

Business Intelligence: An Essential Tool for Every Healthcare Organization



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Market pressures continue to make it harder for healthcare organizations to maintain a positive bottom line. Decreasing reimbursements, increased costs, and the desire to increase quality at any expense are having a major impact on the bottom line. Organizations are investing millions in computer systems, diagnostic technology, and preventive care programs in an attempt to meet organizational goals. Are they working?

This white paper provides an overview of Business Intelligence and its potential for optimizing the operations of a healthcare organization for the benefit of all stakeholders.

Across the healthcare industry, it seems the verdict is out on how best to approach the sweet spot of revenue, cost containment (productivity), and quality. Many of us use our experience and follow the lead of others when it comes to the direction of our specific organization. However, we are not a franchise, and formulas that others use do not always apply, especially in healthcare. The approach of “following others” often results in suboptimal performance. Because each provider environment has its own vision, demographics, medical staff, and other factors, we find ourselves unique in the healthcare industry and require an individual approach when striving for success.

Business Intelligence provides an organization with the ability to:

- analyze hospital operations
- compare your operations to best practices
- make projections and decisions based on fact
- evaluate the results of past decisions so that necessary adjustments can be made.

The foundation of a sound business is based on the simple model of Plan, Do, Check, and Act. Why should healthcare be any different? Successful completion of each of these steps requires accurate data and more importantly ... Information. A Business Intelligence program within your organization cannot only provide the detailed data for analysts within your organization but also provides management with information to monitor performance through Executive Dashboards. Dashboards can be customized, providing the CNO with specific information about nursing operations, for example, while the CFO's dashboard monitors reimbursement and financial indicators.

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Why Business Intelligence?

Information is key to a successful business. Large companies like McDonald's, Walmart, and thousands of other organizations process data continuously, providing management with critical information to make appropriate operational adjustments. The individual transactions (data) provide the foundation from which the analysis is performed and management dashboards are derived (information).

Appropriate summaries of the billions of pieces of data into useful and actionable information is what makes one organization successful while a similar organization in like conditions is not.

In the healthcare industry, we have a much different set of data that also requires analysis. But like other industries, healthcare also focuses on:

- revenue
- expenses
- utilization
- quality

The primary difference in healthcare is that executives must focus on using information to influence behavior of a broader set of constituents. These constituents include, but are not limited to:

- physicians
- government agencies
- community leaders

Sample Information Obtained from a Business Intelligence Solution

- Clinical, Financial, Business Dashboards
- Quality Scorecards
- Market Analysis
- Revenue per MDC, DRG, ICD9, Payer, Product Line, Physician, Cost Center
- Cost per MDC, DRG, ICD9, Payer, Product Line, Physician, Cost Center
- Profitability by MDC, DRG, ICD9, Payer, Product Line, Physician
- Departmental Productivity
- Payer Analysis (AR, Expected versus actual payments)
- Government Quality Indicators (JCAHO)
- LOS Analysis
- Day of Stay Analysis
- Care Plan Monitoring

The “Intelligence” of Business Intelligence

Data within a healthcare organization originates from numerous systems including:

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| ▪ Clinical / Electronic Medical Record Systems (EMRs) | ▪ Accounts Payable |
| ▪ Departmental Systems (Lab, Radiology, etc.) | ▪ Acuity |
| ▪ General Ledger | ▪ Contract Management |
| ▪ Payroll | ▪ Plus external benchmarks |

The data forms the foundation from which operational and strategic information is derived. Business Intelligence systems are designed to accept data from any source and transform that data into information. As an organization grows, coordinating the sources of data into a properly designed BI solution can be easily augmented to accommodate new insights into business trends. The value attained from these various data sources isn't necessarily from the data itself. The value in BI solutions is in combining various data sources into one view so that cause and effect can be evaluated.

Many of the source systems have robust reporting tools that can provide information specific to that data feed. For example:

- How does changing a clinical process for doctors and nurses impact our quality score?
- How does that score compare to state and national benchmarks?
- What was the cost to the organization in making that change to the process?
- Is there a correlation to that score with staffing ratios, quality of care, and patient surveys?

All of these questions are easily answered in a well designed “Data Warehouse / BI solution

A sampling of transformational tools applied with (or external to) a BI solution includes:

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| ▪ data summarization | ▪ DRG |
| ▪ trending | ▪ physicians |
| ▪ case mix index | ▪ productivity |
| ▪ cost accounting | ▪ quality scorecards |
| ▪ profitability of payers / product lines | ▪ care path development / monitoring |

All of this information is available for inclusion into Management Dashboards which are customizable by individual. Each manager within a healthcare organization can evaluate specific information pertaining to his area and monitor actions taken to achieve a higher level of performance.

