

# Establishing a **Culture of Measurement**

■ **A Practical Guide to BI**

**A White Paper**

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## The Business Intelligence Improvement Cycle

Gartner, an information technology research firm, coined the term “business intelligence” during the 1990s. Business intelligence (BI) generally refers to the process of transforming the raw data companies collect from their various operations into usable information. Since data in its raw form is of fairly limited use, companies are increasingly electing to use business intelligence software to realize their data’s full potential. BI software comprises specialized computer programs that allow an enterprise to easily aggregate, manipulate, and display data as *actionable information*, or information that can be acted upon in making informed decisions.

For example, let’s consider the data collected at a supermarket. Tens of thousands, or even hundreds of thousands, of transactions are recorded at the checkout counter every day. Looking at this transactional data in its raw form, one could glean basic information such as which item was sold, when it was sold, and how much it was sold for. However, by implementing BI software, the supermarket can turn that raw product data into information and use that information to gain more profound insight into their business. In addition to determining how many containers of milk were sold on any given day, the supermarket can determine bigger-picture insight such as how discounts and promotions impact sales trends, which items are selling best in each department, and which of their store locations is best at selling a specific product line.

Armed with this knowledge the supermarket’s management can better plan for the future. By tracking buying trends of the customers, the purchasing department knows which products to stock up on. Moreover, management can obtain such information as products that are commonly purchased together, like hotdogs and mustard, so that they can better position them on the shelves, thereby increasing revenue. Promotions that do well in impacting sales in a test location can be replicated across the chain in order to boost sales and profitability.

By providing this type of window into vital information, BI enables companies to improve the way they do business. Companies are empowered with the ability to offer products and services at the lowest possible cost and with the greatest amount of efficiency and productivity possible – while returning the highest revenues and profits. Companies implement BI effectively through a four-phase business intelligence improvement cycle (BIIC).

## The Four Linked Components

A healthy BI strategy should be viewed as the sum of four major components that fit together in a constant cycle. These four components are Measure, Analyze, Plan, and Improve.



### Measure

The measure phase is by far the most widely deployed and far-reaching component of business intelligence. Think of the process of establishing a BIIC as blowing up a long, thin balloon. As you inflate the balloon, the part closest to your mouth expands first, then that expansion extends down the length of the balloon. If you wrote the words *measure*, *analyze*, *plan*, and *improve* down the length of the balloon starting at the end you blow into, the measure section of the balloon would expand first before you see the analyze, plan, or improve sections. Try to blow up any section of the balloon before the measure section and you will find it impossible. The same goes for the BIIC.

In the measure phase, companies report the current and historical status of key metrics used to manage their business. These measures tell a company the “what,” i.e., “What is the status or health of my business?” Although most companies know which fundamental indicators to measure, such as sales or profit, it is not necessarily easy for them to obtain and distribute the status of these measures to the individuals throughout their organization. By employing an effective BI solution, an organization can successfully distribute this information to all the people who affect business inside and outside the enterprise. And through a BI application, an organization can uncover new ratios and metrics that provide even deeper insight and that could potentially modify or enhance what is currently measured. Today, reporting and information delivery software used widely by IT departments provides the bulk of the functionality in this initial phase of the BIIC.

During implementation of the measure stage, a stabilization of the company’s overall BI infrastructure occurs. People viewing measures can determine inconsistencies with the aggregated measures and what is generally expected. This helps to uncover glitches in the collection processes. Determining problems with data collection and connecting them is a necessary evolution that takes place during the measurement stage. Without this weeding out of collection problems, companies cannot successfully move into the latter stages of the cycle because to base analysis and planning on a suspect measurement system makes no sense.

## **Analyze**

During the second phase in the BIIC, analysts review and measure the data in new and different ways to see whether they can uncover hidden relationships that will help them answer “why,” i.e., “Why is this occurring?” In the evolution of BI, several tools have emerged that simplify the analytical process. We will discuss ad hoc query, ad hoc reporting, online analytical processing (OLAP), and advanced data visualization tools in further detail later on.

## **Plan**

After determining some of the reasons why things occur in the analyze phase, companies then try to determine the effects on outcomes should they implement changes. This is when the third part

of the cycle, the plan phase, begins. In this phase, companies use tools to play “what if” games with their data, i.e., varying scenarios that target the process changes they may need to make to help steer the company in the right direction. Software for this segment of the BIIC has been categorized as planning, budgeting, and forecasting. Using these kinds of tools, you can perform scenarios such as “expected measures from the budgeting process” and then combine them with historical measures and forecasting algorithms to determine potential future outcomes. You can then vary your inputs to see how different courses of action might affect these outcomes.

