Understanding the escalating data challenges of “Meaningful Use”

What healthcare IT professionals need to know about managing the data driven transition to Meaningful Use

The Obama Administration’s HITECH Act, which is part of the ARRA Stimulus Bill passed in 2009, offers billions of dollars in incentives for provider organizations that can prove they are in compliance with a progressive set of EHR requirements known as Meaningful Use. In this paper, we’ll outline some of the specific data challenges providers are facing when planning for MU and what kind of technical solutions they can consider to streamline their journey to MU compliance. As this paper will demonstrate, achieving Meaningful Use compliance can be difficult, but it can be accomplished if organizations have the tools they need to handle the massive data integration, management, and governance challenges involved.

Executive Summary

This paper presents an overview of the technical and administrative challenges healthcare IT (HIT) professionals face when preparing to meet Meaningful Use (MU) standards. HIT leaders need to be prepared for a variety of data integration and management concerns that could strain their finances, push their staffs to the limit, and raise new, difficult governance issues.

What you’ll learn in this paper:

- What kind of costs and staffing issues healthcare organizations may face when working to meet Meaningful Use requirements
- Problems providers must address even if they purchase MU-certified Electronic Health Record (EHR) systems
- Critical technical issues that HIT leaders are likely to encounter as they plan their EHR rollout and Meaningful Use compliance efforts
- Unexpected problems HIT leaders may encounter as they plan the data integration and management phase of their EHR implementation
- Capabilities you must have in-house to complete the transition to demonstrating Meaningful Use
Meaningful Use dominating HIT’s radar

As provider organizations know, the HITECH Act of 2009 supplies billions of dollars in Medicare & Medicaid reimbursement bonuses for organizations that can prove they comply with Meaningful Use (MU) standards for EHRs.

The rewards are substantial for those that come on board. Depending on various factors, incentive payments for eligible hospitals may begin with a $2 million base payment, and by 2015, demonstrating MU could pay as much as $3 million to $5 million for a 500-bed hospital, according to research by Accenture.1

However, few institutions are prepared for the magnitude of the task they’re facing in implementing an EHR rollout, much less meeting MU criteria.

Full EHR implementation may take five to seven years and cost $50 million for a hospital of this size, Accenture estimates. Another report, from McKinsey,2 concludes that hospitals may end up spending $80,000 to $100,000 per bed to move through project planning, software, hardware, and implementation costs involved in EHR rollouts.

What’s more, the average hospital has had to increase the number of full time employees focused on HIT support by 45 percent as the EHR installation matured, just to handle training, service, and troubleshooting. CIOs are finding that they need different capabilities to support frontline EHR users, as well as to leverage the data EHRs generate for better health analytics, Accenture says.

But these resource issues aren’t widely understood. In fact, most health systems have underestimated—by nearly 100 percent—the time and costs involved in implementing advanced EHR functions, Accenture reports.

Given the difficulties inherent in EHR rollouts, it’s not surprising that 80 percent of CIOs told PricewaterhouseCoopers3 that they are concerned or very concerned about meeting MU requirements, especially later-stage requirements, such as advancing care processes through decision support, providing and populating patient personal health records, and improving outcomes using data outside their systems.

After all, it’s not just a matter of meeting one standard. Healthcare organizations will need to meet escalating demands imposed by increasingly tough MU stages over the next few years. With 24 core quality measures being implemented in 2011, another set in 2013, and yet another set in 2015, MU compliance will only grow more difficult. Simply assuming that the data your EHR produces can support optimal processes and patient care, much less that it can meet MU standards, is a risk not worth taking when so many dollars are at stake.

However, if done in a comprehensive and thoughtful manner, building MU compliance into your plans can do far more than bring in incentive money.
In this paper, we'll outline some of the specific challenges providers are facing when planning for MU and what kind of technical solutions they can consider to streamline the task. With proper planning and tools, CIOs can realize a wide range of benefits from MU compliance that go well beyond financial rewards. They can not only benefit from incentives and avoid CMS penalties but also do much more to generate ROI on their multimillion-dollar EHR investment.

