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SAP's Business Analytics Solution: Applying Intelligence to Drive Value Through the Enterprise

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WHITE PAPER

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Sponsored by: SAP

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IDC OPINION

Do business intelligence or business analytics provide real value? IDC's *The Financial Impact of Business Analytics* (IDC #28689, January 2003) study researched analytics projects at 43 organizations across North America and Europe, in a range of industries from manufacturing to financial services to government. They deployed a wide variety of packaged and custom analytic applications, achieving a median five-year ROI of 114%. (The figure represents the five-year net present value of the benefits minus the five-year costs, divided by the costs.)

A full 49% of the projects paid back within one year or less. The first major demonstrated benefit was improved productivity: bringing together information to speed up the identification, creation, and distribution of business insights. The second key benefit demonstrated was improved business process efficiency, achieved by linking analytics to specific business operations, establishing a learning cycle of feedback and correction to reduce costs and/or increase revenue.

SAP's business analytics offering is comprised of the SAP BW *data warehouse platform* (with OLAP and ad hoc clients and predefined business content) and *specialized analytic applications* that leverage this integrated data foundation. Together, they can help organizations realize both types of benefits: improved productivity in delivering information and increased business process efficiency.

In This White Paper

This paper examines SAP's business analytics platform and analytic applications:

☒ *Platform:* SAP BW (Business Information Warehouse) streamlines the integration and delivery of information, from SAP and non-SAP sources, in the form of reports, OLAP, and ad hoc query on the performance of all major business functions.

☒ *Analytic applications:* SAP's portfolio of analytic applications, built on BW, helps to optimize specific business operations by applying purpose-built models and analysis. The linking of analytics to operations is the key to maximizing business efficiency.

◻ What are *analytic applications*? IDC established the analytic applications concept in 1997, anticipating the coming convergence between business intelligence and enterprise applications. According to IDC's definition, analytic applications are separate from transactional or operational applications, provide process support for the review and optimization of business operations, and either integrate or access time-oriented data derived from multiple sources.

This definition of analytic applications includes business applications for planning, forecasting, and modeling that relate to specific business subjects spanning industries or specific to industries:

◻ **Financial/BPM analytic applications.** Analytic applications designed to measure and optimize financial performance and/or establish and evaluate an enterprise business strategy. All of these applications are cross-industry rather than vertical-specific.

◻ **CRM analytic applications.** Analytic applications designed to measure and optimize customer relationships.

◻ **Operations/production analytic applications.** Analytic applications designed to measure and optimize the production and delivery of a business' products and/or services.

If operational applications are designed to define and manage business processes, analytic applications are there to enable the intelligent optimization of those processes. Analytic applications (such as SAP's Customer Lifetime Value, a CRM analytic application) supported by an underlying data warehousing platform (such as SAP's Business Information Warehouse, BW) and integrated with an organization's core applications are essential for realizing the two major benefits of business intelligence: increased productivity in delivering information and improved business efficiency.

SITUATION OVERVIEW

The Value of Business Intelligence

In today's difficult economic climate, all new IT investments are under increased management scrutiny, requiring quick and verifiable ROI as well as an overall low TCO. Recently, IDC sought to investigate the value business intelligence projects bring to organizations. For the *Financial Impact of Business Analytics* study, IDC interviewed finance, IT, line of business, and executive managers at 43 organizations across North America and Europe to study the costs and benefits of recent BI or analytic application projects. (Several of these were SAP BW projects.)

All 43 investigated projects met the following criteria:

☑ Supported by an analytical data infrastructure (such as a data warehouse)

☑ Provided trend analysis related to a specific business process

☑ Drove corrective actions based on the analysis

The median five-year ROI across the business analytics projects was 114%. Three types of measurable benefits were identified:

☑ **Technology.** The amount of money saved on technology or technology costs avoided by introducing the analytic solution, such as diverting data processing to a more cost-effective system

☑ **Productivity.** Efficiency savings due to the reduced amount of time and effort required for particular tasks

☑ **Business efficiency improvements.** All identifiable annual savings that were realized due to improved decision making leading to measurable improvements in operations

As Figure 1 shows, the vast majority of BI and analytic application project benefits were attributable to productivity and business efficiency improvements.

F I G U R E 1

Distribution of Benefits for BI Projects

Technology-related benefits (4.0%)

Business efficiency improvements (54.0%)

Productivity-related benefits (42.0%)
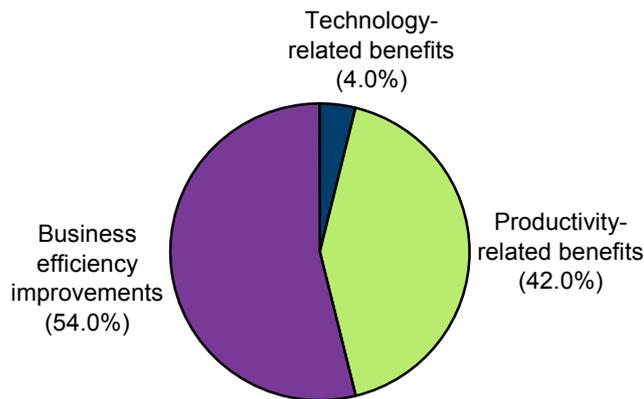
Source: IDC, 2003 (*The Financial Impact of Business Analytics* study)

As Figure 1 shows, technology savings turned out not to be a major factor in BI projects. But both productivity and business efficiency improvement are significant benefits and high-performing organizations must strive to achieve both types of benefits over time through proper BI tool selection, effective project management, and organizational buy-in.

☐ **Productivity benefits:** Delivering information can be streamlined via an enterprise data warehouse. By automating the processes to bring information together, BI projects can realize significant labor savings. By freeing end users and business analysts from gathering information, knowledge workers have more time to spend to use the information to make better business decisions.

