IBM and the Strategic Potential of Web Services

Assessing the Customer Experience

An IDC White Paper
Sponsored by IBM

Analysts: Rob Hailstone and Randy Perry

5 Speen Street • Framingham, MA 01701 USA • Phone 508.872.8200 • Fax 508.935.4015 www.idc.com

IDC Analyze the Future

IDC OPINION

Web services have the potential to fuel the next major development in the evolution of the Internet. Web services technologies will increase productivity and help businesses more effectively address constantly changing demands. By deploying a Web Services Architecture[SM] (WSA) platform, companies gain more choice in determining which of their services should be made available to customers, partners, and suppliers. These external constituencies, on the other hand, will have a wider range of services to choose from. Unlike other ebusiness technologies to date, WSA provides complete platform independence, thus easing integration issues between systems as well as interoperability challenges for users. Web services have the potential to deliver significant return on investment (ROI) by reducing the time and cost to launch applications, enable Webification, and increase revenue.

With its comprehensive portfolio of Web services technologies (as enabled in its middleware solutions) as well as its strong ebusiness emphasis, IBM has claimed a leading position in the growing world of Web services. While many IT suppliers are promoting Web services technologies, few besides IBM can offer the product breadth and integration capabilities — software, hardware, services, and partnerships — that support this compelling new technology.

EXECUTIVE SUMMARY

Although Web services are in the early stage of customer adoption, it is clear that this ebusiness architecture has the potential to fuel the next major development in the evolution of the Internet. Web services technologies, which involve standards-based approaches to connectivity and interoperability made possible by the Internet, are beginning to help businesses better address the constantly changing

demands of the marketplace. By deploying a Web services platform, companies can better manage the information they share internally and externally, making employees, customers, suppliers, and business partners more productive. Companies will be able to quickly create new business opportunities, establish effective partnerships, speed application integration, and forge tight connections with their customers. Unlike other ebusiness technologies, Web services provide complete platform independence, easing integration between systems as well as promoting interoperability. Existing investments in applications can be carried forward into this new model.

This IDC White Paper examines the growing importance of Web services, discussing the many factors that are driving adoption. In particular, the purpose of Web services is to remove many of the constraints currently imposed by IT upon business, enabling better processes and, therefore, a better bottom line. We then focus on the IBM approach to Web services as well as the benefits that some of its customers are currently deriving. With its comprehensive portfolio of technologies (as exemplified in its middleware solutions) and its strong ebusiness emphasis, IBM can claim a first-mover advantage in the growing world of Web services. IBM has an infrastructure platform in place that is rapidly becoming Web-services–enabled.

As part of this study, IDC conducted in-depth interviews with seven IBM customers that are in the early stages of implementing Web services solutions. (Due to the strategic nature of their initiatives, companies did not want to be identified by name.) We found that the use of Web services enhances business value by reducing the time and cost to launch applications, enabling Webification, and, potentially, increasing revenue.

On average, major benefits projected over three years include a reduction in costs of $39.7 million on an investment of $1.8 million, 22% faster time to deployment of key new applications, and an increase of 47% in developer efficiency. It should be noted that the IBM customers we spoke with have been deploying Web services solutions using IBM technology and professional services for approximately six months, making a formal ROI analysis difficult.

Nevertheless, all customers told IDC that implementing Web services is a strategic effort, and they anticipate that the value of improving ebusiness channels will significantly increase over the long term. For most, time to market is a key driver. The ability to deliver services online to employees, customers, partners, and suppliers quickly and easily, using simple interfaces across disparate systems, holds universal appeal. In addition, the ability of external parties to manage their own account information via a self-service model was also val-

ued. Customers are seeking competitive advantage via Web services and are in the early stages of achieving benefits.

All customers interviewed by IDC spoke highly of the IBM services organization, which is helping them navigate through the maze of new technology. The IBM jStart team, in particular, received many favorable comments for its depth of technical and industry expertise. IBM appears to be working intimately with its customers in understanding their specific business goals for Web services, allowing the company to score high in customer satisfaction. The IBM customer experiences and their projected ROI from implementing Web services are discussed in more detail later.

THE BENEFITS OF WEB SERVICES ARCHITECTURE℠ (WSA)

WSA will have a direct impact in the following areas:

- Business process automation
- Enterprise application integration (EAI)
- Business-to-business (B2B) integration
- Application construction and flexible approach to outsourcing
- Better access to business functions
- Freedom to choose the best technology platform in each situation
- Location and device independence

IBM CUSTOMERS ARE BENEFITING FROM WEB SERVICES TODAY

In order to gauge the ROI potential of Web services as envisioned by IBM, IDC assessed the experiences of seven IBM customers. These customers are in the early stages of deployment (four of the interviewed organizations are in the test phase), and the full impact of Web services is as yet unclear. Nonetheless, the organizations IDC interviewed have experienced reduced call center, customer support, and application development costs as well as faster delivery of products and/or services. These organizations and their partners expect to enjoy an average reduction in costs of $39.7 million over three years, resulting from an average investment in IBM technology (enabled in its middleware solutions) of $1.8 million.

