

How Business Intelligence Should Work

The Connection Between Strategic, Analytical, and Operational Initiatives

A White Paper

by Kevin Quinn

WebFOCUS

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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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Introduction

Business intelligence (BI) has been around for a long time, and over the years has taken on many different forms – reporting, OLAP, ad hoc, performance management, predictive analytics, data mining, etc. For someone who's new to the concept of BI, these various solutions can be quite confusing. Many potential users struggle to understand the differences between the numerous technologies and methodologies and find it difficult to prioritize them.

But, the fact is that each facet of BI is important, and each plays a vital role in a company's overall information strategy. However, few organizations truly understand how these different tools and techniques should be used together to drive efficiency and effectiveness across the entire enterprise.

After more than 25 years in the industry, I have learned that BI is used in three distinct ways – strategically, analytically, and operationally. These three “levels” of business intelligence, while unique in their own way, are not mutually exclusive. They should be directly connected to each other, working in concert. Strategic analysis drives analytical BI, while analytical BI directs the focus of operational initiatives. And, these operational initiatives are what impact agility, productivity, cost-efficiency, and profitability.



In this paper, we'll investigate the various levels of business intelligence, discuss the challenges organizations face with today's typical BI deployments, and highlight how to make strategic, analytical, and operational initiatives work seamlessly together to enhance performance and boost competitive advantage across an entire organization.

Strategic, Analytical, and Operational BI: How They Impact Each Other

Just how do the three levels of BI relate? In a sense, they perform as a cycle. Let's start with strategic BI. The primary goal of strategic business intelligence is to drive the performance of the company as a whole, as well as the individual departments and business units that produce and deliver the company's products or services. Management collaborates and agrees on a strategy, and functionality like strategy maps, scorecards, reports, and dashboards are used to communicate the strategy in the form of measurable goals.

Within that same strategy, several critical success factors will exist. For example, customer satisfaction scores, market share, profit margins, or overhead costs. And, the status of those factors will reveal the progress – or lack thereof – towards reaching the overall goal(s) of the strategy.

This approach is much like a car's dashboard, where gauges that are in the red zone or flashing lights tell the driver that something is wrong, and where the problem may lie. By closely monitoring those factors, companies can immediately detect where problems exist and take swift corrective action.

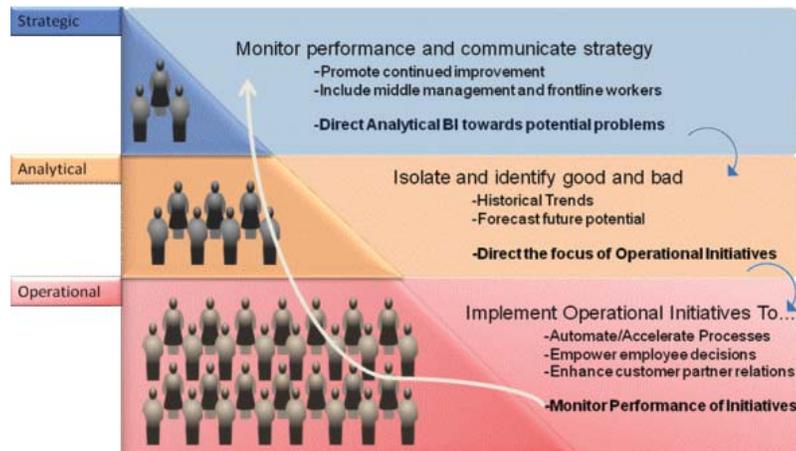
Once the strategy is defined, analytical BI comes into play. While strategic BI sets the foundation in the form of key performance metrics, analytical BI is employed to identify the source of an issue once it has been uncovered. Tools like analytic dashboards, OLAP, predictive analytics, and ad hoc queries are utilized to determine the location or cause of a major problem. For example, if profits are declining, is it because of low sales, or increasing expenses? If customer churn rates are on the rise, is it because of poor product quality, or lack of success in customer loyalty initiatives? With analytical BI, companies can investigate the factors that impact business performance from many different angles.

