RIGHT MOTIVATION, RIGHT TOOLS PAVE THE WAY FOR INTEROPERABILITY SUCCESS

Consider the following scenario: A patient receives a computed axial tomography (CAT) scan in an effort to obtain a detailed, precise image of some bothersome kidney stones. The patient then takes a compact disc loaded with the image to her outpatient surgery center, where the kidney stone procedure will take place. The clinicians at the surgery center can’t read the CD—and, therefore, proceed with the surgery using a sub-standard picture that the patient’s husband had stored on his phone. The patient ends up leaving the surgery with the doctor saying: “I think we got it all but I am not sure.”

Ouch. This example illustrates why the healthcare industry needs interoperable computer systems. When systems don’t communicate with one another, healthcare organizations can expect to encounter a variety of problems, including less than optimal quality and patient satisfaction, as well as increased readmissions and potential revenue loss. On the flip side, with interoperable technology, healthcare providers can improve quality, enhance efficiency, and control costs.

Healthcare leaders have documented the benefits of interoperability for quite some time. As a matter of fact, as soon as providers started to gravitate toward electronic health records in the 1980s and 1990s, the call for interoperability became a common one. At that time, users began to realize that the value of EHRs would increase exponentially if their systems worked...
together. The federal government formally started to call for increased interoperability in 1996 with the issue of the Health Insurance Portability and Accountability Act (HIPAA), which not only called for the protection of personal health information, but also for the flow of information across institutions.

But, alas, nearly two decades have passed and interoperability is still more pipe-dream than reality. In fact, in 2013, according to the Department of Health and Human Services, only 14% of provider organizations reported that they electronically share data with ambulatory care providers or hospitals outside their organization.\(^1\)

However, the industry looks like it is finally standing on the precipice of change. This white paper will take a look at why interoperability is now becoming more important than ever—and how healthcare organizations can finally move forward, turning the long-held interoperability vision into a reality.

A LOUDER PLEA

Even though the call for interoperability has existed for quite some time, the plea has hit piercing decibels in recent months. In fact, in June of 2014, the Office of the National Coordinator of Health IT (ONC) issued “A 10-Year Vision to Achieve an Interoperable Health IT Infrastructure,” a report that points out that interoperability has become “particularly urgent.” The report asserts that interoperability will lead to an infrastructure that “will support more efficient and effective systems, enable scientific advancement, and lead to a continuously improving health system that empowers individuals, customizes treatment, and accelerates cure of disease.”\(^2\)

Fortunately, the following trends make interoperability a more financially viable alternative:

**The shift to value-based care.** Previously, healthcare organizations operated exclusively under a fee-for-service model. As such, when a hospital repeated the same tests that a medical group practice down the street performed, the hospital would still receive payment. Under value-based care, however, healthcare organizations receive reimbursement based on the quality—not merely the quantity—of care delivered. Therefore, the incentive to perform an unlimited number of diagnostic tests disappears, as organizations are encouraged to work cooperatively to efficiently produce the best clinical outcomes. Under this model, healthcare organizations are financially motivated to link their information systems together.

In fact, the model not only encourages providers to link clinical systems, but to also share data between clinical and financial systems. This allows organizations to get a handle on what it truly costs to deliver optimal outcomes.

**Increased consolidation among providers.** More than ever before, healthcare organizations are merging their operations—and that is making it financially prudent to create information systems that can work in unison. In fact, a GE Healthcare survey conducted in late 2013 found that 88 percent of health care executives expect to pursue some sort of merger and acquisition activity in the near future.\(^3\)

When hospitals unite, there is a pressing need to share information among the various care providers and staff members. However, clinicians and others often resist switching from one information technology system to another. The only way leaders can solve this conundrum, then, is to find a way to make the existing systems work together through interoperability initiatives.