These projected savings are all the more impressive given that many companies have been in production for less than six months. IDC talked with service providers using Web services as their business infrastructure, enterprises exploiting Web services to jumpstart their ebusiness, and an online retailer that had set up its extranet partners with Web services. Each company experienced significant cost savings in a short span of time, roughly less than six

months. Further, these companies were able to report several important business benefits, including:

- Reduced time to launch new applications
- Enhanced productivity through Webification
- Increased efficiency and reduced costs
- Increased revenue

Although each company interviewed by IDC had specific reasons for implementing Web services, they also shared much in common. The companies had heterogeneous environments with Intel-based and Unix server platforms from multiple vendors. They were in the second stage of their ebusiness buildout and had already made significant investments in infrastructure. Understandably, they were not eager to "rip and replace" but sought to protect and extend their investment. In some cases, Web services acted as a catalyst and allowed companies to undertake new strategic initiatives. Although results varied, all companies significantly reduced the time to launch applications. Hence, each felt that it had gained a competitive advantage early on from Web services.

Integrating eBusiness Partnerships — A Key Goal

Most of the companies in our study employ Web services as a platform to support integrated ebusiness partnerships. A critical project is typically the launch of an application shared among partners, despite the presence of a variety of hardware and software infrastructure platforms. Applications currently shared across partners include the following:

- Common access control
- Knowledge management application programming interfaces (APIs)
- Account management
- Managing 401(k) contributions
- Content management
- Human resources
- Collaboration
- Communication

Companies we spoke with experienced an average of 22% less time in building selected new applications, from concept to launch.

One large financial services company was able to save three weeks of time (2,700 hours) and $170,000 in costs by introducing new applications via Web services. Another company, an online retailer, reduced the time required to set up the extranet relationships critical to getting its business off the ground from six months to two months. This time savings allowed the company to gain four additional

months of revenue. For this online retailer, the competitive advantage came from being first to market.

Moving Offline Activities Online

Web services enable companies to take advantage of one of the Internet's most significant promises — that is, moving offline activities online. The process of integrating disparate systems is made easier under the WSA paradigm, while customers can also benefit from optimizing the utility of the browser. The ROI impact is the increase in productivity that has been experienced from implementing Web services internally and across extranets. Productivity has to do with the percent of time employees spend on the various subtasks of their jobs that contribute to growing the business. (Productivity is measured in hours and the ROI value in hourly wages.)

One company interviewed by IDC began to develop an application in parallel with its infrastructure definition. Another started an application with its partners, allowing it to receive insurance information for banking customers. Customer profiles and policy information were developed into a one-stop source for its customers. The company is building the presentation layer and the communications interfaces on the banking side. Web services are used to communicate with the insurance company. The benefits of more effective management and better consolidation of information contained within multiple databases (internal and external) that can be expected from Web services has been a key driver of the project. Although formats are still being worked out, the company feels that it will be able to put many services into a central repository in cooperation with its partners, thereby benefiting both parties.

A medical services provider interviewed by IDC is a consortium of professional medical societies. The customer created XML and Web services standards to facilitate exchanging data. The goal was to create online communities using common interfaces for the purposes of sharing information and resources. The customer replaced a paper-based forms process where medical forms were sent in for verification. In automating this business process, its partner companies were able to reduce the time required to process claims by 50% through the elimination of paper handling (clearly, a low-productivity activity). Many members were able to raise productive time by approximately 2,400 hours annually, resulting in collective savings of $1.1 million. The increase in productivity had other significant benefits as well that could not be measured directly. For example, many clerical errors were eliminated and lost documents due to misfilings and misroutings were reduced. Employees had more time to review forms and implement quality-control measures, which resulted in more accurate work, faster turnaround, and higher customer satisfaction.

Realizing Savings Via Developer Efficiencies

Traveling hand in hand with productivity gains is greater efficiency. Efficiency is a measure of utilization of assets, and it has a direct

impact on profitability. The ROI value of increased efficiency is a reduction in costs, a reduction in the rate of growth of costs, or the elimination of cost (cost avoidance). In other words, doing more with less. If the immediate achievement of the implementation of Web services was B2B ebusiness simplification, the most widespread business value impact was the gain in efficiency.

