

# **Business Intelligence in Healthcare**

Have Providers Found a Cure?

June 2008



## Executive Summary

In order to address the challenges of rising costs, the need to improve medical outcomes, and the constant battle to enhance quality of care, healthcare providers are now turning to the information management and analytical capability inherent in Business Intelligence (BI) solutions. Whether implemented as part of an organization-wide physician pay-for-performance initiative, or simply deployed to drive more value from the abundance of data flowing through the organization, providers are realizing measurable improvements through the use of BI tools. Ninety-five (95) healthcare providers participated in this research study.

### Research Benchmark

Aberdeen's Research Benchmarks provide an in-depth and comprehensive look into process, procedure, methodologies, and technologies with best practice identification and actionable recommendations

### Best-in-Class Performance

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Aberdeen used three key performance criteria to distinguish Best-in-Class companies:

- **Composite measure: The change in adverse events per patient and change in unplanned re-admissions.** The Best-in-Class drove a 7% reduction in adverse events per patient and unplanned re-admissions, versus a 1% reduction for the Industry Average, and a 2% increase for Laggard organizations.
- **Improvement in patient satisfaction scores.** Best-in-Class organizations realized a 15% improvement in patient satisfaction scores as compared with only a 6% improvement for Industry Average organizations and a 4% improvement for Laggards.
- **Overtime incurred over the past 12 months versus the prior 12 months.** Best-in-Class organizations achieved an 11% decrease in overtime incurred over the past 12 months, compared with a 1% decrease by Industry Average organizations and a 12% increase for Laggards.

### Competitive Maturity Assessment

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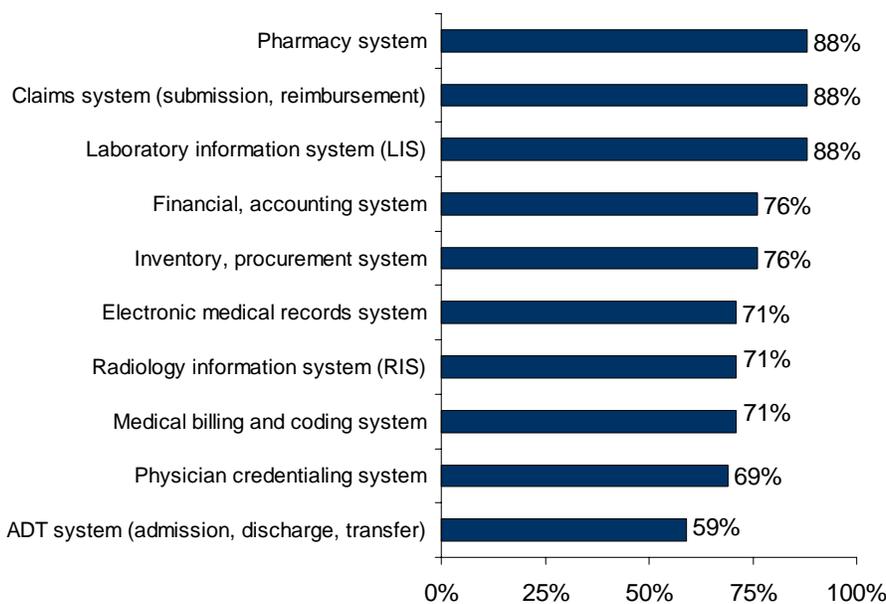
Survey results show that the firms enjoying Best-in-Class performance shared several common characteristics:

- Sixty-five percent (65%) of Best-in-Class organizations have the ability to identify and monitor Left without Being Seen (LWOBS) in the Emergency Department (ED) versus 54% for the Industry Average and 44% for Laggards
- Sixty-five percent (65%) of Best-in-Class organizations have successfully implemented revenue cycle management programs, compared with 51% of the Industry Average respondents and 35% of Laggards
- Best-in-Class organizations are 20% more likely than all other organizations to utilize Hospital Information System (HIS) software to manage hospital operations

## Required Actions

In addition to the specific recommendations in Chapter Three of this report, to achieve Best-in-Class performance, healthcare organizations must look to incorporate information from multiple data sources in order to drive value to the greater organization. Best-in-Class organizations identified several data sources that are currently integrated within business intelligence systems to provide key insight into operations (Figure 1).

**Figure 1: Top 10 Data Sources in Use by Best-in-Class Healthcare Organizations**



Source: Aberdeen Group, June 2008

“Our BI solution helped us make decisions on data that we were never able to get to and never able to see before. We used to rely on month-end reporting that was then loaded into another system to perform analysis. With our BI capability, we can now do the analysis on a real-time basis, not just at month-end.”

~ Jeff Ward, Manager,  
General Financial Systems,  
LMHS

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## Chapter One: Benchmarking the Best-in-Class

### Business Context

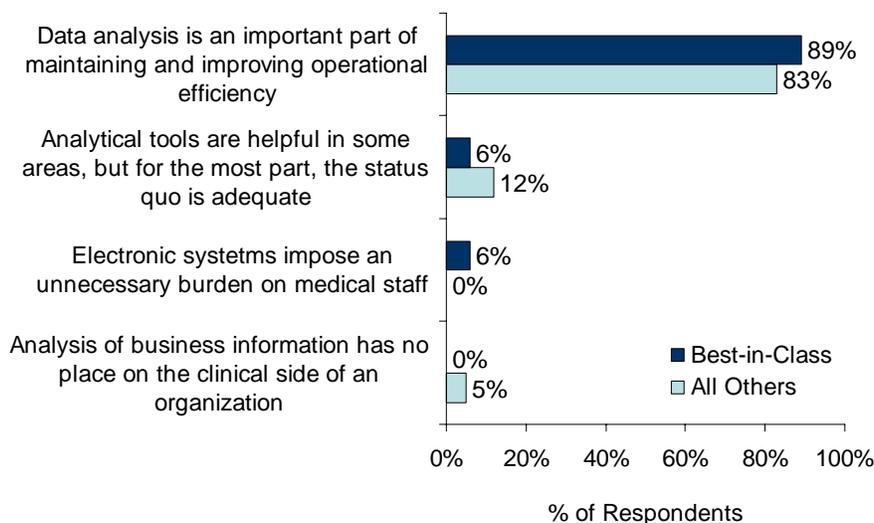
Healthcare providers (hospitals, clinics, and outpatient care facilities) are facing a critical need to gain control over inflating costs and operational processes. Regulatory mandates are increasing the requirement for reporting, and health insurance companies are tying improvement of financial and clinical performance metrics to payments.

As a result, hospitals and other providers are faced with severe pressures to improve patient satisfaction, quality of care, and the financial health of the organization. Aberdeen's February 2008 benchmark report, *Managing the TCO of Business Intelligence*, revealed that adoption and maturity of business intelligence implementations among healthcare providers is lagging behind that of industry norms and Best-in-Class companies.

In May and June of 2008, Aberdeen Group examined the usage of BI and analytical tools within healthcare providers. The research aims to uncover the key challenges that these providers face, and the key actions, capabilities, and technologies in use to produce Best-in-Class results.

