Business intelligence application in performance management

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Business intelligence application gather information about business processes and activities to make it available to business users, enabling them to make more informed decision and take more effective action. This application can help companies have a more comprehensive knowledge of the factors affecting their business, such as metrics on sale, production, internal operation, and they can help companies to make better business decision. Business intelligence application include any application or technology for gathering, providing access to, and analyzing data for the purpose of helping key decision maker to take better business decision.

Key Words:
Business intelligence, performance management, application, scorecard, dashboard, OLAP, data mining, data warehouse, reporting.

Definition of Business Intelligence

Every business is dynamic in nature and is affected by various external and internal factors. These factors include external market conditions, competitors, internal restructuring and re-alignment, operational optimization and paradigm shifts in the business itself. New regulations and restrictions, in combination with the above factors, contribute to the constant evolutionary nature of compelling, business-critical information; the kind of information that an organization needs to sustain and thrive. Further, the need for innovation in the gathering and analysis of business centric data is greater than ever. This kind of innovation supports and enables preemptive as well as retrospective decision making while creating a capability for pioneering business solutions. In-order to achieve this, numerous organizations have either implemented or are planning to implement business intelligence and performance management solutions, which in itself is an ongoing endeavor, where change is the only constant.

Business intelligence ("BI") is broad term that encapsulates the process of gathering information pertaining to a business and the market it functions in. This information when collated and analyzed in the right manner, can provide vital insights into the business and can be a tool to improve efficiency, reduce costs, reduce time lags and bring many positive changes. A business intelligence application helps to achieve precisely that.

Successful organizations maximize the use of their data assets through business intelligence technology. The first data warehousing and decision support tools introduced companies to the power and benefits of accessing and analyzing their corporate data. Business users at every level found new, more sophisticated ways to analyze and report on the information mined from their vast data warehouses. Demand grew for an increasingly more powerful business intelligence solution that put the right information into hands of every user within the enterprise.

BI is a broad topic, covering many different functions (e.g., reporting and analysis) and technologies (e.g., data warehouse, OLAP, portal). An examination of the literature shows many varying definitions of BI. These definitions fall into two classes: a technical description of the components that make up a BI solution and an explanation of the business purpose of BI. A good definition of BI that encompasses both technical functionality

and business purpose is the following: BI is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions[1].

Choosing a Business Intelligence offering is an important decision for an enterprise, one that will have a significant impact throughout the enterprise. The choice of a BI offering will affect people up and down the chain of command (senior management, analysts, and line managers) and across functional areas (sales, finance, and operations). It will affect business users, application developers, and IT professionals. Before deciding on a BI offering, business decision makers must evaluate a company's BI offering with respect to what it has to offer each of these stakeholders.

BI applications include the activities of decision support systems (DSS), query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining. Another way of phrasing this is that BI applications take data that is generated by the operations of an enterprise and translate that data into relevant and useful information for consumption by people throughout the enterprise.

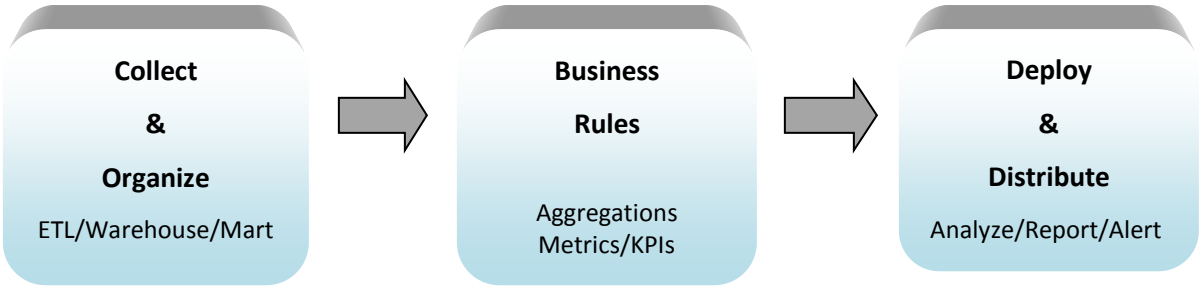

Figure 1.

To deploy BI successfully throughout an enterprise requires a platform, not a hodgepodge of tools and technologies. As such a BI platform must be able to address all the BI needs of an enterprise. Gone are the days where BI was a point solution used by a limited set of highly trained analysts. In today's market, BI is pervasive throughout an enterprise and in many cases mission critical. As such, a BI platform must be able to address both the breadth and depth of the needs of an enterprise.

