Using IBM solutions and expertise to achieve business flexibility and innovation.

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Executive summary

Service oriented architecture (SOA) has the potential to create new opportunities for businesses of all kinds. At the same time, IT advances such as virtualization and the more widespread use of open standards are giving companies the tools necessary to collaborate and redesign business processes. These elements converge to enable businesses to reshape the way their IT assets create value, enabling them to develop innovative solutions that help deliver new products and services to the market. At the same time, these elements enable businesses to reuse existing assets, which ultimately give them the flexibility to address market demands faster and more efficiently.

This executive brief describes two major IBM initiatives that directly affect the way businesses can use their IT resources to their best advantage. It discusses how SOA and IBM Systems Agenda are critical tools that can help companies achieve their On Demand Business goals.

The underpinnings of a successful On Demand Business

In 2006, IBM is focusing on two major initiatives that are designed to establish the next step in IBM's commitment to transform companies to On Demand Business. IBM is delivering on the SOA promise with a range of software and services that have the ability to cover all aspects of the SOA life cycle—from development to management. Also recognizing that innovation is a continuous process that enhances business performance rather than an end in itself, IBM has introduced IBM Systems Agenda. IBM Systems are systems of server and storage products that are built on open standards and designed to be more easily integrated into existing and new IT infrastructures. They incorporate proven, innovative technologies that support collaboration, openness and virtualization. These three concepts are the basis for the IBM Systems Agenda—a commitment to deliver innovative technology that supports your need to achieve business flexibility and innovation.

It's all about your ability to meet market demand with flexibility and innovation. SOA and IBM Systems Agenda are designed to help you do this—regardless of the size of your business. At the core of the IBM SOA strategy is the IBM software portfolio, organized around IBM SOA Foundation, an integrated, open set of software, best practices and patterns that can help you get started with SOA.

ON DEMAND BUSINESS™

The infrastructure to support an SOA foundation should optimally respond to the business need for flexibility by using technologies with capabilities such as virtualization and automation. The infrastructure should also rely on open standards to foster wide collaboration across and beyond the boundaries of the company.

Many of the goals of SOA align with IBM Systems Agenda, which focuses on delivering technologies that can provide a flexible infrastructure to help businesses progress from point-to-point transactions to multidirectional interactions. In this open, shared environment, hundreds — even thousands — of people can work together dynamically to accelerate the delivery of leading-edge products and services to market, reusing their business logic and intellectual capital.

Why SOA?

SOA is, of course, an architecture. But it's also an approach to IT. An SOA approach can help you increase the flexibility of your business processes by making the most of your underlying technology infrastructure through the reuse of existing IT assets. New assets developed under SOA paradigms can also be reused, helping to reduce development and maintenance costs while expanding the gamut of products a company can offer.

Services are the primary component of an SOA. They are usually based on industry-standard Web services, built on XML and defined within the context of Web Services Description Language (WSDL). These groups of software components conduct day-to-day business processes — such as verifying a credit card transaction or processing a purchase order — independent of your underlying IT infrastructure. Within an SOA, autonomous, repeatable business tasks are accomplished by implementing a series of services. These services communicate with each other, and with jobs or applications, in well-defined ways. They then become the building blocks of new products or offers that are relevant to your business — and that you can snap together to create new business processes. In some sense, it doesn't really matter how a particular service is implemented, as long as it responds in the expected way to your commands, and offers the quality of service you require. By focusing on business processes and using standard interfaces, SOAs can mask the underlying complexity of your organization's IT environment.

SOA is process driven, which means a successful SOA requires involvement and leadership from finance, operations, human resources, marketing and any other business units that need access to data and applications. SOA has become a new way to focus on how to do business, because it enables unparalleled IT flexibility to support the business flexibility you need to thrive in a fiercely competitive marketplace. You can achieve this level of business flexibility by reusing existing assets, sourcing some services to a provider better suited to perform that task and by creating innovation ahead of market demands.

With this new flexibility comes a new level of demand on your underlying IT infrastructure. As these services communicate with each other, they might require more computing resources to maintain your service level agreements (SLAs). This communication can involve simple data passing—or it could involve two or more services coordinating some activity. Services can demand more computing resources for processing or storing information, and can be affected by poor performance, slow throughput of messages between services or simply a failure on the servers that host a service. A solid infrastructure is a key element for delivering on the full promise of service orientation.

