

## T E C H N O L O G Y

# The New Alphabet Soup

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In November 2004, the National Coordinator for Health Information Technology issued a Request for Information to solicit public comment on the development and adoption of a National Health Information Network, or NHIN.

The alphabet soup has thickened. What do all these new terms, like LHII, NHIN, EHR, and RHIO mean to providers and hospitals? How do these institutions fit into the emerging national initiatives, and what role should they play in them?

## A CHIN by Any Other Name

The National Health Information Network is the complete set of systems, standards, policies, data, funding, and organizations that enables integration of healthcare information through interoperability. The objective is to make appropriate access to a wide variety of health information secure and straightforward. The successful NHIN is a public-private partnership that will bring out the best that private industry, government, and the rest of the not-for-profit sector have to offer.

There isn't a one-size-fits-all solution to the NHIN. The current state of electronic medical records

deployment, coupled with the political reality of the diversity of the healthcare delivery system in the United States and its concomitant supporting infrastructure, necessitate a flexible approach.

Regional Health Information Organizations (RHIOs) will develop to manage regional deployments that encompass sensible healthcare

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delivery areas. This type of organization should consider the patient central to its mission. In some parts of the country, a RHIO may involve multiple jurisdictions and governmental agencies, and may even cross traditional boundaries. RHIOs were previously referred to as Local Health Information Infrastructures (LHIIs) and were preceded by Community Health Information Networks (CHINs) in the 1980s and 1990s.

RHIO projects and systems will need to interconnect nationally through a set of agreed-upon standards. This interconnection will need to be simple enough to enable projects with different architectures to participate. Transactions will need to be authenticated, and the accurate identity of patients across projects and jurisdictions will need to be ensured. The Office of the National Coordinator for Health Information Technology will need to be particularly active in developing these standards.

## The Barriers

While the need is real, there are some significant barriers to the development of RHIOs and their interconnectivity:

**Financial.** The deployment of electronic medical records (EMRs) has been slow in the United States, especially among small physician group practices. While professional societies have been working hard to promote the use of information technology among its members, a strong business case still needs to be made and a compelling value proposition developed before EMR deployment will be widespread enough in many communities to make RHIO

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deployment comprehensive. Limited funding for community-wide efforts, resulting from suboptimal national and local economic conditions, further hampers efforts at project development.

**Standards.** While many useful standards exist, both medical and technical, they are not fully developed. The consensus process around standards development is slow and cumbersome in many cases, especially when the topics are complex and the path is uncertain. Competing or overlapping standards may exist for some areas. After standards are ratified, the path to wide-scale adoption can be even slower.

**Identification.** Patient identification is still a difficult system challenge. In the absence of a national patient identifier, systems will surrogate identifiers or algorithms to perform patient matching and de-duplication. Personal privacy continues to be an important issue for many Americans.

**Authentication.** It is critically important to be able to authenticate a transaction accurately to ensure that only valid users are participating in transactions, whether they are interactive (user's fingers on a keyboard or other input device) or automated (computer-to-computer without human interaction). This is both a technical and organizational challenge, because there is both technical and philosophical tension between confidentiality and security of data, and access to information for data sharing.

**Organizational.** There are significant challenges in developing and sustaining the proper community-based organizational structures needed to ensure the smooth development, rollout, and operation of a RHIO. Participation is required across public-private boundaries, among business competitors, and among organizations

potentially with strong and differing opinions and philosophies.

**Vocabulary and terminology.** RHIO projects involve the intersection of two of the most jargon-filled and acronym-laden fields of knowledge: medical science and information technology. While significant strides have been made to standardize the vocabulary in each, these are still complex areas that need consistent language to facilitate common understanding.

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**Technology.** There are a wide variety of technical barriers to successful RHIO system deployment, including long tails of legacy system deployment that will hamper participation in newer, more modern systems; data formats and coding that do not map well to the requirements of data exchange in newer systems or across organizations; and uneven deployment of basic infrastructure around the country that is required for system interconnection.

#### The Enablers

That being said, there are still a number of key enablers that provide hope that RHIOs will be developed within the timeframe set by the President.

**Interest and momentum.** There seems to be genuine interest in both the medical and business communities

for developing RHIO projects, as evidenced by the excitement in both communities about the prospect of this activity (and the more than 500 responses received by ONCHIT in response to its RFI).