Despite some lingering sentiment in healthcare environments that analytical tools are unnecessary or even potentially detrimental to proper clinical operations, the overwhelming majority of survey respondents see significant value in BI tools (Figure 2).

**Figure 2: Organizational Attitude toward Analysis of Business and Clinical Information**



Source: Aberdeen Group, June 2008

Given the volume of critical information pulsing through today's hospitals and clinical environments, and the value to be achieved through its proper

### Research Benchmark

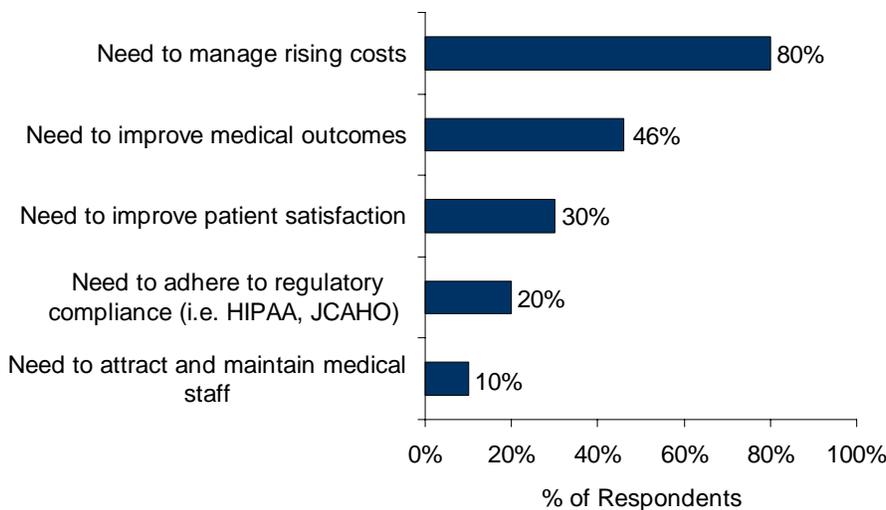
Aberdeen's Research Benchmarks provide an in-depth and comprehensive look into process, procedure, methodologies, and technologies with best practice identification and actionable recommendations

### Survey Respondents by Role

- ✓ 50% technical staff (i.e. CIO, IT manager)
- ✓ 20% financial/administrative staff (i.e. CEO, CFO, financial analyst)
- ✓ 30% clinical staff (i.e. physician, nurse, PA); administrative staff, and others

analysis, the healthcare industry is a prime candidate for BI and analytical tools. Between spiraling costs and the never-ending drive to improve patient care, healthcare providers have a host of reasons to invest in BI. Figure 3 shows the most prevalent challenges forcing healthcare organizations to examine and invest in BI solutions.

**Figure 3: Top Pressures Driving Providers to Focus on BI**



Source: Aberdeen Group, June 2008

**Fast Facts**

Average number of **in-patient beds** under management:

✓ Best-in-Class: 567

✓ Industry average: 530

✓ Laggard: 219

While the need to improve patient satisfaction and medical outcomes will always be a prevalent challenge, this figure illuminates just how daunting the issue of rising costs has become. This data implies that increasing provider expenses are actually hindering healthcare organizations' ability to perform their natural mission of providing top-notch patient care. It is this challenge of rising costs that is compelling an overwhelming majority of survey respondents to capture, manage, and drive significant value from their key organizational data.

**The Maturity Class Framework**

Aberdeen used three key performance criteria to distinguish the Best-in-Class from Industry Average and Laggard organizations:

- **Composite measure - the change in adverse events per patient and change in unplanned re-admissions.** The Best-in-Class drove a 7% reduction in adverse events per patient and unplanned re-admissions, versus a 1% reduction for the Industry Average, and a 2% increase for Laggard organizations.
- **Improvement in patient satisfaction scores.** Best-in-Class organizations realized a 15% improvement in patient satisfaction scores as compared with only a 6% improvement for Industry Average organizations and a 4% improvement for Laggards.
- **Overtime incurred over the past 12 months versus the prior 12 months.** Best-in-Class organizations achieved an 11%

decrease in overtime incurred over the past 12 months, compared with a 1% decrease by Industry Average organizations and a 12% increase for Laggards.

**Table 1: Top Performers Earn Best-in-Class Status**

Definition of Maturity Class	Mean Class Performance
<b>Best-in-Class:</b> Top 20% of aggregate performance scorers	<ul style="list-style-type: none"> <li>▪ 7% reduction in the number of adverse events per patient / unplanned readmissions</li> <li>▪ 15% improvement in patient satisfaction scores</li> <li>▪ 11% decrease in the amount of overtime incurred over the past year</li> </ul>
<b>Industry Average:</b> Middle 50% of aggregate performance scorers	<ul style="list-style-type: none"> <li>▪ 1% reduction in the number of adverse events per patient / unplanned readmissions</li> <li>▪ 6% improvement in patient satisfaction scores</li> <li>▪ 1% decrease in the amount of overtime incurred over the past year</li> </ul>
<b>Laggard:</b> Bottom 30% of aggregate performance scorers	<ul style="list-style-type: none"> <li>▪ 2% <b>increase</b> in the number of adverse events per patient / unplanned readmissions</li> <li>▪ 4% improvement in patient satisfaction scores</li> <li>▪ 12% <b>increase</b> in the amount of overtime incurred over the past year</li> </ul>

**Fast Facts**

- √ Best-in-Class organizations achieved a 15% increase in patient satisfaction scores, three-times the improvement of all other organizations
- √ Best-in-Class organizations reported an average 3% drop in the number of ED diversions (ambulances diverted to competing hospitals), compared with a 3% increase for Laggards

Source: Aberdeen Group, June 2008

**The Best-in-Class PACE Model**

Achieving a high level of performance with BI tools in a healthcare provider environment requires a combination of strategic actions, organizational capabilities, and enabling technologies. Best-in-Class organizations - based on the performance measures defined in Table 1 - have identified the specific approaches they are taking (Table 2).