☐ **Business efficiency benefits:** This infrastructure of integrated data (with its associated productivity benefits) can be leveraged further via specialized analytic applications. By focusing on repeatable decisions such as when to extend credit or which offer to make to a supply chain partner, analytic applications can drive significant returns to a business, one process at a time. The result is increased business efficiency.

A Multilayered Architecture for Business Intelligence

Achieving the benefits of increased productivity in delivering information and improved business operations efficiency are reasons for initiating or continuing a BI project. However, the key to successful implementation of a BI project is the definition, deployment, and proper implementation of a comprehensive information architecture anchored in an enterprise data warehouse that provides a single source of the truth to multiple applications.

As Figure 2 shows, there needs to be a common data model supporting strategic analytic applications (such as a balanced scorecard) and process-specific analytic applications (such as financial analysis or workforce optimization). This enables users to drill down from summary, high-level information to more detailed information in a specific area in order to handle exceptions, investigate root causes, and make better operational decisions.

FIGURE 2

A Multilayer Architecture for Business Intelligence
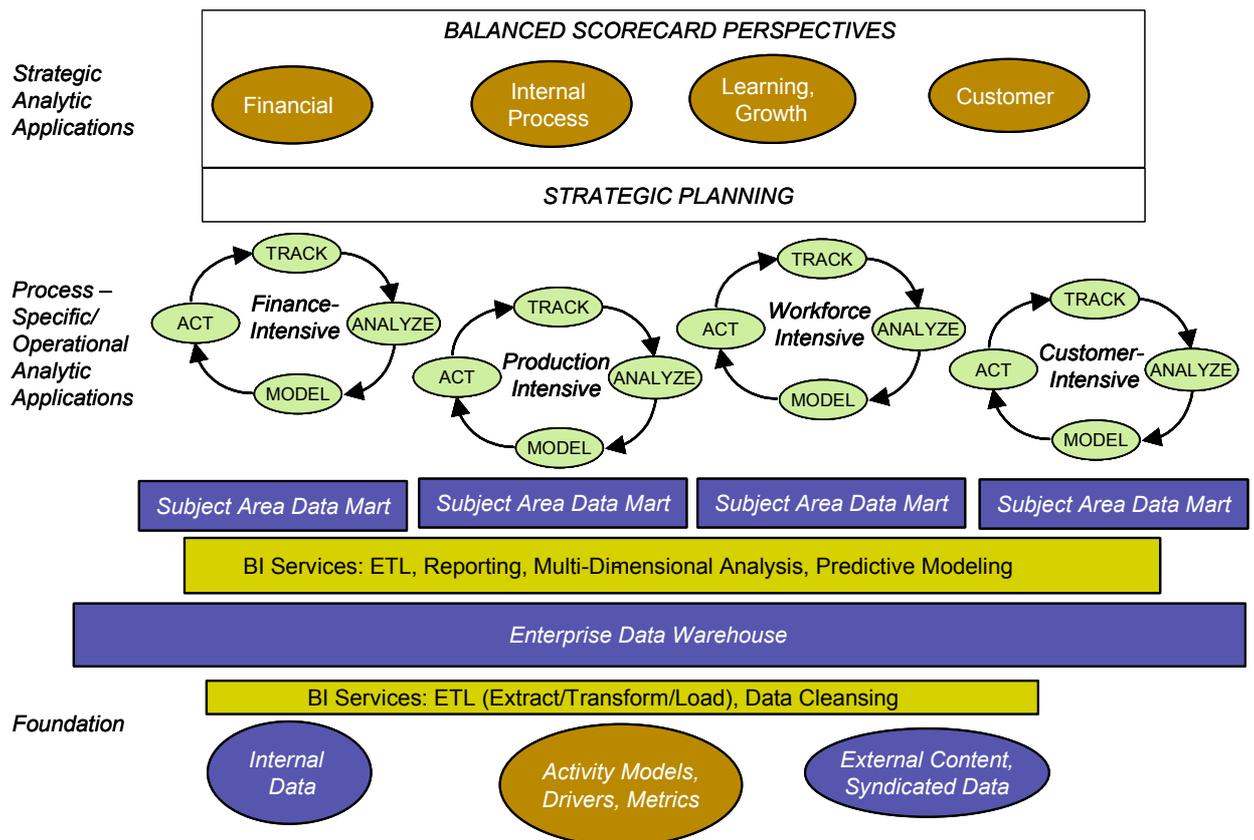
Source: IDC, 2003

The four layers of this comprehensive information architecture are:

- **Strategic analytic applications:** Strategic or business performance management (BPM) analytic applications are high-level, cross-functional applications that enable a company to define its strategic goals and determine key performance indicators that measure progress to these goals.

- **Process-specific analytic applications:** The overall performance of an enterprise is the rollup of the impact of many decisions impacting each of its major processes. These applications should be integrated with the operational applications forming a closed loop as shown, ensuring that the insights gained by analytics are converted to optimized actions.

  - *Financial-intensive processes:* designed to measure and optimize financial performance, such as applications for financial consolidation, budgeting, financial forecasting, cost and profitability analysis, risk management and compliance, and other financial analysis.

  - *Production-intensive processes:* designed to measure and optimize the production and delivery of a business' products and services, usually specific to a vertical industry, such as demand planning, pricing analysis.

  - *Workforce-intensive processes:* designed to measure and optimize processes related to the workforce such as talent recruitment, workforce deployment, and employee retention.

  - *Customer-intensive processes:* designed to measure and optimize customer relationships. Examples are marketing analysis, Web clickstream analysis, customer profitability analysis, and customer retention analysis.

- **Foundation/enterprise data warehouse:** Underlying the strategic and process-specific analytic applications is an enterprise data warehouse that integrates time-based data from multiple sources according to subject areas relevant to the business — providing a single source of the truth. The logical data model upon which it is based enables users to drill down in a consistent manner from higher-level information at the strategic level to more granular information at the process-specific level. The measures (cost, value, profit) used by strategic and process-specific analytic applications must be determined in a consistent way, by applying models built by a foundational application such as activity-based costing or value-based management.

