Volume 2: BPM –
Business Performance Management

White Paper “Pulse Check”:
Operational, Tactical, and Strategic BPM
Part 1: Vendor Independent White Paper and Reference Architecture

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Preface

The present White Paper “BPM – Business Performance Management” is the second white paper of the series “iBOND – intelligent Business on Demand”. It describes the business and technical architecture of operational, tactical, and strategic BPM. From a conceptual point of view, BPM is a closed-loop model for managing the performance of business processes. This is independent of managing the performance on the operational, tactical, or strategic level, but from a technological point of view, rather different technologies from vendors with complete different roots are clashing together: traditional business intelligence vendors and business integration vendors.

For many years already both authors have been working in managing functions in the IT-Business as analysts and business orientated project managers. Both have a practical background and both have been coming to terms with strategic thinking and future developments.

The present BPM-White Paper is divided into two parts. First there is a general part describing the concepts and facilities of BPM as well as its reference architecture. The second part describes vendor platforms necessary to realize the mentioned reference architecture. To enable readers getting a fast survey of the actual market, the authors have created a separate description for each vendor, but an identical agenda is applied to each of the vendor related papers.

Traditional Business Intelligence Vendors

Here we consider technologies and vendors that have evolved from traditional business intelligence tools and data integration platforms to BPM vendors. These vendors first have addressed tactical and strategic BPM and are now also moving more or less quickly towards operational BPM (sometimes called “BAM” – business activity monitoring).

- Applix
- Ascential
- Business Objects
- Cognos
- Hyperion
- IBM
- Informatica
- Information Builders
- Microsoft
- MicroStrategy
- MIS AG
Traditional Business Integration Vendors

Vendors delivering business integration frameworks (see Nußdorfer, Martin, 2003)) have started to add first operational BPM under the terms of BAM and PPM (process performance management). Their challenge is to put their metrics for BPM into the business context. Key vendors are:

- Axway
- BEA
- IBM
- i2 SCOS
- Microsoft .NET
- Oracle 9iAS
- SAP Net Weaver
- Seebeyond
- Siebel UAN
- Staffware
- Tibco
- Vitria
- WebMethods

Best-of-Breed-Products

Supplementary to the generalists of the two camps there are best-of-breed tools, offered by specialists in this market. These products are in particular interesting when business integration platforms do not provide operational BPM features, but just interfaces for accessing transactional data for BAM or PPM.

- Arcplan
- Board M.I.T. (Orenburg)
Enterprises developing BPM solutions will have to decide which basic platform to choose for this evolution and which additional best-of-breed-products will be required. The focus of this series of White Papers will be to assist any decisions in the described environment.

We'd like to encourage you to give all kinds of comments, critics as well as approval.
The authors’ biographies:

Dr. Wolfgang Martin

Biography
Recently designated one of the top 10 most influential IT consultants in Europe (by Info Economist magazine), Wolfgang Martin is a leading authority on Customer Relationship Management (CRM), Enterprise Application Integration (EAI), Business Intelligence (BI), and Business Performance Management (BPM). He is a founding partner of iBonD Ltd and Ventana Research Advisor.

After 5½ years with META Group, latterly as Senior Vice President International Application Delivery Strategies, Mr. Martin established the Wolfgang Martin Team. Here he continues to focus on technological innovations that drive business, examining their impact on organization, enterprise culture, business architecture and business processes.


Prior to META Group, Wolfgang Martin held various management positions with Sybase and Software AG, responsible for business development, marketing and product marketing. Prior to this, he became an expert on decision support while with Comshare. His academic work included Computational Statistics at the Universities of Bonn (Germany) and Paris-Sud (France).

Dr. Martin has a doctoral rer.nat. degree in Applied Mathematics from the University of Bonn (Germany).

Richard Nussdorfer

Biography
Richard Nussdorfer has worked for more than 30 years in the IT-industry. His current expertise includes Business Integration (EAI), Client/Server-Architectures (C/S) and strategic planning of IT-Architectures (RTE).

