OPTIMIZING BUSINESS PERFORMANCE WITH BUSINESS PROCESS MANAGEMENT

Rethinking Business Performance

Companies large and small are now under intense pressure to improve business performance. In the Internet era, expectations have risen sky-high. Customers want immediate response to orders and service requests, knowledgeable service and support available round-the-clock, and detailed information deliverable on demand. Suppliers are no less demanding. Meanwhile, intensifying global competition puts continuous pressure on costs and efficiency, Wall Street insists on predictable financial results, and a growing list of government regulations demands new levels of control, compliance, and record-keeping. To complicate matters further, all of these pressures on the business are continually changing, and at an increasingly rapid rate.

How a company responds to these collective demands of the business environment defines something we call "business performance." Every business executive wants to improve it, but how do you even measure something so complex and multi-faceted? How do you connect it to the core business activities you can control? And how do you keep business performance on track and progressing toward established targets?

Optimizing business performance really boils down to four basic steps:

- Strategic alignment – Identifying top strategic and business goals, and the core business processes that affect them.
- Concrete metrics – Making business objectives quantitative in terms of key performance indicators (KPIs) and other forms of business measures for those processes.
- Continuous monitoring – Computing business measures in real-time and tracking actual vs. target performance through a combination of reports, alerts, and automated remediation actions.
- Incremental improvement – Responding to the changing business environment with process innovations that enhance and optimize business performance.

While these steps are easy to list, implementing them has always been hard. Abstract concepts like business objectives are not easily mapped to concrete core activities. Even after mapping them, each activity maintains its performance data on separate incompatible systems, with no easy way to aggregate them in high-level KPIs, much less continuously monitor those metrics in real time. Moreover, the systems that automate each core activity, while generally efficient, are difficult to change in response to new business conditions.

Those are precisely the problems addressed by *business process management* (BPM). This report describes how BPM can play a vital role in optimizing business performance.

What Is Business Process Management?

BPM is both a management discipline and a technology platform. As a management discipline, it replaces traditional views of business based on discrete functional organizations, systems, and metrics with those based on *cross-functional core processes* aligned with high-level business objectives. Bridging the gap between process objectives defined in business terms and the design

objectives of their IT implementations is a critical element. As a technology platform, BPM provides the set of software tools needed to optimize performance, make abstract performance goals concrete, connect them to process data, automate and monitor process activities, and provide a platform for agile performance improvement. While some have described BPM as just a perspective for understanding and analyzing business performance, a full BPM software suite supplementing modeling and analysis with process implementation and monitoring tools is the key to successfully optimizing business performance.

The Challenge of Cross-Functional Processes

As a management discipline, BPM starts from the premise that companies have traditionally been organized around discrete business functions like sales, customer service, manufacturing, and finance. Each unit's business processes and metrics are typically designed to meet its own internal goals rather than the strategic objectives of the enterprise as a whole. Each functional unit typically has its own IT systems as well. In fact, investment over the past decade in *enterprise application software* has focused on integrating and automating operations *within* each functional unit. Thus, the widespread implementation of ERP, CRM, human resource, and supply chain software has made each of those operations highly automated and internally efficient, but at the same time has made them less able to communicate with each other and increasingly difficult to change in response to new demands.

BPM attacks this stovepiping, both at the organizational and systems level, by describing the enterprise not as a set of discrete functions but as a collection of *core business processes* that each span functional boundaries (Figure 1). The processes most closely aligned with corporate strategic goals around revenue growth, customer satisfaction, quality, and innovation are rarely confined to a single functional unit. Dr Geary Rummler, one of the founders of BPM as a management discipline, talks about "managing the white space in the organization chart," the handoffs *between* organizational units where things are most likely to go off track.

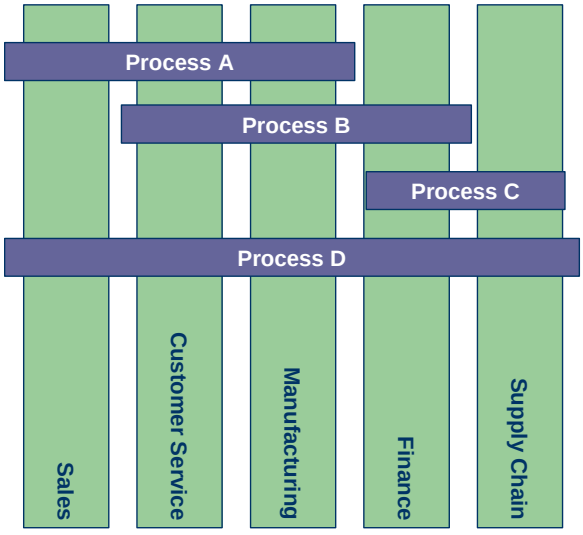

Figure 1. BPM cuts against the grain of stovepiped systems and organizational structures

The processes that really determine bottom line success and customer satisfaction, like quote-to-cash, inventory management, customer dispute resolution, or SOX 404 compliance, need to penetrate the barriers between traditional organizational structures and systems. In fact, the rise of stovepiped enterprise applications has created several problems:

- **Inefficiency.** Exceptions are handled manually, resulting in processes that are inefficient and take too long to complete.
- **Rigidity.** Critical enterprise systems are hard to integrate and even harder to change.
- **Lack of compliance and control.** The same process is done differently in different departments and sites.
- **Poor visibility.** Business performance can't be measured at the end-to-end process level.
- **Inertia.** *The process rules keep changing,* while IT resources are already stretched to the breaking point.

