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Strategic Analysis Report
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The Business Intelligence Competency Center: An Essential Business Strategy

Good business intelligence (BI) doesn't just alert an enterprise to looming problems; it also highlights opportunities and cost savings. But good BI needs a good team — the BI competency center.

Management Summary

The dominant theme in BI is communication. IS organizations and users (and often executives) speak different languages, so who can act as the interpreter? Who understands the needs of the IS organization and users, and can make sense of them in terms of an enterprise's BI strategy? The answer is simple — the BI competency center. What the center can do is:

- Help executives understand the critical role of BI in managing the business better.
- Communicate to the IS organization the important role of BI applications as part of a BI strategy, encouraging IS to work more closely with users.
- Build communication across lines of business (LOBs) to prevent the creation of new BI application silos.
- Help users understand the benefits of a robust BI architecture as the foundation for successful delivery of a BI strategy.
- Help the IS organization realize that users will need multiple BI technologies to meet their varied analytical needs, while getting users to support the IS organization's need to provide a platform that will support changing user needs.

The center also plays an important role in managing the alignment of BI activism as business needs change and new technologies emerge. It can also help in gaining the appropriate executive-level commitment to resolving alignment issues.

In this *Strategic Analysis Report,* we examine the issues surrounding a BI competency center, and offer practical advice on how to establish one, operate it and keep it relevant to an enterprise's overall business strategy.

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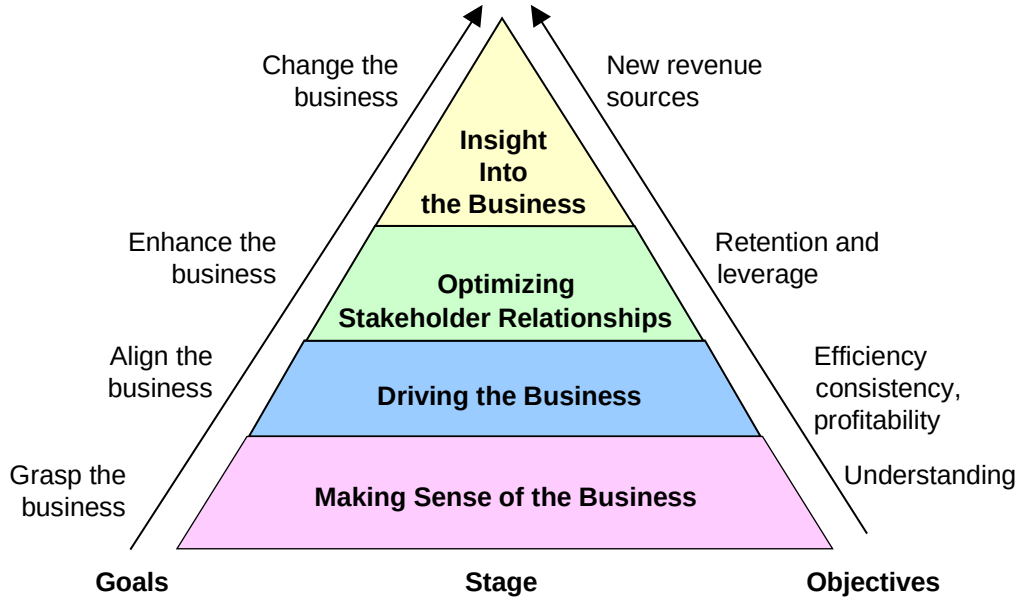
FIGURES

1.0 The Case for BI

Enterprises must understand the impact BI as a strategic initiative can have on their business. It's the beginning of the search for BI "enlightenment" (see Figure 1), where BI becomes an integral part of the attempt to build a more agile enterprise. The goals include:

- Having more insight into your market than your competitors do
- Adapting quickly to take advantage of changing business conditions
- Creating new profit opportunities



Source: Gartner Research

Figure 1. The Road to BI Enlightenment

Putting together a center to manage and coordinate an enterprise's BI strategy is a major undertaking. Despite its inherent practicality, there's little use in doing this until senior managers have a clear understanding of how BI's goals can benefit the enterprise.

2.0 BI Activism: The Sharing of Goals

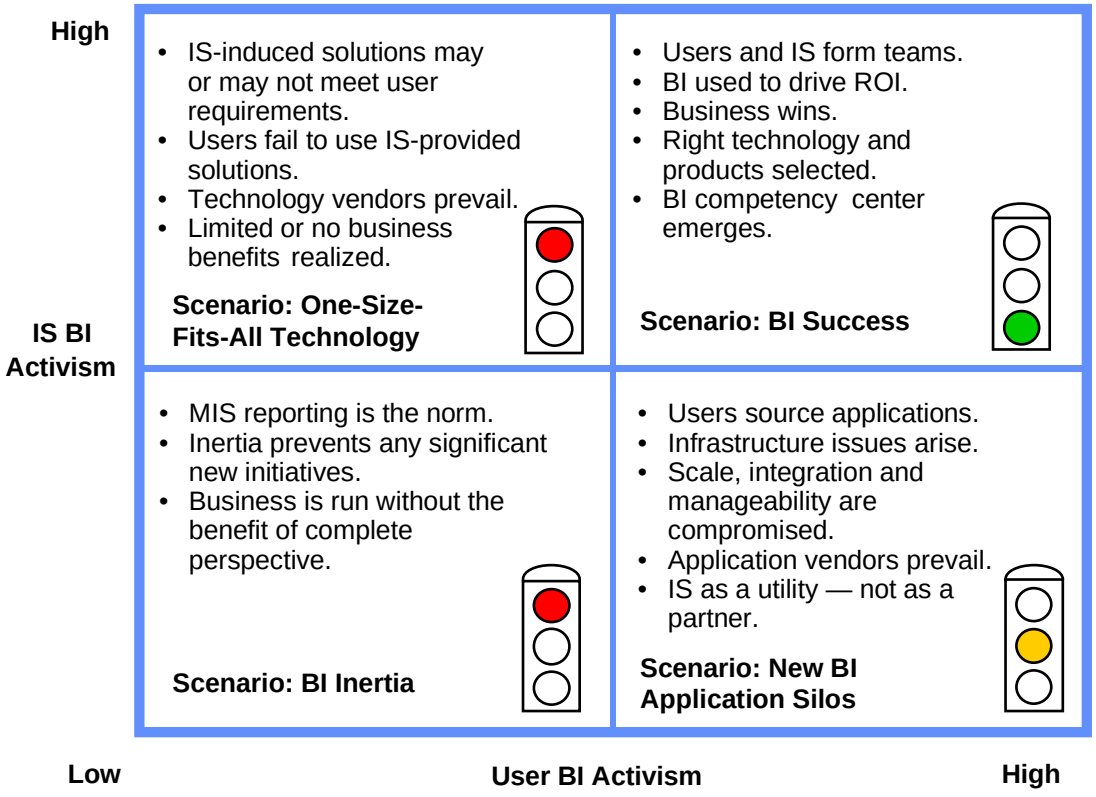
The goal of BI is to deliver more insight and perspective to the business. But successfully implementing a BI strategy can be difficult. One of the big challenges is the level of enthusiasm with which users and the IS organization embrace the concepts — so-called "BI activism." Where everyone agrees on the benefits of BI, there is a good chance of success. However, if users or the IS organization have different levels of enthusiasm, BI is unlikely to deliver any real benefits. Even worse, if both the IS organization and users have a low opinion of BI, projects will fail.

2.1 Assessing BI Activism

Enterprises need to identify how ambitious and determined the IS organization and users are in their desire to promote BI. This can be assessed by looking at practices and attitudes, and the track record of BI projects. There are four possible scenarios that can result (see Figure 2):

- *BI inertia:* Both the IS organization and users have low levels of activism

- *A "one-size-fits-all" technology solution:* The IS organization has high levels of activism not matched by users.
- *New BI application silos:* Users have high levels of BI activism not matched by the IS organization.
- *Likely BI success:* Both users and the IS organization have high levels of activism.



BI	Business intelligence
IS	Information systems
MIS	Management information systems
ROI	Return on investment

Source: Gartner Research

Figure 2. BI Activism Scenarios

2.2 Defeating BI Inertia

BI inertia is most likely in enterprises with a history of poor relations between the IS organization and business users. Users may be suspicious that better BI will open them up to greater management scrutiny, while the IS department may feel threatened that its specialist skills will no longer be needed.

Enterprises in the grip of BI inertia must understand that any BI strategy will fail without high levels of BI activism among the IS organization and users. To be successful with BI, a fundamental cultural shift is required. The way people think about the value of information and how it is used to shape the business must change. This change must be driven from the top with clear, executive-level commitment. However, a catalyst for change is also needed. This could be a business event (such as unexpected poor performance in certain business units) or input from respected external peers (e.g., a review of systems by a trusted consultant).

The impact of BI inertia can be significant. Data volumes are growing rapidly, economic conditions are uncertain and new competitors are emerging all the time. Enterprises that cannot implement BI solutions to help managers and executives better manage the business will find themselves at a competitive disadvantage. Through 2005, half of Global 2,000 enterprises will suffer from the serious effects of this inertia, losing market share to competitors (0.8 probability).

2.3 Avoiding One-Size-Fits-All Solutions

In an effort to save money in the buying and support of technologies, IS organizations will often standardize software tools and solutions. This can be in direct conflict with the business, which needs problems solved, regardless of the technology used. The IS organization may understand the need for BI solutions (faced with user demands for custom reports), so its level of BI activism is high. However, it often seeks a single BI technology or product without really understanding the users' needs. If users do not share the high BI activism of the IS organization, significant investments can be made in technology that promises much but is largely untouched by users, because the generic, technology-driven solutions do not solve their specific business problems.