He is a founding partner of iBonD Ltd.

Richard’s technical knowledge has been used extensively for integration projects, modernizing IT-Architectures, re-centralizing Client/Server-Architectures to Web-Architectures.

He has published 2 e-books: Information-Technology and the EAI-Book. He regularly contributes articles to IT journals and is asked to speak at numerous congresses and seminars such as EAI, DataWarehouses and WebServices.

He is a key source of knowledge on EAI on the internet (see www.eaiforum.de )

Richard Nussdorfer’s professional experience started in 1970 at Siemens AG in software development. He then continued as an expert on databases and project leader for database projects, nationally and internationally, from London to Moscow and from Stockholm to Johannesburg.

His professional career continued as manager for Software-Marketing in Munich and Business Development Manager in South Africa.

From 1990 to 1993 he worked as a consultant for Plenum AG in strategic IT-projects.

In 1994 he founded CSA Consulting GmbH where he works today as Managing Director. Richard Nussdorfer has a degree in computer science from the Technical University in Vienna (Austria).
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1 Management Summary

In economical down times, budgets become tighter and tighter. Indeed, taking wrong decisions today ends in disasters. Identifying potentials for profit, rigorously cutting cost as well as precisely calculating where to optimally spend the remaining resources are key issues not only for top management. Geopolitical uncertainties make planning much more difficult, but more important than ever. New regulations like the Sarbanes-Oxley Act and the International Accounting Standards (IAS) impact financial reporting and consolidation. What is the next strategic move to master these challenges?

One answer is Business Performance Management (BPM), the topic of this second white paper of the iBonD ("intelligent business on demand") initiative. iBonD explains what makes up winners in the markets.

Winners do:

• Focus on customers
• Strip away low value activities
• Decentralise decision making
• Speed up processes
• Collaborate with suppliers, partners, customers
• and adopt business performance management according to the leitmotiv: You can only manage what you can measure

In this white paper, we focus on process-orientation and how to optimally monitor and control the efficacy and efficiency of business processes. The concept is metrics-driven management, the methodology is business performance management, and the technology is business analytics.

Business performance management is fundamentally different from the traditional business intelligence approach for decision support, executive information, and reporting. Traditional business intelligence tools failed to deliver the right information to the right location in the right time for the right purpose. Traditional business intelligence tools did not meet management expectations: results to be applied to processes and strategy for turning information into value. Return of investment in the old tools was typically rather low, if measurable at all. Traditional business intelligence tools were difficult to master. Information remained a privilege in many enterprises. Only a handful of experts (the power users or business analysts) were in a position to exploit information via the old tools. Management decisions and actions were based on guesses, but not on facts.

Business performance management ("BPM", sometimes also called "corporate performance management (CPM)" or "enterprise performance management (EPM)") is a new approach for optimally monitoring and controlling business processes on the level of operations, tactics,
and strategy. BPM is based on metrics associated with the processes. BPM starts when designing and engineering processes: metrics have to be derived simultaneously and in parallel with the operational process design. Goals have to be metricized. Achievement of goals has to be continuously monitored. Actions must be taken for controlling the performance of the processes. BPM is a closed-loop model.

**BPM provides clear benefits to an enterprise:**

- It is a methodology to link strategy to results.
- It turns data into actionable information.
- It empowers all staff by delivering information not only to power users and business analysts, but to everybody inside and outside the enterprise (“information democracy”).
- It delivers high degree of accuracy and consistency of information.
- It provides transparency to management and enhances the bottom line.
- It delivers the right information to the right information consumer to the right location in due time (This is called “real-time”).
2 Business Performance Management – Strategies, Processes and Metrics

Today’s enterprises must be process-oriented (Nußdorfer, Martin, 2003). Today, business processes are cross-functional, cross-departmental, and even cross-enterprise. Processes link the suppliers of the suppliers to the customers of the customers within an integrated network of enterprises. The benefits of integrated end-to-end processes are obvious:

• Cutting costs by automated, straight through engineered processes
• Speeding up time-to-market and process throughput by integrated processes
• Minimizing risk by high quality processes
• Maximizing agility by continuously tuning of process models to market dynamics

This is why “Business Process Management” is the most important challenge for today’s enterprises. Business Process Management is a closed-loop model consisting of three phases:

• Phase 1: Analyzing, planning, modeling, testing, and simulating business processes
• Phase 2: Executing business processes by cross-application workflows
• Phase 3: Monitoring and controlling the performance of the ensemble of all business processes

So, Business Process Management is the process-oriented latest version of managing an enterprise: planning, execution, and performance management have always been the three basic categories of all management (“make a plan, execute it, and manage to keep the actual in line with the plan”). Business Process Management is often abbreviated by the three letters “BPM”. But unfortunately, phase 3 of BPM is also abbreviated by “BPM” which now stands for “Business Performance Management” (also: “Corporate Performance Management (CPM)” or “Enterprise Performance Management (EPM)”). So, whenever the term BPM pops up, one has to be very careful about the context. In this paper, from now on, BPM always means “Business Performance Management”.

BPM is all about managing the performance of all processes that extend across all functions within a business, and beyond to all other relationships. Metrics-driven management is the answer (Fig. 1), a closed-loop top-down model for optimizing the management of a business. Business strategy determines which business processes are to be executed and managed by the enterprise. Business metrics are associated with each business process. Business metrics are defined by goals and objectives to manage a process in a measurable way with information, performance indicators, rules, and predictive models. For example, a tactical business metric for a shipment process could be the term of delivery, where a goal could be that 90% of all shipments should be within 2 days. An operational business metric could be a...
predefined threshold for stock in a dealer warehouse. If stock falls below the threshold, an order is automatically executed. In BPM, metrics may be anticipative as this example shows.

**Strategy, Processes and Metrics**

![Diagram of Metrics-Driven Management](image)

**Figure 1: Metrics-Driven Management is a closed loop model for information-based business management. It is top-down. Measurable goals and objectives are derived from the strategy. Based on strategy, goals and objectives, business processes and business metrics for efficient process control and continuous optimization are modeled in parallel and implemented via applications supporting operations and analytical applications supporting the monitoring. Based on the monitoring, decisions are taken either manually by man or automatically by decision engines. Decisions lead to actions for controlling the performance. The feedback from the actions controls process and activity performance (tactical and operational BPM) as well as updates strategy, goals and objectives (strategic BPM). Synchronizing monitoring, decision and action taking with the speed of the business process and business dynamics is key.**

As we can see, metrics consist of indicators and scales. The indicators (some are called “key performance indicators (kpi)”) are derived from the metricized goals of the related processes. Scales define how to interpret instantiations of indicators. In the first example on shipment reliability, a decision maker is responsible for the interpretation. In the case of such a human interaction, scales are typically presented by traffic lights and/or speedometers. Green, yellow, and red lights ease and speed up the interpretation of instantiations of indicators. In the second example on managing a dealer’s warehouse, the interpretation is automated by a decision engine – visualization is not necessary.

Furthermore, the examples show the impact of metrics-driven management to information management. Information has to be available in “right-time” (often called “real-time”, see Nußdorfer, Martin, 2003) for triggering manual or automated decisions for process control. This corresponds to the “information supply chain” paradigm: supply the right information in
the right time to the right location to the right information consumer to trigger the right decision. So “real-time” means synchronization of information supply with information demand (Note: “real-time” is a relative term and not necessarily related to clock-time).

