



CONNECTED HEALTHCARE: Enabling Enterprisewide Interoperability

HIMSS Media survey highlights interoperability progress, challenges and solutions.

In the decade since the Health Information Technology for Economic and Clinical Health (HITECH) Act was passed, the implementation of health IT has come a long way. The most recent statistics show that 96 percent of all non-federal acute-care hospitals have adopted certified electronic health record (EHR) technology.¹ But the digitization of data is only the first step; facilitating access to that data via interoperability is today's challenge.

How close are providers to achieving interoperability? A recent HIMSS Media survey of U.S. hospitals showed the answer to that question depends on whom you ask.² Overall, two-thirds of respondents (74 percent) rated their organization's efforts to improve interoperability as "excellent" or "good" (Figure 1). However, when the survey results were broken down by respondent role, the answers varied. Seventy-eight percent of IT/Technology respondents rated interoperability efforts as "excellent" or "good," compared to less than half (48 percent) of clinical respondents. About one-third (30 percent) of clinical respondents rated interoperability efforts as only "fair"; 13 percent rated efforts as "poor"; and 9 percent rated interoperability efforts as "terrible."

Why the differing perspectives? "It's not surprising that technology stakeholders believe there have been significant improvements in interoperability," says Mari Greenberger, Senior Director of Informatics, Technology and Innovation at HIMSS. "IT interoperability capabilities are much further

along than they were several years ago due to the many regional and national frameworks that have been established. Oftentimes, what technical folks view as improvements can sometimes be experienced as distracting or disruptive to the workflow from the clinician's point of view."

Interoperability drivers and challenges

"Optimizing clinical workflows" topped the list of goals for interoperability efforts, with 68 percent of respondents identifying this as a top driver. Second and third among interoperability goals were "to improve communication/coordination of care" (61 percent) and "to meet regulatory compliance requirements" (59 percent).

But providers face multiple obstacles in trying to achieve these goals. The top three obstacles cited by respondents were "integrating new solutions with legacy systems" (68 percent); "integrating data from multiple EHRs" (56 percent); and "managing unstructured data/content" (56 percent). What these challenges have in common is they all require integrating data from diverse sources (legacy systems, other EHRs, unstructured content) that use different – and sometimes incompatible – data models.

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Mari Greenberger | Senior Director of Informatics, Technology and Innovation | HIMSS

Figure 1. IT, Clinicians Differ on Perception of Interoperability Efforts

3/4 of hospitals/acute care facilities rate their interoperability efforts as excellent or good, but clinician perceptions lag.



Greenberger is optimistic that the maturation of technical standards used to support interoperability – such as Health Level Seven’s (HL7) Fast Health Interoperability Resources (FHIR®) – and other open data-sharing technologies, will help “make sense of healthcare data input” and further advance our national interoperability capabilities.

Greenberger says that continued alignment with these open APIs and essential IHE profiles will ensure that legacy systems will be able to properly interoperate with new solutions. “Many of the national interoperability challenges became abundantly clear when the healthcare industry was incentivized to move from a paper-based world to an online world,” she says. “Like everything else in the United States, innovation from the private sector and policy from the public sector will continue and will help us learn the steps to this slowly orchestrated interoperability dance.”

The rise of unstructured data

A particular area of concern for survey respondents is the exponential increase in unstructured data. Structured data is typically character-based and resides in discrete fields within an EHR database. Examples include the patient’s name, address, diagnoses codes and/or procedure codes. Structured data is relatively easy to input, identify, transfer and retrieve because of the way it is defined.

Unstructured data – such as a physician’s progress note, scanned oncology treatment plan, an X-ray image, a photo of a wound or point-of-care ultrasound image – is much more

challenging to integrate into a patient’s record in a way that will be accessible to clinicians later. Industry estimates suggest as much as 80 percent of clinical information is unstructured and often resides outside of EHRs. Evidence also suggests that this percentage is increasing.