**Standards.** While standards were listed as a key barrier, they are also a key enabler, as the relentless drive to discuss and determine appropriate standards for data descriptions, structure, and sharing marches on with much success. The participants in these numerous efforts should be commended for their selfless contribution to their fields of expertise.

**Public health expertise.** Public health has been struggling with issues of data interoperability and sharing for years. Community-wide projects for such functions as immunization registry deployment and disease surveillance provide rich experience to be drawn upon related to medical, technical, and organizational aspects of RHIO planning and deployment. This experience should be leveraged wherever possible.

**The Internet.** While in widespread use for barely 10 years, the Internet is a pervasive, worldwide enabler of inter-system and inter-organization communications.

#### Role of Integration

The NHIN's purpose, through RHIO deployments, is to provide a rich data and application environment for patient-centric and population needs to support clinical activities and population health. To support this vision, two distinct types of integration—shown in Figure 1—are important. Data integration involves forming valid relationships between data sources. Application integration for data presentation involves making integrated data available by presenting a unified view of data to a user

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through a computer application, which can range from a personal computer to a Web browser to a smart card.

These two types of integration ultimately come together in the tools, applications, and data that end users can access and use. As shown in the lower portion of Figure 1, participating data sources contribute data to the regional effort through one of several data integration models. The RHIO system enables the presentation of that data to end-users in a variety of ways—identified in the upper part of the diagram—through one of several application integration models.

How does a RHIO know what kind of data or application integration model to deploy? First, a RHIO project

must determine its functional requirements and then determine which of the data integration or application integration models represent a good fit.

Other common factors include:

**Timeliness.** How quickly will data be available to the end user, in light of the fact that it is likely coming from multiple disparate sources? Timeliness may depend more on the habits and capabilities of the participating organizations than the attributes of the RHIO, because ultimately the availability of data rises and falls on the ability of participating organizations to supply it.

**Reliability.** How reliable is the quality of the data being presented? Have the pieces of a patient's record

assembled from different sources been properly compiled? Is the original source of the data authoritative and accurate?

**Comprehensive.** How comprehensive is the data being presented? Are parts of the patient's record missing or unavailable?

**Cost.** How expensive is the proposed solution, both to the RHIO itself and to participating members?

### Models for RHIO Development

So where do we go from here? In subsequent columns, I will present several models for application and data integration, along with advice on when each is a "good fit" for RHIO development.

But the truth is that the technology is not the first hurdle to overcome. It is much harder to build the necessary coalition with a clear and compelling purpose than it is to find technology to fulfill that vision. Bringing competitors as collaborators toward a common good can prove to be a tall order in some communities. And the sense of turf between players—public and private—can poison even the best intentions.

### About the Author

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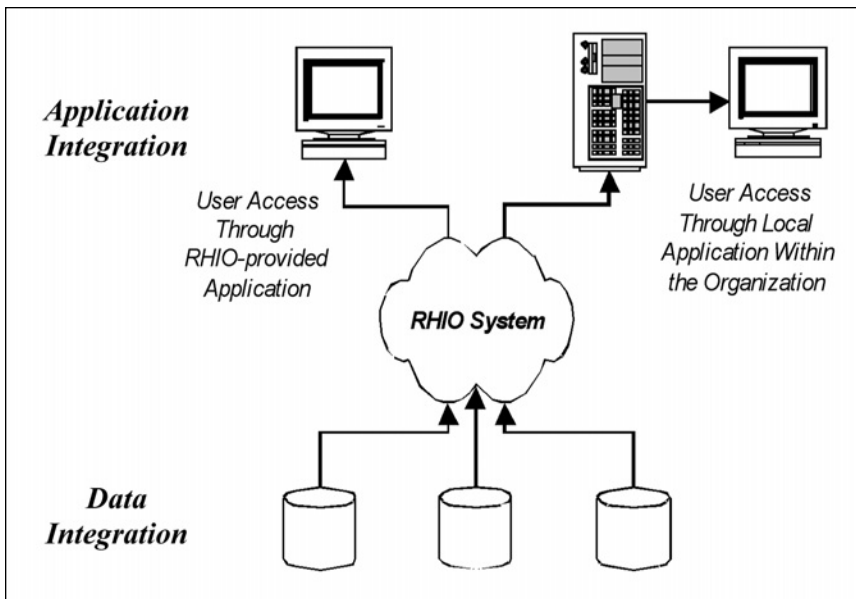


Figure 1. Two types of integration.