The Benefits of BPM

BPM as a software technology attacks these challenges head-on. It does not replace your existing IT investments but *coordinates their actions* to make end-to-end processes more efficient, more flexible and agile, more standardized and compliant. BPM *automates, integrates,* and *optimizes* business processes. It does that by defining *process models* or templates that specify the flow of activities, both human and automated, and then manages that flow and continuously monitors its performance.

- It's *efficient* because it automates manual tasks and handoffs, and makes sure the most important tasks are done first and on time. In applications as diverse as loan origination, claims processing, telco service provisioning, customer service, and billing dispute resolution, BPM can cut cycle times by over 70% and commonly enables dramatic increases in processing volume with no addition to headcount.
- It's *agile* because executable process models are not built with complex code but composed graphically like a flowchart, so they can be built quickly and easily changed. A key enabler of BPM has been the emergence of service-oriented architecture (SOA), which allows the process to integrate discrete activities of external applications without writing code. This accelerates time-to-market with new offerings and allows exiting processes to respond instantly to new competitive demands.
- It's *compliant* because process logic is based on rules reflecting policies and best practices. Process components based on those rules can be shared and reused across the organization, so you're always following the rules and standards in every office of your enterprise. Moreover, because BPM records every step performed, processing is auditable from start to finish.
- And it makes processes *visible* end-to-end by aggregating data from disparate business systems along with human workflow statistics, and displaying key performance indicators in management and administrative dashboards. Performance management allows process bottlenecks to be relieved in real time, while maintaining a secure audit trail to ensure provable compliance.

The automation, integration, and visibility BPM brings to cross-functional processes translate into tangible return on investment. BPM makes processes run faster and employees more productive. Besides automating manual procedures, it streamlines handoffs and optimizes tasks by priority. It also provides deadlines, notifications, and user-defined escalation actions that put the focus on customer value rather than simply first-in first-out.

BPM also brings standardization and control. You can enforce business rules, and prove to an auditor that you did. You can replicate best practices globally across all offices in the enterprise. You can track service level agreements (SLAs) and compliance with regulations, even when the

process spans departments or possibly outsourced functions. Exceptions are handled explicitly within the process model, and all actions are logged automatically for performance management and auditability.

Moreover, BPM lowers the cost of developing and maintaining business solutions. Because executable processes can be designed and maintained with little programming and process model components can be reused easily in new variants, BPM reduces the demand on critical IT resources as well as total cost of operations.

Beyond those quantifiable benefits, BPM adds strategic value as well.

- *Agility,* the ability to bring new products and services to market quickly and to respond rapidly to changing demands. While enterprise applications are hard to change, the process model that coordinates their actions is easy to change.
- *Business integration.* Through its standards-based integration middleware, BPM allows you to extend the scope of process automation and management across the IT barriers that historically have separated departments, front and back office, and your customers and suppliers – despite the diversity of system platforms, API languages, and data models they represent.
- *Global visibility.* BPM makes process performance visible at the process level, tracking process data and aggregating it in tables of key performance indicators and graphical dashboards at various levels for process owners, system administrators, and business executives.

Optimization Through Modeling and Analysis

BPM begins not with the demand that companies change their traditional organizational structures, but simply that they endeavor to *understand and manage their operations at the cross-functional process level.* It sounds obvious, but before BPM it was not easy to implement. In many companies, cross-functional processes are not even documented end-to-end – since the business units responsible for each segment rarely talk to each other – and their respective applications and information systems were never designed to share data or talk to each other, either.

BPM attacks this problem through modeling and analysis of the end-to-end process as a whole. It provides modeling tools that allow business analysts to document existing and proposed new processes using graphical flowcharts that can be analyzed in software and adjusted for optimum performance. Equally important, modeling tools allow business analysts to define *concrete performance metrics*, aligned with strategic business goals, and link them to specific process activities and parameters. Those metrics could be related to revenue, margin, costs, timeliness, throughput, productivity, customer satisfaction – *anything!* In principle, any process performance metric is built up, based on a set of user-defined rules, from the results of each process instance. Process models connect those metric definitions to specific activities, events, and aggregation rules – one of the fundamental prerequisites to optimizing business performance.

Linking business goals to concrete metrics is just the first step. Models are also the key to process implementation. They diagram the sequence of activities and events and identify the resources required at each step, the branch points in the flow, and the conditions that determine the path to follow in each instance. They also provide organizational information like resources and costs that are critical to process analysis. Unlike freeform flowcharts, modeling tools impose a methodology and discipline on the process diagram. For example, shapes for various activity types and the various lines that interconnect them have specific well-defined meanings. While this adds a slight learning curve, the benefits are significant. Because the semantics of the

diagram are unambiguous, process details are more easily shared across organizational boundaries – even with trading partners.

