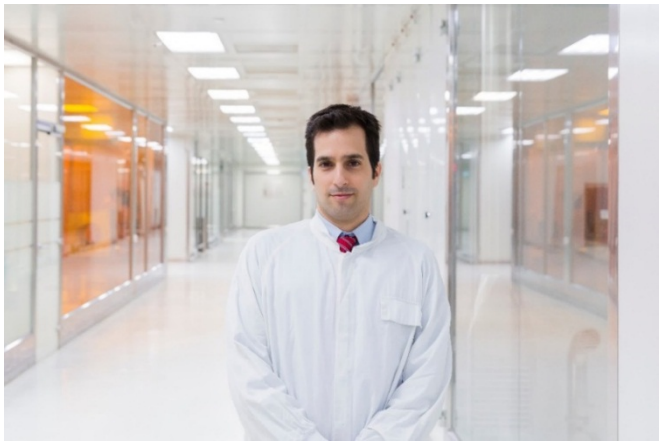
Demystifying EHR data

Harnessing advanced analytics to mitigate risks

February 2016

Electronic health records are helping move medicine into the digital age, but have the risks been accounted for?



Overview

Incentives have helped accelerate implementations of electronic health record (EHR) systems. However, in some cases, those implementations have increased an organization's levels of exposure to financial, clinical, system integration, and compliance risks.

This paper focuses on a series of case studies to explore ways that organizations can mitigate those risks. In particular, it considers the use of data mined from EHRs and the use of advanced analytics to support holistic data governance and build testing; to identify operational inefficiencies and control gaps; to find out revenue-leakage root causes; and to develop real-time compliance-monitoring programs.

pwc

The heart of the matter

Enacted in February 2009, the American Recovery and Reinvestment Act (ARRA) set in motion a plan to modernize America's healthcare delivery system within six years through the increased adoption of technology. More specifically, the Health Information Technology for Economic and Clinical Health (HITECH) Act dedicated $25.9 billion in spending to both promote and expand the use of healthcare information technology, including the meaningful use of electronic health record (EHR) systems.

In addition to the HITECH Act's spending, the ARRA itself-directed $150 billion in new funding to meaningful use, thereby creating a carrot-and-stick model that would prompt healthcare providers to implement EHR systems. Starting in 2011, each eligible provider became entitled to up to $44,000 per year in awards through the Medicare EHR Incentive Programs and up to $63,750 per year in awards through the Medicaid EHR Incentive Programs. The "stick" was in the form of a penalty of 1 to 3% of Medicare reimbursements starting in 2015.

As a result, EHR implementation initiatives usually concentrated on the core challenge of meeting tight timelines while managing costs. But even though implementation risk mitigation has also been a priority, providers have, understandably, not always made it a central, short-term focus because the complexities inherent in large-scale information technology projects and the gaps they can generate often reveal themselves only over time.

But now that the dust has settled and many providers have successfully hurdled their initial implementations, those providers are objectively assessing their EHR systems and identifying areas that may not have delivered the value they had hoped for. It is a prudent approach, because there are typically opportunities to enhance EHR systems at any stage of an implementation—with the ultimate goal of improving outcomes.

In this paper, we focus on a key pillar of EHR controls optimization that some organizations may not have fully explored: the use of advanced analytics for prelive testing and postlive monitoring.

Where we are now: EHR system enhancements that are top of mind for many providers

Addressing financial, clinical, technical, regulatory, and compliance risks and control opportunities as they arise throughout the implementation life cycle

Where we believe there is significant additional opportunity

Using advanced analytics for prelive testing and postlive monitoring

Overview of key EHR data risks

System integration, system interoperability, financial, compliance, and clinical risks are among the key challenges organizations face when implementing an EHR system. It's important to understand the implications of those risks, what the risks mean in real-world situations, and how they can affect the success of providers, who operate in an increasingly competitive environment.

1 *Sample testing may not always suffice for a system as large and complex as an EHR system, and it can expose organizations to risks at go-live.*

Incomplete testing can lead to patient safety concerns, charging errors, revenue leakage, work flow inefficiencies, interoperability challenges, segregation of duties, noncompliance, medical device and printer connectivity, and more. **The severity of those risks calls for a thorough, data-driven approach to assess the effectiveness and completeness of an EHR system.**

2 *Complex information technology projects are costly, and they pose a degree of inherent risk to a hospital organization.*

EHR implementations usually represent the largest single project an organization undertakes, with costs rising into billions of dollars in some cases. And beyond that high cost of the implementation itself are other issues such as revenue leakage, decreased efficiency around go-live, charge description master conversion errors, and lost reimbursements caused by a new denials-and-remittance process, all of which can push the true cost even higher. **Analytic forecasting tools can help prepare for the unexpected.**

3 *Compliance risk is increasing as regulators become more proactive and exacting in their audits.*

The conducting of analytic risk assessments and the promotion of compliance were mentioned as top priorities in the Office of Inspector General (OIG) Strategic Plan 2014–2018.[1] The OIG and other regulatory bodies are demanding greater accountability and precision with regard to governance, process, risk, and controls.