Business metrics represent management policies within metrics-driven management. The idea behind is obvious: You can only manage what you can measure. So, flexibility of changing and updating any metrics is one of the top requirements of the model. Furthermore, business metrics must be consistent. Metrics specified to control the execution of a particular group of processes should not contradict other metrics. Indeed, metrics are cross-functional and cross-process: The performance of a business process may influence and interfere with the performance of other processes. For example, delivery time, a supply chain related metric, may influence customer satisfaction, a customer relationship management metric.

These problems are addressed by business scorecards. A business scorecard aligns all management policies across the enterprise. Examples of particular business scorecards are Norton/Kaplan’s balanced scorecard or the six sigma model. The balanced scorecard, for instance, is a collection of metrics that is not only based on financial parameters, but uses also customer, employees and shareholders loyalties to provide a look to the business performance beyond the quarterly results. It is indeed one style of metrics-driven management. Despite the wide variety of these metrics, the end goal remains the same: transform data into information and knowledge and maximize its value for the business.

BPM is applied to all business domains like customer relationship management, supply chain management, human relations etc. For instance, Financial Performance Management like the other analytical solutions is a closed loop process depicting the information management of financial information. The process stretches from planning, budgeting, and forecasting to performance measurement and auditing via financial metrics including the statutory legal financial reporting and consolidation requirements. Performance management includes profitability analysis, and planning includes simulations and what if analysis. Decisions are then made based on the financial metrics and analysis and fed back into the planning, budgeting and forecasting activities: The loop is closed.

As Fig. 1 already implies, BPM takes place on three levels, the operational, tactical, and strategic level (Fig. 2). Operational BPM is also called “Process Performance Management (PPM)”, and it includes “Business Activity Monitoring (BAM)” (Note: a business process consists of a group of activities, where the group structure defines the workflow). Operational BPM has been addressed first by vendors coming from process engineering and business integration by adding reporting and graphical features for visualizing operational performance indicators. Today, this approach lacks to put the indicators into a business context. To close this gap from a business point of view, activity based costing is a prerequisite for putting the metrics into a monetary context. This means technically to have access to financial data in a data warehouse.

Tactical and strategic BPM was addressed by the vendors of traditional business intelligence by moving from the data warehouse model and business intelligence tools to analytical
applications and closed loop processing. Today, the two independent approaches to one and the same problem are confusing the market, but will converge by 2004/05.

**BPM, BAM, PPM - Definitions**

![Diagram](image)

Figure 2: Business (or: Corporate) Performance Management (BPM/CPM) is the process of monitoring/measuring the performance of business processes by applying metrics, deciding on the outcome of the metrics, and deploying actions for controlling the performance, a closed loop model. (Note: a business process is considered as a group of activities, where the group’s structure is defined by a workflow.) BPM spans from operational to strategic BPM, but is addressed by two separate camps of vendors rushing to exploit the new opportunities of a strongly growing analytics market. This is confusing business and IT people looking for real solutions to solve their more and more complex analytical needs. One key issue for all BPM approaches is to put the metrics into a monetary context. This requires process-oriented accounting principles like activity based costing.
3 Information Democracy

Process-orientation comes with a process ownership model. It describes who of the constituents (employees, partners, suppliers, customers etc.) participates in and is responsible for what processes or activities within the processes. In metrics-driven management, this process ownership models also includes the metrics that are necessary to monitor and control the process and its performance. This can be understood as information sharing and filtering. The constituents share data, information and knowledge in the context of their process-oriented communication and collaboration. All other data is filtered out. Information sharing and filtering is done via information profiles describing the context of collaboration based on the process ownership model. This is called “information democracy” (Fig. 3).

Information Sharing and Filtering

Figure 3: Information democracy comes with the information supply chain paradigm. Everybody has access to all information necessary to manage the processes and their performance specified by the process ownership model – not less and not more.

