



BPM AND CLOUD COMPUTING

Easing the Barriers to BPM Adoption

Business process management is moving out of the “early adopter” phase. By now, most Global 2000 companies have begun to model and analyze their key business processes, and have one or more automated BPM implementations under their belt. Many are now considering how to transition BPM from one-off projects to a broader programmatic approach across the enterprise. Advances in the underlying technology of BPM, such as service-oriented architecture (SOA), have made that transition easier. But despite the growing maturity of BPM technology, serious barriers to enterprise-scale implementation remain: cost, resource availability, feature/function limitations, and cultural barriers. Fortunately, another round of technological advancement now promises a new way forward: cloud computing. This paper explains the benefits of cloud computing for BPM, and shows how one leading vendor, IBM, is making cloud a key component of its BPM strategy.

Let’s talk first about the barriers:

- **Cost.** We have ample evidence that the return on investment from BPM can be considerable. But there is also no denying that a BPM implementation project requires a significant capital outlay up front. The BPM software license cost alone is a six-figure investment, and that does not include the cost of the hardware systems, the integration middleware, or custom solution development and maintenance. Moreover, the BPM hardware and software cost is typically governed by the peak load rather than average usage. Seasonal or “spiky” process volume thus exacerbates the cost barrier.
- **Resource availability.** BPM implementations are line-of-business solutions, but the business depends on available IT resources to integrate and customize the solution, to administer and maintain the BPM platform, and to provision the infrastructure with each new implementation. In today’s leaner organizations, available IT resources are hard to find, or already fully committed to other strategic initiatives. Even high-ROI BPM projects have no way to get started without IT resources available for basic things like provisioning and administration.
- **Technology limitations.** While BPM technology, particularly BPM on SOA, has matured greatly, its tools are still largely oriented to project-scale rather than enterprise-scale implementation. Typical missing features include collaborative company-wide repositories and tools for business-oriented process modeling and analysis, self-service provisioning of shared BPMS infrastructure, and ready runtime integration of service providers beyond the firewall.
 - **Modeler community support.** Today’s Business Process Analysis (BPA) tools and repositories are designed for a small cadre of architects rather than for a broad modeling community. They have high cost per seat and require extensive training. Moreover, they do not offer collaboration and social networking features needed to advance BPM at the enterprise level.
 - **Business self-service.** Even when an organization has made an “enterprise” commitment to a particular BPMS platform, provisioning and administering new applications on that platform still requires significant IT resources.

- **Service provider integration.** SOA has made integration of business systems behind the firewall fast, reliable, and secure, and easily called by BPM. But equivalent performance, quality of service, and ease of integration are not available for connecting BPM to service providers outside the firewall.
- **Cultural barriers.** BPM implies change, and change inevitably invites resistance. The business may prefer to stick with a process that has serious but known problems rather than commit to an improved process with unknown impacts. In BPM, aligning business and IT goals is critical. IT must empower business to play a more direct role in specifying and even designing the systems that affect employees' daily work. The ability to experiment and iteratively improve would be extremely valuable, but BPM's cost, resource availability, and other barriers make this difficult. To expand across the enterprise, BPM must lower both the cost and risk of continual change.

You may be asking, doesn't SOA solve this problem? SOA is an important component in today's BPM, as well as an important underpinning of a successful cloud computing implementation, but it does not directly address these issues. SOA is an IT initiative aimed at increasing agility by more effective management of IT assets. SOA reduces IT development costs and improves agility by leveraging existing systems, exposing their functionality, along with new capabilities, as reusable business services with standards-based interfaces. SOA simplifies integration, especially behind the firewall, allowing once-isolated stovepipes to talk to each other. By itself, however, SOA does not eliminate important barriers to BPM proliferation: upfront capital outlay; resource backlog for application and infrastructure provisioning, customization, and maintenance; and the need to provide all of the services required by the BPM solution.

The next era of BPM will extend SOA to address these issues. It will lower the required initial capital cost and provide a cost structure better aligned with usage. It will empower business to play a more direct role in modeling, analyzing, designing, and provisioning solutions, encouraging collaboration and experimentation, reducing the cost and risk of continual change. And it will facilitate discovery and integration of external service providers, allowing the business to manage their processes end-to-end without necessarily performing all the steps themselves. To achieve that, the next era of BPM must leverage *cloud computing*.

