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# Performance Management: Enterprise Performance Improvement through Business Intelligence Dashboards

A Carefx Issue Brief

## Turn disparate healthcare data into actionable insights with business intelligence

Business Intelligence (BI) is critical for achieving top clinical, financial and operational performance. The effective use of BI dashboards—from throughput, physician scorecards and patient experience to mortality, core measures and clinician-to-clinician comparisons—will help your organization realize its destiny in “simply advancing healthcare.”

Carefx, a Scottsdale, Arizona-based leader in providing interoperable workflow solutions, recognizes the power and potential of BI to overcome typical problems of fragmentation, duplication, inefficiency, errors and disparities in quality and outcomes while maximizing emerging opportunities for meaningful use, medical home and accountable care.

Carefx knows and understands BI from experience. In 2010, we forged a BI-focused partnership with the Cleveland Clinic, whose BI solutions Carefx has commercialized, while also meeting the BI needs of University HealthSystem Consortium, the University of Kansas Medical Center, Hartford Hospital and the University of North Carolina.

Carefx realizes that not all BI systems are created equal. To guide providers in BI system selection and implementation, *Enterprise Performance Improvement through Business Intelligence Dashboards* outlines five key BI differentiators—from single source of truth, top-down orientation and intuitive drill-downs to accelerate decision making, “datamarts” and addressing the needs of individual users.

The issue brief also offers providers multiple lessons learned and practical strategies for implementation, including alignment with mission, C-suite involvement, realistic expectations, integration with meaningful use and focus on process improvement.

Sharing their knowledge are Eric Leader, Vice President, Technology Architecture, Carefx; Howard Dresner, author, “Profiles in Performance: Business Intelligence Journeys and the Roadmap for Change”; and Tom Wadsworth, Principal, Business Intelligence, Carefx and former Senior Director of Medical Operations and Nursing at Cleveland Clinic.

Carefx is thrilled to share its experience and strategic advice on how providers can best select, implement, monitor and evaluate BI systems. We welcome your comments on the growing role of BI in healthcare, including underlying problems and pain points, functions, benefits, success factors and lessons learned.

Sincerely,

**Andrew Hurd**  
Chairman and CEO  
Carefx Corp.

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## Enterprise Performance Improvement through Business Intelligence Dashboards

### Opportunities and Challenges: The Evolution of Business Intelligence

*"[Business Intelligence (BI) has evolved from] an esoteric tool used by statisticians wearing white coats to a mainstream solution offering useable, practical and accessible tools and technologies."*

**Howard Dresner**

President  
Dresner Advisory Services, LLC

Business Intelligence (BI) has evolved from "an esoteric tool used by statisticians wearing white coats to a mainstream solution offering useable, practical and accessible tools and technologies," according to Howard Dresner, a 20-year BI veteran and author of "Profiles in Performance: Business Intelligence Journeys and the Roadmap for Change" (Wiley, 2009). Unfortunately, BI has penetrated only 20 percent of organizations, making healthcare what Dresner labels "a late adopter."

The good news is that leading healthcare organizations are quickly "making up for lost time" in the BI revolution, observes Dresner. Enterprises across the country, large and small, have implemented pioneering BI solutions to convert massive amounts of unstructured data from as many as a dozen systems into strategically relevant information for informed decision-making and action.

BI has also surfaced in recent forecasts and predictions.

- "Business and clinical intelligence will become actionable," according to healthcare provider predictions for 2011 from IDC - Health Insights analysts Judy Hanover and Lynne Dunbrack.
- Investments in BI and analytics will generate a more rapid return on investment, allowing hospitals to pinpoint savings not tied to reimbursement, says Charlie Rapiere, senior director of analytics at group purchasing organization VHA in an interview with *Becker's Hospital Review*.
- Increased mobile analytics, accelerated forecasting through analytics applications and linking of collaboration and social networking with BI are three developments seen by Gartner in "Predicts 2011: New Relationships Will Change BI and Analytics".

Analytics and predictive modeling require open-mindedness, according to Atefeh Riazi, CIO of the New York City Housing Authority. In a recent article by Linda Tucci in SearchCIO.com, Riazi even urges CIOs to start adding statisticians, mathematicians and sociologists to their staffs. "We have to get out of our comfort zone, which means IT is not about deploying hardware and software. It is about intelligence, which is why IT professionals had better understand how to use data," Riazi said. Analytics is going to take the IT profession "from the place of 'thinking' to what I call the wisdom phase. It is not that 'I think, therefore I am,' but that 'I know, therefore I am,'" she said.



