



## **Analytics: Moving health care forward**

### **Business intelligence, clinical data drive operations and patient care**

Hospital administrators are leading the use of health care analytics for a range of functions in provider settings. Driving their increased use are a few key clinical and business factors: the desire to meet meaningful use requirements, create quality reports, and better capture revenue, according to the results of SearchHealthIT.com's business intelligence survey.

Results are based on 243 responses from CIOs and other senior IT executives at medical centers, health systems and physician practices across the country. The survey was conducted online in August. For the purpose of the questions, business intelligence was defined as analytics used for administrative, back-office functions while clinical data pertained to information found in clinical, patient-facing situations.

Clinical data analytics and business intelligence applications are important to hospitals as they expect to increase some spending in the next two years on new tools for areas such as supply chain management, health information exchange (HIE) and predictive analysis of disease. Administrators are working in teams with their IT department and other hospital staff in determining what to spend, and where to spend it, as BI takes on a greater role in health care.

It all comes back to HIE, either within an organization or among various care settings and providers. The country is moving toward greater exchange as providers demand more information to care for their patients, according to Daniel Porreca, executive director of HEALTHeLINK. The Western New York regional health information organization (RHIO) links about 2,000 physicians, 16 hospitals, labs and radiology providers along with three major insurers in the region.

Exchanging data builds the foundation for turning around and using that data in a variety of ways. But just putting technology in place isn't enough; health care

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***"The strong commitment has been there, and I think the value is being realized."***

***- Daniel Porreca, HEALTHeLINK***

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practitioners have to feel comfortable using analytics and integrating those functions into workflow.

That's where information exchanges can play a significant role, Porreca says. Collecting data, making it available in a useable way and providing tools for analysis are the three components of successful HIE. "We're not going to have quality improvement and cost efficiencies" without integration and a cultural shift.

HEALTHeLINK, which connects several different electronic health record products through its HIE platform, recently began to participate in the Veterans Affairs Department's virtual lifetime electronic record (VLER) pilot, which aims to ensure the records of vets who receive care in both military and civilian settings are streamlined and maintained seamlessly. That goal of having records follow patients wherever they go is one ultimately officials and practitioners hope to see occur for all people, through a national information network.

Meanwhile, regional exchange networks are filling the needs of providers and patients. That's going to continue to grow, Porreca says. "The strong commitment has been there, and I think the value is being realized."

Explore the impact of business intelligence in provider settings, and the results of the SearchHealthIT.com reader survey, in this report.

*- Jean DerGurahian, Executive Editor*

# Making use of health care analytics

## EHRs, standards drive hospitals to information initiatives

Like many industries, health care seeks ways to improve efficiency and reduce costs. Hospitals are turning to analytical tools to help accomplish those goals, with 42% of *SearchHealthIT.com* survey respondents pointing to that desire as the driver for using such tools. On the other hand, more than half, 56.4%, say the desire to comply with federal mandates and create better clinical outcomes for patients are driving the use of analytics.

While nearly half of respondents say they already make extensive use of analytics, hospitals equally are just getting started or are planning to implement data analytics.

And what's affecting implementation? All analytics

projects start with searching through organizational data. Two meaningful use requirements in particular will drive use of clinical data analytics: the adoption of electronic health record (EHR) systems themselves, and the standardized terminology contained in the Systematized Nomenclature of Medicine (SNOMED) and the International Statistical Classification of Diseases and Related Health Problems, 10th Edition (ICD-10).

EHR systems will access many data sources -- labs, radiology and pathology, to name just three -- and aggregate them into one spot. This aggregation will mean conducting just one search instead of many that involve separate hospital departments running their own

*Click here to take a deep dive into business intelligence, data analytics and other technology trends impacting hospital IT departments and health care CIOs with SearchHealthIT.com's expert e-books.*

