Information Builders

Five Things You Need to Know About Your Users Before You Deploy Business Intelligence

A White Paper

By Kevin Quinn

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Mr. Quinn has been credited with helping to define business intelligence end-user categories through his creation of guidelines for using and employing business intelligence tools. He has helped companies worldwide develop information deployment strategies that help accelerate decisions and improve corporate performance. His efforts in this position have helped propel Information Builders WebFOCUS and iWay Software solutions to category leadership in their respective areas. Kevin is also the founder of Statswizard.Com, an interactive sports statistics Web site that leverages business intelligence functionality.

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Executive Summary

Have you ever deployed a solution or a capability in response to constant end user demand, only to have it ignored once it was delivered? You gave them what they asked for, so why aren't they using it?

The answer is quite simple. What they say and what they mean are two different things.

Let's look at an example of how this phenomenon occurs. A smart IT professional will ask end users about their requirements, before embarking on the implementation of a business intelligence (BI) application. They will ask questions such as: "What information do you need?" and "How do you want it formatted?". The varying answers they receive seem to indicate that what users really need is flexibility. People will also often say that they need to be able to ask ad hoc questions, because the type of information they require is constantly changing. So, the IT professional interprets these requests for ad hoc and flexibility as a need for a business intelligence tool and a data warehouse.

However, anyone with extensive experience in business intelligence will tell you that 95 percent of your users have neither the time nor the skill to use a BI tool. In other words, their answers and the IT professional's interpretation of them are wrong!

This scenario may seem a bit extreme. But the truth is that users often unknowingly provide incorrect information when expressing their reporting needs. Then, IT mistakenly assumes that users know what they mean when they ask for things like an ad hoc tool.

In our years of experience working with companies of all types and sizes to design and deploy business intelligence systems, we've learned that there are five key things you need to know about your users before you roll out related technologies to them. In many cases, discovering these five things will require more than just polling end users. To provide the right business intelligence capabilities to the right people, you will need to find the answers to a few important questions, and/or gather additional information from knowledgeable managers within your company.

In this paper, we will discuss these five things, as well as their implications. Additionally, we will recommend effective ways to answer questions pertaining to your planned business intelligence environment. Those answers will help you determine the most appropriate form of deployment, so you can ensure widespread adoption and maximum user satisfaction.

Understanding the Things

Below is the list of the 5 things you need to know before you begin planning your application, so you can better understand the blend of capabilities needed to address end user requirements.

1. What is the technical skill level and sophistication of the user(s)?
2. How much time can they spend finding, accessing, and analyzing information?
3. What types of questions will they be asking? [Note: the answer to this question will require in-depth investigation, since it differs greatly from "What kind of information do you need?"
4. How often are the users traveling (or how often are they in the office)?
5. How timely must the data they are accessing be?

Correctly answering these five questions will provide you with a foundation for mapping out the right mix of functionality necessary to meet user needs and optimize application utilization.

A Closer Look at the Five Questions

1. What is the technical skill level and sophistication of the users(s)?
This question should not be posed directly to your users. Many end users have a skewed perception of their level of expertise and most consider themselves savvier than they are. Some may view themselves as advanced users simply because they once bought a book on Amazon or participated in an auction on eBay. The truth is, neither of these experiences classifies one as technically advanced.

What does it really mean to be technically advanced? From a business intelligence standpoint, there are several requirements for this category. Some users can easily interpret numbers and percentages. They gobble up statistics like candy. This alone does not make them technically advanced; it simply makes them curious. But if they are also technically astute, they will be able to apply that skill to effectively using a business intelligence tool. As a rule, if someone is comfortable with Excel's features, such as creating formulas and sorting data, and they can easily interpret numbers (as described above), they are probably also capable of employing a business intelligence solution, such as an ad hoc query tool.

On average only about 10 to 15 percent of any audience of users is actually technically advanced. Of those people, most don't have the time to put their advanced skills to work – leading us to the next question, which is closely related to this one.

2. How much time can they spend finding, accessing, and analyzing information?
This critical question, arguably the most important of the five, is often completely neglected. Yet if it is answered realistically, an accurate plan for deployment can be formulated, even without responses to the other four questions.

The truth is, in a typical organization, most people need to access information, but very few of them have a lot of time to do it. If your users don't have a lot of time to spend finding, accessing, and analyzing information, then they don't require a business intelligence tool.

How much time someone has to devote to reporting is often related to their role in the organization. For example, executives may have very little time to spend analyzing data, while analysts will have much more time, as analysis is their main job function.

3. What types of questions will they be asking?

Have you ever really thought about the questions that people ask? Can they be categorized? If so, how?

