Business Intelligence Strategy

Step-by-Step Guide to BI Implementation and Execution

Data Meaning

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Abstract

Target Audience: The purpose of this paper is to inform IT and business executives of the best practices for the implementation of business intelligence strategy across an entire organization.

By using Business Intelligence technology (BI), users in an organization can track and manage information and, ultimately, gain a deeper understanding of the data they work with. The data produced in a company's operational system is more valuable than ever as businesses seek to optimize their strategies with BI. The ROI of most BI projects surpasses 430%.[1] However, many companies fail to take full advantage of BI projects due to a lack of complete integration and implementation throughout the organization.

A white paper entitled "Business Intelligence Across The Organization-Why Standardizing Business Intelligence Is Critical" provides insight into how to improve results from these projects through standardization.[2] Standardizing the implementation of BI tools helps bring down costs related to the initial purchase, implementation and employee education.

Based on research data and the in-depth experience of BI professionals, this white paper aims to expand the discussion of the practical applications and realities of successfully implemented BI standardization projects. Organizations can use the steps highlighted here to maximize the benefits of a standardized BI strategy.

Determining Your Readiness for BI Standardization

A key measure of how ready your organization is for BI strategy implementation is whether the IT and the business sides are in agreement about the advantages of BI. If they do not see the value of BI, management may have to initiate a deeper dialogue about BI and the benefits it could bring. Therefore, one of the first steps should be evaluating your organization's "BI maturity."

Troubleshoot Preemptively

A few steps taken early on in the implementation process can help stabilize costs.

Audit Previous or Ongoing BI Projects

Clearly delineate the expenses and results of these projects.

Demonstrate The Advantages of Standardization

Using your data, demonstrate the value of standardized BI project. This will help assure that sufficient funds and resources are allocated to the project.

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[1] International Data Corporation, 2002.
[2] Business Objects, 2001.

Executive Summary

Purpose

- Establish clear criteria. Identify the BI needs of your organization and the tools required to meet them.

- Require compliance with the standard. Formal reviews and incentives and similar policies can help ensure proper use of BI tools.

Design a BI Strategy for the Long Term

To make the most of BI, it is best to integrate it, step by step, into your organization's broader vision:

Foster Trust Between IT and Business Users

It is not uncommon for organizations to have tension or a divide between the IT and business divisions, which can hamper efforts to implement a BI strategy. Building more understanding and cooperation between these divisions will facilitate the implementation of a BI strategy.

Create a BI Center of Excellence

Establishing a BI Center of Excellence (BI COE) will give your organization a base for generating and spreading BI best practices across your organization. A program management office can serve as a temporary home until a complete COE becomes feasible. Typically, a business person heads up the COE, reports regularly to core departments and provides an atmosphere of collaboration among departments.

Coordinate BI Initiatives In An Organizational Structure

Draw up a blueprint of how BI will enhance or impact the organization in terms of the business, technical, functional and organizational needs.

Develop A BI Methodology

Clearly identify and define the responsibilities and duties of different users in the organization, such as IT or business users, including technical and user-focused aspects throughout
the project.

Create An Acquisition/Deployment Process

Use financial incentives to encourage the use of your COE.

Communicate the Value of the Strategy

A serious potential danger of a BI standardization project is when leaders in an organization do not thoroughly explain the goals, benefits and overall strategy to different users in the organization.

- Make an implementation plan and convey it clearly. Frequently reiterate how BI and the standardization project will benefit your organization.

Appraising Business Intelligence

Defining Business Intelligence

Business Intelligence is implementing technologies to harness information available in an organization to increase business performance. Ideally, all employees, partners and suppliers can retrieve, analyze and share relevant information to do their jobs better within the organizational framework. The "executive information systems" of the past have evolved into sophisticated, powerful technological tools adapted to different user and data circumstances.

Recognizing the Worth of Business Intelligence

Keith Gile of Giga said, "BI has evolved during the past three years from a niche, departmentally-focused solution to a strategic enterprise asset."[3] This statement highlights the increasing importance of business intelligence when it comes to setting an organization apart from its competitors in today's marketplace.

The current economic climate has driven companies to rethink how they manage and minimize operational costs. The most important benefit BI can bring to a company is the power to distribute information throughout the organization to increase efficiency at all levels. Standard implementation of BI means that multiple information systems can be taken into consideration and analyzed. An example of this would be factoring in all expenses linked to decisions like establishing a travel budget or personnel management. Rather than looking only at salary, a company using a BI strategy can also consider factors, such as how much it costs to maintain communications and facilities for employees.

The idea behind BI is to reduce expenses without disturbing the core business. In an example from the U.K., a supermarket ended up saving customers it might have otherwise lost to competitors. Initially, the chain had decided to eliminate some seemingly unprofitable products from shelves. However, after further analysis, it became clear that these products actually sold quite well among high-profit customers. In this case, cutting out the product would have hurt their core business.

Gross revenue increases can also result from BI. In competitive markets, targeting specific demographics with products that correspond to their needs differentiates a company from rivals. BI can go a long way in helping to pinpoint new customer behaviors, which markets are most profitable, and finding opportunities to cross-sell products—all of which leads to better customer service and increased revenues.

Strengthen Your Current Data Assets with BI

Despite the fact that companies have invested more in operational information systems in the last 10 years, the actual returns have proven to be less than expected for many organizations. On average, information systems require 23 months to get up and running, according to a 1999 survey of multinationals. Moreover, companies in the survey group reported $1.5 million of negative return on investment.

[3] Developing a Business Intelligence Strategic Plan, 2002.

Appraising Business Intelligence

The prospects for ROI do look brighter as time goes by, however. More than ROI, though, these systems help organizations construct an information framework that produces lasting value. The main issue is the lack of access to this information across the organization.

The solution to this locked-up information on information systems is BI. A BI investment usually averages a return of more than 430%[4], according to a study by the International Data Corporation in 2002. This illustrates how important BI is and will continue to be for IT spending in the future. [5] However, as with any undertaking on a large scale, problems do arise. It is worthwhile to consider some case studies of companies that have sought to use BI across their organizations.

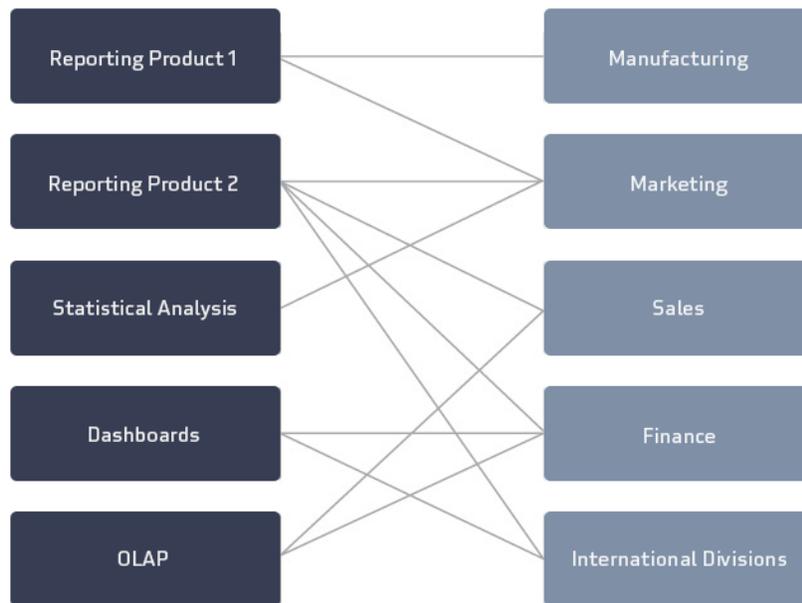[4] International Data Corporation, 2002.