The major benefit of this discipline, however, is that processes can be analyzed, and expected values of their business measures projected, through *software simulation*. Business analysts can define alternative scenarios, differing in resource allocation, branching assumptions at decision points in the flow, and other parameters, and see which alternative results in the lowest cost, fastest average cycle time, lowest percentage of service level agreement violations, or other optimum business measure. In addition, the simulation reveals bottlenecks in the process, allowing new alternative scenarios to analyzed, resulting in an optimum configuration.

Analytical process models are not executable IT implementations. In fact, often an implementation of some of the modeled steps does not yet exist. Nor does modeling require that the business analyst even know how the implementation would be designed. Steps in the model are simply descriptive. For analysis purposes they are specified by basic business parameters – resources required, resource cost, expected duration, inputs and outputs – which can be varied in different scenarios.

But even without specifying an IT implementation, analytical modeling accomplishes a great deal:

- Corporate strategic goals are linked to explicitly defined business processes.
- KPIs aligned with those goals are linked to specific steps and data from those processes.
- Estimated values for those KPIs can be projected via simulation in multiple scenarios, resulting in a model that gives optimum performance results.

Modeling is just the beginning. BPM assumes that you want to actually *measure* the KPIs in an actual implementation of the business process. Comparing actual KPIs with their expected values not only validates and refines the model, but suggests improvements that can be made in the process implementation to optimize real business performance.

Performance Optimization With BPM

The Big Picture

BPM software provides both a methodology and the technology infrastructure for turning optimized analytical models into real-world results. Figure 2 illustrates the four essential steps of the BPM approach:

1. *Modeling*, a business analyst function that describes the steps, rules, and KPIs of a business process, and analyzes expected performance via software simulation.
2. *Assembly*, an IT function that designs an executable process implementation without coding, starting with a skeleton generated automatically from the business model.
3. *Deployment*, in which a BPM process engine automates the execution of the process design, integrating human and automated activities and generating tracking data used for performance monitoring.
4. *Management*, the automated calculation and real-time update of KPIs that are displayed in management dashboards and generate alerts when performance goes off track.

These four basic functions are described more fully below.

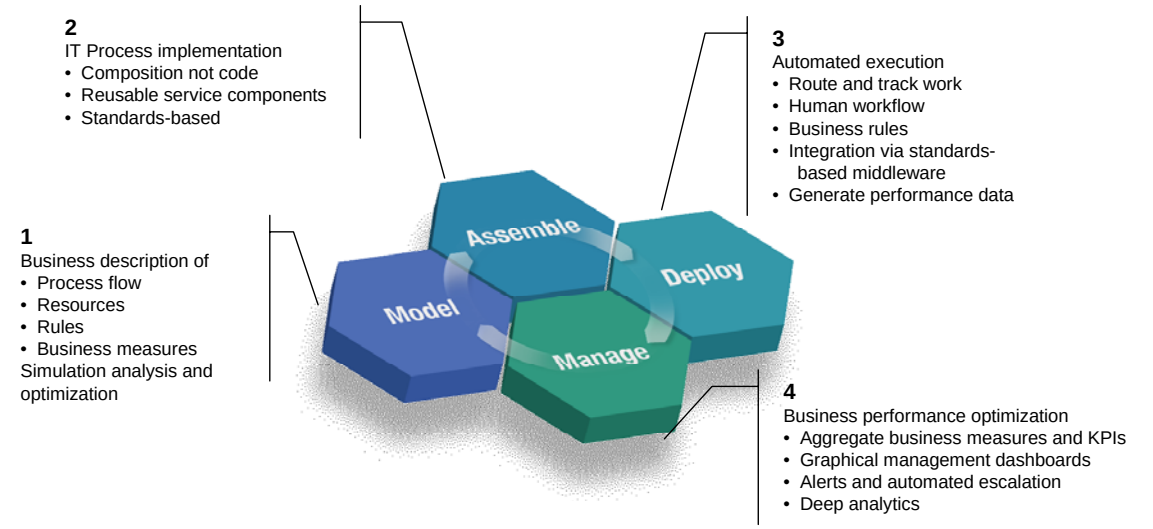

Figure 2. BPM software optimizes business performance through a repeating cycle of modeling, assembly, deployment, and management.

Process Modeling

The first step is *modeling*, documenting the steps, workflows, and key performance indicators of critical business processes. Modeling is fundamentally a *business function*, performed by business analysts in conjunction with line of business managers and process participants. A critical part of modeling is alignment with the company's strategic goals, performance objectives, and governance principles. Modeling in essence defines the business requirements of a performance-optimized process implementation.