**Table 2: The Best-in-Class PACE Framework**

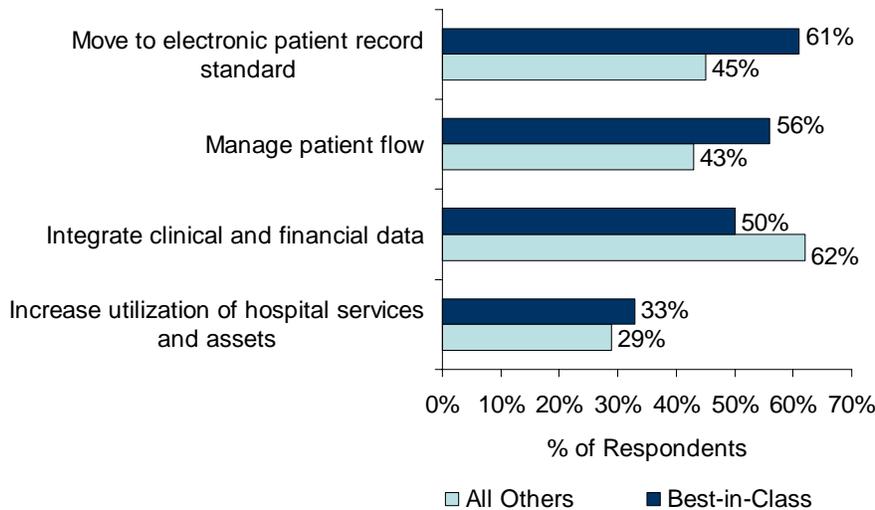
Pressures	Actions	Capabilities	Enablers
<ul style="list-style-type: none"> <li>▪ Manage rising costs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Manage patient flow</li> <li>▪ Integrate clinical and financial data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Formal patient / asset tracking procedures</li> <li>▪ Integration of clinical, ADT, and patient record data with financial billing / claims system data</li> <li>▪ Real-time patient flow update capability</li> <li>▪ Formal training program for educating clinical and financial users on information management procedures</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hospital Information System (HIS / ERP)</li> <li>▪ Business Intelligence (BI) platform</li> <li>▪ BI query and reporting tools</li> <li>▪ Advanced analytic application</li> <li>▪ Data integration and hygiene / cleansing tool</li> <li>▪ Dashboards / scorecards</li> </ul>

Source: Aberdeen Group, June 2008

## Best-in-Class Strategies

The move to electronic medical records systems can be a significant leap for many healthcare organizations. However, Aberdeen's research shows that the Best-in-Class are more likely than all other organizations to take this strategic action (Figure 4).

**Figure 4: Best-in-Class Strategic Actions for BI in Healthcare**



Source: Aberdeen Group, June 2008

In light of the top pressure of managing rising costs, this data suggests that many organizations are losing money when it comes to managing patient information and operational flow. Best-in-Class organizations are focusing their strategic efforts on managing their most important constituency: their patients; and in doing so they are also managing the associated costs.

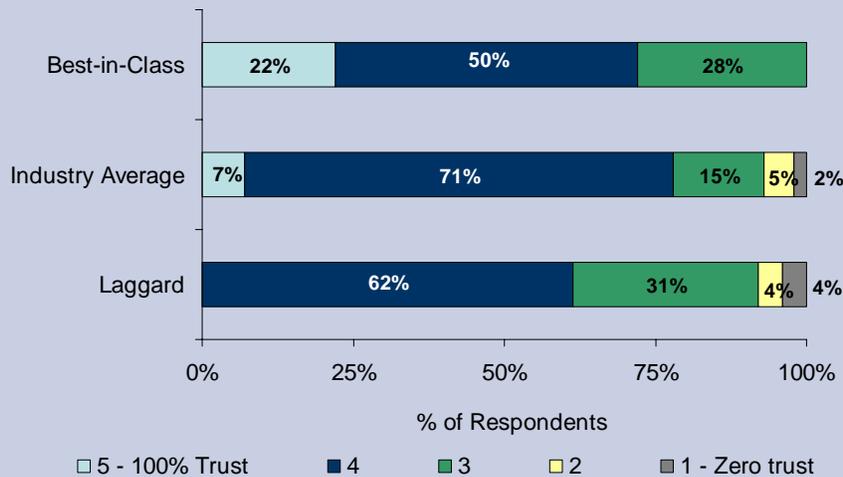
### Aberdeen Insights — Strategy

One of the barriers suggested in conversations with survey participants is the level of trust in the data that exists among stakeholders within provider organizations. While relatively few respondents report 100% complete trust in the data accessed within existing BI systems today, Best-in-Class respondents are significantly more likely to possess this trust. Strategically, Best-in-Class companies are showing that trust in information is a critical goal to attain (Figure 5).

*continued*

**Aberdeen Insights — Strategy**

**Figure 5: Organizational Trust with the Quality of Reporting and Analytics**



Source: Aberdeen Group, June 2008

Conversations with several respondents revealed that this trust is built through involvement of all stakeholders in the iterative process of building and delivering reporting and analytic applications. Interviews also uncovered a trend among Best-in-Class respondents - the trust in information results from an initial success, typically within one department or project that then leads to interest among other departments.

Refer to the case studies in Chapter Two for specific examples of how organizations have achieved this strategic goal. Also, see Figure 7 in Chapter Two for detailed information on a Best-in-Class "Information Culture."

## Chapter Two: Benchmarking Requirements for Success

Between electronic medical records, laboratory information systems, and medical billing systems just to name a few, most hospitals are inundated with a morass of data, the efficient management of which is a daunting challenge. The following case study describes how one healthcare provider was able to start with a targeted project - financial analysis and reporting - and realize rapid ROI with their BI initiative.

### Case Study — Colorado State University's Journey to Best-in-Class BI Deployment and 100%+ ROI

A decade ago, Colorado State University's College of Veterinary Medicine and Biomedical Sciences realized that their financial reporting and analysis capability was being inhibited. The data required for reports and custom views of information was trapped within individual transactional systems – each of which was an “information silo” and did not “talk to” other systems. The college's data was spread across several operational systems that are currently managing over \$600 million in total assets, including revenues from operations and grants.

“At the time, management supported the construction of a data warehouse to provide a centralized view of information for all types of users,” states Thom Hadley, Director of Finance and Strategic Services. “We thought that data warehousing technology was becoming more affordable at the time, but the large data warehouse solution providers did not want to lower their prices to align with a university setting, and the smaller vendors did not really have a solution robust enough to meet the complexities of our disparate data. So, we built it ourselves on our existing database platform.”

While the data warehouse allowed the college to centralize data collection and storage, it could not keep-up with the pace of report requests that end-users demanded. “We developed a very complex data warehouse that was capable of meeting almost any reporting or analysis request, but the complexity required that only highly skilled IT staff could interact with it. The requests were piling up faster than the team could respond. Essentially, we were right back where we started. Then, about three years ago, we ran into a solution provider that was starting to develop something very interesting. We continued to communicate with them as they continued to develop their solution. Last year, they showed us something drastically different.”

*continued*

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~ Thom Hadley, Director of  
Finance and Strategic Services;  
Colorado State University  
College of Veterinary Medicine  
and Biomedical Sciences

### Case Study — Colorado State University's Journey to Best-in-Class BI Deployment and 100%+ ROI

The college decided to implement a self-service business intelligence software solution from a software firm with healthcare provider domain expertise. “With the data visualization, reporting, graphing, and ad hoc analysis capabilities that were delivered, we were able to combine disparate data from any source, including the data warehouse, and allow end users to gain visibility to the data, create their own reports and views, and alleviate the pressure on the IT group. The key to the success of this project was not just the technologies capabilities, it was the vendor's ability to understand our environment, and apply the unique business rules to provide all types of users with the information they need.”