The OIG has hired external auditors to assess certain key compliance factors such as violations of the Health Insurance Portability and Accountability Act of 1996, and it is imposing substantial fines therefor. **Data-driven assessments can help providers deliver the precision that regulators are demanding.**

4 *The Affordable Care Act has spurred a change to pay-for-performance reimbursement models.*

The Affordable Care Act has led to the establishment of many programs that have caused an evolution from fee-for-service to pay-for-performance reimbursement models. The programs cover value-based purchasing, readmission reductions, hospital-acquired-conditions reduction, and, as of fiscal year 2015, measures against hospital-associated-infections. But the implementation of a new EHR system can limit an organization's understanding of the quality and integrity of the data sources feeding those measures. **Analytics can help validate data integrity as well as monitor the performance of targeted improvement projects.**

Where are regulators focusing their efforts?

Regulators are expecting more—and more-precise—data and analytics from healthcare providers as they themselves become more proactive and adept at identifying fraudulent and noncompliant activity and as the scope of their efforts expands. For instance, the US Department of Health & Human Services' Office of Inspector General collaborated with the Department of Justice and federal, state, and local law enforcement entities to form Medicare Fraud Strike Force teams that use data analytics to identify—and even prevent—healthcare fraud, waste, and abuse. The teams focus on nine target areas across the United States and have recovered millions of taxpayer dollars.[2]

[1]http://oig.hhs.gov/reports-and-publications/strategic-plan/files/OIG-Strategic-Plan-2014-2018.pdf.
[2]http://oig.hhs.gov/fraud/strike-force/.

Harnessing advanced analytics to

understand holistic data governance and implementation build testing

Typical EHR system implementation-testing strategies attempt to test the underlying system's build and all records. But because end-user work-flow-specific testing is occurring simultaneously and because build efforts may remain incomplete, organizations have gone live even when there are back-end testing gaps that can have downstream operational and financial implications.

New data-mining, visualization, and analytics tools facilitate more-thorough and holistic testing, better identification of trends or aberrations, and more-dynamic reporting.

Case study #1: Sample testing approach entails unforeseen financial consequences

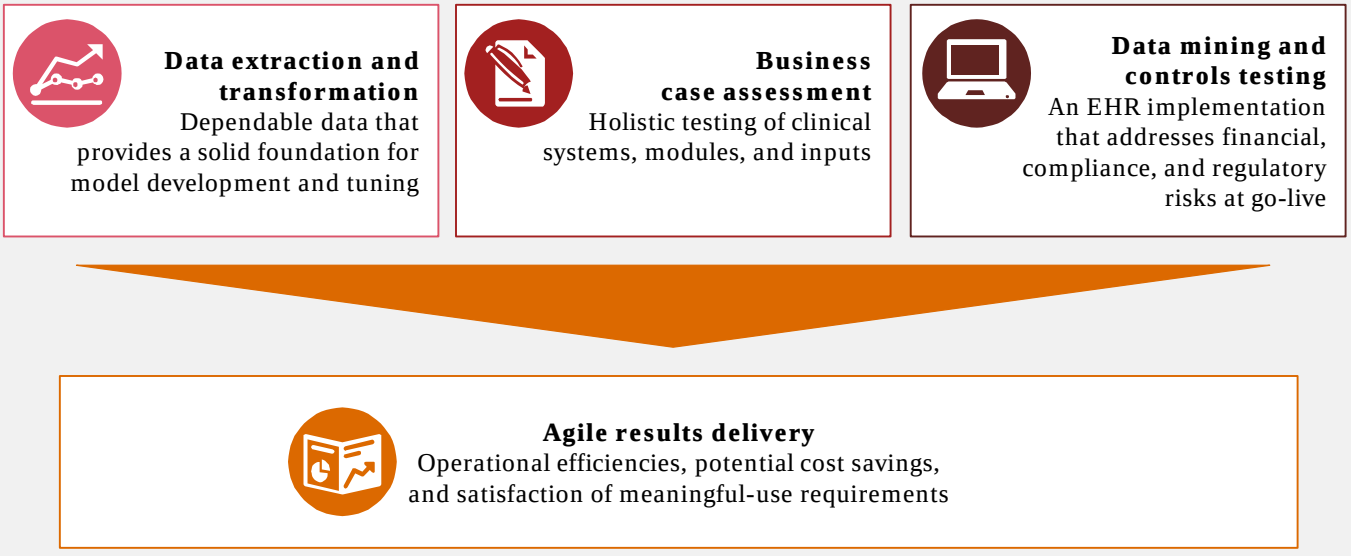
A healthcare organization performed interface functional testing as well as interface charge testing prior to going live. However, that sample testing approach did not establish complete coverage over the quality and referential integrity of the underlying data.