#### Howard Dresner, President of Dresner Advisory Services, LLC

Howard Dresner (<http://www.howarddresner.com>) is President of Dresner Advisory Services, LLC, an independent advisory firm, and a recognized authority in the areas of business intelligence and performance management. He is the author of "Profiles in Performance: Business Intelligence Journeys and the Roadmap for Change." He spent 13 years at Gartner where he was a research fellow and lead analyst for business intelligence and served as chief strategy officer at Hyperion.

*“Integrating BI into the clinical workflow allows clinicians and executives to view performance metrics, such as core measures and costs, at any given point in time, leading to more informed, evidence-based decision-making and problem resolution.”*

**Eric Leader**  
Vice President  
Technology Architecture  
Carefx

Carefx, a leading provider of interoperable workflow solutions, has taken the lead in healthcare transformation and meaningful use of technology through BI, combining its concentration on improving the workflow of healthcare organizations with BI's insights into performance and efficiency. Its creative collaborations with leading healthcare organizations reinforce a long-standing strategy to enhance access to clinical information, share clinical information throughout an organization via its premiere Fusionfx solution suite, and move data across multiple organizations utilizing health information exchange (HIE) solutions.

“Carefx’s success in optimizing workflow for hospitals, health networks and individual clinicians motivated its executives to negotiate partnerships that would generate solutions to measure, drive and optimize clinical performance within a broad range of healthcare organizations,” says Eric Leader, Vice President, Technology Architecture at Carefx. “Integrating BI into the clinical workflow allows clinicians and executives to view performance metrics, such as core measures and costs, at any given point in time, leading to more informed, evidence-based decision-making and problem resolution.”

An effective BI system can, for example, determine how long patients waited for appointments in a hospital’s cardiac lab, as well as how many patients cancelled booked appointments. Executives and clinicians can then act on relevant information to reduce waiting times, improve patient satisfaction and safeguard revenues, according to Tom Wadsworth, Principal, Business Intelligence at Carefx and former Senior Director of Medical Operations and Nursing at Cleveland Clinic.

BI has already played a role in mediating organizational turf wars. “Absent BI, finance has often operated with its own view of the universe, while marketing has functioned with a competing view,” says Dresner. “These disciplines typically came into meetings with different sets of numbers and then invested weeks—sometimes months—debating the veracity and extent of an organizational challenge.” BI offers an alternative by “putting as many eyes as possible on a common set of numbers,” says Dresner.

Despite these gains, BI’s most significant challenge is in the realm of people and culture, according to Dresner. “A culture that embraces transparency and accountability, incorporates conflict resolution and aligns with mission offers the right context for BI,” he says. “A performance-directed culture requires changes in processes, perspectives and behaviors. Technology-led BI initiatives almost always fail because they try to function without a transformed culture, belief system and business processes.”



### **Eric Leader, VP, Technology Architecture, Carefx**

Eric Leader (VP, Technology Architecture, Carefx) brings a rich technology and engineering background to the Carefx team. Prior to joining Carefx, Mr. Leader served as Chief Technology Architect for Catholic Healthcare West (CHW), the largest non-profit healthcare provider in the southwest, where he provided strategic technology oversight for Information and Medical Technologies supporting CHW’s 45,000 employees.

Previously, he held senior engineering and management roles at Digital Equipment Corporation (now Hewlett Packard) and MicroAge. Mr. Leader’s current areas of research include technical architecture and social aspects affecting highly available applications, end-user engineering for clinical systems, and data-driven decision support in healthcare. He is a graduate of Arizona State University College of Engineering.

*“Organizations that refuse to use BI will become dinosaurs. If you don’t know what’s going on in your own organization, how can you compete, adapt to change and turn on a dime? However, unless you’re willing to work with BI in concert with other technologies, technology won’t help and could hurt, working as a weapon rather than a tool for change.”*

**Howard Dresner**  
President  
Dresner Advisory Services, LLC

The significance of BI to healthcare and other industries cannot be overestimated. “Organizations that refuse to use BI will become dinosaurs,” predicts Dresner. “If you don’t know what’s going on in your own organization, how can you compete, adapt to change and turn on a dime? However, unless you’re willing to work with BI in concert with other technologies, technology won’t help and could hurt, working as a weapon rather than a tool for change.”

“Once healthcare enterprises get their internal houses in order, or at least their internal IT systems they’ll be looking to take their systems to the next logical level; making sense of all the data they are amassing to more effectively and efficiently run their operations,” according to a recent report by Chilmark Research. “This will become increasingly critical as the industry moves to bundled payment models with shared risk. Calculating that risk will require data and lots of it. It may also require healthcare organizations to develop closer partnerships with payers for if it is one thing that payers understand, it is calculating risk, something that most healthcare organizations do a poor job of.”

