WORKING PAPER

Health Information Technology (HIT) Adoption – Standards and Interoperability

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<u>**Key Findings**</u>
- In order for the full benefits of HIT adoption to be realized across the State, a comprehensive health information technology network is needed to facilitate the efficient exchange of information between individual HIT systems. Without such a foundation, significant barriers will exist to health information following patients as they access care and health providers who adopt HIT will not have be able to leverage many of the potential benefits of adoption.
- The State has a number of options for facilitating the formation of such a network. Each option implies a different degree of State involvement in promoting HIT development.
- Each option also has different implications for the speed and cost of development, the acceptability of the network to a broad range of stakeholders, and the degree to which the network will meet the State's goals of improving health care quality and access, and ensuring that health care data will follow patients no matter where they seek care.

Overview
Health information technology (HIT) promises a wide range of benefits. Research predicts that the major gains from HIT will come from its potential to effectively exchange health care information.(1, 2) In fact, studies suggest that the overall business case for HIT depends on the degree to which health data can be efficiently exchanged between different computer systems.(1, 3) Without this capability, health data cannot follow patients as they obtain care from different providers. Although broad scale use of HIT applications such as electronic health records (EHR) can provide direct benefits such as eliminating illegible handwriting, EHR adoption alone won't ensure that digital health data can be exchanged.

The Critical Need for Interoperability
Different computer systems are said to be *interoperable* when they can exchange data with and use data from other systems. Simply converting data from a paper format to a digital format is not enough to ensure interoperability. Interoperability depends primarily on all the computer systems that need to exchange information having a common foundation between them. The rules that specify how to send information back and forth need to be defined. Even if all health care providers in Louisiana were given an EHR, they could not easily share the data in those EHRs without a common foundation to ensure interoperability. This foundation of course includes technology issues, but it also includes other kinds of issues such as legal and business rules that need to be coordinated between organizations in order for them to feel comfortable exchanging data.

Unless a common health care computing foundation is developed, the full benefits of EHRs and other HIT systems can't be realized and data cannot follow patients as they move through the health care system.(4)

Defining Options for Developing a HIT Network Foundation for the State of Louisiana

We present options for developing a comprehensive regional health information technology network that will support the State of Louisiana's identified goals of improving health care quality and access, reducing costs and making health care data follow patients no matter where they seek care.

Option A

- Promote development of the foundation required to exchange health data in an efficient, interoperable manner so that information can follow patients as they receive care in different parts of the health care system. Such a foundation should include coordinated governance, legal, business, clinical and technical capacities.

- Closely coordinate the adoption of EHRs with the development of an interoperability infrastructure to ensure that different EHR systems can share a core set of data regardless of differences in software, hardware, or institution-specific practices.

Advantages of Option A

1. Increases the value of the investment made by the State and the private sector in EHRs and other HIT systems by facilitating data sharing, thereby increasing the systems' operational functionality. If the State mandates or aggressively promotes adoption of EHRs before an interoperability foundation has achieved at least minimum capability, significant barriers will exist to data being efficiently exchanged and it will be less likely for data to effectively follow patients as they receive care.
2. Increases the capacity of individual HIT systems to enhance the quality, efficiency and patient centeredness of local care delivery.
3. Decreases aggregate and long term costs. If systems are adopted before an interoperability foundation is developed, they will not share common pathways and rules for exchanging data. As a result, they may require expensive, customized computer programs to connect them on an individual basis.
4. Allows for the development of robust market competition and choice between different HIT products and vendors. If a common foundation links local health care providers, they will be able to select HIT applications that best suit their needs and still be able to share data with other providers. Without the foundation, providers who wish to exchange data may be limited to the handful of applications most frequently used.
5. Promotes the ability of small provider practices to adopt HIT systems by enhancing the value of adoption and lowering the total cost of EHR ownership. Small providers do not have the purchasing power required to ask vendors to extensively modify EHRs. Without a common interoperability foundation, small offices may remain unconnected to the rest of the region even if they adopt EHRs.
6. Facilitates implementation of common standards through a process of consensus building.