The results obtained from analytical BI activities then drive operational initiatives. Operational business intelligence facilitates the kind of day-to-day decision-making that happens at the lower levels of an organization, and enables the attainment of strategic goals.

For example, Utz Quality Foods uses Information Builders WebFOCUS to help manage the production and sales of over 20,000 pounds of potato chips every hour. Utz follows a vendor managed inventory (VMI) model and is fully responsible for stock levels on the store shelves of the grocery retailers it conducts business with.

The company's BI environment allows delivery people (the quintessential example of frontline operational workers) to send and receive data about promotions and current inventory levels at retail stores. This helps ensure that products are fresh and available at the 30,000 grocers that they service. The immediate availability of this type of operational information directly impacts the company's ability to reach high-level objectives such as increased sales or greater profitability.

But, the cycle never ends. New goals must be set, and new areas in need of improvement must be continuously sought.

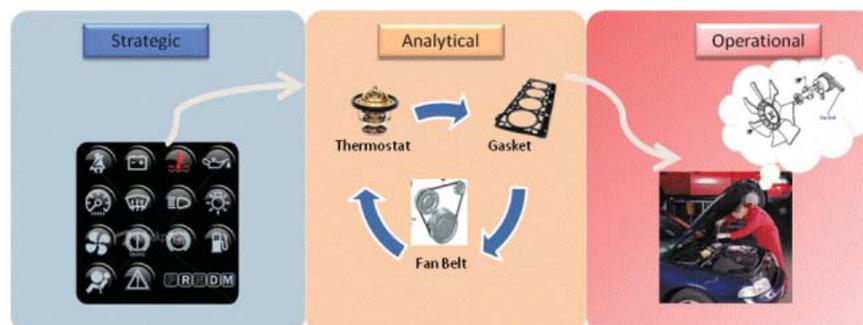


The three levels of business intelligence work together. Strategic – Management monitors performance and achievement of strategic goals. Analytical – Analysts isolate and identify issues that impede performance. Operational – Initiatives in the form of BI applications and process improvement remedy the identified roadblocks. Notice that the number of people affected by each level increases as you move through the cycle.

The Problem With BI

The reason many BI initiatives fail – or deliver less-than-expected returns – is because companies purchase, implement, and utilize their business intelligence software without fully understanding this cycle.

Let's return to the automobile dashboard analogy, this time taking it a step further.



In the scenario above, a warning light on the dashboard (Strategic) shows that the engine temperature has reached excessive levels. In the center, we see that further analysis has uncovered

which of several scenarios may be causing the issue. It could be a faulty thermostat which prevents coolant from flowing through the engine. It could be a bad gasket that is making the engine over-work. Or, it could be a fan belt, which is preventing the cooling of the coolant. In the third frame (Operational), a mechanic is putting the operational fix in place by repairing the broken fan belt.

Now, imagine any of these three steps working individually. The red light on the dashboard would do nothing to help solve the car's problem if it was not investigated further. And, without the indicator on the left, a mechanic (automobile analyst) would need to look in hundreds of places to understand what is truly wrong with the engine, preventing him from focusing on the problem's operational fix.

Here are some examples of the issues an organization may face when they focus on just one facet of BI:

Strategic BI Only

An executive has access to a dashboard that provides performance tracking, but no one else can view the information it contains. The executive can monitor key metrics, but has no means of communicating their importance to other areas of the business, and has no way to identify problems or uncover areas in need of improvement. This approach is similar to a driver who sees a red light flashing on his automobile's dashboard, yet ignores it and hopes the problem either corrects itself or goes away.

Analytical BI Only

Some firms leverage analytic software solutions to analyze data in a data warehouse to uncover trends and predict potential outcomes in certain business scenarios. But, no one is directing the focus of the analysis, making problem detection little more than guesswork. And, when a troubling trend is uncovered, there is no way to drive new operational efficiencies to correct it.