The business intelligence architecture (a subset of the overall IT architecture) is an umbrella[2] term for an enterprise-wide set of systems, applications, and governance processes that enable sophisticated analytics, by allowing data, content and analyses to flow to those who need them, when they need them.

Top management, functional heads, knowledge workers, and statisticians all need information of these types at various times and in various forms. The BI architecture must be able to quickly provide users with reliable,

[1] www.symcorp.com
[2] Thomas H. Davenport, Jeanne G. Harris, The architecture of business intelligence, Harvard Business School Press, 2007

accurate information and help them make decisions of widely varying complexity. It also must make information available through a variety of distribution channels, including traditional reports, ad hoc analysis tools, corporate dashboards, spreadsheets, e-mail, and pager alerts.

Top Ten Signs of Effective Business Intelligence[3]

1. Managers and analysts have direct, nearly instantaneous access to data; they never argue over whose numbers are accurate.
2. Information workers spend their time analyzing data and understanding its implications rather than collecting and formatting data.
3. Managers focus on improving processes and business performance, not culling data from laptops, reports, and transaction systems.
4. A hypothesis can be quickly analyzed and tested without a lot of manual behind-the-scenes preparation.
5. Data is managed from an enterprise-wide perspective throughout its life cycle, from its initial creation to archival or destruction.
6. Rather than have data warehouse or business intelligence initiatives, companies manage data as a strategic corporate resource in all business initiatives.
7. Both the supply and demand sides of the business rely on forecasts that are aligned and have been developed using a consistent set of data.
8. High-volume, mission-critical decision-making processes are highly automated and integrated.
9. Data is routinely and automatically shared between the company and its customers and suppliers.
10. Reports and analyses seamlessly integrate and synthesize information from many sources

Performance Management

Performance Management is a set of techniques and applications that review the success of business processes against a set of objectives. Business performance is managed through planning and budgeting to set expectations, and monitoring the actual business performance against the desired results. Managing business performance improves business acumen, ensures accountability, and raises investor confidence.

Performance Management represents a renewed focus on quantitative management — a "management by the numbers" — using insight gained from data analysis and performance reporting.[4]

Performance Management Systems are found under a number of different terms and concepts, including: Corporate Performance Management (CPM), Business Performance Management (BPM), Enterprise Performance Management, and Operational Performance Management.

Driven by technology and business, Performance Management combines management methodologies that focus on analytical performance, with long-standing operational business needs for executive reporting and budgeting. Newer business needs for financial planning tools and enterprise-wide, Web-based analysis and reporting have further expanded the depth and breadth of performance management applications.

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[3] Thomas H. Davenport, Jeanne G. Harris, The architecture of business intelligence, Harvard Business School Press, 2007

[4] Adapting Business intelligence and Performance Management frameworks to address major business changes, TATA consultancy services, white paper, 2009

Reflecting this combination of analytical and operational needs, Performance Management technology is provided by three vendor types: Business Intelligence (BI), niche applications, and Enterprise Resource Planning (ERP).