During the plan phase, for example, management may determine that, based on expected operating expenses, profits will be down in the next quarter. Using planning software, they can determine how much more they would need to sell to realize the same profits as last quarter. Or, they may try to see how an increase in price for certain items would affect their bottom line if the same number of items were sold. Such a planning application enables a company to determine what steps they will need to take to keep the company on a strategic course toward meeting its goals.

## **Improve**

The plan phase logically progresses into the fourth stage of the BIIC, called improve or the “how” phase. In this stage, key players within the company discuss outcomes and potential solutions to the problems they have uncovered in the previous stages and then make decisions regarding how to improve them, such as what they can do to positively affect their bottom line. This is where collaboration as part of BI becomes crucial. During review, individuals can annotate and comment on reports and analysis that have resulted from the other stages, or even vote on a course of action. Collaboration functionality within BI simplifies and documents this whole process so each comment, vote, or opinion can be weighed in the final decision. As a result of the improve phase, new areas or dimensions of measure may be added to the upcoming measure phase in order to track the progress of decisions made during the previous cycle.

In this way, a company’s BIIC is a process of perpetual improvement that keeps inching the company toward perfection. Once the cycle begins, it is hard to stop it and once you see its effect, you’ll wonder how you could have lived without it.

## Reasons for Failure

There is no doubt that a BIIC should exist in every organization, but many factors can prevent its becoming a fixed part of a company's culture. These factors generally boil down to a lack of understanding of how people work and a lack of experience with BI software and its best practices. It is imperative to remove these roadblocks to build momentum and get the cycle moving.

Here are some of the more significant reasons why the BIIC is not effectively established within an organization:

- Users' skills and desires are misinterpreted
- An emphasis is put on the wrong stage of the cycle
- No information self-sufficiency
- A culture of measurement is not established
- Disparate tactical BI solutions gain footholds

Let's look at each of these roadblocks to see how they impede the BIIC's evolution.

### **Users' Skills and Desires Are Misinterpreted**

There are four categories of information workers: nontechnical business users, business analysts (somewhat technical business users), power users (very technical business users), and IT developers, who create information for users in the other three categories. IT developers typically are not business-oriented. That is, their jobs are not part of the day-to-day business process of the company or organization. Instead, they use technology to enable or enhance the business processes and functions performed by other information workers.

In most organizations, nontechnical business users make up 80 to 90 percent of all information workers, while analysts and power users make up the remaining 10 to 15 percent. Yet, surprisingly, many organizations put an emphasis on the minority – analysts and power users – when choosing BI tools. They fall into the trap of seeking sophisticated analytical features and functions that satisfy the few, as opposed to a tool set that will allow them to share information easily with the entire user base. Far from increasing knowledge, this feature overload actually serves to restrict information flow by preventing the majority of users from using the tools and becoming part of the information culture. (As discussed earlier, with so few people involved, it is difficult for stable measurements to be generated and input to the analysis stage becomes suspect.)

### **An Emphasis Is Placed on the Wrong Stage**

There is a logical connection between the four stages of the business intelligence improvement cycle discussed earlier and the three categories of business users. Typically everyone in the organization will be involved in the measurement stage of the BIIC. That is, every business user has critical measures they need to know and understand to perform their jobs effectively. However, just as companies incorrectly emphasize the needs of the analyst and power user over the nontechnical business user, they also tend to prematurely jump to the latter stages of the business intelligence cycle. The three latter stages of the BIIC are dependent on measurement, as we described using the balloon analogy, but very often an organization will immerse itself in over-zealous efforts to analyze, plan, and improve itself before establishing a working, functional, culturally accepted measurement foundation.

Once again, we look to the supermarket model. If management does not lay the groundwork for a healthy and holistic measurement process, they will ultimately work in a vacuum. For example, if management views a list of milk orders, they may see that those orders are placed on Friday of every week. However, if the frontline people, i.e., the dairy managers, were participating in the measurement process, they would inform management that milk is in fact ordered every day but only entered into the system on the last day of the week. These types of data collection mistakes can proliferate throughout an organization, skewing the measurement process.