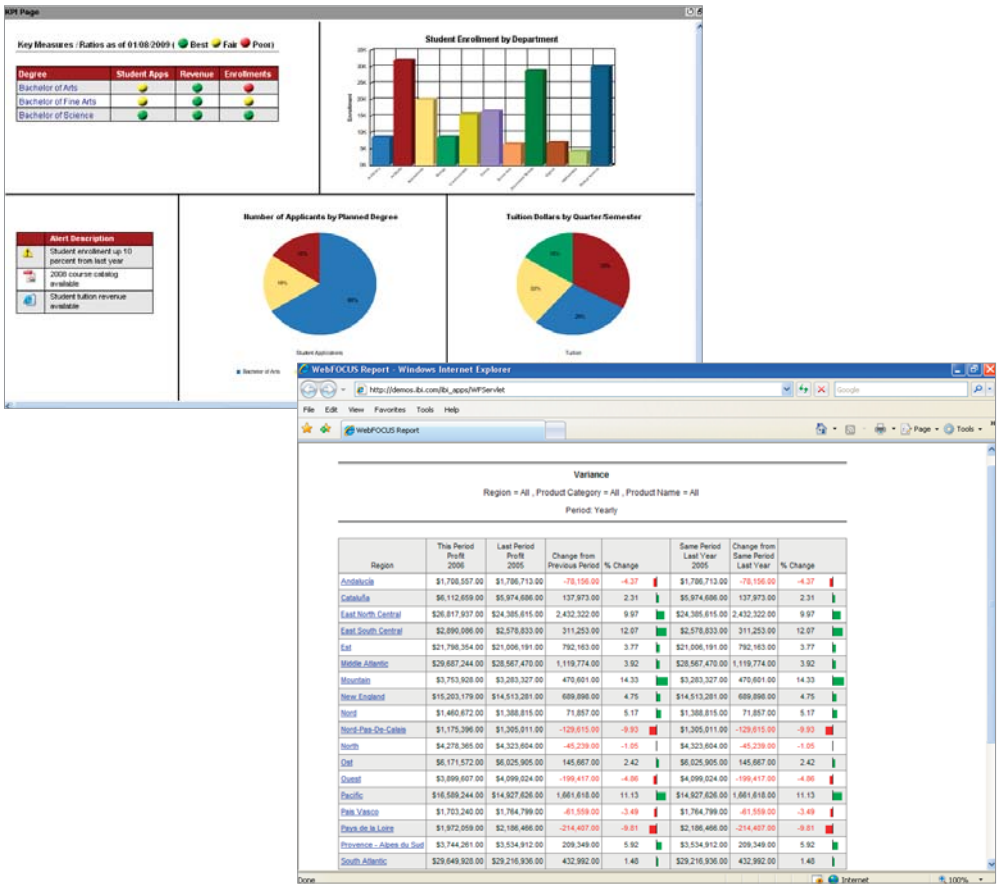
Different types of questions are best asked and answered by different types of solutions. Performance management, dashboards, and scorecards are about monitoring the status of a key metric. While ad hoc query tools are ideal for asking random or on-the-fly questions.

The following categories describe the various kinds of solutions available and highlight the types of questions that each is best for answering:

Status

Status is measured regularly. Users know this measure exists and where to get the data related to it. Therefore, you want to make it easy for them to access through pre-built reports or dashboards.

Common deployment methods: reports, dashboards, and scorecards.