IS organizations can raise the BI activism level of users by identifying areas of "business pain" that can be addressed as part of a BI strategy. For example, budgeting and forecasting are areas of business pain for most enterprises. Deploying budgeting-and-forecasting applications that can leverage a corporate data warehouse will generate a higher return on investment (ROI) than stand-alone budgeting systems, because all required data (such as finance, human-resources, sales and marketing data) can be accessed from one place. This makes the budgeting-and-forecasting application more responsive to changing business needs compared with a stand-alone implementation that depends on custom (and often manual) interfaces that cannot easily be changed. By communicating the benefits of a BI strategy in this way, IS can make users better understand the need for BI and their level of activism will rise.

2.4 Preventing the Growth of BI Application Silos

In some enterprises, LOB managers are keen for answers to business problems and their level of BI activism is high. Unfortunately, IS organizations often do not share this enthusiasm and are seen to be holding LOB managers back. Managers then independently acquire BI solutions. However, these managers are typically ill-equipped to evaluate the technological foundation and architecture of these BI applications, because they focus predominantly on product features and business functionality.

As a result, they may get a feature-rich product that is poorly constructed and conflicts with the enterprise's established architecture and technology. Tactical business needs are addressed, but the piecemeal approach means there is a danger that new BI application silos will be created. This creates a BI application mess that becomes increasingly costly to maintain, and that prevents the delivery of some high-value strategic BI goals (such as analyzing customer profitability) because the silos cannot share data or analysis.

Enterprises need a cross-functional team that spans LOBs to build a shared BI application strategy that addresses the needs of each LOB and those of the enterprise. Through this approach, business users not only define and prioritize their strategy for BI applications, but also better understand the need for a robust IT infrastructure. The IS organization can then get involved. It sees that users have a clear definition of their BI needs (and understand the importance of a robust infrastructure), so its level of BI activism will rise as well.

2.5 Aligning IS Organization and User BI Activism

It is possible for users and the IS organization to have high levels of BI activism and still not achieve the "BI success" scenario because they pursue independent initiatives. Typically, IT departments will pursue the one-size-fits-all technology scenario, while users buy their own BI applications, heading toward the "new BI application silos" scenario.

This is clearly the worst case possible (although it is happening in many enterprises). It results from the lack of an overall BI strategy. The key is to define an overarching BI strategy and communicate it to the IS organization and users, so that their BI initiatives are aligned with the enterprise's strategic goals.

3.0 Enlightenment Obstructed

Through to 2004, more than half of Global 2000 enterprises will fail to properly use BI, losing market share to those that do (0.8 probability). Even in the most sophisticated enterprises, IS departments have to continually respond to management and user requests for customized reports in response to critical business needs. But as these demands grow, this flawed model breaks down even further. Users get old information and have to fend for themselves, often making decisions with incomplete, outdated or anecdotal information. This has multiple, negative effects on the IS organization and the business:

- Users begin to doubt IS's ability to do its job.
- Multiple end-user-driven technologies begin to emerge (which the IS department will ultimately have to integrate).
- Expensive consultants are hired to fill the gaps the IS department can't cover.

Lack of coordination between the IS and business organizations is one of the major challenges on the road to BI enlightenment. Even if the executive team recognizes the strategic importance of BI, any BI strategy is likely to fail if users and IS are not aligned toward common goals.

Other challenges include:

- How do you leverage scarce BI skills to support a wide range of BI initiatives?
- How do you prioritize and serve the needs of different user communities?
- How do you accommodate cross-functional needs in an IS-led data-warehousing initiative?

These challenges can block progress to BI enlightenment, leading to the failure to deliver expected benefits, and to user dissatisfaction and disillusionment.

4.0 Planning a BI Competency Center

The BI competency center is one of the key steps on the road to BI enlightenment. Enterprises need to put in place the right organization to successfully deliver a BI strategy. Those that use a competency center to make better use of scarce skills, exploit the experience gained in data warehouse projects, and align the users with IS are much more likely to successfully deliver a successful BI strategy than those that deploy ad hoc teams for each BI project. The center's roles and responsibilities must be clearly defined, however, with guidelines for establishing successful reporting lines.

A competency center alone is not enough to guarantee success. A number of factors must be considered to ensure it works:

- Everyone needs to share the same goals. Misalignment between executives, users and IT in their enthusiasm (or "activism") for BI can cause serious problems.
- The center must understand clearly the needs of different users and their role in the enterprise.
- The center needs tools and methodologies to help deliver the enterprise's BI strategy.
- Best practices have to be used to successfully deliver BI consistently and reliably.
- The center needs to anticipate problems and turn them into opportunities for growth and profitability.
- The use of data mining and sophisticated statistical analysis requires specialized skills. The center requires a range of both business and specialized technical skills.

4.1 Coordinating the Center With Other Initiatives

The value of the competency center in delivering a BI strategy cannot be denied. However, is it always the first step in a BI strategy? Should the center always be established prior to initiating, for example, a major data warehouse project?

The answer may not be a simple "yes." Developing a center before the data warehouse could lead to BI efforts without the proper infrastructure in place. A center can develop from the cross-functional commitment required to deliver a successful data warehouse, but it does not have to be a precursor to data warehouse delivery. Similarly, ensuring the right skills are available to manage the data acquisition aspects of a data warehouse project can be successfully achieved without a center. However, enterprises that fail to exploit the skills developed in a successful data warehouse project will miss a significant opportunity if they do not develop these into a full BI competency center (see Section 10).

All enterprises face issues that will require the center to work closely alongside other enterprise initiatives that have an effect on their BI strategy. Financial services providers (FSPs), for example, face a particular challenge. Many FSPs have a multitude of application silos that need to be re-engineered or replaced to support their new business strategies.

This requires a new view of the role and value of data — one that recognizes data as an information asset that needs to be managed, from its source through its application across all processes and systems within the enterprise. Gartner believes that FSPs — as well as many non-FSP enterprises — can benefit greatly from the assignment of a strategic information officer (SIO) to address this requirement (see Section 8).

4.2 The Need for Effective Analysis and Skills

The ability to collect, interpret and act on information quickly and effectively can be a competitive differentiator. But merely getting the information (or data) quickly does not, by itself, provide the competitive edge. What provides the edge involves how the information is used, how the analysis is performed, and what is done with the analysis once an action is determined.

Users having the power to change a business process based on what is learned from the analysis is also a competitive differentiator, and can have a positive bottom-line effect. The more quickly and efficiently an enterprise can get information and use it, the sooner it can reduce costs or increase profits.

Many enterprises want to become global, but there are many enterprises that do well because they focus on local geography and serve it well. Even so, many enterprises have a strong drive to become global, embrace e-business and become more transparent to stay competitive and profitable. As data volumes explode, the number of high-impact strategic and tactical decisions grows as well.

These issues need to be addressed. Technology is not the main inhibitor; analytical skills are. Enterprises do not have a choice — they need to invest in skills by educating staff or hiring new staff now. By 2005, large enterprises will need three times the BI staff they needed in 1999 (0.6 probability). At the same time, by 2004, demand for BI staff will outweigh supply by a 2-1 ratio (0.6 probability).

Where complex business decisions and plans are required to carry the business forward, good BI is important, but effective analysis and application of this intelligence are what makes BI successful. Because analytical skills are scarce, enterprises cannot afford to scatter their experts. Enterprises should organize these experts in a tactical and strategic team that complements and overlaps areas of expertise — the competency center. 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 (0.8 probability).

As enterprises become much more data-centric, they should realize that analytics are a direct competitive differentiator. With a looming shortage of analytic skills, enterprises should invest in these skills as soon as possible, preferably by establishing a competency center. Enterprises that fail to do so will most likely fail in strategic initiatives such as e-business and customer relationship management (CRM), or at best achieve only mediocre results.

4.3 The Center's Main Tasks

The BI competency center has five main tasks:

- Guiding the users in self-service to meet their BI needs, primarily by training them on how to use the data, as well as on how to use BI tools as a mechanism to access the data and manipulate it. This allows the center to have some leverage, instead of having to create every report or query itself.
- Performing ad hoc or complex analysis, in conjunction with the business units. After all, the center's personnel are analytic experts. If and when the analysis becomes repetitive, it can be made into a self-service task for users, e.g., by implementing BI applications.
- Overseeing the analytic approach used across the enterprise to ensure it is consistent. The center connects various parts of the enterprise that have similar needs and are experiencing similar problems.
- Coordinating use and reuse of business metadata in the enterprise, and helping to define and integrate definitions of the relevant business terms.
- Setting standards for BI tools that will be used and supported throughout the enterprise.

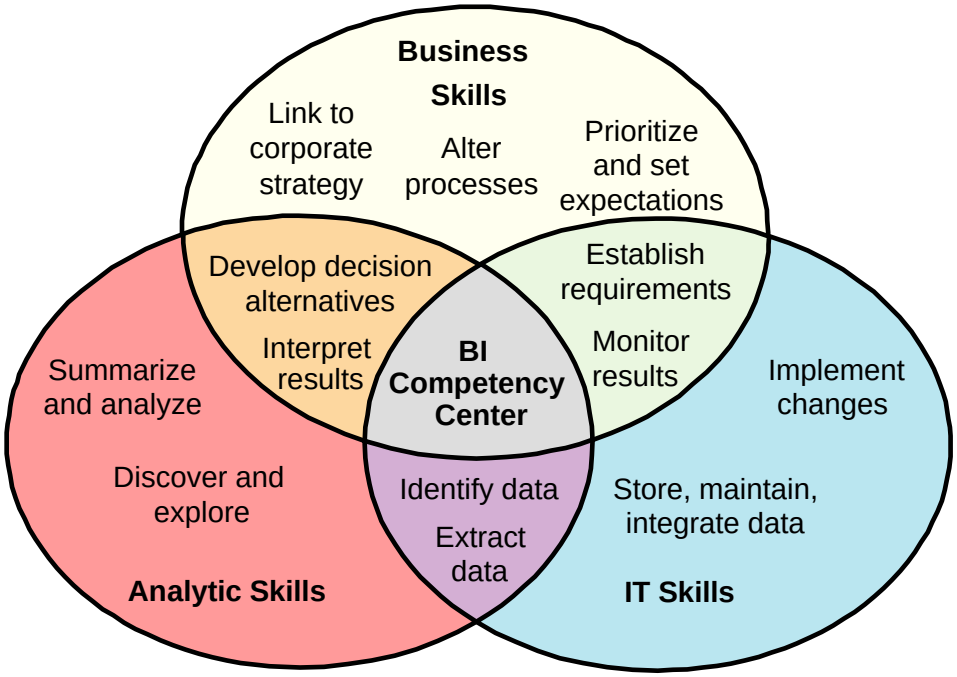
4.4 Putting a Successful BI Competency Center Together

The center contains dedicated analytic, business and IT experts. They support business managers in making intelligent, well-informed decisions. Business managers are not, typically, part of the center: Their responsibilities go well beyond analytics. However, business skills are a key part of the center, which must understand the needs of business managers and be able to "speak their language."