Operational BI Only

The use of operational business intelligence alone will rarely have a negative effect – or no effect at all – on a company's performance. Any use of information at the operational level will deliver positive results. However, with operational BI alone, there is no way to ensure that the most important problems and goals are the ones being focused on, and that the entire company, all the way down to the frontline worker, is aligned towards the achievement of the same strategic objectives.

How It Should Work

Many companies make the mistake of relying too heavily on BI in general, as if without it, they would have absolutely no way to create, sell, and deliver a product or service. Yet, decades ago, long before business intelligence and other types of software were introduced, businesses were successfully run with little more than bookkeepers, manufacturing staff, and a whole lot of paper. This meant that they had to find manual ways to assess efficiency, but it didn't prevent them from operating productively and turning a profit.

Through instinct and bottom line numbers, the ways in which a business should be effectively operated and/or improved can be understood long before volumes of data are collected and analyzed. For example, Company ABC produces a specific product and wants to sell it for a profit. In order to do so, they must build it with minimal overhead expenses, charge more than it cost to make, have enough inventory on hand to meet customer demands, and ensure that the product is of high quality to avoid returns.

The point is that businesses don't run on BI software. They just run better when timely information can be used to detect and correct problems – or even prevent them proactively – before they have a major effect on performance.

The key to success is to have a strategy in place before the business is launched. Business intelligence then becomes the tool for communicating that strategy to everyone in the organization, regardless of their role, and defining and measuring the factors that relate to its achievement.

Types of BI Tools: Where They Fit In

Balanced Scorecards and Strategy Maps

Whether a company subscribes to a specific management methodology or not, the benefits of monitoring and communicating performance results cannot be argued against. By clearly stating goals and translating them into measurable objectives, organizations can quantify and assess their progress. Without this, the status of the business can go unchecked for extended periods of time, which can be particularly detrimental if performance results are negative.

The purpose of performance management is two-fold. First, it enables senior executives to collaborate on and agree to a corporate strategy. Second, it facilitates the sharing of those goals with middle management and frontline workers, so everyone is properly aligned and striving to reach the same objectives.

In Robert Kaplan and David Norton's book *The Balanced Scorecard*, strategy maps and leading and lagging indicators are discussed. This concept is essential to truly effective performance management, even for companies that don't follow the balanced scorecard approach.

Kaplan and Norton claim that the overall goal of a company, or even one of its individual business units, can be described as a single end result. For example, the primary objective may be higher profitability, but having everyone in the company monitor only profit levels would serve no purpose in helping to achieve that goal. Why? Because profit is a lagging indicator, one that relies on other factors – like increased sales or reduced overhead costs – in order to be reached. These other factors are referred to as leading indicators.



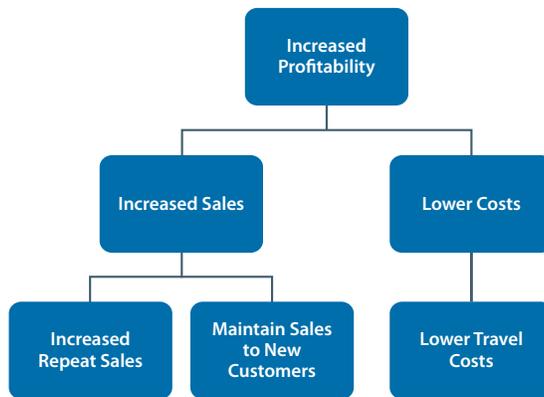
But, there are many levels to leading indicators. Let's take a look at reduced overhead costs. Expenses associated with travel, shipping, manufacturing, human resources, and other business functions all contribute to overhead. And increased sales can be impacted by sales to new customers or sales to existing customers.