Current Challenges

The majority of companies in the market make use of BI to some extent. For the most part, these solutions are applied on an as-needed basis in individual departments with little-to-no BI strategy. While these projects often result in a significant return, they still fall short of the total potential of a complete BI strategy implemented throughout an organization. Many organizations report that few employees (19%) feel they have access to enough data for their daily decisions[6].

Trend: Increased BI Fragmentation

Typically, companies turn to BI for solutions to sudden problems that arise due to user demands. They also tend to ignore other existing projects and software in the organization. In other cases, organizations have built up BI through the accumulation of other enterprise solutions like customer relationship management (CRM) and enterprise resource planning (ERP) systems. The result fails to maximize the benefits of BI and requires additional maintenance and support.

Fig. 1: Many organizations now use redundant products across different departments—the result of fragmented BI.

Reporting Product 1 — Manufacturing

Reporting Product 2 — Marketing

Statistical Analysis — Sales

Dashboards — Finance

OLAP — International Divisions

[5] AT Kearny and Line 56 Research, 2001.
[6] HP–Business Objects study, 2001.

Current Challenges

A major reason for this is the complex nature of BI technology market. Until recently, the market has been host to a number of entities with distinct products and data sources. According to META Group, "Proliferating business intelligence tools, with overlapping functionality, are a common problem in large organizations."[7] Now, however, the market is beginning to consolidate somewhat.

Within two years, an estimated 50% increase in companies using BI is anticipated.[8] If they choose not to develop an overall BI strategy, fragmentation will likely spike as well.

The Costly Drawbacks of BI Fragmentation

The result of a fragmented BI strategy, or a lack of one entirely, is increased strain on the organization and more inefficiency in terms of the integration, operation and support. In turn, companies end up spending more time and money on procurement, training, implementation. Moreover, disjointed projects mean more personnel, less consistent organization-wide information and significantly reduced opportunities for sharing and innovation between departments in the organization.

In the end, the most dangerous aspect of neglecting fragmentation is the failure to take advantage of the full potential of BI. As Gartner has noted, "through to 2004, more than half of Global 200 enterprises will fail to properly use BI, losing market share to those that do."[9]

BI Fragmentation and ERP

Some organizations seek to remedy this situation by engaging ERP vendors. These operations offer to store the information on the organization's behalf. Such vendors often promote "integrated BI" packages to potential clients.

This quick fix overlooks a few problems, the first of which is that of data dependence. Namely, ERP systems make use of a sole data source to link information together.

However, to truly benefit from a BI strategy, individual users in an organization need the freedom to access information from a variety of systems in the organization.

The IDC estimates that most Fortune 1000 companies have dramatically increased the access points and sources of critical data in their organizations in recent years. On average, these companies maintain over 40 distinct applications and more than two dozen databases integrated within a broader warehousing strategy. Of course, with time, the amount of data archived in such systems will naturally increase.

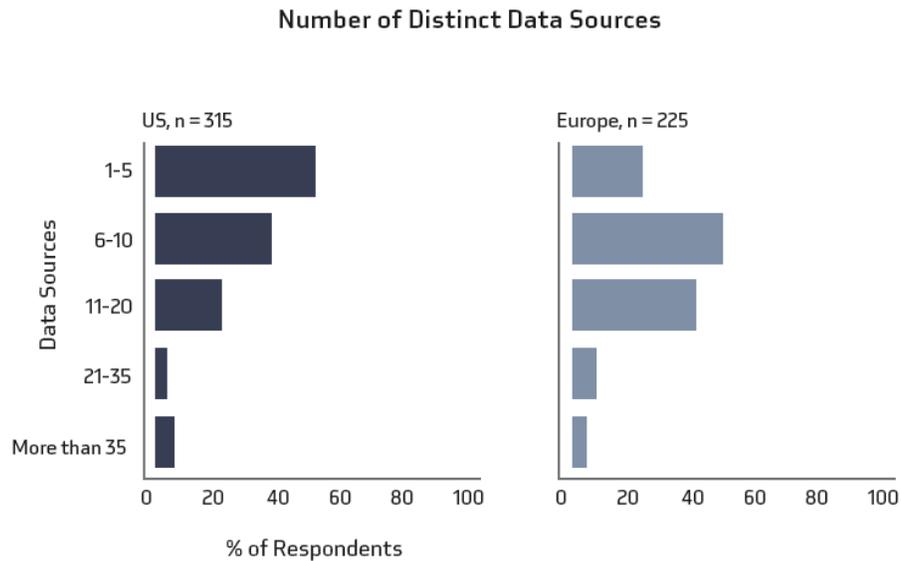[7] META Group, Business Intelligence Tools: Setting the Standard, 2001
[8] Gartner, Business Intelligence Multi-client Study, 2002.
[9] Ibid.

Current Challenges

Figure 2: Most organizations rely on an increasing variety of data sources.

Source: Gartnergroup multiclient study

Number of Distinct Data Sources

For these reasons, relying on a sole data source from an "integrated BI" package does not solve the problem of fragmentation. META Group states that, "For enterprise-strength analytics, such as business performance management (BPM) across multiple divisions employing diverse mega application packages (e.g., SAP for financials, PeopleSoft for HR, etc.), it is recommended that enterprises use staged data from the ERP packages' integrated analytics as a source of information to feed the enterprise data warehouse. Such an enterprise DW or operational data store strategy will provide the enterprise with the flexibility to adapt new analytical tools when they offer competitive advantage regardless of the vendor."[10]

Specialization poses additional problems. Again, META Group contends, "A key reason for ERP vendors' poor track record in BI solutions is the fundamental philosophical differences between operational systems and analytical systems…BI vendors have been honing their analytics for more than a decade, and ERP vendors are now playing catch-up."[11]

The recommendation of industry analysts has not gone unnoticed. In fact, organizations would rather turn to a vendor whose main mission is to provide BI solutions as opposed to working with ERP providers, according to a U.S.-based Gartner study.[12]

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[10] META Group, Business Intelligence Solutions for ERP Packages: Best Practices 2003/04
[11] Ibid.
[12] Gartner, Business Intelligence Multi-client Study, 2002.

Current Challenges

Figure 3: Companies increasingly demand BI specialized solution providers.

Pie chart:
- 30% — Provides software in> 1 category
- 26% — Focuses primarily on BI
- 13% — Focuses primarily on DB/DW
- 18% — Focuses primarily on ERP/CRM
- 13% — No preference
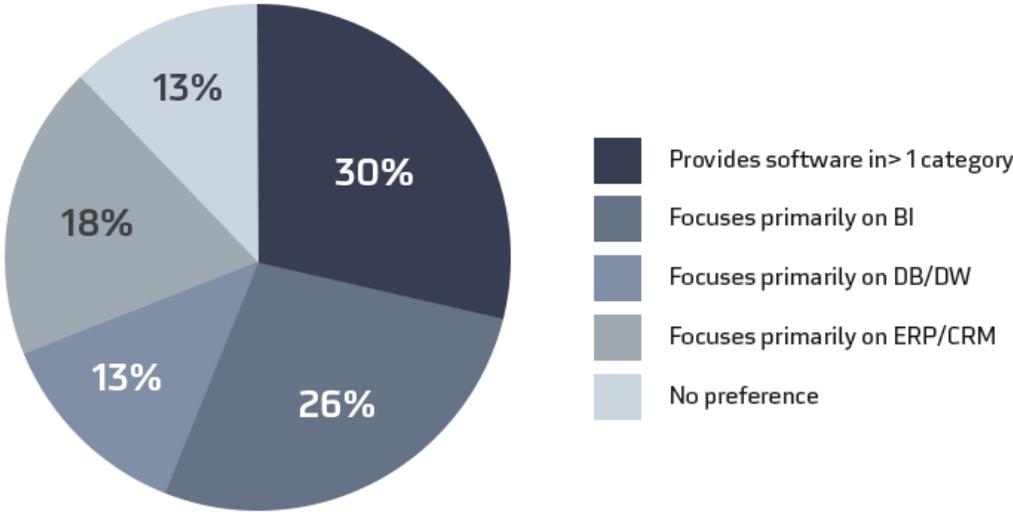
What BI Standardization Can Change

It has been established that a significant return can be achieved through BI for unique, focused projects. However, organization-wide standardization can result in even greater returns.