He continued, “It used to take a significant amount of time to create custom reports. For example, we built a report format to enable analysis of our academic staff's average salaries by gender and profession. After 45 minutes, the data warehouse was still churning and we had no report. I had to stop the process as it was consuming considerable CPU resources. Now, with the new solution, our end-users just point and click and the report is created in a few seconds. Another benefit is that our IT staff has become managers of data instead of report writing workers. By distributing access to the data and having a method for manipulating it, we have captured the power of the entire organization's ability to think about things that IT alone could not have done.”

The college has started to measure the ROI that has been achieved with the project. Several accountants are required to track the financial data related to 1,100 employees and \$150 million in annual revenue. Prior to implementing the business intelligence solution, the accountants were spending three weeks out of each month reconciling financial reports against 1,800 accounts. Now, the entire three-week process has been boiled down to an hour-long exercise that is almost fully automated in the solution's reporting engine. The savings alone on eliminating the three-week process and boiling it down to an hour saved an equivalent of \$600,000 per year – far more than the cost of the solution.

In addition to this quantitative ROI, a qualitative benefit has been uncovered. Top executives can now access information that is not filtered or presented through someone else's interpretation. This represents a tremendous source of ROI, and could actually be the most important benefit of the entire program.

## Competitive Assessment

Aberdeen Group analyzed the aggregated metrics of surveyed companies to determine whether their performance ranked as Best-in-Class, Industry Average, or Laggard. In addition to having common performance levels, each class also shared characteristics in five key categories: (1) **process** (the

approaches they take to execute their daily operations); (2) **organization** (corporate focus and collaboration among stakeholders); (3) **knowledge management** (contextualizing data and exposing it to key stakeholders); (4) **technology** (the selection of appropriate tools and effective deployment of those tools); and (5) **performance management** (the ability of the organization to measure their results to improve their business). These characteristics (identified in Table 3) serve as a guideline for best practices, and correlate directly with Best-in-Class performance across the key metrics.

**Table 3: The Competitive Framework**

	Best-in-Class	Average	Laggards
<b>Process</b>	Review process for critical measures / KPIs revision and adaptation		
	47%	44%	19%
	Revenue cycle management ability		
	65%	51%	35%
<b>Organization</b>	Formal training program for educating clinical and financial users on information management procedures		
	47%	37%	27%
	'Information culture' established enterprise-wide		
	50%	29%	19%
<b>Knowledge</b>	Real-time patient flow update capability		
	39%	25%	16%
	Automation of report generation		
	67%	64%	44%
<b>Technology Management</b>	BI technology enablers currently in use:		
	<ul style="list-style-type: none"> <li>▪ 75% Hospital Information System (HIS / ERP)</li> <li>▪ 100% Spreadsheets or other static reports</li> <li>▪ 29% Domain specific data modeling (i.e. automated clinical logic, handling of outliers, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>▪ 65% Hospital Information System (HIS / ERP)</li> <li>▪ 90% Spreadsheets or other static reports</li> <li>▪ 18% Domain specific data modeling (i.e. automated clinical logic, handling of outliers, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>▪ 62% Hospital Information System (HIS / ERP)</li> <li>▪ 85% Spreadsheets or other static reports</li> <li>▪ 8% Domain specific data modeling (i.e. automated clinical logic, handling of outliers, etc.)</li> </ul>

	Best-in-Class	Average	Laggards
Performance	Operational Key Performance Indicators (KPIs) defined and monitored		
	61%	55%	46%
	Ability to identify and monitor Left Without Being Seen (LWOBS) in the ED		
	65%	54%	44%

Source: Aberdeen Group, June 2008

“If a cardiac floor knows they only have a few beds left, they can go into the analytics system and look at the ER, see what may be coming their way and predict what their staffing needs will be. They can take a proactive approach to patient flow through, rather than a reactive one.”

~ Nursing Manager, Large US Hospital System

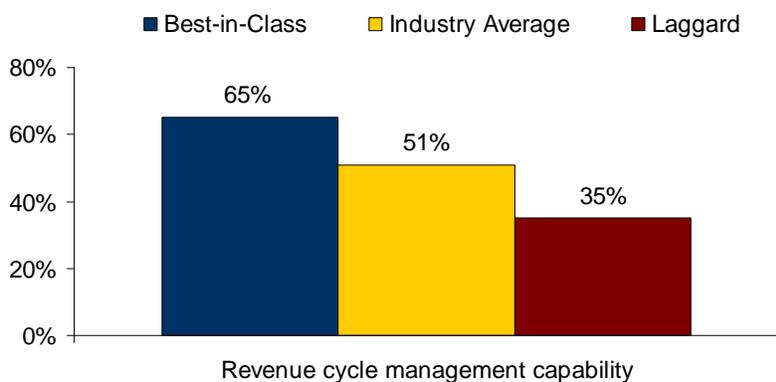
## Capabilities and Enablers

Based on the findings of the Competitive Framework and interviews with end users, Aberdeen’s analysis of the Best-in-Class demonstrates that successful deployment and use of analytical tools within healthcare providers depends on a combination of specific capabilities and technology enablers. Aberdeen’s research has identified several capabilities that Best-in-Class companies share in order to achieve their analytical goals.

### Process

With the cost challenges that almost every healthcare organization faces, there is increasing pressure to closely manage all the various facets of their revenue cycle. Between improving pay or reimbursement performance, expediting the cash conversion cycle, and responding to increasingly elevated consumer demands, healthcare providers are required to be more nimble and responsive than ever before. Aberdeen’s research shows that Best-in-Class healthcare organizations are almost twice as likely as Laggards to have the ability to manage their crucial revenue cycles (Figure 6).

**Figure 6: Best-in-Class Process Capabilities - Currently Deployed Revenue Cycle Management Capability**



Source: Aberdeen Group, June 2008

Additionally, as more hospitals investigate the ideals of a physician pay-for-performance system, the ability to define and understand the operational

### Fast Facts

Among all survey respondents, the method of analytics management breaks down as follows:

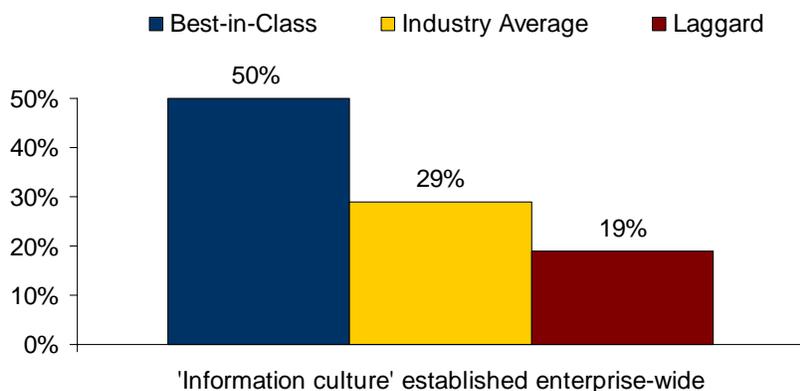
- ✓ 52% managed centrally at headquarters
- ✓ 31% indicate that some systems are managed centrally, and some managed locally within facilities
- ✓ 6% manage analytics projects locally at each individual facility
- ✓ 4% manage their analytics at a separate, outsourced data center
- ✓ 7% don't know

metrics that matter to an organization will become even more important. Aberdeen's research reveals that Best-in-Class organizations are 2.5 times more likely as Laggards to have established procedures to review and measure these KPIs.