As a result of deploying WSA platforms, the companies in our study were able to launch applications much faster and easier, thus increasing the efficiency of the developers. Since many of the companies were part of extended or virtual organizations, these efficiencies became apparent quite rapidly, with business benefits realized in the short term. On average, developers became 47% more efficient and companies were able to save $2.2 million annually through reallocation of developer assets or meeting increased demand for applications without hiring additional developers. In addition, companies with call centers were able to increase the efficiency of their operations by 15%. Because Web services are standards-based, it also protected prior investments in technology. Companies were not locked into specific service or platform providers.

By employing a Web-enabled ecommerce system, a government agency was able to standardize and automate the reporting format and data requirements for the companies that it regulates. In turn, the automation increased the efficiency of the government agency and the companies being regulated by 20–30%. Today, only 10–25% of the companies are involved, and the government agency estimates that by the time all companies are part of the system, it will have avoided hiring 10–12 people to monitor regulatory compliance.

The scale of Web-services–enabled projects varied widely from large-scale projects such as the government agency above to the Webification of a single process. Regardless, Web services had a positive, quantifiable business benefit, with money typically saved in development costs.

One company IDC interviewed offers financial products such as insurance and banking. This customer is using Web services to define interfaces to partners using SOAP and XML formats. The company wants to share information and to improve B2B relations with partners and large, high-value customers. The manager interviewed noted that the Web services project is one of the most important projects now being undertaken by his business, in cooperation with its banking partners. The company sees new possibilities to combine applications with partners for improved marketing and customer service. Like others interviewed, this company is using an IBM CICS-based system for maintaining and delivering customer information and will leverage it through Web services. Web services are expected to make the developers' jobs at least 50% easier, since better information will be generated from partners to launch new applications. The company does not expect new sources of revenue from its 3 million customers, but it does foresee the ability to improve service quality. Web services will be used to support back-office applications, improving customer service, and enabling faster new

product and/or service introductions. For this IBM customer, financial payback is a secondary concern to improving service levels.

Increasing Revenue: The Golden Ring

The near-term business benefit of Web services is clearly in cost reduction. However, as companies implement Web services and increase productivity and efficiency, the potential for increased revenue will be realized and will ultimately become an important driver of Web services demand for the future. Three sources of increased revenue will be directly attributed to Web services: applications with richer functionality, improved business process automation, and syndication to partners.

The first source of increased revenue will result from launching new applications with richer functionality. In a business-to-consumer (B2C) environment, enhancing the customer experience should produce more sales. The online retailer in our study estimates that its revenue has increased by 2% due to its distributors being able to create better B2C applications. The customer has only 10 retail stores, and it generates about 80% of its business from online sales. Web services technology lets the company get its distributors online faster by using simple interfaces, accelerating time to market. Setup time for initiating extranet relationships has been reduced by 33%, going from one year to eight months. Since Web services can be deployed using industry standards, an added benefit has been that the technical staff among its distributors is more eager to build applications than in the recent past.

This company views increasing the value of its distribution channel using Web services as paramount to its success. It also sees the possibilities for reuse and the potential for cost savings as important benefits. The customer has reasoned that the more useful, simplified applications it builds for its distributors and the more easily they can create their own, the more this extended sales force will want to sell its products.

This company's first project was a payroll application to be deployed for the customers of its customers. Its customers' applications currently communicate with Domino, and payment authorizations are conducted using smart cards and readers. Data is passed using XML and XMLife (a vendor); Domino passes it to the WebSphere server. Its WebSphere server sends XML data to the MQSeries server queue. Web services then sends a confirmation from the payroll server. And the Web services MQSeries integrator routes the messages intelligently to multiple application servers, or legacy translation. This company reports that positive results abound from its recent deployment of Web services. The company now has more distributors using online systems and estimates that a significant portion of its call center operation, about 100 people, are approximately 25% more efficient. The ability to reuse software through a WSA makes feature exposure easier across company borders for this company's 200 developers. As a direct result, 50 developers will become 30% more productive over the near term.

This online retailer's customers can now expect to get real-time updates of account information, with data synchronized. An accurate account update is calculated using a complicated formula, but now it can be done using online input from the customer and data from legacy systems. Web services will help the retailer grow its distributor base and make it more productive, which will give it true competitive advantage.

The second source of increased revenue is improved business process automation that can be expected from deploying Web services. Today, the key advantages reported by companies using Web services can be quantified in terms of greater efficiency and reduced costs. But over time, many companies anticipate that Web services will yield shortened production cycles, higher availability, and decreased customer churn, which together will result in increased revenue.

