



Maximizing Your BI Investment

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Executive Summary

Business Intelligence has progressed from the concept of static, periodic reporting to a new era of information enlightenment. What once passed as sufficient now has progressed to business critical. Decisions supported by BI are made on a daily basis which drives growth, revenue and stability in today's business strategies. Operational performance is now measured and monitored at a summary level using information once stored in an ODS for operational reporting only, which has enabled better predictive analysis and cost-saving initiatives at the executive level. Critical success factors are tracked at all management levels via dashboards and scorecards. And data once used only for reporting is now utilized in real-time marketing campaigns and business processes. Companies are coming to the common knowledge that Information is Power – and this power drives the success or failure of their ability to obtain and keep their marketing edge.

The first steps toward determining how well your company is making best use of their BI investments are to understand:

- **How are you using your data?**
- **How well are you obtaining and managing your data?**

The answers to these questions are of course not simple or straight-forward. This white paper series will discuss some key areas that may hinder or impact your efficient use of your BI investment, and some ideas on how one might take best advantage of their company's data assets. We will also discuss how your company may use their data most effectively, and key factors to be considered at each stage.

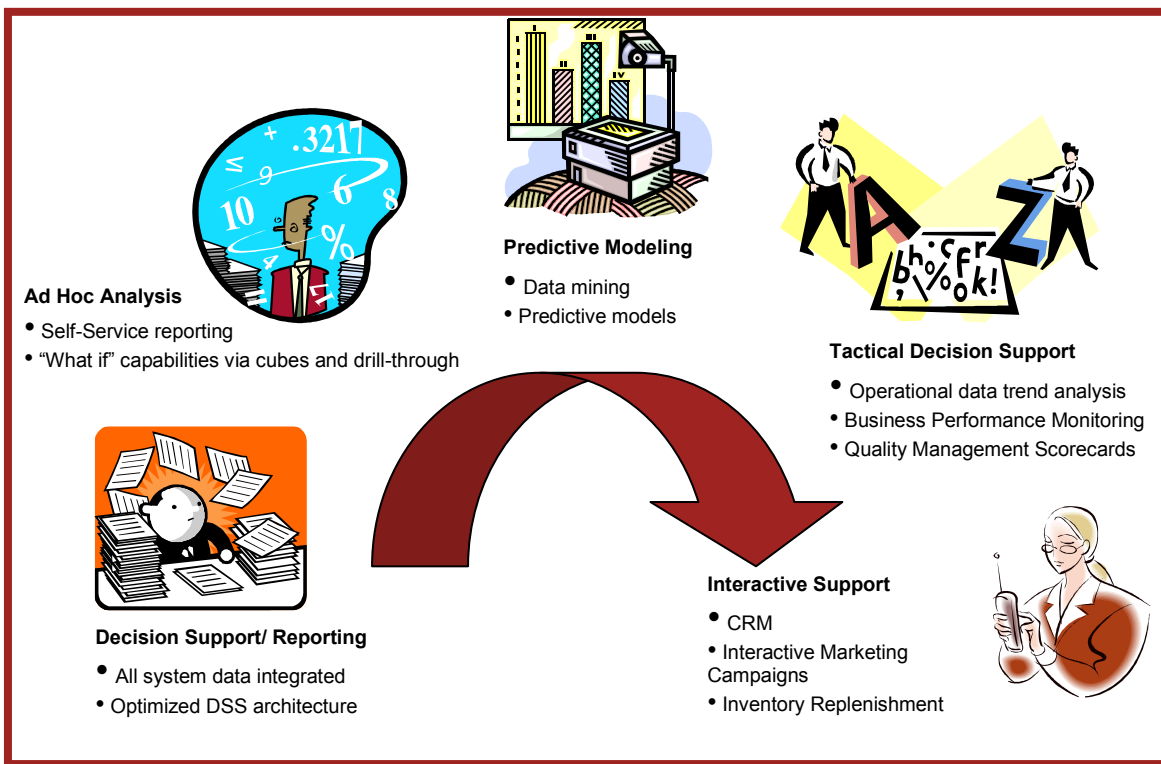
Using Your Data

Making best use of your company data requires planning, forethought, and a good understanding of how your business is run at various levels. Your business intelligence solution (or solutions in some cases) must cater to the needs of your business units to help your company run and prosper. Answers to some business questions can produce quantifiable ROI for your BI dollars if your data access structures and tools are optimal, and data quality is assured. Data can even drive future business, or prevent credit risks if current and timely information is available during customer contact. How well you are making your data available to your business users when they need it, and how well your

company is making best use of their data asset is what Spartan labels as your BI Maturity Index (BIMI).