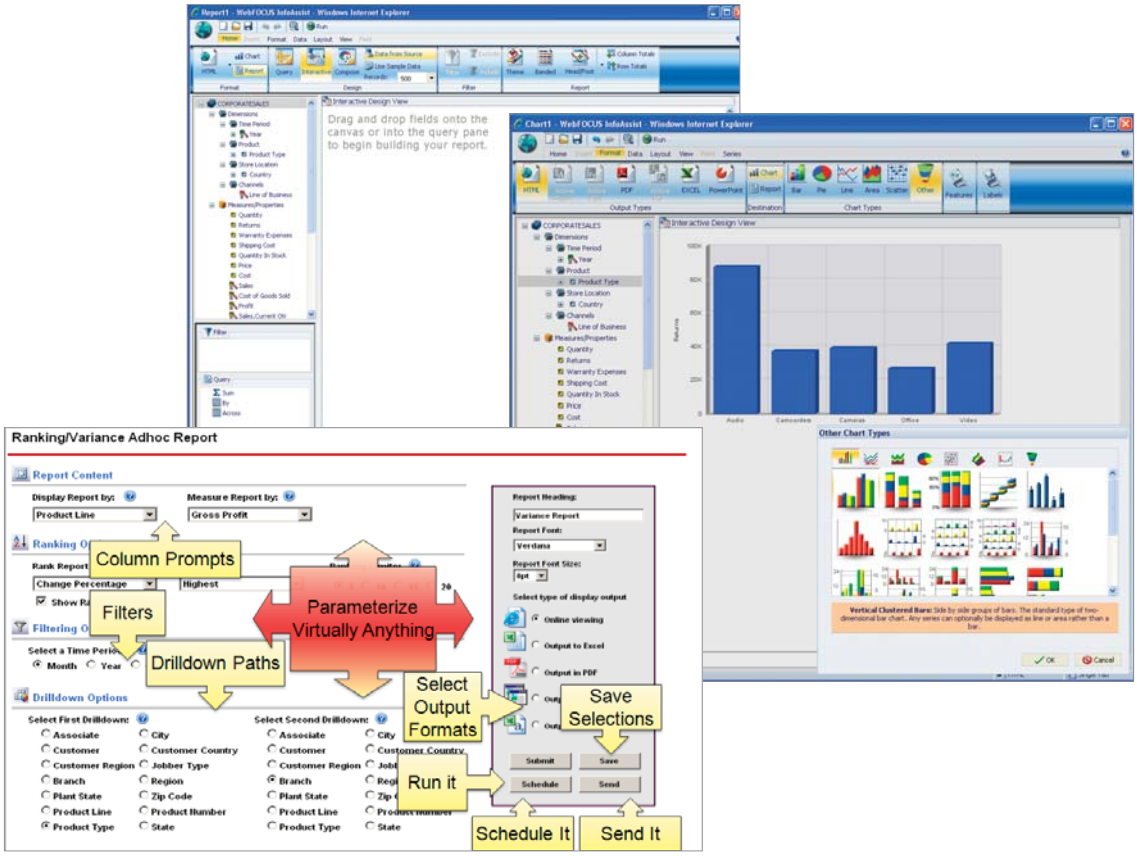
Ad Hoc/Investigative

A variation of status is where a measure or related data is required, but is not readily available through a pre-defined dashboard or report. This is known as an "ad hoc question." It is investigative, meaning that some knowledge or curiosity has sparked the user's interest. He or she knows that the answer exists in the data, but does not have a way to retrieve it automatically. This type of question is one of the most challenging, because it can be asked and answered in multiple ways, but each way may or may not be practical, depending on the sophistication of the user asking the question.

A business intelligence tool like ad hoc query can certainly solve the problem, but not all users have the skill or the time needed to use such a solution. An alternative approach is called "guided ad hoc," which is comprised of one or more parameterized report templates. These templates allow a user to customize a pre-existing report as a means of answering an ad hoc question.

Different business intelligence products have varying degrees of guided ad hoc capabilities. Those tools that enable a developer to parameterize columns (e.g. sort groups and/or measures) are best suited for quickly and easily posing ad hoc questions. At Information Builders, we prefer this method, because it is intuitive enough for users at all skill levels to rapidly answer ad hoc questions.

Common deployment methods: guided ad hoc, ad hoc query, and reporting.

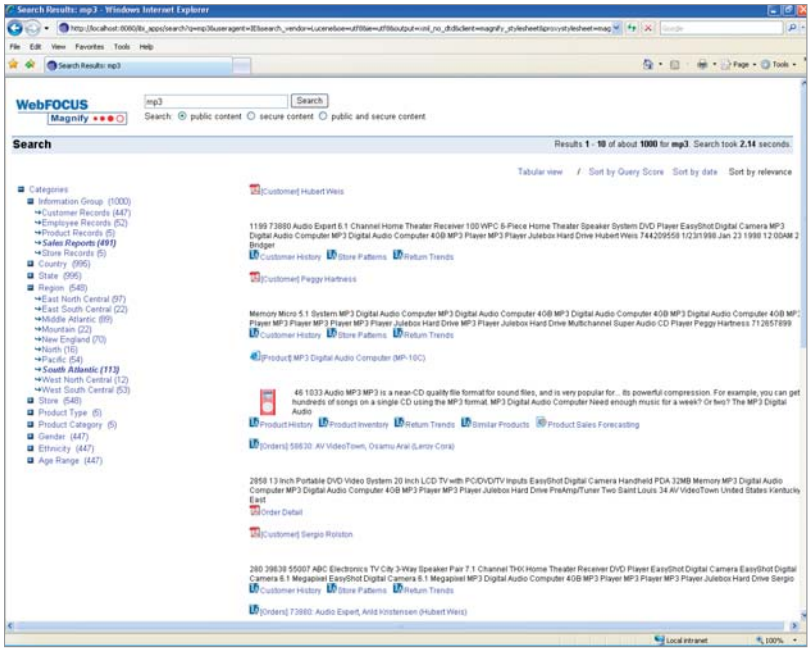


Discovery/Search

Sometimes, users are unsure or unaware of the existence of something (e.g. a product or a customer), and will need to explore or discover data to find the right information. The question they are asking is, "Does XXX exist, and where I can find it?" which is a much more common question than you think. It is asked countless times every day through search engines such as Google. Even in corporate scenarios, this question is best answered with a search-style interface. Users type in a word or phrase to see if there are any matches within the databases or applications that reside across a company.

This is a very useful tool for many business professionals, particularly customer support staff. In addition to search functionality, it's the type of question that can often be answered with a few drill downs within a pre-built report or dashboard. This approach, however, will only work if the drill down crosses paths with the target of your inquiry. The point is that, with a blended approach to building your business intelligence application, you can provide users with more than one means of finding the answers they need.