**What struggles are providers facing with Meaningful Use?**

Few institutions have prepared for costs of testing, management, and staffing needed to demonstrate MU. For example, hospital IT budgets are likely to spike 80 percent between now and 2015 as providers gear up to demonstrate MU, Accenture estimates.

Even with these extra budget dollars in place, however, dozens of critical initiatives will be competing for those dollars, such as the transition to ICD-10, ongoing efforts to ensure HIPAA-compliant security, integration with state and regional HIEs, and transitioning to pay-for-performance tracking.

Most facilities that have moved forward with EHRs have spent heavily on an MU-certified system. Nonetheless, deploying even certified systems will be arduous and expensive—so much so that providers may still be at significant risk of missing the MU deadlines. In addition, there’s no guarantee that organizations can realize any value from MU compliance until many years into the future.

Why? Providers must make these systems work for their patients and optimize their care delivery. In this section, we’ll provide an overview of some of these data integration issues, including:

- Integrating historical patient data
- Tapping into IT best practices
- Merging incompatible data formats
- Developing data governance expertise
- Strengthening analytics capabilities

**Integrating historical patient data**

Although centralized and certified electronic health records promise many benefits, the majority of these won’t be realized until the EHRs contain enough relevant data about the patients. Choosing to ignore the rich datasets already contained in various legacy systems is not a pill that either clinicians or patients are willing to swallow.

A common concern for any clinician is ensuring that his or her patient’s existing health records are still accessible. In many integrated delivery networks and academic medical centers, providers must migrate data from existing legacy systems, some decades old, to
ensure that data access is not broken. Unfortunately, converting legacy data into the EHR can be costly, difficult, and time consuming because few institutions have the staff or competency that can assess, design, and implement a data conversion effort.

One of the most common mistakes is to ignore the complexity and simply assume you can apply the same integration approaches used for years with interface engines and HL7. The combination of a lack of knowledge of proprietary databases, looming go-live deadlines, and no capable data analysis tools can wreak havoc in even the most well-intentioned integration process. Without proper analysis, data glitches inevitably pop up, and these can cripple an EHR system’s efficacy, adoption, and efficiency. Many institutions opt for what they feel is the path of least resistance by “flipping the switch on” and converting the minimal amount of historical data. Unfortunately, this strategy rarely works long-term, especially as clinicians become more engaged in the implementation process and go-live nears.

Another often neglected step is to properly test and verify that the data has been properly assigned and validated in the new system. In many cases, this part of the integration can prove to be immensely complex. A platform that served well for many years as a billing system, for example, may hold rock-solid financial data, but determining how it relates to clinical data could take up huge amounts of staff time and resources. In addition, new systems imply new processes. Otherwise, where is the value in the new system? However, those processes will use data in different ways, so data that worked fine in one system could break the new system if not properly addressed.

Lastly, regardless of all prior decisions, CIOs must address what to do with data that is not migrated to the new EHR. Data is often kept to meet compliance requirements or conduct clinical research, or data is simply retained due to a general feeling that throwing any data away is a bad idea. The challenge quickly becomes a question of how to retain the data, but shut down the legacy system, and the costs associated with that system.

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Karen Marhefka, Associate CIO for Cornerstone Initiatives
University of Massachusetts Memorial Health Care

“Implicitly, we are able to fully analyze all the data to be migrated, apply rules to ensure the quality of the data we do choose to move, and then move large volumes of data, reliably and efficiently, which was not possible before implementing the Informatica solution.”

Karen Marhefka, Associate CIO for Cornerstone Initiatives
University of Massachusetts Memorial Health Care

The University of Massachusetts Memorial Health Care is a great example of how a data-focused strategy lowers the risk associated with modernizing all core application systems. In 2009, UMass Memorial embarked on a massive undertaking to entirely revamp the core systems that support care delivery and help manage the hospital’s operations. This included replacing its inpatient and outpatient EHRs and financial systems and deploying a new clinical data repository spanning care settings. This daunting task accounted for the majority of the IT initiative budget dollars over the course of four years, and it carried high visibility and large amounts of risk. If UMass Memorial had started this effort in 2011, it likely would have focused primarily on EHRs because of MU incentives and requirements (which would have been less useful to the business).