IBM Systems

Companies can use IBM Systems together with IBM SOA Foundation to help create a flexible infrastructure in which information can flow more freely and securely, while maintaining high levels of availability and security in their IT environments. This flexibility is made possible by the core concepts underlying IBM Systems Agenda:

- Collaborative innovation. *IBM provides an extensive array of technology, services and solutions. In doing so, IBM enables you to better integrate your business processes with your IT processes.*
- Openness. *IBM has made significant investments in industry-wide development communities and in delivering systems that incorporate open standards. This commitment means that you can adopt new applications and systems into your existing IT infrastructures more easily and faster.*
- Virtualization. *IBM has one of the industry's most-comprehensive approaches to product virtualization—for both IBM and non-IBM products. As a result, you can adopt a flexible infrastructure that can improve the utilization and productivity of your IT systems.*

With IBM Systems Agenda, IBM has accelerated its focus to help break down barriers between hardware components and enable them to be integrated into more complete systems helping your organization evolve toward an infrastructure that can better support SOA. This infrastructure can provide elements such as virtual machines and virtual partitions, as well as management machines and software that can dynamically assign system resources to higher-priority services within composite applications in a heterogeneous environment. IBM Systems also offer capabilities that enable services and composite applications to be mobile across virtual machines and partitions.

Complementary goals mean a more flexible business for you

The focus on both SOA and the underlying infrastructure are natural evolutions of IBM's commitment to helping companies achieve their On Demand Business goals — so that they can integrate business processes end to end across the company and with key partners, suppliers and customers, while responding with flexibility and speed to customer demands, market opportunities or external threats.

IBM's vast experience with thousand of clients and engagements has demonstrated that successful SOA implementations are deeply related to a clear understanding of our clients' business pains. Because services can vary, you need a security-rich, adaptable hardware infrastructure that can grow as your business needs evolve, without sacrificing previous investments in resources and personnel.

With SOA, although the focus is on business processes with no particular emphasis on a piece of software or hardware, it is important to understand that implementing its architectural principles can affect your whole company. In fact, engagements with hundreds of IBM clients demonstrate that successful SOA projects have the potential to deliver their full promise of flexibility when they rely on a robust infrastructure that facilitates the reuse of existing assets and is poised for growth. Experience shows that SOA projects that are simple to deploy on open and reliable infrastructures can deliver tangible results and create a positive momentum to spread service orientation across the organization.

The underlying infrastructure must evolve over time to support application-level services in an SOA. For this reason, characteristics, such as virtualization, grid capabilities and open-computing options like using Linux® technology as the underlying operating environment, are particularly important as you start to build support for an SOA implementation.

Many of the goals required by the infrastructure that supports SOA align with the three major areas of the IBM Systems Agenda:

- *Collaborative innovation is supported by combining what IBM has learned from thousands of IBM Business Partners, along with specific industry expertise and IBM's own systems know-how to deliver tested solutions for businesses of all sizes. For more complex problems, IBM can collaborate directly with our clients—using your skills and our technology to solve real business problems.*
- *Openness is supported by significant monetary and intellectual investments in industry-wide development communities. IBM's commitment to open standards has enabled us to create products that connect and interoperate in standard ways. IBM also shares its technology and expertise with its Business Partners and other IT companies, helping to develop new and innovative business and industry solutions that you can choose from to address your particular business needs.*
- *Virtualization is supported by IBM Systems unique value for virtualization capabilities, which are IBM differentiators. These IBM virtualization technologies extend the view and capabilities far beyond the realm of simple partitioning beyond the box to create virtual access to resources, and the ability to access and manage resources as one.*

Focus on virtualization
Because one of the goals of SOA is to break down the physical connection between applications and the infrastructure on which they run, it is easy to realize how important virtualization capabilities can be. The services that make up a composite application should run in a distributed environment where they can get access to appropriate resources as they need them. This capability requires a flexible infrastructure that appears to these service as a virtual pool of resources with a common interface.

Virtualization offers several potential benefits for SOA implementation

- *It removes barriers that could prevent flexible access to IT resources.*
- *It helps maximize the use of existing IT investments.*
- *It provides a common interface to resources, helping to increase your flexibility to combine diverse technology.*
- *It aligns the performance of your IT infrastructure with your business goals.*

A virtualized infrastructure can provide the flexibility that SOA deployments require because it presents a logical representation that hides the physical characteristics of the connections. This capability enables you to view your IT infrastructure as one large pool of resources—and lets you split single resources into components so that you can manage them from a more-granular perspective. Also, access to a virtualized infrastructure is consistent regardless of the location or type of resource. And you can allocate resources dynamically to adjust to the needs of both applications and services. The flexibility of a virtualized infrastructure can enable you to add resources as needed to meet spikes in demand, while helping to minimize complexity and overprovisioning. You can also more-efficiently use your hardware resources—making it easier to shift loads to resources that are best suited to a particular request.

