



# *Transformation through interoperability: Are we there yet?*

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I see healthcare information technology as a journey. We've been traveling the path for a while now, and we have taken a few scenic routes, including at the turn of the century with "Y2K;"<sup>1</sup> in the last few years with "Meaningful Use;"<sup>2</sup> and in the last 12 months or so with the transition to ICD-10.<sup>3</sup> The journey has been an interesting one, and the path ahead seems even more eventful with opportunities galore in the space of precision medicine, in payment reform and in exponential technological advancements, such as in deep learning, image analytics, machine learning, sensors and big data.

A little over one year ago, we celebrated the "Decade of Healthcare IT." This marked the anniversary of the day, April 27, 2004, when President George W. Bush called for the majority of Americans to have interoperable electronic health records within 10 years. In doing so, the President signed an Executive Order establishing the Office of the National Coordinator for Health Information Technology (ONC), which would be tasked with developing, maintaining and overseeing a strategic plan to guide nationwide adoption of health information technology.

Earlier this year, the ONC released a paper fondly referred to as the "10-Year Interoperabil-

ity Roadmap."<sup>4</sup> In our journey toward intelligent healthcare, I wonder where we will be and what questions we will still have at the end of the next decade. The onus is on us to lead the charge and maximize the capabilities of the data, the systems and the opportunities before us.

The Health Information and Management Systems Society (HIMSS) describes interoperability as the extent to which systems and devices can exchange and interpret data. For two systems to be interoperable, they must be able to exchange data and subsequently present that data in way that can be understood by a user. Anyone who has had a personal journey through the harrowing realities of healthcare understands the challenges facing us. Interoperability is about so much more than just data exchange. It is about the delivery of contextually relevant insights efficiently and securely to facilitate care coordination, irrespective of application, vendor or device. It is not about checking a box to meet a measure—it's about bettering care.

## **Standardize the standards**

It is time for us all to wake up and realize that healthcare information technology interoperability is not just a "nice to have" anymore—it's a strategic imperative. One key impediment

to HIT interoperability is—ironically—standards. We do not need more *standards*. We need better *discipline* around embracing national standards around HIT interoperability. We need *simplicity*, a level of ease and reliability that is akin to plug-and-play around HIT interoperability standards.

We need clearer *guidelines* around standards, better *discipline* around adherence to core standards, and clear *measures* so we can hold vendors, providers and payers accountable for ensuring HIT interoperability. Loose standards need to be tightened up. Vendors need to be better disciplined to adhere to national standards. Perhaps vendors need to start first with enabling cross-walk capabilities between the core standards they adhere to and national standards around key data elements, such as medications, allergies, problems, immunizations and labs. There also needs to be better synchronization in provider adoption of HIT interoperability standards.

Imaging is no stranger to standards. Indeed, in the world of interoperability and standards, imagers have been pioneers. The birth of the Digital Imaging and Communication in Medicine (DICOM) standard in 1983 gave way to a digital tsunami of innovation in imaging. Today, the mantra of “any image, anywhere, anytime” does not even raise an eyebrow, and is expected as the norm.<sup>5</sup> Indeed, as we take a look at imaging today, we have not just grown from being a departmental solution to an enterprise asset, but we have also set the tracks for new waves of patient-centered care across vast areas of medicine. The DICOM standard facilitates interoperability of medical imaging equipment by specifying protocols, transfer syntaxes and semantics of commands, information conformance standards, medical imaging services, security profiles, and content management, and it continues to keep up with the times. To cite just one example, DICOM-web is a set of RESTful services, enabling web developers to unlock the power of healthcare images using industry-renowned toolsets. As other specialties such as cardiology, pathology, dermatology, otolaryngology and others embrace everything digital, there is a growing need—an imperative—to manage and grow

these digital assets in a much more coordinated manner across the enterprise.

