BI TRENDS IN HEALTH CARE

Business intelligence and data analytics are pushing into health care. Here’s what you need to know to make the most of them.

IN SEARCH OF QUALITY
Clinical data analytics unlock the potential for quality improvement.
BY DON FLUCKINGER

THE DATA CHALLENGE
BI use is up at health care providers, but standards are needed to go to the next level. BY JEFF KELLY
Clinical data analytics aren’t new: For centuries, doctors and researchers collected and collated patient data, on paper, in search of ways to improve treatment. The new side of this old science is applying cutting-edge technology, a trend that’s rapidly expanding the scope and power of analytics. Add to that a federally funded national health IT push, which yields unprecedented access to patient data in electronic health records (EHRs) and data warehouses for both health care practitioners and researchers.

Analyzing clinical data can accomplish many goals: Improving patient care through understanding trends and showing the paths to improvement; reporting on private or public payer quality (sometimes called pay-for-performance) goals as well as documenting metrics required for accreditation from The Joint Commission; enhancing research for developing insight on how diseases affect certain patient populations en route to creating new therapies; tracking items needed for recertification of staff such as physicians and nurses; and of course, creating business efficiencies and cutting operational costs.

“The goals are numerous—the list is as long as my arm,” said Judy Hanover, research director at IDC Health Insights. “As providers increasingly get information and more clinical data into their repositories from the use of new technologies like EHRs, computerized physician order entry and health information exchange that is coming as a result of the meaningful use requirements, they’re coming up with new applications for analytics.”

There are two holy grails of clinical data analytics technology that could
be in the not-too-distant future: using analytics to feed real-time decision support systems for physicians as they’re seeing patients, and real-time disease surveillance for public health officials.

DIFFERENT APPROACHES TO ANALYTICS

According to a survey conducted by the Healthcare Information and Management Systems Society (HIMSS) earlier this year, many facilities are attempting to use analytics on both the clinical and business sides despite barriers such as data being tracked on paper and lack of consistency and structure in electronic data (such as in electronic health record free-text notes fields). The lack of return on investment can be a barrier for other facilities, said Jennifer Horowitz, co-author of the survey and a senior research director at HIMSS Analytics.

Furthermore, the incoming ICD-10 diagnostic code set from the International Statistical Classification of Diseases contains nearly 10 times the codes of the present ICD-9 set, promising much more granular health data tracking and analysis.

A range of tools enables analytics. While the federal meaningful use regulations remain under development, many experts agree that basic tracking and reporting of quality indicators will be part of the certified EHR systems all health care providers will need to use in order to reap financial incentives and avoid Medicare penalties. Some vendors offer Software as a Service analytics that don’t require installation and maintenance on a hospital network. These choices can be cost-effective for medium-sized hospitals on down.

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—JUDY HANOVER
RESEARCH DIRECTOR, IDC HEALTH INSIGHTS
“When you have government intervention in certain areas such as we’re seeing with the HITECH Act as well as some of the patient safety initiatives that come out of the government, obviously there’s a requirement that hospitals need to take action to be able to comply ... there’s a focus on certain analytics activities that ensure an organization is compliant to receive funding for Medicare and Medicaid.”

USING BUSINESS INTELLIGENCE TOOLS
Hospitals can also use business intelligence (BI) tools such as those offered by SAS Institute Inc. to develop scorecards to track quality indicators across EHR systems. Some larger facilities—especially those tied to academic institutions—create clinical data warehouses that clinicians and researchers mine for analytics projects.

The tools can also help tune up bed and inventory utilization and staffing, and produce other data such as how to more quickly and effectively treat patients whose care costs the most. Doing so would not only improve care, but also limit spending when possible and prevent patient re-admissions due to inadequate access to data.

Ian Healy, manager of data analysis/SAS BI administrator at Maine Medical Center, said his facility adopted SAS after determining that it was collecting clinical data in an ad hoc fashion in office applications like Crystal Reports and Excel spreadsheets across “a bunch of different systems, a bunch of different databases.”

Since 2003, Maine Medical has developed scorecards for tracking more than 70 different quality measures.

A tool such as SAS, Healy said, helps organize and formalize the tracking of quality indicators for state and federal compliance programs, as well as finance and the center’s own self-analysis such as for emergency department staffing.

It can also help streamline workflow: Maine Medical ported medication storage tracking for more than 110 locations from a paper process to a Wi-Fi tablet-enabled one using SAS, giving instant access to data that had previously taken time and chewed up clerical resources. The facility tracks safety measures, too, such as staff hand-washing policy compliance, which intersects with both patient and employee safety standards and regulations.

HUMAN FACTORS DRIVE THE TECHNOLOGY
The key to effective clinical data analytics is not necessarily in the technology, Healy said, but in the human
analysis of what’s being tracked, how and why. Getting employee feedback from outside the IT department helps keep the tracking efforts grounded in reality, and not just tracking for tracking’s sake.

“They are periodically re-evaluated,” Healy said, adding that the next wave of analytics is setting up self-service forms so that staff members outside the IT department can set up their own analytics projects, and opening access to dashboards to foster competition on quality improvement initiatives. “We try to find things that are useful. If people aren’t using them, if there are better metrics to track, we will evaluate them, often on a yearly basis.”

Scottsdale Healthcare in Arizona is in the process of integrating McKesson Corp. data analysis tools throughout the enterprise in addition to the finance and business departments, said CIO Jim Cramer.

Scottsdale’s 860-bed organization consists of three campuses—the Osborn Medical Center, Shea Medical Center and Thompson Peak Hospital—in the Northeast Phoenix area. Cramer said the new analytics tools will enable clinicians, quality and financial users to work from the same database, and will provide service-line leaders with balanced scorecards. But Cramer said spreading data analytics beyond the business side of the organization would have its challenges—including training and evangelizing.