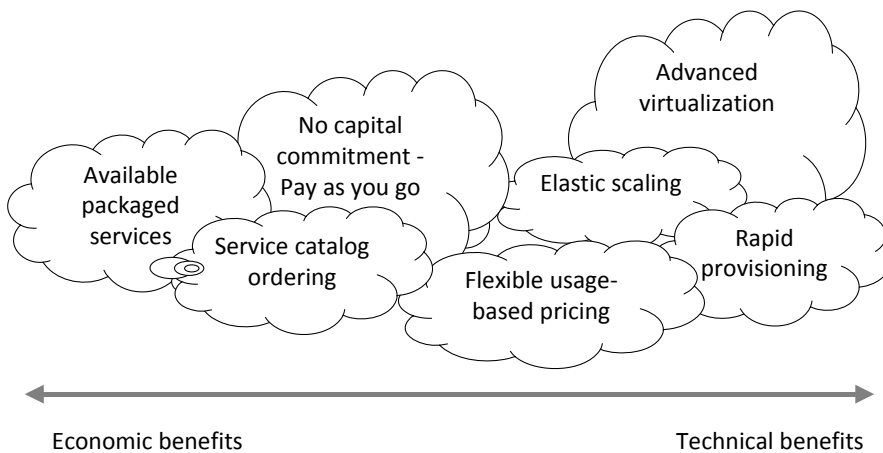


Figure 1. Common attributes of cloud computing

Cloud Computing: The Next Era of BPM

Cloud computing will enable the next era of BPM, in which implementation expands from isolated projects to a broad enterprise program. Cloud computing won't replace traditional

enterprise IT, but rather will offer an important additional mode of service delivery that greatly lowers the barriers to broad BPM adoption. In the past year, cloud has become a popular buzzword for many technology vendors, even without a single agreed-upon definition. You could say that cloud computing represents an extension of SOA to the World Wide Web. While conventional SOA uses Internet standards to interconnect services (mostly behind the firewall), cloud puts the service infrastructure itself on the web, available on demand.

For business, cloud computing represents a new way to access and consume business services. Cloud computing promises wide availability of business services packaged as a catalog of standard offerings and hosted by the service provider. That means companies don't need to build the services themselves, provision and host them on premises, or administer and maintain them using the company's scarce resources. Cloud computing offers the economies of scale of a shared infrastructure, while giving each application or business unit its own private space within the shared environment, and provisioning that space quickly, on demand, to the scale and quality of service required. Most important, cloud computing offers the business a new pricing model, one that does not require large upfront capital but flexible usage-based pricing, either per-use or per-user-per-month, fluctuating according to the peaks and valleys actual use. At the application level, this is often called Software as a Service (SaaS), but a similar pricing model can be applied at the platform or infrastructure level as well.

For service providers, cloud computing represents a new way to deploy and sell business services. Cloud computing relies on the new technology of virtualization to create an elastic platform based on blade server arrays that can scale to meet the instantaneous demand. Virtualization is the technology that enables the combination of elastic scaling with private spaces for service consumers within the shared infrastructure. Cloud computing gives service providers the tools to manage it all as a single large resource, plus metering and billing tools tailored to the new cloud-enabled pricing model.

These aspects of cloud computing all reduce the barriers to BPM adoption across the enterprise.

- **New BPM economics.** Cloud computing eliminates the large upfront capital outlay for BPM implementation, not just for the BPM platform but for the server hardware, database and storage components, development and test resources, etc. Because pricing is tailored to actual use, initial cost is low, encouraging iterative experimentation and change. For processes with seasonal or spiky volume, the cost rises and falls with actual usage, instead of paying for peak volume all the time. As improved technology becomes available, users are not locked in to prior capital investment but can upgrade without penalty to take advantage of the new capabilities.
- **Expanded BPM services.** Cloud computing enables process improvement by leveraging external service providers, either alone or in combination with internal services, instead of having to provide all process functions internally. Cloud-based BPM offerings could range all the way from packaged end-to-end solutions to BPM platforms running customer-specific processes, to collaborative infrastructure for modeling and analysis, to individual business services available for orchestration in customer processes. Whatever the scale of the offering, cloud computing lowers the barriers to BPM adoption by allowing the business to focus on continuous innovation rather than on the details of service development, hosting, and maintenance.
- **New culture of BPM.** With cloud computing, business is empowered to try out process improvements quickly, freed from dependence on scarce IT resources. At one extreme, business can acquire and deploy new process solutions on the fly with little or no IT involvement. In other cases, IT may be involved in some aspects of development and administration, but is freed from the burden of provisioning, maintenance, and so forth.

By reducing the barriers to experimentation and change, business self-service actually fosters business-IT alignment and BPM maturity throughout the organization. Beyond that, cloud computing has the possibility of creating a community of “BPM leaders” on the business side across the enterprise, further smoothing the path to programmatic adoption of BPM.