Despite interfaces' sending the correct number of charges into the EHR system, the organization encountered mapping issues with (1) certain fields that had not been covered as part of the sample testing and (2) incorrect and incomplete data housed in the ancillary radiology system.

In this case, the "Service Provider" field from an ancillary system was mapped incorrectly to the "Billing Provider" field in the EHR system, ultimately leading to a large number of high-priced claims billed under the Resident—instead of the correct, Physician—and generating millions of dollars in denials.

It is vital to obtain an independent assessment of the implementation build and testing processes through a risk, compliance, and controls lens. A data-driven, holistic approach to the testing of key revenue cycle risks and controls supports thorough and independent testing of relevant charge interfaces as well as back-end record population gap analysis for added comfort with build prior to go-live.

Process for data governance and implementation build testing based on a holistic, data-driven approach



Harnessing advanced analytics to

identify operational inefficiencies, risks, and control gaps by way of real-time surveillance

Once an organization goes live with a new EHR system, a thorough review of upstream and downstream work flows becomes vital to determining gaps, inefficiencies, and the root causes of underlying issues in the production environment.

By taking an iterative approach to the design and execution of data analytics programs, organizations can deploy resources cost-effectively and thereby continuously improve efficiency. One of the critical advantages of such an agile approach is that it facilitates the rapid design of sophisticated analytics programs that use existing technology architectures to achieve more-efficient operational work flows.

Case study #2: New analytic dashboards help uncover inefficiencies and provide automated insights for a top-ranked organization

An academic multispecialty healthcare system that went live with its EHR system continued to struggle with its health information management (HIM) coding processes for years after implementation. One of the main issues was that coders and accounts were dispersed across different types of work queues throughout the organization, and there was only limited reporting.

To fully understand its own revenue cycle, the organization needed a panoramic, integrated view of HIM-related work flows and had to have the ability to analyze key HIM coding risks. An audit of the organization's HIM coding process revealed that departments had failed to monitor all of the associated HIM departmental charges, and in one instance, a specific HIM coder had outstanding uncoded charges dating back almost three years after implementation, totaling more than $3 million.

The analytic solution the organization implemented consisted of a set of dashboards that provided a holistic view across work queues in order to uncover risks, inefficiencies, and control gaps in current-state coding practices in real time. Using data analytics enabled the institution to enhance productivity and uncover issues not previously exposed.

Specifically, the drill-down features enabled the organization to view granular account-level details to identify trends within work queues and correlations between providers and coders. That step aided in the recognition of operational inefficiencies in the forms of (1) coders that were possessing large numbers of unworked accounts, (2) high-volume work queues that required additional resources, and (3) high-risk providers who more frequently had missing or incomplete documentation.

Moreover, through a single view of HIM coding work flows, high-level reporting—previously performed manually because source data had originated from different parts of the EHR system—became consolidated and automated so as to provide the organization with a more accurate measure of HIM-related activities, including benchmarking with peer institutions.

Harnessing advanced analytics to

pinpoint revenue leakage and optimize end-to-end revenue cycle work flows

Identifying and analyzing trends can be difficult with static EHR revenue cycle reports. Without the ability to dynamically filter data, drill down into departments, and uncover specific details, it can be hard to identify the root causes of trends and issues. That lack of visibility can lead to lost revenue in the forms of denials and missed charging opportunities. Interactive assessment and the monitoring of dashboards with drill-down capabilities identify underlying root causes and can thus reveal potential missing revenue and revenue enhancement opportunities.

Solutions include identification of areas for longer-term net revenue through the detection of outlier behavior based on (1) a scoring methodology for patient invoices, (2) prioritization of patient invoices with the highest scores, and (3) determination of bottom-line impact based on total dollar value of each missing charge and expected reimbursement.

Case study #3: Post implementation use of data visualization tools and other tools bolsters an EHR program and identifies a $2.5-million revenue leakage

An academic multispecialty healthcare system elected to perform a post implementation internal audit assessment of the current state of (1) its EHR utilization, (2) its EHR system's impact on charge capture and revenue reconciliation processes, and (3) its utilization of EHR reporting tools.