Visualization of metrics according to the principles of information democracy is done via dashboards. A dashboard visualizes a structured set of metrics associated with the functional role of a constituent within the process ownership model. Furthermore, the dashboard arranges the visualization of metrics according to the granularity and importance of information. So-called key performance indicators are always presented whereas more detailed indicators can be invoked by clicking through the dashboard’s structure. Trend is to make dashboards active: only alerts that need decisions and human interactions will be
presented and pushed to decision makers via message based publish and subscribe communication methods.

From a technical point of view, dashboards should be embedded into portal technologies. Portals have evolved from intranet and extranet solutions to the central point of control for collaboration providing the P2S (person to system) interface. A portal is defined as an application system that enables sharing and filtering of data/information, functions/functionality, content/knowledge, and processes. This sharing and filtering is related to the functional role of a collaborative team within the process ownership model. A collaborative team is a group of people representing the various constituents that work together according to the collaborative goals and objectives of the team. In this way, portals support cross-functional, cross-departmental, and cross-enterprise virtual teams. As a special case, a team could also be an individual portal user. In this sense, portals enable information democracy.

The portal can be understood as an abstraction layer linking and aggregating contents and services as well as reducing the complexity of their access. In this sense, the team-context defines the collaboration bandwidth, i.e. which data/information, functions/functionality, contents/knowledge, and processes are exposed to the collaborative team together with the appropriate collaborative tools. Each portal user gets a personalized environment that can be further individualized. Such a person portal can also be understood as an integration technology. But the ultimate integration is done via a human interaction, i.e. within the team-context, a user can execute a message transfer between contents and services within his context.

Furthermore, portals also provide synchronous and asynchronous collaborative tools, e.g., e-mail, co-browsing, chat, instant messaging, web-conferencing etc. We will describe the role of portals and its relationship with business process management elsewhere in another white paper.
4 Business Performance Management – the Reference Architecture

Business Performance Management is implemented by analytical application frameworks (Fig. 4) corresponding to application frameworks for business operations (see fig. 1 and layer 5 in Nußdorfer, Martin, 2003). Indeed, analytical applications running on analytical application frameworks are component based, and the analytical application framework will typically reside on a standard J2EE and/or .NET application server. Analytical applications and operational (OLTP-) applications should run in the same application framework. This saves IT-costs and resources, and enables a tight communication between analytical and operational components which is a must in certain cases within operational business performance management.

**Figure 4: Technical Architecture for operational, tactical, and strategic business performance management.** The heart is an analytical application server that is to be understood as a logical application server. Physical implementation may be based on a federated/distributed server model. The ETL processes are part of the data integration platform. This is the reference architecture for an analytical application framework for planning, executing, and managing analytical applications.

The analytical application server includes business intelligence components (spreadsheet, report generator, adhoc inquiry, OLAP, data mining, statistics), analytical business content (predefined and customizable business metrics), and an analytical application life cycle management environment. Traditional business intelligence tools that could only be managed by power users and business analysts, turned into embedded components of
analytical applications providing transparently their analytical services. This is another key success factor for information democracy: no training is required for consuming analytics. But power users and business analysts are not at all redundant. Today, the analytical application framework also includes a data exploration environment enabling power users and business analysts to explore the data in a bottom up way for identifying and deriving new structures and potentially new metrics from the data. (Martin, 2003-A)

It has been common practice to put an analytical application server on a data warehouse infrastructure, where the data warehouse is supplied by ETL (extraction, transformation, load) processes. ETL processes are either supported by batch and/or message/queuing, depending on whether time is critical for data supply. Recent approaches like BAM and PPM use alternative concepts by embedding analytical components in operational systems and accessing their operational data bases directly. This avoids the redundant intermediary storage of data in the data warehouse, and this saves time so that certain metrics can be used for “online” monitoring and controlling of time critical operational processes. But, the disadvantage of these BAM/PPM approaches is that specification of metrics is restricted to the process data. This problem can be avoided when the analytical application server sits on a data integration platform (Fig. 4) enabling the simultaneous access of data warehouse and operational data via an EAI (enterprise application integration) hub. The EAI hub integrates OLTP systems on the application level. In the past, one has tried to solve this time critical data access problem via an ODS (operational data store). Using the ODS approach is not always sufficient, because storing data in an ODS already costs time, and unfortunately, business rules needed for calculating more complex metrics were hidden in the application logic and not available on the data level. The question of time critical operational BPM will be expanded in the next chapter.