Public and Private Clouds

In the popular imagination, cloud computing usually implies software hosted on the public Internet, priced and delivered “as a service.” Well-known examples of such *public clouds* (Figure 2) range from Amazon’s EC2 infrastructure-as-a-service, to Google’s App Engine platform-as-a-service, to Salesforce.com’s packaged software-as-a-service. But many benefits of the cloud delivery model can be realized just as well with *private clouds*, that is, cloud infrastructure hosted on premises behind the firewall. Public and private clouds have their own characteristics and advantages, and both will play a role in the evolution of BPM.

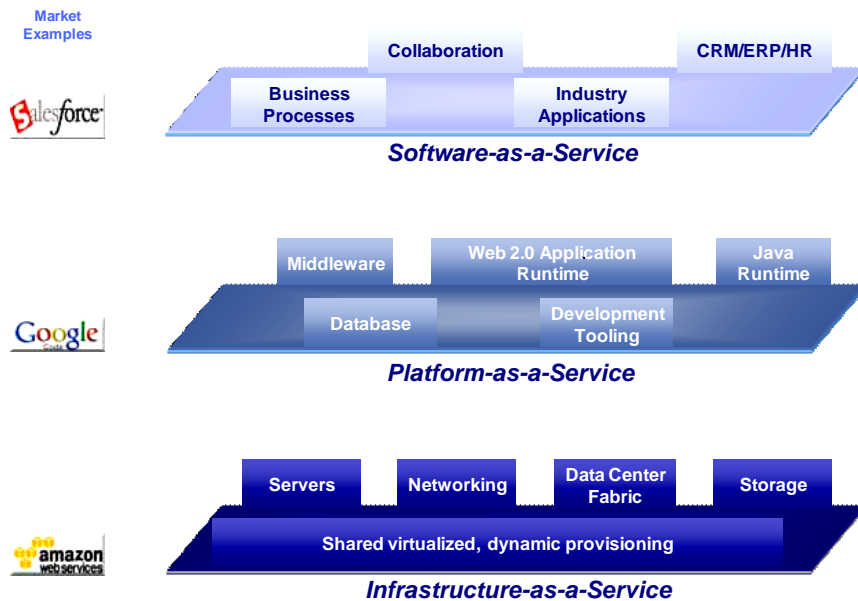


Figure 2. Cloud computing technology includes infrastructure, platform, and application-level technology offered “as a service.” Source: IBM

Figure 3 summarizes the differences. Public clouds, whether at the infrastructure, platform, or application level, are owned and operated by the service provider. The consumer of public cloud services does not need to provide anything except the subscription fee, typically on a per-month or per-use basis. This provides maximum preservation of capital and economic flexibility, and minimizes time-to-value. The services offered are packaged and standardized. They may be configurable by the service consumer but generally not customizable. Again this offers instant availability and convenience, with the added feature of enforced standardization.

Weighing against these public cloud advantages are concerns that could be important in certain circumstances. An obvious one is security and privacy. Regardless of the assurances and technical protections offered by the service provider, well-publicized instances of security breaches, particularly those where financial or health-related information is compromised, make many organizations reluctant to store sensitive data in a public cloud environment. A second

Public cloud	Private cloud
Service-provider owned and managed	Customer-owned and managed
Accessible to public subscribers	Accessible to private network only
Standardized packaged services	Customized services
Web-based security, privacy, performance, availability...	Enhanced security, privacy, performance, availability...

Figure 3. Features and benefits of public and private clouds.

concern is the lack of customizability. Standardization of cloud-based services offers convenience, but limits consuming organizations’ ability to tailor them to their own special requirements. Third, the cloud service provider’s performance, availability, or quality of service standards may not be sufficient for some applications. In any of these circumstances, private clouds may be a better solution.

Private clouds refer to cloud architecture hosted and operated by the service consumer organization. They require the consuming organization to provide the hardware, custom development, administration, and other solution components that users of public clouds don’t need to worry about. Private clouds run behind the firewall, not on the public Internet, so they are more secure than public cloud-based services, and can be designed to deliver performance, availability, and quality of service characteristics superior to those available on the public cloud. What makes private clouds different from traditional behind-the-firewall infrastructure is that cloud-based services retain the benefits of elastic scaling based on demand and instant provisioning of private domains within the cloud, with usage metering that enables fair and flexible cost allocation to users across the organization.