Enterprises may already have these experts, without knowing it. Typically they can be found among the technologically minded business users — people that look after their own data — or they are in the IS organization but have a strong understanding of the business.

4.5 Defining Skills: The First Step

Skills associated with three disciplines — analytics, business and IT — are needed by the center (see Figure 3). Staff should, preferably, be skilled in more than one discipline.



Source: Gartner Research

Figure 3. Skills Needed Within the BI Competency Center

Analytic skills needed in the center include the ability to:

- Research business problems, and create models that help analyze these problems
- Explore the data, and discover patterns, meaningful relationships, anomalies and trends
- Work with the IS department to identify data for a specific analysis or application
- Use a palette of techniques, ranging from simple data aggregation, to statistical analysis, to complex data mining
- Develop and maintain fluency in the use of analytics tools
- Distill the relevant information and produce sound recommendations, based on the right set of metrics
- Train users in how to utilize the data

Business skills required in the center include:

- An understanding of LOB needs, such as finance, sales and marketing, human resources, and supply chain management

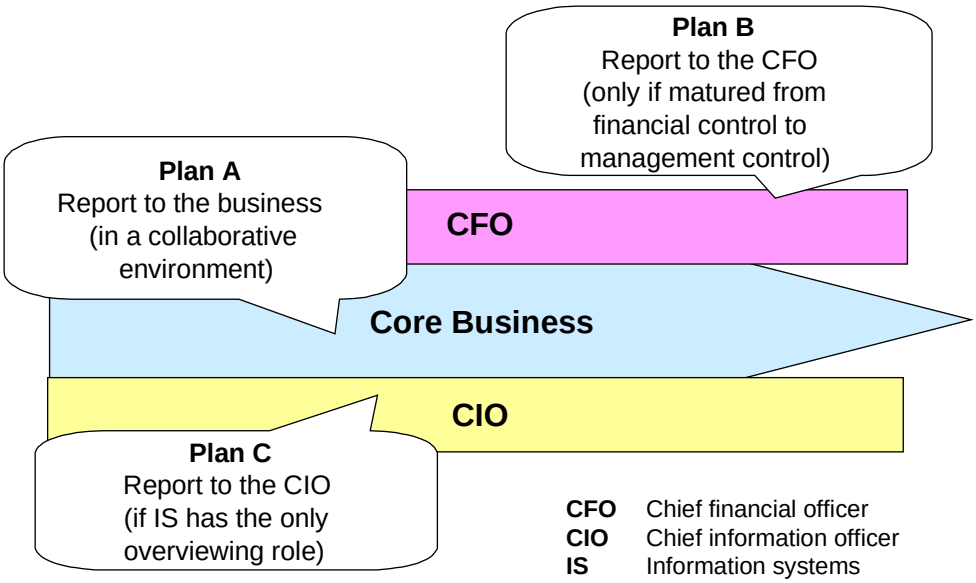
- An understanding of cross-LOB issues (such as customer and channel profitability)
- The ability to communicate at an executive level and link BI with the enterprise's strategic goals
- The ability to help business managers to set priorities by analyzing the consequences of choices and creating business cases

IT skills required in the center include a deep understanding of:

- The BI infrastructure implications of business and analytical requirements
- How to access and manage the data required to support business and analysis requirements
- BI tools and technologies, the data warehouse, and data administration

4.6 The Reporting Structure

The reporting structure of the center is a crucial factor (see Figure 4). If the center is placed too high, reporting directly to the board of directors, it runs the risk of becoming a "paper tiger," disconnected from the real world by its exalted placement. If placed too low — e.g., within a specific unit — the center risks losing its overarching view. The center should not be a large department. In an analytics-intensive environment, such as a midsize financial institution, a typical BI department might employ five or, in exceptional cases, 10 analysts; a very large financial institution could employ 20. Managers of the BI department should be BI specialists themselves.



Source: Gartner Research

Figure 4. The Reporting Structure

The best location for the center will vary from industry to industry and enterprise to enterprise. Within the IS department, directly under the CIO, would be an appropriate location, but only if IT is considered strategic within the enterprise, because the center should have a direct business impact. The finance department would also be appropriate, but only if this department has evolved from a financial control function to a management control function.

If one discipline drives the business, the BI department could be housed there. For example, marketing is crucial in the consumer goods and retail-banking industries, where companies often have database-marketing departments. However, operations might be more important in a production company. Bear in mind that the center should not be focused on one discipline alone, so placing it within a department only works if internal politics allows cross-departmental collaboration. If, for political reasons, there is no organization within the enterprise that is able to oversee all relevant areas, the center is destined to fail.

Reporting-structure considerations may be further complicated by the existence of other, related competency centers in the enterprise. The BI center has some overlap with the "integration competency center" or, in many enterprises, with the "SAP competency center." It is best to keep competency centers virtual, if corporate politics allow. Competency centers can then share resources, while competency managers have the task of prioritizing the deployment of resources.

Another factor that may influence the reporting structure of the BI center, particularly in FSPs, is the role of the SIO (see Section 8). While the SIO has a different role than the BI center, overlaps and common interests must be carefully managed to ensure that the roles complement each other. As with the BI center, the SIO can report to different positions in the enterprise. Where roles partially overlap, it is important to ensure that reporting structures are not in conflict. This would severely inhibit the success of the BI center.

4.7 Funding the Center

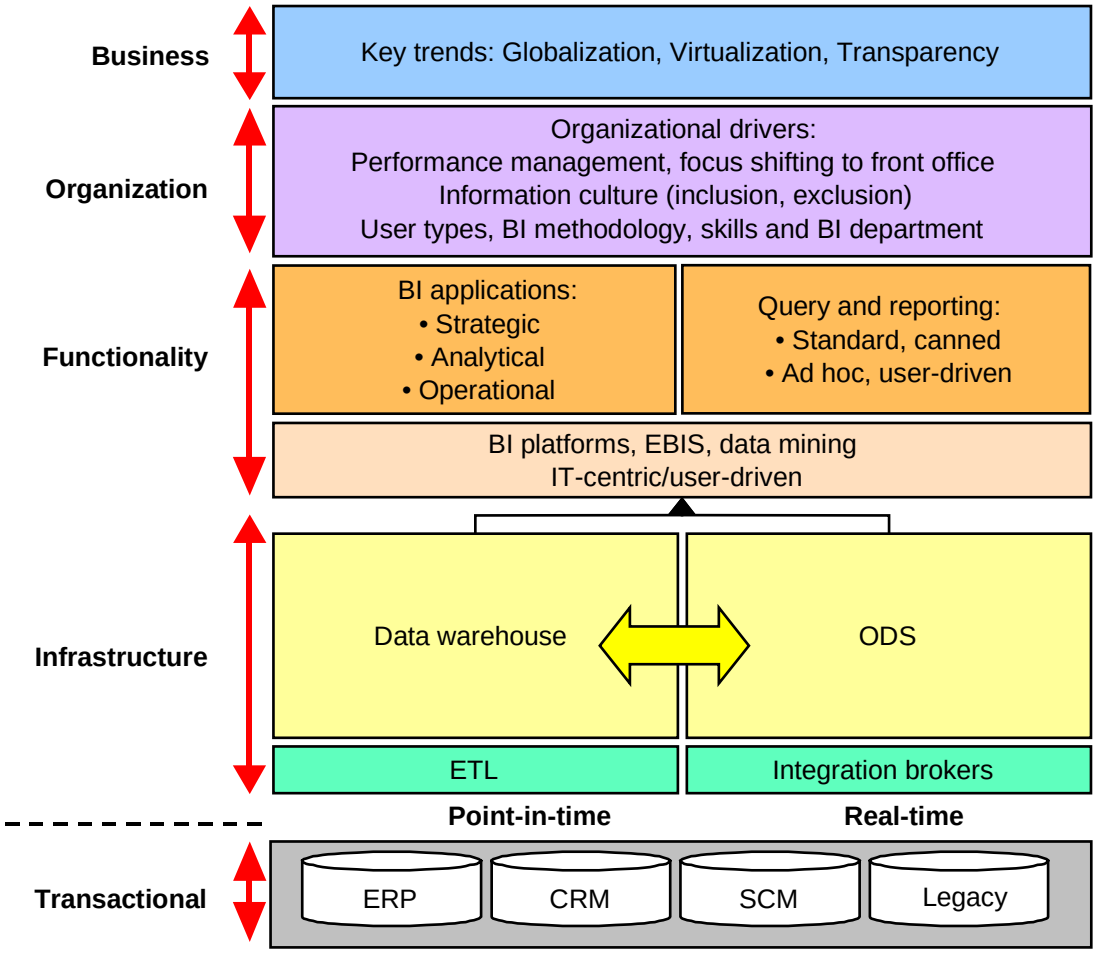
By its nature, the center has a cross-functional role, which makes it hard to book all costs to a single cost center. In many cases, the center's sponsor sees the costs as overhead. This means there is no barrier for the various departments to use its services, but there is also no indication of economic value. The added value may not be fully appreciated and the center could become the department to which ill-conceived questions and futile report requests are sent — obviously, a bad situation.