- **BI services:** Business intelligence services are needed to prepare the data for analysis (via ETL, extract/transform/load services) and to manage the access to the data by means of ad hoc queries or more structured reports and multidimensional analysis.

Individual analytic applications, if not built and implemented according to the comprehensive, broad architecture as shown above, risk becoming stovepipes — disconnected from other business systems and disallowing organizational users from identifying and then acting on cross-application or cross-functional insights. One of the immediate determinants of success is the presence of an enterprise data warehouse providing the foundation of integrated, comprehensive data necessary for delivering consistent information to users across the enterprise as well as the measures and KPIs required for the enhancement of specific processes critical to overall business performance.

Organizations desiring a successful BI or analytic application implementation must ensure that their foundation architecture is as broad as that shown in Figure 2 and must approach it in well planned out stages. Most organizations will adopt a combination of a build and buy approach to implementation, leveraging packaged components where available.

SAP's Business Analytics Offering

SAP's business analytics offering addresses the critical needs of delivering business information and improving operational efficiency via an enterprise data warehouse and a comprehensive suite of analytic applications that span all major architectural tiers of Figure 2. SAP's business analytics solution represents a significant step forward in the packaging and integration of key components of the architecture shown in Figure 2. Especially noteworthy is SAP's broad and deep suite of operational and analytic applications across the major business functions and processes.

SAP BW: Foundation for Analytics Through Integration, Reporting, and Delivery of Business Information

SAP's business analytics solution is anchored by an enterprise data warehouse and business analysis product called SAP BW (Business Information Warehouse), which integrates time-based data from SAP and non-SAP, heterogeneous sources in order to report on business trends. This fills the role of the foundation in the IDC architecture shown in Figure 2.

Not simply a generic data warehouse, SAP BW provides pre-built connectors to SAP and non-SAP transactional and third-party applications as well as pre-built multidimensional cubes, queries, reports, and data structures related to all key business functions (HR, finance, marketing, production, and so on). Additionally, SAP BW includes Web-based and desktop-based clients for OLAP and ad hoc query and analysis.

Introduced in 1997, SAP BW's first implementations were focused on accessing data from SAP's transactional applications for operational reporting and multidimensional analysis. Five years later SAP holds the leading software revenue share in the packaged data mart/warehouse market. SAP BI, a technology solution of SAP NetWeaver, incorporating the SAP BW product, delivers a complete, packaged business intelligence solution that address users' needs for data warehouse generation, management, and access tools enabling processes such as data extraction, transformation, loading, metadata management, OLAP, query design and execution, report creation, and information delivery.

Through successive releases, SAP BW has evolved into a comprehensive analytic applications development platform that is the basis for SAP's own pre-built analytic applications as well as for custom developed analytic applications. The SAP BW platform not only incorporates SAP's data integration, management, and access tools, but also provides an open and extensible architecture that is often implemented in conjunction with best-of-breed software tools.

SAP BW is built on an open architecture that enables third-party packaged applications' and content providers' data to be seamlessly integrated with data originating in SAP's own applications (via pre-built extractors for SAP content). The integrated data can be distributed as needed to other, downstream decision support (or transactional) applications via SAP BW's Open Hub service. The benefit is that SAP BW provides a comprehensive data warehouse foundation enabling an enterprisewide "single version of the truth" with improved productivity and visibility. SAP BW users spend less time gathering or reconciling data and have more time to analyze and act on resulting insights, reducing overall business process costs and improving efficiencies.

SAP BW is composed of four primary capabilities, as shown in Figure 3.

FIGURE 3

SAP BW Architecture
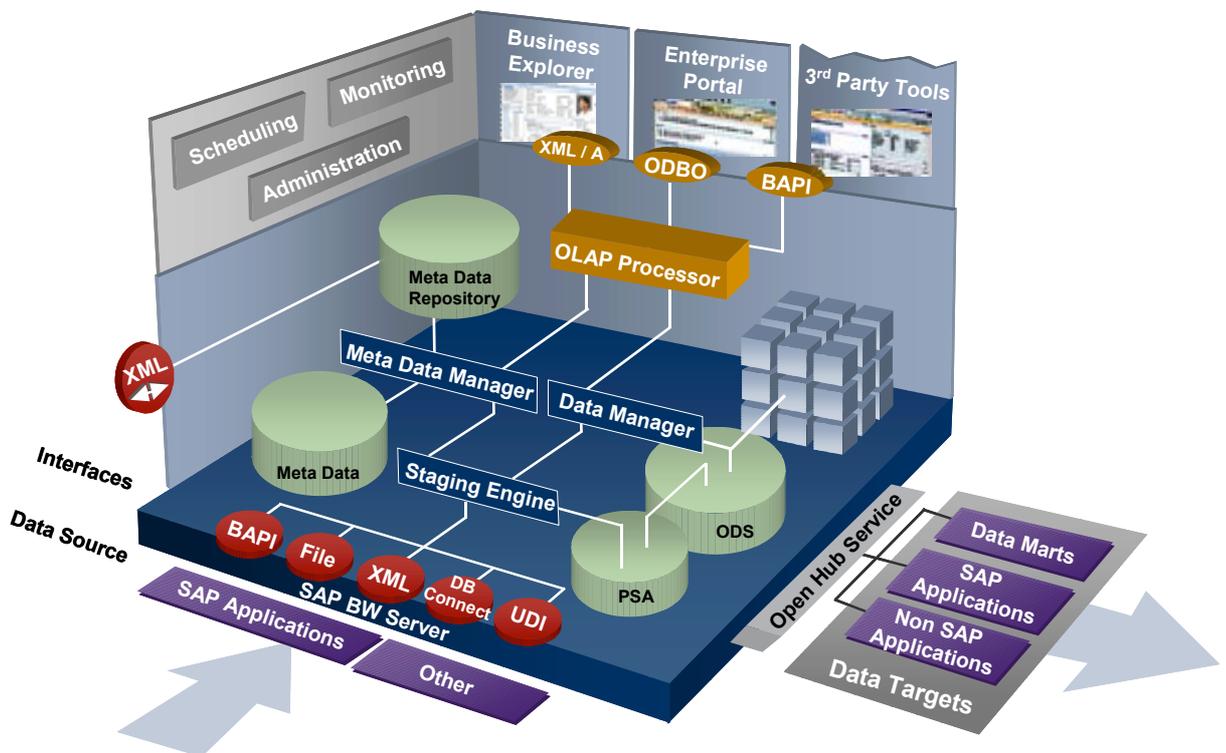
Source: IDC and SAP, 2003