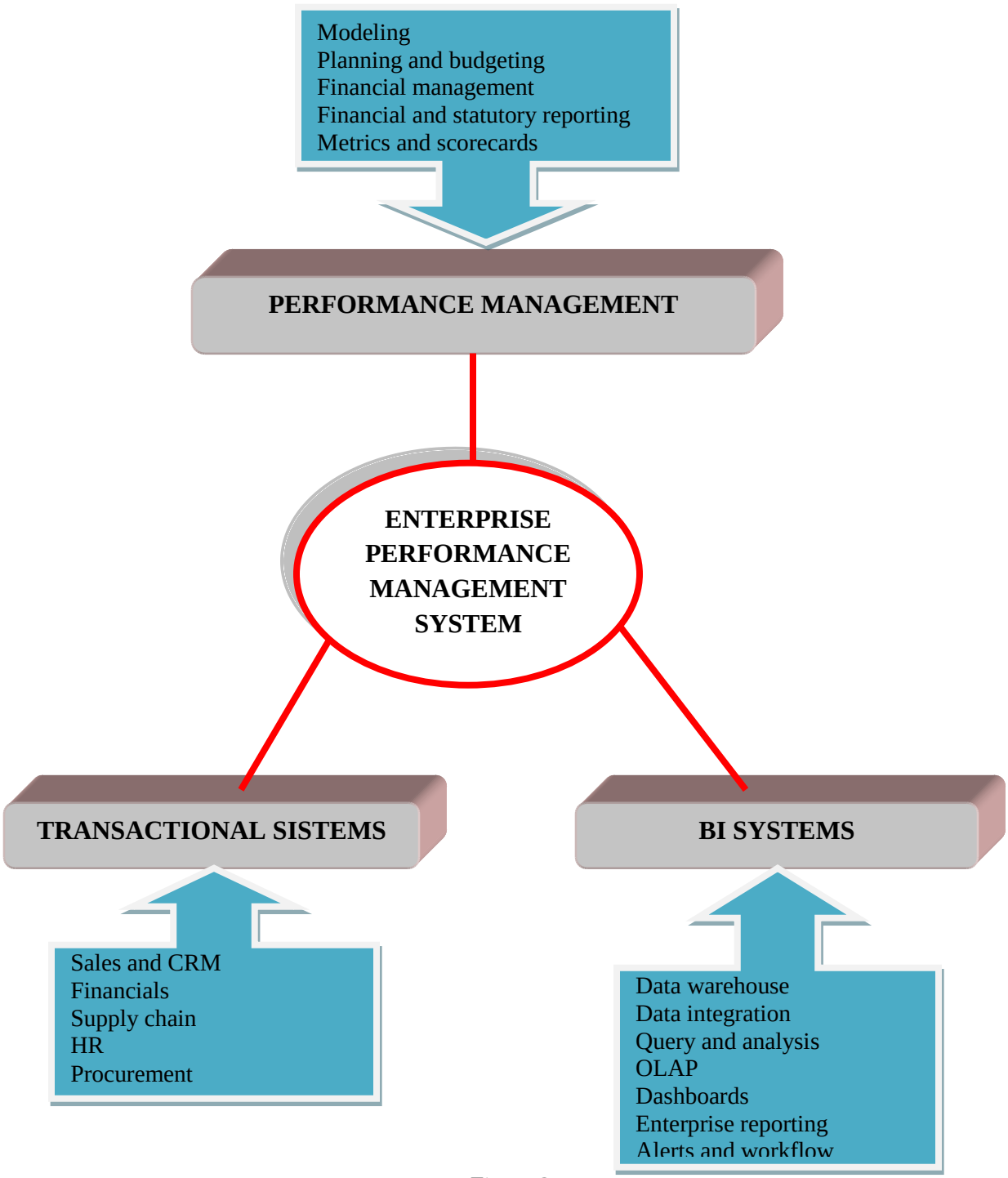

Figure 2.

The relation between business intelligence and performance management

There is no doubt that performance management (PM) is fundamental to building, growing and managing a successful business. Improvements in performance can be delivered if performance is measured in specific business areas and related to strategic business objectives and targets. Popular methodologies exist to manage performance at strategic levels. However, while different performance management methodologies are used, many companies have not yet managed to achieve enterprise-wide execution of business their strategy or use business intelligence optimize business operations. To make this happen requires that business intelligence is integrated into processes in the context of the activity being performed by each and every user. If everyone in the enterprise could contribute effectively to performance we could manage performance at both strategic and operational levels and move beyond business intelligence towards right-time business optimization.

Some would argue that performance management is business intelligence problem and to date, much of the software aimed at supporting it has come from BI vendors. These so called corporate performance management software products are however limited in that they are often standalone systems with their own database holding summary key performance metrics data and in some cases data on objectives and objective owners. Yet many executives have a vision of PM that is way beyond just a scorecard product with integrated budgeting, planning and reporting built on top of a BI system. Their vision is that PM is a process oriented problem requiring a solution that helps and guides everyone in the company to all contribute towards business performance. Methodologies like Six Sigma are process improvement based and yet CPM tools on the market are not yet integrated with business process management software. Performance management requires a lot more than CPM. It is a holistic problem that requires every person and every system in the enterprise to be able to leverage the right intelligence at the right-time in every process activity to guide them towards making their contribution to the overall performance to the business. PM is therefore about going beyond strategic level scorecards and dashboards to building an intelligent business by integrating BI right into operational business processes to guide and drive decision and actions in everyday business.