As an early step in the maturity of the center, an internal billing system could be used. Under such a system, users are charged various fees for major projects or ad hoc analysis. One advantage this brings is a fairer distribution of the cost burden between heavy and light users. Furthermore, it allows the center to prove its own value, by having its own virtual profit-and-loss sheet. This approach can also pose serious limitations, however. Those who leverage enterprise's investment in the competency center by using it more heavily are, in a sense, "punished" by incurring more fees. In this way, internal billing can be a barrier to the center's use.

More-mature centers often adopt subscription-based billing models. By differentiating the user profiles, each user is assigned its fair share of the costs. But once these costs have been covered by an annual fee, all barriers to using the center's services — and to leveraging the investment to obtain a positive ROI — have been eliminated.

5.0 Aligning BI Initiatives: The BI Framework

A BI framework enables enterprises to align their various BI initiatives and helps them to determine the right ROI (see Figure 5). The involvement of the center, in both a strategic and business sense, is central to this — not just as a stepping stone along the way, but as the main enabler. Project costs and investments are always being examined, and enterprises need a BI framework to align their BI initiatives to achieve an optimal result. The BI framework also enables enterprises to find — and reach — maximum ROI by looking for it in the right place.



BI	Business intelligence	**ETL**	Extraction, transformation and loading
CRM	Customer relationship management	**IT**	Information technology
EBIS	Enterprise business intelligence suite	**ODS**	Operational data store
ERP	Enterprise resource planning	**SCM**	Supply chain management

Source: Gartner Research

Figure 5. The BI Framework

The framework suggests that enterprises align their BI initiatives on four levels. Each of the layers affects the others, and maximum benefit is only achieved if enterprises understand how the layers work together. Just to be complete, the framework also addresses a transactional layer; however, as this is not part of BI, it will not be discussed in detail.

Layers have a meaningful return only if viewed in combination with the other layers. It is of little use to have an infrastructure if there is no BI functionality that uses it. And it is of no use to apply BI in a way that doesn't fit the organizational culture. But in the overall integrated framework, each layer has its own specific and indispensable contribution to the overall ROI. This is a "return on integration" as much as on investment.

5.1 Infrastructure Layer

It is crucial for BI to have an infrastructure layer in which the data is collected, integrated and generically made accessible. Optimally, this is done by a data warehouse fed by an extraction, transformation and loading (ETL) tool, but ETL tools are still only used in a minority of cases.

A data warehouse is not the only possible component of the infrastructure layer. To enable a more real-time approach to corporate performance — a process we call "business activity monitoring" (BAM) — enterprise applications integration processes become involved, on top of transactional systems. To deploy BAM, there may be a need for an operational data store (ODS), possibly linked to the enterprise's workflow structures. These structures become increasingly connected. In many cases, the ODS can function as a source for the data warehouse, so it is not necessary to go back to the source systems. In its turn, the data warehouse provides relatively stable analytic context to real-time indicators in BAM, providing a frame of reference.

The ROI of the infrastructure is in *efficiency* and *flexibility*. The infrastructure generically enables other applications, provides economies of scale for support costs and systems management, and ensures better-quality operations. Aiming at a tangible business result — currently a popular approach — usually leads to creating sets of data marts, not a generic infrastructure.

5.2 Functionality Layer

The functionality layer consists of BI applications, enterprise business intelligence suites (EBISs) and BI platforms. Because no single tool is capable of supporting the broad spectrum of user requirements economically, larger enterprises need a portfolio of BI applications. Each application serves a specific need, usually within a specific domain of the enterprise, on an operational or strategic level. EBISs provide end-user-driven query and reporting, as well as some simple analysis. A BI platform enables the creation and customization of deep analytic applications.

Gartner research shows that 60 percent of BI requirements can still be categorized as static reporting. Increasingly, the functionality layer receives the attention of database, enterprise resource planning (ERP) and CRM vendors that are looking for ways to extend their "footprint." By 2003, most ERP vendors will offer a credible BI platform — as a "Trojan horse" strategy to lure customers to broader product portfolios (0.7 probability). By 2003, relational database management system (RDBMS) engines will have absorbed 60 percent of BI platform functionality — making them suitable for most applications (0.6 probability). RDBMS engines will still offer low-end functionality, addressing common "slicing and dicing" and easy analysis such as filtering, ranking and very basic time-series analysis (e.g., year-over-year comparisons or moving averages).

In seeking ROI at this layer, enterprises need to focus on taking *effective* action to achieve their goals. Enterprises need to define solid business cases, and link usage of BI tools and applications to improving key corporate performance indicators, and to reaching defined business objectives.

5.3 Organization Layer

Organizational characteristics drive which BI functions are needed and, equally importantly, how to deploy BI. Enterprises need to assess a number of factors:

- How mature is their performance management? Are they ready for popular methodologies such as the balanced scorecard, or do they need to improve basic planning and control first?

- What is the primary focus of BI? Are they ready for boosting performance in the front office, or do they need to clean up back-office fulfillment first?
- How would they define their "information culture"? Do they see tactical and strategic management information as something to exploit through broad deployment — possibly even sharing this information with business partners and customers (i.e., in an "information democracy" approach) — or as something to protect by fiercely restricting its distribution? Do they inhabit the middle ground, where certain information is protected and other types of information should be freely distributed?
- Which user types do they differentiate, and how specific should the services offered to each of these user types be?
- Which analytic skills does the enterprise have, and which skills are needed? Do political circumstances allow the enterprise to leverage these skills by organizing them in a cross-functional way (e.g., by forming a BI team)?

The key word in achieving ROI on this level is *leverage*. This is achieved by organizing and deploying BI in a manner appropriate to the organization's own characteristics — and by sharing and reusing methods, concepts, data and, most importantly, insights.

5.4 Business Trend Layer

Large enterprises increasingly need to globalize their activities to survive. Forming partnerships, and outsourcing activities such as distribution, production and sales, are ways of accomplishing this relatively quickly. Furthermore, stakeholders such as shareholders, customers and governmental authorities demand more insight into how the enterprise deploys its activities.

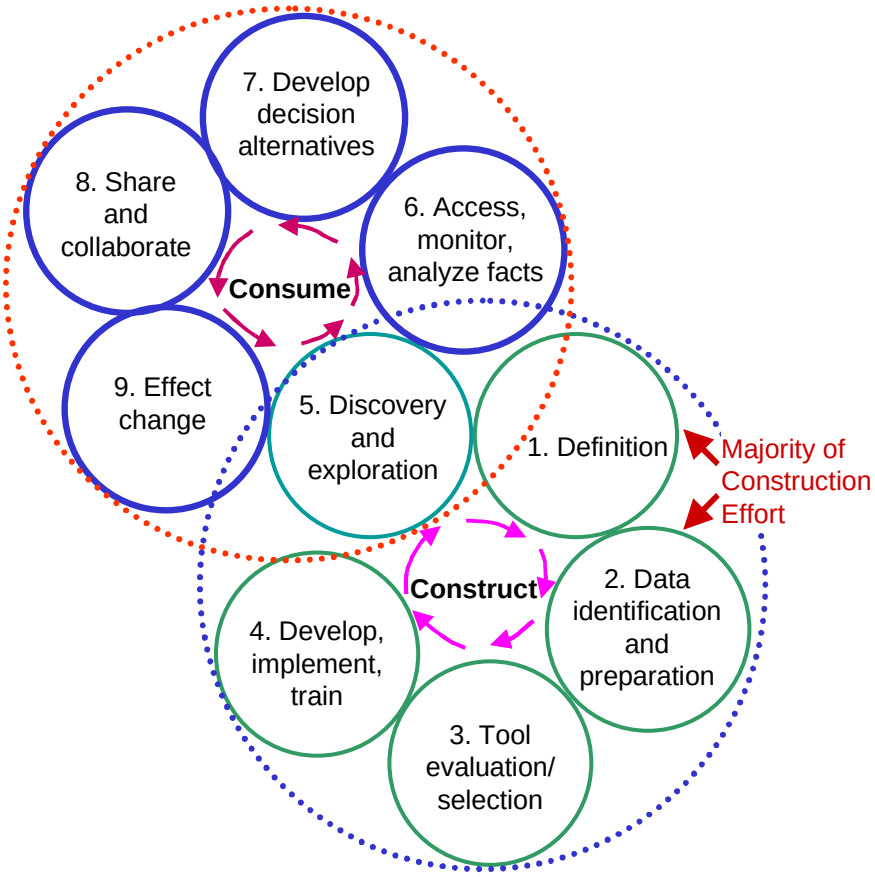
These key business trends make BI imperative as never before. Global enterprises must take local variations into account at all times, but without losing their speed of decision-making. The sheer volume and complexity of data to be assimilated poses huge problems for managers. Business partners and outsourced activities only make managing the enterprise more complex and increase the need to have accurate business insight.

BI has an enormous return here, even greater than in the other layers: It directly impacts competitiveness. Enterprises that are capable of deploying BI to make the right decisions throughout all global components of the value chain — and are capable of serving the information needs of external stakeholders — will be able to improve their market position at the expense of enterprises that do not deploy BI strategically.

6.0 Gartner's BI Methodology and Life Cycle Model

A successful competency center must have the appropriate tools to successfully deliver BI consistently and reliably. One of the best tools is a methodology that embraces best practices.

Gartner's BI methodology and life cycle model identifies nine significant steps in the life of a BI deployment (see Figure 6). This model is based on the best practices established by enterprises that have successfully implemented BI. It embraces the ideas and concepts associated with concurrent engineering and "iterative" (rapid) development methodologies. In essence, it encourages all involved parties to break down traditional barriers in the specification, development and use of applications — replacing such barriers with a more-fluid cycle, where all parties are simultaneously involved in the various steps to achieve rapid "time to action."