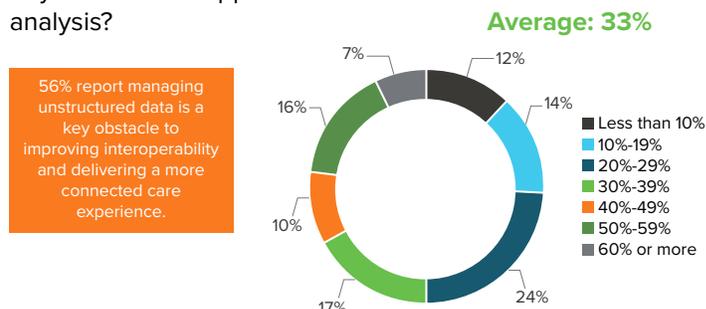
“The volume of unstructured content being captured is increasing because of new technologies,” says Sandra Lillie, Director of Global Healthcare Enterprise Imaging at Hyland. “Conventional unstructured content, such as a PDF file, takes up less space than a surgical video, wound photo or ultrasound. As you move up the scale to PET scans and MRIs, and then to digital pathology slides or genomic data, these assets are orders of magnitude bigger than traditional unstructured data elements.

“The saying, ‘A picture is worth a thousand words’ is really true in healthcare,” Lillie says. “All of this data provides increasingly insightful information about a patient. It is clinically rich, but much more difficult for electronic health systems to mine.”

Indeed, survey respondents indicated an average of only 33 percent of the unstructured data residing outside of their core health information-technology applications is currently accessible and available for analysis. This means two-thirds (66 percent) of the unstructured content being generated is not available to support patient-care decisions (Figure 2).

Figure 2. Two-thirds of Unstructured Data is Not Accessible/ Available for Analysis

What percent of the unstructured patient data residing outside of your core HIT applications is accessible and available for analysis?



56% report managing unstructured data is a key obstacle to improving interoperability and delivering a more connected care experience.



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Matt Zawalich | Director of Clinical Imaging Technologies, Information Technology Services | Yale New Haven Health

Matt Zawalich, Director of Clinical Imaging Technologies, Information Technology Services, at Yale New Haven Health, says: “We are now in the reverse of our original situation. Before digitization, we didn’t have enough electronic information to share ... but now we have so much detail in our EMR, we have no idea what the important pieces are. This is really where we make a clinician or provider inefficient because we can’t appropriately organize the data for them.”

The inability to efficiently manage unstructured data creates multiple problems. Limited or awkward access to unstructured patient data frustrates clinicians, makes it difficult for them to do their jobs and contributes to physician burnout. Lack of access to complete patient data can also delay diagnoses and negatively impact patient outcomes.

Solutions on the horizon

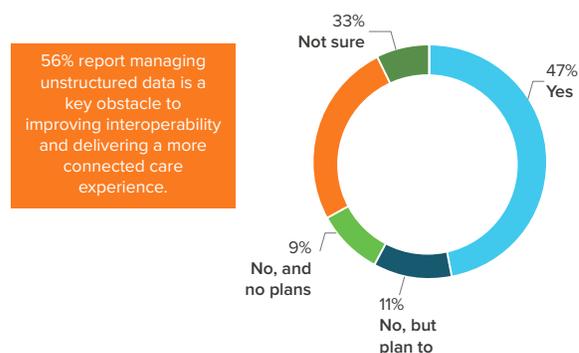
Just as with structured data, agreed-upon standards can provide a pathway to interoperability for unstructured data. The Digital Imaging and Communications in Medicine (DICOM®) standard, for example, is used to transmit, store, retrieve, print, process and display medical imaging information. But even with the DICOM standard in place, integrating imaging information into the clinical workflow can be difficult.

“Even though DICOM is a well-understood standard, providers still suffer from picture archiving and communication system (PACS) vendors having value-added extensions to their DICOM standard that makes it difficult for one PACS vendor to read and view all images from another PACS vendor,” says Lillie. “That is where vendor-neutral archives (VNAs) come in – to be able to provide intelligent routing across the enterprise from one ecosystem to another.”

VNAs are often the centerpiece of adopting an enterprise imaging strategy — an increasingly popular and effective means to manage much of the clinically relevant unstructured data that exists throughout a health system. Nearly half of survey respondents (47 percent) indicated they are adopting an enterprise imaging strategy (Figure 3). An additional 11 percent plan to do so in the future.

Figure 3. Nearly Half of Providers Are Adopting an Enterprise Imaging Strategy

Is your organization adopting an enterprise imaging strategy?



