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Achieving business flexibility with a service oriented architecture

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– Steve Mills, senior vice president and group executive, IBM Software Group

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Sincerely,

Sandy Carter
Vice President, IBM WebSphere Marketing

IBM Software Case Studies

Achieving business flexibility with a service oriented architecture

CASE STUDIES	LOCATION	INDUSTRY
Acuity	AG/USA	Insurance
Avis	AG/USA	Travel & Transportation
businessMart AG	EMEA/Germany	Computer Services
Charles Schwab	AG/USA	Financial
Citizens and Hanover	AG/USA	Insurance
CNH	AG/USA	Industrial
DaimlerChrysler	AG/USA	Automotive
IBM	AG/USA	Computer Services
Kookmin Bank	AP/Korea	Banking
Ministry of Justice	EMEA/Austria	Government
National Australia Group UK	EMEA/UK	Financial
OAG	EMEA/UK	Travel and Transportation
Standard Life	EMEA/UK	Financial
Travelex	EMEA/UK	Financial
Volkswagen	EMEA/Germany	Automotive
Xerox	AG/USA	Electronic

ACUITY leads the insurance industry in helping agents work efficiently.

Overview

- ***Challenge***
  Insurance company foresaw an opportunity to increase premiums and agent productivity by making it faster and easier for agents to access information
- ***Why Become an On Demand Business?***
  By responding to agents with realtime business processes, ACUITY could help agents gain efficiencies and productivity, while increasing its own market leadership and company marketshare
- ***Solution***
  ACUITY created direct company-to-company communication processes—connecting agents' own management systems to its core insurance transactions—by creating an adaptable, open infrastructure using industry standards
- ***Key Benefits***
  US$200 million increase in premiums over a 2-year period; 15% higher profitability than national average for property-casualty insurance companies; 40% increase in average premium per agency in the most recent fiscal year

ACUITY's technological initiatives have resulted in rapid growth for the company, creating the need for the additional space it will enjoy in its stately new headquarters.

As easy as it is for insurance companies to sell directly to the public over the Internet, many still choose to work through independent agents because of the expertise and personal commitment they lend to the process. In fact, companies like Wisconsin-based ACUITY (www.acuity.com) distribute their property and casualty insurance products exclusively through independent agents. A mutual insurance company, ACUITY provides policies to more than 170,000 commercial and personal customers in 11 Midwestern states. It manages over US$1 billion in assets and writes more than US$600 million in premiums.

"We needed to continue to streamline the insurance process and keep adding efficiencies to be responsive to our agents. We wanted to differentiate ourselves and make our agents loyal to us in the long run."

—Neal Ruffalo, vice president of enterprise technology, ACUITY

On Demand Business Benefits

- Increase of US$200 million in premiums over a 2-year period
- 15% higher profitability than property-casualty company national average by using technology to lower administrative costs and accelerate sales cycle
- 40% increase in average premium per agency in most recent fiscal year
- Productivity per employee 46% higher than the national average for insurance companies
- Ability to integrate business processes with those of agents while adding few or no extra steps to the agents' workloads, leading to increased agent satisfaction and productivity
- Resilient, easy-to-maintain infrastructure
- Ability to develop new applications in days, as opposed to months

The traditional partnership between independent agents and insurance companies continues to work as long as each party attends to the needs of the other. And when it comes to meeting the needs of its agents, ACUITY has a simple formula: "We try to make it as easy as possible for agents to do business with us," says Neal Ruffalo, vice president of enterprise technology, ACUITY. "Pressured to use every moment productively—in other words, sell—agents naturally favor responsive, easy-to-deal-with companies. We want to be one of those companies because therein lies tremendous opportunity." With this in mind, ACUITY has repeatedly transformed many of its operating processes in order to transact business faster and more easily, resulting in higher productivity and increased revenue for itself and its agents.

For instance, ACUITY recently moved some of its business-to-business (B2B) transaction processing to the Web, saving agents a significant amount of time. However, while the company continued to expand its online insurance system, it realized that it needs to remain sensitive to imposing extra tasks on its agents. According to Ruffalo, "We needed to continue to streamline the insurance process and keep adding efficiencies to be responsive to our agents. We wanted to differentiate ourselves and make our agents loyal to us in the long run."

Agents clamored for a way to provide comparative quotes for customers without having to access other online insurance systems. They found it cumbersome to leave their own agency management systems, log on to several insurance Web sites, and keep track of user names and passwords. They wanted to submit and manage business automatically by entering information only once, without duplicating data-entry tasks.

"This solution's technology costs very little to maintain and provides agents with the single-entry system that's been repeatedly called for by the insurance industry. Thanks to IBM and nVISIA, we have realized this vision."

—Doug Thayer, director of information technology, ACUITY

Strategy for long-term market leadership

As ACUITY weighed strategies for meeting the needs of agents, it observed that much of the insurance industry used systems that did not communicate with one another. ACUITY knew there were vast amounts of business waiting for the company that could introduce new communication processes using standardized methods. Moreover, groups within the insurance industry supported standardized information-exchange formats to enable companies and agencies to pass information back and forth automatically. By adopting these standards—and creating new insurance processes that any agent could access without having to jump around on the Web—ACUITY saw its chance to respond to agents with the systems that would open a new era of convenience.

Industry standards mean more profits

Working initially with IBM Business Partner nVISIA, ACUITY adopted the industry's information-exchange standards that connect companies in realtime and enable agents to obtain quotes without leaving their own agency management

systems. Instead of laboriously re-entering the information needed for quotes from multiple insurance companies, agents enter the information once and access as many companies as they wish simply by clicking on their names within an agency management system—assuming these companies are technologically equipped. Agencies provide their customers with better coverage at better prices, and still have more time to sell. Besides bringing in more revenue, the agents can leverage the systems and training in which they've already invested. And by opening up these automated channels, ACUITY quotes more business without needing to invest in new systems or additional human resources.

ACUITY saw evolving industry XML standards as a unique opportunity to respond to agents with new realtime business processes that would lead to greater productivity. The resulting solution has also kept administrative costs low and helped the company to develop competitive positioning to put it at the forefront of the industry. "We wanted to make it easy for any agent or industry provider to connect with us to do business automatically," says Ruffalo. "This is what the agents wanted because it would give them a wider choice of companies. By being an early adopter, we could become one of their premier choices."

nVISIA provided its Adaptive Software Infrastructure, a service-oriented architecture that greatly accelerates the development time for new applications. The nVISIA infrastructure enabled ACUITY to accept quote requests and application submissions in the standard XML formats used by most agency management systems. With nVISIA's mentoring, ACUITY leveraged IBM WebSphere® Studio Application Developer to create Java™ servlets. The solution utilizes IBM WebSphere Application Server Advanced Edition as a runtime environment for the Java code running on an IBM UNIX® processor-based system. IBM DB2® Universal Database™ for AIX® manages user profiles and other system data.

To obtain quotes, agents invoke requests using the agency management systems with which they are familiar. These systems are designed with the ability to access the Internet and pass XML data streams to IVANS Transformation Station or other industry-standard clearinghouses for XML data exchanges, which access the IP address of the ACUITY Web server. ACUITY's IT department created applications to cleanse and edit the XML streams and reconnect with the agent's system if any data is missing. Otherwise, the ACUITY applications running in WebSphere Application Server complete the transactions using IBM CICS® software on the ACUITY IBM @server® zSeries™ mainframe. Both nVISIA and ACUITY relied on IBM Rational® Unified Process® to develop business objects using a consistent methodology to minimize errors. According to Doug Thayer, director of IT for ACUITY, "IBM Rational Unified Process is an iterative process that enables developers to meet business requirements and reduce risk from their applications. It also has helped us to greatly accelerate our development process."

Key Components

Software

- IBM WebSphere® Application Server Advanced Edition
- IBM WebSphere Studio Application Developer
- IBM DB2® Universal Database™ for AIX®
- IBM DB2 Connect™
- IBM CICS®
- IBM Rational® Unified Process®

Servers

- IBM @server® zSeries®
- IBM UNIX® processor-based server

Business Partner

- nVISIA

While ACUITY can connect with most agency-management systems that utilize industry-standard XML formats, many of its agents use the Applied Systems agency management software to access and execute the ACUITY application. "This type of solution requires open-standards technology, which is what IBM provides," says Ruffalo. "IBM is a leader in the insurance industry precisely because of its commitment to open standards such as XML and Java technology."

Streamlined communications boost profitability

With its new online applications helping to boost ACUITY's premiums and keep costs low, ACUITY's combined ratio (a profitability measurement) is 15 points better than the national average. The company reports an increase of US$200 million in premiums over the past two years, from US$418 million to US$618 million. In ACUITY's most recent fiscal year, the average premium per agency increased 40 percent, while productivity per employee was 46 percent higher than the national average for insurance companies. Using nVISIA's Adaptive Software Infrastructure, ACUITY can now develop new applications in days, as opposed to months.

ACUITY is also able to integrate its business processes with those of its agents while adding few or no extra steps to the agents' workloads, a factor which has led to increased agent satisfaction. Citing ACUITY's consistent use of technology to meet challenges, rating agency A.M. Best has awarded ACUITY its A+ rating. Winner of four awards, in 2002, for early adoption of industry standards by ACORD—the industry standards body—ACUITY garnered eight technology awards given by the organization in 2003, as well as recognition from ASCNET, the Applied Systems user group.

Building on flexible technology

ACUITY has recently added a new function to its online services that enables agents to answer their own questions about a client's account balances. The company is working on additional applications that will further enable agents to manage policy changes.

"Our solid foundation requires little effort on our part to adapt for new applications, business partners and new agents," says Thayer. "This solution's technology costs very little to maintain and provides agents with the single-entry system that's been repeatedly called for by the insurance industry. Thanks to IBM and nVISIA, we have realized this vision."

For more information

Please contact your IBM sales representative or IBM Business Partner. Visit us at:

ibm.com/ondemand

For more information about nVisia, please visit:

www.nvisia.com

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Avis Futures drives customer service innovation to grow Avis brand.