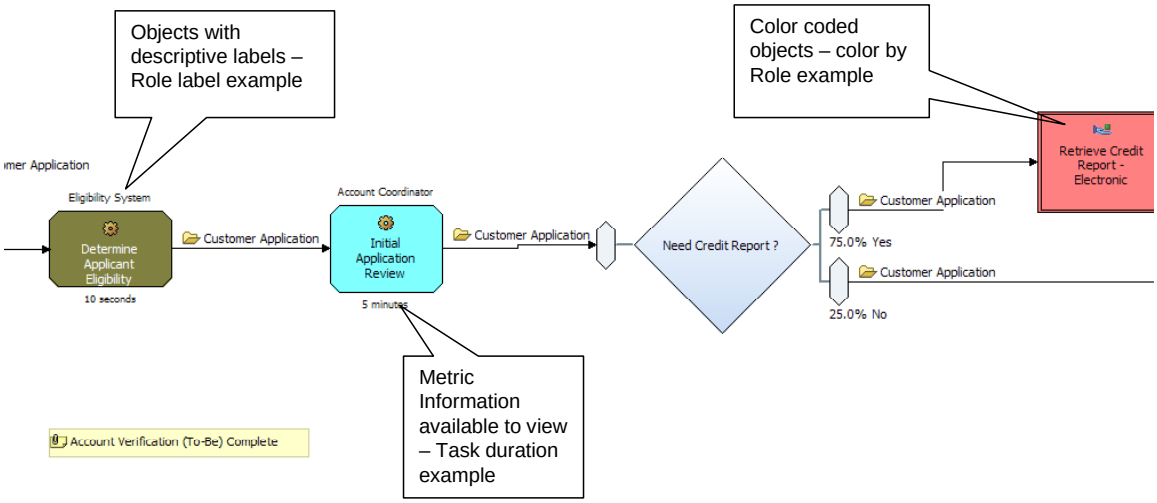

Figure 3. Modeling is a business-oriented process description that allows optimization via simulation analysis. Source: IBM

A process model looks like a flowchart (Figure 3). It describes the sequence of steps in the business process, which may be performed both by people or automated systems. The model specifies which business system or human role performs each step and the rules governing when an instance of work follows one path versus another. For analysis purposes, the modeler can also specify the cost and available quantity of each resource, the expected processing duration of each step, and the branching ratios at various forks in the processing path. None of this requires

technical knowledge of the systems involved in the process implementation, just knowledge of the business.

Process Assembly

The second step is *assembly*, which means designing the IT implementation of the business process. Each step in the implementation design is typically represented by a software component that implements that step's business activity. In advanced tools like those provided in the WebSphere BPM Suite, skeleton assemblies are generated *automatically* from the business model, linking business analysts directly to the IT implementation. This provides a cleaner handoff from business to IT than traditionally documented "business requirements."

Assembly refers to a particular style of application development enabled by *service-oriented architecture (SOA)*. With SOA, IT solutions are no longer coded from the ground up as self-contained mega-projects but are constructed quickly by assembling reusable software components. Integration adapters, a form of SOA middleware, create many of these components automatically by "wrapping" existing IT systems, turning them into "services" available for invocation by other applications. The ability to leverage existing IT investments rather than rip-and-replace is one of SOA's chief attractions.

Other service components may be provided by third parties and accessed over the Internet. In addition, new components can be built using IT tools. Once built, all of these components form a palette of reusable business activities that can be composed into complete solutions without programming using WebSphere Integration Developer – simply by "wiring" them together in a graphical design tool. SOA's flexible component assembly and reuse with minimal coding is the key to BPM's agility. In addition, because it relies on standardized, platform-independent interfaces, SOA breaks down traditional barriers to business integration.

The end result of the assembly step is an IT implementation of the end-to-end business process. Because the assembly started from a business-generated model, the implementation reflects essential characteristics specified by the business and supports capture and analysis of business-defined KPIs and other metrics critical to success.

Process Deployment

The third step is *deployment*, which means executing the assembled IT solution on a BPM *process engine*. When a business process solution is executed, the process engine routes each instance of work according to the steps defined in the assembly – consistent with the original process model – and tracks process performance at every step of the way. Some steps in the process represent human interaction, and others represent automated functions of business systems. For human interaction, the BPM process engine automates and manages the workflow; for automated functions, the process engine automates the business integration, mapping data between the various systems involved as required by the SOA middleware.

Human workflow automation is a major contributor to BPM's ROI. It accelerates cycle time, allows more work to be performed without increasing headcount, and ensures that all processing conforms to established policies and business rules. The process engine routes work to queues linked to individuals or shared work teams. It knows where each piece of work is in the process at any time, and can automatically send notifications or execute escalation actions automatically if a task is overdue. In addition, administrators can monitor queues and reconfigure resources or reroute work to alleviate backlogs.

Business integration means the diverse enterprise applications and information systems involved in the end-to-end process work in concert even though they were not originally designed to do so.

BPM improves on the EAI technology of the 1990s in two ways: First, leveraging SOA, BPM is now on Internet and J2EE standards, greatly increasing the availability and lowering the cost of the needed middleware. Existing investments in enterprise-scale EAI technology such as WebSphere MQ, however, can still be leveraged in the new architecture. Second, while EAI is limited to quick data exchanges between business systems, BPM retains the context of the entire business process, which could last days or weeks. Thus BPM has the ability to undo long-running business transactions – cancellation or change to an order, for instance – and maintain performance metrics for the process end-to-end.