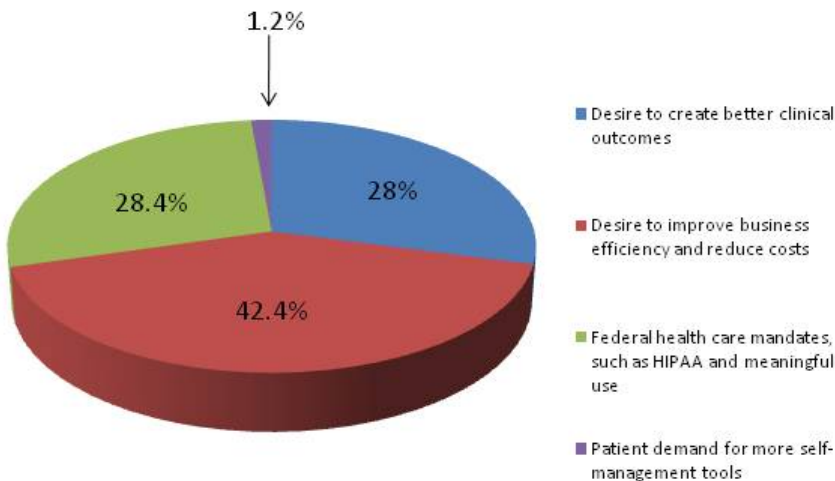
proprietary applications.

Right now, searches across multiple departments require the extra step of comparing and aggregating results. That can take weeks. Once EHR systems offer an on-ramp into all of a hospital's data systems, that step will be automated too.

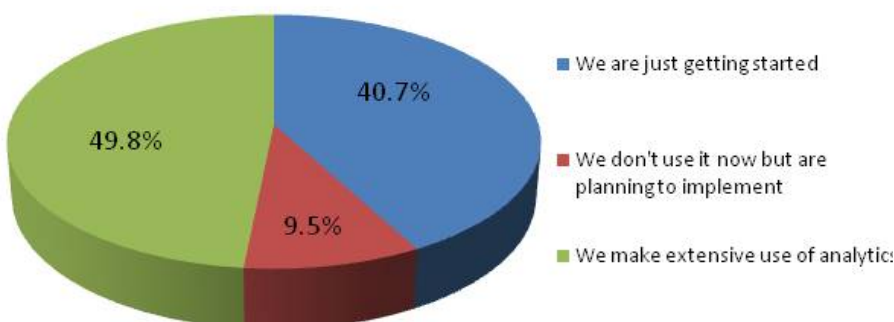
While hospitals already use ICD-9, the ICD-10 code set features tens of thousands more descriptions for patient conditions. They not only will yield more detailed data to analyze, but also will make databases more searchable. When everyone uses the same expressions and terminology, search results will be more comprehensive, accurate and useful for quality-improvement initiatives.

"[Search] will get smarter and smarter; the engines will get smarter; and you'll be able to develop even more useful tools when there's standardization," Woojin Kim, M.D., chief of radiography modality at the University of Pennsylvania in Philadelphia.

## What's driving the use of analytical tools?



## How does your hospital use data analytics?



# Hospitals get creative with uses for analytics tools

While mandates and economics are driving health care to use analytics, what they use those tools for also becomes more important. Administrative business intelligence -- using analytics for back-end office functions, billing, and improving efficiencies -- is more important this year than last, according to 65% percent of survey respondents.

Some 69% of respondents, however, said clinical analytics -- using patient data to improve clinical outcomes, report quality measures, and identify medical and patient trends -- is more important compared to last year.

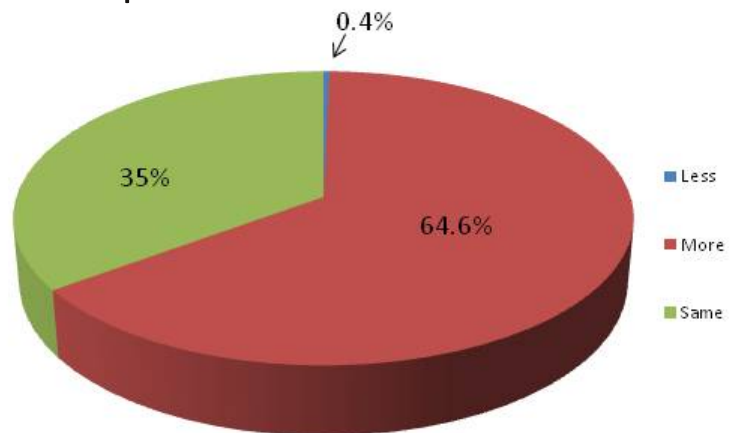
And the uses of analytics will only grow. Keith Dreyer, vice chair of radiology informatics for Massachusetts General Hospital (MGH) in Boston, discussed his department's in-house clinical data search tools. The challenges have been many -- everything from complying with HIPAA to working with different database schemas across applications, to generating complete results.