BI is a Building Block of Business

In the past, essential materials for employees consisted of office space and equipment, Internet access, email and other network services. Now, more companies consider BI as an essential tool to spread and share relevant information within and between teams and employees.

META Group indicates that "BI…must be subjected to the same standardization processes used for other technologies widely deployed throughout the organization (e.g., productivity tools, workgroup databases, corporate databases, web servers, browsers)."[13] According to the Gartner Group, more than half of IT managers in 2002 expressed interest in organization-wide BI standardization.[14]

BI Standardization and ROI

Substantial gains in direct and indirect ROI can result from BI standardization.

Direct

Decreased Costs Per Project

Projects can be planned and put into action with less time and money, as well as fewer unforeseen problems.

Less Waste On Redundant Infrastructure

The technical side remains the same for projects across an organization. As a result, teams can focus on the project at hand instead of coming up with organizationally isolated solutions and having to retrain employees. Teams can utilize the same technical components and make use of the most up-to-date products available for a given project.

A Stronger Position Vis-À-Vis Vendors

Standardizing the BI strategy across an organization facilitates support at all levels and increases an organization's ability to deal effectively with vendors.

Indirect:

A Better End-User Experience

Compliance with and acceptance of the BI strategy will increase greatly when an organization's applications are standard in look, feel and utility along with easy-to-find help resources.

Reduced Strain On IT teams

IT departments can concentrate on high priority areas, like customer delivery and complex architecture issues.

A More Efficient Use Of BI

According to Gartner, BI will have become a key strategic concern in at least half of all companies by 2002. This approach helps organizations set goals and objectives using the correct resources in a more coordinated way.[15] Such a coordinated approach is more easily accomplished through standardization.

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[13] META Group, Business Intelligence Tools: Setting The Standard, 2001.
[14] Gartner, Business Intelligence Multi-client Study, 2002.
[15] Gartner, Business Intelligence Multi-client Study, 2002.

Step 1:
Determining Readiness

A key consideration for creating a BI strategy is how mature an organization is in terms of information. Most organizations fall into one of the following categories:

Little to No Interest in BI

Companies in this category tend to concern themselves primarily with problem solving but do not have a management team interested in or aware of the benefits of a more comprehensive information strategy. IT departments in such organizations tend to see the issue in purely technical terms while their business counterparts do not value the benefits of a comprehensive BI strategy.

In such organizations, either the market or other external factors may lead to a change in how executives evaluate the importance of BI. Action at the executive level can then spark a change in the organization's culture.

Fragmented BI

Most present-day organizations find themselves in this category. These organizations use BI, but usually only on an as-needed basis. It is not uncommon for BI projects in these organizations to be completed independently of the IT department, instead of in a collaborative manner.

While BI projects like this are often still beneficial for the organization, many organizations have difficulty determining which BI products line up with their needs. As a result, organizations in this category often end up with BI products that do not fit with their current technology and infrastructure. Consequently, users in the organization are not able to access information as quickly or easily as desired and communication between BI silos is less than optimal. In short, the resulting system is fragmented, which costs the company directly and indirectly.

For this type of organization, executives need to evaluate the goals and objectives of the organization as a whole and adapt the existing infrastructure to accommodate a comprehensive BI strategy.

BI Straight Out of the Box

In an attempt to standardize software and minimize support and purchasing costs, some organizations simplify too much. Unfortunately, this often results in an unappealing end-user experience and an underused system, despite the large investment.

Step 2:
Anticipate and Minimize Problems

Organizations should keep the end-user in mind when implementing a BI system and IT must concentrate on the parts of the organization that will benefit most from BI, in terms of ROI.

Agreement About BI

Some organizations have IT and end-users who are on board with the decision to implement a comprehensive BI plan, but they still face significant obstacles.

A common hurdle is a lack of trust between departments, especially IT and business teams. For example, failure to coordinate projects in an environment based on trust could cause the IT team to apply a "straight-out-of-the-box" strategy while the business side attempts to develop independent information access nodes.

Alternatively, some organizations begin implementing BI, only to find that budgets have changed or departments are being split or merged, causing them to put the BI implementation on hold. This might also lead to a weakened BI strategy that fails to encompass the entire organization.

To remedy these problems and make the most of BI, organizations should make use of a BI Center of Excellence and a BI framework as organizational hubs for the BI strategy.

Wherever your organization fits in terms of the categories mentioned above, steps should be taken to prepare for a larger number of BI projects and to look out for signs of BI fragmentation.

Audit Your BI Capacity

All organizations should begin with a thorough audit of current BI projects, taking into account the costs and benefits and how each project is being applied in each department. Based on this information, planners can determine the appropriate standards for BI technologies in order to keep management and training costs down.

Then, a task force should be formed, consisting of IT managers familiar with establishing organization-wide standards, employees involved in current BI projects, and select end-users. Ultimately, your organization's experience and familiarity with BI strategy and implementation will dictate the breadth of the audit.

This task force will need to amass data on the total number of users, types of tools and versions, upcoming upgrades and appropriate platforms. It is possible to save time if you are using a BI system that allows you to track usage. Do not forget to check the status of software licenses currently in use.

Step 2:
Anticipate and Minimize Problems

The task force should compare operating and implementation costs (software licenses and training as well) with the total number of users for all existing projects. The team should also categorize each project by function, such as analysis, statistics or dashboards. This will enable the development of non-redundant criteria for standard tools. Once these criteria have been established, the team can evaluate the benefits of individual projects in comparison with the cost. It is most likely impossible to determine an ideal valuation method. The important thing is that the team agrees on it and that it is consistent for cross-functional comparison purposes. If the BI solution is better than what was previously available, the best valuation method is usually defined by the users of the system.

Be sure to have the proper technical resources to deal with any issues or complaints that arise. For the most part, simply engaging in the audit process will improve the appeal of the BI system for end-users.

Demonstrate the Benefits of Standardization

The data resulting from the audit should reveal the costs and any redundant functionality in the existing BI projects. This information should serve to excite executives about the cost-reduction possibilities of standardization and help them promote BI standardization and implementation. This executive support is essential for the next more difficult stage, which is actually designating standards and applying them in practice.

Avoid Redundancies by Setting Clear Criteria

When designing BI standards, it is important to eliminate redundancies in function while avoiding a one-size-fits-all approach.

The first step is to evaluate the current tools in the organization and compare them to the required BI tools. Most organizations find it more challenging to evaluate end-user requirements for a new BI strategy than to evaluate architecture requirements.