Performance Management

The fourth step is *management*, which primarily refers to monitoring business performance. A key benefit of process implementation on a BPM engine is the generation of *events*, or tracking signals, at each step of the process. These are filtered by the BPM system and aggregated into business measures and KPIs. Not only are the resulting metrics instantly viewable in *management dashboards*, but they can be processed by business rules to generate *real-time alerts* and other triggered actions when performance goes off track, a feature called *business activity monitoring*, or BAM.

Dashboards provide both strategic high-level views and detailed operational views of business performance. High-level views (Figure 4) allow executives and process owners to easily monitor the overall health of a range of business processes through graphical scorecards, tables and charts, with business alerts indicating situations requiring immediate attention. Operational views (Figure 5) allow managers to drill down to KPIs associated with specific processes and see detailed breakouts by product, geography, workstep, individual performer, or any other dimension specified for the metric. Dashboard views are business-oriented. Business analysts specify the metrics, dimensions, and sources of the information as part of the original modeling and analysis step.

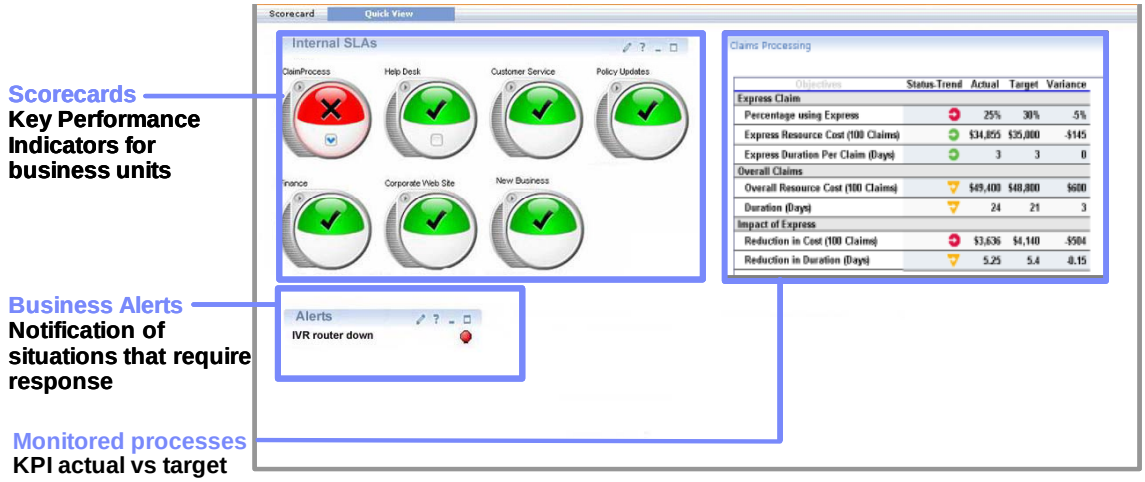

Figure 4. BPM management dashboards provide real-time indication of process health through scoreboards and alerts. Source: IBM

BAM represents the action side of performance management. When processes are executing on the BPM engine, KPIs are continually being updated as each process instance progresses toward completion. With BAM, those KPIs are continuously monitored by business rules, which trigger automated notifications or escalation actions when KPIs begin to deviate from their target range. While BAM is sometimes associated with analytical reporting technologies like business intelligence, it is BPM that provides BAM with its platform for action. With BPM, the rules

monitoring a KPI are not limited to flashing alerts on a management dashboard, but can be set to reroute work, reconfigure processing resources, or switch to alternative procedures automatically.