Source: Gartner Research

Figure 6. BI Methodology and Life Cycle

Our BI methodology model is divided into two distinct, but intersecting cycles: construction and consumption. These cycles often operate at different rates and are iterative in nature. Resources from the BI competency center, the IS organization and the user community are needed at different points in the cycle, with varying degrees of involvement (see Figure 7).

At the inception of any new BI endeavor, it is recommended to begin with definition (Step 1) and follow the steps in the prescribed, consecutive order. For any BI environment, the competency center is presented with the challenge of determining its current stage and where in the life cycle to begin.

These models, although extremely useful, are only a general guide. Gartner recommends that enterprises adopt the methodology for their centers, but adapt it to their specific needs and organization.

Step	Primary	Secondary	Tertiary
1. Definition	Competency Center and User		
2. Data Identification and Preparation	IS	Competency Center	User
3. Tool Evaluation/ Selection	Competency Center	User and IS	
4. Develop, Implement, Train	IS	User and Tech Support	
5. Discovery and Exploration	Competency Center and User	IS	
6. Access, Monitor, Analyze Facts	User	Tech Support	Competency Center
7. Develop Decision Alternatives	User	Tech Support	Competency Center
8. Share and Collaborate	User	Tech Support	Competency Center
9. Effect Change	User	Competency Center	IS

Source: Gartner Research

Figure 7. Activities and Roles

6.1 Steps 1–5: Construction

The construction phase for any BI deployment takes up the most time, resources and money. It is the single most-important phase in the BI deployment life cycle. Success here determines success in all the other phases.

Step 1. Definition: Find out just what insight or information is being sought and move from the vague to the specific. This is a repeating process and should include key business and IT managers. When focusing on specific business questions to be answered and prioritized, patterns may emerge that enable the competency center to begin to identify:

- Relevant information domains
- Meaningful indicators that support the business quest for a complete perspective

This exercise should be carried out without regard to available information sources. The objective is to establish the overall business needs, even though support for some may be impractical or impossible. This step should be conducted by the center in partnership with end users.

Step 2. Identify and Prepare Data: Determine which information sources can be used to support the business needs the BI deployment is aimed at addressing. This not an easy step; significant IT and user resources are needed to decipher the various internal and external information sources, their reliability and what transformations are needed to make them suitable for analysis. This effort is led by the IS department, with support from the center and active participation by strategic end users. It implies the

adoption of a significant set of initiatives surrounding data quality, and the implementation of data marts or a data warehouse. This data infrastructure could count for as much as 70 percent of the effort and cost. This and Step 1 typically consume a majority of the time and resources during the construction cycle.

Step 3. Select Tools: Part of the development and preparation phase is the selection and use of technologies, a sometimes onerous and difficult task. Tools can range from basic reporting technologies to sophisticated and robust BI platforms, but the right technology will depend on the users' needs and the complexity of the deployment. This effort should be driven by the center (functionality and fit for purpose), with active participation by end users (functionality) and support from IS (architectural standards and technology).

Selecting the technology is also a repeating activity. Choices should be re-evaluated regularly; the life expectancy of any BI technology usually ranges from just two to five years. This is, of course, dependent on the users' evolving needs, and the vendors' abilities to keep their technology and product lines up-to-date and in accordance with their customers' demands.

Step 4. Develop, Implement and Train: The amount of effort in this step will vary, depending on the deployment's complexity. With many technologies, configuration is required more than customization, so this development and implementation stage will be modest. In contrast, developing a customized application will take time to design and create such things as customized interfaces and logic. Irrespective of the selected technologies, success with end users will depend heavily on the quality of training and support, especially in the early adoption phase of the deployment. This effort may be led by the IS organization, with significant guidance and direction from the center. The end users serve in an advisory capacity to both. This is also the step in which the center and the IS organization train the technical-support department for ongoing user support.

Step 5. Discovery and Exploration: This step is critical and requires a partnership between the center and end users, with appropriate IT support. With a BI environment now in place, it is here that we begin to truly understand how the center will be used, which is often different than what was planned. Using the notion of iterative design and development (e.g., prototyping and rapid application development), the center and users build on the initial environment to create a solution that can only be formed when a base system has been established. This step also defines the intersection with the "consumption" cycle, with the center serving to keep these two cycles in synchronization. As users progress through the consumption cycle, this step represents an opportunity and responsibility to re-evaluate the application, and possibly to begin a new, related "construction" cycle.

6.2 Steps 6–9: Consumption

The consumption cycle is where end users have the primary role for interacting with the BI environment and applying it to the business. Although this cycle suggests a specific sequence of steps, users will likely navigate them arbitrarily, as needed, for the task at hand.

Step 6. Access, Monitor and Analyze Facts: Having identified indicators and information of value during the "definition" and "discovery and exploration" steps, end users begin to access, analyze and interpret information, leading them to deeper insight and perspective, in support of the business mission. The end user is primarily involved in this activity, with the center taking a more passive role. The users may call on tech support for assistance or (on occasion) re-engage with the center for additional guidance.

Step 7. Develop Decision Alternatives: Once the BI deployment's specific aims and direction have been decided, different answers to the same questions can be developed and appropriate action taken. This is

primarily an end-user activity, with occasional center involvement to ensure that optimal value is being obtained.

Step 8. Share and Collaborate: Analysis of the above-mentioned questions and answers must involve collaboration and communication with those who are part of the enterprise's decision-making process. The resulting action will involve some change in organizational behavior, which may be short-lived or permanent. This is also primarily an end-user activity, with occasional center involvement to obtain optimal value.

Step 9. Effect Change: More-permanent changes may suggest more-fundamental process re-engineering. At this point, technical resources and the center may have to review the problem to help address and assess the changes.

6.3 The Ongoing Cycle

After the cycle has been completed, it should begin again at Step 1, but with the methodology operating at a new level of focus:

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

This allows for the benefits of experience to be put back into the process to keep the deployment fluid and relevant to the business.

The use of a BI methodology gives the center a useful tool for understanding and promoting the sequence of steps for successfully developing and implementing BI. The methodology can also serve as a guide in the application and alignment of resources and funding.

7.0 Advanced Skills to Fuel the BI Competency Center

Advanced skills in a center can bring out value-added information that would otherwise lie hidden and, probably, wasted. It is essential to understand the mathematics of data.

A good center has staff members with well-rounded and complementary skills. But a center with advanced skills in analytics will shine. Often, economists, operations researchers, actuaries and MBAs have significant mathematical skills and business backgrounds, making them good choices.

By understanding the mathematics of business data very well, the center's staff can identify which analytical techniques should be employed to deliver the insight the different user communities need. These advanced skills are of real benefit only to enterprises in data-intensive fields, such as the telecommunications, financial-services, retail, pharmaceutical and utility industries.

7.1 The Role of Advanced Skills

To deliver successful BI, it is essential to understand the business processes and the effects of any changes to them. This point is illustrated by the following anecdote about a government fishing agency.

From one year to the next, the agency's figures showed a sharp decline in the population of small fish. Their conclusion was that all the small fish had died. What they failed to consider, however, was that they were using new nets with larger holes that allowed the small fish to escape.

This shows how deeply analysis can be entangled with the real world's complexities. BI cannot be successful without a thorough understanding of the underlying processes — how the data has been captured and processed (i.e., what type of net has been used), and the relative quality of the information. Is the data relevant to the business decisions to be supported? Is it correct, complete, timely and of sufficient quantity? Quantity is important to ensure that the data holds statistical significance.

Advanced BI (e.g., data mining) can be complex. Choosing which analytic techniques to apply in a given context can be a real art. These techniques include multidimensional analysis (also known as online analytical processing); various forms of regression, trending and time series analysis; clustering; simple and advanced visualizations; neural nets; decision trees; and even more-complex mathematical and simulation models of the business processes. Analysts in the center with skills in these advanced techniques will work very closely with the business-oriented analysts to make appropriate selections.

7.2 Types of Advanced Skills

There are virtually unlimited possibilities in what data to search for and what to do with it. The team needs creativity, common sense and the resolve to simplify the process wherever possible, particularly in the brainstorming and initial data analysis phases. Projects can be ongoing (such as the analysis of Web site traffic) or short term (such as judging the success of a one-off program). But surrounding it all is the problem of being effective. Where complex business decisions need to be made and plans put in place to carry the business forward, business acumen is crucial.

The key areas for advanced skills in a BI competency center are:

- *Business Requirements Analysis*
  - Understanding established business processes.
  - Understanding what can be improved and what it is worth. This is the first step in an ROI analysis.
  - Understanding the possible improvements that can be supported by data analysis.
  - Developing an ROI analysis from a financial perspective. This is often crucial to obtain buy-in for projects that could be expensive to deploy and roll out.
- *Data Analysis*
  - Understanding the available data within the business. What process steps are involved?
  - Understanding secondary data sources, such as those coming from data providers.
  - Knowing whether there is enough data to provide statistical validity.
  - Understanding the integrity of the data — is it complete, correct and timely?
  - Building an online analytical processing, or multidimensional analysis, capability.
- *Advanced Data Analysis*
  - Examining univariate and bivariate statistical analysis distributions.

  - Carrying out factor analysis, visualizing the data, looking at clusters, building decision trees to segment the data, and detecting anomalies and trends.

- *Advanced Data Modeling (i.e., Statistics, Data Mining)*
  - Familiarity with the major statistical techniques, including the most common data-mining methods (e.g., clustering, regression, case-based reasoning, neural nets and decision trees).
  - A good understanding of probabilistics and multidimensional spaces (although data miners or BI analysts need not be trained mathematicians or statisticians).
- *Validation (During Modeling and Deployment)*
  - The ability to validate the analysis against historical data via back-testing during modeling, or a champion-challenger test during deployment.

The interdisciplinary nature of advanced BI activities has been underestimated. Gartner believes that the BI competency center is the right place to combine these skills for various types of business applications (including CRM and ERP, as well as quality, risk and knowledge management). Staffing the center to include advanced BI skills is a key factor for success, significantly outweighing tool selection.