UMass Memorial’s additional challenge was that it was not moving from paper to electronic medical records, but from electronic to electronic. Therefore, data migration and conversion of data were essential, not optional. Karen Marhefka, Associate CIO for Cornerstone Initiatives, identified this as a huge risk factor to the overall success and adoption rates of the new applications. With more than 10 years of data in its core MEDITECH systems,
UMass Memorial knew it had to move patient demographics and medication history as a starting point to maintain patient satisfaction and reduce the risk of drug and medication complications.

UMass Memorial adopted Informatica® technology, which provided a systematic methodology and comprehensive platform that simplifies data access to disparate systems, identifies critical data quality issues, converts data, and finally loads data (via HL7) to the target systems.

**Need for EHR best practices**

For most health systems, MU is creating a major disruption in their HIT system strategy. Many have chosen to deploy systems across multiple facilities and care settings. Almost all are deploying in phases and choosing to roll out by facility, region, or clinical domain. This deployment creates a need for a well-defined process and strategy that can be repeated and applied, adding another layer of complexity to the mix.

It’s no secret that provider institutions must slice through many data silos when they implement an EHR system, but many CIOs underestimate the number of systems required for the migration project. Depending on the size of your institution, patient data may be scattered across dozens or even hundreds of systems outside the EHR environment, including medication management, clinical decision support, pharmacy, labs, and ambulatory care.

To their dismay, healthcare IT leaders have sometimes found dozens of undocumented data sources that they must now include in their efforts. There might even be ad hoc, fragmented data storage in the form of personnel’s spreadsheets and localized personal copies of data. Planning appropriate integration of well-used systems is difficult enough; finding back-office silos and adding them to the to-do list is even harder.

**Incompatible data formats**

Many HIT systems still use data formats such as flat-file models or custom mainframe applications, which are difficult to integrate into a single, manageable database.

Data housed in obscure, proprietary silos may still be in use, and the personnel who knew those systems inside out might have long left the organization. CIOs may be unaware of many formats in which data is stored across their institution, and without robust data analysis and conversion tools, they may run into big delays when integrating these data sources; without these sources, clinician adoption may slow clinical workflows down.

Healthcare organizations are accustomed to building complex interfaces and data transformations to and from HL7, but they have little experience establishing data benchmarks to ensure the accuracy of the data itself. As core quality measures are exposed both internally and externally, the requirement to collect, cleanse, and harmonize data from across departments becomes vital. In essence, clinicians will view data at the point of care, and it will also be aggregated to measure clinical quality performance and effectiveness. The data must be trusted and consistent in order to provide accurate and meaningful results.
HIT leaders who attempt to merge such varied formats without adequate tools risk project setbacks and potential failure. Even without the added challenges faced by healthcare institutions, 80 percent of pure data migration projects fail or overrun time/cost estimates, according to the Standish Group. The odds only increase when you consider the particularly fragmented nature of healthcare data sources.

In 2005, the University of Pittsburgh Medical Center commissioned the Software Engineering Institute at Carnegie Mellon to help it develop an EHR strategy. UPMC, one of the largest nonprofit health systems in the United States, faced enormous challenges in integrating data from its international network of 20 hospitals and 400 ambulatory care sites.

Carnegie Mellon advised UPMC to avoid installing a single-vendor EHR solution and instead to look for best-of-breed tools that would accommodate the differing workflows within facilities and departments. Their strategy included using a variety of health information management systems, plus a core interoperability platform co-developed by the health system. Without this central interoperability platform, officials concluded, they'd be unlikely to accomplish their larger goal of fluid information exchange.