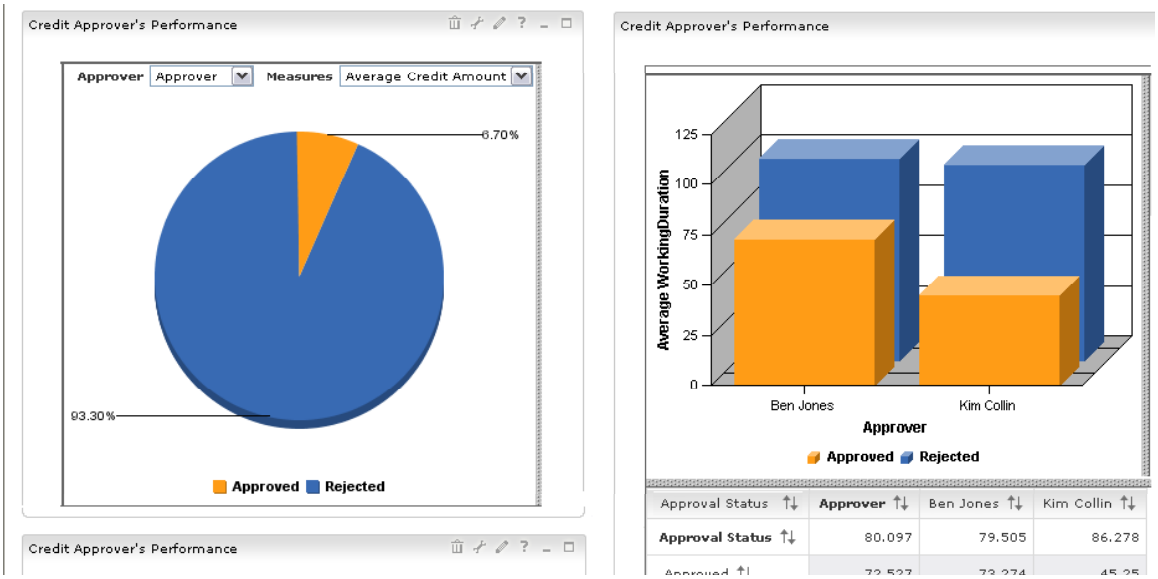

Figure 5. Process analytics with drilldown views supporting breakout of KPIs by time, product, workstep, work performer, location, or any other user-defined dimensions. Source: IBM

IBM WebSphere BPM Suite

Today, no BPM offering exemplifies this cycle from modeling through to performance management, all layered on SOA and Internet standards, better than IBM's WebSphere BPM Suite. Each of the four steps of the business process improvement cycle is represented by a WebSphere BPM Suite component (Figure 6):

- **WebSphere Business Modeler** provides process modeling, KPI definition, and optimization through simulation analysis.
- **WebSphere Integration Developer** (WID) provides process implementation via component assembly. It is an IT tool, but does not require programming. Skeleton assemblies and data definitions are imported from Business Modeler to create a clean business-IT handoff.
- **WebSphere Process Server** is the BPM engine. Process Server is essentially the SOA hub of the WebSphere Application Server, based on J2EE and web services standards. Assemblies created in WID are executed on Process Server, automating human workflow and integrating diverse business systems via SOA middleware. Process Server includes the WebSphere Enterprise Service Bus (ESB), a secure standards-based communications fabric linking all process components.
- **WebSphere Business Monitor** provides performance management. It captures, filters, and aggregates events from the Process Server and continuously updates the KPIs previously defined in Modeler. It displays performance metrics in graphical management dashboards running on WebSphere Portal and accessed through a web browser, supporting both strategic and operational views of performance data. Monitor also provides BAM, rule-based monitoring of KPIs with automatically triggered actions. Because Monitor was designed to work with Modeler, actual performance results can be

fed back easily to update modeling assumptions, improving simulations and accelerating the cycle of continuous process improvement.

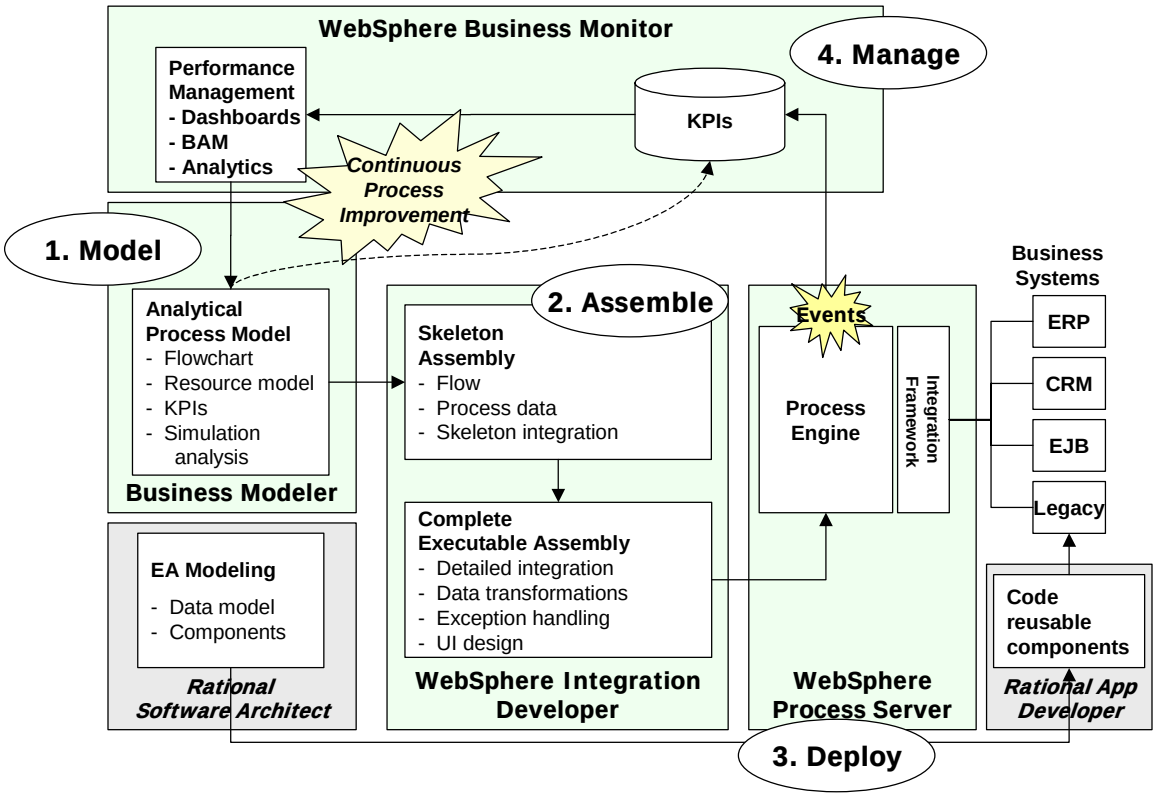

Figure 6. IBM WebSphere BPM Suite supports a closed cycle of performance improvement layered on standards-based SOA.