In this section we'll focus on sales to existing customers, because its common knowledge that it is far more profitable to generate repeat business than it is to solicit new clients. Many experts claim that with skyrocketing advertising and marketing expenses, the cost of acquiring a new customer can be as much as ten times more than the cost of selling additional products and services to current accounts.

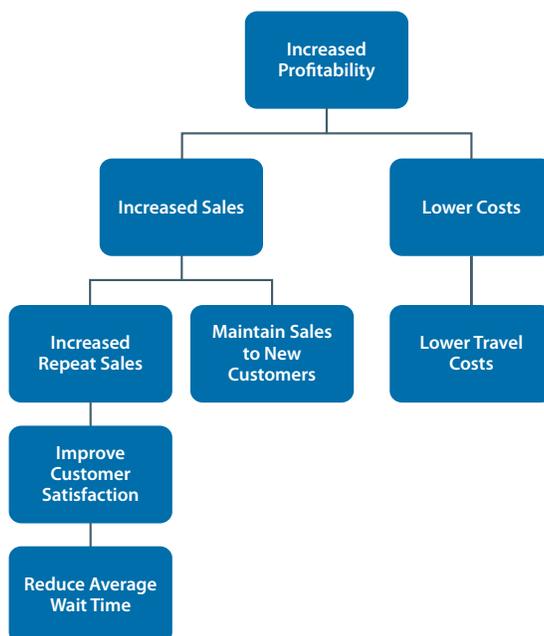
So, a company striving to improve profitability may seek to:

- Increase sales to existing customers
- Maintain revenue levels from new clients
- Reduce travel expenses by booking flights only on discount airlines

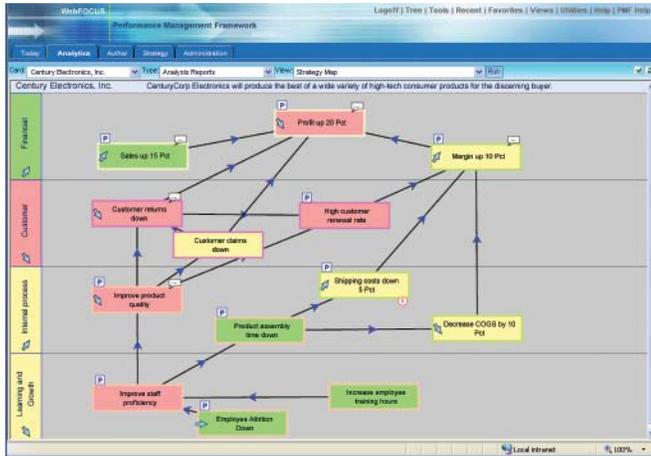
Each of these initiatives will be represented on the strategy map, and their importance will be communicated to line of business workers, such as sales reps, or the administrative staff that is responsible for making travel arrangements. The strategy map may look something like this:



The initiatives that link up to the overall strategy can drill further down into more specific and detailed operational processes. For example, in order to sell more to existing customers, a company would need to boost satisfaction levels. In order to improve customer satisfaction, service and support staff, particularly agents in the contact center, will need to be more courteous and responsive.



As the strategy, and the specific activities that will support it, are communicated throughout the company, every individual right down to frontline workers like customer service staff will fully understand how they play a role in corporate performance.



Strategy map from the WebFOCUS Performance Management Framework (PMF).

Periodic distribution of scorecard reports will then allow employees to view and monitor all key factors, right down to the level of individual tasks. For example, how well is the customer support team operating? And, how is each individual agent performing?



Cause and effect scorecard report from WebFOCUS Performance Management Framework (PMF).