Finally, better syndication and distribution of functionality to other organizations via Web services will increase productivity, operational efficiency, and revenue. Over time, we believe Web services will generate a profound, beneficial change for most enterprises in how they interact with external parties.

Investing in Web Services

The other side of the coin in the ROI analysis for Web services is the investment required to generate related benefits. Here again, because of the leading-edge aspects of Web services, we are not yet able to formally assess the total investments of customers. One company we spoke with has invested very little in Web services to date but foresees a significant return on its small investment. It has focused on the development of applications and infrastructure. The company plans to install WebSphere to serve as a key component in building its Web services environment.

Since by design Web services involve the integration of hardware, software, and services, many associated costs cannot be easily disaggregated from other related IT costs. IDC did, however, obtain investment estimates from each organization interviewed and found that companies spent, on average, $6.76 per user for their Web services projects. Costs ranged from $0.17 to $17.50 per user. Users were defined as anyone in contact with the applications launched via Web services and included employees, partners, distributors, consortia members, customers, and regulated companies.

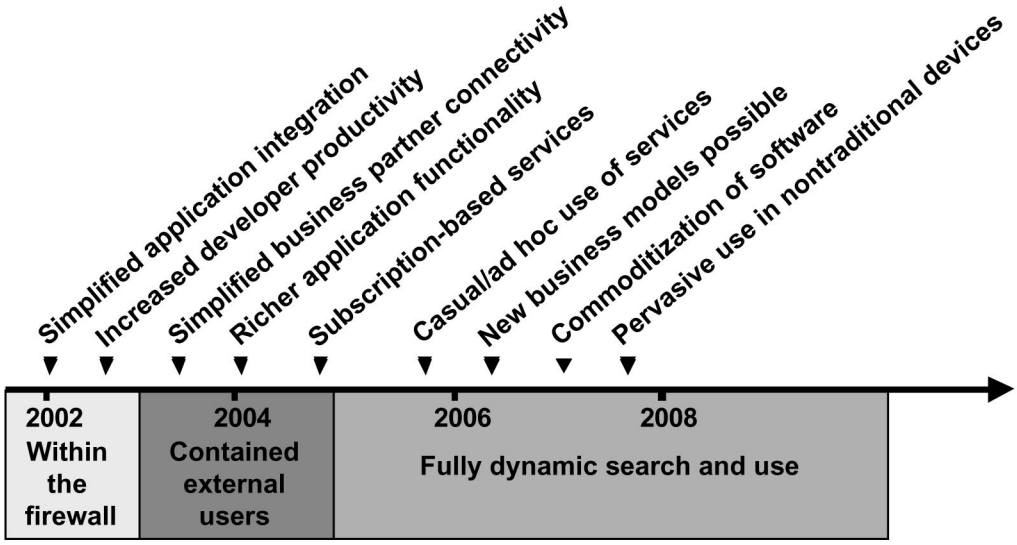
IDC believes that Web services will accelerate the fruition of ebusiness and will potentially result in staggering business value over time. Yet companies also have to realize that the business practices and methods within their organizations will need to change in order to take advantage of the new possibilities. It will not be possible to reap the potential rewards without rethinking some of the most basic assumptions about how one conducts business.

THE IBM APPROACH TO WEB SERVICES

IBM is a leading player in fueling the adoption of Web services, as it provides technologies necessary for deployment, especially in middleware and hardware platforms. Among other technologies, IBM provides development tooling to enable the creation of new Web services, the wrapping of legacy functions to expose them as Web services, and a runtime architecture that manages the movement of messages between Web services. WebSphere, DB2, Tivoli, and Lotus play an integral role within the Web services offerings from IBM. WebSphere Studio and WebSphere Application Server are the two main IBM offerings for deploying Web services. WebSphere Studio is a comprehensive suite of tools for building Web services, allowing developers, designers, graphic artists, and Webmasters involvement in the process. WebSphere Application Server supports Web services standards and integrates them with WebSphere Studio so that businesses can develop Web services with Studio and then deploy them to the server. The application server also includes interoperability with many other WebSphere and IBM products such as WebSphere Commerce Suite and Lotus Domino.

IBM does not approach Web services as another product offering, however, and there is no such thing as an "IBM Web services product." Rather, the company focuses on the infrastructure and is enabling its existing products to perform Web services, starting with internal Web services solutions. IBM sees the corporate intranet inside the firewall as the place where the benefits of Web services will initially be realized, given that companies can address their own operations faster and more easily than those involving external companies. In addition, security, protocol, and other standards that deal

Figure 1: IDC's Web Services Adoption Timeline



Source: IDC, 2002

with public infrastructure outside the firewall are in earlier stages of development and adoption. This focus fits with IDC's Web Services Adoption Timeline (see Figure 1), where Web services inside the firewall will be adopted sooner than those that reach outside.