Overview

- ***Challenge***
  Expand brand leadership by strengthening customer service and increasing responsiveness to market opportunities
- ***Why IBM?***
  IBM solutions provide the scalability, flexibility and openness required to help remove the roadblocks that slow service delivery
- ***Solution***
  A flexible service-oriented infrastructure that helps Avis rapidly launch dynamic service offerings
- ***Key Benefits***
  Accelerates service delivery time; reduces service delivery costs; enables the business to respond faster to customer requirements and competitive challenges; helps strengthen security and reduce risk

Because customer loyalty in the travel industry is typically low, Avis must deliver higher levels of service to keep customers coming back time after time. It's about making it fast and easy for customers to reserve, pick up and return rental cars while providing customers with a unified experience across the globe. To accelerate past the competition, Avis needs to be first to market with dynamic new service capabilities—whether it's enabling staff to check out cars using handheld devices or allowing customers to locate their rental cars using cell phones. According to Avis, dynamic services are essential to expanding marketshare. Avis units around the world work closely to build the Avis brand and create a seamless service experience worldwide.

"Avis Futures is very much about being an enabler. Our business units were constantly reinventing the wheel. We needed to help Avis become more responsive to customers or risk limiting its flexibility in the years to come."

–David Thomson, human resources director, Avis Futures

On Demand Business Benefits

- Providing reusable data integration, workflow and security components will reduce the time and cost of developing new services
- Automating document and identity management processes will reduce administrative costs associated with processing changes
- Centralizing identity management will help ensure the consistent application of policies to reduce risk and meet audit requirements
- Supporting single sign-on will help the company build a unified user experience across both Avis and Avis partner services

To meet this goal, Avis found that it needed to reduce the time and cost of delivering new services. Each time a business unit wants to launch a new service, developers need to write new code that enabled the sharing of data with the company's existing reservation, rental and information management system. They needed to build a new security infrastructure to help ensure appropriate access to sensitive and private information. Additionally, they had to re-create the underlying information management services that drove service delivery. All of this is time-consuming and costly, and limits the number and types of initiatives the business can deliver.

"What differentiates us from our competitors is our service. We must make it easy for customers to do business with us and respond quickly to market demands," says David Harris, chief information officer for Avis Futures, a project that is helping increase the company's speed and agility in delivering new business services.

"Avis Futures is an enabler," adds David Thomson, the project's human resources director. "Our business units were constantly reinventing the wheel. We needed to help Avis become more responsive to customers or risk limiting its flexibility in the years to come."

Passing the competition

To help drive innovation in customer service, the Avis Futures team realized that it needed to provide Avis companies with a set of building blocks that enabled the fast, secure and cost-effective integration of data and business processes. To accomplish this, the team is creating an infrastructure service that will make it easy for business units to share data between new Web-based applications and the existing reservation, rental and information management system.

Based on a service-oriented architecture (SOA), the infrastructure will enable Avis business units to deliver new services using any device type—from handhelds to cellular phones to laptops. It will offer document management capabilities to help business units more easily produce or change rental agreements and other forms, dynamically merge data, and leverage e-mail and fax to communicate with customers. It will also automate data sharing processes to help ensure that new information, such as an updated list of car locations, can be automatically distributed to relevant service applications. Finally, it will enable centralized security management to reduce support costs and help staff ensure that security is consistently applied across new services.

For Avis Futures to succeed in its objective, the team wanted to enable the infrastructure to support any business service the business managers could dream up. That meant providing an environment that would scale to support a large number of users and that would automate administrative functions to enable better use of staff time. It had to be platform-independent so that Avis business units could leverage the hardware, software and authorization mechanisms (e.g., digital certificates, biometric devices) that best meet their needs. Additionally, it had to be open to support the delivery of integrated service offerings that span Avis and Avis partner services.

Following a proven route to success

Working with IBM Global Services, Avis Futures is implementing IBM WebSphere® Business Integration and IBM Tivoli® identity management solutions to drive the company's new infrastructure service. IBM WebSphere MQ for z/OS® software and IBM WebSphere Business Integration Message Broker technology enable the sharing of data between new online applications and the Avis reservation, rental and information management system that resides on an IBM @server® zSeries® mainframe system running IBM DB2 Universal Database™ software. Additionally, these solutions help facilitate the movement of information to support publish/subscribe requests, such as enabling a customer to automatically receive an e-mail confirmation of his or her reservation.

Tivoli Security Management solutions help strengthen security, lower costs and accelerate development of new services by providing a centralized identity management infrastructure that helps secure access as a request moves from the Web to the company's mainframe and back. For example, IBM Tivoli Identity Manager software centrally coordinates the creation of user accounts, the automation of the approval process and the provisioning of resources. IBM Tivoli Access Manager for e-business software delivers comprehensive policy management and administration that provides the authentication and authorization framework to help prevent unauthorized access, protect the privacy of customer information, and enable single sign-on for Avis companies' online

Key Components

Software

- IBM WebSphere MQ for z/OS
- IBM WebSphere Business Integration
- IBM WebSphere Business Integration Message Broker
- IBM IMS®-MQ Bridge
- IBM IMS-MQ Adapter
- IBM IMS
- IBM Tivoli Access Manager for e-business
- IBM Tivoli Access Manager for Operating Systems
- IBM Tivoli Access Manager for Business Integration
- IBM Tivoli Identity Manager
- IBM DB2 Universal Database

Servers

- IBM @server zSeries

Services

- IBM Global Services

applications. IBM Tivoli Access Manager for Operating Systems technology protects individual application, data and operating system resources by building rules that establish access privileges for all accounts, including those on UNIX® and Linux® systems, while also providing robust auditing. IBM Tivoli Access Manager for Business Integration software provides end-to-end access control to help secure data and transactions as they are shared between the e-business applications and the company's reservation, rental and information management system.

"IBM solutions provided the scalability, flexibility and openness to support whatever our business units needed to do," says Joseph Pittari, the project's chief technology officer. "We felt the integrated approach would help us effectively keep pace with evolving Web services standards and enable us to reap the benefits that come with working with one vendor instead of three or four."

Speeding delivery of new services while taking control of costs

According to the Avis Futures team, once completed, this new infrastructure will enable Avis business units to respond faster to customer requirements and competitive challenges and help them bring new customer services to market more quickly. Additionally, it will help ensure the consistent application of security policies to reduce risk.

Providing reusable data integration, workflow and security components will reduce the time and cost of the development process. Similarly, automating document and identity management processes is expected to reduce administrative costs associated with processing changes—from provisioning new users to adding or changing contracts. For example, the intelligent workflow and provisioning engines embedded in Tivoli Identity Manager software can help administrators reduce the "turn-on" time for new users from days to minutes. "The automation provided by IBM solutions makes it much easier and more cost-effective to administer access and maintain control over our services," says Pittari.

Harris is quick to point out that it's too early to discuss what types of services each Avis business unit will ultimately develop using these infrastructure services. But that's OK, he stresses. Avis Futures is creating a new landscape that provides the business with virtually unlimited opportunities. "Using IBM solutions, we've built a flexible service-oriented infrastructure that will enable Avis to develop creative solutions to widen our competitive advantage," he explains.

For more information

Please contact your IBM sales representative or IBM Business Partner.

Visit us at:

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WebSphere® software

New paths for the marketplaces of businessMart AG.

Overview

- ***Challenge***
  Creation of a scalable open platform for an electronic B2B marketplace
- ***Solution***
  With IBM WebSphere® software, a stable, robust, and secure platform could be found which became the basis of a consistent restructuring into a service oriented architecture
- ***Key Benefits***
  The most important portal functions could be used directly in the software of the portal user. The labor expenditure for unclear order positions was minimized thanks to the possibility of real-time correction

To connect an increasing number of subscribers to its portal-based transaction system, businessMart AG adopted a service oriented architecture solution powered by WebSphere software from IBM.

Young and successful

businessMart AG was founded in February 2000 and currently employs a workforce of twenty-eight. businessMart conceives and realizes electronic marketplaces and e-business systems for commerce, industry and handicraft in sectors with catalog-based articles. Measurable improvements and savings are achieved with the consistent orientation to the sector processes of its customers and to the in-depth integration of the computer systems of the suppliers and customers.

"The primary success factor for a B2B marketplace is to build and model complex electronic business processes running parallel without a bottleneck. The immense, high functionality of the WebSphere platform gives us the flexibility to scale."

– Thies Frahm, COO, businessMart AG

Key Components

Software

- IBM DB2® Universal Database™
- IBM WebSphere Application Server
- IBM WebSphere Business Integration Server Foundation
- IBM WebSphere MQ
- IBM WebSphere Studio Application Developer - Integration Edition
- SUSE LINUX® Enterprise Edition V8.1

The broad spectrum of services from businessMart ranges from conception through technology modules all the way to the founding of independent, market-leading portal operating companies. businessMart now carries out the ordering processes of more than sixty suppliers with nearly 3,000 customers and more than 25,000 orders per day. businessMart currently operates two sector portals, and additional projects are in preparation.

Better integration—but how?

The continuous growth of the portals gives businessMart AG increased transaction revenues and clear growth in subscribers. Accordingly, more and more outside systems have to constantly be connected to the portal. The decisive head start in technology—the far-reaching integration of the computer systems of suppliers and customers into the portal—was to be expanded even further to be able to be converted substantially more economically. businessMart went in search of a solution which would significantly simplify the interface management and provide a reliable, flexible and easily controllable platform for the exchange of business process information.

Conversion of the architecture

businessMart conceived a service oriented architecture (SOA) and implemented it throughout the entire portal. Within that context, the technology components were corrected in independent individual modules, so-called “services”. With them, business processes no longer had to be conducted through the bottleneck of a portal center, but rather could be processed in parallel in the allocated modules. The architecture uses IBM middleware to connect the customer systems with the available applications. In that regard, a central interface is employed for all of the portal components. The use of the component architecture makes a significantly faster development possible. The computer systems of new clients may now be integrated just as quickly as separate modules. What is created are thus efficient and reusable application modules. The result is software maintenance and care that is significantly more economical. In addition, the consistent use of fallback rules ensures that the system stability is not threatened by the failure of a single (outside) component.

The advantage of the new solution

The decisive additional value arises for the customers of businessMart AG, however, through the now unrestricted transferability of individual portal services to outside software systems. The most important portal functions can now also be used directly in the customers' usual software via Web service interfaces. In order to call up product details with pictures, exploded diagrams, operating instructions, or even supplier searches, the customer no longer needs to exit his or her own merchandise information computer system. These portal services are seamlessly integrated into the software and passed on online from the portal. The customers of businessMart profit from faster and more comprehensive possibilities for intervention: Time-consuming, manual information processes were digitized and have thus been made more economical.