The system inspires medical residents to come up with new and innovative research ideas that drive new and better patient care. They've done research examining data by patient population; by disease; by physician; and by method (for example, computed tomography, or CT, scan; positron emission tomography, or PET, scan; or magnetic resonance imaging, or MRI). Moreover, especially enterprising residents create their own software tools to work with MGH's data search, Dreyer added.

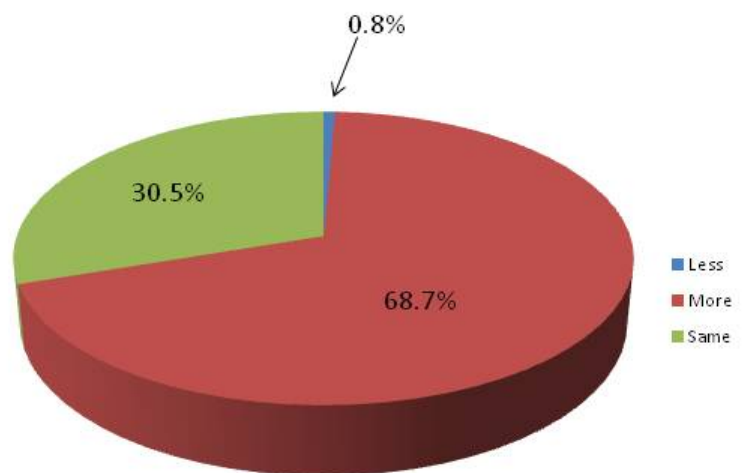
"I don't know anyone who doesn't use data mining in our department, of one sort [or another]," Dreyer said.

The search tool combines data from the pathology and radiology departments and de-identifies it for the sake of HIPAA compliance. The tool lets medical residents search data for potential clinical research studies without having to get their ideas vetted by the institutional research board (IRB). The Food and Drug Administration would require IRB vetting if there were HIPAA-protected patient data included in the results. Using the tool saves everyone time -- the school, the residents, and the IRB -- because in the past, residents would have to get IRB permission just to pore through patient records to see if their study ideas were even

## Compared to last year, are administrative business intelligence functions more important?



## Compared to last year, are clinical analytics more important in your organization?



feasible, he said.

Opening up the search to everyone, including administrators, has reaped dividends for the teaching hospital, Kim said. The more people can use search, the more creative ways they have discovered to take advantage of clinical data analytics, he said.

"You give that ability to pretty much everyone in your practice, [and] the kinds of things they will come up with are absolutely fantastic," Kim said. "You will get tremendous ideas, tremendous advancements in research and operational processes."

# Hospitals apply range of analytics to clinical, operations

Analytics are applied to a range of functions within health care organizations, from clinical quality reporting to supply chain management. The next three graphs describe the types of projects survey respondents most likely are using analytics for. Expect analytics tools to be applied increasingly to projects such as predictive analysis and health information exchange in the next two years as federal mandates continue to be rolled out.

Meaningful use rules are pushing doctors and IT leaders to work together and implement fledgling clinical data analytics software and clinical decision support systems. In the back office, though, hospital supply chain managers are turning to data analytics software to help bolster the bottom line.

Catholic Health East -- comprising 32 hospitals from Florida to Maine -- uses analytics software to help fine-tune supply chain management by keeping much more detailed tabs on vendor performance between its facilities.

As beta testers on Lawson Analytics for Healthcare, an application by Lawson Software, Manager of Application Development Kimberly Martin and two of her colleagues said applying business intelligence to human resources, supply chain and financial information helped create efficiencies.

The hospital chain -- which uses Lawson supply chain management software -- already had a pretty good grip on orders and logistics, Martin said. However, data

analytics software has helped it even more finely tune the supply chain to be even closer to just-in-time by harmonizing Catholic East's data sets with that of its vendors.