One way to determine this is to use surveys. However, before distributing surveys, it is useful to ensure that all users understand the tools and what they can do to maximize the quality of the survey responses. Similarly, business users may provide more insight if they see the costs and benefits of this strategy in comparison with others. Additionally, do not forget to consider other players that might be impacted by these changes, like customers, suppliers and partners.

This feedback, along with IT requirements, will help you set the criteria to define, implement and promote your standardization approach. In most cases, the criteria cover three principal areas:

Step 2:
Anticipate and Minimize Problems

Functionality

An organization should assess what areas and users' needs a product can address. An important consideration here is how straightforward the product is to use. Organizations should prioritize products that allow for upgrades to more advanced tools when necessary.

Other things to keep in mind are the currently available management tools and possible future products. When assessing a BI tool kit, the following areas should not be ignored:

- Data management
- Information delivery
- Data mining and analytics
- Business specialization (i.e. functionality for a particular horizontal or vertical business domain, if relevant)
- Support for collaboration and goal-setting

Infrastructure

The degree to which certain tools fit with the organization's infrastructure requirements:

- Architecture (scalability, security, extensibility)
- Integration
- Consistency
- Globalization

Selecting a Vendor

Several factors influence which vendor an organization selects, but political pressure to use an inferior or outdated product should not be one of them. Priority should be given to top-tier products that the organization has already implemented. Additionally, take a good look at the vendor's market position and track record with BI standardization projects. A vendor with a strong position can help ensure continuity during tough economic times, so these criteria are important:

- Vendor strength (market leadership, market vision)
- Price

Using these criteria typically reduces the number of appropriate options to a select few. Price plays a major role in this decision, but more subjective factors also come into play, such as support and the compatibility of the vendor's strategy with the organization's strategy.

Ensure the Standard is Uniformly Applied

Once you have decided on a particular product, you need to figure out what to do with individuals who are still using

Step 2:
Anticipate and Minimize Problems

products that do not conform to the new standard. Take the time to clearly communicate how you will assist them in making the transition so they do not become isolated.

Since the costs of training and maintenance for existing BI projects are generally not greater than those of retraining, most organizations do not attempt to apply the standard to existing projects unless the users are dissatisfied with it. Rather, organizations focus their standardization efforts on new projects.

Until organizational and technological changes make the switch to standard tools, which are convenient and appropriate, managers should not neglect to offer support to users on legacy systems, although they should not promote the growth of the old system.

Ignoring or hastily implementing one of the aforementioned steps can result in difficulty enforcing standardization. The effects of strong executive backing and an effective, diverse task force, combined with understandable, thoroughly explained criteria, should open the way for an effective standardization process. It should be noted, however, that standardization can take a toll on an organization if not done correctly. In and of itself, standardization can reduce the costs that come along with fragmentation. However, the true benefits of BI cannot be attained without a BI strategy for the long term.

Step 3:
BI Strategy for the Long Run

The tactics discussed up to this point are the basis for a solid BI strategy. To achieve proper implementation, though, a comprehensive BI strategy that corresponds to your organization's needs is required. This, in turn, will depend on altering the way in which your organization utilizes BI.

Overview

To maximize the advantages offered by BI, organizations have to think carefully about how different actors within the organization cooperate and coordinate during projects and make necessary changes. Gartner's Howard Dresner states, "Smart enterprises are beginning to recognize the strategic impact of BI. They understand the need for the investment, the need to move past tactical and isolated implementations, and the need to involve every department and every function, especially senior management, in the BI implementation."[16] Attempting to introduce standardization independently from a COE ultimately causes increased costs, low rates of adoption by end-users and loss of trust across an organization. The success of these short-term solutions pales in comparison to that of solutions for the long term, which make use of a BI Center of Excellence that maintains and promotes best practices within the organization.

Sheer entropy can kill a standardization bid. Also, an organization's standards will eventually be obsolete and lose the truly integrated nature they were meant to have. In addition, some more dynamic departments will begin to seek exceptions to the standards. This ultimately leads to fragmentation and, in turn, higher costs. This is where a COE can help. The COE promotes the standards across the organization, checks their implementation and stays on the cutting edge of available technology.

Although creating a COE from the ground up is possible, some organizations find it too demanding, especially given the current economic climate. Instead, these organizations settle on an intermediary step: setting up a program management office, or PMO, for BI. The PMO, under the guidance of the executive team, takes control of BI projects and standards. As the members of the PMO become more familiar with their roles, it can also take charge of the best practices that are usually under the purview of a COE.

Foster Trust

A high level of trust between the main sectors of an organization, especially IT and business users, is integral to setting a good foundation for a COE. Before a successful COE can be built, organizations should always establish a high level of trust between the business users and IT. Many IT and business divisions experience tensions and mistrust. Since this is exactly the point where BI hinges, this step is extremely important. Without it, success may prove elusive.

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[16] Gartner, Business Intelligence in 2002, the User's View, 2002.

Step 3:
BI Strategy for the Long Run

Often, it is due to the nature of their specialized roles—IT takes charge of security and data management; the business side develops, purchases or manages its own applications—that such mistrust evolves. The problems arise when the business side takes on duties and roles that would be better off in the hands of the IT professional, like hardware or software administration, results tracking or design. Occasionally, these systems end up being too complex or bulky, and IT is called in to remedy the situation, adding to their workload. This decreases satisfaction on the IT side, increases tensions between the divisions and leads to rising costs of integration. As mentioned earlier, simply going through the process of a BI audit can help resolve some of these issues. However, in more severe cases, organizations have to bring in new faces to bridge the communication gap between these divisions in order to proceed.

Create and Roll Out a BI Center of Excellence

Applying BI strategically and forming a long-term plan for BI both fall under the auspices of a COE, with the following goals:

- Educate executives about the role BI plays in improving business management
- Establish and encourage cross-business-unit communication to avoid the accumulation of application silos
- Demonstrate the advantages of a solid BI architecture as the basis for an effective BI strategy
- Promote an IT culture that recognizes the varied needs and demands of different users; simultaneously drum up support for a dynamic platform that can handle ever-changing user needs

Beginning with a Program Management Office (PMO)

Establishing a program management office (PMO) can ease the transition to a fully functioning COE. An organization's executives and suppliers involved with BI form the Executive Steering Committee, or ESC, which directs the PMO.

Periodic ESC meeting should aim to:

- Establish and emphasize the importance of and PMO commitment to the task at hand
- Set PMO initiatives and establish deadlines
- Serve as a platform for identifying and anticipating obstacles or challenges before they happen
- Guide and explain measurement rubrics to the PMO. The initial project management duties will go to the PMO, which is made up of architecture or BI project managers as well as those from important BI suppliers.

Step 3:
BI Strategy for the Long Run

PMO objectives:

- Put the ESC's strategies and initiatives into action.

- Monitor the COE's development with a view to it becoming the central exchange of BI knowledge and expertise.

- Help with individual project plans as needed and encourage teams and individuals to use quantifiable measures of success during projects, such as metrics and milestones.

- Use ROI as a guide to monitor and give feedback about BI activities, keeping the overall plan and vision in mind

- Constantly offer ongoing education, training and guidance about the features of the product for business users

- Keep an open line of communication with vendors—get feedback about potential problem areas, improvements and product guidance as dictated by the project.

- Make tech support available to teams during projects and, more generally, in the form of a help desk.