## Core BI Differentiators

Carefx recently announced that it was granted exclusive license rights to market and further develop the BI dashboards that are a part of IntellisEPM, a Cleveland Clinic start-up that originally built the dashboards after more than 10 years of experience. To that foundation developed by IntellisEPM at Cleveland Clinic, Carefx is adding its own like-minded approach to workflow improvement, offering a BI solution that is characterized by multiple but essential differentiators:

### 1. Effective BI drives performance improvement and functions from the top-down

The healthcare industry must tap the power of BI to enhance financial and clinical performance, patient experience and operations, according to Andrew Hurd, Carefx’s Chairman and CEO.

That was the challenge of Cleveland Clinic, which sought to pinpoint what the organization had to accomplish each month to achieve optimum clinical and financial results. With few metrics and strategies to drive performance to start with, Cleveland Clinic typically evaluated performance based on whether a service, department or product line made or lost money, according to Carefx’s Wadsworth.

After some further experience, physician leaders and executives from finance and operations at the Clinic joined forces to identify metrics that would help the institution track and eventually help it generate positive monthly financial outcomes. The team then developed strategies to extract data from multiple, disparate reports for inclusion in monthly trend analysis.

After relying on these reports for months, the team realized the need for direct CEO involvement. Following a period of significant downturn in financial performance, the CEO established a governance structure that allowed for performance improvement to thrive across the organization.

“It wasn’t until the CEO got involved that Cleveland Clinic moved to a performance-directed culture with an actionable mission,” says Dresner. “Visionary leadership acted as a catalyst.”

*“Driving performance improvement with any tool—specifically BI—is as much a function governance structure of the organization and how the C-suite use the tools to drive performance as the tools themselves.”*

**Tom Wadsworth**  
Principal  
Business Intelligence  
Carefx

Cleveland Clinic CEO Toby Cosgrove, M.D., “owned” BI by clarifying its importance to the entire enterprise, notes Dresner. “By stating that the Clinic would be run via BI dashboards, people within the organization were eager to get up to speed and secure access to BI data and information,” he says.

**Lesson Learned:** Involve executive management and clinical leadership, as well as divisions, departments and product and service lines. “Driving performance improvement with any tool—specifically BI—is as much a function governance structure of the organization and how the C-suite use the tools to drive performance as the tools themselves,” says Wadsworth.

## 2. Effective BI is strategic and relies on a single source of truth

In a best-case scenario, BI is a top-down, strategically relevant tool that drives alignment, accountability and strategic indicators across the organization. Unfortunately, CEOs tend to take a different path. They commit to BI, purchase appropriate tools and then query executives, department heads and managers on which reports would most likely improve performance.

Carefx’s more sensible and realistic pathway, which was successfully implemented at Cleveland Clinic, involves building dashboards that support an organization’s strategic objectives. This approach offers the CEO and members of the C-Suite intuitive tools for understanding performance in the context of the organization’s strategic initiatives.

Executives and physicians who orchestrate performance improvement through BI also must isolate a single source of truth. For example, hospital finance and operations functions may depend on the same data sources to report on length of stay but tend to generate different numbers. The solution, says Wadsworth, is for everyone “to agree to a single source of truth so that no matter which department reports on length of stay, each party relies on a similar set of rules and exclusions.”



### Tom Wadsworth Principal, Business Intelligence, Carefx

Prior to joining Carefx, Mr. Wadsworth served as the Managing Director, Cleveland Clinic Business Intelligence (CCBI). He received a BS in Engineering from the University of Michigan in 1978 and an MBA from Case Western Reserve University in 1985. Prior to joining the Cleveland Clinic in 1993, Tom’s healthcare-related work experience included Senior Consultant with Ernst & Young (1985-1990), and Manager Decision Support at Mercy Health Services, a multi-hospital system (1990-1992). At the Cleveland Clinic, Tom served as Administrative Director Medical Operations (1993–2004), and Senior Director Medical Operations and Nursing (2005-2008). In his career, Tom has focused on the use of Information Technology to drive organizational alignment and accountability for strategic objectives and performance improvement. CCBI is a company of the Cleveland Clinic for commercialization of healthcare management innovations, including business intelligence applications. Tom is part of a team which has developed cutting-edge Business Intelligence applications for the Cleveland Clinic. Tom has presented nationally and internationally on this topic, including HIMSS, Gartner BI Summit, American Medical Group Association, Epic User Group and KronosWorks.