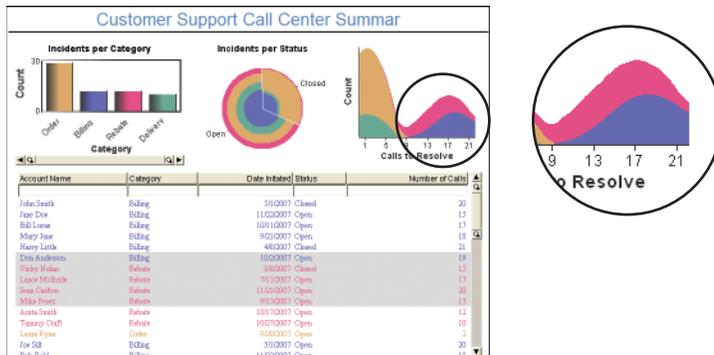
Analytic Dashboards

While the strategy map and scorecard enable visualization and communication of high-level goals, they do not facilitate the detection and correction of things that go awry. But, poor results in any key area may help identify which aspects of the business need to be further analyzed.

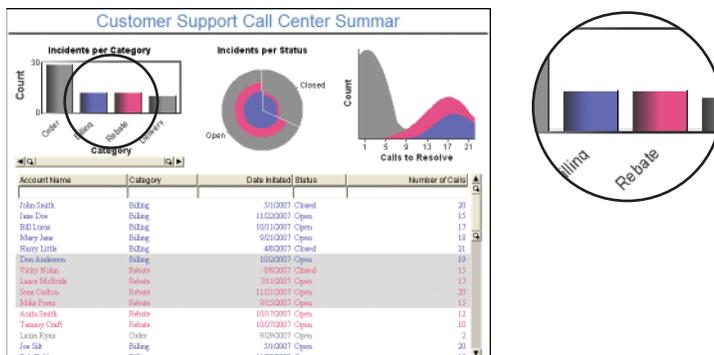
Analytical BI will demonstrate, for example, that average wait times for calls coming into the contact center have gotten worse in the past several months. Therefore, analysts can be directed to look at customer support more closely, and will use historical data and analytic tools to uncover the patterns and trends that are hindering strategy attainment.

The analytic dashboard below shows a scenario that may help an analyst isolate the underlying problem. The histogram on the top right shows a group of support incidents that required between five and 21 phone calls before a resolution was reached. By further investigating those calls, the analyst can clearly see that the incidents in question were related to billing and rebate issues.

The analyst discovers that these specific problems can only be resolved by referring callers to representatives who have been trained to use a different computer application. Multiple phone calls were required because the first representative the caller reached could not address the issue. Therefore, those representatives who could, had to call the customer back after they were finished handling calls that were already in progress.



By isolating problems with an excessive number of return phone calls (above), the problem is narrowed down to support problems related to billing and rebates (below).



So, strategic BI was used to outline and define the strategy. It also helped analysts understand which areas of the business have the greatest impact on the attainment of that strategy, so they know what needs to be analyzed.

Next comes problem resolution. Although the above scenario is fictional, the resolution to follow is based on a real-world initiative that was implemented at a leading telecommunications provider. This organization effectively utilized both business intelligence and enterprise integration to deploy a comprehensive operational BI solution.

Customer support information was stored in three separate databases, creating silos of customer data. This problem is not unique to this company alone. In fact, it is quite common in many organizations today. Some of you may have experienced this firsthand, waiting on hold to be transferred to another call center agent, or waiting for the right help desk representative to call you back.

The information contained within these disparate systems was integrated to build a real-time customer support data warehouse. Transaction-by-transaction updates from all relevant systems are sent to the warehouse. As a result, all customer-related information is fully centralized, so every representative can work on and resolve any customer issue.

The days of putting a customer on hold or transferring them to another staff member were over. Customer satisfaction ratings skyrocketed, repeat sales to existing clients rose sharply, and higher profitability was easily achieved.

This is how BI should work.