### **No Information Self-Sufficiency**

A common pitfall when setting the BIIC in motion is that the IT department is relied on as the sole information-producing group in an organization, even though they are not the only group capable of generating information. Although advanced users have access to the tools and, thus, the information, they often do not share this information with the nontechnical users. This causes an imbalance that leads to a heavier burden on IT because as more and more information consumers need information, more and more requests are made of IT. Moreover, IT often does not understand the nature of the business questions that information consumers are looking to answer, so they often don't produce the correct response or the entire response.



If advanced users played a more active role, they would accomplish two things:

- Less dependency on IT, freeing up the department for more projects and increasing productivity
- Better and bigger-picture answers from people who have a sound understanding of from where the questions are coming

### **A Culture of Measurement Is Not Established**

If executives are the only people who care about measurement and the improvement of those measurements' outcomes, the motivation to improve will not be established among the ranks of workers who have the capability to make the necessary changes. The implementation of BI software should ultimately improve the way that all people work and, therefore, the communication of the results must permeate the organization from staff worker to executive. For example, a very common measure in any public company is "revenue per employee," but what good is this measure if every employee is not aware of this number or does not know that they can affect the number by working hard and not being wasteful?

The problem with many organizations is that measures like these are seen as proprietary and are not shared within the organization. Employees are never informed of the company's strategy, how achievement of the goals related to the strategy will be measured, and how those measures are affected by each employee in the organization as they perform their job. Constant reminders of these measures should be distributed via e-mail and other channels so measurement becomes an integral part of enterprise culture.

Let's look at an example: Ford Motor Company has a warranty report that indicates specific information about claims and service provided at each of the Ford dealerships. For many years, this report was viewed by a few back-office analysts who in turn shared the results with executives. To start the BIIC, Ford needed to make the report widely available to dealerships and suppliers. Once the report was distributed daily to dealerships and suppliers and around Ford Corporate, it changed the way people worked. Dealerships were able to compare themselves against other dealerships in warranty service. Not being the worst in service and striving to be the best became the norm. Ford Corporate was able to identify when a dealership needed

additional training on cars that were brought in for the same service multiple times. Suppliers became more accountable for faulty parts. One employee noted that by using the report appropriately they could identify potential fraud in service. That one report saves Ford several million dollars per year, all realized simply by broadly distributing it to the people who could affect change.

### **Disparate Tactical Business Intelligence Solutions Gain Footholds**

Many organizations purchase BI tools without a clear strategic plan for using them to affect change within the organization. In fact, most BI software purchases occur for tactical reasons, e.g., “the boss wants this report.” Often a purchase will result from one or more executives saying, “We should know that.” Or the driving force could be government regulations that require accurate financial reporting. Whatever the catalyst, tactical reasons that are driven from an individual business unit’s needs often result in disconnected reporting applications that can never fulfill the true promise of BI. A few key reports may be created and communicated to a few key executives, but a complete cycle is never created and therefore only part of the organization is in the know.

Another drawback to these tactical deployments is that there is never just one. Disparate, disconnected BI projects pop up all over the enterprise and each project may be completed with a different set of BI software. Common knowledge of a single set of tools that can be shared within the enterprise is never developed. Reports from different units return different results – multiple isolated versions of the truth – that are not shared. Another tangential drawback is that software maintenance bills rise as each unit pays the highest possible maintenance for their “limited use” BI application. So at a higher cost for BI, limited productivity gains are realized.

## Rules for Success

Now that we understand the BIIC and the common reasons why improvement does not occur in many organizations, let's take a look at some simple rules you can follow to increase your chances of success in establishing a culture of measurement.

### **Rule #1: Understand the Users**

Typically consumers of information in an organization are analogous to drivers of cars. Imagine:

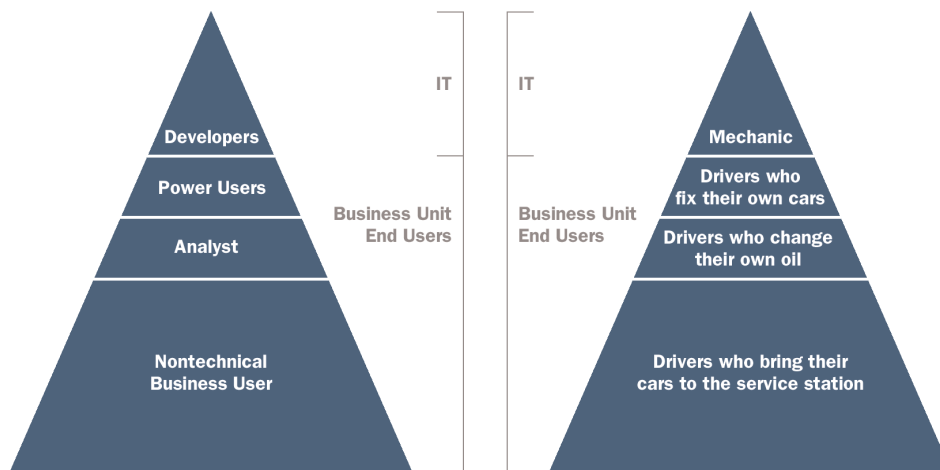
- Nontechnical business users as the drivers
- IT programmers or developers as the mechanics at the service station
- Business analysts as drivers capable of moderate maintenance such as rotating the tires, changing the oil, or checking the fluids
- Power users as drivers capable of heavy maintenance on their own cars

Nontechnical business users, the largest group, are not necessarily computer-savvy and don't want to work to get information. Reports can be delivered to them automatically for viewing, or they can select and retrieve reports through a simple interface. This is similar to the way an ordinary driver wants to simply get from point A to point B. At the first sign of car trouble, a driver will go to a mechanic. In a similar fashion, the nontechnical business user will go to the IT department if they need newer or different information. Like the IT programmer, the mechanic is very technical. He knows how to keep cars running smoothly but doesn't necessarily know how or why the individual driver will use the car on a day-to-day basis.

Business analysts, on the other hand, are more computer-savvy. They are experienced with using tools such as Excel to perform advanced analysis. For example, these users typically would be familiar with how to change reports by resorting, adding new calculated columns, or filtering records to discover trends and relationships in the data. Users in this category also use sophisticated functionality like OLAP tools to manipulate and analyze information.

The final level of business end users is the power user. The power user is a very technical end user similar in knowledge and capability to the IT developer. However, the power user is business-oriented and an in-depth command of technology is just one of their skills. These

users are capable of building their own reports in an ad hoc fashion. They understand database technology and are fully capable of using software tools to develop and analyze their own information. In the driver analogy, these people are the ones who like working on their own cars. They have attempted heavy-duty jobs such as changing brakes, transmissions, or even an engine on their own. In a typical organization, each business unit has one or two people who fit this profile. Often, the other information consumers in the department will go to the power user before resorting to IT.



**The pyramid above represents the percentage breakdown of the different user communities in most organizations.**

We can take the driver analogy one step further. We have discussed the skill level of the user but not their desires as a business user. Most business users typically do not wish to seek out and analyze information, just as most drivers typically don't want to work on their cars. If you ask the people who are capable of working on their own car how often they bring the car to the service station, you would find that at least half or more bring their cars in for service as needed. This directly correlates to analysts and power users in most organizations. Even though perfectly capable of producing and analyzing their own information, they often will still go to IT to get new reports and new information. This is related to productivity and to their job definition. They don't necessarily think that spending two hours analyzing data is a good use of

their time because it is not part of the day-to-day business processes they are involved with. Even when given the tools to create their own reports, they still prefer information access to be an easy and noninvasive process.

This last revelation leads us to the following conclusion: nearly 90 percent or more of the business users in most organizations do not want to spend their time with BI tools to create, change, or manipulate information. Almost everyone wants getting information to be as easy as starting and driving their cars – not fixing them.

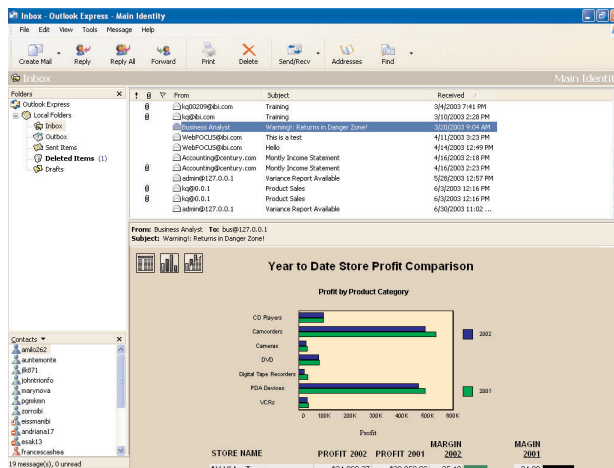
Keith Gile of the Giga Group stated that today's feature-packed BI tools have not reached deployments wider than 5 percent in most organizations, supporting the conclusion that most of these tools are appropriate only for advanced users. Providing information via BI tools like OLAP will mean that information is accessible only to advanced users – a small percentage of the audience. Alternatively, companies should concentrate on building an information access and distribution infrastructure, using a bottom-up approach that satisfies the information requirements of the nontechnical business user first. Information that is easily accessed by nontechnical users is just as pertinent to advanced users. So by handling the needs of the nontechnical user first, you are handling some of the needs of advanced users. When required, more advanced tools can be provided to supplement your current infrastructure. This methodology for deployment ensures the largest percentage of informed users in your enterprise.