**The evolution of Meaningful Use.** The ONC has asserted that the goal of the Meaningful Use program is to make sure information follows the patient throughout the continuum of care, regardless of the care delivery location. More recently, the ONC’s JASON Task Force recommended that Meaningful Use Stage 3 requirements more narrowly focus on interoperability. The group pointed out that Stage 1 and 2 of the program had not achieved “meaningful interoperability” and stressed a need to create a unifying software architecture using application programming


Consequently, healthcare organizations stand to receive financial rewards from the federal government for implementing interoperable systems.

**Decreased resistance from provider organizations.** For many years, providers did not want to share information due to competitive concerns. Hospitals, for instance, were reluctant to share information, as leaders feared that other providers might market similar services to their patients. While these concerns still persist, many providers are beginning to warm up to the idea of sharing data, as doing so could lead to financial gains under value-based care models. In addition, providers were reluctant to share information with other providers due to HIPAA concerns. More advanced security technologies and protocols, however, are providing the ability to safeguard organizations from HIPAA violations. So, while protecting data in accordance with HIPAA is still a major concern, many providers are becoming more confident in their ability to share information in a safe, compliant manner.

**CONQUERING CHALLENGES**

With financial incentives in place, healthcare organizations are pushing to achieve interoperability with a renewed vigor. Even so, the quest for interoperability in healthcare still poses many challenges.

The HIMSS definition of interoperability sheds some light on this complexity. The group describes interoperability as “the ability of different information technology systems and software applications to communicate, exchange data and use the information that has been exchanged. Data exchange schema and standards should permit data to be shared across clinician, lab, hospital, pharmacy and patient regardless of the application or application vendor.”

While this baseline concept sounds complicated enough, HIMSS points out that to succeed, healthcare interoperability needs to escalate across three levels:

- “Foundational” interoperability enables data exchange between systems but does not require the receiving information system to interpret the data.
- “Structural” interoperability, an intermediate level, defines the structure or format of data exchange (i.e., the message format standards) where there is uniform movement of healthcare data from one system to another such that the clinical or operational purpose and meaning of the data is preserved and unaltered.
- “Semantic” interoperability provides interoperability at the highest level, which is the ability of two or more systems or elements to exchange information and to subsequently use that information. Semantic interoperability takes advantage of both the structuring of the data exchange and the codification of the data, including vocabulary, so that the receiving information systems can interpret the data.²

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Reaching the semantic level of interoperability is quite a challenge in healthcare, where the shared information is so inherently complex. The following examples shed some light on potential pitfalls:

**Same symbol, different interpretations.** A surgeon in Florida practiced at two different hospitals. Each hospital had implemented a patient safety initiative to prevent wrong-sided surgery. That is, the hospitals were ensuring that clinicians would not operate on the left leg when the right leg warranted the attention. In one hospital, it was determined that an “x” would be placed on the leg that was to be left alone. In the other hospital, the “x” was placed on the limb that required the surgery. Of course, the surgeon became confused and eventually performed a wrong-sided surgery.

**Lack of consensus on terms.** Simple terms do not seamlessly transfer from one system to another. For example, some information systems spell out male, some use an “M” to represent male, while others simply use the number 1 to indicate a male patient. For these systems to work together, they must all use one term. The need to focus on one term for other more complex things is also difficult.

**Same term, different meanings.** Medical terms such as length-of-stay vary in meaning across organizations. For example, in a hospital, length of stay indicates the number of days that a patient is treated in the facility; in a medical practice, length of stay stands for the time between cutting a patient open and delivering the patient to post-op.

**The monolithic technology myth.** Many electronic medical records vendors purport that they can solve interoperability challenges by moving organizations to one monolithic system. The problem: Healthcare provider organizations are merging and forming alliances in quick fashion. And, unfortunately, merging EMRs is a tall, if not impossible, order. In addition, many larger organizations run multiple EMRs within their organizations. And, finally, as computerization continues to permeate the healthcare industry, application diversity—not standardization—is becoming the norm.