How BI Should Work: Real-World Successes

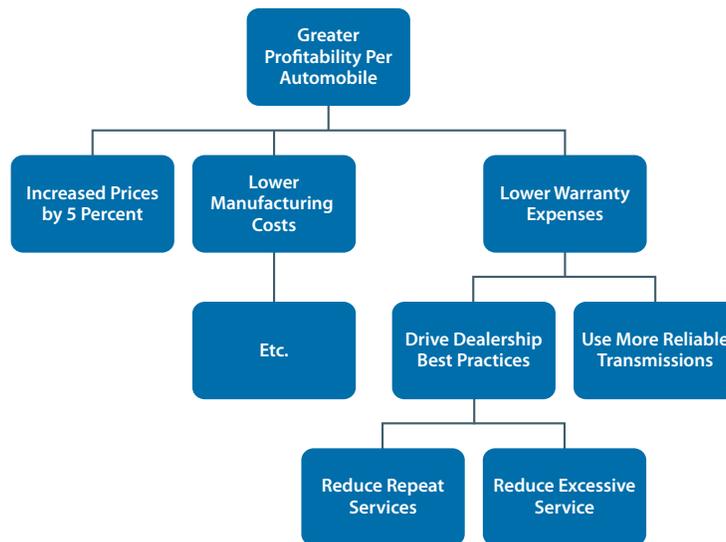
Let's look at two other real-world examples to see how the cycle of BI should work – with strategic planning driving analytics, and analytics directing the focus of operational initiatives.

Case Study: Automobile Manufacturer

This success story highlights how a well-known automobile manufacturer used business intelligence at every level of the organization to drive new efficiencies, and reach strategic goals.

The company was experiencing slipping revenues for each of the cars it produced, and shareholders were demanding increased profitability. But, driving profitability is a multi-faceted goal. One way to achieve it is to raise prices. However, in an industry as competitive as automobiles, where buyers are very cost-conscious, that simply wasn't an option.

Reducing costs is another way to boost profits. But, there are many factors that contribute to overhead expenses – manufacturing, payroll, warranties, etc. The strategy map below depicts some of the key initiatives that were agreed upon by senior management, and communicated throughout the company's ranks.



Note: The strategies depicted here are significantly simplified to ease understanding of the concepts presented in this paper. In real-world scenarios, these maps will have numerous layers and components. Analysis will typically point to many operational areas that are in need of improvement. Company management will then collaborate to prioritize these operational initiatives. In some cases, several operational initiatives will be underway at the same time. And in other situations, management will undertake smaller, less critical initiatives that can be accomplished quickly, instead of larger, more strategic ones that may take a longer time to complete.

The map helped the company's business analysts focus their efforts on the right cost-cutting measures. During the course of their analysis activities, many questions arose. How could the company cut costs, while maintaining high levels of product quality and support? Perhaps purchasing cheaper parts from different suppliers would increase profits by reducing the cost of goods sold, but this may compromise quality and result in higher warranty expenses down the road.

An analyst came up with the idea of increasing profitability by driving down warranty costs. This could be accomplished by providing dealerships with fast and simple access to timely information. Operating expenses could be dramatically reduced, without sacrificing quality. And, the cost of building and deploying such a solution was minimal, since the supporting technology infrastructure was already in place.

The resulting application enabled dealerships to more closely monitor and manage warranty service, so practices could be optimized (for example, reducing the number of repeat service appointments, and eliminating excessive service) to increase cost-efficiency. Additionally, since the dealerships are not owned by the manufacturer (they are partners of the company who sell and service the products), the application allowed competing dealerships to track each other's performance levels.

All performance-related data, including dealership ratings and comparisons, is communicated and shared via the Internet-based warranty management system. Red flag alerts for repeat services and other critical issues dynamically notify both the manufacturer and the dealer of potential problems. When needed, inspectors and trainers are dispatched to delinquent dealerships to address ongoing troubles.

Today, more than 60,000 employees – from service managers to mechanics – at 14,000 dealerships use the application daily. As a result, the company has cut as much as \$40 to 60 million dollars in warranty costs, a reduction that contributed significantly to their goal of higher profits.

This is how BI should work.

Case Study: Commercial Airline

The pressures of competition, combined with higher fuel prices, were causing a major airline to lose money. Those at the highest levels of the organization gave this charge to company employees – find a way to regain profitability.