Most organizations will lean more heavily on BI suppliers during their first projects to help train and direct individuals in the organization. The commitment of the various actors in a project will depend on a variety of factors, such as the amount of projects, their complexity and where they are in their life cycle. Many participants will not need to dedicate all of their time to these projects. Regardless, the organization should ensure that the PMO has access to sufficient resources to handle several projects simultaneously.

Transforming Your PMO into a BI Center of Excellence

The PMO is a temporary entity with the ultimate goal of preparing BI expertise and being dismantled or absorbed once the COE is complete. When the COE is operational, it takes on the role of managing the infrastructure and resources necessary for effective and adequate technical support for ongoing projects.

The COE takes full control of projects initiated through the PMO and:

- Trains users so they can eventually access data and use the product independently.

- Uses the advanced analytic skills available to step in to provide analysis when doing so is too complex for end-users. With time, end-users will be able to handle more of this work individually.

- Is a source of consistency for users in the organization. Problems and concerns in different divisions can often be solved with consistent solutions created at the center.

- Standardizes data vocabulary in all departments by using available business metadata.

- Ensures standards are being used across the organization within the desired BI framework.

Equip the BI COE with the Proper Competencies

Step 3:
BI Strategy for the Long Run

Essentially, a PMO relies on a mixture of technical and project skills. However, a COE has to strive to go beyond this by applying advanced techniques to analysis and information-usage tracking in order to aid in the decision-making process and translate those decisions into action. In this way, the COE can use the information available for the benefit of the broader strategy.

Business users with a firm background in technology and experience running BI projects often perform the best in the COE context, as opposed to IT professionals with business knowledge.
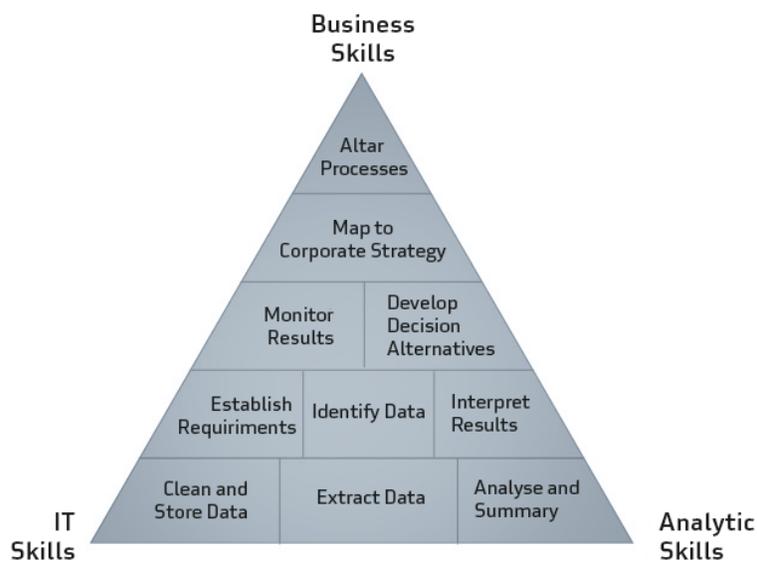

Figure 6: Ideal COE staff members work with three different skills concurrently.

This underscores the importance of staffing the center with people who have developed trust among business users and know what they need and expect. As a whole, the ideal center will draw from talented IT, business and analytic specialists, although business managers usually have responsibilities elsewhere that preclude them from being part of the COE.

Finding the best employees for the COE is a difficult, moving target. Gartner warned of an insufficient amount of BI professionals by 2004. Also, he notes that, "by 2003, enterprises that do not recognize and leverage their analytic skills and staff, and do not invest in them by forming a competency center, will be unable to meet strategic objectives."[17]

Analytic skills are central to the COE's mission and the center should be able to:

- Anticipate issues and produce analytical models to deal with them
- Work with available data to discern correlations, trends and outliers

[17] **Gartner, The Business Intelligence Competency Center: An Essential Business Strategy, 2002.**

Step 3:
BI Strategy for the Long Run

- Engage in continued education to stay abreast of changing analytic tools

- Define metrics used to make recommendations and provide a summary to related parties

- Ensure that users actively understand the uses of the data

Essential skills for a BI Center of Excellence:

- Knowledge and comprehension of the needs of the distinct business units in the organization, from sales to HR, as well as cross-business-unit issues, including customer and channel profitability

- Sufficient expertise to set strategic BI goals in conjunction with the organization's goals and express them clearly and convincingly to related executives

- The ability to work with managers to make ROI models, business cases and analysis of decisions to prioritize their activities

On the IT side, however, members should be thoroughly familiar with:

- How business and analytical requirements will be impacted by BI infrastructure

- Ways to support business and analysis requirements by accessing and managing the proper data

- BI tools and technologies, the data warehouse, and data administration

Initially, sourcing employees with such a specific skill set might seem like a daunting task. However, most organizations discover that they already have individuals who handle several of these tasks, even though these tasks are not strictly in their job description. Such so-called "power users" are a decent starting point.

Integrate the COE Center into the Organization

The COE should occupy a particular place in an organization. If placed outside of the daily orbit of most employees, it could become an abstraction and become out of touch with the core business. If the center ends up mired in the day-to-day working of the business, though, it will lose its vantage point and its ability to gain a broader view of the organization's activities.

That said, each organization has to make a careful decision about where to place the COE based on the nature of the business and the BI strategy. Large multinationals, for instance, might implement BI across hundreds of business units, each one containing a number of departments.

The most common reason a BI strategy fails is because of the business and management side rather than technology. In terms of structure, COEs should liaise with the largest unit or the main driver of business in the organization. This will vary from organization to organization. Of course, the largest unit still needs to communicate and cooperate with the COE as well as with other units to ensure success, given the cross-functional nature of BI.

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Some organizations find that it is impractical for the COE to communicate regularly with the business units and opt instead to have the COE link to a strategic point in the IT department, such as the CIO. For others, the finance department is a decent replacement, especially if its duties extend beyond the financial operations of the organization.

The placement and organization of a COE should also depend on the teams already operating in an organization. Cross-functional teams like a data warehouse, for example, may alter the timing since data warehouse projects usually precede the development of a COE. Additionally, the intermediate PMO may also facilitate the transfer of the data warehouse project to a COE, which will serve as the central location of best practices and ongoing training across multiple projects.

Budgetary and funding issues also play a role in how well the COE will operate within the organization. Some organizations classify these centers as expenditures only, which means that BI users can use all the features of the service. This approach runs the risk of undervaluing the COE, though, and the center could eventually degrade into an overpriced, underperforming help desk.

Another approach is to actually attach a fee to the service for users. This offsets some of the costs and encourages value-added behavior, but also risks restricting the pace of the center's growth. Early adopters will likely pay for the service, but hold-outs, who are already hesitant, may need some convincing before deciding to participate, as the fees represent another barrier.

A subscription-based approach will allow an organization to incentivize workers and produce an internal virtual profit-and-loss statement, as well as spread costs among users and their habits.

Putting Together the BI Framework

The different levels of an organization are coordinated through the BI framework, which is a critical function of the COE.

Organizations can take advantage of pre-existing standardization projects and the institutional knowledge that comes along with them, all within the framework of corporate structures that are already in place. This can be achieved by using the conventional view of the IT "stack" by which several layers are implemented sequentially.

Despite its advantages, this layered approach often results in a failure to take critical cultural and business features into account during such processes and instead concentrates mostly on the technical side of the process. However, the readiness of an organization on the business side is equally important in this process. Catering the framework to the unique nature of BI standardization takes this into account and helps improve the success of a given standardization effort.