Performance Optimization in Action

To see how performance optimization with WebSphere BPM Suite works, consider the following insurance claims scenario. To reduce the cost of claims processing, the claims executive wants to implement an express (low touch) process for certain claims. Express claims would reduce the number of steps to process a claim from first notification of loss to settlement and route them to less experienced adjusters.

Using WebSphere Business Modeler, a business analyst documents the current claims process and specifies the modified "to-be" process including new express claim path. Modeler specifies the time for each processing step, the cost of processing resources attached to each step, and the fraction of claims that follow each path at a process branch. Through simulation of various scenarios, Modeler indicates that the desired savings can be achieved if 29% of claims go through the express process (Figure 7). Implementation of this new process is approved.

As a starting point for the implementation, WebSphere Business Modeler generates a skeleton assembly and exports it to WebSphere Integration Developer. This skeleton assembly specifies the sequence of steps, selected data elements, and business rules involved in the express claims process. Using WID, an IT developer fleshes out implementation detail by mapping process activities to service components. Many of these components, including integration with the claims adjudication system, user screens, business rules, and Explanation of Benefits generation, will typically already exist in the process designer's palette of available activities. Realizing the value of SOA, implementation in WID is more a matter of graphical assembly than writing code.

When the implementation design is complete and tested in WebSphere Integration Developer, it is deployed to WebSphere Process Server. As dictated by the original model, Process Server routes each new claim to either the express or high-touch process, based on the particulars expressed in claim data. As claims are processed, Process Server generates events that track the status at each step. WebSphere Business Monitor aggregates these events and displays them as KPIs, scoreboards, and alerts, which can be customized in management dashboards that make actual performance visible in real time.

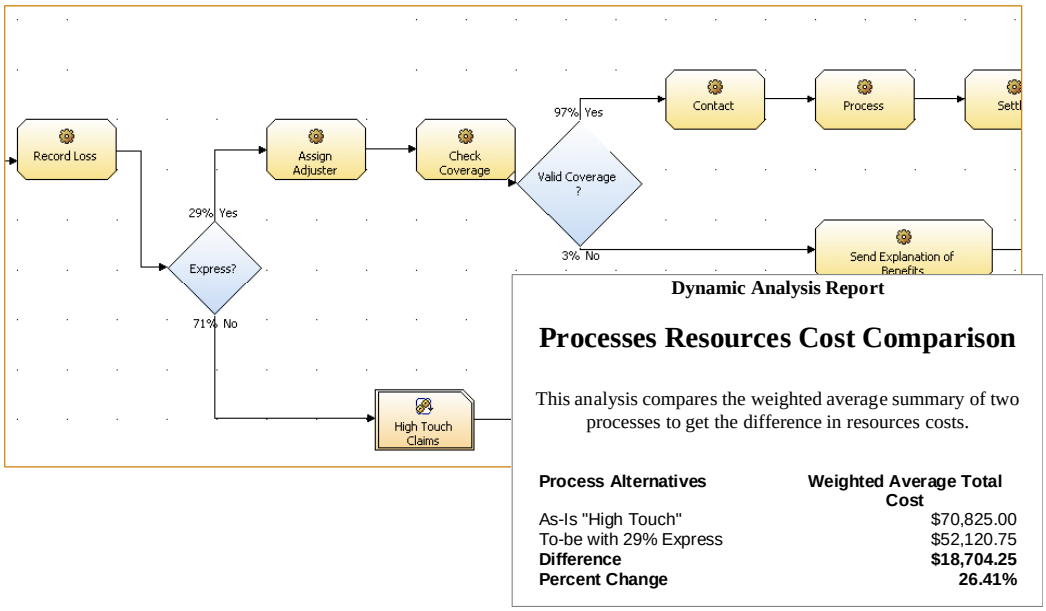

Figure 7. WebSphere Business Modeler supports optimization prior to implementation using simulation analysis. Source: IBM

For example (Figure 8), an executive scoreboard that monitors the performance of several strategic processes might flag the express process as not meeting its intended goals. The executive can then drill down to a management view specific to the new process, which indicates the problem is that only 25% of claims are going through the express process rather than the expected 30%.