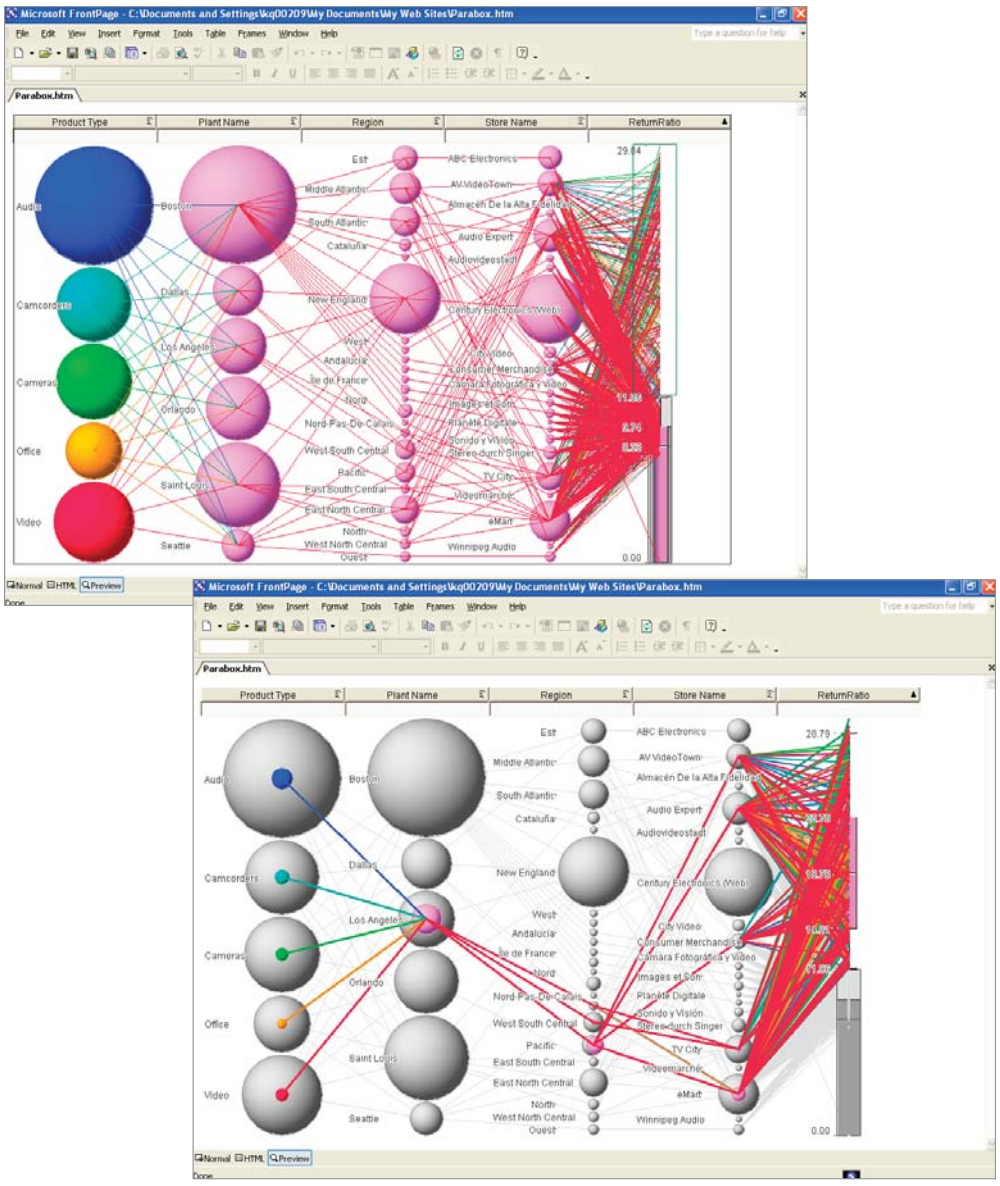
Common deployment methods: search and/or investigative drill down.



Show Me What's Interesting

This is one of the more unusual questions, and is typically posed by the curious people described earlier. Often it is the responsibility of an analyst to find small issues before they become big problems. Users will say, "Look at this data set and tell me what I should be concerned about." They want the analyst to point out what is unusual, so they can begin to ask more educated ad hoc questions. These inquiries are best answered by visualization software that presents large or complex sets of information in a more intuitive, graphical way. This makes it much easier – and much faster – to identify patterns and trends, and understand what is out of the ordinary (also known as outliers).

Common deployment method: data visualization.