8.0 The SIO: A Critical Role for BI Competence

A consistent and comprehensive data architecture is essential for many enterprises because of the importance of initiatives such as application integration, straight-through processing, T+1 compliance and relationship management. Many enterprises have a multitude of application silos that need re-engineering or replacement to support new business strategies. This requires a new view of the role and value of data — one that recognizes data as an information asset that needs to be managed, from its source through its application across all processes and systems within the enterprise.

To oversee this new view of data, Gartner has proposed the assignment of a "strategic information officer," or "SIO." A new position may be created to perform this role, or the role may be assumed within an established position. By facilitating the creation of a comprehensive and consistent enterprise data resource, the SIO provides a critical piece of the foundation for BI competence. With decentralized development taking place in a historically stovepiped and siloed data environment, the data infrastructure required to support many cross-LOB, enterprise and extra-enterprise BI initiatives is lacking in many enterprises.

The SIO can be crucial in addressing the data management issues of BI initiatives. To be complementary, the SIO and the center must be coordinated and interlocking. For strategic information and BI needs to be met, enterprises must recognize the complementary nature of these disciplines, and how the roles and activities of the SIO can be leveraged to help deliver an enterprise BI strategy.

8.1 The Role of the SIO

The SIO is primarily responsible for:

- Identifying the business information needs of the enterprise for operational and transactional applications and for BI initiatives
- Defining a logical data architecture that addresses current, short-term and long-term information needs, and that is consistent with operational, transactional and BI requirements

- Reviewing new development and business unit processes to ensure compliance with the enterprise's data architecture
- Working with the IS organization to ensure that this data architecture is in place

Although short-term information requirements are based on function- or application-specific criteria, long-term requirements address a different set of critical success factors (CSFs), and this is where the SIO is key. Gartner believes these emerging, long-term CSFs — which involve flexibility, persistence and consistency — are essential for enterprise survival and success. Many of these CSFs are also essential for cross-LOB, enterprise and extra-enterprise BI.

In many enterprises, the SIO role will be most effective if positioned in the business- and IT-neutral strategic-planning domain, as opposed to under the more operational and IT-focused CIO position. The SIO serves as an intermediary and translator between an enterprise's business units (which are usually focused on their own immediate and unique needs) and IS (which usually concentrates on infrastructure creation and maintenance, emphasizing standardization and efficiency). Thus, business and IS neutrality (and the appearance of neutrality) can be preserved.

However, in some enterprises, the CIO has achieved a more-strategic focus. In this case, the assumption of the SIO role by the CIO, or by an individual reporting to the CIO, may be more appropriate.

8.2 The Relationship Between the SIO and the BI Competency Center

The SIO, or a representative, is an important member of and contributor to the BI competency center. Likewise, coordination with the center is essential for the SIO. In many enterprises, business units and the IS organization have differing levels of commitment to BI. Even in enterprises where BI commitment is high, inertia can still occur because of problems in communicating. In essence, the business side of the house is not a single entity with wholly shared goals, but is a collection of entities in competition with one another for resources, and driven by short-term and individual goals.

Cross-representation within the center is needed so that the SIO can understand and incorporate the enterprise's BI strategy as a driver of the logical data architecture. The center also needs to understand established data requirements and incorporate them into its plans and initiatives. If the SIO is established ahead of the center, it can provide some, or even all, of the data architecture input.

While the relationship between the SIO and the BI competency center is an important one, it is also important to recognize how the center and the SIO differ:

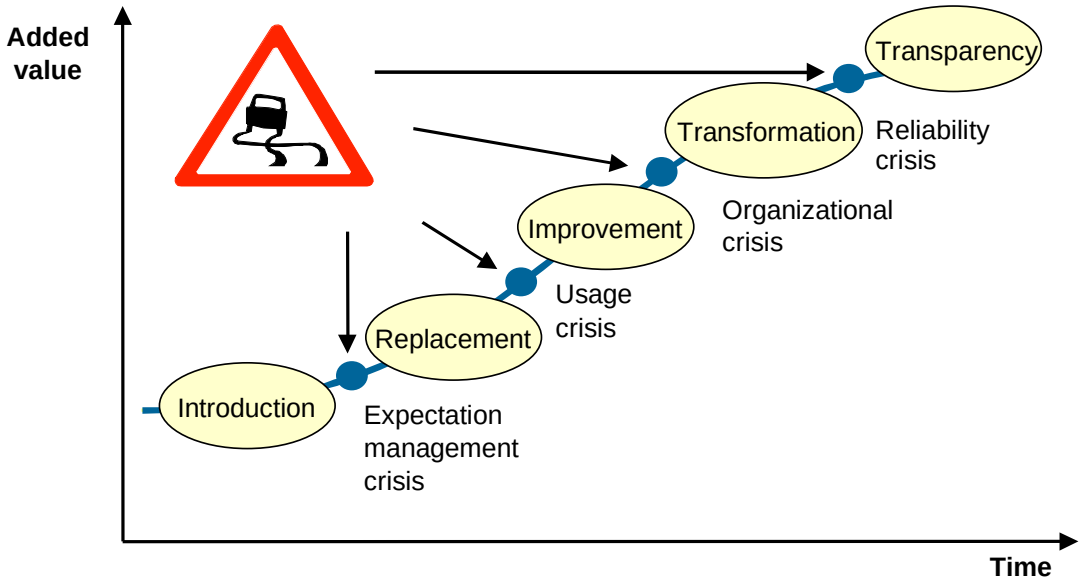
- The SIO is concerned with data, whether it is derived from (or used for) BI or some non-BI-related operational or transactional application. The SIO must integrate BI needs with these other information requirements, but is not directly concerned with determining how the data is to be used.
- The center is concerned with the definition of analytics to be performed and their application (not just the definition of data needs), and the data the center should be expected to provide to the information infrastructure. The center's challenge is to do something with the data, but it is not directly responsible for ensuring that appropriate data standards are created and maintained.

The information-intensive operational and transactional nature of some enterprises can drive much of the input into their BI systems. The SIO and the center have a crucial role in ensuring comprehensive, actionable and accurate BI. Placing the two under a common organizational umbrella, such as strategic planning, can make the most of the synergistic nature of their roles.

The information-intensive nature of many enterprises cries out for the establishment of an SIO because strategic enterprise data management is critical to the success of operational activities and enterprise BI. Participation of the SIO in the center is needed to ensure that BI data requirements are met and, equally, to ensure that BI initiatives comply with the enterprise's data architecture.

9.0 The BI Road Map Manages Expectations

In general, the phases in BI deployments are similar. So are a number of common problems. By using the BI road map (see Figure 8), the BI competency center can anticipate these problems and turn them from a threat into a growth opportunity.



Source: Gartner Research

Figure 8. The BI Road Map

Experience shows that BI deployments usually go through a number of phases. Working through each phase adds value. The phases in the BI road map can be described as follows:

- *Introduction* — A new BI deployment can be triggered by the need for change — for example, when old ways of working no longer apply, old BI systems have become outdated, an enterprise shakeup follows a merger or acquisition, or a methodology such as the balanced scorecard is introduced. Requirements are drafted and budget is allocated. After a successful pilot, the business and the IS organization decide to move on to a structural and broader deployment.
- *Replacement* — After the first deployment of the new BI system, old systems must be discontinued. The new system becomes primary, but the old system is kept alive for a short period of time to perform "shadow runs." At this point, the new BI system often mimics existing reports and analysis and is aimed at established users, to avoid alienating these users and to present them with reports and measures with which they are familiar.
- *Improvement* — During this phase, it is common to take one step back to be able to take a few steps forward. The new system is deployed more broadly, new functionality and data are added and, based on the new possibilities, new reporting, query and analysis capabilities are discovered and requested.

Use of the system gradually spreads as new users generate new requirements, which in turn attracts more new users.

- *Transformation* — Working with the new system, users come to new conclusions. Growing insight leads to old beliefs being challenged and, as a result, existing processes are altered or new activities are initiated. Changing the business is key here — the BI deployment starts to have a more fundamental impact.
- *Transparency* — There is always room for improvement (e.g., in ETL processes, report distribution or system performance), but the objectives that led to the BI deployment have been met. The new system has been embedded within the organization, and people are familiar with its use. A new level of understanding is reached. The cycle pauses until the need for change is triggered again.

However, these phases are not what is most critical to the BI road map — rather, it is the crises between the phases that are crucial: They drive the move to the next level. If it were not for these crises and their attendant discomforts and pain, there would be no imperative for progress. As with the phases, these crises have proven to be recurring themes in BI deployments:

- *Expectation Management Crisis* — The vendor's pre-sales consultant will have done a wonderful job. Awareness and momentum have been created. Users understand that there is some need for documentation and some tidying up during implementation, but most things seem to have been addressed. However, in most cases, data delivery will still be a major issue and there are usually many exceptions to common business rules that need to be addressed. If stakeholders are not aware of these issues, the success of the project will be under pressure before it has even properly started.
- *Usage Crisis* — At this stage, users often complain that "the old system could do so much more." Indeed, taking a step back may be necessary to move forward. If too much is lost or it takes too long before new functions are added, users start complaining. There needs to be some kind of improvement in functionality, performance, usability, ease of maintenance, or ease of customization to individual needs and preferences.
- *Organizational Crisis* — New insights lead to new questions. Often, a center will conclude that the data needed to answer these questions is not stored fully or consistently — or may not be stored at all. The center may come to the conclusion that certain processes must be redesigned because they are inefficient, or even lead to the wrong result. It may even decide that a whole new range of analysis, metrics and reports is needed. This may substantially affect the enterprise's business rules and, in turn, affect the BI deployment. Parts of the BI system may have to be rebuilt. Regardless, these growing pains lead to the ultimate goal: A mature BI system.
- *Reliability Crisis* — What else could go wrong now that the enterprise is being managed on the basis of new data and metrics, and now that all the resulting insights have been implemented? The reliability crisis creeps up from behind. Users are not used to the new metrics, or they simply don't believe the results, which are different from those they are used to. The users' frame of reference, the truths they always believed in, must change too — a process that takes time. The center finds itself defending the new data, reports and metrics, and having to repeatedly prove that the new system is right and the old one has always been wrong.