- ☑ **Data warehouse generation layer**. Includes ETL tools for integrating data from SAP and non-SAP sources that are incorporated into SAP BW through four primary methods:

    - ❑ DB (Data Base) Connect for direct access to data from relational sources.

    - ❑ Application level integration with SAP's mySAP Business Suite applications.

    - ❑ BAPI interface to third-party ETL tools such as Ascential DataStage.

    - ❑ Flat file and XML source file imports.

    - ❑ UD (Universal Data) Connect for additional data access including JDBC, SAP Query, and other specialized third-party interfaces.

- ☑ **Data warehouse management layer**. Includes components of the business intelligence platform such as OLAP, data mining, and alerting engines as well as data staging, master data, and metadata repositories and management tools. Specific software product modules of SAP BW include staging engine, meta data manager, data manager, OLAP processor, and Open Hub Service. Open Hub Service enables distribution of consistent data to target SAP and non-SAP downstream applications or BI data marts and third-party BI tools.

- ☑ **Business intelligence suite of tools**. Includes query design, reporting, visualization, alerting, and collaboration tools. Specific SAP BW product modules include Web Application Designer, Ad-hoc Query Designer, Reporting and Analysis, and Mobile Intelligence/Download scheduler (for offline reports). Reporting functionality is provided through SAP's own tabular reporting tool and for pixel-oriented needs, through Crystal Reports for formatted reports. Additionally, GIS data is incorporated and presented through a partnership with ESRI.

- ☑ **Business content**. In addition to the tools described above, SAP BW includes preconfigured business models, templates, and industry- and business process-specific content. Examples of business content include over 11,000 InfoObjects, 340 ODS objects, 650 InfoCubes, 3,200 Queries, 1,900 Workbooks, and 800 Roles. As a layer on top of the foundational data warehouse generation, management and BI tools platform, business content provides a starting point for developing customized analytic applications. By leveraging SAP BW Business Content, developers can incorporate standard domain-specific content into analytic applications, while having the flexibility to extend and customize SAP BW's best-practices content to accommodate the unique needs of their organization.

SAP's BI product set leverages and powers the integration capabilities of SAP NetWeaver. The following are key capabilities of SAP NetWeaver:

Data integration: SAP BW provides a foundation of integrated data and a platform for building analytic applications for individual business functions regardless of the disparate data sources.

Enterprise portal: The portal infrastructure to ensure common end-user interface regardless of source data or applications.

Collaboration: The collaboration infrastructure is leveraged by developers to build analytic applications that support a wide range of ad hoc enterprise decision-making processes. This is enabled through work-flow design, annotation of information with comments, and integration of BW with SAP Enterprise Portal. This provides integration at the people level.

Knowledge management: Extending BI with access to unstructured data via SAP Knowledge Management and delivering another people-level integration.

Master data management: The emphasis is on an architecture that leverages centralized master data, meta data, and business content enabling cross-functional enterprisewide tactical and strategic performance management. Applications such as product definition and supplier relationship management require master data management to consolidate and distribute master data for analysis and for operations.

Exchange infrastructure: Real-time data access and updates through the use of SAP XI.

Mobile infrastructure: Access from mobile devices.

Web application server: SAP WebAS ensures OS and RDBMS portability as well as providing common user administration, security, and alerting services.

This data, people, and process integration is critical for improving productivity in bringing together and delivering information across the enterprise and ensuring that organizations leveraging SAP NetWeaver begin running their business intelligently. SAP NetWeaver, through its people, data, and process integration, is also the key for developing and deploying compelling analytic applications — the key to improving operational efficiency.

SAP's Analytic Applications: The Key to Improving Business Operational Efficiency and Productivity

Enterprise transactional applications are designed to automate business processes such as procurement and customer service. Analytic applications are complementary, analyzing data from ongoing operations and delivering feedback in the form of insights, status reports, and recommended corrective actions. The feedback may consist not only of reports and historical analysis but predictive models that compare the likely results of alternative courses of action. In fact intelligent integration between operational and analytic applications can produce "virtuous cycles" where it is the interaction between various applications that monitor, enhance, and refine business processes.

SAP's analytic applications are distinguished by the breadth of processes supported (from cross-sell analysis for marketing to supplier analysis for procurement), their tight integration with SAP's core operational applications, and their utilization of SAP BW data warehousing as the analytic application foundation. This multilevel, multi-touchpoint integration produces a comprehensive BI solution stack with faster deployment and measurable, bottom-line improvement in business efficiency and productivity.

How SAP Analytic Applications Change the Way Business Is Done

SAP's analytic applications leverage the rich set of integrated data that can be stored in SAP's BW. This changes the way that business is done in the following key ways:

☒ It removes decision-making silos and provides a comprehensive, multisource enterprise data integration hub able to distribute consistent data to downstream applications and data marts.

☒ It introduces new levels of quantification into the decision-making process.