Analytical tools and applications

Choosing the right software tools or applications depends on several factors. The first task is to determine how thoroughly decision making should be embedded into business processes. Should a decision be automated or made by a person? If it is automated, technologies exist that both structure the workflow and provide decision rules-either quantitative or qualitative-to make the decision.

Next, companies must decide whether to use a third-party application or create a custom solution. The “make or buy” decision hinges upon whether a packaged solution exists and whether the level of skill required exists within the organization. A growing number of functionally or industry-specific business applications, such as capital budgeting or mortgage-pricing models, now exist. Vendors of enterprise systems such as Oracle and SAP are building more analytical applications into their products. According to IDC, projects that implement a packaged analytical application yield a median ROI of 140 percent, while custom development using analytical tools yields a median ROI of 104 percent. Nevertheless, powerful tools have been created that allow organizations to develop their own analyses. Companies such as Business Objects and SAS offer product suites consisting of integrated tools and applications. Some tools are designed to slice and dice or to drill down to predetermined views of the data, while others are more statistically sophisticated. Some tools can accommodate a variety of data types, while

others are more limited (to highly structured data or textual analysis, for example). Some tools extrapolate from historical data, while others are intended to seek out new trends or relationships.

Whether a custom solution or off-the shelf application is used, the business IT organization must accommodate a variety of tools for different types of data analysis. Employees naturally tend to prefer familiar products, such as spreadsheets, even if they are ill suited for the analysis to be done. Another problem is proliferation of technologies. In a 2008 survey, respondents from large organizations reported that their organizations had, on average, 13 business intelligence tools from an average of 3.2 vendors[5]. In the past, different vendors had different capabilities—one might focus on financial reporting, another on ad hoc query, and yet another on statistical analysis. Today, however, leading providers have begun to offer business intelligence suites with stronger, more integrated capabilities.

Business intelligence solution for performance management

To achieve an effective Performance Management solution, a BI platform needs to deliver on all analytic requirements. These core analytical capabilities are delivered through the five styles of Business intelligence[6]:
Scorecarding and dashboarding-Scorecards and dashboards provide "at-a-glance" information about business performance across the enterprise. They are typically generated for managers and executives who need an overall view of business performance and find tremendous value in viewing timely, visually intuitive snapshots of strategic financial and operational data.

1. **Scorecards** provide a visual representation of standard key performance indicators (KPIs) - carefully selected metrics that help enterprises measure and manage performance. Enterprises can choose from the hundreds of pre-defined KPIs included in the pre-built analytic modules or build an unlimited number of KPIs based on a specific methodology, such as the Balanced Scorecard, Six Sigma, Activity Based Management or individual enterprise design.
2. **Dashboards** provide an illustrative representation of business performance across the entire organization. Dashboards are designed to deliver maximum visual impact in a format optimized for quick absorption, using a combination of tables, graphics, gauges, dials and other graphical indicators, as well as conditional formatting, free-form labels, borders and background colors.
3. **Managed Metrics Reports** are the cornerstone of Corporate Performance Management (CPM), allowing managers to continually track business performance status.

Cascading Scorecards and Dashboards are delivered throughout the organization across all functional areas. With cascading Scorecards and Dashboards, everyone can view their personal contribution to corporate performance through score-cards and dashboards that link individual performance indicators to corporate goals. Managers and executives can also use Scorecards and Dashboards to navigate from a high-level to the lower-level view of their subordinates' performance contributions within the scorecard and dashboard framework.

Scorecard and Dashboard Integration ensures that any number of users can securely access the reports they need anywhere, any time and using any interface. Scorecards and dashboards have unlimited user scalability and can be published and distributed to tens and hundreds of thousands of users both internal and external to the enterprise - efficiently and securely via the Web and email.

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[5] SAS White Paper, Implementation of Business intelligence and Performance management tools and solution, March 2009
[6] www.microstrategy.com

Automatic personalization of Scorecard and Dashboard content is a significant feature that requires a robust, secure platform architecture that guarantees data access to only authorized users.

Enterprise reporting-provides business intelligence to the masses by delivering the detailed information that impacts decision-makers throughout the enterprise. Individuals at all organizational levels and job functions, as well as supply chain partners and customers, rely on powerful, flexible enterprise reporting systems that present targeted data in the most consumable format for day to day operations.