"From our end, we're trying to make sure we're being efficient -- using our contracts, getting the requisitions in and purchase orders out quickly," said Michael Weber, manager of supply chain data analytics. "We're also working with a particular distributor. We had to talk their language. Otherwise, it's just our information against theirs. So we wanted [analytics reports] to be molded to their distribution centers so we could talk apples to apples with them, with our data underlying in it."

Specifically, Lawson analytics lets Catholic Health East better understand metrics such as on-time delivery of supplies, as well as the completeness and accuracy of orders they deliver.

After collecting supply chain data each day, Catholic Health East groups its hospitals together in regions. Its Lawson analytics application aligns these regions with its vendors' various distribution centers to assess delivery timeliness and order fulfillment success rates. The data analytics software will also let supply chain leaders see whether the same vendor is charging some hospitals higher prices for the same item. The next project for the team, officials said, is explaining that phenomenon to vendors and leveling the pricing across all its hospitals.

	In use now	To be added in next two years	Not in use/no plans to
Data capture for mandatory patient care quality reporting	165 67.9%	54 22.2%	24 9.9%
Improved diagnosis, treatment and outcomes	124 51.0%	84 34.6%	35 14.4%
Health information exchange	112 46.1%	102 42.0%	29 11.9%
Clinical research	90 37.0%	66 27.2%	87 35.8%
Predictive analysis of diseases	62 25.5%	106 43.6%	75 30.9%
Supply chain/inventory management	112 46.1%	73 30.0%	58 23.9%
Revenue capture	141 58.0%	68 28.0%	34 14.0%
Coding accuracy	132 54.5%	72 29.8%	38 15.7%

# Spotlight: developing scorecards to track quality metrics

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 government mandates.

There are two holy grails of clinical data analytics technology targeted for 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.

Hospitals can also use business intelligence (BI) tools 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

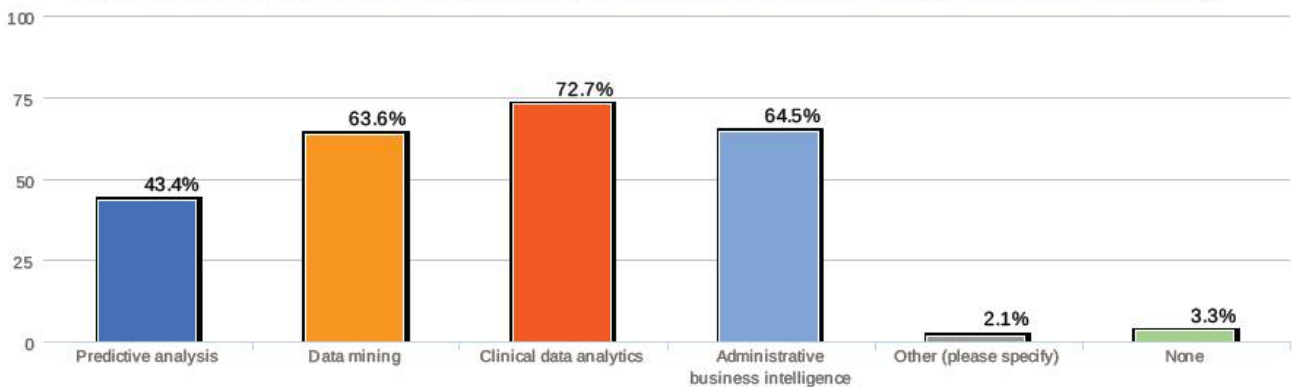
and prevent patient re-admissions due to inadequate access to data.

Maine Medical Center has adopted analytics tools after determining that it was collecting clinical data in an ad hoc fashion in office applications like Crystal Reports and Excel spreadsheets.