While healthcare organizations face a multitude of challenges associated with effectively sharing information, they also encounter hurdles when it comes to protecting information. Most notably, all information shared between systems must adhere to HIPAA standards. In short, organizations need to use standard formats and security mechanisms to ensure the confidentiality and integrity of any information that can identify individuals.

**TAKING THE BULL BY THE HORNS**

Since EHR vendors traditionally have not focused on creating the interoperability that can overcome these challenges, provider organizations must take up the charge and invest in the plumbing and infrastructure to enable data and information to flow freely and securely. By doing so, organizations will be able to share information across multiple systems—from EHRs to operational to analytic systems. In addition, with such a framework in place, healthcare organizations will be able to connect with one another, making it possible to create longitudinal patient records, regardless of the care delivery location. With such widespread interoperability, organizations can get the data that will enable them to deliver the best care and to also tie clinical operations to financial performance.

Getting to this level of interoperability, however, requires a concerted effort. Industry-wide interoperability initiatives such as Health Level 7 (HL7) and Fast Healthcare Interoperability Resources (FHIR) can help considerably—but they will only take providers so far.

For example, even though many systems rely on the Health Level 7 (HL7) standard—a common healthcare information exchange protocol—to share some data, provider organizations need to think beyond this standard to achieve true interoperability.

Similarly, FHIR has been created to take interoperability to the next level by simplifying interoperability implementation without sacrificing information integrity. FHIR leverages existing logical and theoretical models to provide a consistent, easy to implement, and rigorous mechanism for exchanging data between healthcare applications. While FHIR is poised to make it easier for organizations to connect disparate systems, it is not likely that all systems will adhere to this standard at any time in the near future.

As a result, providers should leverage interface engines that enable organizations to go beyond the data sharing made possible through the standards such as HL7 and FHIR. Indeed, such tools enable healthcare providers to achieve comprehensive and agile integration and improve
patient care outcomes by ensuring that the right information (such as patient history, medications, lab, and imaging) is transmitted to the right person at the right time, regardless of what information systems, software applications, or data repositories are being deployed. And, because interface engines like this use pre-packaged “clinical bridges” designed to link one system to another, the cost of integration and time to value becomes greatly reduced. What’s more, interface engines also can be used to connect FHIR-enabled systems to non-FHIR-enabled systems.

In addition, exchange technologies and models have advanced greatly over the past decade, making it easier to quickly move data across organizations. As such, information extracted from the formerly impenetrable monolithic clinical systems can be exposed in standard formats. Data then can transfer from system to system, even in a world with limited standards. Large integrated delivery networks (IDNs) have leveraged this strategy for years. By utilizing this approach, some of these organizations are processing more than 50 million HL7 messages a day with ease. Smaller organizations are following suit as well. For example, a 1,000-bed hospital on the west coast recently provided the platform, standards and stability that enabled multiple EMRs to co-exist and collaborate around patient data.

BUILDING A REAL TIME HEALTH SYSTEM
Cost-effective information sharing can help healthcare organizations build a foundation that will enable them to use data more strategically and to ultimately move toward what Gartner Group, an information technology research and advisory company based in Stamford, Conn., has termed the Real Time Health System (RTHS). The RTHS uses patient event information, operational intelligence and situational awareness to optimize critical workflows, and to adapt to changing business conditions. Under this paradigm, healthcare enterprises compete by using up-to-date information to progressively remove delays to the management and execution of its critical business processes. Organizations need to rely on a variety of technologies that enable transparency into quality and safety, access to information and agile communication. Organizations need to use information and communications technologies to create the real-time business intelligence necessary to improve patient care and outcomes, while also streamlining workforce resources.