To understand where your company lies within the BI Maturity Index spectrum, we must first look at how companies utilize their data as a whole. The following diagram shows the Business Intelligence Maturity Life Cycle, which progresses the importance of data in your business from passive to strategic.

Diagram 1. Business Intelligence Maturity Life Cycle



As we see in the diagram, the entry level into the BI Maturity Life Cycle supports basic reporting which is often static in nature and developed by IT. Progressing forward, users become more in control of their reporting environment, enabling them to pose new or one-off questions with the same ease that repetitive analysis is performed. Today's BI tools have become more robust which allows totally unstructured analysis via data

mining products, as well as predictive analysis which combines current and “guestimated” data values to predict future process or spending behavior. One might note that as a BI strategy progresses through these cycle stages that the access of the data become more open, while the control of the data become paramount (via optimized data models, architecture, and governance).

The next stage in the BI Maturity Life Cycle involves using large quantities of data distilled or summarized into metrics that provide insight into the business; usually displayed on a dashboard or scorecard. And finally, real-time use of information is becoming prevalent, either directly via a call center operator or automatically via imbedded processes like real-time campaign offers or automated risk analysis/credit approval processes. The final stage of data evolution elevates the importance of the data and its environment to one of business critical, which is a far cry from a casually used DW environment that may not be included within disaster recovery (DR) planning.

Each stage produces value from the company data asset, which grows in importance to the business as the usage expands. But many factors can conspire to dilute that value such as over-head costs, poor data/change management, poor or strained performance, and lack of confidence in the data itself. The following paragraphs describe each of the BI Maturity Life Cycle stages in greater detail, and note the different challenges that plague BI budgets and acceptance levels when striving for the best return on their BI investment.

Decision Support/Reporting

Back in the early 1990s, Decision Support Data Warehouses (DSDWs) became popular to solve the corporate need for standard reporting. It became apparent that ERP systems designed to handle data coming in were not optimal for generating complex answers out. Middleware became popular, as did a host of reporting tools designed to access key data components seamlessly, effectively and timely. But these placed a burden on the operational systems they read. Manually combining data from multiple data sources was complex and time-consuming, as well as sometimes erroneous since a consensus about data components and their meaning within various business units had not been achieved. DSDWs took the guess work out of reporting, providing a myriad of improvements to support critical business requirements.

Benefits

- Data relationships established within the DW across multiple business areas (via joins and reporting tool semantic layers) replace user frustration and manual work-arounds.
- Report creation and modification are performed by technical people who understand the data environment and tool set.
- The Data environment is optimized for standard reporting needs, via indices, summary tables and a cohesive data design.
- Historical tracking of key data points to monitor behavior is now available to bridge gaps at the source system level.
- Quality assurance that consistent answers are produced regardless of the business perspective (i.e. “single version of the truth”).
- One-stop shopping for business users that need answers to recurring questions
- Reporting is “locked down” to optimize performance and establish tight data security.

The data in the DSDW is often only as current as the reporting requirements dictated at the time the DW was created, sometimes daily but often weekly or monthly. Original DWDWs were sometimes limited to 2 years of data to enable storage of details that mirror the ERP systems, coupled with a Business Data Warehouse that held summarized data for longer periods (often 7-10 years depending on legal data retention requirements). Over time and as storage space became cheaper while data modeling improved, these environments collapsed into data warehouses that we see today.

As with all business challenges, there are some factors that impact how successful or cost-effective these DW initiatives are. The challenges below are common to many simple reporting environments where IT drives report creation as well as DW design and delivery.

Challenges

- Data Warehouse environments and structures require and experience growth as with all other business systems. Therefore, remodeling antiquated structures, enhancing load procedures and implementing performance improvements should be estimated into DW maintenance strategies.

- Business Rules must be well-defined, understood and documented to facilitate common understanding and data confidence. They must also be changeable as the business changes and expands.
- The data design must be open enough to allow new data sources to be integrated over time.
- Data Stewards must be actively involved in change control and quality assurance.
- Proactive Governance for the DW is critical to ensure quality over time, and end-to-end management of changes with broad impact.
- Data frequency requirements may change over time, which drives change throughout the DW load process and may impact access windows.
- Tools must be selected that are easy to use, as well as viable for the DW environment.
- New report requests or changes must be funneled through IT across the company, which may create a development bottleneck unless sufficient resources are available and good planning is executed.