## **Rule #2: Use the Clicks Paradigm**

Rule #1 leads very logically to rule #2. The clicks paradigm is a simple way to understand and set the amount of effort required for a user to get information. There are five click levels for obtaining information, starting with zero. The higher the number of clicks to the final result, the greater the effort. A company should spend the better part of their BI implementations ensuring that the vast majority of their users can receive information in two clicks or fewer.

Zero-click information finds you. No effort is required of the user to receive zero-click information because it is automatically sent to the user electronically, via e-mail to their desktop or to a wireless device. The information finds the user because it is scheduled for delivery by an administrator, because the user subscribed to the information while online, or because an event

triggered an alert – which occurred due to a previously set condition (e.g., “Notify me if the margin on any sale is less than 6 percent”). In a strong and well-defined measurement culture much of the information can be distributed this way.



**This diagram shows information received via e-mail, requiring no effort on the user's part.**

A one-click report is one where a user must log onto a system, find the particular report they wish to run, and select it to view its content. This online report can be one that was run previously or it can be a point-in-time snapshot, i.e., run at the point of request and reflecting current data. The effort for the user here is similar to the effort of using a Web browser. You would launch the browser, search the corporate intranet, and click to run the report as you would click on a hyperlink to view a Web page or document.

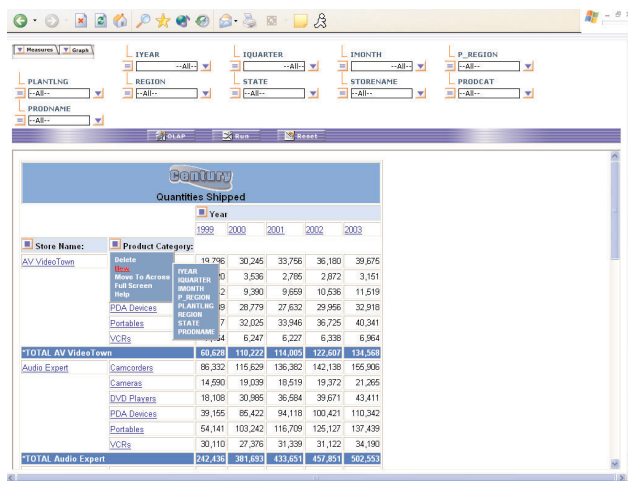
While the two methods described can be used for standard commonly run reports, they do not give users a lot of flexibility with regard to content. A two-click report, on the other hand, is one in which options are provided to the user for running the report. The options could range from filtering the data retrieved (“Show only data for the last week” or “Show data for Eastern region”), to changing the sort groups and measures on the report, to even changing how the report is delivered, e.g., as an HTML Web page or as an Excel document. This flexibility is controlled by the developer of the report and can be made as simple and as robust as needed.

Two-click reporting can satisfy most ambitions a user has for finding information. It is often referred to as “structured ad hoc reporting,” since the user has the ability to change the parameters for the report before it is run. An important benefit of a two-click report is that with an appropriate amount of flexibility, most users can easily find the information they require without having to ask for IT assistance. Thus, IT’s time is freed up for other projects.



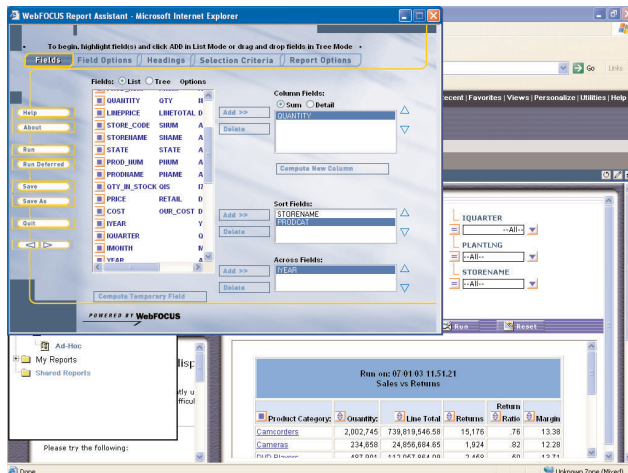
**Two-click report:** This screen shows a structured ad hoc report in which the user has options for customizing the information.