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To establish the "information" layer, two types of readiness are necessary: technical and organizational.

Technical readiness encompasses the following:

- Currently functioning operational systems. The BI framework will consist of a different set of components, but the quantity and quality of the data in existing systems will dictate the quality of the BI analysis.

- The infrastructure to store and translate into BI-appropriate data. The infrastructure required by a particular organization will vary, but typically, operational data stores, or ODS, are used to keep detailed data from several systems and data warehouses or marts archive data in a search-friendly way. Information can be made appropriate for BI manually or by extraction, transformation and loading software, or ETL.

Achieving readiness on the technical side helps organizations maximize efficiency while remaining flexible. An example of this is when several data marts are created for different projects for a simpler structure and direct ROI.

In cases like this, the data mart should follow the criteria issued by the BI framework to keep the consistency of the definitions and allow access among all the projects involved. In this way, the BI framework remains coherent.

Organizational readiness requires creating a framework and communicating to users how to use the information effectively. This is where the technical framework plays out in an organization. However, many organizations overlook this issue. It is this part of the framework that customizes BI and helps maximize its efficiency.

Organizations should keep the following things in mind:

Alignment of corporate goals and BI strategy

Have you done a thorough audit and evaluation to see if these are in sync or have you considered using business improvement methodologies?

Decision making culture

What kind of culture has developed in the organization that dictates how decisions are made and how can BI improve the use of data in such an environment?

Current analytical skills

How far does the organization need to go to develop the necessary analytical skills for BI, and should they be sought externally, internally, or both?

Where do you want BI to take your organization?

Is the organization in need of cost reductions, improved customer satisfaction or something else entirely? How do they rank in order of importance?

The way employees and other actors use information

Does the organization encourage sharing of information, including metrics and dashboards, between employees, partners and customers, or not? Who interprets the information?

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Different types of users

Among the BI users in the organization, how might the user experience vary, depending on location and position?

The broader market

Are your competitors using BI to achieve similar goals and in similar ways? Are your competitors sharing information with customers and partners as well? Have they developed a better understanding of customers and customer trends than you?

The current economic climate

How does your organization's use of BI change, given the dynamic global economy of the modern world? Will it help you forecast and assess fluctuations in demand, markets and different regions? Will it add value to your strategic planning when dealing with customers or partners?

Globalization's impact

Is your BI strategy adapted to the needs, demands and realities of customers across the world with different languages and circumstances to those in your primary market?

Changes in the regulatory environment

How have relevant regulatory environments changed and is your organization implementing internal oversight in reaction or anticipation of such changes?

Your organization's reach

Do you share information with partners and their customers and in what capacity? Could they possibly benefit from sharing information with your organization?

After this comes the knowledge layer. Using the BI applications chosen earlier in the process of standardization, the organization must use concrete business cases to roll out the BI system and set up BI projects following the best practices established at the COE.

Finally, the profit layer puts information to work in the organization to change how you do business. With a system properly in place, collecting and deploying information is just the beginning. Thinking about how to use information in a different way is what might necessitate more fundamental changes at the management level to approach processes differently. Return on investment analysis should indicate whether or not you are achieving your goals.

The benefits in terms of ROI are often substantial, due to how BI helps an organization react more confidently and flexibly to unforeseen events using technical and organizational modifications. This differentiates one organization from another and often determines which ones succeed and which ones fail. A comprehensive, customized BI strategy can help information work for your organization from top to bottom.

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Prepare for BI Methodology and Life Cycles

Running a COE for regular and sustained success means using best practices for BI methodology and the right tools for the job.

Each organization has to find its own answer to this challenge, but there are some guidelines. There are five main BI deployment steps, illustrated in figure 8, which is based on work by the Gartner Group and others.

Behind this methodology are the ideas of concurrent engineering and rapid (iterative) development methodologies. Note that, in the model, actors are participating in multiple steps at the same time.

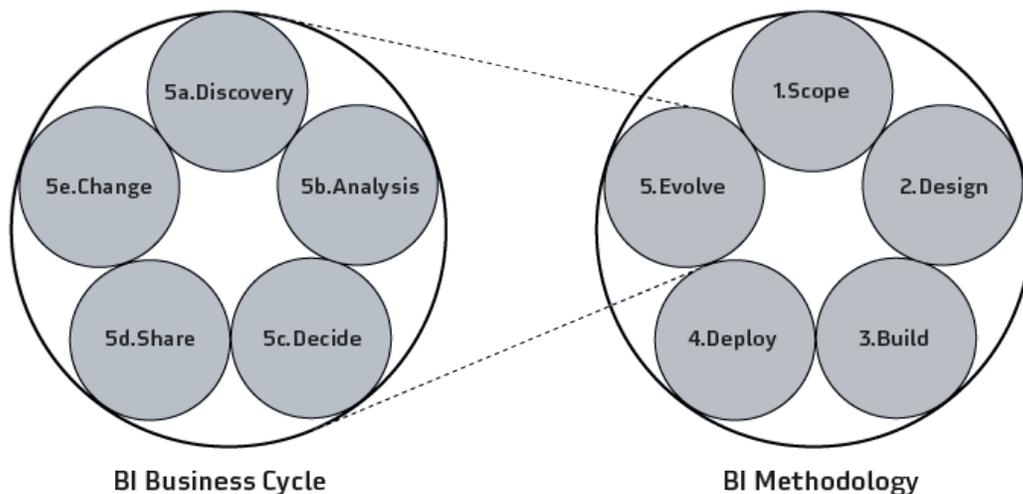**BI Business Cycle**   **BI Methodology**

Figure 8: Success can be enhanced by employing a BI best practice methodology for your projects.

For all the various steps, participants should clearly understand their roles and who is heading up the project. At different points, the input and participation of the IT department, users and the COE are required.

The first four steps represent the construction phase, which is the most demanding in terms of time, money and other resources and it is also the most crucial phase. Success elsewhere will depend on what happens here.

Step 1. Scope
Determining the scope should not be overlooked as it helps ensure that the project, using the BI framework, is a match in terms of the technical and organizational requirements as well as the goals of the organization.

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Step 2. Design

This step requires that the team evaluates the needs of the organization. This includes key performance indicators, or KPIs, that end-users need. The team can prioritize projects according to the organization's needs using an ROI case to determine what value the new information brings to the project. Even if the organization cannot currently support the identified business needs, KPIs are still important for establishing a plan, regardless of the information the organization currently has at its disposal. Once these needs are established, project members should select and design solution components and information sources associated to the project and come to a formal agreement about the plan and how to implement it successfully.

BI technologies should also be chosen at this stage. The COE and IT department should work cooperatively to decide which tools are appropriate for the project's level of complexity and the user needs. End-users should also have input at this stage of the process. The group also needs to make sure that sufficient support is available for the necessary KPIs, what information sources will be used to this end and whether they need any modifications made before analysis.

Step 3. Build

This stage requires a prototype to see if the initial idea matches the plan's goals. This testing should evaluate and model how actors use information throughout the organization. Do not limit the testing to IT specialists.

The "design" and "build" steps are the most time and resource intensive parts of the cycle, and up to 70 percent of the costs may originate in data infrastructure.

Projects will vary according to complexity, which, in turn, determines the amount of work that will be required in this phase. Sometimes, the solution will require careful customization, as is the case when using a digital dashboard application. Other solutions might be simpler to build.