## Organization

The data in Figure 1 earlier reveals that the vast majority of healthcare organizations do see the value in managing key information for analytical purposes. However, in order to drive sustainable value from a BI solution, the understanding of this type of analysis needs to be ingrained in the mindset of the organization. Aberdeen's research shows that a significantly elevated percentage of Best-in-Class organizations feel that they have established an information culture wherein knowledge flows freely and the organization as a whole has a vested interest in leveraging this crucial information (Figure 7).

**Figure 7: Best-in-Class Organizational Capabilities**



Source: Aberdeen Group, June 2008

Having this type of environment established can lead to numerous other ancillary benefits. An organization-wide understanding of, and appreciation for, key information can reduce staff training requirements as members of the organization will be more inclined to bring themselves up to speed on the systems. This type of culture can also promote better and cleaner information as it is entered into the system, thus reducing the impact of the "garbage in, garbage out" phenomenon.

## Knowledge Management

In the business and healthcare worlds alike, the ability to capture and respond to key threats and opportunities in real time or as close to real-time as possible is becoming increasingly prevalent. Especially in light of the fact that respondents to this survey are managing an average of 440 beds, the ability to manage patient flow and react to critical changes in a timely fashion is all the more important. Aberdeen's research demonstrates that

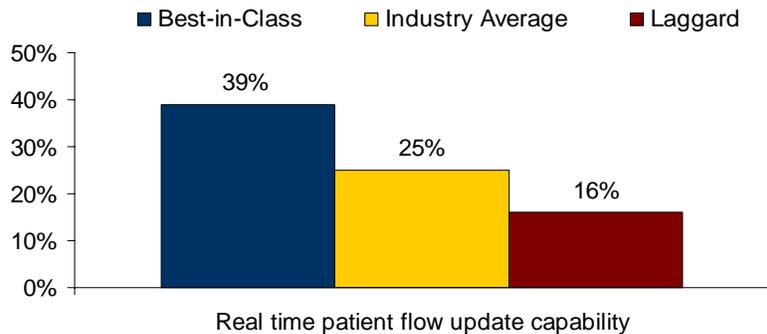
### Fast Facts

Best-in-Class organizations invest in IT staff. **The average number of FTEs** deployed at each facility for IT / BI purposes is:

- ✓ Best-in-Class: 15
- ✓ Industry Average: 13
- ✓ Laggard: 9

Best-in-Class organizations are 2.4-times more likely than Laggards to have this capability (Figure 8).

**Figure 8: Best-in-Class Knowledge Management Capabilities**



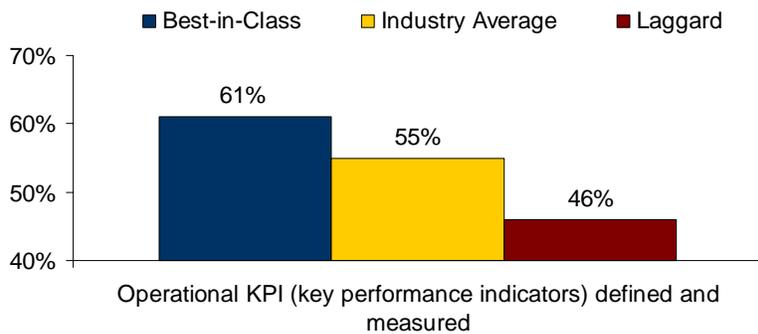
Source: Aberdeen Group, June 2008

As patients are admitted, treated, and released, even small status changes can produce dramatic differences in medical outcomes, and in some instances could even mean the difference between life and death, to say nothing of the wasted time, effort, and resource involved in tracking and updating patient flow. Having the agility to react and update patient flow in real time is a significant factor contributing to Best-in-Class performance.

**Performance Management**

The old adage, what gets measured gets managed, is just as applicable in a healthcare setting as anywhere in the business world, if not more. Particularly when considering the increase in physician pay-for-performance programs, the ability to define and measure KPIs can be crucial for a healthcare organization to improve medical outcomes and eventually contribute to lower overall costs. Aberdeen's research shows that the companies performing the best, are also the ones most likely to have these operational KPIs defined and monitored within their organization (Figure 9).

**Figure 9: Best-in-Class Performance Measurement Capabilities**



Source: Aberdeen Group, June 2008

**Fast Facts**

Best-in-Class top data sources in use AND integrated into BI analytics:

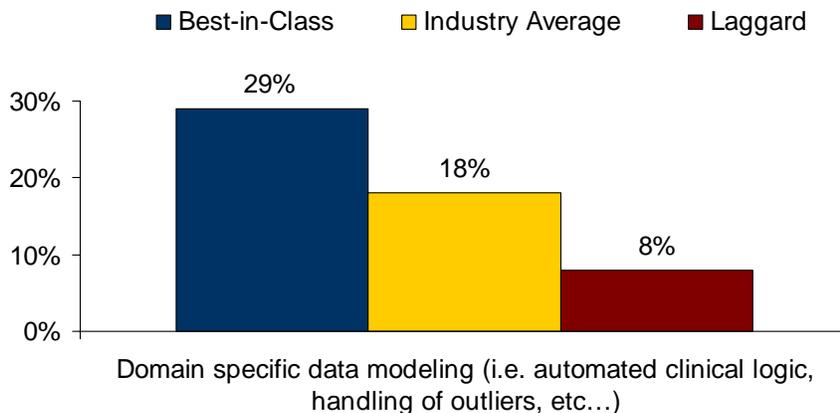
- ✓ Admission, Discharge, Transfer (ADT) system: 35%
- ✓ ER / ED system: 29%
- ✓ Electronic medical records system: 24%
- ✓ Financial / accounting system: 24%
- ✓ Radiology Information System (RIS): 22%

Whether the key metrics involve bed utilization, patient satisfaction scores, Average Length of Stay (ALOS), or some other performance indicator, the first step to improvement is measurement. Leveraging this visibility into numerous key performance indicators has led to Best-in-Class organizations driving substantial value from their BI deployments.

### Technology

Having built and invested in a foundation of internal capabilities, Aberdeen's research shows that Best-in-Class organizations are also leveraging several technology enablers in order to bolster their performance in BI deployment. Given that healthcare environments are inherently statistically driven, the ability to model key organizational data and forecast potential future threats and opportunities can be crucial for an organization to promote efficient patient flow operations and hospital administration. Domain specific data modeling tools enable providers to fully leverage the data at their disposal. By producing cleaner, more relevant data, these tools lay the necessary foundation for organizations to drive future value from current information. Best-in-Class healthcare organizations are 3.6-times more likely than Laggards to have this vital technological capability in place (Figure 10).