In three-click reporting, the concept of an end-user tool is introduced to that small portion of the audience who frequently have abstract information requests. Since these requests often will not be satisfied by two-click reports, a tool is required that will provide the user with the ability to change anything about the current view of the data – such as moving or calculating new columns, filtering and resorting on the fly, and pivoting dimensions to split and distribute the data across the screen rather than sorting it down. Tools that provide this kind of functionality are referred to as OLAP or ad hoc query tools. These tools provide hundreds of features for changing or enhancing the current view of the information. As simple as they might seem, the complex nature of these features limits their use to advanced users only.



This screen shows a three-click report – an OLAP report that gives the user hundreds of options to pivot, filter, resort, and recalculate items.

Finally, an advanced power user can create four-click and greater information from scratch. Four-plus-click information starts with an empty page that gives the user access to a view of the database and the ability to request or build anything they want. This often requires an in-depth knowledge of the data structure and how tables of data need to be joined to produce the correct results.

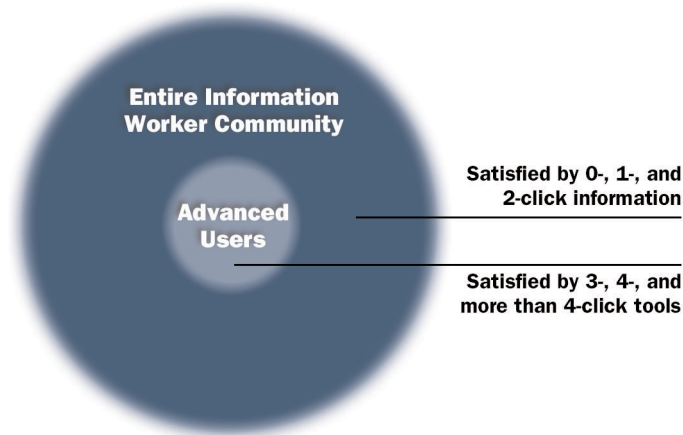


Four-click and greater report: This ad hoc reporting tool allows an advanced user to create their own report.



As we discussed, an understanding of the clicks paradigm, and of the levels of your user community, is critical when it comes to designing an information deployment methodology for your organization. It makes far more sense to concentrate on building a comprehensive zero-, one-, and two-click infrastructure before deploying three- and four-click tools. That way, everyone reaches some level of satisfaction with the simplest access.

Assume the large circle below represents the entire community of information workers and the small circle in its center represents the advanced users. By working from the outside in, you will satisfy the broad needs of the entire circle first before focusing on the needs of the smaller circle. This is imperative for success in BI implementations.



Returning to the driver analogy, if you provide all users with a complete set of mechanic's tools, could they all change a transmission in their own car? Unlikely. The majority would not even know what most of the tools are or how to find the tools they need. A side benefit of taking the lowest common denominator approach to BI implementation is that zero-, one-, and two-click information can often be deployed at little or no cost, while advanced tools come at an expensive per-seat price.