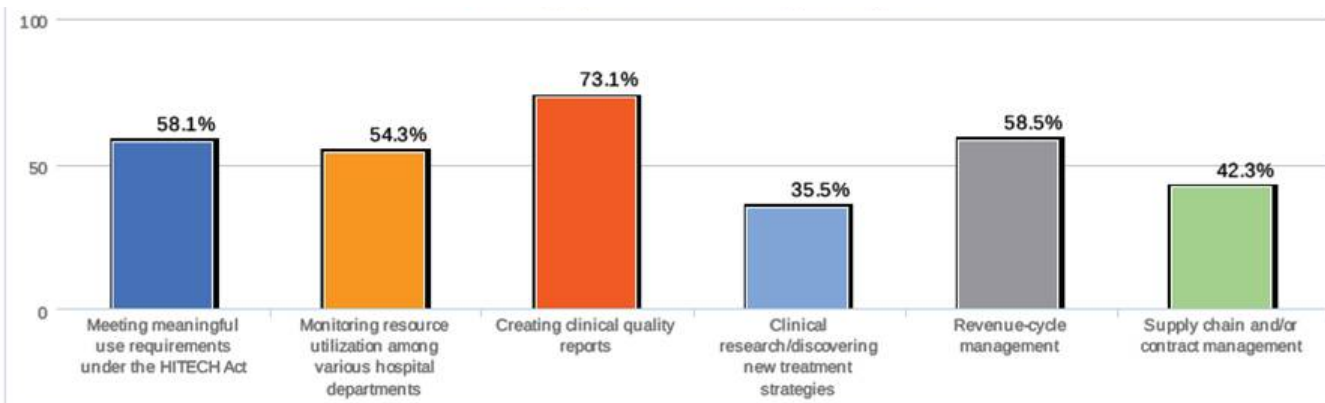
Since 2003, Maine Medical has developed scorecards for tracking more than 70 different quality measures. Analytics have helped organize and formalize the tracking of quality indicators for state and federal compliance programs, as well as finance and the center's own self-analysis such as for emergency 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, giving instant access to data that had previously taken time and chewed up clerical resources to collect. The facility tracks safety measures, too, such as staff hand-washing policy compliance, which intersects with both patient and employee safety standards and regulations.

## Which advanced analytics tools does your organization plan to use in the next two years?



## What kind of projects will these analytics support?



# Implementing analytics: a multidepartment effort

While survey respondents reported that administrators are the primary users and decision makers for analytics systems in hospitals, results indicate that -- like an electronic health record implementation project -- increasingly, it is cross-department groups that influence which systems are used and how those systems will be applied to workflow. Not least important is a hospital's IT department, which plays a significant role in selecting systems and deploying them across the organization.

Follow these tips from

*SearchHealthIT.com* expert contributor Reda Chouffani for business intelligence implementations:

## Address complex tasks

For a successful implementation of BI in a patient-centric environment, there are many complex tasks that need to be addressed. Some are related to showing value and engaging the leadership to back the initiative, and others relate to all the technical requirements for a successful install and deployment. But whether you're focusing on logistics, ER, A/R, or nursing dashboards, all of these areas have meaningful data that will help ensure the organization's goals are met at all levels and everyone is in line with the objectives.

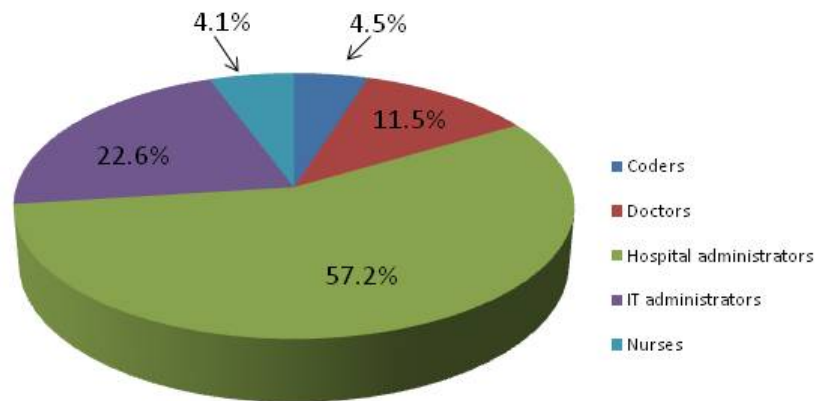
## Get the right data at the right time

It is very critical to ensure that there is sufficient data available to plot your progress in certain areas. This would require first analyzing the reports and trends -- and looking beyond meaningful use when doing so. Second, identify how often the data will need to be reported for each department within the organization.