The BI road map is a valuable tool for centers in managing expectations through these crises, and in ensuring they bring constructive change rather than inhibit project speed. By acknowledging upfront the crises that the project will encounter, the center can anticipate and leverage the crisis point to move to the

next phase. When growing pains occur, they allow the center to send a positive message, since a crisis simply means a step toward a more-mature solution. Best practices for the center to use in addressing these crises include:

- *Keep the project up-to-speed.* When crises occur, explain (again) what has been planned to overcome them. Don't dwell on the problems.
- *Structure the project into a number of smaller ones, where possible.* Long-lasting projects run a greater risk of getting out of control because of the crises.
- *Ensure that the business and the IS organization are aligned at all times.* Crises tend to be worse when there is misalignment.

Most important, the BI road map shows how crises direct enterprises toward maturity and added value. A natural reflex would be to avoid the crisis, but that would lead to a suboptimal result. Aggressive growth and added value are reached by actively looking for these crises.

10.0 The Data Warehouse Team and the BI Center

While a data warehouse is a project that contains some operational characteristics that need to be managed, the center serves an ongoing role. While the center and the data warehouse team are closely related, they don't always come into being at the same time. Usually, a project starts out with the data warehouse team.

A data warehouse project builds on specialized knowledge about production, which should be transferred to the production environment, as with any development-to-production phase. In addition, considerable knowledge is needed to develop and use the data warehouse as well as to help users, and this knowledge must be protected. There is a risk that, unless this knowledge is brought together under one umbrella, it can be lost.

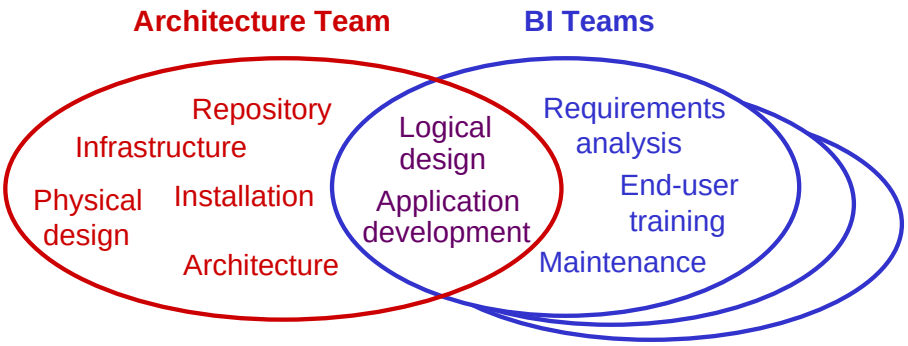
Consider issues such as metadata management, how to analyze data and rule exceptions. These issues are too specific to assume they are known to all users. The oversight for these activities is best placed with a central authority, the competency center, which itself could come out of the ranks of the data warehouse team. Business analysts are an obvious first choice to staff it, along with people from the business side who would play a more central role because of their business skills.

This centralized, coordinating role would help to preserve knowledge and also provide perspective so the use of BI can grow. A few of the business analysts and possibly even one or two developers would also grow to play more-strategic roles. Follow-up projects would probably need a development team to be brought together again. By their very nature, projects have a beginning, middle and end. But there is a core of knowledge that must be stabilized, and the center can play that role.

10.1 The Cross-Functional Implementation Team

Data warehouse implementations require strong corporate commitment. The lack of such commitment will result in disappointment or, worse, failure at a significant cost to the enterprise. Commitment starts with the effort required to create the right implementation team. It's crucial that the center be given a commanding role. Many enterprises struggle with the structure and skill sets required for a team to implement a data warehouse. The makeup of the project team and strategies can increase the chance of success.

The project team must include a diverse range of technical and business skills, forming cross-functional architecture and BI teams with overlapping responsibilities (see Figure 9).



Source: Gartner Research

Figure 9. Data Warehouse Implementation Team

The architecture team includes:

- Project implementation manager
- Hardware and operating-system installation/support
- Database administrator/data administrator (DBA/DA): physical and logical model
- Technical staff — for each BI team: overlap with BI teams; write data extraction and transformation programs

The BI teams include:

- Technical staff: provide input to DBA and DA; write extraction and transformation programs; overlap with central architecture team
- BI application developers: each functional area
- Technically savvy business analyst: per one or two functional areas; could serve as Tier 2 manager

This structure may cause enterprises to re-engineer project team orientation and require a new approach to accommodate the implementation process. Different team members will need to take a lead role at different times, since each phase has different demands on skills and expertise.

IS organizations must not approach the development of the data warehouse and of BI tools and applications in the same iterative fashion as traditional projects, where users are surveyed and execution and delivery is left entirely to IS. Instead, a dedicated cross-functional team is required to avoid iteration and ensure accuracy and completeness. Most data warehouse implementation teams are put in place to deliver the data warehouse infrastructure prior to formation of the center. However, if the enterprise already has some form of center in place, it can obtain business analyst resources from the center rather than obtaining new resources directly from the business functions.

10.1.1 Dedicated Leadership

Enterprises must support such a strategic project with a high-level manager who reports to someone on the executive management committee. A full-time, dedicated manager must be assigned to the data

warehouse implementation, to avoid the risk of distraction from "more important" issues arising in other projects.

Many enterprises draw on the expertise of a business-oriented DBA to lead the project. Although this type of individual certainly has valuable skills that can assist in the data warehouse implementation, enterprises must establish an individual at a much higher level in the IS organization. Such an individual must have the authority to obtain the necessary resources to overcome various challenges that will face the implementation team, and have the respect of management across various LOBs.

Business skills are an absolute necessity for the project implementation manager. The individual must be able to draw out and understand the business requirements, as well as ensure that the data warehouse deliverables are aligned with the cross-functional business objectives. The implementation manager must be politically savvy to mediate and gain consensus among the various viewpoints across business functions.

10.1.2 The Architecture Team

First, the data warehouse architecture team concentrates on the architecture and infrastructure (e.g., data model) aspects of the implementation, keeping flexibility and extensibility of the data warehouse as the primary goal. Enterprises that have not had strong data administration supported by an enterprise repository strategy will need a greater number of resources to perform data planning and modeling. A significant portion of time is spent determining the appropriate data elements that should be propagated to the data warehouse. Most enterprises underestimate the time and effort required to complete this task.

One enterprise with which we have spoken determined it would take a minimum of two to three months and several dedicated resources simply to uncover the data elements, definitions and business rules maintained in each of its operational systems. The architecture team will require dedicated time from operational-system support staff to understand the business rules and data maintained, and to identify data quality issues. DBA and DA resources must be committed to the implementation project and not be part of a shared-resource service. The use of shared resources increases the risk of the implementation failing or stalling due to more "urgent" production application issues.

10.1.3 The BI Teams

The second aspect of the project team consists of multiple BI teams representing business functions. These teams provide input to the architecture team to build the logical data model and create data extraction and transformation processes. This provides the enterprise with the flexibility to perform functional implementations concurrently. The timing of participation by these teams will vary based on the order of delivery of data subject areas within the data warehouse and applications to be deployed.

Business analysts provide valuable knowledge and guidance from the perspective of the end users and business units, bringing a positive relationship with the business departments to the project. Business analysts are key individuals from the enterprise's business side. They have a comprehensive understanding of the business area and some understanding of the technical issues involved.

The analysts can assist with the data preparation (transformation) of corporate operational data into business-analysis-oriented data, as well as with the reconciliation of warehouse data with data accumulated by users. It is critical to allocate some percentage of time for involvement in the data-planning phase to determine common data definitions and business rules. This task will expose problems with how some business areas may be using and interpreting data elements. These are business issues

and will often require the involvement of business leaders for resolution. The business analysts become critical in the data warehouse deployment — and for training users on how to use the data and BI tools — eventually migrating into roles in the center.

The data warehouse team should be viewed more as a project structure, while the competency center should be viewed more as a continuous team. The center might be established with people from the data warehouse team.

10.2 Coordinating the Extraction Process

Technical staff members, in addition to participating on the architecture team, work closely with the BI teams to plan, design and implement data extraction and transformation processes. The amount of effort involved in this process is often underestimated and requires coordination with other BI teams that have overlapping data needs.

With data elements for a subject area often spread among multiple data sources, the integration of data from disparate data sources is a complex process and requires a clear understanding of the sources and the methodology to perform integration. Extraction and transformation tools — e.g., from vendors such as Acta Technology, Evolutionary Technologies International and Oracle — can provide relief in resources required, enabling flexibility in aligning technical staff closer to the architecture team and reducing BI team overlap. The tools do not replace the effort required to accurately complete the data definition and analysis.

The cross-functional implementation team fosters a vision for the enterprise vs. a focus on one's own business area. The latter approach, taken by less-strategic-minded enterprises, leads to "stovepipe" applications. Implementation teams must have corporate commitment with the implementation manager at a high level in the enterprise, and dedicated staff with the right set of skills. Architecture teams must work closely with the business areas to successfully implement a data warehouse that meets the needs of multiple areas, allowing analysts to take the lead role.

10.3 Staffing Data Acquisition Efforts for the Data Warehouse

Data warehouse projects involve a large number of tasks, a significant investment in time and a wide range of skills. The process of data identification and acquisition, normally the starting point and a critical component of the effort, is unfortunately the part that is frequently understaffed in terms of the number of resources and required skill sets. Most enterprises focus the majority of their efforts on the front end of the data warehouse (the access of data by end users), making the assumption that sourcing the data from operational systems, and integrating and transforming this data, is a simple technical task.