IBM also offers training, education, consulting, and professional services to help developers and business executives alike understand and take advantage of the emerging technology. The company's range of offerings that touch upon Web services is very broad, giving IBM an extremely robust platform from which a company can launch Web services applications. Users have the ability to tie their applications together within the IBM infrastructure framework (database, transaction processing, messaging, systems management, collaboration, etc.). The IBM approach to Web services leverages the J2EE technology foundation and supports industry standards such as SOAP, WSDL, and UDDI.

IBM sees one key priority facing business IT investment today: creating an integrated infrastructure that ties together business processes deriving from multiple value chains by which an enterprise operates. To that end, IBM is a firm proponent of standards-based integration that will enable cross-platform interoperability, allowing customers to leverage the IT investments they already have rather than "rip and replace." The technology has evolved to the point where simple and accessible Internet standards such as HTTP, TCP/IP, and HTML have shown users the possibilities of a standards-based world, fueling the demand for a rapid adoption of standards beyond the browser. Using standards will reduce the costs of integration, a labor-intensive undertaking. IBM is a leading proponent of emerging standards that are required to support the advancement of this promising technology.

IBM encourages and supports developers at early adopter firms through alphaWorks, giving them access to the latest technologies, including those that are still in "alpha code," before they are licensed or integrated into other products. This allows users and developers to experiment and provide feedback to IBM research and development. Through developerWorks, IBM offers tools, sample code, tutorials, Webcasts, education materials, and other types of support for developers.

CHALLENGES FACING IBM

IBM is a highly visible leader in Web services technologies and related services. By working to set standards and to simplify sometimes-confusing technologies, IBM is helping users achieve complete platform independence. As with any new, promising technology, many claims are being made by a variety of IT suppliers that are seeking to gain traction in the market. Hence, it is difficult for some potential buyers to separate the hype from the reality. There is also some confusion in the market as to what Web services means and how it will benefit users. As a result, some potential customers are wary of investing in another technology that could turn out to be a passing fad, and IBM, like other suppliers, faces some skepticism. It

is also difficult for any company, even a large player such as IBM, to differentiate itself in a widespread undertaking that is so heavily reliant on industry standards.

CONCLUSION

Despite the many hurdles facing the adoption of any new technology such as Web services, IBM has made a major commitment to being a leading force. As an early market entrant in Web services with strong ebusiness initiatives, IBM, through its well-known offerings such as WebSphere, Lotus, Tivoli, and DB2, will play a key role in helping aggressive companies benefit from the adoption of Web services technologies. IBM has vast experience and resources to offer companies of virtually any size. On the technology side, IBM affords its customers the opportunity to better integrate and interoperate the many heterogeneous technologies that exist. Yet it is important to point out that companies do not have to be locked in to any one vendor in order to generate payback. The choice of vendor and product can be based on value and compatibility with the business rather than be dictated by prior investments.

The quantifiable benefits of implementing WSA, as realized by IDC in ongoing research and confirmed through the customer interviews conducted for IBM, are as significant as they are numerous. Productivity and efficiency gains, increased revenue, and reduced application costs, to cite a few, can contribute to a very positive ROI for companies adopting Web services.

THE EMERGENCE OF WEB SERVICES ARCHITECTURE℠ (WSA)

Why does IDC believe that Web Services Architecture℠ (WSA), an industry development, will be an important force behind the next major initiative in IT adoption? One reason is that this is the first time that major platform vendors, software infrastructure providers, application vendors, and consumers of IT have come together to agree on the standards by which the market will work. The level of cooperation among competing vendors in support of WSA surpasses previous cross-vendor standards movements that have taken place in the past, offering much promise.

The WSA is defined by IDC as the following:

"A standardized approach to dynamic component connectivity and interoperability that relies on self-describing components and open connectivity standards and emerging standards including IP (Internet Protocol), SOAP (Simple Object Access Protocol), and WSDL (Web Services Description Language). Other standards are evolving to meet operational and business requirements and, as they mature, will become part of the WSA."

The words "standardized" and "standards" are of great importance here, as the promise of Web services lies in technology independence and the adoption of and adherence to standards. WSA is an initiative aimed at realizing the full benefits of distributed computing, which permits new and existing components of logic to be brought together in different ways to support the evolving requirements of the business. The emphasis on the reuse of components introduces the potential for great improvements in developer productivity and the subsequent ability for companies to respond very rapidly to new business needs.