☒ It leverages organizations' in-house SAP and business process expertise, delivering added value to SAP customers.

The changes can at first be driven by a specific, localized organizational goal. But as the SAP BW centralizes the data streams and makes them available to all areas, the potential benefits become more broadly recognized within the organization and adoption expands. It is SAP BW's ability to consolidate all enterprise-relevant data, whether or not the data is sourced from SAP applications, that eliminates information silos and enables each organizational unit to both contribute to and access data and to do this on a highly scalable basis that helps an organization evolve away from a siloed mentality and into one of integrated cross-application, cross-functional decision making and optimization. This enables the same information to be included in high-level planning analytics as well as in process-specific and operational analytics so that the company speaks and calculates in one language.

At the strategic level the ability to apply, for example, SAP's SEM (Strategic Enterprise Management) analytic application to develop a balanced scorecard can help an organization to create a common language of weights and measures. This language provides an objective basis for prioritizing and conducting intra-company operations. Once the scorecard is established as an updateable snapshot, the use of SAP's Business Planning and Simulation (BPS) module, now part of BW, gains strength as a device to actionably relate the scorecard to ongoing operations.

In the Royal Norwegian Air Force case study (see Appendix A), the initial motivation consisted of meeting the NATO standards. In addition to helping the Air Force come within reach of its goal ahead of schedule, the use of the SAP SEM Balanced Scorecard (BSC) analytic application has evolved into a more data-based, goal-specific way of managing, that involves personnel at all levels of the Air Force, and is being extended to other branches of the armed forces. Of course, none of this could be reasonably attempted, let alone accomplished, without the ready availability of understandable organization-wide data from such disparate areas as logistics and human resources. This integrated information resource, achieved by implementing SAP BW, was necessary to draw and manage the complete picture of the factors that affect the Air Force's ability to reach its goals.

Recognizing the Need for BI to Impact Business Processes

In most organizations, limited information and decision-making expertise are major barriers to optimal business performance. Not knowing the conditions on which decisions are founded nor the proper combination and weighting of these conditions that leads to different alternative decisions reduces effectiveness. The fallback positions for dealing with these uncertainties have usually consisted of institutionalized rules of thumb (aka "standard operating procedures"), behind which lie intuition and blind guesswork.

SAP has incorporated its breadth and depth of industry-specific experience into an extensive array of data models and analytic applications. The value of *buying* a packaged analytic application is to shorten the time to implement a solution and to extend the benefits of business intelligence to a wider class of users, thereby replacing "we've always done it this way" with KPI and fact-based, intelligent decision making.

SAP's approach has been to create through the use of the common SAP BW foundation, an accessible collection of best-practices analytic application models coupled with relevant data and then to channel that data through a large set of analytic modules to the appropriate end users. This supports a learning organization via a feedback-correction cycle to examine and then modify business processes. SAP's analytic modules stand out for their breadth and depth of coverage, and integration with operations through the underlying platform.

Depth and Breadth of SAP's Analytic Applications

The following examples illustrate the way SAP's analytic applications leverage SAP's depth of expertise across all major functional domains — extending the benefits of business intelligence to a wider class of users.

Strategic Analytic Applications: Examples

SAP's BSC (balanced scorecard) application is an example of a strategic level analytic application built on the SAP BW and NetWeaver platform. SAP's BSC, a module of SAP's SEM (Strategic Enterprise Management), provides a series of perspectives that assist the key functions of a balanced scorecard application, all of which are fed by the same data:

☒ The **drilldown view** presents objectives in a hierarchical tree format so that objectives can be clearly seen and their prioritization explored for potential change.

☒ The **strategy map view** shows the strategic level goals with respect to the financial, internal, learning/growth, and customer-intensive sectors of the process-specific level, as well as the linkages among them, along with tabular numerics on actuals, plans, and targets.

☒ The **scorecard comparison view** provides a cross-view between multiple business units for progress tracking purposes.

☒ The **management cockpit view** shows the dashboard of KPIs with built-in stoplight graphics for rapid determination of status.

☒ The **value driver tree view** shows a progressive rollup of high, middle, and low estimates for revenues and costs within the unit so that the impact of each local activity area on larger areas can rapidly be assessed.

These views and others within SEM BSC help managers to understand the current status and direction of their areas with respect to a common structure and language. This scorecard links with the SEM risk management application as well as the Business Planning and Simulation module that is part of BW. This module contains a workbench with user interface and templates for modeled financial statements and portfolios, and takes the impact of timing into account.

Process-Specific Analytic Applications: Examples

In addition to cross-functional, strategic-level applications, SAP has developed a set of analytic application modules that address process- or function-specific issues within the production, workforce, finance, and customer-intensive categories described in the second level of Figure 2.

In the Adobe case study (see Appendix B), the implementation of a budgeting analytic application has resulted in greater accuracy and currency and the freeing up of analysts' time. This freed resource, in turn, has increased the available planning time more than either faster budgeting or more analyst time could accomplish alone.

In the customer-specific domain, SAP provides analytic applications designed to support several common customer relationship management objectives such as cross-selling, customer retention, and optimized marketing. Customer focused planning applications enable companies to properly evaluate customer revenue opportunities and to create the appropriate budgeting to support corporate sales, service, and marketing goals.

Considering another example, the Web Analytics module extends the ecommerce process by examining the behavior surrounding transactions. This particular module goes far beyond the necessary but basic visitor statistics. While most Web analytics allow for a degree of sessionization — reconstruction of the visitor experience — the reconstruction is typically limited. SAP module allows for an actual "re-living" of the session, with a marketer able to see exactly what the end user saw at each click. Re-living an experience can help the marketer cut through many layers of guesswork to learn when and why prospective buyers are abandoning shopping carts and order forms. The same technology can be used by IT departments to diagnose technical issues like faulty links that cause visitors to leave.