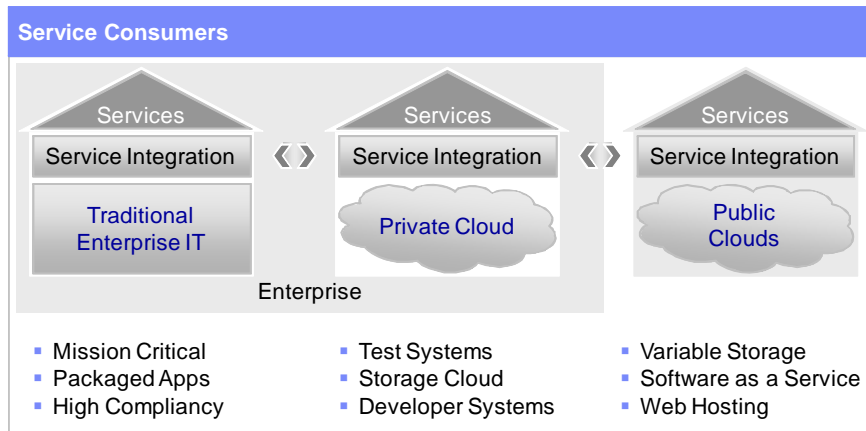


Figure 4. Typical use cases for public and private clouds vs traditional enterprise IT. Source: IBM

Figure 4 illustrates the kind of systems addressed by public clouds, private clouds, and traditional enterprise IT. Public clouds are typically used for convenience storage or backup of non-sensitive data, packaged SaaS applications, and a company’s web environments. Private clouds are often used for developer, pilot, test, or demo systems, and for large-scale storage management (storage cloud). Today, traditional enterprise IT is still the norm for mission-critical applications

with strict performance, availability, or compliance requirements. It is also the norm for packaged enterprise applications, where cloud computing is still used mainly to augment computing resources needs, as the enterprise cannot typically afford the risk or cost of migration to new environments. As cloud computing technology matures, an increasing fraction of functionality current delivered via conventional IT will shift to private and public clouds.

BPM in the Cloud

BPM in the cloud will not be a single type of offering, but will take multiple forms.

Cloud-Based Process Modeling and Analysis

Business process modeling and analysis tools and repositories are a logical entry point for BPM in the cloud. Tools such as WebSphere Business Modeler today provide a rich set of features for business process analysts to model activity flows, process data, and key performance indicators, and project expected end-to-end performance using simulation analysis. Typically these tools are used by business analysts through a rich desktop IDE such as Eclipse, with publication of read-only models for broader consumption through a web portal.

Extending this to the cloud could allow much broader participation in process modeling and analysis, in several ways:

- Subscription-based BPA. Repository-based enterprise business process analysis tools can be extended to a broader base of business-oriented BPM leaders throughout the organization. *Forecast: Public cloud. Today high cost-per-seat desktop BPA tools dominate this technology segment. Subscription-based public cloud offerings could expand the market.*
- Self-provisioned collaborative modeling workspaces. Cloud-based tools make it easier for distributed BPM project teams to instantly create and provision their own team workspaces for collaborative modeling and analysis. *Forecast: Public cloud. While a case can be made for private cloud here, tool vendor investment in browser-based tools and cloud-oriented repository technology favors the public cloud business model.*
- Hosted modeler communities combining host-provided tools and value-added services with self-provisioned private team workspaces and repositories. Cloud architecture's Web 2.0 user interface technology enables collaboration and social networking, features essential for driving broad consensus but usually missing from conventional process modeling tools. *Forecast: Public cloud. Communities of any sort just work better on the public Internet.*

Cloud-Based Process Design and Execution

BPM Suites allow design of executable process models, with deployment to the suite's process execution engine. For certain types of processes, extending BPMS to the cloud offers obvious economic, time-to-value, and business empowerment advantages. Again, a variety of offerings are possible:

- Cloud-based developer tools and repositories. As with business-oriented modeling, today's developer tools are typically Eclipse-based. While that is appropriate for most types of process design, cloud-based tools and repositories make collaboration easier among globally distributed design teams, and help extend BPM design to business users. *Forecast: Public cloud. For the same reasons given above for business-oriented modeling tools and repositories, tool vendor economics favors the public cloud business*

model, except when these tools are provided as part of a more complete cloud BPMS offering.