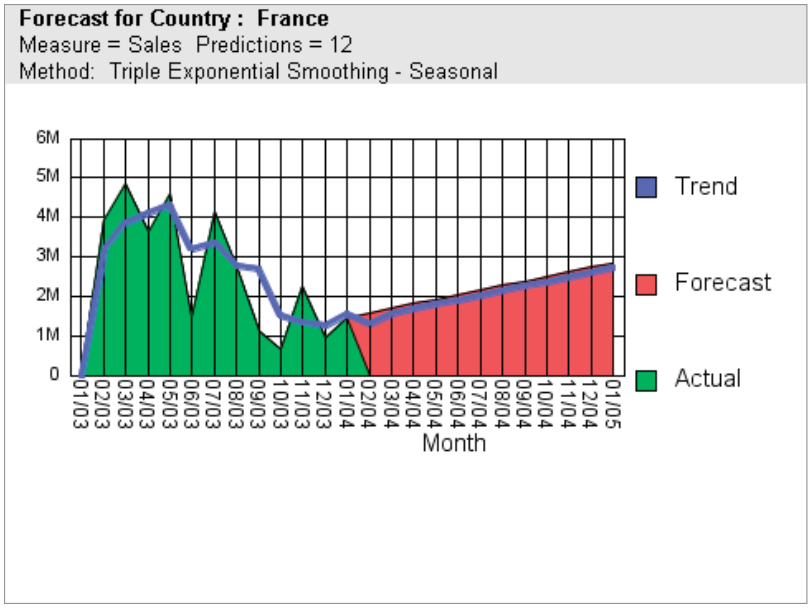


Predict (What Should I Expect?)

In the past, predictive analytics were reserved for statisticians. But this analysis method is becoming more popular as business intelligence vendors find better ways to embed it in operational applications. When the two technologies are effectively combined, predictions can be applied to nearly all other forms of information delivery. They can be incorporated into dashboards or reports, or customized via guided ad hoc interfaces.

While the creation of a predictive model still requires the assistance of a specialist, the results of those efforts can become part of any frontline processes. Universities are using predictions to choose likely graduates from a sea of applicants. Police departments are using them to understand where best to deploy their officers to deter crime. And insurance companies have been using them for decades to adjust insurance rates for different risk categories.

Common deployment method: predictive analytics embedded in business intelligence applications.



4. How often are the users traveling (or how often are they in the office)?
The ubiquitous availability of an Internet connection is having a profound impact on this question's importance. Historically, for frontline workers like sales reps and truck drivers, the only connection back to the home office was though mobile phones. Today, police officers and truck drivers ride the streets with laptops by their side, connected via satellite to the Internet. Or, more likely, they are linked back to the information systems at home base through a BlackBerry, iPhone, or other smartphone.

These tools are not the best or most common way to deploy business intelligence, such as ad hoc query, advanced visualization, or OLAP analysis. Workers who spend a significant amount of time – half or more – at remote or off-site locations are limited in the types of business intelligence deployments with which they can interact.

5. How timely must the data they are accessing be?
Finally, your BI deployment will be influenced by the required latency of the data involved. Business intelligence has three possible levels of latency – scheduled update, on demand, and real time.

Scheduled update means that the information does not have to be up-to-the-minute. The data source could be updated on a scheduled basis, such as once a day or each hour. Or, the data can be near real time, updated incrementally within minutes of a transaction. The majority of BI deployments work well with some form of a scheduled update.

On demand means that the user will require direct access to operational data or information contained in a near real-time data warehouse. While this does not necessarily affect the BI deployment itself, it is very uncommon for BI tools to give users access to operational systems, because operational data is usually not stored in a form that is conducive to creating ad hoc queries. However, dashboards, reports, and guided ad hoc reports are highly effective business intelligence deployment methods when on demand access is required.

Finally, true real-time data is only needed to support the monitoring of frontline operational processes. True real time means that the information being displayed is updated as a business event occurs – even before the related data makes its way into a database. Only dashboards and

reports enable the dynamic display and update of information as business events take place. Ad hoc query, guided ad hoc, and search are all tools that require a user to initiate information retrieval, which is not true real time because there is always a certain delay, no matter how small, between the event and the access of the related data.

The Question That Wasn't Asked

In theory, this paper could have included a sixth question: "What role does the user play within the organization?". We alluded to this within the first section when we discussed users' technical skills. It was also touched on to some degree as we highlighted some of the others.

Understanding a user's role gives you a certain perspective when it comes to their BI needs. For example, executives look primarily for the high-level status of a key performance indicator (KPI), while analysts will often spend their day analyzing data in great detail. A frontline worker, such as a customer service rep, often searches for information to solve a specific problem. While there may be some variations to roles and related needs from one organization to the next, understanding the idiosyncrasies of the various users in your particular company will help you create a more accurate profile of user requirements.

These three user types – the executive, the analyst, and the frontline worker – all require different interfaces, which will become more apparent as we move on. The executive may find that high-level status is best viewed through a dashboard. Analysts may require a more powerful tool that allows them to manipulate and combine data in an unlimited number of ways to satisfy their unique analysis needs. The frontline worker may best be serviced through a Google-like search interface.

So, why did we leave the sixth question out? Because the profile of users based on their role, is typically established by the answers to the other five questions.