Since then, UPMC has been able to develop a federated EHR system that seamlessly moves aggregated patient records from independent physicians to UPMC-employed doctors to hospitals. Along the way, UPMC was forced to rethink its data vocabulary as national standards evolved, but because it had built such a flexible data infrastructure, it was prepared.

Because its interoperability platform offers semantic mapping capability, UPMC has been able to transition at its own pace. What’s more, having a powerful data integration platform has allowed it to be prepared, in advance, for Stage 2 and Stage 3 of Meaningful Use requirements.

Lack of data governance expertise

In virtually every healthcare organization, IT staffs are already overburdened, especially given the huge demands imposed by an EHR rollout. IT staffers face the unenviable job of keeping existing systems running “business as usual” while simultaneously integrating the new systems. Although you may have successfully mapped your system landscape, developed a workable legacy integration plan, and have a great relationship with your IT vendor, it will not be enough if you don’t have the right data integration tools available. While Meaningful Use has defined “measurement periods” and various Stages, it is not a one-time event.

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recruiting veteran IT workers with sophisticated clinical data management skills; finding them may slow the project more than working with the team you’ve got. Training existing staff might mitigate the problem to some extent, but the problem remains a sore spot.

Data governance expertise is not new to IT, but it is relatively new to healthcare. The largest organizations have built this competency, but they currently stand alone. Luckily, filling this competency gap can be accelerated through the usage of comprehensive data management suites and methodologies that are in place at thousands of organizations across the globe.

Gaps in analytics capabilities

To meet MU standards, providers will have an expanded need for enterprise business intelligence. Currently, many providers are relying on the EHR’s (or financial application’s) native analytics capabilities. The major shortfall is that these systems will focus on the data within their system and accomplish the bare minimum required for MU compliance. Very few organizations only have one core system. For example, many popular EHR systems will not address any FDA-regulated software systems. This means that blood banking, fetal monitoring systems, and payment card systems may all be left out.

So, now what do you do? Most organizations will find it difficult to document quality of care, patient safety, and other key MU requirements without a robust business intelligence platform to complement their EHR tools. More and more clients are looking to certify their enterprise data warehouse as the system of record to demonstrate the “Calculate and Submit Clinical Quality Measures” MU requirements even when they have a certified EHR in place.

Core quality measures are pushing many healthcare organizations to evaluate or re-evaluate their business intelligence and analytics strategies. However, that is only the beginning and most are looking beyond to reap the benefits of secondary use. A recent survey by Healthcare Informatics showed that 46 percent of respondents still cite data integration as a major barrier to creating robust information management capabilities.

EHRs may offer powerful capabilities for tracking and documenting care, but they’re typically not designed to offer the powerful cross-system analytics and decision support required to prove MU compliance. For this reason, more and more providers are looking to their enterprise data warehouse or business intelligence platforms to accelerate their ability to calculate measures across the system.

MD Anderson Cancer Center, which ranks number one among cancer hospitals in U.S. News & World Report’s annual “America’s Best Hospitals” rating, is devoted exclusively to cancer patient care, research, education, and prevention.

Given the unique nature of care delivery, operations, and research, MD Anderson knew that no single vendor would be able to meet its needs, so relying on a certified EHR simply isn’t sufficient. In addition, a patient-centered data warehouse sits at the core of its research initiatives, and it incorporates data from a variety of systems, including its home-
grown EHR solution. MD Anderson is not new to analytics and has been building robust business intelligence and data management capabilities with Informatica for the past 10 years. This data infrastructure naturally lends itself to meeting many of the quality reporting MU initiatives. MD Anderson continues to innovate and rely on comprehensive data platforms that are flexible and robust enough to meet the constantly changing and evolving requirements.

The data warehouse currently impacts everything from facility and resource planning to measures of care protocols and guidelines to driving innovative clinical research. MD Anderson is well positioned to meet the quality of care reporting requirements head-on with its data warehouse. Although Stage 1 requirements only mandate a handful of quality measures, many organizations such as MD Anderson are already looking at Stages 2 and 3. The enterprise data warehouse gives MD Anderson a robust data platform to keep up with the MU pace. However, it plays a much more vital role than just focusing on Meaningful Use; it adds significant value and drives innovation across all parts of the organization.