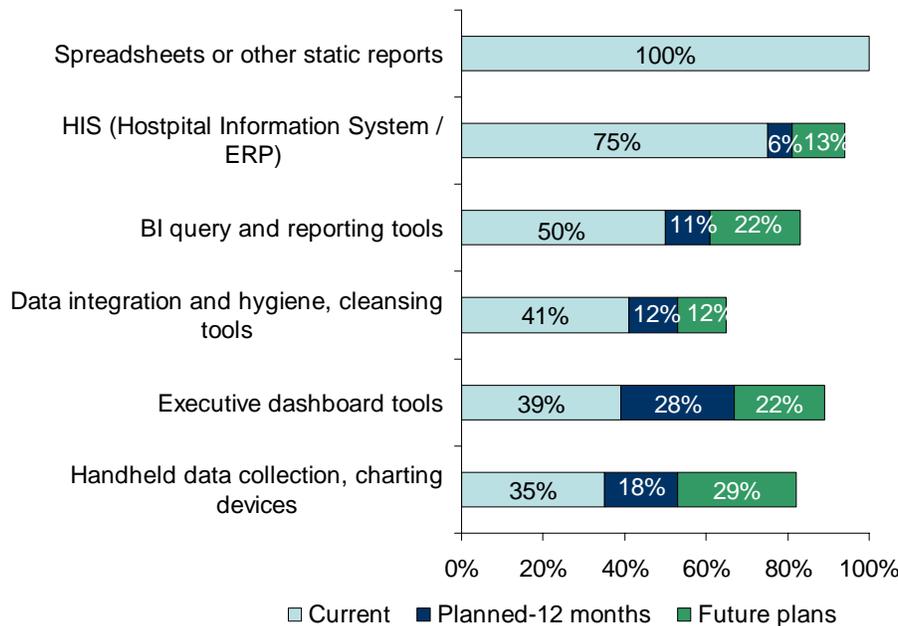
**Figure 10: Best-in-Class Technology Management Capabilities**



Source: Aberdeen Group, June 2008

The technology tools and solutions that Best-in-Class companies are utilizing to gain the aforementioned capabilities are numerous (Figure 11).

**Figure 11: Top Best-in-Class Current and Planned Technology Investments for BI**



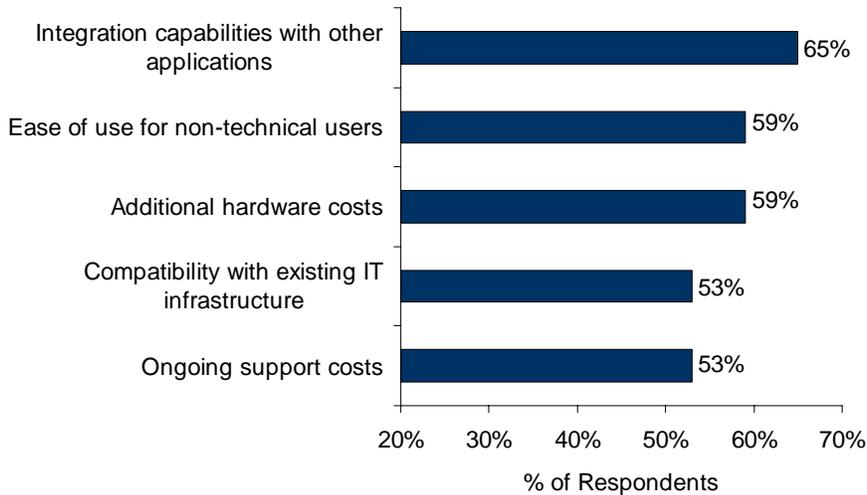
Source: Aberdeen Group, June 2008

Healthcare analytic capability involves several technology disciplines that span the entire range of information management and data flow within an organization, including:

- Standard spreadsheets, such as Excel® and other static reports that allow an organization to track and monitor data in a widely accepted format
- HIS technologies that incorporate data from multiple sources including financial, clinical, billing, nursing, etc.
- Data integration and cleansing tools that enable an organization to draw data in from multiple disparate and legacy data sources and cleanse the data in order to make it more manageable and ultimately more valuable
- Handheld data collection and charting devices that promote faster input and easier incorporation of crucial patient information into the overall systems
- Data capture via RFID technology, enabling tracking of patients and assets (such as drug carts, medical devices, equipment, etc.) throughout the facility or campus

In addition to delineating the technologies currently in use and planned for use, Best-in-Class survey respondents indicated a number of different criteria that guide their decision making processes when it comes to BI and analytical tools (Figure 12).

**Figure 12: Best-in-Class BI / Analytics Solution Selection Criteria**



Source: Aberdeen Group, June 2008

While hardware and support costs are always a concern with any technology implementation of this magnitude, the top feature that Best-in-Class organizations look for is the ability to integrate BI capabilities into existing applications. This speaks to how complicated many healthcare IT infrastructures are, and how many of these companies need a solution that can draw data from, and work with existing applications to deliver analytical value to the greater organization.

**Case Study — Lee Memorial Health System Increases visibility to Patient Satisfaction & Profit Margins through Business Intelligence**

As a leading not-for-profit community-owned healthcare provider, one of the primary aims of Lee Memorial Health System (LMHS) is to increase patient satisfaction. This measure is a top driver of profit margins – the key to giving back more to their community. This is akin to customer satisfaction in other industries, and as such, patient satisfaction is driven by key indicators that must be constantly measured, monitored, and acted upon, including:

- Decreased wait times
- Increased nursing-to-patient ratios
- Improved quality of care measures
- Lower cost and higher revenue-per-patient

*continued*

"Our BI system takes the power of information and decentralizes it for all departments that need it, without them having to come to decision support to get it."

~ Richard Senicola,  
Senior Decision Support  
Analyst, LMHS

### Case Study — Lee Memorial Health System Increases visibility to Patient Satisfaction & Profit Margins through Business Intelligence

In essence, the factors that drive operational efficiency and performance also drive patient satisfaction. This presented a need to tap into years of accumulated clinical and financial data in order to provide new and timely insights into the operation of the business for managers and staff who work directly with patients. Like most healthcare providers, LMHS has a large number of disparate IT applications to manage both clinical and business operations. While each individual application is outstanding at recording transactions for a given medical or business function, many were implemented before the need to have a holistic view of the business was recognized. LMHS struggled to deliver timely information that was easy to access and use by decision-makers.

By partnering with a BI application provider, LMHS was able to gain insight into information previously unavailable. This has resulted in several performance improvements:

- Increased patient satisfaction by reduction of waiting time
- Reduction of operating costs by increasing bed utilization
- Increased revenues by maximizing reimbursements
- Continual improvement of business efficiency by spending more time on intelligent analysis of task-specific data

The key to their success was the ability to identify the data necessary for a set of people who are tasked with specific goals (i.e. patient satisfaction) and deliver it within a very straight-forward environment that allows for analysis and decision-making by line-of-business managers and staff. This has proven to be far more successful than the previous process of having technical data experts drilling into massive sets of corporate data to answer point-questions from management.