An analytical application framework is meta data driven. The meta data layer spans across all layers of the analytical application framework. Meta data is key for a consistent data model, for consistent comprehension and communication of the data model, for data quality and data security. Meta data is organized by three layers:

- Meta data on business operations (business rules and definitions, e.g. unique calculation of “revenue” across all business constituents)
- Meta data on navigation (sources and sinks of data, cross references, time stamps)
- Meta data on administration (responsibility, security)

Meta data standards are slowly evolving: In Sept. 2000, the Meta Data Coalition initiative merged with the CWM (common warehouse model) of the OMG (object management group). Despite the slow progress, there is no alternative to this standard.

The presentation layer provides all services for visualizing the metrics. These services should be independent of the deployed peripherals. Graphics, tables, spreadsheets, geographical and time series presentations must be automatically adapted to the bandwidth and display capacities of the peripherals. Key peripheral types to be supported are web and mobile wireless (e.g., PDAs – personal digital assistant, smart phones etc).
Analytical workflows provide analytical scenarios based on best practices for analyzing and understanding complex situations. Typically, such scenarios are jointly developed by information consumers and business analysts. In case of a new situation not yet supported by a business scenario, the analytical workflow is extended by a joint incremental development step. This joint development model for best practices is a key part of the information democracy model. Business analysts and power user’s roles are updated. Instead of delivering first line support by creating reports and running adhoc inquiries on demand of information consumers, they now provide second line support for data exploration and the development of analytical scenarios.

The deployment layer should be embedded as a portlet in a more general portal. The portlet acts as a dashboard (Fig. 5). According to the process ownership model, all relevant metrics are arranged and presented to the information consumer. Deployment is either passive, i.e. the information consumer uses search and navigation tools to access its metrics and is guided by an analytical workflow, or active, i.e. only exceptions and alerts are passed by appropriate channels to the information consumers triggering decisions. Alternatively, in time critical operational processes, alerts and exceptions could directly drive decision engines. Finally, certain instantiations of metrics could provide input for updating certain compound metrics: analytics feed more analysis.

**Example of Dashboards**

![Example of Dashboards](image)

Figure 5: This example shows that the user interface can look very different and indicators can range from text, to speedometers to charts. This is a hospital emergency center where patients waiting and stay times can be tracked to reduce bottlenecks and deliver higher customer service.
5 Latency matters

Today, BPM must address the operational, tactical, and strategic aspects in a seamless way. Leading process-oriented businesses use highly automated processes for straight through processing. Metrics trigger decision engines and actions are taken in an automated way. Just in case of exceptions, escalation management, authorization, entry of triggers (self-service), and when applying collaborative services human interactions are needed. Now, when the identification of alerts and exceptions becomes time critical, human interactions even become to slow. This is where latency matters and action time becomes critical (Fig. 6). The action time model shows three critical phases, data latency, analysis latency, and decision latency.

Real-Time and Action-Time

![Diagram](image)

Figure 6: In operational BPM, time may be critical. The action time model decomposes action time into data latency, analysis latency, and decision latency, and it shows by which approaches, action time can be minimized.

Data Latency. This is addressed by real-time data integration (Fig. 7). There are two options, low latency and zero latency data integration. So, the key point is first to determine what latency can be tolerated for a given process. Note that latency is correlated with cost: the lower the tolerated latency, the higher the cost.