### Playing with FHIR

Perhaps one of the more promising developments in the area of interoperability has been the emergence and widening acceptance of Fast Health Interoperability Resources, or FHIR (pronounced “fire”). FHIR is a new specification based on emerging industry approaches but informed by years of lessons around requirements, successes and challenges gained through defining and implementing the Health Level Seven (HL7) standard. What is exciting about FHIR is its simplicity, where, based on a modern web services approach, it leverages existing logical and theoretical models and simplifies implementation without sacrificing information integrity.

Innovative vendors and other organizations are beginning to develop applications leveraging FHIR and are already starting to see its benefits. FHIR clearly represents an exciting opportunity to accelerate healthcare data interoperability.

But wait, there’s more.

Supported by the ONC, the Strategic Healthcare IT Advanced Research Projects (SHARP) program aims to move the needle toward high-performing, adaptive, nationwide healthcare products and services. An interesting development has been an architecture called SMART, or Substitutable Medical Apps, Reusable Technologies, which facilitates easy extensions of electronic health records (EHRs) and enables the equivalent of an iTunes App Store approach to distributing healthcare apps.

Further mashing things up, SMART on FHIR is a new platform that provides a complete open standards-based technology stack that leverages emerging protocols such as OAuth2<sup>6</sup> and provides a much more flexible developer-friendly application programming interface (API). Brennan Lehman, CIO at Mosaic Life Care, described the development of SMART on FHIR apps within EHRs as being “comparable to smartphones replacing pagers.”<sup>7</sup>

### Operate, then interoperate

One has to crawl before one walks—or runs, for that matter. We cannot attain true interoperability

without first ensuring “operability.” Often, clinical information systems tend to be proprietary and ‘closed,’ although the trend seems to be toward adopting a more “open” approach to data exchange across systems.

There is a massive lapse in the way current clinical information systems are designed, and workflow and “design thinking” principles seem like foreign concepts. As a result, care today in many ways is application-centric, siloed, fragmented and uncoordinated. Electronic medical records have been embraced to ease care processes, but by design they are built to aid in transactional activities related to care, such as documentation and billing.

There seem to be great tradeoffs between capability and usability. As an industry, we have not figured out how to optimize capability and maximize usability in our clinical workflow as we design clinical information systems. At first glance, capability seems vastly more important than usability; but, in practice, the reverse is true.

Interoperability needs to embrace and enable newer care models, not just fix older problems of a fragmented healthcare system. Accountable care entails a keen focus, not on the volume we generate out of our imaging centers or hospitals, but on the quality, outcomes and costs across the entire care continuum. In this new model, continuous quality improvement is the linchpin that will enable better clinical outcomes at lower costs. The initiative has the potential to remake the way healthcare is delivered, incentivizing physicians and health care providers of all types — hospitals, clinics, long-term care facilities and others — to work together to improve outcomes and generate shared savings. The need for real interoperability and streamlined data flow could not be more urgent.

### **Betting on the right horse**

The U.S. healthcare system currently has a high degree of dependency on HIT vendors. Indeed, vendors have really not been incentivized financially or otherwise in the past decade to enable real interoperability. They have, I would argue, been *dis-incentivized* to enable real interoperability. The past decade has seen the emergence of disparate ways to capture, store and exchange data. But this is changing, and

vendors who adhere to proprietary standards or that are less interoperable with others will eventually lose.

Instead of relying solely on HIT vendors to enable interoperability, the healthcare industry needs to think outside the box, and enable more of a patient-centric approach to interoperability. Perhaps we have been “betting on the wrong horse” all along. Perhaps, if we allow patients freer access to their own data and enable patients to be true arbitrators of their own data, we can truly make an impact and get at real interoperability.

A wealth of information often exists in patient-entered data, data from patient-portals, from apps, and from connected devices and wearable technologies.<sup>8</sup> The lines between “mHealth” and traditional “brick-and-mortar” healthcare are blurring quickly. It is critical for the healthcare industry to capitalize on this dynamic by ensuring that we are able to free the patients’ data from the clinical information systems and make them available in actionable ways to patients so they can become even more engaged in their care.

