid Transformation program; the bulk of those grants were focused on implementing e-prescribing, EHRs, and the capability for health information exchange. CMS also provides technical assistance to small and medium-sized physician practices to help them obtain health IT systems and coaching for practices that acquire health IT practice management systems.

These initiatives are a good start but in key areas such as interoperability and setting standards the government agencies by virtue of its position as the largest market players can significantly change the equation

8. State government as a unifier and a laboratory

This paper would not be complete if no mention is made to the role that state governments can play to rationalize various aspects of the healthcare delivery market to reduce the fragmentations, e.g. implementing quality measurements across healthcare plans. States can function as laboratories in the US and state initiatives like universal healthcare in Massachusetts can be followed by other states and eventually get adopted by the Federal Government. Welfare reform in Wisconsin was adopted by other states and then the federal government under the Clinton administration.

Conclusion

Health Information Technology in the US is at a critical 'tipping' point. There are isolated efforts both private and by the government in several areas that are successful. Due to the nature of the sector itself no integration will be complete unless and until there is a national network which can connect all providers, health organizations and hospitals and there is a seamless flow of information across the various user groups. Again due to the nature of the data itself, these are to be safe guarded for privacy concerns, integrity and provided legal and legislative protection. The private initiatives are fragmented and require a clear road map for integration. HIT projects must be re-looked as strategic healthcare reforms and not merely as tactical automation projects. The role of the government has become an imperative both in policy making and as the largest market player. Three key areas that the Federal Government can lead with active private sector engagement are:

- ◆ Interoperability and Standards must be high on the agenda in the healthcare systems and the components of any healthcare reform planning and implementation
- ◆ The combined market clout of the Federal Government (CMS, VA and others) should be fully leveraged to achieve comprehensive interoperability and setting of standards. These will then be followed by the rest of the market

- ◆ A formal Public Private Partnership Policy towards HIT with interoperability and standards as the first steps

In a market like the US where both the supply side and the demand side remain highly fragmented, it is only the government that can play a meaningful role to significantly increase adoption. In countries like the United Kingdom where the supply or demand side is not fragmented the governments provide a road map and enforcement or compliance through a mix of mandates and incentives. The Policy framework should be one where the government will lead and the private sector will engage. Effective models of Public Private Partnership that has been tested in other industries in IT initiatives should be replicated in the healthcare industry. A formal Public Private Partnership to promote interoperability and standards in HIT would be the small step but a giant leap.

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