

Improving Business Intelligence: The Power of Metrics

Improving BI: The Six Sigma Way

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- DM Review Online, August 27, 2008

The *Six Sigma Way* for improving business intelligence (BI) quality is a program that is rigorous, structured, iterative and based on metrics. In this column, I will focus on the metrics. Why do we need to base the improvement program on data? What are some of the metrics that are crucial to improving BI quality? What should be measured and how do we measure? How do metrics fit into a BI quality improvement program?

Metrics and Improving BI

Why Metrics?

Metrics are important in creating an effective and successful program for improving BI quality. First, it is important to understand and define BI quality and then to decide what actions should be taken to make it better. We define quality by using metrics. It is not sufficient to say that the quality is good or bad. If organizations make changes that seem likely to impact BI quality, they need to be able to measure the impact of those changes. That means that they must be able to measure quality before and after such a change. Organizations need to be able to answer such questions as:

- How effective was the change?
- Is the result worth the risks and the costs incurred?
- Are the positive effects sustained over time?

Adopting an effective improvement program for BI requires:

- A clear definition of both BI quality and the factors which impact BI quality; and
- Some way to measure BI quality and the impacting factors.

It may be determined that in order to meet industry standards, an organization should add two steps to the development process. We will use metrics to both determine that a change is necessary and also to measure the impact of the change on BI quality. To do so, we:

- Audit the development process;
- Measure the results of the audit against a scale of standards for the industry;
- Identify, measure and document changes made in the process; and

- Measure any resulting changes in BI quality.

The Improvement Process

Metrics are used for BI quality and for the factors that influence quality in an iterative process to improve BI. The basic steps in that improvement process loop are:

1. Measure the current BI quality,
2. Make a change to an impacting factor and
3. Determine the effects on the BI quality.

The Six Sigma Breakthrough Formula

The breakthrough formula, that is often used in general business Six Sigma programs, is a foundation for my proposed Six Sigma BI Continuing Improvement Model (BI-CIM). The formula is: $Y = f(X) + E$. It defines the relationships between BI quality and the factors that cause or impact quality. The formula may be called breakthrough because the improvements are often dramatic. The formula, as I apply it to BI, means that quality (Y) is a result of, and dependent on, all the impacting factors (X). Y is the quality of the BI product. X includes all those components that cause or impact product quality. E is the uncertainty factor. Because the Six Sigma BI continuing improvement program discussed in this column is based on the breakthrough formula, it is important to define Y and X and the metrics for X for Y.

Measuring BI Quality

The Y Factors

Quality of BI is defined in terms of customer perceptions. What factors are perceived to make up quality in the view of the end user, i.e. the BI customer? (The organization should also be considered a customer, but we will not address that in this column.) A tentative list of the factors critical to quality (CTQ) for BI for the end users are:

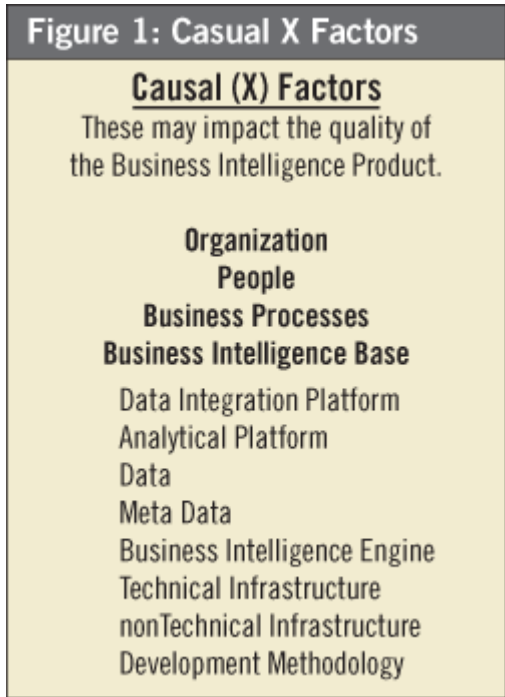
- Performance,
- Reliability,
- Quality of Information,
- Meets Business Requirements,
- Format,
- Velocity,
- Availability and Comprehension and
- Support and Training.

The metrics chosen for each of the CTQ factors should meet certain criteria. For example, they should be easy to understand. In addition, an individual or organization should be able to identify and easily collect the data for measurement. Response time is good a metric to choose for performance, because it fits all of the four qualifications:

1. Response time is important to the customer.
2. The customer can easily explain their requirements in terms of how fast they need an answer to a query.
3. Response time is easily defined. The most common definition is time from the key-in of the request to the time an answer is presented.
4. The data is easily collected from currently available logging and other operations tools.

Measuring the Causes of BI Quality

First we need to identify the causal and impacting factors for BI quality. Consider the list in Figure 1 as a starting point.



Metrics that may be used to measure each of the X factors have been identified. They are used in the proposed Six Sigma BI-CIM. The first X factor which I will discuss in more detail is the *organization*. This will include identification of the metrics which may be used to measure the impact of the organization on BI quality.

There are several points to keep when mind in measuring any of the causal or impacting X factors:

- Characteristics and attributes are audited.
- Results for the organization are compared against a scale for the industry.
- The success or effectiveness of each component is determined by comparing the organization audit results to rating standards.
- The audit results for the BI component are used to determine whether there is a need for change in order to improve BI quality.

The *organization* component, which is the first topic for review, is probably the most difficult to change. It is possible, however, for some characteristics of the organization to dramatically impact BI quality. Therefore, it is important to try to make changes, if necessary.

Metrics to Assess the Organization's Impact on BI Quality

How do we know what factors may be influencing BI quality? Why are we not meeting the potential? If there are problems, what factors are causing those problems?

The organization is probably the most pervasive and crucial of the X factors which impact the quality of BI. Therefore, it is important to identify and understand the characteristics of the organization which are most closely correlated to BI quality. Then, it may be possible to make those changes which could improve BI. The characteristics of the organization which are most closely tied to the quality of BI are:

- Integration of BI into the organization,
- Organization planning,
- Focus on strategic and tactical goals,
- Understanding and support for BI,
- Communications and training,
- Organizational structure and
- Organizational culture.

In the Six Sigma BI-CIM, these characteristics are translated into metrics by developing standards and rating scales that may be used for assessment of the organization.

My next column will continue with a discussion of the first characteristic: integration of BI into the organization.

Figure 2: Integration of BI into the Organization

5	Outstanding: Process integration, analytic BI and organization with Six Sigma initiative
4	Excellent integration: Common awareness and use of BI
3	Good: Integration and some shared BI across the organization
2	Tactical use of BI
1	Departmental BI
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