

A Six Sigma Initiative for Business Intelligence

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Applying Six Sigma principles to business intelligence requires strong management support and a recognized Six Sigma action program.

Achieving business intelligence excellence means pushing quality to new levels through the application of Six Sigma principles. This article describes a Six Sigma initiative.

About-Face for Business Intelligence

Information technology has been caught up in a rapid race to create more and more new business intelligence applications. There is no question that the needs for business intelligence are critical and the push from the business community and information technology management is strong. However, we have completely bypassed that stop in the road where we critically assess the quality of the business intelligence being produced. Follow-through and support for the customer post-delivery of the business intelligence application has been minimal, at best. Service level agreements, where they exist, usually provide limited troubleshooting remedies for the most basic of customer issues. The value in business intelligence lies not just in a continuing stream of new applications. Improving the creation process and the current infrastructures and systems should be a priority. There is a real value that is hidden in the current applications and asset base. Improving the process and the product and extracting that hidden value are keystones for a Six Sigma business intelligence initiative.

How do we achieve the highest quality business intelligence? A Six Sigma program clearly identifies and recognizes *the customer* as the focus for business intelligence and uses metrics to ensure that customer needs are defined and satisfied. Just as the organization must concentrate on satisfying the requirements of the external customers of the business, information technology must apply those same levels of concentration and professionalism to satisfying the needs of the internal customers for the business intelligence product. Six Sigma programs have proven extremely successful in other parts of the business. This customer-focused, metrics-based approach can be used just as successfully in the business intelligence arena. The first step is to define a Six Sigma program for business intelligence.

The Six Sigma Initiative

Pursuing Six Sigma business intelligence in any meaningful way requires a program that is recognized, understood and has strong support from management at the CIO level. There are a number of routes to success, but the most likely path is a formally adopted Six Sigma business intelligence initiative. The results will, most likely, include some significant changes in business intelligence infrastructures, systems and development methods. Information technology best practices, standards and business intelligence application methodologies will be directly impacted. The business intelligence direct customers and, in fact, everyone who creates, manages and uses business intelligence within the organization will be impacted. Each will be asked to understand, agree and participate in achieving Six Sigma business intelligence for the organization.

The Six Sigma business intelligence initiative requires at least the following:

- Strong management support
- A management sponsor
- A Six Sigma business intelligence team
- Trained resources to assist in business intelligence project development, customer CTQ monitoring, and business intelligence audits
- A clearly defined Six Sigma action program
- Training for the team and organization

- A communications and marketing program to inform everyone of the goals, principles and organization impacts

Six Sigma Terminology. There are some basic terms that have been coined within Six Sigma, and you should consider making them part of your own program. It should be easier to communicate program goals and methods using terms that already have established definitions and application to the program. Even though it may seem strange to label a Six Sigma expert as a Black Belt, there is industry recognition of the role. Since Six Sigma has been recognized and well accepted in the business world, officially adopting the terminology will also communicate the importance and something about the methods for the Six Sigma business intelligence initiative. A few of the most helpful of these words concern the roles and responsibilities of the people involved. It has become customary to label skill levels for the people involved with martial arts terms (e.g., a Six Sigma Black Belt has the expertise of a master, and for lesser degrees of mastery, the Green and Yellow Belts). These labels generally refer to mastery of the techniques and statistics involved in the Six Sigma programs. Other terms that will be helpful and can readily be incorporated into the Six Sigma business intelligence Initiative will be discussed in the following sections. Most of these relate to methods and processes (i.e., including DMAIC, CTQ and the process X and Y's). You will need these to define and describe the Six Sigma methods and principles to be used.

The Six Sigma Business Intelligence Team

Establishing the Six Sigma business intelligence team is the second step in pursuing a Six Sigma program. The first step is the recognition of the need for such a program. The team cannot be created without the support of executive-level management. The next requirement is the identification of a manager sponsor who is high enough in the corporate structure to support the team requirements, as they are recognized. The Six Sigma team should be composed of the sponsor, the team leader and several well trained team members who will be responsible for implementing the preliminary program. The most likely candidates for the team positions will be people who currently have responsibilities in using, creating and managing business intelligence. If chosen from this business intelligence arena, however, each one must be capable of stepping back and objectively assessing the processes and products. There may be some value in adding team members who have not been actively involved in creating and managing business intelligence in order to ensure an added level of objectivity for the team.

There are several aspects of the Six Sigma team that should be defined at the beginning.

Term and participation of team members. The members of the initial team should be full time, with each team member assigned for the term of the initial program definition. However, once the initial goals of the Six Sigma initiative are met, then much of the Six Sigma responsibility will be transferred to those who create, manage and use the business intelligence. However, there will still be a continuing need for the expertise from a support level Six Sigma team.

Training. For the team, there should be a formal and rigorous training program – in Six Sigma principles, processes, and business intelligence best practices and methods. There should also be introductory training for those involved in the current business intelligence operations world. As the Six Sigma initiative progresses and there is more and more involvement by those who are part of the current business intelligence operations, then the training for them in the new methods and practices should be intensified.

Responsibilities of the Six Sigma business intelligence team. The initial team will define and set in place the Six Sigma principles and practices required to reach and maintain Six Sigma-level business intelligence. They will provide the Six Sigma foundation (e.g., identification of customers, the factors that are critical to quality for those customers and all the relevant metrics and processes for Six Sigma business intelligence). This will include all the analysis, prototyping and incorporation of the proven metrics and processes into the business intelligence standards, methods and best practices for the organization. Moving into the next stage of continuing operations, the team will be transformed and take responsibility for providing expert advice and support for the business intelligence community. This "post implementation" team will also monitor results and ensure that the Six Sigma program stays on track.