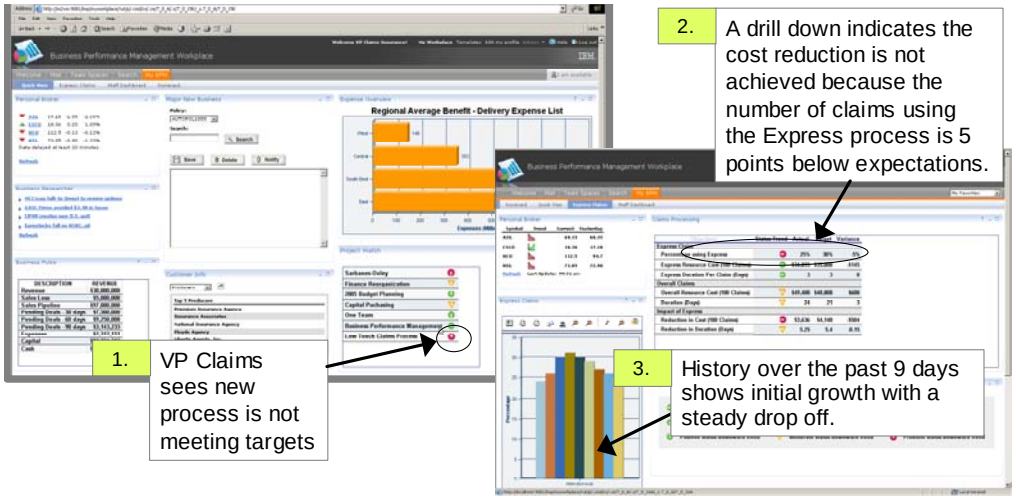

Figure 8. BPM makes process performance visible in real time through a hierarchy of scoreboards, charts, and tables. Source: IBM

Business Innovation and Optimization

Managing business performance from the perspective of cross-functional end-to-end processes is really a revolutionary idea. As a technical capability suddenly enabled by the emergence of SOA, it opens up a whole new way of thinking about the business. Thus, while WebSphere BPM Suite provides the software tools to make it happen, IBM realizes its customers may need help in the form of best practices and prebuilt design patterns geared to performance optimization using BPM. To that end, the company has embarked on a new initiative called *Business Innovation and Optimization* (BIO) that provides a structured methodology, vertical industry expertise, and a set of software components layered on top of the WebSphere BPM Suite.

Figure 9. BIO provides a three-step methodology aimed at performance optimization using BPM. Source: IBM

The BIO methodology (Figure 9) encompasses three steps. The first uses business modeling to identify and understand the key business goals and the processes associated with achieving those goals. The second step, relying on industry expertise and best practices, is to define KPIs that measure progress toward those goals. The process model and associated KPIs guide the IT implementation of the process. The third step is to define dashboards and alerts that allow managers to continuously monitor the process in action, analyze results, and incrementally optimize performance.

In addition to WebSphere BPM Suite components, BIO's software supports integration of other IBM offerings under the WebSphere, Tivoli, Lotus, and Rational brands, as well as third party software. These components support business intelligence and analytics, IT system management, content management, team collaboration, and other functions important to an end-to-end solution. The key, however, is BPM.

Realizing the Cycle of Continuous Business Performance Improvement

BPM is the technology that actually delivers what management consultants like to talk about – a platform for continuous performance improvement. The cycle starts with modeling, performed by business analysts with an eye on alignment with strategic business goals. Modeling outlines

the process steps and maps them to the key performance indicators used to measure success. Modeling assigns basic business parameters to each step, such as time and cost per resource, and uses them to optimize the model using simulation analysis.

The optimized model then generates a skeleton assembly. IT fleshes out the skeleton by attaching implementation detail, creating a fully executable business process. The completed assembly is deployed to a BPM engine that actually executes the process, managing both the human workflow and the application integration. While executing, the process engine generates events that signify completion of each step for every piece of work. BPM's process monitoring component collects these events and uses them to continuously update actual measurements of the KPIs and display them in management dashboards.

Now actual measured performance can be compared to the model. If they match, it confirms the modeler's assumptions. If they don't, the performance data can be used to correct the assumed model parameters. Either way, the refined model can be still be tweaked and analyzed for further improvement. With BPM, such incremental improvements are easy to implement. Usually they involve changing just a few of the components in the end-to-end process, or possibly just reconfiguring the flow logic that interconnects them. BPM is agile – easily changed – because the flow design, or orchestration, is all graphical. It doesn't require code, and with SOA, individual components can be swapped out easily without affecting other process components.

With BPM, performance modeling, process design and execution, and performance measurement are all interconnected in a virtuous cycle.

BPM is the foundation of the next generation of enterprise software. It comes at a time of fundamental change in IT infrastructure toward SOA based on industry standards. For that reason, it makes sense to look for BPM technology that not only closes the cycle of continuous performance improvement but is in step with the new IT infrastructure. In that regard, IBM stands head and shoulders above its competitors. To date WebSphere BPM Suite is the only BPM offering that integrates process implementation based on SOA standards with business-oriented modeling and monitoring. The BIO initiative provides the supplementary methodology, expertise, and best practices to put this revolutionary new approach into action.

If optimizing business performance is on your mind, you should be talking to IBM.

Bruce Silver

For additional information

- On SOA from IBM: **www.ibm.com/soa**
- On IBM's WebSphere BPM Suite: **www.ibm.com/software/websphere** (Click on **Business Integration**)
- On IBM Business Innovation and Optimization: **www.ibm.com/software/innovate**