For the integration of the customers' various back-end systems, businessMart uses the IBM WebSphere technology with IBM WebSphere Business Integration Server Foundation and IBM WebSphere MQ. Among other things, sixteen different SAP systems are connected to this. Marketplace participants now can simplify the flow of information, as well as increase their sales and reduce their procurement costs.

In e-business, the contribution margin killers are unclear order positions that generate manual questions by telephone and annoyances through wasting time. It is especially this step which can now be processed significantly more efficiently through the portal: If the system recognizes an obsolete article number, an unclear entry of a packing unit, or even a format error, the supplier or the customer is contacted in real time. They can immediately remedy the problem by themselves directly in the portal through a correction or through the creation of a conversion rule.

Subscribers can correct inaccuracies in the order system themselves and thus reduce the number of time-consuming phone calls they have to make.

The technology behind the portal

In order to convert the integration platform, the robust WebSphere software platform was used. The following components are used with this:

- *IBM WebSphere Application Server is used as the Java™ 2 Platform, Enterprise Edition (J2EE) application server in connection with IBM WebSphere Business Integration Server Foundation as the integration server under SUSE LINUX Enterprise Edition V8.1, which at the same time executes the processes with the Business Process Choreographer under BPEL (Business Process Execution Language) and makes Web services available. IBM WebSphere MQ supports the communication between the portal and the various systems of the clients.*
- *IBM DB2 Universal Database functions as an SQL database for the business process engine and the Web services of the application servers. IBM WebSphere Studio Application Developer - Integration Edition offers a robust Eclipse-based development environment. The integrated Business Process Choreographer allows a comfortable graphic conversion of business processes through the use of the BPEL standard. In addition, the WebSphere Studio Application Developer offers comprehensive support for Web services.*

Well equipped for the future

With the transfer of the portal functions to the systems of the customers and suppliers, the first step was taken in the expansion of the business model. In the future, companies will no longer exchange their order information only by means of contacts, but rather they will allocate applications and have joint access directly to IT services. A portal will have to take over the role of the interface management in order to keep the complexity at an acceptable level for the market partner. While in search of a modern technology base, businessMart at the same time also found an engine for an evolutionary step.

For more information

Please contact your IBM sales representative or IBM Direct at: 1 800 IBM-CALL.

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For more information about businessMart, visit *www.businessmart.de/en*

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Case Study

Charles Schwab Responds to Market Conditions and Customer Needs

Services-Oriented Architecture Improves Time to Market and Leverages Existing Investments

By David S. Marshak
December, 2003

A Patricia Seybold Group e-business on demand case study prepared for IBM Corporation

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Charles Schwab Responds to Market Conditions and Customer Needs

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By David S. Marshak, Patricia Seybold Group
Prepared for IBM

EXECUTIVE SUMMARY

Thirty years ago Charles Schwab, Inc. revolutionized the brokerage industry with a new business philosophy: providing the individual investor with useful services for a fair price. A dynamic marketplace, however, has created new challenges and opportunities for Schwab. The market downturn and competition from Internet discount brokers have cut into transaction fees, the company's main source of revenue. At the same time, many investors have lost confidence in traditional, full-service brokers due to apparent conflicts of interest. For Schwab, this presented the opportunity to grow and differentiate itself by providing access to independent consultation and advice on a clearly defined fee basis.

Historically, Schwab has tied its IT infrastructure tightly to its business goals – in particular, the company focused on delivering an architecture that supports the best customer experience possible. To grasp this new opportunity, Schwab knew that it would have to standardize and simplify its infrastructure in order to provide seamless support across multiple channels.

Leveraging its long-term relationship with IBM, Schwab elected to create a services-oriented architecture, based on open standards, to support enhanced communications and integration, and virtualization, to make better use of existing assets. Ultimately, the goal is to create a more efficient, available and resilient architecture and set of tools that will permit Schwab to deliver relevant, consistent advice in a more responsive manner—whether the customer is at an investment center, on the phone or on the Web.

The services-based architecture, and the new processes and applications it supports, means that Schwab can provide customized advice to all its customers, whether they choose to work one-on-one with a Schwab Private Client Consultant, with the Schwab Advisor Network, or independently. With its focus on being responsive to market conditions and customer requirements and its commitment to an integrated services-oriented architecture, open standards, and leveraging its existing environment, Schwab is providing a strong example of a company that is positioning itself for success in the on demand world.

Background on Charles Schwab

Schwab Principles:

- Respond and adapt to changing business climate, evolving customer needs, and new opportunities
- Create an adaptive, flexible services-oriented architecture to enable new business applications without impacting existing systems or customer experiences
- Maximize the use of existing resources and reduce costs

The Charles Schwab Corporation (NYSE:SCH), through Charles Schwab & Co., Inc. (member SIPC/NYSE), U.S. Trust Corporation, CyberTrader, Inc. (member SIPC/NASD) and its other operating subsidiaries, is one of the nation's largest financial services firms serving 8 million active accounts with $758.4 billion in customer assets. Schwab provides a full-service investing experience to customers through 422 domestic offices, 4 regional client telephone service centers and automated telephonic and online channels. The independent, fee-based investment advisors served through its Schwab Institutional division manage about 30% of Schwab's customer assets and 15% of its customer accounts.

Charles Schwab revolutionized the brokerage industry (see Illustration 1) by focusing on the principle of providing the best customer experience within and across all channels and touchpoints. For Schwab, customer experience encompasses not only the specific customer interactions in retail locations, on the Web, and on the phone, but also includes a common, seamless experience across them—after all Schwab President David Pottruck coined the term "Clicks and Mortar." In addition, customer experience extends to the actual business being done via these touchpoints and channels, while it is critical to maintain the customer's confidence in Schwab as ethical, objective, and independent.

Schwab and Schwab.com are often cited as best in class, and just in the past year Schwab has won top honors from organizations such as Gomez (Internet Broker Scorecard #1 ranking over all and #1 for ease-of-use and onsite resources), Forbes (who singled out CyberTrader as "Best for 'Hyperactive' Traders" and Schwab.com as the "Forbes Favorite" brokerage Web site), and CIO Magazine (one of the CIO-100, where Schwab was honored specifically for "effective integration of customer information from various channels").

Schwab was able to ride (if not drive) the investment wave of the late 90s by sticking to this customer-centric principle, and is now creating its new "post-bubble" identity based on that principle. In fact, rather than simply scaling back as its industry dramatically slowed down over the past few years; Schwab is evolving its focus on customer experience (particularly on customers' desires for ethical, objective, and independent advice) to recast its previous transaction-oriented relationships with the majority of its customers into more of a trusted advisor relationship.

According to Beth Devin (Executive Vice President, Advisor and Client Technology), in order to maintain and extend its relationship with its customers, as well as deal with the day-to-day realities of its business sector, Schwab continues to focus on a set of business and technology principles.

In this Case Study, we will examine how these principles have been and continue to be applied across a set of infrastructure and business application projects at Schwab. We will further see how Schwab is using these principles to guide it as it evolves its business in an on demand world.

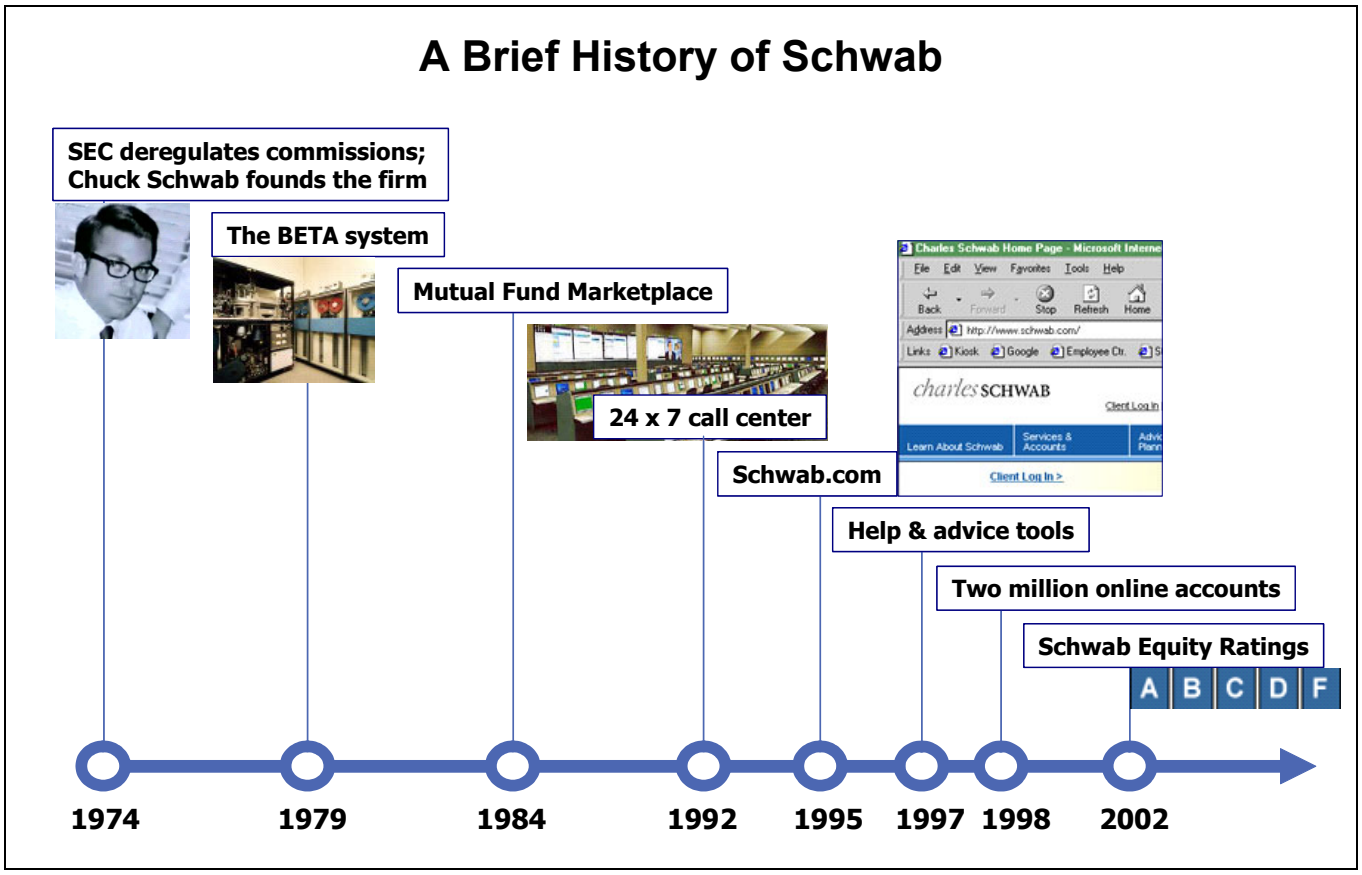

Illustration 1. Over the past 30 years Charles Schwab has continually demonstrated its leadership and innovation.