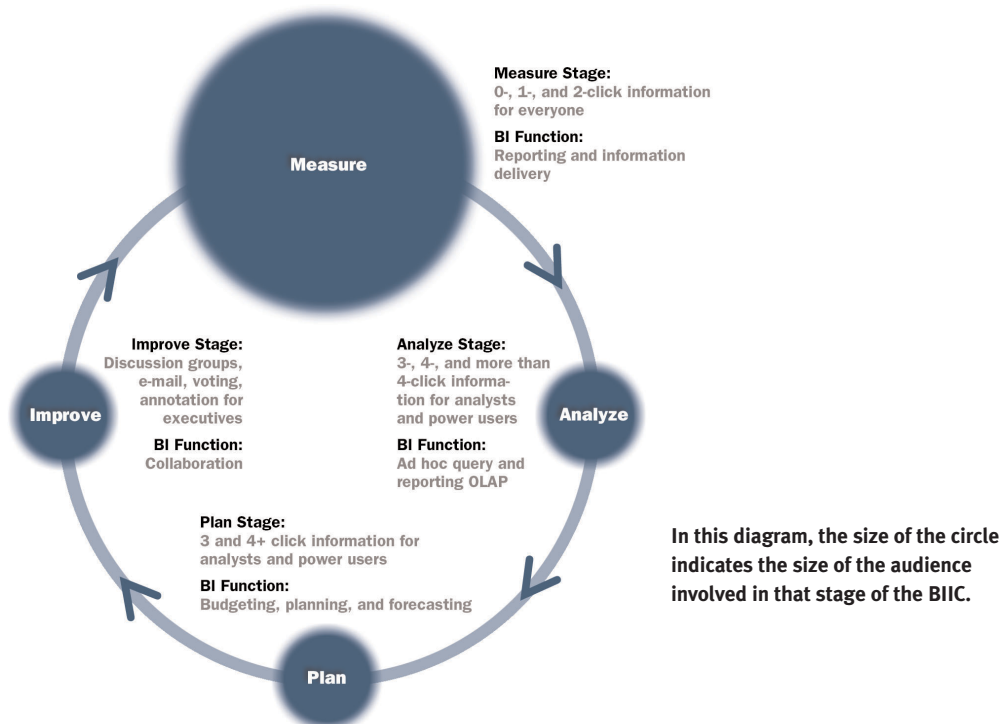
Let's now take what we've learned about the user pyramid and the clicks paradigm and apply that to the BIIC – the business intelligence improvement cycle.

Every business user in the organization should rate the quality of their work by the measures produced and distributed in the measurement stage of the BIIC. During this stage, measures are

distributed as reports to different types of users according to the zero-, one-, and two-click methodology.

As previously discussed, during the analysis stage of the BIIC, analysts who fall into the advanced-user category use specialized three-click and four-click and greater tools that allow them to look at abstractions of standard measures to see if they can uncover trends and relationships in the data. Potentially, any identified trends or relationships uncovered can reveal “why” things are occurring in your business. Although everyone participates in the measurement stage, typically only advanced users will participate in the analyze stage as well as the subsequent plan stage of the BIIC. Once advanced users provide analysis and plans to the decision-makers in the company, the final improve stage is where educated decisions and shifts in strategy as well as plans for new measurements will be formulated so an enhanced-measurement stage will result.

Visually the process looks like this:

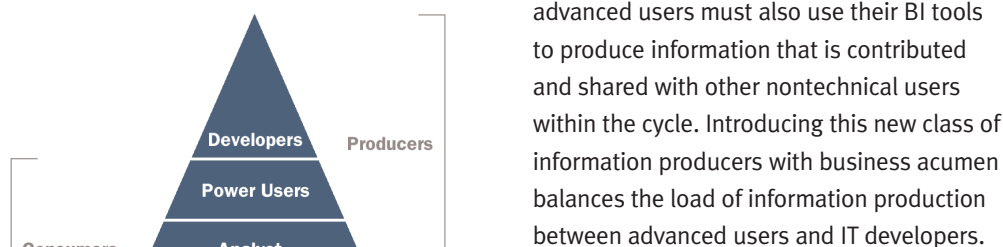


### Rule #3: Establish Advanced Users as Information Producers and Consumers

Earlier we established that the IT developers were the information producers, while the business unit end users were the information consumers. To have a successful BIIC, however, developers cannot be the sole information producers. There are two reasons for this.

First, IT developers are a very small minority within the organization and as more people become included in the measurement process, they can quickly become inundated with requests for new information. Second, since IT developers are not primarily business people, they cannot foresee all the kinds of information that will be needed by business users.

For these reasons, advanced users need to play a dual role in the BIIC as the cycle gets moving and a groundswell of requests for information begins to build. Already information consumers,



advanced users must also use their BI tools to produce information that is contributed and shared with other nontechnical users within the cycle. Introducing this new class of information producers with business acumen balances the load of information production between advanced users and IT developers.

Now we have a cycle that is developed and supported by a well-balanced community of information producers and consumers.

The above diagram shows the dual role of the advanced users (power users and analysts).