A one-month historical look back two years after its EHR system's go-live revealed 13,200 signed notes with missing professional charges and with an estimated $2.5 million in revenue leakage from the inpatient setting. The data-driven solution established the scope of the audit by providing a risk-based, high-level overview of the revenue cycle. Dynamic drill-down data visualizations allowed for further segmentation and root cause analysis with a more intuitive interface for the identification of missed charges and their effective follow-up.

Harnessing advanced analytics to

build a robust continuously monitored compliance program

In the face of evolving and ever-expanding regulatory standards, hospital organizations sometimes struggle to integrate data from different systems so they can meet compliance and reporting requirements. Dashboards facilitate integration of disparate data sets, including data from multiple EHRs and other external sources such as laboratory, radiology, procurement, and general-ledger systems. A risk-based approach to sampling and drill-down testing leads to the extrapolation of findings from manual testing across data populations.

For example, a continuous-monitoring solution for the 340B Drug Pricing Program, which requires drug manufacturers to provide outpatient drugs for eligible healthcare organizations at significantly reduced prices, allows end users to explore variations in utilizations and costs across hospital encounters and pharmacy prescriptions. Drilling down on EHR data and purchasing data at the hospital, location, and encounter levels leads to the identification of noncompliant billing practices and then, opportunities for cost savings.

A number of organizations have identified high-risk billing patterns that generate duplicate discounts. In order to comply with state Medicaid guidelines, covered entities are required to flag 340B claims with a particular modifier.

Case study #4: Analytics-driven review of multiple data sources—including EHR data—uncovers a $16-million cost-savings opportunity

An institution flagged less than 5% of 340B claims with a specific modifier in a 12-month time frame. That gap represented $10 million in charges that could potentially lead to repayments to manufacturers following an audit by the Health Resources and Services Administration. Furthermore, through integration of data from disparate sources—including publicly available data sets and incorporation of nationwide benchmarks—the organization became able to calculate a systemwide opportunity of $18 million.

This particular hospital was, however, capturing only $1.6 million, leaving on the table more than $16 million in cost savings.

The hospital's analytics-based review, using EHR data, resulted in an effective investigation of the root cause of that low capture rate; and management became able to remediate the inefficiencies by establishing the analysis as a framework for continuous monitoring.

In the illustrative dashboard below, the drug level breakdown by location is represented visually on the left, and the drug-purchasing mechanism—such as 340B, group purchasing organization, and wholesale-acquisition-cost account—by hospital. The average charges for each drug are represented on the right. Using an interactive dashboard like this lets a user explore different opportunities for growth and improvement.

Sample 340b dashboard

Conclusion

EHRs have the potential to drive a hospital organization's financial and operational success. But their success depends on the conversion of raw data into actionable intelligence.

The power of data and analytics does not stop at data collection or even at reporting to a government entity. Additional value comes from the real-time communication that properly visualized data, continuous monitoring, and advanced analytics promote. Financial, operational, and clinical data coupled with the right analytics can provide the enhanced oversight, auditing, and controls necessary to realize the potential that EHR systems tantalizingly offer.

Tools and accelerators

Leading organizations are applying advanced analytics to better validate existing models; to identify issues, gaps, and limitations; to better understand things about clinical care delivery and copy-and-paste notes with unstructured text analytics; and to display findings by way of dynamic and intuitive new visualization techniques. By harnessing such innovative, data-driven tools optimized for their EHRs, those leading organizations are even more efficiently managing their work flows and establishing reliable audit trails that monitor system activity and evaluate improvement initiatives.

Contact us

Risk Assurance helps an organization's management make well-informed decisions. The insights and independent assurance that PwC offers build an invaluable safeguard into today's complex operating environment. We work with you in your boardrooms and back offices, helping you protect—and strengthen—every aspect of your business: from people to performance, from systems to strategy, and from business plans to business resilience.

Within Risk Assurance, PwC's Advanced Risk & Compliance Analytics practice provides customized solutions to help you identify new challenges and uncover future opportunities. With our strategic, sustainable approach to analytics, you'll have the right technology to monitor and prioritize threats in order to build trust at every turn.

To have a deeper conversation about EHR data and how the use of data analytics can help your organization, please contact:

Terry Puchley
Risk Assurance National Health Industries Leader
+1 312 298 3087
terry.puchley@pwc.com

Jeff Hoover
Partner
+1 412 417 3619
jeff.hoover@pwc.com

Richard Clark
Principal
+1 713 356 6691
richard.m.clark@pwc.com

Arvind Kumar
Principal
+1 617 530 4146
arvind.p.kumar@pwc.com

Semhal Araya
Director
+1 646 471 2161
semhal.araya@pwc.com

Jose Gonzalez
Manager
+1 646 471 7991
jose.j.gonzalez@pwc.com