The Importance of a Blended Approach to BI Deployment

Have you ever tried to hammer a nail into a wall with the end of a screwdriver or wrench, simply because a hammer wasn't within reach? It might work, although it may take far more time than it would have if you had used the proper tool. Or, it may cause damage, making the task at hand much harder and requiring you to go find the hammer anyway. The point is that using the proper tool for a specific job is the only way to ensure efficient completion and the desired results.

The same is true when it comes to delivering business intelligence. Successful BI is something you achieve by blending the right set of tools, access methods, and presentation, so information is not only retrievable, but also easily understood.

The problem for many organizations is that trade journalists, analysts, bloggers, and other industry pundits tend to hype the flashiest and most current technologies. In doing so, they can skew our instincts and cause us to select the wrong tool for certain types of reporting requirements.

Business intelligence software comes in many forms, each offering a combination of four components – access vehicles, query modes, presentation options, and output formats.

1. Access vehicles – An access vehicle is what will be used to retrieve or receive information, such as a Web browser on a desktop, laptop, or smartphone, or an e-mail application, such as Outlook.

2. Query method – The query method is the Web-based software that will be used, such as:

a) A search interface (Google, Yahoo, etc.)

b) A Web form (a BI parameter form)

c) A BI tool (ad hoc query, reporting, or OLAP)

3. Presentation – Information will be viewed in formats, such as:

a) Tabular reports, which typically include summarized information in a finely laid-out table, with subtotals, calculations, etc.

b) Charts, such as bar charts, pie charts, scatterplots, etc.

c) Dashboards, which combine reports and charts to show a high-level view of multiple performance metrics and other indicators

d) Visualization, an abstract way of using maps, geographic shapes, colors, and other graphical elements to represent data in a more meaningful and intuitive way than simple reports and charts. Advanced visulization allows you to expose relationships and outliers in large amounts of data that may be difficult to see otherwise

4. Output formats – Over the years, output formats have been created and supported by every software vendor. The most popular solutions provide a way to view, interact with, print, and share information in formats like Microsoft Excel, Adobe PDF, Adobe Flash, HTML, Microsoft PowerPoint, or Microsoft Word. Each format provides different benefits, depending on the culture of the company and the needs of the users. It is particularly valuable when BI software supports all of these, enabling users to switch between formats as needed.

Combining Components

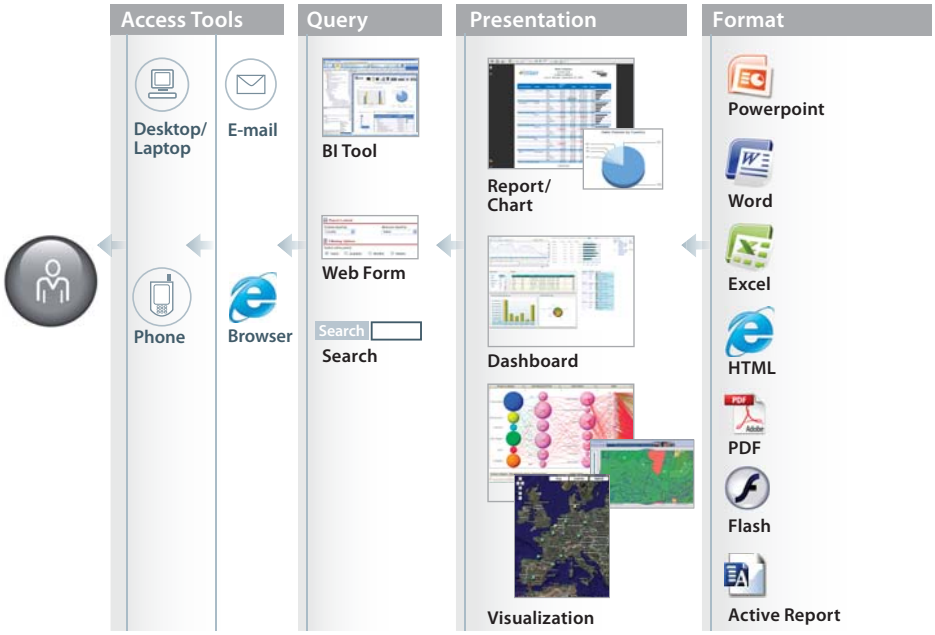
With a flexible business intelligence platform, you can use the four components in any combination, creating a BI application that suits the needs of each and every one of your users. Each component provides particular advantages when it comes to solving certain types of challenges, but none are necessarily ideal for addressing all possible challenges. Think back to the example of the screwdriver. While it is not the best tool for hammering a nail, it is the perfect one for tightening a screw.

Let's look at a few more scenarios.

For a non-technical user who has very little time to spend accessing information, but needs to continuously monitor the status of key performance indicators, it might be best to send them a simple report, chart, or dashboard via e-mail as an HTML or PDF attachment. Or, you can allow them to logon to the BI system through a browser on their desktop, laptop, or smartphone to view the live report or dashboard online in any format they choose.

For non-technical analysts trying to uncover the reason behind a dip in margins for the third quarter, an online interactive visulization dashboard might suit their purposes perfectly.