**Overcoming MU Challenges**

In sum, an EHR is a necessary and wise investment for healthcare providers. Even without the pressure to demonstrate MU, payers, employers, regulators, and quality organizations are increasingly demanding fine-grained data quality. What’s more, to participate in an accountable care organization, health information exchange, or pay-for-performance program calls for data sophistication.

However, it’s better to ensure that the EHR delivers on its benefits rather than hoping that it will. Even the most powerful EHR is unlikely to provide a “one-stop shopping” approach to both MU compliance and true meaningful use. In many cases, the importance of historical and external data is ignored because of the focus on getting the EHR system running. Some issues to keep in mind:

- Be aware that many EHR solutions aren’t built to migrate, validate, deduplicate, and analyze the volume of data pouring into your EHR system. Most EHR vendors are only truly comfortable with data their system creates. Without robust data management and integration capabilities, it will be very difficult to provide a comprehensive view into your data that meets most clinicians’ and patients’ expectations.

- Demonstrating MU may be far more difficult than it appears if you don’t have an integrated data management system in place. Many providers have failed to document many systems that could prove key to a successful EHR rollout. Systems to document can include all ancillary systems, CPOE, PHRs, ambulatory EHRs, health information exchanges, and closed-loop medication.
• Be prepared to manage data storage, aggregation, master data management, data quality and validation, and ongoing integration as clinical data sources are migrated into the main HIT system. In addition, you’ll need to manage these processes long after your EHR system goes into production. After all, it’s unlikely that the first iteration of your EHR rollout will include the full dataset you’ll ultimately want to manage.

• Your data integration tools must be capable of certifying data quality; assessing data migration needs; managing data retention processes and policies; and automating data discovery, design, and development. They must also be capable of data validation, documentation, and creating an audit trail. Again, while EHRs can be immensely powerful tools, they’re largely focused on such functions as clinical documentation, document management, and clinical decision support.

• The quality of care measures required by MU standards only get tougher during the next few years, and they will continue to measure outcomes that may require data from multiple systems. Our expectation is that many organizations will be forced to shift to data warehousing and business intelligence strategies to meet these increasing requirements. Even the few hospital systems with relatively low complexity will need a trusted and reliable method of collecting, processing, and managing this distributed data into an analytics repository.

Data is at the core of Meaningful Use

Implementing an EHR is a business necessity for providers. To succeed in demonstrating Meaningful Use of that EHR, and generate ROI on their huge EHR investment, providers will need additional database integration tools that can supplement the EHR’s capabilities. With complementary tools in place, providers will not only demonstrate MU successfully but they’ll also get the value they deserve from their EHR.

1 “Finding Meaning in Meaningful Use, Insights into Achieving EMR Success”, Accenture 2010
2 “McKinsey on Business Technology, Reforming hospitals with IT investment”, Number 20, Summer 2010
3 “Ready or not On the road to the meaningful use of EHRs and health IT,” June 2010
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Shahid Shah, CEO of Netspective, is an internationally recognized enterprise software analyst that specializes in healthcare IT with an emphasis on e-health, EHR/EMR, Meaningful Use, data integration, medical device connectivity, health informatics, and legacy modernization.

Over the last 15 years the health IT positions he’s held include CTO for CardinalHealth’s CTS unit (now CareFusion), CTO of two Electronic Medical Records (EMR) companies, a Chief Systems Architect at American Red Cross, Architecture Consultant at NIH, and SVP of Healthcare Technology at COMSYS. He also worked with the National Institutes of Health on standards and helped define the needs for standards at the Executive Office of the President (White House) and OMB.

Shahid is also a winner of Federal Computer Week’s coveted “Fed 100” award given to IT experts that have made a big impact in the government.
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