The Six Sigma Business Intelligence Program

Developing the Six Sigma methods, metrics, best practices, and tools for use in a continuing Six Sigma business intelligence program is the paramount role of the Six Sigma team. The initial work of the team requires the creation and testing of principles and processes that can be successful in creating and managing Six Sigma business intelligence. The process should incorporate the best of the Six Sigma industry experience, the organization assets and culture and the business intelligence industry best practices and knowledge base.

Some of the tenets and processes of the Six Sigma business intelligence program are discussed in this section.

Focus on the Customer. We need to identify and describe the customer for business intelligence. There are two categories of direct customers for business intelligence – the end user and the organization. The end users are the people and systems who directly use the business intelligence product in the operations and management of the business. It is also important to designate the organization as a customer. Only at the organization level will there be a recognition and definition of umbrella factors, such as alignment of business intelligence with the business needs, including the satisfaction of overall business objectives.

Define the factors that are critical to quality for the customer. One of the most crucial of the jobs of the Six Sigma team is to determine what the factors are inherent in the business intelligence product that reflect what is critical to quality for the customer. (CTQ is another of those standardized Six Sigma terms.) The goal of the team should be to identify and define five to eight core level factors that can be measured and provide a template. These critical to quality factors for the customer are called the inputs or X factors. They will be translated into metrics that can be used to monitor customer satisfaction and the quality of the business intelligence. In defining these factors and associated metrics, we should keep in mind both the customer perception of quality and what is realistic and achievable within the constraints of technology and organization resources.

Some examples of CTQ factors that might be identified are:

For the Category 1 Customer (i.e., the end user)

- *Performance* – Response time is the probably the most relevant performance factor for the customer (i.e., time from request/query for information to receipt of the information).
- *Quality of Information* – Is the information accurate, timely and clear?
- *Meets Business Requirements* – Does it satisfy the requirements that were defined initially; and we might possibly ask: Can it meet expanded requirements with minor enhancements?
- *Format* – Is it intuitive and easy to use, from simple reports to power user analytics?
- *Velocity* – How soon is the data available (i.e., from data entry into the system to user accessible)?
- *Availability and Comprehension* – Is the desired information available? Do we have all of it?
- *Support and Training* – Do the users get help when they need it?

For the Category 2 Customer (i.e., the organization)

- *Satisfaction of Business Objectives* – Do the available information and analytics satisfy the organization business goals (i.e., alignment with business goals)?
- *Quality of Information* – What are the expectations of management? Is the information accurate, timely, integrated and up to date?
- *Velocity* – How soon is the data available (i.e., from data entry into the system to user accessible)?
- *Availability and Comprehension* – Is the desired information available when it is needed? Do we have all of it (i.e., the data warehouse – comprehension and accessibility of "integrated information")?
- *User Understanding and Satisfaction* – Are the service level agreements for end users accomplishing the goals? Are users being trained? What is the Category 1 customer satisfaction level?
- *Cost to Benefits Received* – Can we afford it? Is it worth it?

The team needs to identify a set of these factors that can be generally used within the business intelligence continuing operations. The identified factors must then be tested to ensure that they do, in fact, capture the critical to quality requirements for the business intelligence customer.

Define the factors that impact and cause the fluctuations seen by the customer. Perhaps the most difficult of the tasks in a business intelligence Six Sigma program is to determine the exact causes of the quality issues seen by the customer. Once identified, the solution may be quite easily achieved. However, the business intelligence asset base is complex and difficult to analyze in any comprehensive way. These causal factors may be labeled Y or output factors in Six Sigma terminology.

Translate the X and Y factors into meaningful and relevant metrics. Six Sigma principles are based on metrics and statistics. One of the most difficult and the most basic responsibilities of the Six Sigma business intelligence team is to translate the identified X and Y factors into meaningful metrics. The X factors, used to monitor quality for the customer, may be measured in ways that are relatively direct and supported by metrics that are (or could be) collected by information technology operational areas. However, the Y factors, and relevant metrics, may not be so easily identified. An audit of the business intelligence assets may be the most successful way to uncover and provide measurements for these Y factors. The Six Sigma team should conduct a pilot business intelligence audit and extract relevant causal factors, metrics and methods for a continuing Six Sigma process.

Analyze, test and validate the X and Y metrics. Once the metrics have been identified and collection of the numbers has begun, then the Six Sigma team needs to determine the validity of the metrics. This should also include such topics as setting Six Sigma quality levels and tolerances. For example, in defining the response times metric for the CTQ factor, performance, we need to determine what represents quality. Does the customer need at least a 3-second response time for a certain category of queries? The metric levels and tolerances should:

1. Stipulate exactly which queries fall into the defined query category.
2. Define the percentage of queries, based on specific measurements over defined time periods, that must meet or best the 3-second response time. In addition, there must be a designation for exactly what level of deviation is allowed (i.e., if a single response time is 10 seconds, will we trigger an event to search for cause?).

Design and prototype the processes and methods for continuing operations. The Six Sigma X metrics should be incorporated into continuing operations through the use of templates, such as those for service level agreements. The methods for collection, analysis and response to these metrics should be defined and quantified. The metrics, the relevant statistics and processes should be tested and validated using several sample (i.e., pilot) business intelligence applications. The Six Sigma team needs to use business intelligence audits to ensure that they can identify, prioritize and resolve problems with defined and relevant Y level metrics. The team also needs to create a program for conducting audits for continuing improvement to business intelligence.

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