But limited budgets made the aggressive advertising and marketing campaigns needed to boost sales impossible. So, profits would need to be driven through improved operational efficiencies.

The strategy map below depicts part of the company's strategy to improve profit margins. The majority of the strategy is aimed at increasing productivity.

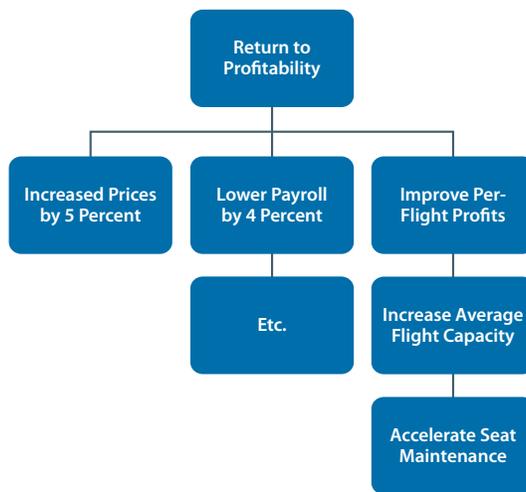
An analyst at the airline noticed that many flights, which were typically filled to capacity, were not selling all their seats. Further investigation showed that trivial maintenance issues, such as a faulty seat-back table or a torn seat cushion, were preventing the airline from selling tickets for those seats. But, maintenance workers weren't always notified of these problems in a timely manner, because repair-related information was distributed across three disparate applications.

What the airline needed was real-time information that would expedite service to planes between flights. Developers built a report that combines data from the distinct operational sources:

- The primary maintenance system, which contains information about plane problems such as broken seats
- The parts inventory system, which stores data about the location of replacement parts needed for repairs
- The plane routing system, where scheduling information resides

This single report keeps all maintenance workers informed about which planes need repairs, which parts are required to make those repairs, and where those planes are. This enables them to fix each problem as soon as possible. And, by ensuring that maintenance issues are fixed in the timeliest fashion possible, the airline can increase seat sales. As a result of this single report, as well as other operational initiatives, the company quickly returned to its previous levels of profitability.

This is how BI should work.



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Business Intelligence Maturity Level

In my experience, organizations who commit to improving their performance through information-sharing will move through various levels of maturity in their use of business intelligence and integration technologies. At any given point in time, they will fall into one of the five categories below.

Basic (Management Only)

Organizations in this stage provide reporting to workers at the executive and middle-management level only. Business is typically run month to month or quarter to quarter. Although reports are available more frequently, the end of each weekly, monthly, or quarterly cycle are the heaviest BI usage times. BI is used to monitor but not necessarily manage and guide the business. Information is looked at as secure and proprietary, and results will often be hidden from lower-level employees for reasons executives can't explain. Change is often based on the gut-feel of senior management.

Basic (Shared)

At this level, reports are utilized in the same way as in the previous level. However, the insight gained from them is looked at more openly, and more readily communicated throughout the organization. This type of company is more likely to institute change and ideas that come from the bottom up, instead of relying solely on executive intuition.

Intermediate

These organizations recognize the importance of creating a strategy and communicating it down through the ranks. They also understand that sharing and monitoring performance at all levels facilitates greater collaboration and coordination among business units and individual employees. As a result, they are implementing performance management and analytic solutions, and promoting analysis at the business unit level, so managers can leverage corporate information to identify potential organizational improvements.

Advanced

Advanced organizations are aware of the cycle of business intelligence, and understand the connection between strategic, analytical, and operational initiatives. Strategy and performance are clearly communicated to those employees on the frontlines. Analysis is targeted at critical areas of the business. Frontline workers are armed with access to real-time information, to accelerate and improve operational decision-making. And, people at all levels collaborate to develop new ideas for efficiency enhancements.

Expert

What could be better than the advanced use of information? The truth is, companies who have reached the advanced level have often realized maximum efficiency from the information they currently have. It's those expert businesses that have learned to take it a step further.