- Self-provisioned demo/POC spaces. Today's agile/iterative design methodologies feature frequent review by the customer, whether internal or external. Cloud technology allows instant provisioning of private team environments for test, demo, or proof of concept. *Forecast: Private cloud. Self-provisioned team spaces are already established in the collaborative content world with Microsoft SharePoint and Lotus QuickPlace. Even for non-cloud BPMSs, self-provisioned deployment spaces integrated with the BPMS provide a great way to demonstrate, test, or pilot BPM solutions for customers. Private clouds offer the required security and privacy, and may simplify application integration.*
- BPMS Platform-as-a-Service. Major barriers to BPMS implementation include the capital investment required upfront and the IT resources needed for development and administration. *Forecast: Public and private cloud. BPMS vendors can eliminate both of these barriers by hosting their BPMS on the public cloud. Alternatively, for companies looking to expand BPM to many applications across the enterprise, private clouds empower business by reducing provisioning bottlenecks, and provide a better platform for backend application integration and protection of sensitive information.*
- BPMS runtime component as a service. In addition to complete BPMSs, we could see individual BPMS components offered in the cloud. *Forecast: Public cloud for new, expensive, or "exotic" technology, such as business rule or CEP engines, as well as for standardized open source components such as BPEL engines, WS-HumanTask based universal worklists, and cloud-based service buses. In the first case, cloud offers a try-before-buy option for expensive technology; in the second, cloud-based subscription offers a delivery model consistent with open source economics.*
- Prebuilt SaaS processes and services. Several of today's popular SaaS offerings like Salesforce already include embedded process logic. The next generation of cloud-based BPM solutions will offer enhanced configurability of that process logic using a similar pricing and delivery model. *Forecast: Public and private clouds. SaaS BPM offerings could range from end-to-end processes and process libraries to individual BPM-aware services. Public clouds work best when all data is hosted by the cloud provider; private clouds may be a better choice when data systems of record remain behind the firewall.*
- SaaS BPM marketplaces. Cloud-based BPMS offerings will attract partner communities offering SaaS solutions on top of those platforms. As those ecosystems gain strength we can expect to see online marketplaces where solution developers can offer their solutions for cloud-based deployment. *Forecast: Public cloud. Like communities, marketplaces work best on the public Internet.*

Cloud-Based Process Monitoring and Optimization

Cloud-based process monitoring and optimization is the flip side of modeling and analysis. It could be offered either as part of a complete BPMS in the cloud or standalone, independent of a BPMS. The BPMS components related to monitoring and optimization include business activity monitoring (BAM), related to real-time monitoring and alerts, and operational analytics, a form of business intelligence focused on operational performance data. Cloud-based process monitoring and optimization could include the following:

- CEP in the cloud. Real-time business events from a variety of sources could be sent to a cloud-based complex event processing engine for correlation and aggregation, generating

alerts according to user-defined rules. *Forecast: Public cloud. Like other high-cost “exotic” technology, complex event processing vendors can expand awareness by hosting their offerings on the web.*

- **BAM in the cloud.** In addition to BAM within a cloud BPMS, process events could be sent in real time to a standalone BAM engine in the cloud for aggregation in dashboard widgets that monitor KPIs in tables, charts, and alerts. *Forecast: Public cloud. Databases and enterprise applications can be instrumented to issue events to BAM in the cloud for aggregation in tables, charts, and alerts. Security issues of inbound integration across the firewall are avoided. Some BPMS vendors could offer this as motivation for a full BPMS.*
- **Process analytics in the cloud.** Log data could be uploaded in bulk to populate OLAP cubes in an analytics engine in the cloud. Users would be able to slice and dice data by any dimension and generate dashboards of tables and charts to identify trends with drilldown to see details. *Forecast: Public and private clouds. For public cloud, the reasons are similar to BAM. Because of the large amount of data involved, private clouds can offer benefit of elastic scaling of storage and database.*

In addition to a database to manage the performance data, all of these offerings would include browser-based tools to define data elements, aggregation, monitoring rules, and presentation. In addition, they would provide dashboard widgets for predefined tables and charts, and query widgets for ad hoc analysis.

IBM's Strategy for BPM and Cloud

The Overall Cloud Strategy

As a major infrastructure and middleware provider, IBM has identified cloud computing as a central component of its technology strategy, and has signaled its intent to offer a broad cloud portfolio (Figure 5) including a common cloud platform, cloud services and tools, a common cloud user experience, and expertise to assist customers in cloud-enabling their business.