The low latency model is based on a data integration platform that collects all relevant transactional data and operational data and stores it in a so-called low-latency data mart (LLDM). This requires an integration of the data integration platform with the EAI platform where the transactions across all enterprise systems are managed. The LLDM is refreshed...
either by message queuing or by batch, where the batch is executed in short periodicities according to the tolerated latency (e.g., hourly etc.). Innovative “real-time” enterprises use the LLDM for real-time data propagation. This is a feedback loop for triggering events in operational systems via cross-process metrics. This coupling with operational systems requires managing the data integration platform like the EAI platform: The data integration platform is an operational system.

This model is different from an operational data store (ODS) where data from operational data bases only is stored via ETL processes. So, all transaction logic that is not stored in the operational data bases cannot be mapped to operational data stores. Furthermore, The ETL process is not synchronized with the transactions, i.e. ODS data is not always in sink with the state of transactions. This stresses the need for low latency data marts, especially in the case of legacy systems.

The zero latency model is based on a logical data base access layer spanning across all operational data bases and the data warehouse. For an application, this layer looks and behaves like a data base, all SQL operations – update included – can be executed across the distributed data. This is in contrast to an ODS. No data is redundantly moved into a special store which saves time. But as with the ODS model, all logic that is included in the transactions, but not stored in the distributed data bases is lost.

**Figure 7:** Real-time data integration bridges traditional data warehouse architectures and operations. EAI = enterprise application integration, LLDM = low latency data mar, ODS = operational data store, OLAP = online analytical processing. Innovative enterprises already use real time data propagation to drive operational systems with cross-process metrics via a data integration platform.
Analysis Latency. This is addressed by BAM solutions. As discussed in the previous chapter, analytical and operational components are executed on the same application server. This saves time. Furthermore, for certain complex metrics, special fast algorithms have been developed (e.g., matching algorithms for monitoring traffic). This is still a young area of development and many solutions are still in an experimental stage.

Decision Latency. Indeed, when time matters, decision cannot be taken anymore by humans, but must be automated by decision engines. Decision engines are based on rule engines. Rules are either generated bottom-up via predictive models. Predictive models are the outcome of data mining processes, so the decision rules have been identified from detected data structures and patterns. Rules may be also specified by experts in a top-down approach. This is a certain revival of the old expert systems popular in the late 80s and early 90s. Ultimately, rules engines can be modeled by a combination of predictive models with expert rules. Decision engines have been discussed in detail in Martin (2003-B).
6 BPM and classical BI: fundamental differences

BPM has evolved from the old decision support and business intelligence approaches, but today, BPM is a completely different model then classical business intelligence.

- BPM is a top-down model starting with business strategy. Business Process Management links process analysis and design with cross-functional process execution and business performance management. Process performance metrics are engineered simultaneously when engineering the processes.
  - Business Intelligence was bottom-up and not process oriented.
- BPM is based on an information supply chain model for synchronizing information supply with information demand.
  - Business Intelligence was a model for information supply only (the “information factory”).
- BPM is a closed loop model for optimally monitoring and controlling business processes on the operational, tactical and strategic level.
  - Business Intelligence only supported decision making, but not action taking. Operational aspects of business intelligence were not addressed in a coherent model.
- BPM is forward looking. It comes with predictive models that anticipate problems before they occur. But all traditional retrospective features are still useful.
  - Business Intelligence was retrospective. It focused on analysis and diagnosis only.
- BPM enables information democracy by sharing and filtering information according to the business process ownership model.
  - Business Intelligence tools did not sufficiently support information consumers. So, there was either the problem of information un-accessibility (or sometimes even information hiding) or the problem of an information deluge (“information for the masses”)
- BPM is based on analytical application frameworks running on open standards application servers.
  - Business Intelligence was a tools based approach running on proprietary technologies.
7 Players in the Market

Taxonomy BPM/BAM

Figure 8: Action time based taxonomy of BPM market players. (ETL = extraction, transformation, load; LLDM = low latency data mart)

From the three phases of action time (Fig. 6), we can derive taxonomy for classifying the players in the market (Fig. 8). Key players in the different categories are listed below. More details on specific vendors will be published in part 2 of this white paper, where in each paper we will map the vendors’ architecture and strategy to the vision and reference architecture developed in this part 1.