For non-technical frontline customer support representatives trying to research a billing issue for a customer, a search interface or a parameter form will allow them to investigate and interrogate multiple data sources to uncover and fix the problem.



The above diagram depicts a simplified view of how the four components can be used in various combinations to create a BI application.

Using the tools on the following pages to profile your users will help you to precisely determine, which combination(s) will best satisfy their needs.

Describe the User

Skill Level	Time Connected (This is related to the travel question)	Time Available	Types of Questions (Multiple Choice)	Timeliness of Data
○ Advanced ○ Non-tech	○ Always ○ Sometimes ○ Never	○ 30 - 100% ○ 10 - 30% ○ Less than 10%	○ **Status** – I know what I want and it exists ○ **Ad hoc** – I know what I want and it doesn't exist ○ **Discovery/search** – Not sure what I want or what exists ○ **Show me what's interesting** – What should I be looking at ○ **Predict** – What should I expect	○ Periodic ○ On demand ○ Real time

Tools to Help You Plan Your BI Application

The above grid represents the five questions discussed earlier. Simply fill in the appropriate circles as you begin to answer the questions about your user(s). Most of the columns allow for only one choice to be selected, with the exception of column four, "Types of Questions," which will allow for multiple responses. Please note that this is only a template. It can be modified or customized (e.g. by adding more choices or changing the phrasing of certain options) to address your specific needs.

The grid below will help you marry certain user profiles with the appropriate business intelligence deployments. Note that the technology column on the left does not map directly to the component chart we saw earlier. Each technology listed represents a combination of one or more of the components previously highlighted. For example, e-mail is listed as a technology that is appropriate for a certain type of user profile, but the grid does not specify what is being e-mailed (a report, dashboard, or visualization). It also does not distinguish between delivery formats (e.g. PowerPoint, PDF, Excel). Those decisions must be left to you, the system designer.

Sample Profile

Skill Level	Time Connected (This is related to travel question)	Time Available	Types of Questions (Multiple Choice)	Timeliness of Data
○ Advanced ● Non-Tech	○ Always ● Sometimes ○ Never	○ 30 - 100% ○ 10 - 30% ● Less than 10%	● **Status** – I know what I want and it exists ● **Ad hoc** – I know what I want and it doesn't exist ○ **Discovery/search** – Not sure what I want or what exists ○ **Show me what's interesting** – What should I be looking at ○ **Predict** – What should I expect	● Periodic ○ On demand ○ Real time

Types of BI Deployment

Tech-nology	Skill	Time Connected	Time Available	Types of Questions	Timeliness of Data
E-mail	Advanced ●	Always ◐	30 - 100% ◐	**Status** – I know what I want and it exists ●	Periodic ●
	Intermediate ●	Sometimes ●	10 - 30% ●	**Ad hoc** – I know what I want and it doesn't exist ◐	On demand ○
	Non-tech ●	Never ●	Less than 10% ●	**Discovery/search** – Not sure what I want or what exists ○	Real time ●
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ◐	
Search	Advanced ●	Always ●	30 - 100% ●	**Status** – I know what I want and it exists ◐	Periodic ◐
	Intermediate ●	Sometimes ●	10 - 30% ●	**Ad hoc** – I know what I want and it doesn't exist ◐	On demand ●
	Non-tech ●	Never ◐	Less than 10% ◐	**Discovery/search** – Not sure what I want or what exists ●	Real time ○
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ◐	
Dash-board	Advanced ○	Always ●	30 - 100% ●	**Status** – I know what I want and it exists ○	Periodic ○
	Intermediate ●	Sometimes ●	10 - 30% ●	**Ad hoc** – I know what I want and it doesn't exist ◐	On demand ●
	Non-tech ●	Never ◐	Less than 10% ●	**Discovery/search** – Not sure what I want or what exists ○	Real time ●
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ◐	
Guided Ad Hoc Form	Advanced ●	Always ●	30 - 100% ●	**Status** – I know what I want and it exists ◐	Periodic ●
	Intermediate ●	Sometimes ●	10 - 30% ●	**Ad hoc** – I know what I want and it doesn't exist ●	On demand ●
	Non-tech ●	Never ◐	Less than 10% ◐	**Discovery/search** – Not sure what I want or what exists ◐	Real time ○
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ◐	
InfoAssist Tool	Advanced ●	Always ●	30 - 100% ●	**Status** – I know what I want and it exists ○	Periodic ◐
	Intermediate ●	Sometimes ◐	10 - 30% ◐	**Ad hoc** – I know what I want and it doesn't exist ●	On demand ●
	Non-tech ○	Never ○	Less than 10% ◐	**Discovery/search** – Not sure what I want or what exists ○	Real time ○
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ◐	

● **Good Match** ◐ **Fair Match** ○ **Poor Match**

The BI deployments in the grid above are described in more detail below. The circles show which technology best maps to a particular profile. The completely shaded circle is the best match, the unshaded circle is the worst. If you have a BI platform that is flexible enough to do each of these, you will be able to build the exact BI application your users need. Otherwise, you may find your users trying to hammer a nail with a screwdriver, so to speak.