Foundation of Business Intelligence

As mentioned above, Business Intelligence starts with the data collected by the organization. In most cases, the more data that is available, the more robust your BI solution will be.

Terminology for Business Intelligence applications has been watered down over the years but for the purposes of this discussion, the foundation of the BI solution needs to be a robust Data Warehouse. The classic definition of the data warehouse focuses on data storage.

However, the means to retrieve and analyze data, to extract, transform and load data (ETL), and to manage the data dictionary are also considered essential components of a data warehousing system.

There are several potholes in the road to a successful Data Warehouse / BI system that need to be carefully avoided. Arguably, the biggest issue that must be addressed before information is produced from your new BI solution is data integrity. The computer industry adage, “Garbage In Garbage Out” has never been more applicable than in the world of Business Intelligence. A good BI solution must not only collect data from the various sources that are available but must also verify the accuracy of the data coming into the data warehouse. In some cases, the BI solution must also employ “data scrubbers” that help correct data quality issues.

Business Intelligence systems are designed to accept data from any source—internal or external to the organization—and transform that data into actionable information.

Another Data Warehousing tool that is often found in the foundation of a good Business Intelligence solution is the ability to perform data mapping. Data should be related to others types of data. However, because a specific element is called one thing in one system and another thing in another system, the correlation of data is lost. An example of this situation may occur when a fast food restaurant explores the sales volume of French fries. Without performing data mapping, the sales volume may be underestimated because the term “American fries” or “*pommes frites*” may not be captured when requesting sale volume for French fries.

Approaches to Business Intelligence: “Build” vs. “Buy”

Business Intelligence has many definitions. But ultimately, it is the umbrella from which Data Warehousing, Business Decision Support, Clinical Decision Support, Data Marts, Dashboards, and Executive Scorecards are housed. Many books and white papers have been written on these topics, and approaches to a robust BI solution are varied.

Like most technology solutions, implementing Business Intelligence starts with a “build” versus a “buy” decision. A framework of the decision process is presented below:

Build vs. Buy		
Key Considerations for implementing Business Intelligence tools		
	Positives	Negatives
Build	Ultimate flexibility	High IT staffing costs High cost for BI software tools High ongoing software maintenance (18-20% of purchase price) Difficulty in obtaining consensus High ongoing support costs
“Buy” Options:		
from Healthcare BI Vendor	Healthcare Model Healthcare Terminology Medium flexibility Predefined solution	Medium IT staffing costs High cost for initial purchase of software Solution often focused on one aspect (clinical, financial, ERP) High ongoing software maintenance (18-20% of purchase price)
from Business BI Vendor	Sophisticated Tools Large resource pool in IT Industry	High IT staffing costs No healthcare knowledge High cost for initial purchase of software High ongoing software maintenance (18-20% of purchase price)
from ASP Provider	Sophisticated Tools Large resource pool in IT Industry Low cost Quick startup	Less Flexibility Do not own the software Heavy reliance on vender

Implementation of a BI solution can take many forms depending on your Build versus Buy strategy. Many BI initiatives have failed miserably by trying to design the ultimate solution before rollout. Because of constant improvement to BI tools, a thorough design quickly becomes outdated due to new technology or a change in the business. A BI solution must be nimble and quick to respond. The focus on a BI strategy should be on quick and continuous wins for the customer in the form of new and timely information.

Conclusions

Business Intelligence is an essential element in any organization. A successful management team must have accurate and timely information to lead an organization through the challenges found in the

healthcare industry. At a minimum, a Business Intelligence solution must be designed to provide immediate value to the organization while at the same time incorporate a high degree of flexibility to address future information requirements.

About the author:

Colin Korschak is a Partner with DIVURGENT and leads the Advisory Services Practice. He is a decisive, results driven leader with demonstrated success in delivering multimillion dollar consulting engagements on time and within budget, while maintaining client satisfaction. He is a registered Pharmacist, possesses an MBA in health services administration and is a Six Sigma Black Belt. Colin is an adjunct professor at Old Dominion University, teaching coursework on the topic of “Performance Improvement in Healthcare”. Colin is a fellow in the American College of Healthcare Executives (ACHE) and the Healthcare Information Management and Systems Society (HIMSS) and is the Immediate Past President of Virginia HIMSS where he was recently named the Chapter Leader of the Year.

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