For SOA, using a virtualized infrastructure provides a standard, homogeneous environment that you can rely on to meet your business demands. It enables you to automate more aspects of your hardware platform—and as a result, your hardware platform can respond to new business-services requirements faster—and with the potential for lower operational costs to you.

Focus on open computing

Building capabilities across companies requires that all parties "speak" the same language—and that's the role played by open standards. As services become building blocks to implement business processes, you can improve your focus on keeping interfaces open and agreed upon. Standards are more than a nice-to-have feature; they are instrumental in helping to ensure that different building blocks can be connected to respond quickly and efficiently to the business needs.

Linux means flexibility for SOA project deployments

- *It is supported across many different types of hardware.*
- *It scales up and out to support SOA business demands.*
- *It delivers a solid business case for lower cost of ownership.*
- *It protects investment in existing UNIX® skills.*

At the very core of IT environments resides the operating environment, which shields the details of the hardware infrastructure to the middleware and final applications. Linux is one example of an open-source operating environment that is stable, highly secure and robust. Enterprises all over the world are adopting Linux for its flexibility, reliability, scalability and potential for cost savings. These benefits enable you to:

- *Scale your environment up and out to respond to processing demands.*
- *Leverage its support across many different hardware environments to help ensure the maximum reuse of IT investments.*
- *Take advantage of the power of community contributions that enable you to focus your attention on choosing the best hardware environment to fit your business needs.*
- *Avoid the costs and lock-in associated with proprietary alternatives that can prevent you from sourcing services to other vendors.*

What's your next step?

You've probably been searching for a way to implement your SOA project that helps you keep costs low by using existing IT infrastructure components and skills. As business and IT departments become more aligned, you can take a more-holistic approach to SOA—reusing existing investments and avoiding being locked in to a particular architecture.

In a traditional environment, the planning for IT capacity in terms of processing power, memory and storage—all the way to the physical considerations for the infrastructure—is normally performed in relation to, but not necessarily linked to, business needs. Many companies overprovision their infrastructures just in case there are spikes in demand. But the flexibility that SOA brings demands a nontraditional way to provision and manage the IT environment.

SOA is driven by business needs. It's fueled by the need to increase business-process efficiency and business agility. But you must not forget to take platforms into consideration from the very beginning. And although the encapsulation and reuse of existing business logic is core to SOA, you must be sure that the service performs and is available when needed—which makes it directly dependent on the reliability of your infrastructure.

You can begin with a starter project that offers reduced operational costs for building and implementing an SOA. Use this project to create momentum based on successful SOA proof points, and then move toward a company-wide implementation.

You'll probably start out by using the extra capacity available in your IT infrastructure, using resources made available through virtualization. And, as the SOA projects start to gain traction within your business, make sure you evaluate the impact this might represent to your operational infrastructure servers and storage.

Consider the benefits that virtualization, openness and a collaborative environment can provide if you embrace SOA. Virtualization can help shield your SOA deployment from the details of each particular operating environment while providing effective access and mobilization of resources across the company. Services created using open standards and open-source computing, like Linux, can help lower your total cost of ownership (TCO), and might be more suited to connecting other areas of your business, or connecting your business with your partners and suppliers.

Recommendations
Now is an exciting time. Technologies have matured and converged to deliver the means to implement more collaborative interactions between companies. SOA-based open architectures have the potential to deliver unprecedented degrees of IT flexibility. And SOA can help you fully explore the benefits technology can bring—and help you gain the advantage in addressing business challenges. SOA offers the potential to make the concept of reuse real. Use SOA as the basis for collaboration—and as a means to align your business needs and your IT environment. And gain the freedom to innovate by using your IT resources more efficiently.

IBM Systems virtualization and open-computing capabilities enable the tangle of heterogeneous, disjointed hardware resources to be presented as an unlimited set of capabilities—flexible, with reasonable cost, yet capable of handling complex tasks. All of your resources can collaborate to maximize business value.

Making your SOA a reality means that business, IT, suppliers and partners must collaborate. But it also requires that the IT resources collaborate, too. And IBM is uniquely positioned to deliver solutions that can meet these criteria. By adopting common standards, an industry can achieve uncommon things—like using technology innovations to bring business and IT together to address common objectives using SOA. IBM can provide easy-to-use technology and affordably priced integration functionality across the full range of requirements—as well as hardware and financing—to deliver a holistic view of technology that addresses your business challenges.

If you want to increase the flexibility of your business processes, strengthen your underlying IT infrastructure, and retain and reuse existing assets, SOA and IBM Systems Agenda features can provide the solution.

For more information
To learn more about IBM SOA Foundation, contact your IBM representative or IBM Business Partner, or visit:

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To learn more about IBM Systems Agenda, contact your IBM representative or IBM Business Partner, or visit:

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