This includes the strategic use of IT and communications technologies, and the real-time business intelligence necessary to improve patient care and outcomes, and balance demand and resources.6 With this model in place, organizations need to not only integrate information, but also find a way to tap into this intelligence. Leaders, in fact, need to look for systems to help make all the data more actionable. They need solutions that take information from multiple systems and pull it all together into one meaningful presentation, making it much easier for end-users to digest the information—and act upon it. In addition, they also need technology that connects people to people—making it possible to meaningfully share and respond to information. For example, such a solution also could employ social media concepts to empower business process improvements, ultimately transforming how a healthcare organization operates.

MOVING BEYOND INTEROPERABILITY TO DATA ANALYSIS FOR BETTER PATIENT CARE
In addition to seeking improved interoperability and communication, healthcare leaders should look to employ information technology solutions that can truly leverage integrated data by:

- Supporting exchange of health data from any system within the healthcare digital network and community

• Empowering staff members across the entire care continuum to communicate and collaborate—from sharing information such as documents, plans, photos, videos, and more—in a centralized location, with real-time updates that are stored and easily searchable
• Organizing conversations around enterprise-wide business topics
• Creating workflows and alerts that dramatically improve exception management
• Designing or changing business processes with minimal IT involvement
• Enabling organizations to scale IT resources up or down to meet evolving needs
• Managing labor costs and compliance through advanced planning and scheduling
• Saving time by automating key workforce management processes
• Better analyzing workforce data
• Accessing near real-time data on labor and supply costs at the patient level to help reduce the cost of care

With these capabilities in place, organizational leaders can then rely on integrated data to more strategically make business decisions. For example, a hospital might discover that it is financially prudent to focus primarily on orthopedic services, and to discontinue its maternity services. Or, an accountable care organization might realize that it would be financially advantageous to create population health programs for diabetic patients.

Perhaps most importantly, with interoperable systems supporting the RTHS, the patient can then become the center of the healthcare universe, instead of continuing with the healthcare organization as the focal point. As a result, this 360-degree perspective on patient care can empower healthcare organizations to leverage comprehensive information in an effort to make the best operational, financial, and clinical decision each and every time.

And, in such a world, doctors would be much more likely to confidently know that they have succeeded at the conclusion of a surgical procedure—instead of simply hoping for the best.

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**Banner Health Experiences Interoperability Success with Interface Engine**

Like most healthcare organizations, Banner Health, Phoenix, Ariz., does not have a fully integrated electronic medical records system. But unlike many other organizations that are struggling to share information among various information systems, Banner has been achieving a high level of interoperability with Infor’s Cloverleaf product for nearly two decades.

Indeed, Banner is using the integration engine to:
• Share data among the organization’s critical clinical systems (including EHRs, pharmacy systems, ADTs, and more)
• Send and receive messages to and from more than 90 distinct systems
• Sustain a total of 750 individual system connections and 3.5 million transactions daily
• Support its own internal health information exchange (HIE), which then connects to outside HIEs, such as the Health Information Network of Arizona (HINAz)

What’s more, the integration engine enables the 23-hospital delivery system to achieve this high level of interoperability without expending a great deal of human and financial resources.

“Especially being a multi-hospital, multi-regional environment, we’re operating in multiple states and multiple time zones, so doing point-to-point feeds between different systems that need to share information would be completely unmanageable,” says Steve Drozdowski, IT integration analyst and head of the four-member Cloverleaf team at Banner Health. “We’ve taken the approach that Cloverleaf is our hub of clinical information; so we route all the different data sources from all of our different clinical systems into Cloverleaf, and from there, if anyone needs it downstream, we route that back outbound.”

Healthcare Informatics:
Integration Engines Drive System-wide Interoperability; by Jennifer Prestigiacomo
ABOUT INFOR

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To support healthcare organizations in the shift to value-based reimbursement, Infor is moving beyond inflexible packaged software by leveraging new technologies, such as social, mobile, cloud and big data, to deliver fully connected, healthcare-specific solutions that provide capabilities that are inherently collaborative and intuitive. Learn more at infor.com/healthcare