### **Interoperability is not optional**

It is critical to understand that regardless of a provider’s strategy around clinical information system implementation, interoperability should be a key consideration, even when purchasing a solution. It is also critical to comprehend that even for organizations with a “single vendor” strategy, there is never really just one vendor. Providers need to ensure a high level of “stickiness” across referring provider groups, across neighboring provider organizations and often across state and national lines. This calls for both a stricter level of adherence to data standards and methodologies, as well as a broader need to really push their respective vendors to embrace national standards and having better discipline around adherence to core standards.

There are three top ideas to understand about interoperability:

1. It’s really about the patient. Those who have endured frustrating challenges in their own care or the care of their loved ones understand this best.
2. Interoperability is hard, but it must be achieved.

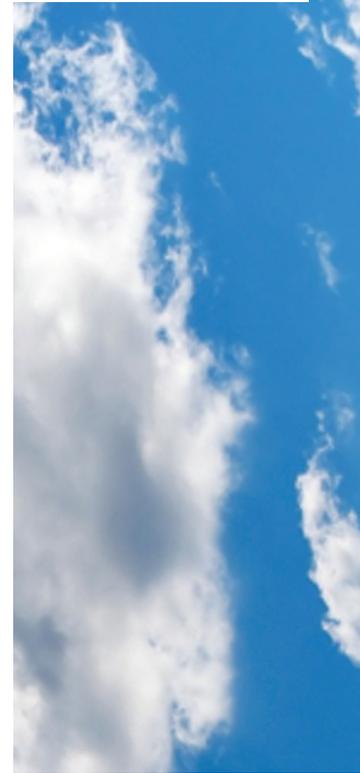
3. At the end of the day, interoperability is less about technology and more about leadership. We need to rise to the occasion and show real leadership both within our own organizations and more broadly to make this happen.

## Conclusion

The journey of interoperability continues, and it is time for us to rethink, recalibrate and reinvigorate. Interoperability is the bedrock of better personalized care, better population health management, better analytics and better usability. It is critical to focus on a ground-up approach to data interoperability, with the goal of enabling better workflows and better decision making. The millions we invest in implementing clinical information systems become meaningless if usability goes down, or if clinical workflow is impeded.

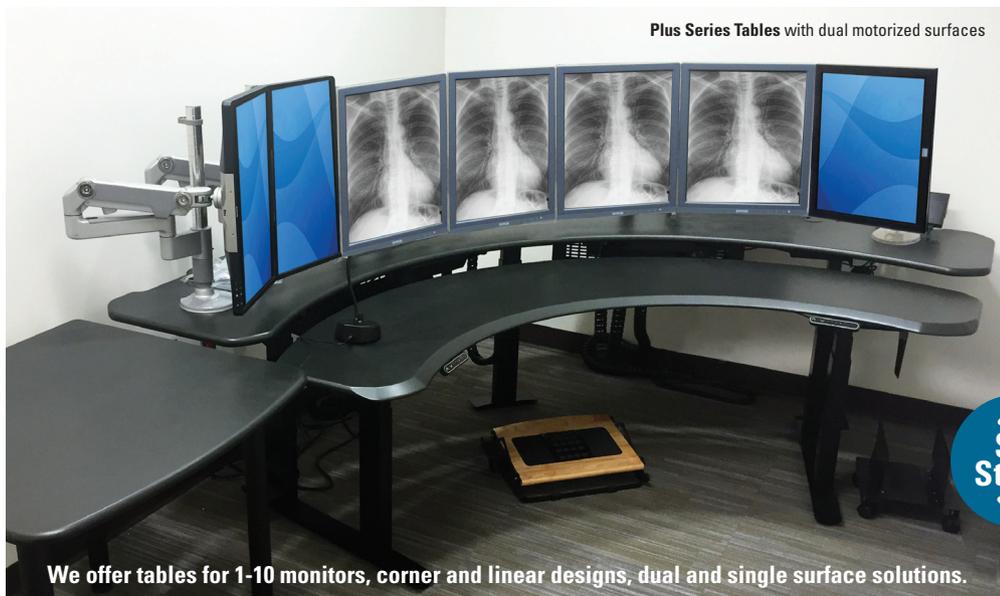
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