Ad Hoc Analysis

As some of the problems and challenges of static reporting environments became more prevalent, the business began to become more detached from IT. Business users that could not wait for new reports or new data sources to become available became impatient, and began to take action. This expediency drove change in the DW Maturity cycle, placing power and control with the business instead of IT. Many business units began establishing their own IT budgets to accommodate their information needs, and DW silos began to form. Data Warehouses and data marts were established independently to meet specific business needs, and tools were selected that suited the new environments.

Benefits

- DWs and Data Marts were built for a specific use or context, such as customer-centric data marts, which better suited the business unit's requirements.
- Self-service reporting environments enabled the user to pose their own questions to the data rather than being constrained to a pre-defined set of reports.

- Change control was brought closer to the data steward, who holds intimate knowledge of the information components, content and on-going business initiatives.
- Business users were able to use new expanding functionality available from their reporting tool(s), thus empowering true ad hoc analysis.
- Business Sponsors were able to see quicker return on their investment, by focusing development and resources on their specific needs.

Challenges

- Silo'd data means that a uniform data view from a company perspective may no longer be possible. Multiple departments with their own BI objectives, environments and toolsets create a disjointed approach to BI that strengthens specific requirements delivery but limits/hinders a corporate or broader view.
- Multiple tool sets mean multiple maintenance fees, upgrade schedules, and multiple skills/resources needed. This can introduce significant cost to the company as a whole while diluting negotiation power with vendors.
- Self-service reporting transfers responsibility to the user instead of IT. This places a greater need on training, and establishing a "power user" community that can address more complex needs.
- Self-service reporting often expands the user base population, placing a greater level of demand on the DW or DM environment as concurrency increases.
- Performance tuning requires better usage monitoring tools or methods, since the data retrieval path becomes more unknown. The data model and environment must be able to accommodate more unstructured queries without impacting overall performance.
- As above, the frequency of the data available for analysis may prove insufficient, thus driving change in both load processes and environment capacity.

It should be noted that many companies that once embraced a silo'd BI approach are now moving toward an Enterprise DW model. A unified corporate data approach is often the most cost-effective solution, which can facilitate:

- Tool rationalization and consolidation
- Data Base rationalization and consolidation
- Common support and development costs spread across the participating business units

- Common usage and development standards
- Skills development for a smaller set of tools and environments
- Expansion capabilities for data usage

Creating an Enterprise DW is a time-consuming and often difficult process that requires active participation from each contributing business unit via executive sponsorship. Close coordination is needed, as is a well-defined decision-making process to ensure that all corporate needs are addressed within a level playing field. Priority decisions become paramount to the foundation process, since it must be determined what system represents the primary source of information for each DW dimension. Other critical factors to consider are user bases that span time zones and use multiple languages. Companies often find that a third party vendor is able to assist with cross-department coordination more efficiently than in-house resources, to achieve a common goal outside of internal politics.

Predictive Modeling

Business users today not only need to know where they have been, but also where they are going. Progressing through the BI Maturity Life Cycle, we see companies begin to use their large data stores to help support business growth by using patterns and root cause analysis to predict future behavior. Marketing can use the strength of their customer data asset to understand and define profiles for campaigns, and to understand buying patterns. Operations and Finance can use current and past behavior noted in data trends, then combine them with subjective or variable driver data to observe and predict business change and financial impact. All of these objectives use the power of data typically used for reporting to help their business grow and become more competitive by exploiting new business patterns.

Benefits

- The business can extend data usage based on established data quality and data completeness standards to predict future trends and process shifts.
- Business users can take advantage of new tool functionality such as data mining and trend analysis tools to tap into unknown knowledge about their customers, operations performance, or budget/spend ratios.

Challenges

- Data Mining tools and trend analysis tools often sweep huge data volumes to find the answers they seek. This can impact over-all DW and DM performance significantly without solid planning and adequate architecture design.
- Predictive analysis often requires a high level of business and data understanding. This narrows the number of users that can perform this function optimally.
- As with other maturity phases, performance tuning requires better usage monitoring tools or methods, since the data retrieval path becomes still more unknown. The data model and environment must be able to accommodate more unstructured queries without impacting over-all performance.
- Data quality becomes key to enabling the educated business decision based on data mining results. Ironically, Quality Management programs can use this same data approach to constantly evaluate the completeness and accuracy of the DW data, which can then be published via scorecards and dashboards.