### Aberdeen Insights — Technology

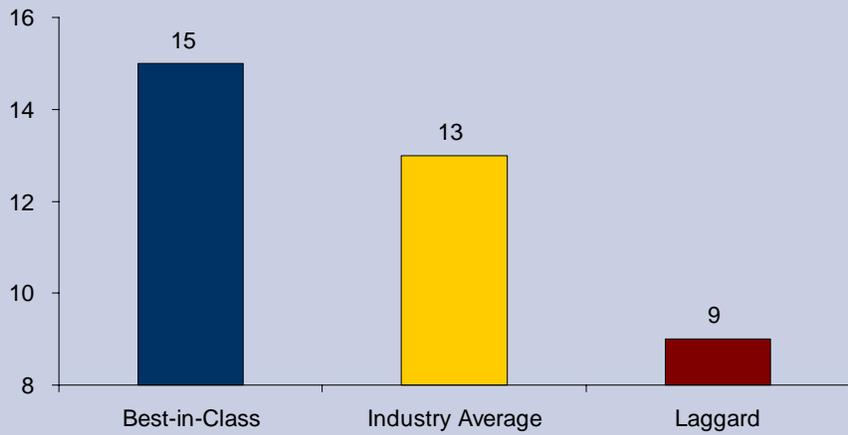
Hospitals and other provider environments are characterized by their complex IT infrastructures and challenges. Historically, many healthcare provider organizations have taken a "best-of-breed" approach when selecting software to run mission-critical systems. This has resulted in systems that, while strong in the execution of their intended tasks, are not capable of producing easily integrated data for analysis across multiple areas of the hospital.

*continued*

### Aberdeen Insights — Technology

This has resulted in the need for added IT resources in order to overcome the complex data integration tasks that must be accomplished. While this investment may seem daunting, interviews with respondents have revealed that the ends justify the means. Best-in-Class companies are likely to have the highest investment in IT resources (Figure 13).

**Figure 13: FTEs Deployed Per Facility for IT Purposes**



Source: Aberdeen Group, June 2008

## Chapter Three: Required Actions

Whether a healthcare provider is trying to move its performance in BI / analytics from Laggard to Industry Average, or Industry Average to Best-in-Class, the following actions will help spur the necessary performance improvements:

### Laggard Steps to Success

- **Establish a review process to revise and adapt critical measures / KPIs.** Only 19% of Laggard organizations reported having this capability, less than half as likely as the Best-in-Class. KPIs can include measures such as:
  - Adverse events per patient
  - Hospital bed utilization
  - ED patient wait times
  - Nurse staff retention rate
  - Patient satisfaction scores

As healthcare organizations grow and mature, the key metrics that matter will evolve and change frequently. Having a process in place to continually define and revise these KPIs will insure that the right metrics are being measured and monitored in order to achieve growth and success.

- **Develop a formal training program for educating clinical and financial users on information management procedures.** While a healthcare environment is ripe to drive benefit from information management and the use of analytical tools, prior Aberdeen research shows that many healthcare environments are lagging behind in terms of deployment age. Moreover, less than one-third of Laggard organizations have training programs in place to educate the end-users of this technology. By deploying BI tools “blindly” in many cases, Laggards are not equipping their workforces with the education required to achieve the benefit that these solutions promise. Providing a solid training program to deliver this education will enable Laggards to bring BI functionality to a wider audience within the provider organization and develop deeper levels of expertise, thus promoting more efficient use of analytical functionality.
- **Deploy data integration and cleansing / hygiene tools.** Another characteristic that many hospitals share with companies in the for-profit world is a disparate morass of back-end data sources and systems. Through organizational growth and the proliferation of technology, the IT infrastructure can become unwieldy, a problem that healthcare providers face as well. Data integration tools such as

### Fast Facts

- √ **61%** of Best-in-Class organizations have visibility into their continuity of care and case management, versus **35%** for all other organizations
- √ **24%** of the Best-in-Class have an established physician pay-for-performance program in place compared with **18%** for the Industry Average

Business Process Management (BPM) can help an organization bring together all the heterogeneous data sources and bring collective value from a confusing web of software. According to the research, only 23% of Laggard organizations are leveraging these tools. This represents a striking opportunity for Laggards to gain better control of their information infrastructure and drive the cost savings and patient satisfaction characteristics of a Best-in-Class organization.

## Industry Average Steps to Success

- **Improve real-time patient flow update capability.** Despite the time-sensitive, or in most cases time-critical nature of hospital operations, only one quarter of Industry Average companies had the ability to monitor and update patient flow information in real time. Through a combination of people, process, technology, and tools, Industry Average organizations need to start thinking of ways to update key patient flow information as close to real time as possible. Faster and more accurate information regarding patient flow will improve ED operations, promote better use of hospital assets, and in-turn help control some of the rising operational costs inherent in most provider environments.
- **Create a formal committee to define processes and procedures for data analytics facility-wide.** A problem that plagues organizations large and small is a lack of homogeneity in the processes used to govern information management across the facility. Industry Average organizations are no stranger to this challenge as less than one-third have established these cross-functional teams to help define analytical procedures. When the procedures for collection and analysis of clinical data vary substantially from the procedures on the financial side of the organization, it becomes that much more challenging to align clinical performance metrics with business metrics. By creating a team to evaluate how the data is collected, analyzed, and measured, Industry Average organizations will be able to create the type of goal alignment necessary for future growth.
- **Start evaluating hospital RFID systems for patient and asset tracking.** One of the more powerful tools for managing patient flow is an RFID system. This technology enables tracking of patients, helps insure better communication between hospital departments, and enables more efficient use of precious hospital assets. According to the research, only 17% of Industry Average providers are leveraging this technology. While RFID is certainly not a cure-all for all cost and patient care related challenges, it provides a markedly elevated level of visibility into the hospital operations and affords an organization the opportunity to identify issues in patient flow and inefficient use of assets, the discovery and management of which can lead to considerable cost savings.

### Fast Facts

- ✓ **33%** of Best-in-Class organizations are using advanced analytics applications **2.3-times** that of Laggard organizations
- ✓ **39%** of the Best-in-Class have deployed executive dashboard tools, **25% more** than Laggards

## Best-in-Class Steps to Success

- **Enhance patient and asset tracking capabilities.** Whether it is through the use of a specific technology such as RFID described earlier, or through the augmentation of operational procedures, all organizations, Best-in-Class included, can benefit from more formalized tracking capabilities. Despite the importance of keeping tabs on patients and critical hospital equipment, less than half of the Best-in-Class have formal capabilities in this area. Constantly updating and monitoring equipment inventories and establishing facility-wide procedures for patient identification and tracking will help all organizations better understand their operational processes and eventually increase patient satisfaction.
- **Implement departmental scorecard tools.** In order to promote better overall operations within the provider environment, each organizational silo (surgery, nursing, finance, etc.) can benefit from performance measurement. Whether the measurements are exclusively clinical, exclusively business related, or a mixture of both, dashboard and scorecard software can enable much better visibility and understanding of how certain departments are performing. The tools will help organizations define what metrics need to be measured, set targets for performance, and monitor that performance. By measuring and monitoring the performance of these various departments, the provider will be better positioned to aggregate these specific silo improvements into top line growth for the organization as a whole.