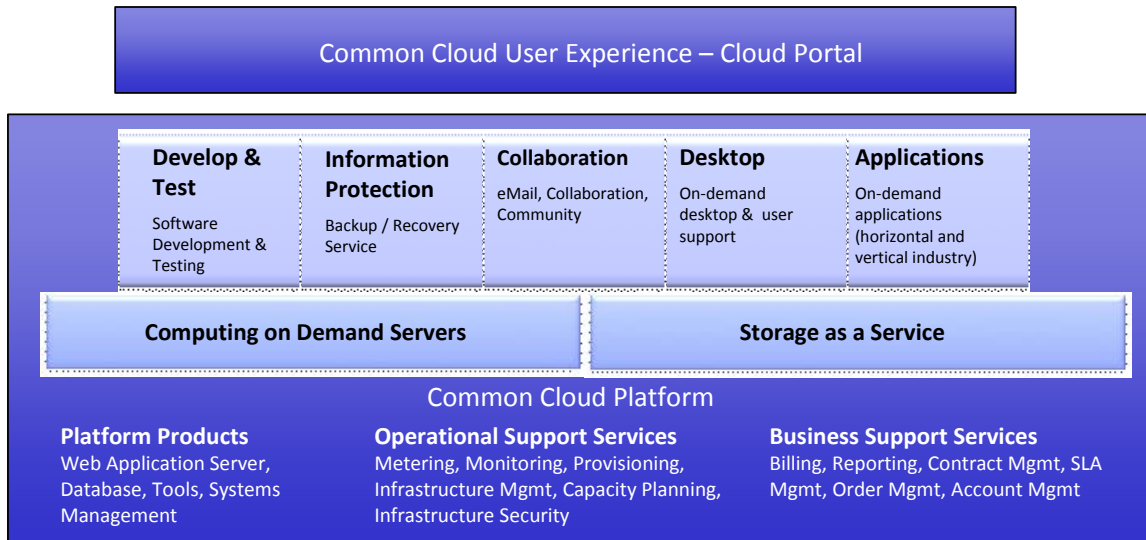


Figure 5. IBM plans a comprehensive cloud technology strategy. Source: IBM

IBM’s cloud computing strategy emphasizes three key elements:

- Common infrastructure to provide computing and storage resources for the clouds, including computing on demand servers and storage as a service.
- Common platform, Business Support Services and Operational Support Services to operate and manage clouds. BSS includes billing, reporting, SLA management and the like. OSS includes provisioning, metering and monitoring, infrastructure management and security.
- Implementation and Hosting Services to build private clouds. While public clouds have received most media attention, IBM believes that a significant fraction of traditional infrastructure can benefit from redeployment to private clouds.

Moving BPM to the Cloud

In BPM, IBM believes the key motivations for cloud computing are *shifting cost* and *accelerating time to value*, and that adoption will occur first in solutions and tools that provide immediate value. For example, community portals and industry solution content add immediate value, rather than a BPM platform-as-a-service on the public cloud.

Accordingly, IBM is setting the pace on a critical front: Web 2.0-based tools and reporting components packaged as *widgets* that can be arranged in role-based *business spaces*. You can think of widgets and business spaces as the evolution of portal technology to the cloud. Widgets are the Web 2.0 equivalent of portlets. They are browser-based components, with zero footprint on the desktop, that can be freely arranged within the business space, or portal, with other widgets, including those of other providers. The widget hides the underlying implementation, so that widgets can interact with each other, or *mashed up*. All of these capabilities are central to cloud computing.

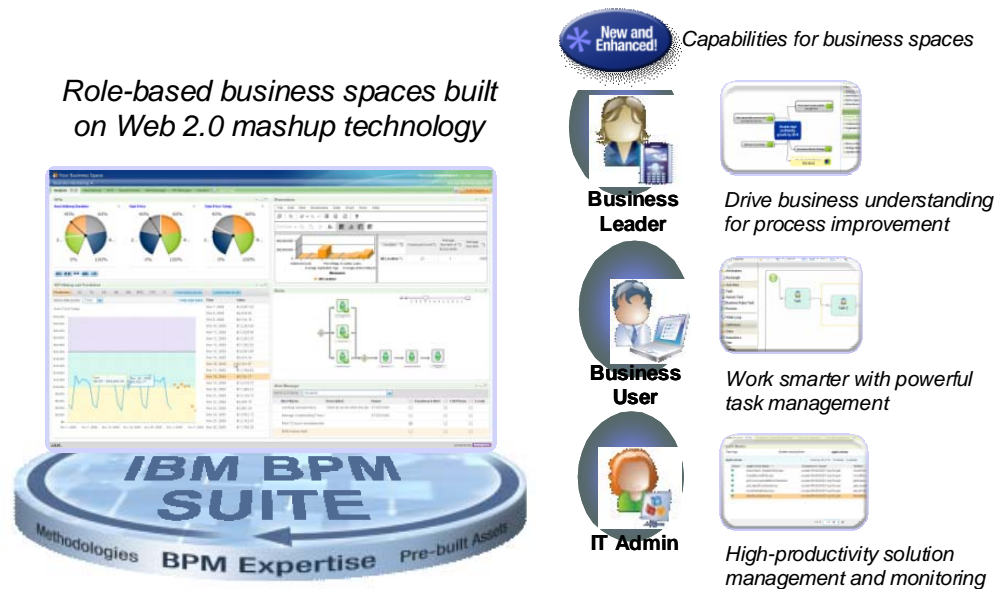


Figure 6. Widgets and Business Space cloud-enable IBM’s BPM tools. Source: IBM

IBM BPM Suite v6.2 introduced widgets and business spaces to BPM, exposing the functionality of WebSphere Business Modeler, WebSphere Business Monitor, WebSphere Business Services Fabric, and other BPMS components through role-based widgets hosted in a new portal environment called IBM Business Space powered by WebSphere.

For BPM, IBM has identified three basic roles, and widgets appropriate to each:

- *Business leaders*, involved in planning and strategy, including process modeling and analysis;
- *Business users*, who perform tasks as part of a running process; and
- *IT administrators*, responsible for managing and monitoring the systems involved in BPM.