Step 4. Deploy

This is the stage where the solution begins to make its way to the end-user. Success at this stage, and for the project as a whole, will ultimately be a result of quality training and support for the end-users via an iterative approach. This is especially true at the beginning of a project, regardless of the particular technologies used. In this stage, reports and analyses should be created with business users in mind. This will serve as a foundation for more sophisticated analytics later on.

The COE can lend support and guidance to the IT organization during this process and end-users should be constantly in the loop. At this stage, user support mechanisms need to be established and explained by the IT organization so the technical support department can carry out these duties.

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Step 5. Evolve

With the solution deployed, end-users will now put the information to work in their decisions and business processes. During this stage, the organization should aim to increase information sharing inside and outside of the organization, promote the solution throughout the organization, and measure the success of the project.

However, during this step, the technical aspects should not overshadow the business aspects. This is a potentially dangerous point where projects fail to take off if a business manager is not up to speed with what is happening. To explain this step in more detail, it has been divided into five sections.

Step 5a. Discovery

It is difficult to envision just how a COE and end-users will interact once everything is up and running. For this reason, the establishment of the COE is just the beginning. End-users and the COE should foster a cooperative environment to discover the system's true potential.

Step 5b. Access

End-users need access to tech support and COE staff for their projects. This will help them manage and engage more intimately with the information, which will further the business mission.

Step 5c. Decide

With the COE supporting and guiding end-users for the best results, end-users use the information available to make important business decisions.

Step 5d. Share

True change in the way an organization operates will derive from how these decisions, and the analysis of these decisions, are shared.

Step 5e. Change

The COE should take the responsibility to review problems and evaluate whether changes are necessary, which may indicate a deeper process re-engineering.

The cycle then starts over with the first step with a slightly refocused methodology:

- Analysis
- Re-evaluation
- Modification
- Optimization
- Tuning

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End-users and the COE can use this new focus to use what has been learned in future processes for a more fluid and relevant deployment.

The COE can use the BI methodology to determine how to allocate and apply funding and organizational resources as well as understand and promote the steps of the cycle for successful BI implementation.

Clearly Defined Roles and Responsibilities

Each organization will have to look to its structure and personnel to determine how to divvy out responsibility in the form of information, support and approval roles. This might also change on a project-to-project basis. Even the vendor an organization works with could be a factor, since some external vendors might have advice on strategy or implementation.

Take a Close Look at User Needs

Regardless of the nature of your BI project, customer needs are of utmost importance. These needs can be analyzed using the following criteria:

Required Functionality

Determine the level of functionality required by users: segmentation, statistical analysis, forecasting, visualization and mapping.

Level Of Detail

Each organization will have its own definition of what detailed information is, depending on the industry and the size of the organization. The solution should be tailored accordingly.

Data Breadth

Some users will need to compare available data across a number of systems, such as the impact HR information has on customer satisfaction.

Level Of End-User Control

This will vary from users who work independently for the most part to users who require more guidance during a project.

Complexity Vs. User-Friendliness

Organizations will have to decide how to strike a balance between functional complexity and user-friendliness, which is common with IT products.

Level Of Customization

Some projects require interfaces specifically designed for a particular task, as is the case when using executive dashboards.

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BI users typically fit into one of the following categories:

Analysts

These individuals are perhaps the most capable users and can operate independently, but require broad and deep information to fulfill their duties of tracking, comprehending and managing information. They also act as a conduit of information across the organization.

General Knowledge Workers

The majority of BI users fall into this category. They require information for the day-to-day operations of the business. However, they need simpler, less powerful interfaces than analysts and they primarily access less global information than analysts.

Executives And Managers

Currently, this is the smallest category of BI users, but due to the increasing use of dashboards, this group could grow in the coming years. Executives and managers are somewhat of a hybrid, as they require broad data on an easy-to-use, customizable interface. This is because their needs change frequently and they control a wide range of activities. As opposed to using detailed analysis, these users rely on KPIs, exceptions and trends.

Customers And Partners

More than ever before, customers, partners and suppliers beyond the organization's firewall are part of the BI system. In fact, BI systems are expanding most rapidly in this direction.[18] The interface for these users tends to be user-friendly and web-based for straightforward, practical information retrieval and use. Mostly, these users are interested in accessing status and service level agreement information to forge a deeper relationship with the organization.

Acquisition and Follow-Up Process for BI Methodologies

BI acquisition can help your organization implement and promote best-practice BI methodologies. It is essential that business units use ROI cases and tracking metrics for BI projects, and the procurement department should play a role in this acquisition process.

Incentives can also play a role in encouraging the continued participation and cooperation of business units and the COE. These incentives could be financial, such as centrally developed license purchases that business units can access.

Often it is the case that vendors put forward offers to individual business units. Well-known, highly competitive businesses often receive enticing offers. The COE should retain control of decision making when it comes to deployment choices, no matter how attractive offers from technology vendors may seem. This will help avoid fragmentation and help keep projects in line with the current BI framework.

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The COE's Relationship with External Vendors

To promote smooth and effective BI projects over the long run, it is often advantageous to collaborate with external vendors, assuming that they conform to the BI framework criteria you have employed.

The first principal type of vendor the COE might deal with is also the most common: technical services related to the BI infrastructure. During the early days of the COE, external vendors can be a great asset, although as the COE gains competence, these vendors will probably only be used for certain projects.

Organizations can benefit from external vendors for projects because of:

In-Depth Technical Knowledge

It is a vendor's job to stay informed of the technical advantages of their products and how to best implement them.

Experience

Vendors are typically extremely familiar with best-practice BI deployments from other assignments. They can use this know-how to advise your organization during its deployment.

Focused Knowledge

In the early days of a COE, your organization will still probably lack some of the skills necessary for an effective implementation. Vendors, on the other hand, have specialized knowledge that they can share with the COE.

Availability

During a BI deployment, your organization might feel the demands on internal resources. Vendors, though, can be more flexible and offset some of these stresses during this demanding period.

Training

While your organization will ultimately be responsible for data-related training, vendors can be a great source of technical know-how. It is not uncommon for vendors to provide training to help organizations assimilate their products more efficiently, and they often cover these subjects more thoroughly than a COE in its early days. BI is still in the process of coming into its own. As a result, there still are not many vendors that have experience supporting a partnership-style relationship with organizations.

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Taking that into consideration, you should keep the following in mind regarding the relationship with a vendor:

Global Reach

In order to reduce the complexity of pricing, support and contracts, the vendor should be available in all of the regions in which your organization operates. Ideally, the vendor will provide one individual or one team to take care of your account.

Resources Dedicated To Your Projects

Larger, more complex projects will benefit from having a vendor that understands how to act within the context of your organization but still takes responsibility like any external vendor would. The vendor should also be able to assign resources dedicated to your projects alone and help your organization understand its needs.

Thinking Like A Partner

No matter what your relationship with the vendor, it is in their best interest to see your organization succeed. However, the best results will come from partnering with vendors that look beyond one-time deals and see the big picture. To achieve this, look for vendors that are prepared to incentivize their team in ways that promote continued cooperation with your organization, such as sales quotas and customer satisfaction incentives.

Strategy consulting is the second principal type of external help that organizations use. Most major consulting firms assist organizations with the implementation of the COE.

