

SUCCESS STORY



NIEM and the HHS Meaningful Use “SPRINT”

FROM A PORTFOLIO OF NIEM SUCCESS STORIES

A Virginia family travels to California for a vacation. While they are there, Dad suffers a minor fall, is injured, and needs to see a doctor. With health information exchange, the emergency room physician can quickly acquire critical information made available by Dad’s primary care physician, saving time, avoiding error, and improving care.

A migrant worker and her family follow the harvests, moving up the East Coast as crops come ripe for picking. A legislator might ask, “What is the sum total of services the claimant has received in all these states?” A state Medicaid director could not possibly answer that question today. Tomorrow, with health information exchange, she will be able to do so.

The federal government provides healthcare benefits to individuals through the Veterans Administration, the Department of Defense, the Centers for Medicare and Medicaid Services, and the Indian Health Service. Today, it is extremely difficult to determine with accuracy the full entitlement of individuals to the range of available services. Tomorrow, with health information exchange, beneficiaries will have one-stop shopping for the services

they need, and will be assured of receiving an accurate and complete set of services.

Doug Fridsma had a problem: he was charged with developing a process that would assure the implementation of the provisions of the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009—and that would get the nation’s healthcare information systems “talking” to each other.

Fridsma came to the challenge with a portfolio of past successes. As a physician and professor of biomedical informatics—first at the University of Pittsburgh, and then at Arizona State University—and with experience working with major pharmaceutical firms as well as the federal government, Fridsma had seen the problems created by a lack of coordination between healthcare

systems recur time and again. Now, with a brief from the Department of Health and Human Services (HHS) with the purpose of implementing the provisions of the HITECH Act, he knew how monumental the task could be—but he also felt he had the know-how to do it.

After all, Fridsma had developed a variety of interoperability suites and test beds for healthcare information sharing. Among them was a process he had demonstrated assuring interoperability across clinical trials for cancer research. He had developed a way of taking “use cases” that involved information sharing across organizational boundaries, developing computational artifacts, and delivering back to all a capability for system-to-system sharing that would create a harmonized view of the world—in other words, developing a “common operating picture.”

As a member of the HHS Health IT Standards Committee, Fridsma had been asked by the Office of the National Coordinator for Health Information Technologies (ONC) to help frame its approach to this same challenge. The scale on this project would be significantly greater, Fridsma knew; but substantively it would be similar to his previous successful efforts. Still, he was daunted, thinking, “I’m going to have to do this all myself.”

Fortunately, John Teeter, Deputy CIO for HHS, had an idea for an approach that he thought might appeal to Fridsma. Teeter knew that the National Information Exchange Model (NIEM) had already proven itself in a process much like the one Fridsma was now charged with developing. Moreover, NIEM was already in use within HHS for purposes of coordinating information about child support.

In 2008, the HHS Administration for Children and Families’ Office of Child Support Enforcement had formally adopted a NIEM-enabled information exchange—the “Child Support and Court/Judicial Message Exchange Data Model.” This action had capped a multi-year collaboration with the National Center for State Courts and the child support enforcement community to automate the exchange of data between child support enforcement agencies and courts. It promised increased collections, improved access to case information, faster case intake and disposition, reduced paperwork, and fewer errors.

In 2009, Teeter briefed Fridsma on the use of NIEM at HHS. Though it had had its origins in the law enforcement world, NIEM had gained the attention and support of HHS officials, who saw that it could also provide value in areas

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of vital interest to HHS. Fridsma and Teeter weren’t very far into their conversation before Fridsma realized that the NIEM approach was similar to work he’d done before in private industry, and that it could be useful in meeting the needs of ONC.

“NIEM had an almost identical process for the very same problem that I had spent blood, sweat, and tears trying to develop—successfully—on my own,” Fridsma said. “There are just certain things you have to do—anyone has to do—if you want to get to the goal, and NIEM was doing them.”

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As he learned more, another similarity stood out for Fridsma: both NIEM and the HITECH Act had been spurred into existence by a national crisis in information sharing.

After all, it was the attacks of September 11, 2001 that had energized the move to link the disparate federal and state law enforcement and intelligence organizations who had been unable to exchange terrorism-related information with each other on that fateful day, even though they were all tracking and talking about the same events. These dangerous gaps in the ability to share information at a critical moment had been a key driver in the creation of the Information Sharing Environment, which was established to help address information-sharing issues that the 9/11 Commission had deemed critical for maintaining and protecting national security.

“What they lacked [on 9/11] was a consistency in the definitions of data, and in the data packages they were exchanging,” Fridsma thought.

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– Doug Fridsma, HHS Health IT Standards Committee

Similarly, the HITECH Act was meant to address a crisis of information-sharing in the healthcare domain: and now, energized by a national mandate, it would provide for the free flow of information between disparate healthcare information systems. Again, performance was at stake, in this case concerning the efficiency, quality, and safety of healthcare.

“Different words, same problem,” Fridsma thought. “State, local, and federal systems that don’t communicate with one another, but need to if they’re going to achieve their goals.”

“As soon as I saw how NIEM mapped to what we were trying to achieve around the issue of ‘meaningful use,’ and how it mapped to the previous process in healthcare that had been successful in creating interoperability solutions, we moved to explore how we could work together, and to test the possibilities.”