Tactical Decision Support

When Decision Support Data Warehouses were first built, and reporting environments were established, low level operational data was often excluded so as not to over-pollute data volumes with information thought to be only useful for operational reporting, which was best performed against the source system directly. As process improvement programs began to evolve, the importance of this granular data became clear. A user could not only look at high level numbers and key performance indicators to observe efficiency trends. By providing access to this detailed data, one can now look for anomalies as they occur (near-time), thus enabling proactive resolution to problems before they grow in impact and complexity. True “what-if” capabilities are needed against large volumes of data to observe driver impact or the frequency with which problems occur within the data process context. Multi-dimensional cubes and data marts are often used to store this information, which must balance to the higher level details in the DW but exist at a much lower level of granularity than most DW components.

A good example of how one might utilize Tactical Decision Support was seen recently when a new Product Manager was hired to address excess costs at one of Spartan’s clients. Product return information was an area previously excluded from the DW, as it was deemed too detailed in nature and superfluous to standard business processes. By

making this detailed data available for analysis using a cube, the Product Manager was able to observe recurring return trends for merchandise, then address the root cause of the return with the providing vendors. This analysis drove changes in packaging, product selection for future sales cycles, and produced ROI within the first 3 months.

Benefits

- The business is able to observe high level trends and root cause for peaks and valleys nearer to the time of occurrence. This facilitates a proactive business reaction to a previously undetected business problem.
- Positive business benefit from the DW can now be seen at lower management levels due to the availability of more granular data. Cohesive business decisions can be made upon data that balances at the summary and detail level; therefore all users are making decisions from a point of coordination.

Challenges

- Adding detailed data to an already large DW can present capacity challenges. Growth estimates must now include data sources that may grow exponentially.
- Archive strategies become more important so as not to over-burden the DW with details no longer needed. It is important to understand how much time the detailed data is needed at the lowest level, and when can it be summarized or archived so that the granular details are not kept beyond their usefulness.
- Solid planning is needed to provide the data in the best medium for fast retrieval coupled with the right tool to access the information. The data must be current and timely in nature; therefore the frequency also may become a critical factor.
- Low level details must always balance to the associated higher level summary statistics (within an acceptable margin of error). This level of balancing must be included in your over-all DW Error Management strategy.

Interactive Support

The last phase of the BI Maturity Life Cycle is the interactive use of company data to feed or enhance customer-facing activities to expand and increase business. Real-time Marketing solutions can make use of customer buying patterns and customer profiling

over a larger period of time. Applications may use DW data to proactively drive customer reactions, or dictate customer approach. Maximum performance then becomes critical, just as the data components themselves take on real business value, when BI becomes directly involved in revenue-generating activities.

Benefits

- The information being provided to key business functions is assured to be high in accuracy, completeness and timeliness.
- Data that is critical to quick and accurate decisions is now available to provide a new level of business benefit to the company.
- Information associated with using DW data interactively can now be fed into the DW as well – to enhance customer profiling, evaluate campaign effectiveness, or flag a high credit risk.

Challenges

- DW Governance and Architecture become paramount to ensuring that all data is complete, balanced and optimally retrievable.
- Optimal performance also becomes critical to the success at this level of data interaction. A customer will not react favorably to an offer that freezes their purchase.
- Summarization, optimized data models, and extended server functionality may also play a key role to the successful execution of data interactivity.
- The importance of the data has now reached business critical, therefore mirroring, frequent back-up strategies, and solid DR plans now become especially important to the BI solution.

Summary

It is easy to see that both Business Intelligence and Business itself have evolved tremendously over time. Today's market is competitive, and to keep your company at the market edge takes a focused effort to make best use of all assets. This white paper has discussed a number of ways in which companies are producing on-going business benefit from their BI investment. While ROI may not always be measurable, as many of the benefits are subjective or hard to quantify, it is not only possible to realize in short order, but also expanding that ROI is within reach.

Now that we have described the various BI Maturity Levels, may we suggest that you evaluate where your company lies within that Index spectrum. Care and tending to your BI environment will most assuredly produce business benefit, seen in less man hours spent, better information available when it is needed, and more proactive decision-making capabilities. Having a solid BI roadmap to follow that is strategic for your current and future needs will help to keep your BI Investment on track, and your BI solution stable.

Author

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Dana is one of the founding partners of Spartan Technologies. Dana has an extensive background in BI as a Data Warehousing Specialist, managing or assessing many end-to-end implementations across the US and Europe for over 16 years. Dana also has extensive knowledge of ERP System design and CRM Integration and Configuration.