7. At this point in time, the State of Louisiana has a unique opportunity to promote interoperability. One of the chief barriers to sharing digital data is the presence of disparate existing computer systems that providers may use – e.g., billing systems. All of these legacy systems would need to be individually retrofitted to connect them, a prohibitively costly undertaking. Since relatively few legacy systems remain in the Gulf area, creating an interoperability foundation will be simpler now than it will likely be again for the foreseeable future.

Disadvantages of Option A
1. Creating an interoperability foundation is a complex, multi-stake holder process that may be difficult to put together, leading to delays in the development of the foundation.
2. Focusing on developing the interoperability foundation first could potentially slow the rate at which providers can adopt EHRs and other HIT systems.
3. Only limited technical models may be available to guide a Louisiana-specific effort. The post-Katrina context makes HIT implementation different from other such initiatives.(4) The fact that relatively few computer systems remain in the Gulf offers the opportunity to develop an efficient new network with modern standards. However, it also means that the State will have to develop an approach different from that used in other regional efforts. Lack of a systematic approach will cause many unnecessary inefficiencies, worsening the business case for HIT and diminishing the potential to achieve regional interoperability.

Option B
- Sponsor development of a joint, non-profit public-private regional health information organization (RHIO) as described in the "Strategic Framework" outlined by the Office of the National Coordinator for Health Information Technology (ONC) to oversee development of the interoperability foundation.(5)

- Oversee the regional exchange of health data in accordance with the principles outlined by ONC for a National Health Information Network (NHIN) and establish the entity to oversee regional data exchange with the flexibility required to integrate itself into the NHIN as it develops.

Advantages of Option B
1. Establishing a common interoperability foundation may greatly benefit from active management by a neutral entity. Development of such a foundation is prone to market failure: its aggregate benefits are large but they are widely distributed. As a result, any single entity in the region has limited incentive to drive the formation of an organization geared towards common benefit. The State may be the only entity with both an incentive and sufficient leverage to sponsor development of the interoperability foundation.
2. Enhances an inclusive approach to privacy and confidentiality issues by creating a non-profit, transparent and open policy making organization.

3. Promotes development of non-proprietary, open standards.
4. Allows for local values and priorities to be put into practice while coordinating initiatives within a larger national effort.
5. Management by a neutral, non-profit, non-proprietary entity will foster development of a competitive, robust market for the HIT applications such as EHRs, which will function on top of the interoperability foundation.

Disadvantages of Option B
1. The State's presence may lead to centralization of effort around the public sector instead of allowing for more balanced development of a shared public-private partnership.
2. A multi-stakeholder organization will require complex consensus building around divergent interests.
3. A business model will need to be developed to prevent the entity from being dependent on the State over the long term.

Option C
- Adopt the principles in the "Common Framework" for health information exchange outlined by the Connecting for Health[1] collaborative as a starting point for developing a regional data exchange organization and interoperability foundation.(6)

Advantages of Option C
1. Using the Common Framework would efficiently leverage a broad spectrum of national stakeholder perspectives and expert opinion to move the Louisiana HIT effort forward much more rapidly than otherwise possible.
2. By incorporating a diverse range of stakeholders, Connecting for Health has sought to balance interests and perspectives. Basing policy on balanced information may lead to better outcomes.
3. Development of the Common Framework was supported by two highly regarded, non-partisan, non-profit foundations, likely decreasing the bias in the recommendations.
4. Connecting for Health has worked collaboratively with a number of other HIT organizations. Its recommendations have attracted wide support and are consistent in important respects with the thinking of many other experts groups, including ONC.

Disadvantages of Option C
1. The principles in the Common Framework may not reflect local concerns or values.

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[1] Connecting for Health is a public-private collaborative involving over 100 different health care stake holders whose goal is to address the policy, technical, and legal barriers to establishing an interconnected health information system. The initiative was supported by two philanthropic organizations: The Robert Wood Johnson Healthcare Foundation and the Markle Foundation. A diverse range of thought leaders participated in the initiative and their recommendations have been widely recognized. The Common Framework describes a network foundation for connecting health care information with characteristics including: 1) Non-proprietary, 2) Decentralized. Patient information should not be aggregated and stored in one place, 3) Based on widely supported technical standards, 4) Utilizes the Internet, 5) Develops policies and practices that safeguard privacy 6) Shouldn't require a unique patient identification number.