Enterprise Reporting is the most prevalent Style of BI, encompassing a vast array of operational reporting directly from ERP, CRM, as well as invoice and billing systems.

1. **Production and operational reports** is adept at quickly organizing massive amounts of operational data into hierarchical categories that are fundamental to production operations. These reports feature easy page and section navigation, including labels, headers, footer and page break logic.
2. **Invoices and statements** contain detailed transactional data and summary information for any number of customers and partners. These reports uses the same exacting page layout techniques to generate invoices and statements as professional desktop publishing packages.
3. With **Automatically customized content,** BI administrators only need to create one report that the system automatically slices into the different views appropriate for each individual user. Multiple variations of this report are then automatically generated and distributed based on each user's role and group affiliation. This solves the problem of how to deliver information to very large user populations in an economical fashion.
4. **Parameter-driven reporting**-users can answer any number of questions prior to running a report, letting their answers dictate what content will be displayed in that report.
5. **Business reports** can create popular reports such as P&L reports, performance reports and statutory reports - all optimized for on-screen viewing and drillable to detailed or related information.

OLAP analysis-OLAP delivers the simplest form of analysis, allowing anyone to slice and dice interrelated subsets of data or "cubes" with the click of a mouse. Users can analyze data using standard OLAP features such as page-by, pivot, sort, filter and drill up/down to flip through a series of report views. OLAP Analysis offers users primary access to their data warehouses in lieu of more advanced analysis functionality required by power users and analysts.

Most OLAP vendors provide multi-dimensional OLAP (MOLAP) solutions to perform this type of analysis, but limited cube capacity has burdened many IT administrators with deploying and managing hundreds of overlapping cube databases to keep pace with growing organizational demands. To get the most out of BI applications, however, OLAP analysis needs to extend beyond the standard MOLAP cube and provide full speed-of-thought interactivity against the entire data warehouse.

OLAP Analysis with Intelligent Cubes™ is a new analysis environment that lets business users easily and safely explore beyond the boundaries of pre-defined cubes to reach the full depth and breadth of their data warehouses -- without relying on IT to create and maintain the cube data. With Intelligent Cubes, architecture seamlessly combines the speed and interactivity of MOLAP analysis with the analytical power and depth of relational OLAP (ROLAP) for a complete range of OLAP analytical functionality.

Advanced and Predictive Analysis gives power business users and information analysts' full investigative power into any corner of the data warehouse to find out the details behind specific performance outcomes. Such requirements usually exceed the limits of OLAP Analysis. These BI technology was designed specifically to

deliver the common functionality of statistical and data mining tools in a way that is familiar and consistent with everyday business intelligence usage.

Advanced and Predictive Analysis supports advanced and predictive analysis capabilities, enabling users for the first time to perform analyses such as hypothesis testing, churn prediction and customer scoring models within a single unified web interface. With built-in support for over 400 Statistical, Mathematical and Financial functions, Advanced and Predictive Analysis lets users create reporting applications that combine ease-of-use with unparalleled backend sophistication.

1. **Self service reporting and guided analysis**- Users can create customized reports by selecting data objects to display and defining qualifications as report filtering criteria.
2. **Parameter-driven reporting functionality**- Users can customize the content and layout of any given report with a range of variations defined by certain factors or parameters
3. **Set analysis and data segmentation**-users can leverage the set analytics that provides to perform easy segmentation of data. They can manipulate and combine user-defined sets of data to obtain a refined data set for further analysis. Sets can be personalized per user, shared within a department, combined using logical operators and reused across multiple reports
4. **Analytical treatment of the data**- provides the broadest and deepest set of analytical functions available in any business intelligence platform. These range from simple mathematical functions, such as running totals to advanced statistical computations such as f-tests. The analytical packages that are available include statistical, financial, and math function libraries. This enables the business to answer all its analytical questions using a single platform.
5. **Integrating Data Mining with Business Intelligence**- predictive Analysis, or Data Mining, is the process of examining large amounts of data in search of hidden patterns and predictive information that allows organizations to make proactive decisions that ultimately improve efficiency and effectiveness. This integration delivers powerful predictive models to all users -- letting them view, analyze, build and distribute predictive reports through a zero-footprint Web interface and with the highest levels of security.
6. **Multi**-pass SQL analysis- Complex questions that are impossible to answer with other approaches can be answered quickly and easily with **multi**-pass SQL analysis. This is a technique that combines built-in analytical functions with database processing.