In the Audi case study (see Appendix C), the global automobile manufacturer, by taking the first step toward a worldwide uniform, measurable level of service by implementing mySAP CRM in the company's call centers, has already benefited from the reduction of inquiry processing times. With an emphasis on data gathering and metrics, the feedback will be incorporated into the decision process of the company, especially into marketing for a program that will move from reactive to proactive and in manufacturing as a means of performance feedback that can be incorporated into product revisions.

Considering another domain, finance, SAP's *Business Consolidation* takes financial users through the process from data collection to reconciliation to adjustment postings, currency translation, and the elimination and consolidation entries down to the final reporting. The module uses a Consolidation Monitor that allows detailed visual tracking of the status of each business unit. This module provides analytic structure to the process begun with the core General Ledger software.

Financial focused planning applications leveraging SAP BW's planning environment enable companies to properly plan their future cost and profitability situation. Top-down targets can be reconciled with bottom-up planning via closed-loop planning cycles, thus enabling timely plan figures to support corporate financial goals.

These are only a few examples. SAP's process-specific analytic applications extend to major areas such as product life cycle management (PLM), human capital management (HCM), and supplier relationship management (SRM). SAP is in a unique position in providing the benefits of analytic plus operational applications in so many critical areas to the business.

# SAP AND BUSINESS ANALYTICS: OPPORTUNITIES AND CHALLENGES

Business analytics — BI and analytic applications — present an array of opportunities and challenges for SAP, an area of increased investment and attention for the enterprise application leader.

SAP's Opportunities in BI and Analytic Applications

Business intelligence is a growing priority for all sizes of organizations as they seek to leverage and extend the value of their enterprise applications. As a result, IDC sees growth both in business intelligence tools and the analytic applications that are packaged for specific functions and industries. As Figure 4 shows, the overall market for analytic applications is growing more rapidly than the market for the underlying BI tools.

FIGURE 4

Market Opportunity: BI Tools and Analytic Applications
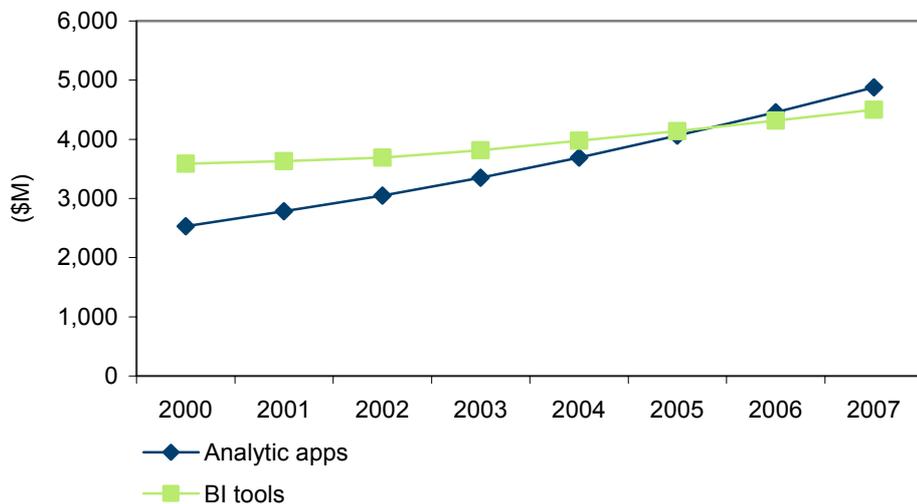
Source: IDC, 2003

SAP's business process and technology expertise and broad customer base put it in an advantageous position to gain a growing share of the broader BI opportunity: packaged data warehousing platforms and analytic applications.

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On the BI tools side, the SAP Business Information Warehouse (BW) enhances the productivity of knowledge workers in streamlined integration and delivery of information. SAP BW already has thousands of "live" installations. But there is significant additional opportunity in the SAP installed base, as well as with new installations to provide the benefits of a packaged implementation.

On the packaged applications side, specialized analytic applications represent the path to even wider adoption and reduced implementation time for key projects. For example, mySAP SCM analytic applications reach supply chain managers who are seeking to improve the efficiency of supply chain operations. CRM analytics coupled with financial analytics enables the targeting of customers based on their profitability and value to the organizations. The opportunities to embed predictive technologies for decision optimization and event monitoring for alerting on exceptions promise greater benefits.

But the real opportunity is only beginning to be tapped. Many knowledge workers at SAP sites are not yet users of SAP applications. The SAP enterprise portal began the process of expanding the user base, reaching thousands of users who gained access to specific, personalized content based on their roles and responsibilities. Adding process management capabilities to the portal is the key to expanding the base of *application* users. Consider the following example.

Imagine the ability to be able to monitor the operations of a power plant through a visual dashboard and receive alerts when a specific event or a trend observed in a series of events exceeds a threshold that has been defined. Then you'd want to receive guidance on the principles for deciding on a corrective action, possibly examining previous decisions in these circumstances, and be able to take action directly within the application.

This is a compelling application because the analytics are embedded within a system that enables the processing of feedback and learning in order to make appropriate responses. Producing such process-rich, integrated analytic and collaborative applications is the key goal of SAP's innovative xApps program. An xApp is an application built upon other applications with a workflow or process model as well as pre-built analytics that ties these components together into a unified process.

Such a composite application requires deep business domain expertise and the technological capacity to tie together operational, analytic and collaborative applications supporting feedback, learning, and correction. This promises a new level of business efficiency and operational improvement in its focus on repeatable operational decisions that have a major cumulative impact.

SAP's Challenges in BI and Analytic Applications

But these opportunities do not come without significant challenges. There is great skepticism in the marketplace about general benefits of IT, and this applies to analytics and business intelligence as well. SAP needs to craft a consistent message to the marketplace around the benefits of BI and analytic applications. In the past, SAP has not always spoken with a single voice in terms of the BI platform and the applications that leverage it. This confuses customers and makes selling more difficult.