Data Integration Platforms

Ascential, BEA, Business Objects (Data Integrator), Data Mirror, IBM (Information Integrator for DB2), Informatica, Information Builders, Oracle, SAS, Tibco etc

Data Warehouse (A – classical BI Tools)


Data Warehouse (B - BI Tools and special data base technologies for real-time analytics)

ETL
Ascential, Business Objects (Data Integrator), Data Junction, Data Mirror, Hummingbird, IBM, Informatica, Information Builders, ISoft, Microsoft, Oracle, SAP, SAS etc

Business Activity Management/Process Performance Management (BAM/PPM)
Axway, IBM, IDS Scheer, Intelicorp, Meta Software, Microsoft, NetIQ, Oracle, SeeBeyond, Tibco, Vitria, WebMethods etc (also: all vendors in category "operational, tactical, and strategic BPM"

Predictive Models
Angoss, Cognos, E.piphany, Eudaptics, Fair Isaac, IBM, ISoft, Kana, KXEN, Magnify, Megaputer, Microsoft, Oracle, Prudsys, Quadstone, SAP, SAS, Siebel, SPSS, thinkAnalytics, Unica etc

Decision Engines
ATG, BEA, E.piphany, Eudaptics, Fair Isaac, IBM, ILog, i2, Kana, MicroStrategy, Oracle, Prudsys, SAP, SAS, Siebel, SPSS, thinkAnalytics, Tibco etc

Operational, tactical, and strategic BPM
Board M.I.T., Business Objects, IBM, Informatica, Information Builders, Oracle, SAS etc

Financial Performance Management
Acorn System, Armstrong Laing Group, Cartesis, Cognos/Adaytum, Frango, Geac, Hyperion, Longview, Microsoft/FRx, MIS AG, OutlookSoft, SAS, SAP, SRC Software etc
8 Summary

We believe that our vision on integrated business performance management across operations, tactics, and strategy will become a standard for continuously evolving metrics-driven management. We also believe that our reference architecture of analytical application frameworks will be a standard for dynamic enterprise specific IT-architectures. This Whitepaper will help to make strategic decisions on strategies and platforms.

BPM is the answer to today’s challenges running a business: You can only manage what you can measure. This is one of the leitmotifs that will lead enterprises into a successful future.

München, August 2004
Annecy, August 2004

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Literature:


9 The Sponsors

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Ascential Software Corporation is the leading provider of enterprise data integration solutions to organizations worldwide. Customers use the Ascential Enterprise Integration Suite to integrate and leverage data across all transactional, operational and analytical applications with confidence in the accuracy, completeness and timeliness of critical information. Ascential Software's powerful data profiling, data quality, data transformation, parallel processing, meta data and connectivity solutions enable customers to reduce total cost of ownership and increase return on IT investment. Headquartered in Westboro, Mass., Ascential Software has offices worldwide and supports more than 3,000 customers in such industries as financial services, telecommunications, healthcare, life sciences, manufacturing, consumer goods, retail and government. More information on Ascential Software can be found on the Web at www.ascentialsoftware.com

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Founded in 1995 and headquartered in Lugano, Switzerland, Orenburg is the developer of Board M.I.T. (Management Intelligence Toolkit), the only programming-free software toolkit for fast, flexible and affordable development of custom analysis and analytic applications.

With offices in the United States, United Kingdom and Germany, Board M.I.T. is distributed worldwide through Orenburg's network of Board M.I.T. Solution Partners.

With over 1,300 customers across the globe, including enterprises like Chupa Chups, GlaxoSmithKline, Johnson & Johnson, Subaru, Salomon and Novartis, companies of all size and industry utilize Orenburg's unique software toolkit approach to improve the analysis of their information and effectiveness of their management decision-making.

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