Data acquisition is often the hardest part of a data warehouse effort due to:

- The large number of disparate data sources that must be tapped to pull together the data of interest to the enterprise
- A lack of available resources with detailed knowledge of — and documentation of — legacy system functionality and data structures
- Data quality issues within operational systems, as well as unintended uses of data elements due to application changes
- Unrealistic time frames for data analysis and development of ETL processes

Most enterprises undertaking a data warehouse effort do not realize the significant challenges resulting from these issues and, thus, underestimate the amount of resources required. Through 2005, 80 percent of enterprises implementing data warehouses will not properly plan for their implementation efforts, and will underestimate the costs related to the data acquisition tasks by an average of 50 percent — leading to cancelled projects or data warehouses delivered with inaccurate or incomplete data (0.8 probability).

Enterprises have a natural tendency to assume that technology alone will solve these problems. Although ETL tools can help, they do nothing to address the issues of identifying where the source data resides, assessing its level of quality, or defining the business rules for how it must be cleansed and integrated before loading it into the data warehouse. The data analysis and decisions involving cleansing and integration rules must take place prior to development of any ETL processes. Doing so will result in optimal productivity of the ETL developers (thereby improving payback on the investment in the tools), and will minimize the risk of rework due to unexpected gaps or data quality problems being uncovered once development has begun.

The number of resources required to define and implement the data acquisition process will vary significantly depending on the size and complexity of the environment — including the number and types of data sources, the extent of transformation and integration requirements, and level of data quality. Although the size of the team will vary across enterprises, the common thread for success is the mixture of skills required. As with the broader data warehouse effort, the data acquisition tasks require a combination of IT and business knowledge. Involvement of business analysts (or key end users) and application support personnel from each business function and operational system is needed to provide ETL developers with the specifications against which they can leverage the tools.

It is critical to understand that the skills required to develop solid data acquisition processes are not the same skills needed to perform these upfront data analysis tasks. While tool-specific expertise is certainly a requirement for success, it is the understanding of the data in the operational systems that is critical. Leveraging the knowledge and experience of application support teams can significantly shorten the deployment time frame and reduce the number of resources required.

Management commitment must be given to allocate the required time of application support teams to the data acquisition phase of the data warehouse implementation project. As an example, one large financial services enterprise has significantly grown its data acquisition infrastructure during the past five years due to numerous acquisitions. It now supports 73 distinct data extraction applications due to the proprietary and complex nature of some of the operational systems in its expanded portfolio. This enterprise has 70 staff members (with application development skills) specifically allocated to supporting and maintaining the total data acquisition process. Leveraging the resources of application support teams would have potentially enabled this enterprise to deliver the same results with significantly less staff.

Guidance from data administration personnel and DBAs will yield further benefits, removing the need for the ETL developers to become experts on all aspects of the enterprise data architecture. Most importantly, dedicated involvement of key business users is needed to ensure the completeness of the data design, define the business rules for integrating data across multiple data sources, and resolve data quality issues. If a BI competency center is in place, ETL developers can obtain the required business skills and leverage knowledge from that organization. The data center staff must support this process to ensure the scheduling and timeliness of the data movement to the data warehouse. This can be a significant challenge, but it must be addressed to support production data acquisition processes.

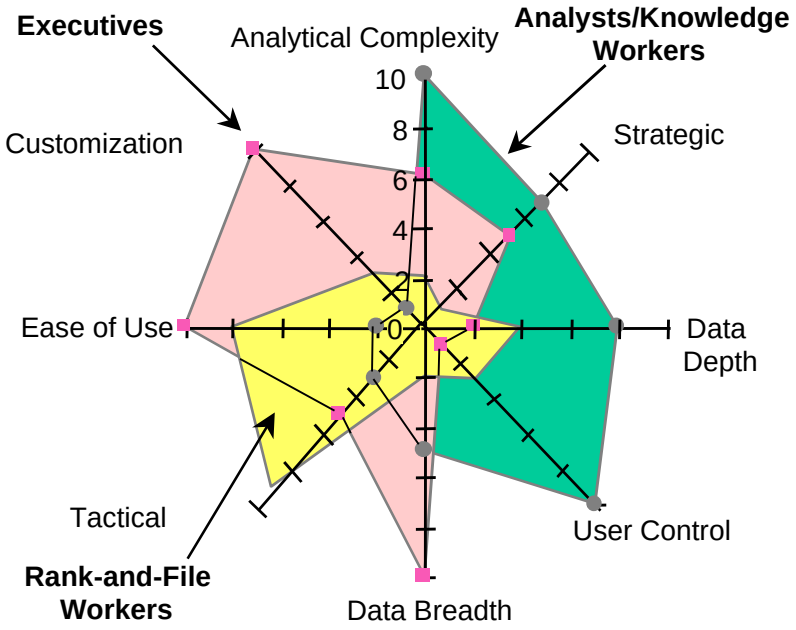
11.0 User Power: How It Can Make or Break a BI Project

The people who have to use any new BI system play a powerful role in determining its success or failure. Most of the time, however, planners overlook these users because management pressures to stick to a single solution or technology prevail.

The significant differences among users' roles and needs must be considered and addressed if the enterprise is to get the most benefit from its BI projects. Enterprises must have a method of assessing these roles and needs that can become part of the methodology in planning a BI project. The competency center's role here is as obvious as it is crucial.

11.1 Gartner's User Assessment Model

Gartner's user assessment model (see Figure 10) is primarily based on a user's role in the enterprise, and assumes an associated work style for that role. Of course, in the "real world," issues are not always as clear, and this model should be adapted to specific enterprise and project needs.



Source: Gartner Research

Figure 10. BI User Classification

11.1.1 Understanding the Model

The user assessment model considers user needs based on several criteria:

- *Breadth and Depth of Data:* These dimensions define the data complexity associated with a BI solution. In most instances, users tend to need breadth or depth, but not extremes of both. This implies the user's span of control, since more business subjects suggest a greater span. However, this needn't be an absolute, as advances in technology can increasingly support breadth and depth.
- *Complexity of Analytics:* Usually reserved for more-strategic uses of information, here the user requires deep insight into the information, using complex models and (perhaps) advanced analytics and algorithms. In some instances, the user is merely the beneficiary of such systems. In other cases, the user may be a practitioner.

- *Ease of Use vs. User Control and the Need for Customization:* These dimensions suggest the level of sophistication on the part of the end user, or what we expect the user to be willing or required to understand to interact with a solution. For the majority of users, ease of use is important. In some instances, ease of use is achieved through the simplicity of the solution. In other cases, it is achieved through careful customization or tailoring of interfaces and applications to suit the user, typically in response to a highly dynamic and volatile environment. User control determines the amount of direct control a user is expected to need (or want) over the core system. Environments with a high degree of user control may require significant technical and analytical expertise.
- *Strategic vs. Tactical Application:* This dimension speaks directly to the user's role and the kinds of decisions he or she is likely to make. Indirectly, it implies the level of data and analytical complexity, as strategic applications tend to have greater complexity.

11.2 Three Profiles Revealed

We used this model to define three different kinds of users — the executive, the analyst/knowledge worker and the rank-and-file worker — and found their individual needs to be quite different. (This model, of course, can be used to map other kinds of users.)

- *The Executive:* This class of user has a unique set of needs that sets it apart from the others. Executives are among the most strategic of users, with a wide span of control, highly interruptive work style and ever-changing information needs. Accordingly, these users score highly in the need for breadth of data, ease of use and customization. Their need for analytical complexity is modest, they have a balanced need for tactical and strategic decision making, and they rely on analysts for more in-depth and strategic data exploration and interpretation. Their need for user control and data depth is low. These users do not expect to understand the inner workings of the system, and prefer to analyze information based on exceptions and trends rather than detailed data analysis and presentation.
- *The Analyst/Knowledge Worker:* There are some differences between these two roles, but their similarities are significant. The analyst spends considerable time analyzing data for business managers. Knowledge workers analyze data for their own purposes and in support of their own business needs. As such, the depth of data, user control, analytical complexity and strategic application are the highest for this group. These people tend to be technologically savvy, and to explore different information domains to reveal deep insights.
- *The Rank-and-File Worker:* All stakeholders in an enterprise need some form of information to do their jobs. However, the rank-and-file class of workers needs a one-to-many approach, where a single solution may be used to simultaneously support many users. These users tend to score highly in the need for ease-of-use and in the tactical application of information. Their need for data depth is modest. User control, customization, data breadth and analytical complexity rate extremely low.

When trying to create a BI solution of any kind, users and their role in the enterprise must be considered. Ignoring this cornerstone of planning and implementation will foster a one-size-fits-all approach, which will diminish any BI project's value and ability to serve the enterprise.

12.0 Conclusion

Forward-thinking enterprises are already experimenting with competency centers, with positive results. They are demonstrating the crucial role a center can play in driving successful business decisions.

But successful BI involves more than one project success, or the choice of the right tool or application. In fact, the road to BI is littered with failures. The pace of business is now so fast that elevating BI to a new and strategic level may be the only way an enterprise can keep up. Those that can reap the rewards of BI will remain competitive, while protecting revenue. Those that cannot will fade into oblivion.

BI and the BI competency center have evolved from an enterprise's need to know what's going on and what to do about it. In the past, this was mostly handled by managers, often working independently and in a vacuum. However, business complexities and issues have grown significantly in the past 30 years. An enterprise needs much more today than just good people — it needs a good system and a good coordinator. It's not that technology is better than people; it's just that technology directed intelligently by people with a plan — the BI competency center — is so much better.

Appendix A: Acronym Key

BAM	Business activity monitoring
BI	Business Intelligence
CFO	Chief financial officer
CIO	Chief information officer
CRM	Customer relationship management
CSF	Critical success factor
DA	Data administrator
DBA	Database administrator
EBIS	Enterprise business intelligence suite
ERP	Enterprise resource planning
ETL	Extraction, transformation and loading
FSP	Financial services provider
IS	Information systems
IT	Information technology
LOB	Line of business
MBA	Master of Business Administration
MIS	Management information systems
ODS	Operational data store
RDBMS	Relational database management system
ROI	Return on investment
SCM	Supply chain management
SIO	Strategic information officer