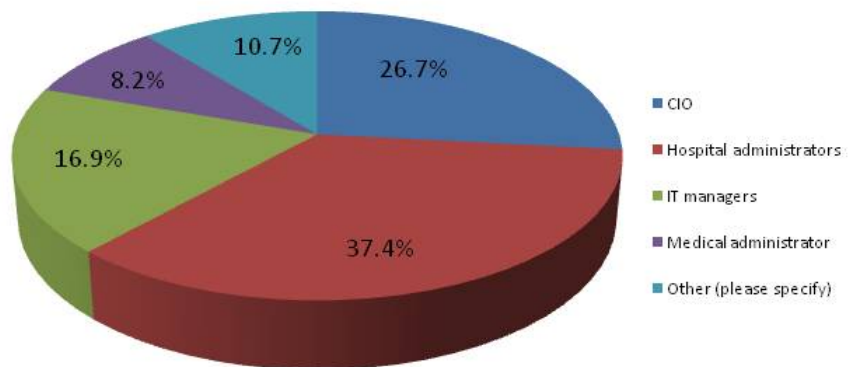
## Define where the data is

The majority of the analysis will be applied against existing data that has been collected through the hospital system and internal applications. But there are a few data sets that will need to come from third parties and/or other public or federal groups. As an example, when reviewing the suggested measures that will assess

## Who are the primary users of analytics in your organization?



## Who is the primary decision maker for analytics systems in your hospital?



the appropriate use of medications based on standards of care for applicable conditions, realize that professionals are comparing data collected within the hospital against standards that are outside the IDN.

This clearly indicates the importance of knowing the origin of the other data collected.

## Share the value with the rest of the group

Unfortunately, not everyone appreciates the power and value BI provides to organizations. But it can be sometimes just a matter of education that can make a world of difference. In most successful organizations, the executive team realizes that, in order to keep the finger on the pulse, you must have a near real-time exposure to stats, scorecards, and other meaningful measures (even on your mobile device).

So it would be beneficial to share with all management

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and executive team members what are the capabilities and value of BI within your organization's context. Whether the team needs to apply it to A/R analysis, the revenue cycle, quality metrics, general charge capture, patient satisfaction or marketing, there are numerous areas that can benefit from the analysis of the overall data.

### Define reporting and analysis intervals

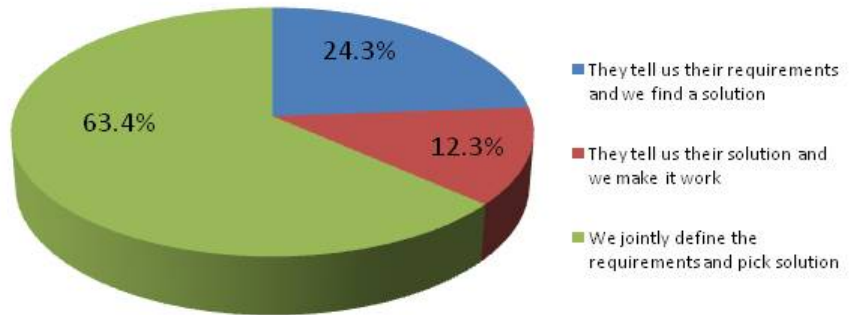
For the data to be properly analyzed and meaningful, it must query from the production system at different frequencies. This will store it at different processing data repositories. In order to avoid performance issues, schedule data extraction and processing ahead of time. For example if we are looking at reviewing the clinical services and perform a comparative analysis over a period of five years, then this is a job to be performed during non-peak hours and would most likely take many hours. But if you are looking to review a ticker in real-time that displays patient admissions or discharges then a simple query can be executed periodically throughout the hour, and *voila*.

### Select the right tool for you

There are a variety of BI tools, from spreadsheets, to online analytical processing (OLAP), and reporting tools. Some are open sources, while others are provided under the software-as-a-service (SaaS) model. But really, the tools that need to be implemented would depend on several things: overall data size, current platform, in-house skill set, physical architecture, mobile app capabilities and support.