Effective **Alerting and Proactive Notification** requires a flexible, well-designed BI application capable of distributing large numbers of reports and alerts to large user populations both internal and external to the enterprise. Most BI vendors support a minimal form of the Alerting and Proactive Notification style of BI, with products that can distribute scheduled emails to user populations with report attachments.

1. **Report distribution through any touch point**- reports can be automatically distributed through the widest range of user touch points on the market - including email, Web browsers, networked printers, networked file servers and corporate portals.
2. **Self-subscription and Administrator-based distribution**- lets users subscribe to reports, as well as subscribe other users to relevant reports, without relying on their IT administrator for help.
3. Delivery On-Demand, On-Schedule or On-Event- users have complete control over the timing of all of their report distributions. They can also customize the reports that they receive and immediately distribute the new results to other users.
4. **Automatic content personalization**- solves the problem of generic report distribution by providing four levels of content personalization:
    - Authenticated personalization: Relevant data is associated with a user-stored profile.
    - Preferences personalization: Users define what information they want to receive.

- Locale personalization: Users can specify what number and date formats, report language and international character sets should be applied to their reports.
- Security Personalization: Report content is automatically tailored to include the data appropriate to each user's role and group affiliation.

The Magic Quadrant for Business Intelligence Platforms

BI and PM solution services include professional services offerings to optimize an enterprise's processes and integrate related technology applications and platforms, which include application related work. BI and PM solution services are offerings to design, develop, deploy, manage and support specific processes, functions, applications or initiatives in user organizations. These services aim to optimize a company's processes and integrate related technology applications and platforms.

BI and PM solution services aim to provide effective alignment and integration of BI and PM initiatives based on the BI and PM framework. BI and PM services encompass the BI and PM framework model that includes information management infrastructure, BI platforms and analytic applications, organization (people and process), performance management and business strategy

The Magic Quadrant for Business Intelligence Platforms[7] presents a global view of Gartner's opinion of the main software vendors that should be considered by organizations seeking to develop business intelligence (BI) applications. Buyers should evaluate vendors in all four quadrants — those from the Niche Players and Visionaries quadrants are driving innovation in areas such as interactive visualization, in-memory data analysis, real-time dashboards, wizard-based application development and spreadsheet-based reporting.

[7] The Magic Quadrant for Business Intelligence Platforms, Gartner RAS core research, Note G00157290, 2008