### Rule #4: Establish a Culture of Measurement

If you believe the old adage, “What gets measured is what gets managed,” then you need to establish measurement as a culture within your company. The easiest way to do this is to constantly communicate your business strategy to all information workers through such tactics

as posting it on the corporate intranet or announcing it at company-wide meetings. Moreover, you should explain how your strategy will be “measured.” By going public, you give individuals the motivation and ability to personally affect a measure that helps the company reach its goals.

For example, if a company’s strategy is to be known to customers as having the best service, how this “great service” will be measured should be communicated to everyone in the company. A customer service representative (CSR) needs to understand that “waiting on hold” is one of the things customers like the least. And the “average wait time” for a customer call will be clearly communicated and displayed to all CSRs. It will be up to them to quickly pick up the next call as their previous call finishes. Customers also dislike callbacks or multiple phone calls to resolve a problem. Therefore the “percentage of first-call resolutions” also will be measured for all CSRs, as a group and individually. Periodically taking a customer satisfaction survey and communicating results to all employees will be important as well.

Making employees accountable for achieving measures is also important. Holding back achievement bonuses for poor performance or rewarding bonuses for exemplary performance help establish a culture of measurement. If you think about it, every employee in an organization affects corporate strategic measures – from the staff worker to the executive.

In many cases, an organization will have multi-layered strategies, since they may need to satisfy multiple audiences. For example, a company’s strategy is to be viewed as the best in customer service; however, to a shareholder it is to show increased productivity through increased revenues and profits while reducing unnecessary costs. For a government agency the equivalent of a shareholder would be a taxpayer, so demonstrating efficiency and effectiveness with taxpayer money is important. Additionally, the taxpayer is also a citizen who, like a customer, might be served by the government agency. Therefore, quick and courteous service is also expected.

So to establish a culture of measurement within an organization requires a continuous four-step process:

1. Communicate corporate strategy to each information worker
2. Break down the strategy into clear measures of progress toward strategic goals
3. Continuously communicate and distribute group and individual measures to information workers
4. Reward and recognize employees for favorable or outstanding effects on a measure

### **Rule #5: Make BI a Strategic Enterprise Decision**

In order to make a sound purchase of BI tools, organizations must make BI a strategic enterprise decision. The entire organization, rather than tactical reasons or an individual unit's request must be considered. We have discussed that, in order to affect change, every person from staff member to executive must be a part of the business decision-making for the organization. The same holds true for a BI purchase. That way, an organization can be assured that the right questions are being asked and answered through the BI software.

Additionally, it is important to consider purchasing as few tools as possible to get the answers you need. This will ensure consistency, lower cost, and a shorter learning curve. When purchasing a BI tool, the organization should only consider solutions that are:

- Scalable to very large numbers of users at the lowest TCO
- Easy-to-use tools for all types of information users such as customers, suppliers, partners, managers, employees, analysts, and executives
- Complete with functionality to support a full range of applications
- Able to leverage all existing applications, databases, and infrastructure

## Conclusion: How It Works

The BIIC described here should have different levels of emphasis, measurement being most important. Measurement serves as the foundation for the entire cycle, and without it the other stages will never materialize. To ensure success in the measurement stage, all users need to participate in the measurement system. This is accomplished by communicating the company's strategy to all employees and breaking down that strategy into measures that can be easily monitored and distributed to all users in the pyramid.

To reach all employees, a simple method of access and distribution must be set up – one that requires the least possible effort on an employee's part to view the measures. This is known as zero-, one-, and two-click reporting, a method of distribution that will handle the information consumption needs of nearly 95 percent of your users. The advanced users who need more information can use three- and four-click and greater OLAP and ad hoc tools to produce additional information. In order to satisfy continually growing information requirements, advanced users should be set up as producers of information, with their work contributed back into the system to be viewed and used by other business users.

This paper serves as a synopsis of Information Builders' philosophy of business intelligence. When used as a model, it can help you establish a powerful cycle of continued improvement within your organization.

## Sales and Consulting Offices

### North America

#### United States

- **ATLANTA\*** GA (770) 395-9913
- **BALTIMORE**, MD CONSULTING: (703) 247-5565
- **BOSTON\*** MA (781) 224-7660
- **CHARLOTTE\*** NC CONSULTING: (704) 494-2680
- **CHICAGO\*** IL (630) 971-6700
- **CINCINNATI\*** OH (513) 891-2338
- **CLEVELAND\*** OH (216) 520-1333
- **DALLAS\*** TX (972) 490-1300
- **DENVER\*** CO (303) 770-4440
- **DETROIT\*** MI (248) 743-3030
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