Another component to selecting the right tools is

## What best characterizes the relationship between IT and other parts of the hospital in choosing analytics systems?



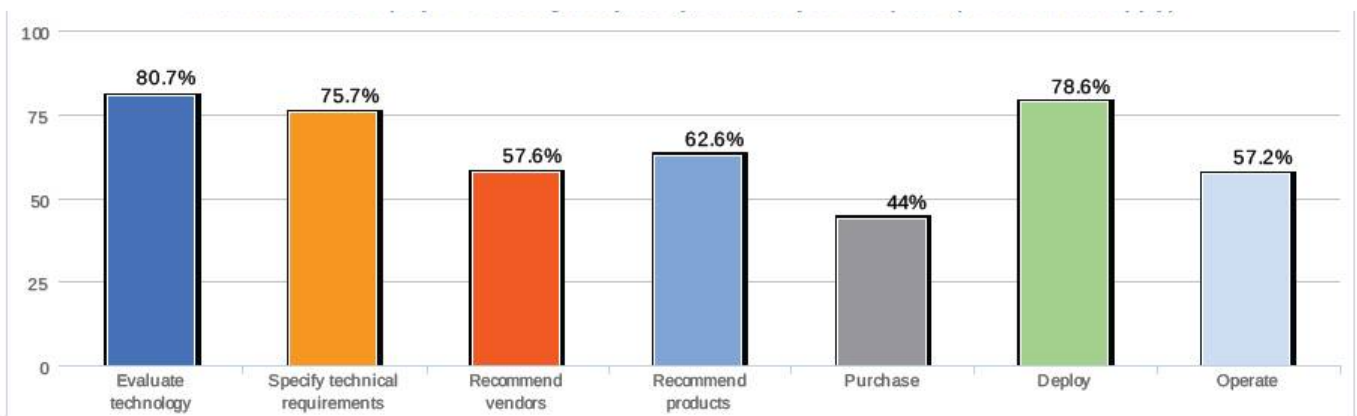
actually identifying the analytical data model for your specific needs. There are several third party vendors that specialize in business performance management that can reduce the customization and building time for your organization.

### Hire help if you are not sure

Many health care organizations have the talent needed to implement the BI widely available. However, given the ongoing complex requirements that require a deep understanding of the data model, metadata, data integration, quality, analytics and different management metrics, it is usually recommended to work with a third party vendor, if budgets permit, to ensure that at least the initial implementation is done right, and in a timely fashion. It also ensures that your team is involved in all the steps so they can take over and ensure that future BI needs are met internally and kept in-house.

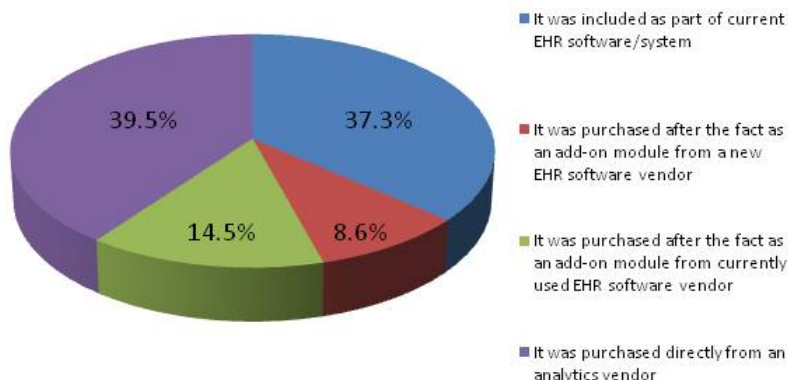
*Read more from Reda Chouffani at his expert blog on the Health IT Exchange*

## What role does IT play in choosing analytics in your hospital?



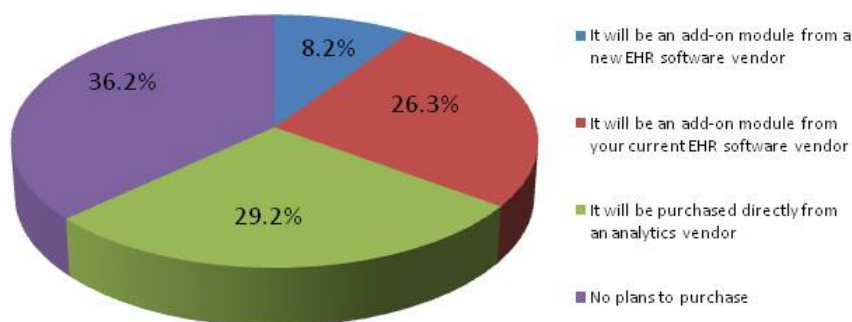
# Analytics software purchasing intentions

If you are already using an analytics tool:



Hospitals in general believe they already have purchased the analytics tools they'll need to meet upcoming demands. Most survey respondents said they either purchased analytics directly from a vendor (39%) or that the tool was included in the electronic health record package (37%). Of those planning to buy analytics tools, 29% said they will buy directly from an analytics vendor, compared to 26% who will purchase a tool as an add-on from their EHR vendor.