Defining an enterprise imaging strategy

Adopting an enterprise imaging strategy is about more than just expanding an existing PACS system to hold a broader range of imaging data. Adopting an enterprise imaging strategy means taking an enterprisewide, patient-centric view of imaging and implementing a technology infrastructure that supports that vision.

The HIMSS-SIIM (Society for Imaging Informatics in Medicine) Enterprise Imaging Workgroup defines enterprise imaging as “a set of strategies, initiatives and workflows implemented across a healthcare enterprise to consistently and optimally capture, index, manage, store, distribute, view, exchange and analyze all clinical imaging and multimedia content to enhance the electronic health record.”

That definition may be intimidating in scope, but moving toward an enterprise imaging strategy needn’t be daunting. Lillie suggested four places to start:

1. Get familiar with the Digital Imaging Adoption Model (DIAM).³ EHRs have the EMR Adoption Model (EMRAM); Digital Imaging has DIAM. The model was developed to help evaluate the maturity of IT-supported processes in medical imaging in hospitals and diagnostic centers. “Organizations ought to familiarize themselves with the maturity model because it helps to define what the journey to ‘good’ could look like,” says Lillie.



“The rest of the unstructured content story is about developing the ability to integrate both imaging and non-imaging clinical content into a common storage and visualization infrastructure that integrates with the EMR.”

Sandra Lillie | Director of Global Healthcare Enterprise Imaging | Hyland

2. Inventory ALL of the sources of images within your organization. This includes everything from scanned insurance cards, to wound photos snapped on a clinician’s phone in the ER, to traditional radiology and cardiology images, to point-of-care ultrasounds. Identify where the images are, what state they are in, and who the stakeholders are responsible for capturing, storing and managing those images.

3. Establish governance and goals around enterprise imaging. Establish a vision that is applicable across the enterprise. “One institution defined its vision as ‘one patient, one chart, one imaging record,’” says Lillie. “It helped guide how each of the stakeholders approached the problem.” It is important for the governance structure to include all stakeholders – clinical, administrative and operational. “Remember that images are captured throughout the organization, and not just in departments that initially come to mind, such as radiology and cardiology.”

4. Identify a partner to help you move your enterprise imaging strategy forward. “Enterprise imaging isn’t necessarily a core competency of providers,” says Lillie. “A third party can help providers evaluate where they are, what their readiness is and where their gaps are. It can also help providers create a plan that will leverage previous investments and suggest aligned incremental investments that will move the organization forward.”

From enterprise imaging to enterprise content services

As organizations begin to adopt enterprise imaging strategies, it is important to keep in mind that a complete patient record is composed of more unstructured content than just imaging data. Although imaging data may generate the largest volume of unstructured content, other types of content are equally important in showing a complete patient picture. For example, though progress is being made on standardizing Continuity of Care Documents (CCD), true interoperability for these important transition-of-care documents has not yet been achieved.

“The rest of the unstructured content story is about developing the ability to integrate both imaging and non-imaging clinical content into a common storage and visualization infrastructure that integrates with the EMR,” says Lillie. When that happens, providers have truly ensured that the information contained in their EMRs is as comprehensive as possible. Adoption of an enterprise content services strategy is not the only solution to providers’ interoperability challenges, but it is a good place to begin, she says. “It’s a good place to start in order to close the gap between technical stakeholders’ perception of interoperability and clinicians’ experience of interoperability successes within the organization.”

¹ Office of the National Coordinator for Health Information Technology. *Percent of Hospitals, By Type, that Possess Certified Health IT*, Health IT Quick-Stat #52. dashboard.healthit.gov/quickstats/pages/certified-electronic-health-record-technology-in-hospitals.php. September 2018.

² *Connected Care and the State of Interoperability in Healthcare*, HIMSS Media Research Report, sponsored by Hyland, January 2019.

³ For more information, see HIMSS Digital Imaging Adoption Model, <https://www.himss.eu/healthcare-providers/digital-imaging-adoption-model>.

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About Hyland:

Hyland delivers the connected healthcare solutions that link scattered unstructured information (e.g. clinical documents, medical images, etc.) from all corners of the enterprise to core systems – allowing you to see your whole patient and improve clinical decision making. Hyland is the only vendor that brings content services and enterprise imaging solutions together, providing you with a single technology framework for all of your unstructured content needs. More than half of the hospitals in the U.S. currently trust Hyland as a partner for managing critical healthcare content.