*“The best BI leverages data that already exists within the organization, organizes it in a way that facilitates decision-making and provides meaningful information.”*

**Tom Wadsworth**  
Principal  
Business Intelligence  
Carefx

Cleveland Clinic achieved gains through BI because “organizational activists” from finance and operations created dashboards that “enabled them to combine their views of the business and present a common theme to management,” writes Dresner in “Profiles in Performance”. Ultimately, this grassroots effort built a strong following among BI users and evolved into an enterprise-wide group.

**Lesson Learned:** “Performance improvement begins with the CEO who works with executives and clinicians to create tools that drive alignment, transparency and accountability across the organization and around the organization’s strategic initiatives,” says Wadsworth.

### 3. Effective BI offers decision-making speed via intuitive, click-of-a-mouse drill-downs

BI provides an alternative to plodding, cumbersome and time-consuming reviews of data and information. Within healthcare organizations, teams typically meet to review data, identify performance issues, conduct research and make plans to share results at a subsequent meeting. Such a process can sometimes drag on for as long as four to five weeks.

BI, in contrast, allows for intuitive, real-time drill-downs into data and information. Physicians, executives and managers might, for example, attend a meeting where they review system, hospital and product line performance. Using BI, they can easily identify which divisions, departments or product or service lines have reached peak performance or failed to meet benchmarks. Instead of waiting weeks for research, team members can answer performance-related questions on the spot within a single meeting.

Carefx’s BI approach accelerates decision-making by generating real-time snapshots of still-hospitalized patients, including the bed, attending physicians, notes at time of admission and data on readmissions. Executives and clinicians can go into the system at any time of the day and discover if a unit has fulfilled its core measures, such as whether or not a patient has received smoking cessation advice or pneumococcal vaccine, as well as the total number of inpatients with core measures already met, says Dr. Andrew Proctor, senior director of business intelligence, Cleveland Clinic.

**Lesson Learned:** “The best BI leverages data that already exists within the organization, organizes it in a way that facilitates decision-making and provides meaningful information,” says Carefx’s Wadsworth.

### 4. Effective BI relies on ‘datamarts,’ not data warehouses

Organizations have typically brought data sources and systems into massive data warehouses and then constructed dashboard applications. Unfortunately, building a large structured data warehouse can take two to three years and cost upwards of \$10 million, according to Wadsworth.

A more efficient approach, one that Carefx uses, is to build small “datamarts” focused on strategic issues such as patient access. Such datamarts can incorporate up to a dozen metrics related to issues like patient access, including the time required to book an appointment in radiology or laboratory.

A datamart also allows executives and managers to identify physicians who are difficult to access, which might, in turn, lead to coaching physicians on how they could improve access through open scheduling or expanded office hours.

At the same time, datamarts allow executives and managers to access and slice data on multiple levels—from a system and specific hospitals, to departments or individual clinician performance. An organization interested in a metric such as length of stay might cross-reference data to readmissions to identify physicians with low lengths of stay but high readmission rates, while also reviewing the relationship of length of stay and admissions across services.

At the Cleveland Clinic, which uses datamarts, a patient access application allowed for in-depth analysis of physician schedules, including number of patients seen, according to Dresner. Once departments learned they had missed the benchmark or were below average, they were able to address the problem. The result: dramatic increases in numbers of patients seen without increases in staff or costs.

**Lesson Learned:** “The most effective BI involves a single BI tool that sits on top of multiple dashboards,” says Carefx’s Wadsworth. “Data is pulled from multiple sources into a dashboard designed for a single executive or clinician who then drills down into the data to make more informed, evidence-based decisions.”

## 5. Effective BI is oriented to the needs of individual users

While BI dashboards must address strategically relevant topics, they must also deliver value and offer intuitive, easy-to-use access to individual dashboard users. Specifically, dashboards need an appropriate level of granularity. With its BI solution, Carefx believes that executives, for example, may need a limited amount of granularity, while department heads may want more detailed slices of data.

A CNO who wants to know hospital patient length of stay within units under each nursing director may request roll-ups of costs per patient day – actual versus budget – for each of several nursing directors. Nursing directors, in turn, may want to know costs per patient day for each nursing unit, while nursing managers may look at performance drivers even more deeply. Being off budget on overtime, for example, could be rooted in factors such as seeing more patients than anticipated.

Among the professionals who can benefit from BI are the following:

- CFOs and finance professionals
- CIOs, CMIOs and health IT professionals
- CEOs and COOs
- Clinical leaders
- Quality improvement professionals
- Compliance officers

**Lesson Learned:** “Design BI for individuals throughout the organization, as well as for the C-suite—CNOs, CFOs, CEOs, CIOs, and CMOs—who will use BI to make decisions that fulfill strategic objectives,” says Carefx’s Wadsworth.