However, the issue goes beyond marketing and message formation. The best analytic applications require the construction of domain-specific predictive models for optimizing a wide range of decisions across customer, product, people, and financial-intensive processes.

This need for specialization is a challenge — more from a business model than a technology perspective. SAP, despite its size and breadth, cannot develop the deep analytics expertise for every type of operational decision. In fact, most innovations in the application of analytics are being developed within custom projects by innovative developers and consultancies. SAP needs a business model to attract such domain specialists to deploy their analytical models on the SAP BW and overall SAP NetWeaver platform.

SAP is taking the right steps in organizing a major initiative to target developers and it is to be commended for putting the resources into this commitment to forging business partnerships with highly specialized and industry-specific domain experts. It's likely that the challenges in formulating the right business model will be greater than the technology challenges in achieving the integration.

CONCLUSION

IDC's study, *The Financial Impact of Business Analytics*, showed that businesses can realize significant returns from BI projects, especially when they link analytics to specific operations and when analytic applications contain appropriate depth of business' best practices encoded within the data model. By focusing on a specific area of the business (e.g., specific processes within customer service, logistics, or finance), companies are able to establish a virtuous circle of feedback, correction, and ongoing improvement.

SAP's product set for business intelligence can enable organizations to achieve each type of benefit.

For increasing productivity in the delivery of information, SAP has enhanced its packaged data warehouse (SAP BW) with packaged connectors and business content.

To improve business operations efficiency, SAP has built an array of analytic applications that leverage the integrated data asset maintained via the SAP BW and broader NetWeaver platform. The breadth and depth of function-specific analytic applications produced by SAP are not generally realized.

The combination of the functionally advanced BI platform coupled with function- and industry-specialized analytic applications provide options for organizations to buy, in packaged form, major components of their information architecture. But this is only a starting point for SAP. The embedding of analytic application functionality within core applications is the future of business intelligence. And this integrated analytic and core application promises to extend the benefits of business intelligence to more users within an organization. This is what is needed to drive business intelligence to the next level of value and ROI.

SAP's business process and technology expertise and broad customer base put it in an advantageous position to gain a growing share of the broader BI opportunity — packaged data warehousing platforms and domain-specific analytic applications.

APPENDIX A: ROYAL NORWEGIAN AIR FORCE CASE STUDY

To learn more about SAP SEM Balanced Scorecard (BSC), IDC interviewed Stig Ingar Evje, Royal Norwegian Air Force Major, Director of Continuous Improvements, and Project Manager for the Balanced Scorecard.

Maintaining a fighting edge is a constant challenge for any defensive force. The Air Force has a peacetime strength of approximately 6,100 personnel and 124 aircraft. The Air Force is a part of the North Atlantic Treaty Organization forces, the alliance originally designed to repel a Soviet invasion — a threat that no longer exists. This has led to the need to adjust capabilities to current threats. As a part of NATO forces, the Air Force is subject to specific requirements and periodic evaluations. In 2000, the Air Force failed two evaluations including one for their most important weapon platform. This evaluation, coupled with a program to downsizie bases, equipment, and infrastructure that required organizational restructuring, triggered the process that led to the implementation of SAP BSC.

The Air Force viewed the balanced scorecard as a framework on which to connect goals to initiatives and measures. However, the differences between typical business usage and the defense sector usage needed to be reflected in the implementation. The balanced scorecard is set at the strategic level of analytic applications, and the four balanced scorecard perspectives — financial, internal process, learning/growth, and customer — include the process of setting goals. However, the Air Force is a part of Norway's defense and therefore must develop its goals only after a higher level of goals has been determined by its "customers," i.e. the Norwegian government's political establishment and the nation. Therefore the Air Force's top layer goal had to be the deliverable of mission-capable units to its customers. The Air Force used the economic perspective, its budget, as a means to determine capacity in the middle layer; here the balanced scorecard enabled the Air Force to link strategy with investment to more accurately track project status and continued relevancy. At the foundation layer were the people and the process of learning and growth.

The project began in a discussion with a general who was also a fighter pilot. The general wanted a "cockpit" — identical to industry software terminology's "dashboard" — with instruments to monitor the process that would lead to improvement. After some exploration, the Air Force embraced the balanced scorecard methodology and developed an initial in-house version on the Web. However, the initial project soon stalled, and it became clear that the project needed intensive input from process-oriented people.

At the same time it was recognized that this originally independent project needed to be folded into a larger, central IT project for all Norwegian defense that would include logistics and economics. The central project's highest priority was getting a new financial system, and the overall defense chose SAP SEM for it. The Air Force then chose SAP's BSC as a direct result of SAP's selection for the overall project.

The implementation began in 2001 as those generals who wanted to explore a balanced scorecard more closely went to the Chief of Air Staff and the Air Force Executive Group. Workshops were organized in which generals defined the goals and worked out the parameters. This participation helped to reduce resistance to the necessary changes. There had been a presumption that officers automatically led and managed so that systems like this were not really necessary. Incorrectly introduced, a new system might also have conveyed a sense that officers were losing power rather than gaining control.

By December 2001 the Executive Group had developed a strategy map for the project. The map currently includes two strategic themes and 19 focus areas. In March 2002 it launched the SAP SEM model (before SAP Financial was launched) and the official production date for the Air Force version of the project was October. The implementation involved consultants for IBM who communicated with SAP.

With the balanced scorecard, the Air Force was able to monitor pilot training by tapping into multiple data areas, including logistics. For example, F-16 fighter aircraft pilots were logging 9,600 hours per year of flight time, insufficient to achieve the requirements. In response, the generals set a goal of 12,500 hours per year by 2005, increasing the length of sorties. New initiatives were launched in order to increase the flight hours on the F-16 aircraft, such as more flexible working hours for technicians and pilots, improved aircraft serviceability due to better logistics planning, and longer flight sorties The Air Force is expected to reach its 12,500-hour goal this year, one year ahead of schedule.