If you are planning to purchase an analytics tool:



## Is your software in compliance?

Federal mandates say that, for health care organizations seeking meaningful use incentives, health IT must be certified. Systems used to create reports for the meaningful use program must be approved by federally-qualified organizations. Read more at [SearchHealthIT.com](http://SearchHealthIT.com)'s regulations resource page.

When are you considering purchase of the following technologies?

	In the next year	In the next 2 years	Not planning on purchasing	Already purchased
Data Mining	34 14.0%	59 24.3%	62 25.5%	88 36.2%
Predictive Analytics	31 12.8%	72 29.6%	72 29.6%	68 28.0%
Business Intelligence	48 19.8%	59 24.3%	44 18.1%	92 37.9%
Quality Assurance	40 16.5%	63 25.9%	54 22.2%	86 35.4%
Data Integration	50 20.6%	61 25.1%	44 18.1%	88 36.2%
Data Warehousing	42 17.3%	45 18.5%	49 20.2%	107 44.0%
Workflow	41 16.9%	45 18.5%	79 32.5%	78 32.1%



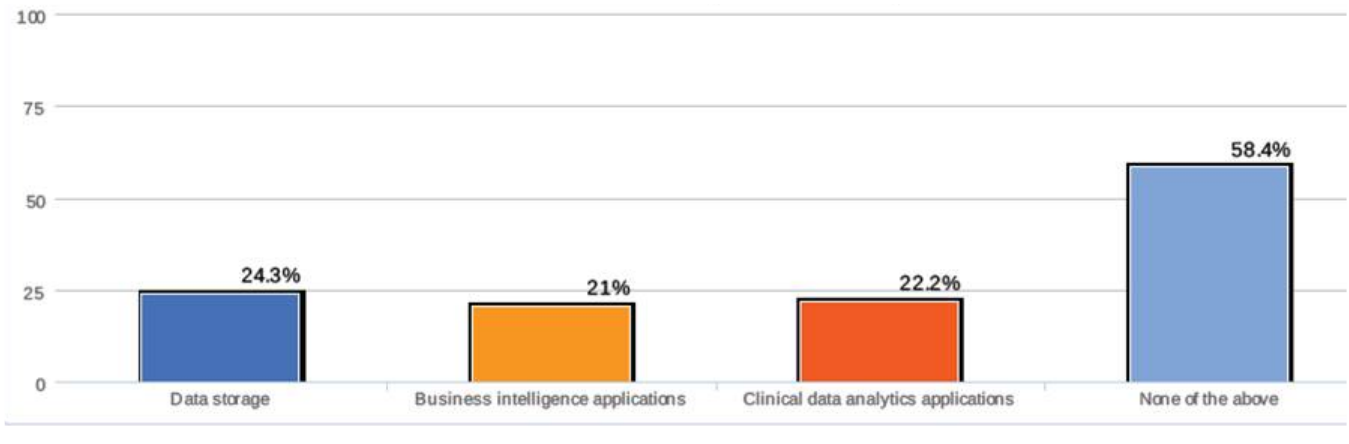
# Health care cloud functions catching on, slowly

In general health care organizations are not using the cloud for analytics, with only 21% and 22% of respondents said they use cloud functions for business intelligence and clinical data analytics, respectively.

But the cloud is still emerging as a useful application for other parts of health care. Some 24% of respondents reported they turn to the cloud for data storage. The need to store an expanding archive of medical images is increasingly driving some health care providers to turn to cloud services. Many hospitals' data centers are already crowded; advances in scanning technologies mean they will have an ever-mounting volume of data to maintain. The cost of managing, cooling and expanding data centers in some cases is looking less favorable than putting the data into the cloud. In a similar fashion, as the health care industry moves to electronic health records, EHR technology is expected to encourage cloud storage.

How can cloud resources be used in health care? Click here to find out more from this [SearchHealthIT.com](#) FAQ.

## What cloud functions do you use for analytics?



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