2. The vision and goals in Connecting for Health may conflict with those of stakeholders in Louisiana.
3. The principles in the Common Framework may not be generalizable to situations in which infrastructure is badly damaged and must be rebuilt expeditiously.

Option D
- Seek to have a single contractor or small number of contractors develop a single, unified, comprehensive HIT system.

Advantages of Option D
1. Likely to be the fastest way to establish a broad regional HIT system.
2. Using a single vendor or limited number of vendors may facilitate exchange of some types of health data.
3. Could decrease costs by generating economies of scale.

Disadvantages of Option D
1. Would likely limit the entry of systems from other vendors into the State, reducing market competition and choice. Even if the single system developed is compliant with accepted standards, it will probably use a number of proprietary technologies, creating barriers to entry. This would potentially substantially increase total long-term costs and would make it difficult to subsequently change IT support.
2. Limits local stakeholder involvement and concerns – e.g., privacy.
3. May lead to a patchwork of systems across the State – for example, providers that favor EHRs from other vendors that can't easily link to the State sponsored system.
4. System would lose flexibility and outside oversight.

Option E
- Use State purchasing power to facilitate HIT adoption by implementing a unified HIT system in all public hospitals and safety net clinics to improve care in those facilities. Implementing such a system would create a de facto standardized HIT system that other providers may feel compelled to link to.

Advantages of Option E
1. Would promote use of HIT in the public sector more rapidly than broader approach.
2. Could act as a benchmark for other providers in the State.
3. Would maintain choice for private sector providers.
4. May decrease the State's overall direct costs.

Disadvantages of Option E
1. Will likely lead to inconsistent use of HIT across the State because many providers may not adopt HIT despite the State benchmark.
2. Will probably lead to a patchwork of systems that are not fully capable of exchanging data. The State may not capture enough marketshare to become a de facto standard.
3. Non-State systems would likely require significant modifications to become interoperable with the system the State selects. This will significantly increase the

cost of these systems. Many vendors may have limited incentive to make these modifications even if compensated.

4. If private sector providers do not provide substantial amounts of care to patients who also use public healthcare systems, providers will have little motivation to link to the State system.

Option F
- Promote adoption of EHRs across the State first, then link them together into a data exchange network.

Advantages of Option F
1. Would probably facilitate the most rapid spread of EHRs among health care providers in the State.
2. Hospitals and large practices may individually benefit more by adopting EHRs sooner rather than waiting to coordinate with a developing interoperability foundation. Because large organizations tend to have more data under their own control, they are less dependent on having data transmitted to them.
3. Enhances institution and provider choice of EHRs: Their choice will not be constrained by the need to coordinate EHR selection with other entities in the State.

Disadvantages of Option F
1. Would lead to a very heterogeneous patchwork of uncoordinated EHR systems.
2. Linking EHR systems afterwards will be significantly more expensive than developing the interoperability foundation before large scale EHR adoption occurs because interfaces will need to be developed to integrate EHRs. Initial integration costs have been estimated as upwards of $90,000 per system.(7) Such costs will be incurred for each system that needs to be linked. Additional costs will be incurred for maintaining the interfaces.
3. EHRs linked through interface integrations will probably experience long-term performance difficulties. When any one EHR is updated, its interfaces to all other systems may need to be updated as well. If complex updates aren't coordinated, data sent may not be received.
4. In aggregate, smaller provider offices and primary care providers will likely have disproportionate difficulty exchanging data. Smaller practices, which tend to have less data in their own systems, will be more dependent on receiving data than larger systems. In order to coordinate care, primary care providers probably need to receive more data than specialists do. Given the complexity of system-to-system integration, these practices will receive less value from their EHRs than they would in a model where a standardized interoperability foundation is developed.
5. No consensus management process will be developed to coordinate differences between the business, legal, and privacy practices used by different stakeholders. This may limit trust in the HIT systems or leave unresolved differences between stakeholders that hinder data exchange.

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