TESTING FOR “MEANINGFUL USE”

“Information sharing” means different things to different people, but in the relatively mature world of health informatics—and certainly under the provisions of the HITECH Act—“information sharing” would have a clear set of requirements.

For example, it would not be enough for a healthcare provider merely to declare that they were “good to go” in terms of sharing the information in their patient records with other providers or organizations. Too much was at stake: the risks associated with sharing sensitive, confidential patient information was too high. Anyone who was going to be moving health data from one data system to another would need to prove they had the capability to do so safely, and would need to be certified.

The test capability would be determined according to a provider’s ability to demonstrate that their purpose was “meaningful use” of electronic health records, defined to include everything from generating prescriptions electronically, to recording smoking status, to checking insurance eligibility and submitting claims electronically. Health IT leadership had already identified 25 such “meaningful use” scenarios against which providers would have to prove themselves capable of sharing information.

The process of establishing capability would not be cheap, and it could be slow. To accelerate the adoption of information sharing, and to lower the barriers to entry of healthcare providers into the network, health IT leadership tapped into the American Recovery and Reinvestment Act of 2009 to secure \$19 billion in stimulus funding—a bounty to be divided among those providers who could demonstrate “meaningful use” capability by May 2011.

With its careful definitions and its considerable incentives, the concept of “meaningful use” has developed as the new Rosetta Stone of the healthcare IT community. The problem is that there are a wealth of data standards already in use in the field—a disparate conglomeration of as many as 100 different sets of data standards—covering data exchange for everything from radiology reports to lab work to surgical care.

What will be the strategy and the architecture that can link all of these standards without requiring massive investments in point-to-point connections? Point-to-point solutions are cumbersome and costly to develop, expensive to maintain, and unable to adjust quickly to exigencies and rapidly changing requirements or different users.

What might an exchange-based solution that was developed within a service-oriented architecture, that would prove agile and adaptive to new users down the road, look like? A solution that would avoid the massive reworking and rewriting of point-to-point connections, and would instead focus on and leverage the ability to re-use information technology services? How might such a capability—or its cornerstone components of information sharing—be provable within the very tactical framework of the meaningful use information sharing scenarios?

ENTER NIEM AND THE HHS MEANINGFUL USE “SPRINT”

As Doug Fridsma and John Teeter approached their challenge in the early winter of 2009/10, they turned to NIEM, to existing healthcare information-sharing

standards, and focused their attention on a single “meaningful use” scenario: the sharing of the patient health summary. Could NIEM provide the basis for the rapid development of an information exchange of the patient health summary in a way that would satisfy the meaningful use requirement?

In the world of health informatics, the patient summary can be expressed in one of two ways. One is called the “clinical care document” (CCD); the other is called a “clinical care record” (CCR). Each is framed by different standards and naming conventions. These two record types “talk” about the same thing—patient care—but they cannot talk to each other. So much for the notion of porting records between providers!

Some reconciliation between the two formats had earlier been achieved via a harmonized standard called C32. But C32 was not yet complete.

Intrigued, Teeter and Fridsma set about investigating whether they could take the C32 model—which combined the CCD and the CCR—and map it to the core elements in NIEM. Were there elements in NIEM they could use? Could they develop the new elements they needed and that did not exist in NIEM, and add them to the core? Could they create a NIEM Information Exchange Package Documentation (IEPD) that could be used to evaluate and even to certify different capabilities regarding the meaningful use requirement?

Could they even, if they were successful, look to the day when they might be able to engineer a full life-cycle specification “factory”—reusing NIEM software services, adding tools to extend the functionality of the NIEM process to include software development, and accelerating vendor implementations and certifications of support for interoperability?

Or would they fail, and have to develop their own CCD-to-CCR data exchanges?

They didn’t know the answers to any of these questions, but they were ready to try.

The “sprint” began late in the fall of 2009. The development teams mapped some healthcare data to existing NIEM

core elements—and created new ones. For example, although the word “patient” is not used in NIEM, the word “person” is. So Teeter and Fridsma decided to try adding “person” to “health information,” to create a NIEM data element for the word “patient.”

“Within about three weeks, we were able to take some existing work that they had been doing around the C32, and generate the artifacts that we needed from a computational perspective to support the clinical care document in the Interim Final Rule,” says Fridsma.

Are those new core elements sufficiently well described to now go ahead and create corresponding XML specifications?

“The test clearly demonstrated the value and the time frames that could be involved in developing an IEPD for broad use across the national health community,” Teeter said.

To Fridsma, the “sprint” indicated at the very least that the NIEM process was not going to impede the nationwide health information development timetable. On the contrary, it appeared that HHS would be able to use the NIEM process to help construct the needed artifacts, saving time and expense. With sufficient privacy, security, and confidentiality safeguards, NIEM could help lead the way for HHS.

On February 25, 2010, this news item appeared in Government Health IT:

“The Office of the Coordinator for Health IT is planning to use a long-established information exchange model that enables data sharing between the Department of Justice and Homeland Security agencies as a testbed for the Nationwide Health Information Network (NHIN).

“ONC plans to use the National Information Exchange Model (NIEM), which ‘has been used successfully in government,’ by adding a healthcare domain to it,” said John Halamka, CIO of Harvard Medical School and co-chairman of the Federal Health IT Standards Committee, at a February 24 meeting of the panel.”¹

It’s another NIEM success story.

¹ <http://www.govhealthit.com/newsitem.aspx?nid=73192>.