“One of the challenges is that we’ll have to communicate, and education will be [made] paramount by involving the key service-line leaders at the front end. They will help as we roll it out and will define the requirements. ... Existing initiatives, patient safety, administration and quality initiatives need to align.”

—JIM CRAMER
CIO, SCOTTSDALE HEALTHCARE

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HEALTH care executives are starting to realize the potential of business intelligence (BI) in their organizations, but the industry as a whole is still behind the adoption curve of other vertical markets.

Diverse data types and lack of standards are the primary issues confronting providers, especially in terms of empowering clinicians. But when health care providers can creatively apply BI principles to their unique workflows and business models, the software tools can reap real benefits in both the clinical side, with patient care, and in the back office, improving business processes.

For example, Saint Elizabeth Health Care in Markham, Ontario, is using BI dashboards to track key performance indicators, according to Mary Lou Ackerman, the organization’s vice president of business capabilities.

“We’re able to use the BI tools to monitor organizational performance [and] contract performance,” Ackerman said.

But like many health care organizations, Saint Elizabeth, which provides nursing, physical therapy and other services to patients in homes, schools and medical facilities, has yet to roll out BI tools to its front-line health care professionals.

“Other than the public sector, it has the lowest level of [BI] adoption,” Forrester Research Inc. analyst Boris Evelson said of health care. “And the
real pain points are on the clinical side.” Evelson was referring to the closed nature of most clinical health care systems and databases, which makes extracting patient data for BI and analytics difficult and sometimes impossible.

**HEALTH CARE DATA BARRIERS**
Clinical systems, which hospitals and other providers use to manage their patient data, typically were built with proprietary data models. And many of the related databases utilize hierarchical data models rather than relational ones.

That makes it hard for the software to communicate and exchange data with other technologies, including BI platforms and data warehouses. Even different products from the same health care systems vendor sometimes can’t talk to one another, let alone tie into a data visualization tool or analytic database, said Dr. Thomas Handler, an analyst at Gartner Inc. and a former physician at Yale-New Haven Hospital in Connecticut. Add to that physicians’ penchant for entering key patient data into free-text fields, which makes it harder for software tools to extract consistent trends information.

USF Health, a mixed-purpose health care organization at the University of South Florida in Tampa, operates the university’s medical schools, a research division and three health care facilities. In 2008, USF pushed to improve the organization’s ability to monitor and report on the progress of each of its operational units. USF Health deployed a data warehouse, where it integrates data from more than 20 source systems, as well as BI tools and dashboard software for use in analyzing the information.

The project enabled financial users and other executives to have a better view into the organization’s financial health. It can track things such as how many patients each physician sees, said Sidney Fernandes, assistant CIO and director of application development at USF Health. But the data that’s being analyzed is primarily financial and operational, not clinical, according to Fernandes.


—BORIS EVELSON
ANALYST, FORRESTER RESEARCH INC.
TAPPING PATIENT RECORDS
Connecting data on patient treatments to medical outcomes is the “holy grail,” Fernandes said, but he added that integrating the clinical data housed in USF Health’s electronic medical record (EMR) system with other data sources is a difficult task that he has yet to take on.

The biggest problem is that the clinical information is stored in multiple forms, from XML documents and free-flowing text—think dictated doctors’ notes—to structured data. Making such a mix accessible to users in USF Health’s data warehouse will require significantly more effort than the financial and operational data did, Fernandes noted. “We haven’t really touched that as much,” he said.

The potential benefits of applying BI software to clinical data are many. For example, predictive analytics technology could make it easier for doctors to compare the likely results of various treatment options. Dashboards and other data visualization tools could aid them in monitoring how patients react to treatments. And with health care costs soaring, BI software could be the key to determining which treatments are the most cost-effective.

But in order for the proprietary-systems barrier to fall, health care software vendors will have to agree on a set of standards upon which to build their products, thus making them compatible with commercial BI tools, said Gartner’s Handler. The federal Office of the National Coordinator for Health Information Technology is pushing interoperability standards as it writes the final versions of EMR meaningful use standards, which will take effect in the coming years.

WITH HEALTH CARE COSTS SOARING, BUSINESS INTELLIGENCE SOFTWARE COULD BE THE KEY TO DETERMINING WHICH TREATMENTS ARE THE MOST COST-EFFECTIVE.

That might be easier said than done. Most clinical health care systems were developed without industry standards because there simply was no incentive for the competing vendors to work together, Handler said. And many of the systems now on the market are quite robust, he said. They have proven extremely helpful, especially for billing purposes, to hospitals and clinics that lacked the IT resources and expertise to build their own in-house systems, Handler added.

So what might push health care systems vendors to make their prod-
ucts more open? Increased competition from mega-vendors could be one scenario, if the big enterprise software vendors decide to get into the health care market.

Accountable-care provisions in the federal health care reform bill could also spur health care systems vendors to act, Handler said, noting that the bill requires clinicians to meet new efficiency thresholds and report against them. He said improved reporting and analytics capabilities will be needed, perhaps giving health care systems vendors incentives to either beef up their offerings with new BI capabilities or open them up to work more easily with commercial BI software.

Ultimately, though, it’s up to customers to demand better BI integration capabilities, Evelson said. “Hospital CIOs should be telling their proprietary vendors that … if they don’t open up, they will start considering someone else,” he added.

At Saint Elizabeth Health Care, Ackerman has started questioning her health care software vendor about bringing together clinical data from EMRs and other sources into a BI platform for analysis. “It’s possible,” the vendor said in response, according to Ackerman. “But it’s very cutting edge.”

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