Traditional IT architecture has often been proprietary, making interoperability difficult and locking customers into prior investments. Web services will allow companies to leverage prior investments, obtaining greater benefit from past investments. From the user perspective, barriers to adoption are low, because WSA is the first major IT architectural development that does not require or expect user organizations to adopt a "rip and replace" policy.

Web services aim to remove current IT constraints by breaking up the tight coupling (or hard wiring) between applications and application components, changing them to a more adaptable loose coupling. The loose-coupling model of Web services is independent of the connected components within an organization or a hybrid service using functions from many companies.

WSA allows an organization to focus more on business processes rather than technology by assisting IT managers and business strategists in automating the following tasks and performing them more quickly and at lower risk:

- Define the activities (functions) it needs to perform in the execution of its business processes
- Determine which of these functions should be supported by its own in-house IT and which can be satisfied by external services
- Evaluate which services should be made available externally to customers, partners, and suppliers
- Ensure that all functions work together seamlessly while also providing the flexibility to change providers or replace individual functions
- Remove the dependency on underlying technology
- Use established functions, or implement new ones, without being held hostage by previous investments in IT

IDC expects that Web services will have an adoption timeline similar to other new technologies, with early adopters beginning to derive application integration benefits within the firewall in 2002 (refer back to Figure 1). Internet-based applications such as business partner connectivity and subscription-based services will not take off until 2003–2005. The technology will mature in the years beyond 2005, with the emergence of new business models and pervasive use in nontraditional (e.g., palmtop, cell phone) devices. Customers are beginning to derive the benefits of Web services today, however, as there are short-term as well as long-term rewards to be gained.

THE BENEFITS OF WSA

The positive impact of WSA will allow businesses to overcome many of the traditional barriers imposed by IT, giving them more freedom as they invent new business models and ways of interacting with stakeholders (see Figure 2 for potential benefits and deployment possibilities). Many of these benefits can be achieved in the short term, especially within the enterprise, but it will take longer to achieve full-scale synergies across the extended enterprise. In addition, using Web services for complex applications will take time due to the many parties and technologies involved.

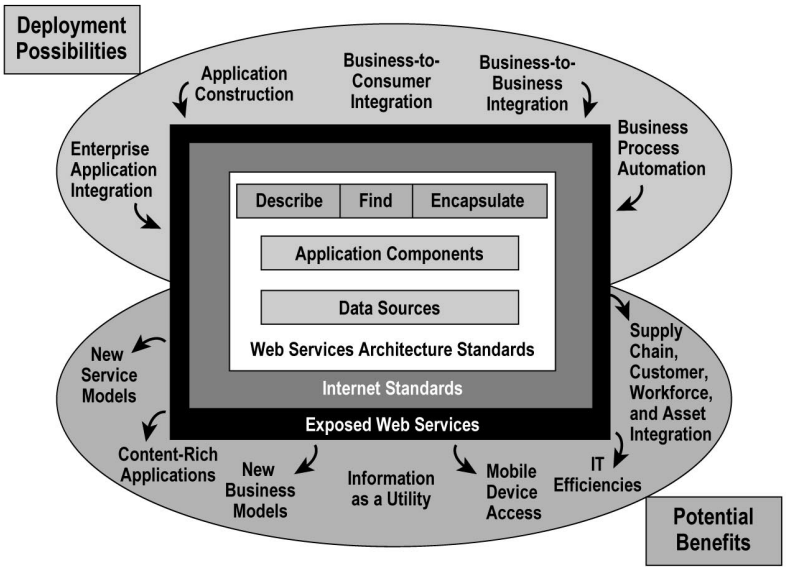
WSA will have a direct impact in the following areas:

- **Business process automation.** Web services exist in order to enhance ebusiness. Web services remove the need to carry out a separate integration project with each partner, customer, or supplier that the organization wishes to conduct automated business with.
- **Enterprise application integration.** Today's EAI products are typically point-to-point solutions built to integrate specific products with each other.
- **B2B integration.** Web services make it simpler for an organization to interact with other businesses and syndicate the functions it provides or aggregate functions provided by others. Organizations will find greater freedom to outsource not only IT functions

but also entire parts of the organization to specialized providers, reducing the scope of the organization and enabling it to concentrate on its core competencies.