Schwab's Challenges

Responding to Changing Economic Conditions

Challenges and Opportunities:

- Changing business climate
- Low trust for some financial advisors
- Schwab's desire for a deeper relationship with its customers

Like many companies over the past few years, Schwab has had to respond to the changing economic conditions—conditions that were magnified because of Schwab's primary business being dependent on the volume of equity trading. Thus Schwab has been evolving its business from simply offering low-cost, self-service stock transactions to becoming a trusted, independent advisor to its customers. This evolution has been driven by a number of factors both external and internal.

With the volume of transactions falling dramatically over the past few years, Schwab has had to seek other sources of revenue—with for-fee advice being an attractive business to get into. At the same time, Schwab customers (and investors in general) were becoming increasingly concerned about the independence of their financial advisors—many of whom also have banking relationships with the companies they recommend. This perception of conflict of interests and the highly visible investment scandals have left a place for an independent advisor, such as Schwab is positioning itself.

Finally, Schwab itself was never satisfied with a relationship with its customers that was mainly limited to enabling transactions. Schwab's view of a complete customer experience always extended both widely (across channels and touchpoints) and deeply (encompassing strong financial relationships).

But in order to make an effective–and profitable–transition, Schwab needed to evolve its IT infrastructure. It needed to create a new, more flexible foundation for its business, one that provided open communications and efficient use of resources in order to support responsive, up-to-date information and advice across multiple channels.

Creating a Trusted Relationship

Schwab started to provide advice in 1999. According to Devin, "This was initially simple—how to balance your portfolio. We are increasingly moving towards detailed analysis—including stock recommendations."

Today, advice is offered via multiple channels—though it is richest when provided directly from Schwab advisors. On the Web, customers can get a "Portfolio Check-up," which takes customers' age, investment goals, risk tolerance, and current cash requirements and enables them to view their portfolio allocations against the recommended allocation for their situation. The recommendations on the Web are relatively generic and focus on allocations rather than on specific investments (this is due to regulatory issues, since Schwab is not yet able to fully audit and track these interactions).

A limited set of interactions is also possible via e-mail and phone, with the most valuable probably being the ability of the customer to sign up to be alerted via e-mail upon certain events—e.g., Schwab downgrading a stock.

Most detailed, customized advice is provided by Schwab Investment Consultants who interact with customers by phone or in person. These consultants have a detailed set of advice tools—tools that are continually being enhanced.

In addition to obtaining direct advice from Schwab, customers can interact with and get advice from any of the over 5,000 independent financial managers who use Schwab as a back-end (e.g., for brokerage accounts, trades, etc.). Within this group, there is a select number, known as the Schwab Advisor Network, who can provide detailed money management services. Schwab consultants will refer those customers who need money management to this network.

Schwab's strategy for transforming itself from a low-cost provider to one that adds value through a trusted investing relationship is based on continually enhancing its existing advice tools and integrating them across all channels. This, in turn, requires enhancing the IT infrastructure in order to create a system that will permit it to respond more quickly and more flexibly as business conditions and customer expectations continue to evolve.

Schwab Results	
Business Benefits	Standards-based architecture provides a new level of responsiveness for Charles Schwab, positioning Schwab to quickly and dynamically respond to changes in the marketplace and deliver new services that add customer value. An enhanced customer experience that is consistent across multiple customer touchpoints and channels. The right information is delivered into the hands of customers and advisors in a more timely manner—enabling better investment decisions. The grid-enabled system has reduced processing time from eight to ten minutes to just 15 seconds, dramatically changing the character of its customer interactions.
Technology Benefits	Resilient, less-proprietary underlying IT environment allows company to quickly roll out new functions without major disruptions to the infrastructure. Embracing open standards, such as XML, has enabled Charles Schwab to speed development and reduce costs. Evolving its services-orientated architecture has shortened its time to market while minimizing the impact on existing applications. Virtualization through use of grid technology has positioned the company for future growth with an evolving, on demand environment.

Schwab's e-business Strategy

An Architecture to Support Responsiveness and Flexibility

Schwab is able to respond to changing business conditions and customer needs by designing a standards-based, flexible, services-oriented architecture and leveraging its partnership with IBM to enable the transformation of core business and technology processes

Schwab has historically tied its architecture very closely with its business goals—with particular emphasis on delivering an architecture that supports the best customer experience possible, while being able to be highly responsive to customers' current and future needs. According to Schwab Executive Vice President and CIO Geoff Penney, this has led to three key principles that drive all strategic business/architectural decisions:

- Customer Centricity—maintaining the consistency of client experience across all touchpoints and channels on the customer side, including Web, wireless, phone, and in person.
- Flexibility—the ability to respond to new business needs by easily adding new customer types and new channels, without touching the back end, and also adding new back-end services without touching the channels.
- Efficiency—creating cost savings through reuse of existing infrastructure, new development, and internal expertise.

Schwab's e-business Environment

Schwab's e-business Benefits:

- Shorten time to market
- Minimize impact on existing applications
- Maintain consistent user experience
- Leverage investment and skills

These new business initiatives (and enhancing existing initiatives) require the development of new applications on the front end as well as new applications (or services) on the back end. Key goals of all of these initiatives would be to shorten time to market, minimize impact on existing applications, and maintain consistent user experience across all channels.

In addition, in order to be successful with these initiatives, Schwab understood that this would require organizational changes and a better leverage of its resources. Schwab would do this by:

- Evolving its services-oriented architecture—see *Schwab's Services-Oriented Architecture*.
- Enhancing its ability to deliver components that can quickly be assembled into new applications and services to meet market and customer needs—See *Business Process Modeling and the Barista Frameworks Initiative*.
- Establishing a system of domain ownership and moving responsibility closer to the customer—see *Domain Ownership* and the section on the *Schwab Content Management System Initiative.*
- Exploring some leading-edge methods of leveraging systems and skills—see the *Schwab Grid Initiative*.

Schwab High-Level Architectural Approach

Driven by these principles, Schwab's architecture takes its application environment and enables the company to react to (and many times anticipate) customer needs and market changes by quickly adding new services and products. The architecture takes what began as a hierarchical mainframe environment and turns it into a peer-to-peer services oriented architecture that enables the customer centricity, flexibility, and efficiency that meet the business demands. Supporting the services oriented architecture, Schwab has also evolved its governance and application development processes, with the key initiatives being, respectively, "domain ownership" and a Business Process Modeling methodology.

SCHWAB ENVIRONMENT. Schwab is a huge mainframe, COBOL, CICS shop that runs the core brokerage systems (portfolio systems, customer systems). These corporate offerings are the first and largest suppliers of business services and they are organized into domains (see Domain Ownership below). Schwab's distributed tiers are generally used for building new business services and building new products.

These core systems, services, and applications are connected to a set of channels and touchpoints accessing the common information for a variety of customers and contexts. In between, there is a middleware software tier that both separates and connects the front-end and back-end services and a business logic tier where customer and employee focused applications are built. As we shall see, the middleware layer (or Bus) is evolving to support a standards-based, services-oriented architecture. Schwab also has a large componentization effort to make it easy to add new value, new channels, new features, new customer types, etc. (see Illustration 2).

SERVICES-ORIENTED ARCHITECTURE. For Schwab, moving to a Services-Oriented Architecture was a logical step in its architectural philosophy. According to Tim Heier, Schwab Technical Director, Application, Infrastructure, Domains and Engineering (AIDE), "Given the heterogeneous computing environment at Schwab, the adoption of a standards-based Services-Oriented Architecture (SOA) was an evolutionary step towards reducing the coupling between interacting software systems. Coupling of system implementations is being reduced by hiding system implementations behind a service layer." Heier continues, "Providing a service layer that hides the underlying implementation from the client is a key element in Schwab's approach to a SOA. Since the service becomes abstract, via the layering approach, requests and responses can be made independent of the location, storage, or presentation mechanism."

Moving to the Services-Oriented Architecture delivers several benefits to Schwab:

- Better scalability through location transparency
- Services can be reused across different presentation delivery mechanisms
- Software reuse is promoted by the architecture

And Heier emphasizes, "These benefits are an important part of Schwab's ability to provide an integrated client experience."