E-mail – Delivery of a report or dashboard (in any format) to a user's e-mail, whether on their desktop or smartphone.

Search – A search interface that retrieves detailed results about records in any database across your organization, as well as existing reports or dashboards, based on a key word or phrase.

Dashboard – Information pages with multiple components showing the status of one or more measures.

- **Performance Dashboard** – Typically displays the status of key performance indicators. It can be viewed online or e-mailed to a user.
- **Real-time Dashboard** – Similar to a performance dashboard (only the status of key measures are presented in real time) with constant updates made as business events occur. Therefore, it requires that the user view it online.
- **Visualization Dashboard** – Visualization is an abstract way of using maps, geographic shapes, colors, and other graphical elements to represent large amounts of data in a more meaningful

and intuitive way. Visulization dashboards are interactive environments used by analysts to more easily uncover relationships and outliers that are difficult to see on standard reports or charts.

Guided Ad Hoc Form – A Web-based application component that lets a user customize a report, chart, or dashboard by selecting options from prompts. It is the simplest way to empower a non-technical user to ask ad hoc questions.

BI Tool – Ad hoc query, reporting, and analysis tools allow advanced users to pose nearly any question. Data can even be combined from multiple sources to uncover unique observations.

Your final result will be to create a chart that gives you a profile of your users' needs. The chart will show you the types of technologies that need to be blended into your application and how much of each is needed. Below is a diagram showing some common profiles for different users.

User Profile

	Skill Level	Time Connected	Time Available	Types of Questions	Timeliness of Data
	Advanced ○	Always ○	30 - 100% ○	**Status** – I know what I want and it exists ●	Periodic ●
	Intermediate ○	Sometimes ●	10 - 30% ●	**Ad hoc** – I know what I want and it doesn't exist ●	
	Non-Tech ●	Never ○	Less than 10% ○	**Discovery/search** – Not sure what I want or what exists ○	On demand ○
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ○	Real time ○

Technology Grid

Tech-nology	Skill Level	Time Connected	Time Available	Types of Questions	Timeliness of Data
E-mail	Advanced ●	Always ○	30 - 100% ○	**Status** – I know what I want and it exists ●	Periodic ●
	Intermediate ●	Sometimes ●	10 -30% ●	**Ad hoc** – I know what I want and it doesn't exist ○	
	Non-Tech ●	Never ●	Less than 10% ●	**Discovery/search** – Not sure what I want or what exists ○	On demand ○
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ○	Real time ●
Search	Advanced ●	Always ●	30 - 100% ●	**Status** – I know what I want and it exists ○	Periodic ○
	Intermediate ●	Sometimes ●	10 - 30% ●	**Ad hoc** – I know what I want and it doesn't exist ○	
	Non-Tech ●	Never ○	Less than 10% ○	**Discovery/search** – Not sure what I want or what exists ●	On demand ●
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ○	Real time ○
Dash-board	Advanced ○	Always ●	30 - 100% ●	**Status** – I know what I want and it exists ●	Periodic ○
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	Non-Tech ●	Never ○	Less than 10% ●	**Discovery/search** – Not sure what I want or what exists ○	On demand ●
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ○	Real time ●
Guided Ad Hoc Form	Advanced ●	Always ●	30 - 100% ●	**Status** – I know what I want and it exists ○	Periodic ●
	Intermediate ●	Sometimes ●	10 -30% ●	**Ad-Hoc** – I know what I want and it doesn't exist ●	
	Non-Tech ●	Never ○	Less than 10% ○	**Discovery/search** – Not sure what I want or what exists ○	On demand ●
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ○	Real time ○
InfoAssist Tool	Advanced ●	Always ●	30 - 100% ●	**Status** – I know what I want and it exists ○	Periodic ○
	Intermediate ●	Sometimes ○	10 - 30% ○	**Ad hoc** – I know what I want and it doesn't exist ●	
	Non-Tech ○	Never ○	Less than 10% ○	**Discovery/search** – Not sure what I want or what exists ○	On demand ●
				Show me what's interesting – What should I be looking at ○	
				Predict – What should I expect ○	Real time ○

Compare the profile to the technology to see which is the best deployment option.

Suggested BI Technology Mix for Various Users

Conclusion

The primary purpose of this paper was to provide you with guidance and advice on planning your next BI deployment. Throughout my 25-year career in the BI industry, I have realized that Information Builders' WebFOCUS is the BI platform with the broadest range of deployment options, making it the ideal choice for addressing the wide array of needs outlined in the planning paradigm. Its robust development environment lets you create easy-to-use, yet flexible reporting and analysis applications that can be leveraged by virtually any type of user. WebFOCUS serves as the foundation of some of the most widely used and adopted applications in the world – some reaching millions of users.

Each of the scenarios depicted in the grids in this paper and each of the combinations of components presented are possible deployments with WebFOCUS.

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