A key element in the successful adoption of this system was the support and strong communications provided by the Chief of Air Staff, who adopted the vision and goals. To maintain support the Air Force now communicates the strategy map, initiative, and parameters in a straightforward document designed to be read by all Air Force personnel. Following the initial success, the system is now being rolled out in the Army and Home Guard.

APPENDIX B: ADOBE CASE STUDY

To learn more about SAP's Business Planning and Simulation (BPS) module (now part of SAP BW), IDC interviewed Bekki Shibayama, manager of Business Systems Analysts. Shibayama supports Adobe's finance department from IT.

Adobe Systems provides software for creating, editing, and managing digital files in document distribution, professional and Web page layout, and video. Adobe is most widely known for its ubiquitous PDF files that are used for sharing, securing, and printing documents as they were intended to be viewed.

Adobe has been using SAP's SEM-BPS module since 2001 and the BW module since 1999. Financial planning was accomplished through the use of a popular software program, but as Adobe grew, the planners found that the software was not scalable to their needs. They literally ran out of dimensions and capacity to calculate actuals. Since all financials were reported from SAP, moving data back and forth between the financial planning software program and SAP to keep them in sync took some time. In addition to the scalability issue, security for the software was very labor intensive, since the system required quarterly updating from cost-center managers. The system also required a full-time employee in finance to prepare the software for upcoming quarterly forecasts.

To resolve these issues, Adobe considered switching to either the same company's newer product or to SAP's SEM solution. No other solution was considered. In 2000, Adobe selected SEM, with its BPS module. The Adobe BPS implementation was one of the earliest in the U.S., and a SAP consultant provided strong support remotely as needed over multiple releases. This was especially valuable with respect to the decision to use mySAP Workplace (now Enterprise Portals) rather than the standard SAP GUI.

Adobe now has a central instance for R/3 and a separate instance for BW and BPS. Reporting is done via several cubes, and BPS planning data is not sent back to the operational system. Annual budgets are completed before the first quarter. Finance then creates rolling quarterly forecasts for the following three quarters. Finance also inputs a weekly outlook that includes the deltas from the previous quarterly forecast.

The full-time person who had been preparing the previous package now spends only one week on preparation per quarter on BPS. Overall turnaround time for the planning process has been reduced from six to seven weeks to four weeks. This change has actually freed up analyst time that has now been shifted from preparing numbers to analyzing the meaning of the numbers.

Although other departments besides finance are not using the full planning scope of BPS, the sales and marketing departments are leveraging value from the system. Sales and marketing each enter their own version of what they believe revenue will be and use that as a framework within which to agree on a single set of numbers. Overall, where only controllers previously entered the data into the package, BPS has a broader user base within Adobe that includes cost-center manager responsibility for entering their own operating expense.

Adobe has implemented a number of other SAP modules, including R/3's consolidation module, which may be phased out in favor of SEM's consolidation module, but hasn't yet implemented SAP's SEM balanced scorecard module, Performance Measurement. With the ability to leverage data in BW and BPS, Adobe is planning to start a BSC beta using a subset of corporate objectives. Finance will assess user acceptance issues before opening the BSC to more objectives and broader user participation.

APPENDIX C: AUDI CASE STUDY

To learn more about mySAP CRM (customer relationship management), IDC interviewed Dr. Christoph Wargitsch, head of CRM and New Media for Audi AG, part of the Volkswagen Group. Wargitsch works in Audi's central marketing department and has global responsibility for CRM strategies and processes, including retention, management systems, Internet applications, and knowledge management for customer care. Audi AG designs, builds, and markets cars for the premium buyer and sells in more than 100 markets around the world.

Audi's marketing departments around the world have been using different software packages to support customer care. This mix has presented a challenge in assessing service and assuring a uniform level of care; there was no standardized way of promulgating standards and measuring the results.

The major goals of improving customer care have been to standardize the process and to distill the customer feedback that was passed to the manufacturing area to refine Audi's products, goals that required unifying the customer information. The mySAP CRM implementation is viewed as the first, reactive, level of CRM, and this is the level described in this case study. Audi's intention is to build from the first level to the second, proactive, level with general, outbound campaigns, and then move to the third, one-to-one, level with individually customized treatments.

Audi decided to standardize on mySAP CRM because SAP offered a platform rather than a single module. This platform gave Audi the ability to solve its immediate inquiry management challenges and the potential to grow the solution beyond the reactive level. The company then selected the German market as its pilot. This market requires over 300 customer care agents who receive communications via phone, fax, email, and letter. Before implementing mySAP CRM, Audi took time to review the business process, including the links that had grown with its external agencies. This gave Audi the opportunity to streamline the overall process and strengthen its agency links. During the nine-month span of the pilot's implementation, Audi devoted a large team to establish a template that could be applied with relative ease to other markets.

Audi built a generic interface to mySAP CRM based on XML, and plans to use XI technology to further reduce the cost of adoption in other markets. All data that was generated from the call center was fed into the Business Information Warehouse for use in automatic routing and tracking (BW). The user population is 80% customer care agents and 20% sales and marketing personnel. Audi is now able to identify which customers are calling and calculate the quality improvements and process cost savings. For example, inquiry processing times have been reduced by 80%.

Once the generic interface was established for the German market, Audi adapted the template to the Brazilian and Italian markets with smaller teams in shorter implementation times. It enlarged the investment in training to achieve better results. Audi also found that the software easily scaled to cope with different numbers of brands. As Audi achieves its goals in this initial, reactive, level of CRM, the company intends to move to the next two levels, bringing in additional data and analytics as needed. Immediate plans are to implement the market planner and campaign planner modules, and in the longer run, predictive modeling.