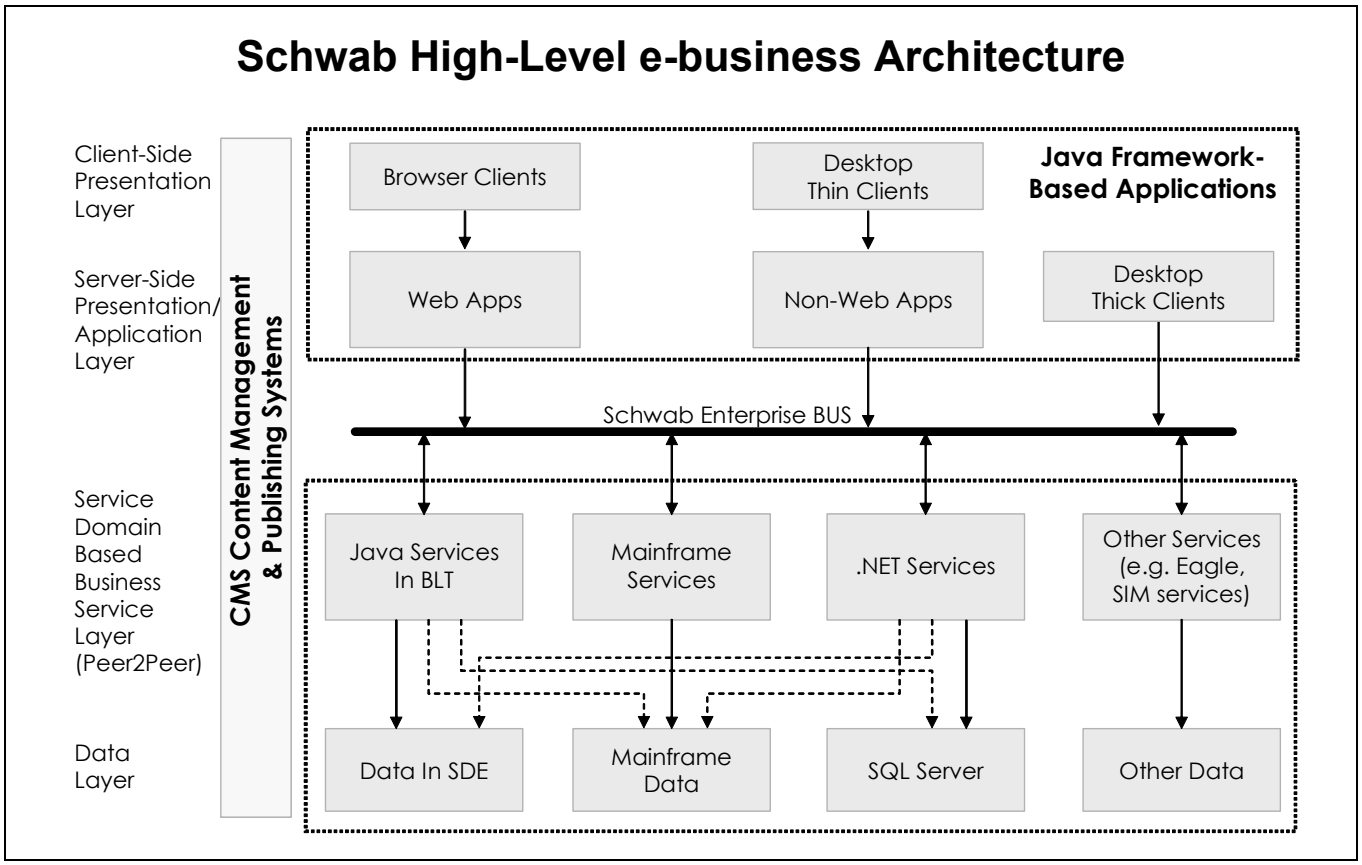

Illustration 2. The logical, peer-to-peer Services-Oriented Architecture at Schwab

BUSINESS PROCESS MODELING. Schwab's development methodology is based on use case driven object modeling and utilizes Unified Modeling Language (UML) notation. Heier re-emphasizes that this methodology is business process driven, with a "strong and obvious linkage between how the business operates and the software applications that support it as the result of Rational Unified Process (RUP) use case models. Each core business process is modeled end to end, looking across the whole value chain—encompassing customer, internal, and third-party activities, whether these activities are automated or manual."

Within the domain ownership model, each information object (e.g., Customer, Order, Security) is aligned with a particular business domain for stable, long-term data sharing based on the RUP business object model.

Schwab points to the following reasons that it has adopted its business process driven methodology:

- Ability to capture the integrated business requirements for seamless client experience
- Business and technology stakeholders gain a more comprehensive business view and communicate with clarity

- Strong linkage between application software components and the way the business operates
- User interfaces—based on end-to-end process flows—are easier to integrate

Domain Ownership enables Schwab to:

- Move decisions and actions closer to the customer
- Reduce time to market
- Leverage Frameworks

DOMAIN OWNERSHIP. Schwab's governance model revolves around domain ownership, where domains are managed sets of reusable services (discrete automated business functions) sharing some common business cohesiveness. In many cases these are subsets of business functions such as Customer Information, Portfolio Information, Customer Ledger, Custody, etc.—as well as investment references like Market Data, Research, and Analysis/Planning/Monitoring Services.

Each domain is responsible for maintaining its own business objects and for publishing interfaces to its services to other domains. The domain offers retrieval and maintenance services for the business object, encapsulating business logic, location, and format associated with its objects and services. When one product or product area (e.g., Advice Suite) wants a service from a domain (e.g., Customer Portfolio) it makes a request and the two determine the relationship creating a service–level agreement. These relationships and agreements also exist between domains (such as Customer Information and Portfolio Information). The domain ownership model is supported by and further supports the services-oriented architecture, as well as extending the services orientation to the business units themselves.

For Schwab, domains are a critical part of its application approach, with key benefits being partitioning services into long-term, manageable subsets, providing subject matter expertise, and promoting ownership which is essential to sustain reuse.

Technology Decisions and Partnerships

"We are counting on our continued partnership with IBM on these projects. Part of the road map that Schwab is developing with IBM is to make Schwab completely on demand."

David Dibble, EVP, Schwab Technology Services

Schwab is an architecturally-driven rather than a supplier-driven company, as Penney notes "Our basic philosophy is to have multiple vendors." While maintaining this vendor independence, Schwab has developed a special relationship with IBM. Penney continues, "One of the strengths of IBM is it plays in almost every space—we interact with IBM more than with any other vendor. IBM has helped us in special projects such as with the Barista framework. At the same time IBM has recognized that we represent a leading edge, high-volume, real-world place where they can learn."

Schwab's e-business Initiatives

From the earliest days, Schwab has understood that being responsive to customer needs would require an ability to easily integrate its own existing systems, future systems that it would develop, and ultimately many external systems. All of these would not be necessarily planned, but would be driven by changing business conditions and relationships and ultimately by how Schwab's relationship with its customers would evolve.

The Bus Initiative—Virtualizing Systems into Services

Schwab's key initiatives include:

- Evolving to a standards-based bus
- Utilizing its Barista Java Framework to build new advice applications
- Designing a new content management system and process
- Piloting a Grid-based method of leveraging existing computing power to enhance new advice applications

One of the key early decisions was to separate Schwab's technology into logical tiers and to virtualize it so that the business could evolve without major disruptions in the infrastructure and visa versa. Penney explains that Schwab's architectural evolution has thus been a "Constant drive for simplicity in the architecture" which has now taken three steps. Step One was to take the backend applications and make them services. "This was many years ago when we added voice response units (VRUs) to offices as the second channel. From then on all backend applications would be services to all channels."

Step Two was to put a middleware bridge (SchwabENTRY or "SEntry") between "the channels world and the backend world." Penney points out that because of SEntry, "When we wrote the wireless channel we wrote no code on the back end." SEntry is based on proprietary Schwab APIs.

Step Three is the design and implementation of a new standards-based Bus whose goal, according to Jim Diven (Schwab Vice President, Design and Engineering, Middleware and Messaging Engineering) is to move away from the proprietary interfaces of SEntry—using Web Services where possible—and create a more publish-and-subscribe, peer-to-peer model for the future evolution of Schwab's architecture.

The evolution from the proprietary middleware to the standards-based Bus architecture is being moved forward by a number of drivers, including avoiding becoming a technology backwater and sun-setting older, end-of-life technologies, lowering the cost of dedicated hardware and software tiers, and increasing responsiveness by eliminating the requirement to rewrite proprietary APIs when services or clients change.

Brad McCarthy (Technical Director, AIDE) notes, "This would potentially get us out of the business of distributing client stubs."

In 2002 Schwab, with the help of IBM's jStart program, ran a successful Web Services proof of concept for the Bus. Diven's major initiative this year is to create and deploy the Web Services layer of the Bus. Within this initiative, Diven feels that implementing the Web Services Definition Language (WSDL) is the most critical, "WSDL is very important to enable different invocation of a service—and the Bus is essentially an enabling technology that supports these multiple services and transports."

According to John Sovereign (Technical Director, SIM—Services for Investment Managers—Technology), the new (Step 3) Bus is being rolled out in three phases:

Phase 1, now in production, supports asynchronous Publish/Subscribe and is deployed on WebSphere Business Integration Message Broker (WBIMB), using the Java Messaging Service (JMS) for distributed connections. WBIMB on the mainframe provides the transformation of COBOL to XML. Phase 1 also reuses Schwab's existing LDAP infrastructure.

Phase 2 will support a synchronous Request/Reply model scheduled for the end of 2003. This work is being built on the IBM WebSphere Web Services Gateway product.

Phase 3 is planned to support Streams, a synchronous form of communication which will provide performance improvement for certain types of applications.

Diven points out one of Schwab's challenges has been to service-enable all of its back-end systems, particularly CICS. "We need IBM to enable CICS as a service provider and eventually as a consumer. We could use Enterprise Java Beans—EJBs (but we don't) or CICS transaction gateway (but we're not doing it because we don't like gateways)." Of course, Diven is "looking forward to the day when CICS is fully Web Services enabled."

Componentization: Barista Java Framework Evolution

IBM Research Labs and Technical Teams played a key role in creating, testing, and implementing a breakthrough framework for building enterprise-class Java applications

Because of Schwab's goals of fast time to market for new services to customers and controlling its own costs though reuse, a second key technical initiative for Schwab is the creation and use of a Java Framework (which Schwab has named Barista.) Originally, Schwab.com had been built as a set of CGI scripts. While this was necessary at the time (given the available technologies), it clearly was not optimal for the long term. As Brad McCarthy (Technical Director, AIDE) recalls, "There was very little sharing, a monolithic structure, data integration was difficult, and reuse was by copy and paste."

This challenge is echoed by Jared Price (Vice President, AIDE) who notes, "We needed to move to a more structured model for reuse and consistency," with, as Jenifer Riley (Senior Manager AIDE, Barista Technical Team) adds, "a better release and maintenance model."

According to Bin Hu, Technical Director, AIDE, Barista Technical Team, the Schwab team began to "work with IBM in 1999 to develop a Java framework to replace the existing environment and create a standardized set of development processes for the whole company." This framework would be called Barista.

Barista is a Java programming framework (a set of compiled code and standards for that code) for application and infrastructure features. Barista is based on a component development model and can be viewed as a container for reusable business logic.

The principles underlying Barista include:

- Reduce maintenance by reuse
- Containers hide technology
- Enforce layer separation
- Portable components that run on any middleware and hardware
- Enable functional releases, rather than completely re-releasing an entire site for each release

BARISTA TIMELINE. The prototype of Barista began in 1999, with the first application going into production in June, 2000. Siva Chandrasekar (Director, AIDE, Barista Technical Team) emphasizes that initial Barista development was a partnership between the Schwab team and IBM Global Services. "IBM consultants were involved at the early stages. We had already begun to develop some Java apps that were developed independent in the electronic brokerage area. Barista began as a way to put these together. The initial prototype, 'Account Overview' in Schwab.com was benchmarked at IBM's Poughkeepsie Labs. IBM still significantly supports Barista by testing the latest releases in the labs."