Rather than worrying about whether you have chosen the absolute best BI strategy available, the important thing at this juncture is to roll out the strategy you have chosen as effectively as possible. It is this very implementation and maintenance that poses the most difficulties during COE projects. This is mostly due to organizational inertia that slows down change. This can be overcome through a clear and thorough explanation of the changes. *CFO Magazine* has reported that over half of executives in a recent survey cited a lack of dependable metrics to gauge the advantages of re-engineering.[19]

Explain and Keep Tabs on the Implementation Plan

With the end-users in mind, organizations need to constantly strive to clearly convey the objective of the BI strategy and how it corresponds to the needs of the end-users. Organizations often use newsletters, workshops and rewards to educate individuals inside and outside of the organization and to monitor and publicize successes. Other BI technologies, such as executive dashboards, can be effective for sharing information and monitoring progress or setbacks.

If you do experience setbacks, these should be analyzed and discussed with business users to maintain the COE's credibility, which will also promote the use of the BI framework.

[19] *CFO Magazine*, **May 1995.**

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Manage Costs and Project Effectiveness

To improve the cost-effectiveness of projects, the organizations should monitor information and use BI analytical tools to maximize metrics such as payroll costs (direct and indirect) and the overall impact of training programs in the organization.

Be Aware of Typical BI Project Challenges

Typically, a BI deployment will pass through similar phases. However, problems can and will arise. It is the COE's mission to encourage communication and troubleshooting methods to deflect these problems and use them to grow.

Underestimating Resources For Data Integration

For an organization's first projects, data available from earlier projects will work. However, as projects increase in number and complexity, additional resources will be required, often in new formats or from different sources. It is important not to short-change projects when it comes to time and resources.

Manually inputting scripts or similar approaches exacerbate this problem, so making use of ETL and data cleansing tools as well as additional staff or services to perform data collection is important. At first, the costs may seem prohibitive, but over the long term, they provide the flexibility required and will pay off. While data may be stored across numerous systems, your organization should ensure that the BI technologies used can summarize and present all the information in the form of reports.

Unreliable Information

If resources are lacking or an organization's data is of poor quality, the resulting system often fails to provide reliable information for business users. If this happens, trust in the system will quickly erode and the implementation will slow down or come to a halt.

Of course, the data will not be perfect right from the outset. This is especially true when those who input data are not motivated to maintain the quality of the data, which happens in sales information systems, most notably. Even "dirty data" can be useful, but it should be explained to those involved how better data would produce even better results. Communication is the key. At the same time, business users have to understand the limitations of the system and adjust their expectations accordingly. Until the data can be eventually cleaned, users will have to do work with the best data available to produce reports.

Unrealistic Expectations

During the process of explaining and communicating the benefits of a BI system, the COE and the vendors may inadvertently create a false impression of what the project can do in its initial stages. Technical issues

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and postponed projects can cause frustration among users in these cases.

While a positive outlook about the final result of the project should be communicated, users need to be aware of the pitfalls and setbacks that will inevitably occur in the initial stages. Of course, any delays or setbacks should be explained in a clear, timely fashion and goals should be adjusted accordingly.

Differences In Functionality

A new system will bring about significant changes, many of them advantageous. However, it may take time to bring all aspects of the new system up to where they need to be. This can also cause frustration among users, leading to complaints and a general negative feeling about the new system.

Organizations should attempt to ensure that any deficiencies in functionality in the new system are not mission-critical or are not permanent. Users should also be informed about what to expect in order to avoid disappointment

Failure To Use Data

By itself, data is not very useful—it requires analysis and action. Collection on its own is not enough. Ultimately, it is the users, including managers and executives, who have to make the data work for the organization.

The COE can take great strides toward resolving this situation through proper staffing with individuals who possess the business and analytical skills to roll out the BI methodology step by step.

Individual-Centric BI

BI does serve individuals, but only to the extent that they are part of a larger group that collaborates and shares information to come to the best decision. During the BI implementation, the collaborative, group-based nature of decision making should be brought to light.

Ever-Evolving Data Needs

 It is a mistake to plan projects for an unchanging world and business environment, as this does not reflect the reality in which any business operates. Both internal and external factors constantly reposition and reshape themselves in relation to an organization's mission, so change is not optional. In fact, the act of implementing a BI system will bring out changes as well, and the organization will have to constantly re-envision how it integrates, analyses and manipulates data.

This ever-changing nature of the business environment needs to be reflected in the BI framework. This is especially true for multinationals operating in a fast-paced, dynamic environment.

Cultural Lag

Once an organization has matured in terms of BI, it often becomes obvious that certain "tried-and-tested" assumptions about business no longer hold. While the information and metrics may show this, there may be a disconnect between the pace of change in the organization and the pace and expectations of the users.

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They may distrust the data or resist rules that do not conform to the system to which they are already accustomed.

To expedite adoption among users, organizations can forge an empirical approach to decision making, using BI as the source of information. Specifically, showing how the new information from the BI system contradicts the prevailing conventional wisdom can be a powerful way to open users up to the possibilities and get them thinking beyond the traditional approach they used before.

Inadequate Communication

Again, communication about the goals and progress of the BI strategy is essential if end-users are to work within the BI framework. Otherwise, they tend to become dissatisfied and look for alternative solutions. So, while people are definitely busier than ever, taking the time to keep users updated on the COE's progress should remain a top priority.Trust can and must be forged through communication about failures and delays as well as about successes.

Treating The Standards As A Static Element

Do not forget that the initial standards set for the BI framework are meant to evolve as the organization develops competencies and skills along with the COE. In addition, new technologies may warrant a change in standards. If the COE solutions seem dated to users, they may be tempted to other solutions from vendors or other sources.This risk is especially acute when a solid partnership does not form between the COE and vendors, which reduces communication about progress and new developments. To avoid this, the COE and the vendor should work together to elicit analyst opinions and evaluate whether the standards are still effective.

Underestimating The Costs Associated With BI

Many vendors now like to bundle BI products along with other application or database services. In a tough economy, such deals seem very attractive. However, BI tools are really just the beginning of a comprehensive BI strategy, and maintenance and deployment require more resources, if done correctly. Without a COE and a coherent BI framework with appropriate standards, these bundled, or "free," BI products may turn out to cost more than the value they add.

Mismatched Personnel Assignments

A common misperception is that the technical side of BI projects is more important than the business side. Organizations that fall prey to this often place an IT person with business experience in the lead, but the opposite would be better. This is because deep knowledge of the technical issues is not necessary for COE and BI project leaders, but the business and political skills are.

Problems will inevitably surface during a BI deployment, but they often serve as signs that different resources or a shift

Conclusion

The current information and technology driven marketplace produces more information than has ever been available before. The question now is what to do with it. More companies are turning to BI to unlock the power of the data that their activities generate in order to become more competitive players in their respective industries. This trend does not seem to be reversing.

This document has discussed the key elements of a BI strategy, such as the establishment of BI standards, corresponding methodologies, and a COE to guide the process. These steps and guidelines can lead an organization toward more efficient operations and better ROI through a more intelligent use of information.

About Our Group

Data Meaning utilizes cutting-edge technologies to build innovative and effective Business Intelligence and Data Warehousing solutions. Their experienced, professional staff can design and deliver pioneering reporting systems to give you a unique perspective to your data and an edge in your decisions.

Along with the world-class consulting services Data Meaning offers, they are also an official licensed reseller of the award-winning MicroStrategy Business Intelligence Reporting Suite, a fully integrated BI platform that makes Business Intelligence faster, easier, and more user-friendly. Data Meaning has MicroStrategy certified consultants available to help you deploy MicroStrategy with ease. For your BI and DW design, install and implementation and training needs please visit us at **www.datameaning.com** or email **info@datameaning.com.**