## Looking to the Future

In considering development, implementation and management of BI systems, Carefx advises that you consider the following advice:

- **Align BI with the organization's mission.** "Develop a mission statement that tells people what you do," counsels Dresner. "Help people understand why they're there and how they can contribute. With strong mission statements, BI has a context for being. Among the slogans flowing from the mission statements of hospitals:
  - "We're here for the children."
  - "Healthcare the way you prescribe it."
  - "Exceptional skill. Extraordinary care."
  - "Leading with innovation. Serving with compassion."
- **Avoid the temptation to get caught within IT; look for partnerships across the organization.** In many organizations BI gets stuck within IT, making it difficult for executives and managers to communicate and translate business and clinical needs. Cleveland Clinic's BI implementation succeeded because two departments—finance and operations—chose to partner. Now, its BI initiative is led by three entities: medical operations BI, finance BI and IT—all governed by a four-member executive steering committee.
- **Think top down.** "Start with the strategic objectives of the organization—not KPIs," advises Wadsworth. "While you might find 50 metrics to measure patient access, it's best to choose three to five with the greatest promise for moving the dial forward."
- **Avoid unrealistic expectations; allow adequate time.** Organizations should take plenty of time to develop, test and promote BI systems. Dresner is convinced that creating a performance-focused culture to support BI could take years.
- **Integrate BI with meaningful use.** Carefx views meaningful use not as a euphemism coming out of the HITECH Act or a fulfillment of government requirements, but as a strategy for the optimum utilization of discrete EMR-based information for making process and workflow changes within the organization.
- **Promote BI as a process and a product.** "Make sure that executives, managers and directors reach consensus on the organization's strategic objectives and essential metrics for tracking," notes Dresner. "Then, look for opportunities to educate, train and build consensus."
- **Involve the C-suite from the get-go.** "If the CEO fails to pay attention to and use BI metrics, it's over," says Carefx's Wadsworth. "BI will work wonders if the C-suite understands, endorses and uses it."
- **Resist the temptation of equating technology with process improvement.** "Technology is no solution for deficits in process," says Carefx's Wadsworth. "While BI tools are a catalyst for change, you must be ready to act on information once you have it. The preferred approach is to first develop a strategy for using information and then work on making information more granular and timely."
- **Look for fresh opportunities to integrate BI into the organization.** Organizations should make effective use of BI as a component of annual performance reviews for executives, directors and managers.

## Resources

Applying Business Intelligence to the Needs of Healthcare Organizations

<http://www.healthleadersmedia.com/content/TEC-90944/Applying-Business-Intelligence-to-the-Needs-of-Healthcare-Organizations.html>

Business Intelligence for the Healthcare Industry

[http://www.ciohealthcaresummit.com/media/pdf/solution\\_spotlight/sap\\_healthcare.pdf](http://www.ciohealthcaresummit.com/media/pdf/solution_spotlight/sap_healthcare.pdf)

Hospitals Use Business Intelligence to Boost Patient Throughput

<http://www.healthcareitnews.com/news/hospitals-use-business-intelligence-boost-patient-throughput>

Business Intelligence Helps Connecticut Hospital Streamline ED

<http://www.fiercehealthit.com/story/himss-virtual-conference-business-intelligence-helps-conn-hospital-streamline-ed/2010-06-14>

Five Ways Business Intelligence Will Affect Pricing Negotiations

<http://www.beckershospitalreview.com/hospital-financial-and-business-news/5-ways-business-intelligence-will-affect-pricing-negotiations.html>

Business Intelligence Can Help Hospitals Process IT Data

<http://www.ihealthbeat.org/Perspectives/2008/Business-Intelligence-Can-Help-Hospitals-Process-IT-Data.aspx>

Using Business Intelligence to Improve Performance: Cleveland Clinic Tracks KPIs Daily to Measure Progress toward Achieving the Organization's Strategic Objectives

<http://www.allbusiness.com/company-activities-management/operations-quality-control/13711858-1.html>

Dollars and Sense: Business Intelligence and Financial Decision Support

[http://www.cmio.net/index.php?option=com\\_articles&article=24347](http://www.cmio.net/index.php?option=com_articles&article=24347)

BI Made Easier for Healthcare

[http://www.informationweek.com/blog/main/archives/2010/09/bi\\_made\\_easier.html](http://www.informationweek.com/blog/main/archives/2010/09/bi_made_easier.html)

Healthcare Providers' Interest in Business Intelligence Growing

[http://www.informationweek.com/blog/main/archives/2010/09/bi\\_made\\_easier.html](http://www.informationweek.com/blog/main/archives/2010/09/bi_made_easier.html)



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