Nick Efthymiou (Vice President, Wireless Architecture, Core Portfolio Services) reinforces IBM's role, "The IBMers were part of the team. It was a true partnership, with IBM providing Schwab with individuals with unique talents."

In 2001 the Schwab team released Barista 2.0. This release expanded the framework's use beyond Schwab.com only by providing channel independent functionality.

In 2002 the Schwab team met with IBM to create a roadmap to figure out what parts of Barista could be retired to take advantage of new features in WebSphere and emerging Web Services. Schwab's goal is to move away from Schwab proprietary to industry-standard or IBM supplied technologies. For example, Schwab plans to begin to describe Barista components using WSDL and retiring its own proprietary component description language.

BARISTA GOALS. According to Efthymiou, Barista has been implemented by Schwab to meet the following goals:

- Component reuse
- Insulate the business logic from the underlying technology
- "Concept of separation of concerns" allowing developers to focus on the business application; not caching, memory management, where it's going to run, etc.
- Maintainability, sustainability where the applications can be maintained by other than the developer himself providing much more reusability and flexibility of people
- Efficient use of system resources

RESULTS OF BARISTA…THUS FAR. Schwab points to both soft (organizational) results and specific development benchmarks that have come from adopting Barista. Efthymiou explains, "The introduction of Barista got most development groups at least seriously thinking about a structured development environment. It was a cultural shift. The framework has put in the ground rules for common design and reuse." Jared Price echoes, "The big driver is around consistent experience—this is starting to connect to the component based development. This is what will drive it into the business."

At the same time, Schwab is facing hurdles in shifting the culture towards component–based development and the ownership model for components (see Domain Ownership),

as Riley notes, "Now we need a business owner for each component. This is a large change and we are working on that. Developers are thinking differently, but we still have a ways to go."

Ultimately, the results of the Barista framework can best be seen through its use by specific development groups—two of which we shall highlight in the next section.

MOVING PAST BARISTA. Schwab is now evolving its component framework strategy to extend the Barista principles more broadly and create an even tighter linkage to overall e-business strategy. Dubbed Kraftwerk, this initiative is a strategy and high-level design for evolving the Java frameworks in use at Schwab to more tightly align with the services-oriented architecture and bus initiatives to build reusable business services. Kraftwerk will also leverage advances in Java and Web Services technologies that have occurred since Barista was rolled out—with a particular emphasis of moving away from proprietary development that Schwab has been forced to do, towards the adoption of standards-based implementations. Kraftwerk frameworks will thus enable Schwab to build components that run in multiple Java environments, as well as lowering the cost of development and maintenance of its proprietary implementations. Finally, Kraftwerk will enable Java Services to be used as dynamic assets by the Schwab Content Management System (see below). Kraftwerk Phase 1 is scheduled to be released in early 2004.

Examples of Process-Driven, Domain-Owned, Barista-Based Development

Barista is being used to improve development and speed time to market of key initiatives, such as creating a more powerful advice applications suite for Schwab advisors and creating a set of services that define a customer's portfolio.

ADVICE APPLICATIONS SUITE. The Barista framework was initially implemented by the Advice Applications group. The role of this group is to deliver the suite of tools the advisors can use when they talk to customers. Since 2000, this group had used Barista Services that are integrated in the business domain through the business object model. Specific components include:

- Customer risk profile
- Portfolio definition
- OSH pricing
- Asset allocation
- Sector diversification
- Equity concentration
- Bond diversification
- Style analysis
- Cash flow analysis

According to Karin Hempel (Vice President, Individual Investor Technology, CMS Implementation and Business Team), the results of using the Barista components have been, "with the same team size and same budget dollars we are able to deliver more and deliver it faster. We can prototype new functions in a day to send back to the business unit for comment. And we can customize for each client-type faster. We need to do this for our business needs—this is the overall business driver."

Daniel Masseloux (Managing Director, Investment Technology Solutions) notes that the group has been able to achieve "a lot of the reuse in creating new functionality, as well as gain significant savings in maintenance. We can maintain more with fewer people, and we get savings from common knowledge, common code, and common architecture."

The Advice Applications group has been working closely with the Barista team. Panos Lambrianides (Technical Director, Investment Technology Solutions) explains, "Last year we were working on making the Suite more cross-channel. Our cross-channel work actually fed back into the Barista framework."

Ultimately, the value of using the component framework directly impacts the Schwab customer experience—as Robyn Leonard (Senior Vice President, AIDE), relates, "Components let us respond quickly to the changing needs of our customers and our changing business models."

CORE PORTFOLIO SERVICES. In order to deliver the type of advice applications that Schwab is moving to, a set of fundamental services around the concept of the customer portfolio has had to be built. The Core Portfolio Services group is charged with this task. Under Schwab's domain ownership model, Core Portfolio Services is contracted to provide its services to other entities, such as the Advice Applications Group.

According to Sid Bhatia (Managing Director, AIDE, Core Portfolio Services), Core Portfolio Services began to use the Barista framework in November, 2001. The major driver was, notes Graham Luce (Managing Director, AIDE, Core Portfolio Services), to provide component reuse. "We're looking at two levels of re-use: within the domain and for other domains."

Schwab Content Management System Initiative

In 2001, Schwab found itself in a difficult position. The company and its Web site kept winning awards for customer satisfaction and quality, but the cost of maintaining the content on the site was increasingly becoming an untenable burden. The Schwab sites at the time contained about 3,500 pages and over two million lines of code.

One of the most strategic initiatives for Schwab is the architecting and implementation of a content management system (CMS). For Schwab, CMS is not merely a platform implementation to support the content creation and publishing lifecycle. Rather, according to Robyn Leonard, "CMS is an initiative that will fundamentally change the way Schwab does business."

The chief problem was each page of Schwab.com had to be created individually by the Schwab development organization. All of the content elements (verbiage, links, images, phone numbers, directions, tables, charts, etc.) had to be added to pages by developers. This then had to undergo all of the normal development and testing procedures—creating bottle-necks and costs that were making it extremely difficult for Schwab to adapt its site to changing customer needs and emerging business opportunities. With this system, it took approximately *six weeks* to make even a simple content change to the site.

Mats Nilsson (Technical Director, AIDE, CMS-Technical Development Team) notes, "The systems and processes made it less likely that content gets created, updated, and retired because of the difficulty and time." Leonard adds, "It also created maverick ways of getting the stuff out creating a maintenance nightmare—a lack of coordination, control, and consistent client experience."

Kathy Anderson (Senior Vice President, Individual Investor Technology) cites the following drivers for the CMS initiative:

- Take content creation, updating, maintenance out of the hands of developers and put it into the hands of content owners
- Drive revenue by freeing up innovation resources to pursue new opportunities
- Save costs by freeing up development and maintenance resources
- Increase business timeliness and the ability to respond to and proactively take action on new opportunities

Put most eloquently by Jan-Olof Karlsson (Managing Director, AIDE, CMS-Technical Development Team), "We will with our technology enable the people who have the decision power—the power to make swift decisions."

SPECIFYING THE FUNCTIONALITY. The Core Technical Schwab Team made the decision to create an architecture that decouples the authoring, publishing, and run-time environments. This enables Schwab to have the flexibility of choosing the best of breed technology for the specific purpose of the actual application or environment. The key decisions in each area were:

- **Authoring Environment.** Schwab decided that the authoring environment would need to be built on browser, Java, and XML/XSL technology, and would support the complete set of content management principles and features.
- **Publishing Environment.** The publishing application would be a standalone service to acquire, deploy, and acknowledge data/file transfers between environments—essentially creating a bridge and independency between the authoring and run-time environments such that each area could optimize their design for their own purpose.
- **Run-Time Environment.** The run-time environment would use XML/XSL, Java, and DB2 Technology to manage the customer experience principles for ease of

change, performance and 100% read consistency while dynamically publishing changes into run-time.

Working with the Business Units

Early in the process, Schwab's technology team enlisted the support of specific business units primarily to verify that the feature set would live up to business expectations and requirements, and secondly to be trained on and test the system and be the first ones to roll it out.

Laurie Ailworth (Vice President, Representative and Client Tools, CMS Implementation and Business Team) notes that her group's role will also be to "help create best practices and educate the next groups for distributed publishing."

SELECTING THE TECHNOLOGY. In July 2001, with the budget approved, the Schwab team began to evaluate the technologies upon which to build its content management system based on the technology design principles and requirements. The team looked at 49 vendors on the initial list and eventually brought it down to three: IBM Content Manager 8 (now called DB2 Content Manager), Vignette Story Server, and Interwoven TeamSite.

After a thorough evaluation of each product, Schwab chose IBM Content Manager (CM8). Leonard explains, "We were really looking at a toolset rather than a solution; we needed the ability to develop a system that we could hand over to the business. The IBM model matched our needs best—particularly basing it on RDBMS. In addition, IBM provided an easier integration path." Nilsson adds, "We planned to develop and integrate a content management solution including the authoring client, publishing bridge, and run-time services into the existing infrastructure and architecture. IBM as a CM toolset/API provider did not put any barriers to us."

Karlsson recalls seeing the first IBM demo of CM8 and saying "this is exactly what we are looking for." And he concludes, "It is an architecturally sound platform for growth. It provides scalability and extensibility, with support for newer technologies such as XPath, XML, Web Services, and extensions for potential streaming technologies. CM8 can, with their data connectors, reside in front of our content repositories. It provides a content middleware layer and much more."

CMS DEVELOPMENT AND ARCHITECTURE. In April 2002, Schwab began to build its content management system using for the authoring environment IBM CM8 as the back-end solution with CM APIs, Library Server, Resource Manager and DB2. IBM was closely involved in the development—McCarthy notes "IBM has put resources to help develop the content management feature set and Schwab fed back requirements for CM8. We were on the 8.0, 8.1, 8.2 beta tracks."

IBM CM is where all content is created and managed as separate assets. These are then published to the run-time rendering system. The CM implementation includes DB2 storage, Library Server, and Asset Manager. The Schwab application uses CM versioning, workflow, ACL and its API.

For Schwab, content is more than documents and pages. Good examples of Schwab content are page templates which reside in the CM system. Templates enable different customer experiences for the same information by controlling layout, design, channel parameters, and functionality.

Key elements of the Schwab content management process include:

- Content providers (business users) are given rights on specific templates, within which they can make specific changes and view/access tasks in workflow. They use a

WYSIWYG browser-based client to create and manage content. The client gives Schwab central control without having to roll-out and install anything on desktops.