### Aberdeen Insights — Summary

Healthcare provider environments present a seemingly perfect scenario for justifying the investment in BI technologies, yet this industry has historically been one of the slowest to adopt. This conundrum has been fueled by past "best-of-breed" technology purchase behavior, a now diminishing lack of trust in electronic systems and data, and a lower investment in IT resources among Industry Average and Laggard providers. Internal and external pressures are converging to create the "perfect storm" of business and clinical drivers for renewed interest and adoption, and providers are experiencing different results based on the strategic and tactical actions they are taking.

From a technology perspective, providers must first overcome the challenges surrounding the integration of data from multiple disparate systems. Moreover, Best-in-Class organizations have shown the way to organizational and cultural changes that yield improved performance. The potential benefits of a well-implemented and deployed business intelligence solution are becoming more concrete, but the early-stage nature of BI within healthcare provider environments will continue to yield new insights and best practices over time.

*Send to a Friend* 

## Appendix A: Research Methodology

Between May and June 2008, Aberdeen examined the use, the experiences, and the intentions of 95 healthcare providers using Business Intelligence in a diverse set of organizations.

Aberdeen supplemented this online survey effort with interviews with select survey respondents, gathering additional information on companies' strategies, experiences, and results.

Responding enterprises included the following:

- *Job title / function:* Technical roles (i.e. CIO, IT manager) made up the majority of respondents at 50%. Other responding constituencies included clinical staff (i.e. physicians, nurses) at 20%, administrative staff (CEO, CFO, financial analyst) at 16%, and other at 14%.
- *Industry:* The research sample included respondents exclusively from healthcare industries. Stand-alone acute care hospitals represented largest segment with 51% of the sample.
- *Geography:* The majority of respondents (74%) were from North America. Remaining respondents were from the Asia-Pacific region (13%) and Europe (9%).
- *Company size:* Fourteen percent (14%) of respondents were from large healthcare organizations (annual revenues above US \$1 billion); 62% were from midsize organizations (annual revenues between \$50 million and \$1 billion); and 24% of respondents were from small organizations (annual revenues of \$50 million or less).
- *Headcount:* Sixty-three percent (63%) of respondents were from large organizations (headcount greater than 1,000 employees); 28% were from midsize organizations (headcount between 100 and 999 employees); and 9% of respondents were from small organizations (headcount between 1 and 99 employees).

Solution providers recognized as sponsors were solicited after the fact and had no substantive influence on the direction of this report. Their sponsorship has made it possible for Aberdeen Group to make these findings available to readers at no charge.

### Study Focus

Responding executives completed an online survey that included questions designed to determine the following:

- √ The degree to which BI is deployed in their healthcare operations and the financial implications of the technology
- √ The structure and effectiveness of existing BI implementations
- √ Current and planned use of BI to aid operational and promotional activities
- √ The benefits, if any, that have been derived from BI initiatives

The study aimed to identify emerging best practices for BI usage in healthcare, and to provide a framework by which readers could assess their own management capabilities.

**Table 4: The PACE Framework Key**

Overview
<p>Aberdeen applies a methodology to benchmark research that evaluates the business pressures, actions, capabilities, and enablers (PACE) that indicate corporate behavior in specific business processes. These terms are defined as follows:</p> <p><b>Pressures</b> — external forces that impact an organization’s market position, competitiveness, or business operations (e.g., economic, political and regulatory, technology, changing customer preferences, competitive)</p> <p><b>Actions</b> — the strategic approaches that an organization takes in response to industry pressures (e.g., align the corporate business model to leverage industry opportunities, such as product / service strategy, target markets, financial strategy, go-to-market, and sales strategy)</p> <p><b>Capabilities</b> — the business process competencies required to execute corporate strategy (e.g., skilled people, brand, market positioning, viable products / services, ecosystem partners, financing)</p> <p><b>Enablers</b> — the key functionality of technology solutions required to support the organization’s enabling business practices (e.g., development platform, applications, network connectivity, user interface, training and support, partner interfaces, data cleansing, and management)</p>

Source: Aberdeen Group, June 2008

**Table 5: The Competitive Framework Key**

Overview	
<p>The Aberdeen Competitive Framework defines enterprises as falling into one of the following three levels of practices and performance:</p> <p><b>Best-in-Class (20%)</b> — Practices that are the best currently being employed and are significantly superior to the Industry Average, and result in the top industry performance.</p> <p><b>Industry Average (50%)</b> — Practices that represent the average or norm, and result in average industry performance.</p> <p><b>Laggards (30%)</b> — Practices that are significantly behind the average of the industry, and result in below average performance.</p>	<p>In the following categories:</p> <p><b>Process</b> — What is the scope of process standardization? What is the efficiency and effectiveness of this process?</p> <p><b>Organization</b> — How is your company currently organized to manage and optimize this particular process?</p> <p><b>Knowledge</b> — What visibility do you have into key data and intelligence required to manage this process?</p> <p><b>Technology</b> — What level of automation have you used to support this process? How is this automation integrated and aligned?</p> <p><b>Performance</b> — What do you measure? How frequently? What’s your actual performance?</p>

Source: Aberdeen Group, June 2008

**Table 6: The Relationship Between PACE and the Competitive Framework**

PACE and the Competitive Framework – How They Interact
<p>Aberdeen research indicates that companies that identify the most influential pressures and take the most transformational and effective actions are most likely to achieve superior performance. The level of competitive performance that a company achieves is strongly determined by the PACE choices that they make and how well they execute those decisions.</p>

Source: Aberdeen Group, June 2008

## Appendix B: Related Aberdeen Research

Related Aberdeen research that forms a companion or reference to this report includes:

- [\*Data Management 2.0: Making Sense of Unstructured Data\*](#) July 2007
- [\*Delivering Actionable Information to the Enterprise: Does On-Demand Solve the Skill Set Shortage?\*](#) July 2007
- [\*On-Demand BI: Not Just for SMB\*](#) August 2007
- [\*Serving the Underserved: Is On-Demand BI the Answer?\*](#) August 2007
- [\*Enterprise BI: Comparing the BI Giants\*](#) September 2007
- [\*Smart Decisions: The Role of Key Performance Indicators\*](#) September, 2007
- [\*Measuring Marketing Performance: The BI Roadmap to Information Nirvana\*](#) October 2007
- [\*Operational BI: Getting Real-Time About Performance\*](#) December 2007
- [\*The Expansion and Contraction of Business Intelligence\*](#) January 2008
- [\*Managing the TCO of Business Intelligence\*](#) February 2008
- [\*Data Management for Business Intelligence\*](#) March 2008
- [\*Business Intelligence Deployment Strategies\*](#) April 2008
- [\*Financial Planning and Budgeting\*](#) April 2008

Information on these and any other Aberdeen publications can be found at [www.Aberdeen.com](http://www.Aberdeen.com).

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