In new v6.2 Feature Packs, IBM is introducing new widgets for each role.

- A new *Human Task Management widget* for business users puts user's BPM worklist in the cloud. It allows business users to view their processes, filter and sort their assigned workflow tasks, and claim, perform and monitor them.
- A new *Solution Administration widget* for IT administrators moves BPM system administration to the cloud. It allows administrators to monitor system health and determine and resolve problems when they arise.
- A new *Business Strategy and Motivation widget* for business leaders (Figure 7) introduces new high-level modeling capabilities that engage business analysts early in the process improvement cycle. It allows them to define strategic goals, process metrics and capability requirements, and link them to high level process views, as typically required in a vision document, strategy document, or project kickoff document at the start of a BPM project.

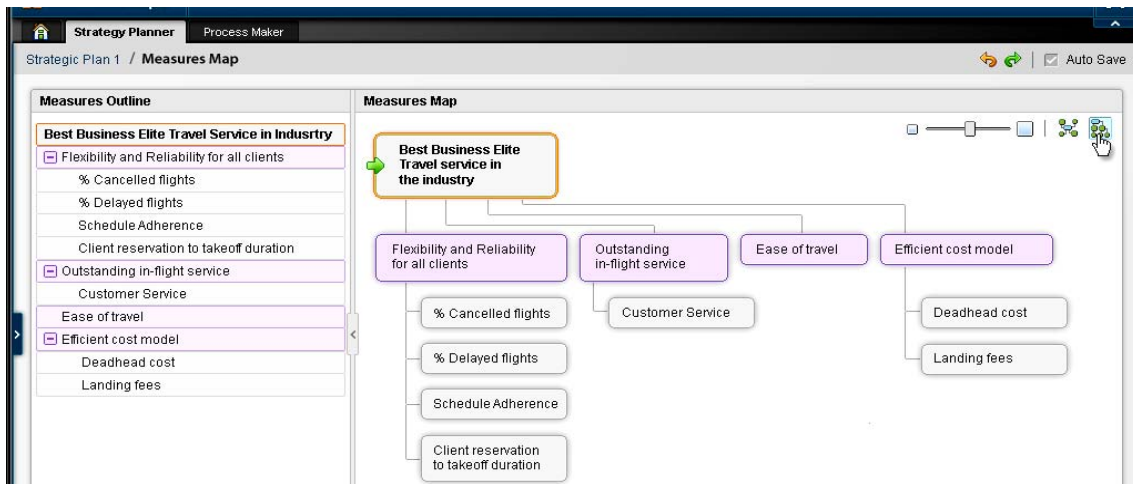


Figure 7. New Business Strategy and Motivation widget. Source: IBM

In addition to offering the Business Strategy and Motivation widget as part of the BPMS, IBM is making its capabilities available through a new public cloud-based BPM Community offering.

The community, open to the public, offers (Figure 8):

- A *content portal* through which users can search and retrieve process models and value chains, strategy maps, capability maps, and KPIs, in addition to papers, demos, podcasts, webcasts, and other collateral information
- Hosted *business-oriented modeling tools*, allowing users to view and extend artifacts in the content portal. They will be able to modify the process and organizational models, export artifacts to WebSphere Business Modeler and SOA Sandbox, and run through interactive process design.

- *Online collaboration services* using Lotus Live, facilitating networking and sharing of knowledge, artifacts, and files