- All content published to the run-time environment goes through workflow. A phase in the workflow is the Publishing Certification environment. This environment mimics the run-time environment to test look and feel, behavior, and performance of the content before it is published to the live environment. All new and revised content goes through this process.

- All content in CMS are managed as separate assets that are published into the run-time environment. The CMS run-time services dynamically assemble each page from assets for the users each time they are requested—and it is fast. The Schwab architecture load balances interactions for customers—they go to different servers—and it ensures that the customer experience is identical each time.

Reducing Publishing Time from a Month to a Week:

With the new CMS system, adding content to the Web site (a process that used to take 27 to 35 days) will be reduced to about a week.

SCHWAB CMS RESULTS. Though just beginning to be rolled out, the Schwab CMS is already delivering results to the business units. Ailworth explains, "We, as the first business unit, are very excited by it. It's because of the potential for Schwab. It's a very powerful tool with which we are tapping the tip of the iceberg. We can now address new opportunities that we could not have before. When we show this to people, the light bulbs go on—opening a new dimension of creativity. Once we have demonstrated this, it will spread across the company."

The time savings have also been evident, Ailworth specifically noting that "an executive was able to take the tool and after 15 minutes build a site." Overall, Schwab expects the time to add content of small and medium complexity to be reduced from 27 to less than 6 days and from over 35 to fewer than 9 days respectively (see Illustration 3). This does not even take into account larger, more complex projects that would previously not have even been attempted. And once widely adopted, this will get the development people out of the content management business.

CMS will also be used by the technology team to componentize functionality and eliminate duplication of code, increase re-use, and enforce standards and consistency. This points to the ultimate direction of the Schwab content management system as a full object/component management and control environment.

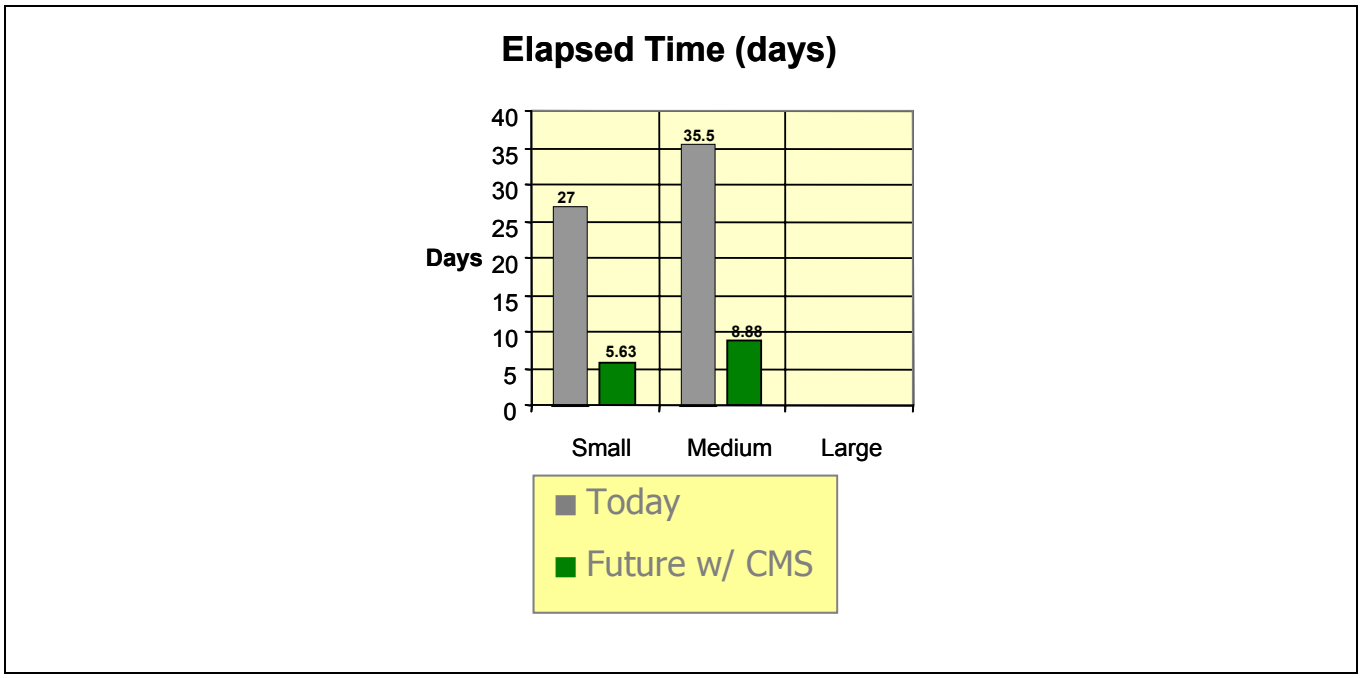

Illustration 3. The Schwab content management initiative will save days and weeks for small and medium scale content updates and enable large scale updates that previously would not have been even undertaken.

Schwab Grid Initiative—Virtualizing Its Resources to Provide a Better Investor Experience

As we have discussed, Schwab is moving from a transactional model to a trusted advisor relationship model. This has created a large number of challenges—business model, organizational, competitive, etc. One of the most interesting challenges is the way this evolution impacts Schwab's underlying computing infrastructure.

Over the years, Schwab's infrastructure has been built and honed to handle high volumes of transactions—transactions that frequently occur in very high peaks (particularly at stock market open and stock market close). Schwab's advice initiatives, according to David Sherr (Vice President, Advanced Technology), require a different type of computing power. Sherr explains that providing independent advice means doing "a lot of computation-intensive 'what-if' calculations (such as simulations, random number generation, and Monte Carlo routines). These can take a lot of time and computing power." Sherr recalls, "A year ago David Dibble, Executive Vice President, Schwab Technology Services, asked 'How can we create scalable advice?'"

The answer, according to Chalon Mullins (Director, Technology Architecture & Oversight) may be found in Schwab's existing infrastructure, "Schwab has a lot of extra computing power, if we could leverage the white space (unused cycles) when transactions are below peak."

All of the initiatives we have observed thus far have had some element of a goal (and in a number of cases a result) of leveraging resources and reducing costs, including the Services-Oriented Architecture, support for standards-based platforms, use and reuse of component frameworks, and the content management initiative. Schwab is now taking this even further by examining how one of the most leading-edge technology developments—Grid computing—can be used to leverage resources in the Schwab environment.

In 2001, Schwab began to investigate the emerging areas of Grid computing as a way to leverage these unused mainframe cycles to provide and scale the investment advice. Schwab was drawn to Grid because, as Sherr notes, "For us Grid is clearly a multi-vendor, heterogeneous initiative that is based on open standards and service-oriented architectures." IBM's support for Grid (as well as its support for open standards and service-oriented architectures) was also important to Schwab both because the validation that it gives to Grid and because of the existing strong Schwab/IBM relationship. Mullins emphasizes, "We had our vision about Grid and IBM had its own vision and these were remarkably close—a natural fit."

And Dibble notes, "IBM shares a common interest in Grid with our insistence on open standards, commitment to open source (Linux), and the need for industrial standards for Grid—with both of us supporting the Globus project, Open Grid Services Architecture, and Open Grid Services Infrastructure."

In 2002, Schwab ran a Grid pilot in order to prove that it could use Grid within its environment. IBM played a key role in this proof of concept, as Mullins points out "IBM Research helped with the coding on the porting of the code to the Grid environment, and IBM provided the test environment for our POC." And Sherr adds, "From IBM's standpoint this was truly a global effort—project meetings included people calling in from Germany, England, US, etc."

The pilot addressed one of Schwab's key applications in its advice offering—Forecaster—the ability to recommend optimal portfolios for each customer (see Illustration 4). To do this analysis today requires multi-variant analysis and other advanced numerical techniques. It is thus expensive and time-consuming to provide. The customer generally has to come back to the advisor's office at a later date or receive the recommendations by e-mail, fax, or mail.

IBM worked with Schwab to break down the application into manageable pieces that can be distributed to multiple processors and then re-aggregated following the compute-intensive analysis work. The Grid-enabled system, using the Globus Toolkit for Linux and the processing power of multiple IBM eServer xSeries 330 servers, reduced the processing time on the application from eight to ten minutes (and sometimes hours) to just 15 seconds, and it could do this by using white space without impacting any transactions. While this reduction may not seem to be a lot, it can change the very character of interaction with the customer. Dibble emphasizes, "One of the things that the grid has done for us is enable us to generate near-real-time results." Thus, the customer sitting with the advisor and iteratively examining her investment options will have a much different relationship with Schwab than the customer who has to go home and wait for a fax. She is more likely to make the investments, to make better investments (having looked at more options), and have an overall better experience with Schwab.