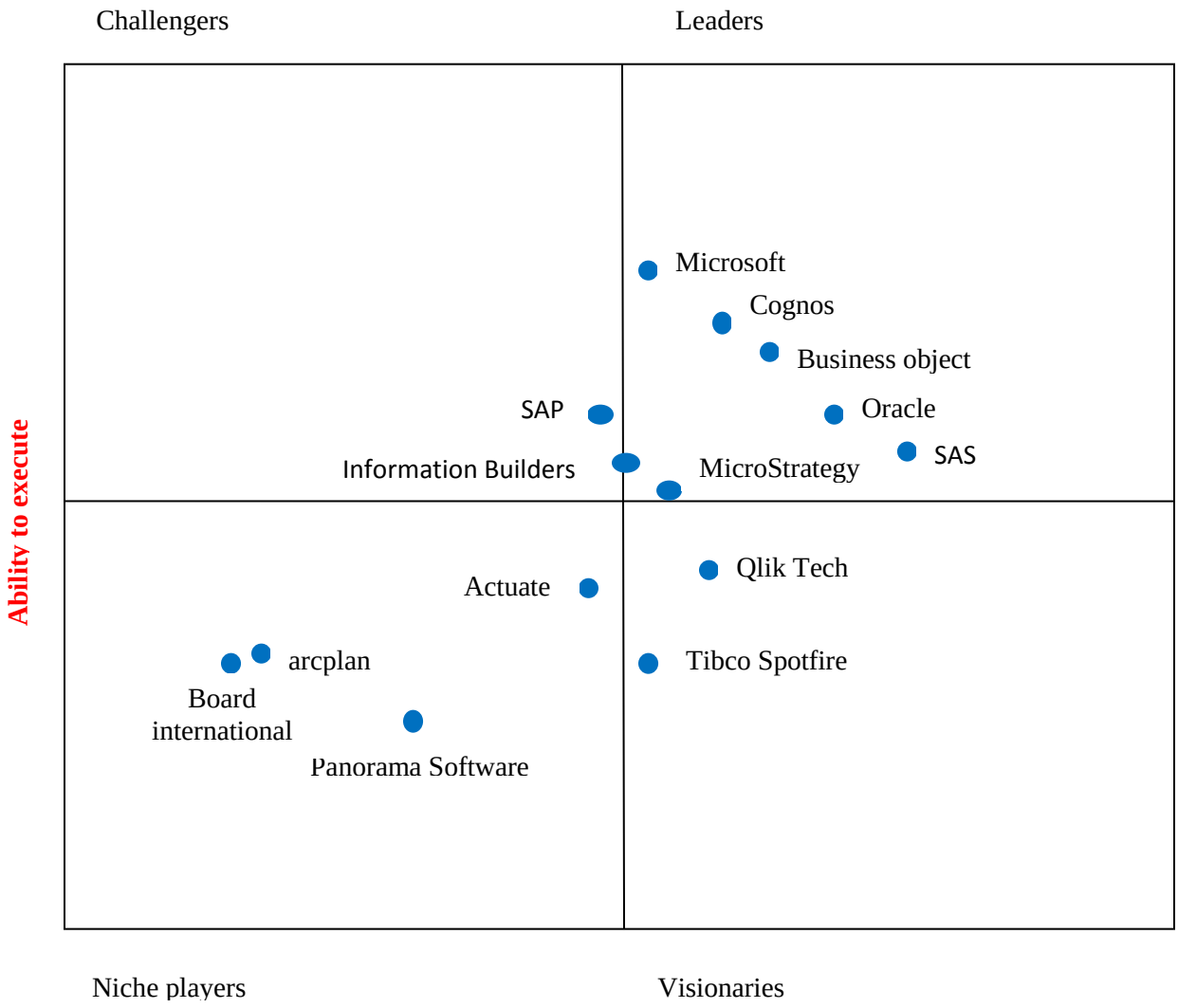
Challengers
Leaders
Microsoft
Cognos
Business object
SAP
Oracle
SAS
Information Builders
MicroStrategy
Actuate
Qlik Tech
arcplan
Tibco Spotfire
Board international
Panorama Software
Niche players
Visionaries
Ability to execute
Completeness of vision

Figure 3.

Conclusion

This belief in the power of information has led companies to deploy a wide range of applications, reporting tools and analytical technologies over the years. At first, these deployments were fragmented, as different systems were implemented for various areas of the business. This resulted in silos of information that hampered efforts to get comprehensive visibility into all the workings of the business and its markets. So, over time, efforts were made to unify visibility into these disparate systems. The goal of unfettered visibility into any and all aspects of the business operation came to be known in the industry as Business Intelligence (BI).

Companies believed that comprehensive BI would enable managers to make smarter decisions, resulting in improved business performance. As a result, much effort and investment have since been dedicated to corporate BI implementation. IT organizations have labored to build BI architectures that give decision makers insight into every area of the data stored across the enterprise. This trend has led to a substantial focus on data integration, analytical sophistication, delivery of querying capabilities and reporting tools to the desktop, and other infrastructure-related issues. In fact, because of its strategic value, BI has become a key concentration for today's IT organizations.

However, it's also evident that as BI implementations have progressed and matured, they no longer provide the competitive advantages they once promised. There are two reasons for this. First, BI has become pervasive – and companies can't gain competitive advantage by doing what everyone else is doing. Second, BI is exclusively focused on providing users with insight into stored data: it doesn't deliver the tools to deliver operational change. Insight without action cannot fundamentally impact business performance. That's why companies seeking to differentiate themselves and gain competitive advantage in today's extensive global markets are now taking the next step: transforming BI into Business Performance Management (BPM).
With PM, the insight gained from BI is directly linked to the financial and operational systems that run the business. BPM is thus used to *enact* game-changing action. While BI promoted an internal focus on uncovering trends and tendencies in stored data, PM promotes an external focus on using what BI can discover to direct business operations.

Companies that tightly link the information generated by their BI infrastructure to the specific actions that improve business performance – smarter allocation of resources, optimization of product price-points, etc. – are a step ahead of the competition. They are quicker to capitalize on emerging market opportunities, to pinpoint and remedy operational inefficiencies, and to flag potential compliance issues. An aggressive transition to PM is therefore critical for any company seeking to maintain and extend its competitive edge.

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