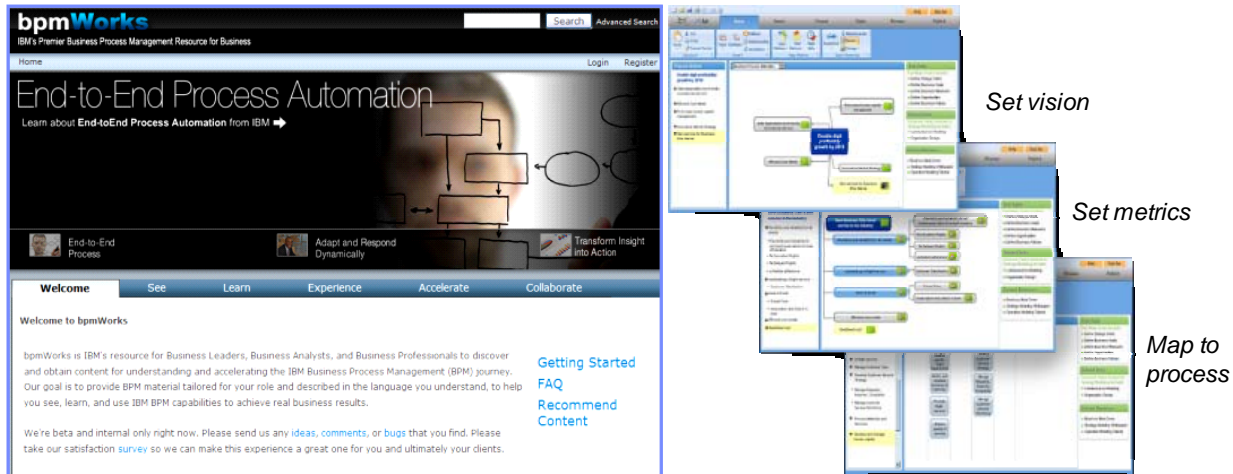


Figure 8. Cloud-based IBM BPM Community provides hands-on process modeling, analysis, and BPM education. Source: IBM

The new BPM Community not only allows business leaders to familiarize themselves with the capabilities of BPM tools, but also provides an easy way for them to try them out using IBM’s cloud-enabled technology.

The Future of BPM in the Cloud

These are still early days for BPM and cloud computing. IBM’s BPM Community is just a taste of the offerings to come. The technology is still evolving and key tools and infrastructure have just begun to roll out. But there is no doubt that the cloud computing paradigm will play an important role in the maturation of BPM. Certainly, economic pressures in the current environment favor cloud’s subscription-based pricing model, and the unrelenting pressures of change favor the agility of cloud’s business-empowering self-service capabilities. IBM believes the evolution of BPM in the cloud will begin with communities and portals, and progress to prebuilt SaaS process and service offerings, with BPMS platform-as-a-service limited to private clouds.

While admittedly speculative, here is my own forecast for the road ahead.

Modeling and analysis tools in the public cloud will dominate the first wave. Several offerings are either available or announced already. The key is the model repository, the database at the center of model governance and collaboration. Not only are repository-based BPA tools expensive, but the traditional client/server databases underneath just add to the IT provisioning and maintenance bottleneck. Subscription-based self-service cloud offerings fit the bill perfectly here. The release of BPMN 2.0 later in 2009 will likely further stimulate this segment of the market. However, to succeed in the cloud you need browser-based tools, ideally packaged so they can be mashed up in Web 2.0 business spaces, as IBM has done with its widget portfolio. No vendor has yet announced a BPMN 2.0-compliant process modeling widget, however.

The first wave will also see the beginnings of configurable packaged process solutions on the public cloud offered by subscription. Initially they will be developed by BPMS platform vendors, but once an offering gains traction the goal is creation of an ecosystem of solution partners with domain expertise. Again, a few BPMS vendors have already launched such offerings. The first round of these process solutions will mostly be non-critical situational processes that rely on the

service provider to host all of the data. It remains to be seen whether BPMS vendors will be able to compete with SaaS application vendors with less flexible process logic in this arena.

The second wave will see the rise of BPMS platform-as-a-service on private clouds. It will require a bit more maturation of cloud-enabled infrastructure and middleware, as well as a return to a more robust economy for enterprise buildout of BPM. The shift from projects to programs in BPM depends on increasing levels of business self-service, and private clouds offer that. While technical solutions for integration performance and security across the firewall will be found, they will take some time to gain public trust, so private clouds will likely be the principal path of “enterprise” BPM.

This is pure speculation, but offering special-purpose BPMS components like complex event processing, business rule management, and operational analytics by subscription via the public cloud seems likely in the second wave, as those technologies seek to establish their BPM value in try-before-buy configurations.

The Bottom Line

Cloud computing addresses many of the barriers that stand in the way of turning BPM projects into enterprise BPM programs. BPM leader communities such as IBM’s new offering will make it much easier to collaborate across globally dispersed organizations to align business strategy and process analysis, fostering consensus and business-IT alignment. Cloud-based modeling tools will enable not only model sharing across the enterprise, but standardization on notational conventions and best practices across the enterprise. The launch of BPMN 2.0 later this year provides a perfect opportunity to begin that transition.

Packaged BPM solutions on the public cloud allow the business to enjoy BPM benefits more quickly without the barriers of capital expense, IT resource availability, and alignment with the internal IT stack. Custom BPM solutions with seasonal or spiky volume profiles can take advantage of flexible cloud pricing based on actual use, not peak load. Where security, performance, customization, or backend integration requirements make BPM on the public cloud unattractive, private clouds simplify the proliferation of BPM projects on a common BPMS platform. Particularly when a BPM solution is replicated in the organization, the private cloud architecture empowers each business unit to provision and deploy with minimal drain on scarce IT resources. Moreover, the economics of scale mean lower operational cost for all participating units, and lower administrative costs as well.

We’re just at the starting line for cloud-based BPM, but the promise is already exciting.

Bruce Silver