- **Application construction and flexible approach to outsourcing.** Businesses will have more choices in how they construct applications. Instead of being faced with the alternatives of keeping all IT in-house or using the services of an application service provider (ASP) to deliver all (or a substantial part) of its IT services, an organization can select a mix of in-house and outsourcing with complete freedom to mix and match.
- **Better access to business functions.** A business may elect to provide external users with access to functions it has developed for its own purposes, either on a commercial basis or to foster better relationships.
- **Freedom to choose the best technology platform in each situation.** The decision regarding the most appropriate platform on which to deploy any new business function has often been colored by the need to integrate with established systems, both in-house and, increasingly, with business partners. Web services provide complete platform independence, reducing customer lock-in.
- **Location and device independence.** Web services are independent of the type of device, connection mechanism, or location of users. Mobile use, small form-factor devices, wide or narrow bandwidth connection, and other such technologies can all be easily integrated and/or utilized.

Figure 2: Potential Benefits and Deployment Possibilities of WSA



Source: IDC, 2002

Each of these business benefits is critical in the decision to deploy Web services technology. However, the long-term aim will be to remove the IT constraints that currently limit businesses from being structured in an optimal way. Many obstacles, of course, are in the way of achieving this utopian vision, but the necessary components are beginning to fall into place.

Whatever the initial factor that provides the incentive for a business to adopt Web services, once the initial project has progressed to the point where a number of applications have been "exposed" as Web services, these applications are now available to be reused in many new ways in support of new business initiatives. Subsequent projects will therefore be simpler to implement and will provide faster payback.

IDC Worldwide Offices

CORPORATE HEADQUARTERS

IDC
5 Speen Street
Framingham, MA 01701
United States
508.872.8200

NORTH AMERICA

IDC Canada
36 Toronto Street, Suite 950
Toronto, Ontario M5C 2C5 Canada
416.369.0033

IDC California (Irvine)
18831 Von Karmen Avenue
Suite 200
Irvine, CA 92612
949.250.1960

IDC California (Mountain View)
2131 Landings Drive
Mountain View, CA 94043
650.691.0500

IDC New Jersey
75 Broad Street, 2nd Floor
Red Bank, NJ 07701
732.842.0791

IDC New York
2 Park Avenue
Suite 1505
New York, NY 10016
212.726.0900

IDC Texas
100 Congress Avenue
Suite 2000
Austin, TX 78701
512.469.6333

IDC Virginia
8304 Professional Hill Drive
Fairfax, VA 22031
703.280.5161

EUROPE

IDC Austria
c/o Loisel, Spiel, Zach Consulting
Mayerhofgasse 6
Vienna A-1040, Austria
43.1.50.50.900

IDC Benelux (Belgium)
Boulevard Saint Michel 47
1040 Brussels, Belgium
32.2.737.76.02

IDC Denmark
Omøgade 8
Postbox 2609
2100 Copenhagen, Denmark
45.39.16.2222

IDC Finland
Jarrumiehenkatu2
FIN- 00520 Helsinki
Finland
358.9.8770.466

IDC France
Immeuble La Fayette 2
Place des Vosges Cedex 65
92051 Paris la Defense 5, France
33.1.49.04.8000

IDC Germany
Nibelungenplatz 3, 11th Floor
60318 Frankfurt, Germany
49.69.90.50.20

IDC Italy
Viale Monza, 14
20127 Milan, Italy
39.02.28457.1

IDC Netherlands
A. Fokkerweg 1
Amsterdam1059 CM, Netherlands
31.20.6692.721

IDC Portugal
c/o Ponto de Convergancia SA
Av. Antonio Serpa 36 - 9th Floor
1050-027 Lisbon, Portugal
351.21.796.5487

IDC Spain
Fortuny 18, Planta 5
28010 — Madrid
Spain
34.91.787.2150

IDC Sweden
Box 1096
Kistagangen 21
S-164 25 Kista, Sweden
46.8.751.0415

IDC U.K.
British Standards House
389 Chiswick High Road
London W4 4AE United Kingdom
44.208.987.7100

LATIN AMERICA

IDC Latin America
Regional Headquarters
8200 NW 41 Street, Suite 300
Miami, FL 33166
305.267.2616

IDC Argentina
Trends Consulting
Rivadavia 413, Piso 4, Oficina 6
C1002AAC, Buenos Aires, Argentina
54.11.4343.8899

IDC Brazil
Alameda Ribeirao Preto, 130
Conjunto 41
Sao Paulo, SP CEP: 01331-000 Brazil
55.11. 3371.0000

International Data Corp. Chile
Luis Thayer Ojeda 166 Piso 13
Providencia
Santiago, 9, Chile
56.2.334.1826

IDC Colombia
Carerra 40 105A-12
Bogota, Colombia
571.533.2326

IDC Mexico
Select-IDC
Av. Nuevo Leon No. 54 Desp. 501
Col. Hipodromo Condesa
C.P. 06100, Mexico
525.256.1426