In addition to previously being BI users at the advanced level who fully understand the entire BI cycle, expert organizations have two key traits. They are forward-thinking and have implemented predictive analytics at the operational level to anticipate the factors that affect core activities. For example, they may predict the customers that are most likely to remain loyal or those most likely to defect – and use that information to maximize retention. Or, they may predict inventory levels for more effective demand planning.

These experts also use business intelligence outside their walls, making information readily accessible to the extended enterprise. This drive efficiencies not only with internal employees, but with customers, vendors, agents, resellers, and other strategic business partners. We even see expert organizations that are looking for ways to generate revenue by utilizing the information they collect.

The Business Intelligence Maturity Scale

Basic (Executives)	Basic (Shared)	Intermediate	Advanced	Expert
Monthly and quarterly reports are shared by management only. Change is instituted from the top down and very slowly.	Monthly and quarterly reports are shared throughout the organization. It's more likely that change is only instituted from bottom up. Change is instituted slowly.	Performance management and analytics are used more often to promote and communicate change. Analysis is implemented but not directly connected to strategy.	The business intelligence cycle is instituted and connected through all three levels: strategic, analytical, and operational. Frontline operational initiatives are implemented within the organization.	The business intelligence cycle is instituted and connected through all three levels in the advanced stage. New initiatives are focusing on change through predictive analytics and outbound customer- and partner-facing operational initiatives.

Conclusion

The topics in this paper highlight a pragmatic approach to utilizing business intelligence software in general. To conclude, let's discuss WebFOCUS from Information Builders, and what makes it the best choice for supporting enterprise-wide initiatives that embrace strategic, analytical, and operational BI.

Ease of Use

WebFOCUS is specifically designed to empower developers to rapidly build BI applications that can be utilized by employees at all levels. This expands business intelligence far beyond analysts and power users – who have always been able to employ complex BI tools – and makes it readily available to line of business workers who require operational reporting to support their day-to-day activities and drive process efficiencies across functions.

Scalability

The BI applications that have the greatest impact on operational efficiency are those that are used by frontline workers, as well as customers and external partners. Therefore, BI environments need to scale to thousands, tens of thousands, or even millions of users.

WebFOCUS delivers optimum scalability in three areas:

- **Performance.** Companies can build BI applications that support thousands of simultaneous users, without the need to spend millions of dollars on additional hardware.
- **Price.** Enabling millions of users to retrieve enterprise data is not cost-prohibitive with WebFOCUS.
- **Users.** Applications built with WebFOCUS are so simple and intuitive that even business professionals with no technical savvy can run their own reports, with little or no training.

Integration

Business intelligence has had limited impact in many organizations because the solutions used do not properly support the complexities associated with operational initiatives. For example, the scope of some of the integration scenarios described in this paper go far beyond the capabilities of many BI tools on the market today.

Operational BI requires unhindered access to real-time data. Additionally, in many operational initiatives, vastly different back-end systems must be tightly linked in order to solve a problem. Therefore, companies need more than BI tools. They need integration software – something that many BI solutions are lacking.

However, WebFOCUS is built on a robust integration platform that can access and leverage over 300 unique data sources running on over 35 different platforms. So any data, anywhere, can be effectively used to support operational initiatives.

Platform Independence

WebFOCUS can run on any platform and can leverage any enterprise data. So, it allows organizations to configure the most flexible and fully integrated solution to fit their specific needs and infrastructure.

Support for the Entire BI Cycle With One, Tightly-Integrated Solution Suite

WebFOCUS is unique in its ability to link all three levels of business intelligence. Information in transaction systems can be accessed directly for operational reporting purposes. That same data can also be incorporated into data warehouses for in-depth analysis by analysts. And, it can be combined with other information, and aggregated to create key performance indicators (KPIs) for the WebFOCUS Performance Management Framework, a powerful performance management system.

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