IDC Venezuela
Calle Guaicaipuro
Torre Alianza, 6 Piso, 6D
El Rosal
Caracas, Venezuela
58.2.951.1109

CENTRAL AND EASTERN EUROPE

IDC CEMA
Central and Eastern
European Headquarters
Male Namesti 13
110 00 Praha 1
Czech Republic
420.2.2142.3140

IDC Croatia
Srednjaci 8
1000 Zagreb
Croatia
385.1.3040050

IDC Hungary
Nador utca 23
5th Floor
H-1051 Budapest. Hungary
36.1.473.2370

IDC Poland
Czapli 31A
02-781 Warszawa, Poland
48.22.7540518

IDC Russia
Suites 341-342
Orlikov Pereulok 5
Moscow, Russia 107996
7.095.975.0042

MIDDLE EAST AND AFRICA

IDC Middle East
1001 Al Ettihad Building
Port Saeed
P.O. Box 41856
Dubai, United Arab Emirates
971.4.295.2668

IDC Israel
4 Gershon Street
Tel Aviv 67017, Israel
972.3.561.1660

IDC South Africa
c/o BMI TechKnowledge
3rd Floor
356 Rivonia Boulevard
P.O. Box 4603
Rivonia 2128, South Africa
27.11.803.6412

IDC Turkey
Tevfik Erdonmez Sok. 2/1 Gul
Apt. Kat 9D
46 Esentepe 80280
Istanbul, Turkey
90.212.275.0995

ASIA/PACIFIC

IDC Singapore
Asia/Pacific Headquarters
80 Anson Road
#38-00 IBM Towers
Singapore 079907
65.6226.0330

IDC Australia
Level 3, 157 Walker Street
North Sydney, NSW 2060
Australia
61.2.9922.5300

IDC China
Room 611, Beijing Times Square
88 West Chang'an Avenue
Beijing 100031
People's Republic of China
86.10.8391.3610

IDC Hong Kong
12/F, St. John's Building
33 Garden Road
Central, Hong Kong
852.2530.3831

IDC India Limited
Cyber House
B-35, Sector 32, Institutional
Gurgaon 122002
Haryana India
91.124.6381673

IDC Indonesia
Suite 40, 17th Floor
Jakarta Stock Exchange
Tower 2, Jl. Jend. Sudirman Kav. 52-53
Jakarta 12190
6.221.515.7676

IDC Market Research (M) Sdn Bhd
Jakarta Stock Exchange Tower II
17th Floor
Jl. Jend. Sudirman Kav. 52-53
Jakarta 12190
62.21.515.7676

IDC Japan
The Itoyama Tower 10F
3-7-18 Mita, Minato-ku
Tokyo 108-0073, Japan
81.3.5440.3400

IDC Korea Ltd.
Suite 704, Korea Trade Center
159-1, Samsung-Dong
Kangnam-Ku, Seoul, Korea, 135-729
822.551.4380

IDC Market Research (M) Sdn Bhd
Suite 13-03, Level 13
Menara HLA
3, Jalan Kia Peng
50450 Kuala Lumpur, Malaysia
60.3.2163.3715

IDC New Zealand
Level 7, 246 Queen Street
Auckland, New Zealand
64.9.309.8252

IDC Philippines
703-705 SEDCCO I Bldg.
120 Rada cor. Legaspi Streets
Legaspi Village, Makati City
Philippines 1200
632. 867.2288

IDC Taiwan Ltd.
10F, 31 Jen-Ai Road, Sec. 4
Taipei 106
Taiwan, R.O.C.
886.2.2731.7288

IDC Thailand
27 AR building
Soi Charoen Nakorn 14,
Charoen Nakorn Rd., Klongtonsai
Klongsan, Bangkok 10600
Thailand
66.02.439.4591.2

IDC Vietnam
Saigon Trade Centre
37 Ton Duc Thang Street
Unit 1606, District-1
Hochiminh City, Vietnam
84.8.910.1233; 5

IDC is the foremost global market intelligence and advisory firm helping clients gain insight into technology and ebusiness trends to develop sound business strategies. Using a combination of rigorous primary research, in-depth analysis, and client interaction, IDC forecasts worldwide markets and trends to deliver dependable service and client advice. More than 700 analysts in 43 countries provide global research with local content. IDC's customers comprise the world's leading IT suppliers, IT organizations, ebusiness companies and the financial community. Additional information can be found at www.idc.com.

IDC is a division of IDG, the world's leading IT media, research and exposition company.

02C3335SOFTWA3335
May 2002

IDC
Analyze the Future

www.idc.com