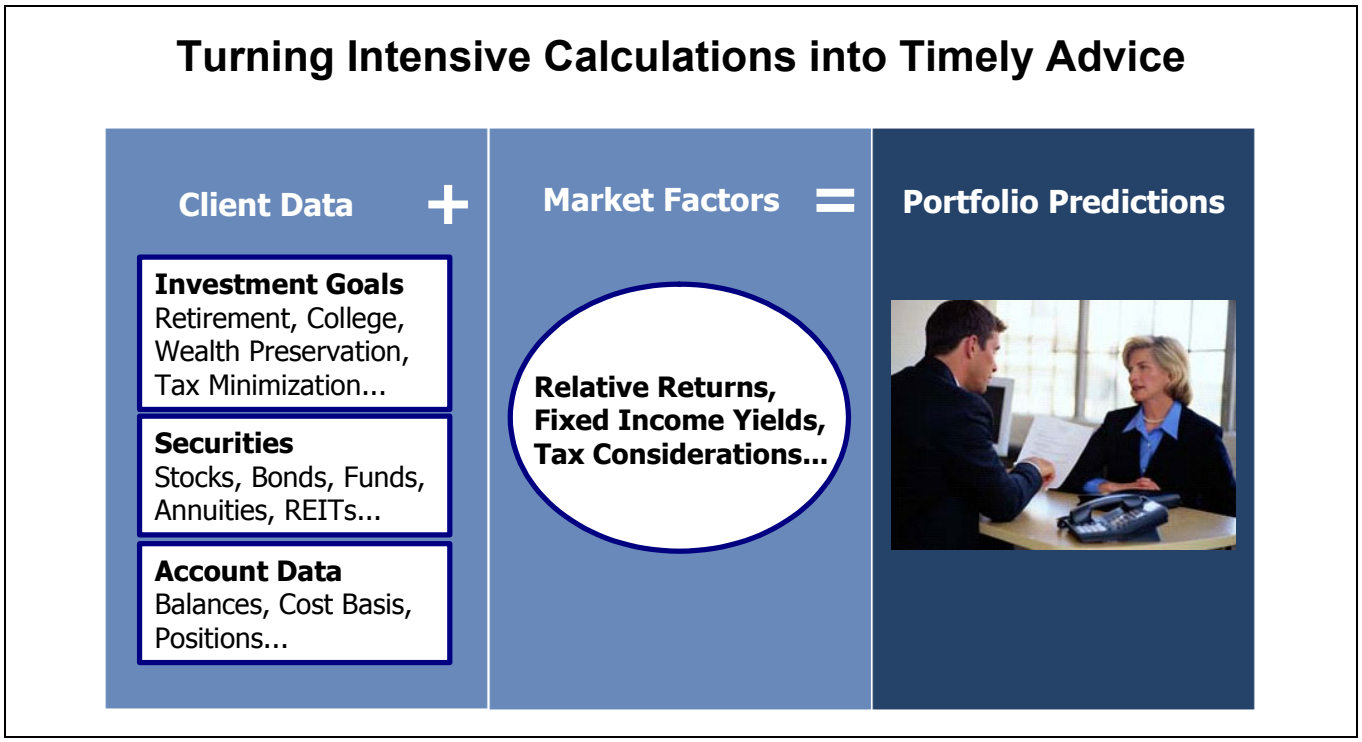

Illustration 4. Schwab's Grid pilot addressed the key issue of providing timely, independent advice to clients.

For Schwab, the Grid approach represents the true value of evolving to a virtualized, on demand environment. Not only can Schwab make use of its existing investment to produce a new product (at no or very little additional infrastructure cost), Schwab can change the very quality of its customers' experience.

The grid-enabled application will not only directly impact Schwab's customers; it will do so at a minimal cost and disruption for Schwab. As Dibble notes, "I'm not going to go out and buy grid boxes. We're going to deploy grid on our existing machines, bought and paid for." Dibble continues, "The initial goal was to provide for a better customer experience. The fact that it can better use existing assets is just an additional payback."

Schwab is planning to role out Forecaster by the end of the year—after putting it though rigorous testing to meet Schwab's standards of availability and user experience. The production version will use IBM Server Allocation for WebSphere, which automatically and intelligently monitors application workload and routes traffic to one server or another according to its workload at a given point in time. The grid system will tie into Schwab's IBM Tivoli Monitor, which monitors UNIX, Windows, and Linux environments.

At the same time, Schwab is investigating other uses of grid, such as data grids, which Schwab plans to pilot shortly. According to Dibble, this "technology will allow the firm to integrate data on a single customer from dozens, if not hundreds, of applications and platforms. That will allow Schwab to offer better integrated, more targeted service and product offerings to our customers than we have been able to in the past." Dibble concludes, "Grid adds a whole new level of computing power and scalability to our client capabilities."

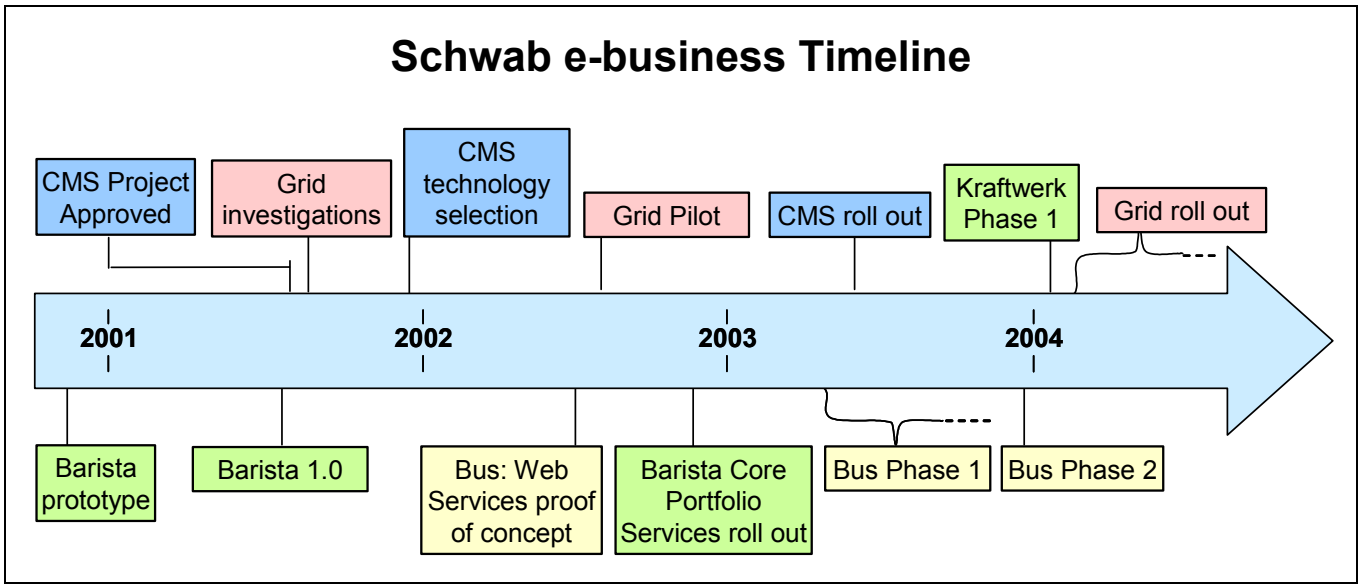

Illustration 5. For the past three years, Schwab has focused on Content Management System (CMS), Java Framework (Barista and Kraftwerk)), Grid, and integration Bus initiatives.

Conclusion

In her book *The Customer Revolution,* Patty Seybold summed up her thoughts on Schwab:

"As we've watched Schwab plot and execute its technology strategy and its acquisition activity over the past several years, what shines through most clearly is that all of the company's decisions are grounded in its desire to improve its customers' experience and their outcomes. There are certainly challenges along the way, and many more seams to stitch up, but I'd place my bets on a company with the kind of singular focus and dedication to customer outcomes that Schwab has, any day."

Today Schwab is continuing and enhancing this focus by quickly responding to changing business conditions and customer needs and evolving its business model and relationship with its customers to become THE trusted advisor. Schwab is able to do this by leveraging its services-oriented architecture and its investments in key technology initiatives such Web Services, Java, Content Management, and Grid computing to become a great example of an on demand company.

12-03

Citizens and Hanover score multiple gains for insurance agents through improved Web site

Solution from IBM and Bowstreet provides self-service window to better serve customers

Overview

The Challenge

To support business growth through a Web portal based on rapid development of easy-to-use applications

The Solution

IBM WebSphere® and IBM DB2®, CICS Software, IBM eServer® zSeries®, Bowstreet Portlet Factory and Linux™ operating system

The Benefit

New-business transaction time cut up to 75 percent, productivity in customer service improved 15 percent, Web traffic more than doubled

When an insurance company enables its agents to reduce the time it takes for them to transact business by up to 75 percent, that's not the only good thing that happens.

At the Citizens and Hanover Insurance Companies, a property and casualty insurer based in Worcester, Massachusetts, other good things included boosting productivity of the customer-service operations of its agencies by 15 to 20 percent; doubling the agency- and customer-related traffic through its Web site; and putting the company on a trajectory to increase its property and casualty revenues substantially in the next three to five years.

Changes at the company, which does business primarily in the Northeast, Southeast and Midwest, started soon after the arrival in 2003 of a new executive team led by Chief Executive Officer Fred Eppinger. When Eppinger came in, revenue growth was flat, and even declining in some cases. The company was mired down in large part by aging IT infrastructures and agency products.

Transforming the technology infrastructure to support the company's new growth strategy became a top priority. So, it turned to IBM and Bowstreet, Inc., an IBM Business Partner headquartered in Tewksbury, Massachusetts.

> ***"It would typically take 45 minutes to an hour for an agent to conduct a transaction… Now it's around 15 minutes."***
>
> Brad Scott, independent agent with Spence & Mathews agency, Berwick, Maine

IBM PartnerWorld Industry Networks serves Bowstreet as 'a means of closer integration' with IBM

Benefits

- Transaction times up to 75 percent shorter
- Speed of development of new portal applications at least twice that of old system
- Productivity of agencies' customer-service operations through new portal is up 15 to 20 percent
- Unique log-ins per day on new agent portal are up more than 100 percent since its launch.

"Now, managers come in every morning and see what kind of business was closed the previous night."

Dick Lavey,
vice president of operations,
Citizens and Hanover

To pull ahead

Mike Clifton, chief technology officer at Citizens and Hanover, noted that the company's sales and revenues come almost entirely through a network of independent agents. "It wasn't hard to figure out that the company that makes it easier for independent agents to conduct business is the company that will pull ahead in this industry," Clifton said.

Independent agent Brad Scott, a member of the Spence & Mathews agency in Berwick, Maine, backed up Clifton's logic. "Pricing of policies is less a factor in choosing what provider to associate with than the ease of doing business and the efficiency of the work flow," Scott said. "Agents nowadays are really stretched for time, so they're going to migrate toward companies that are enabling them to quote and underwrite and issue policies at a much faster speed."

Citizens and Hanover kicked things off with three strategic decisions: the operating system, the plug-ins and the architectural path.

First, the company decreed that Linux would be the foundation operating system for its new technology direction. As Clifton explained, "Our IT staff numbers around 500 in house, plus a large contingent of variable staffers. Even so, we were building IT systems that would soon outgrow our ability to manage them. Linux, with its easier maintenance and wide availability of skill sets, was clearly the way to go for flexibility of approach, lower costs and faster return on investment."

Service Oriented Architecture was key factor

The company then queried IBM for its recommendations on what plug-ins might be available to accelerate the design and implementation of new portlets and applications.

IBM responded by recommending Bowstreet, which offers easy-to-learn, rapid-development products based on its "Factory" technology. The company responded with its second strategic decision. It chose the premier offering of Bowstreet – Portlet Factory for WebSphere.

Supporting middleware in the solution includes IBM WebSphere Application Server – Express, WebSphere MQ, WebSphere Studio Application Developer (now known as Rational® Application Developer for WebSphere), WebSphere Portal for Multiplatforms, IBM DB2 Universal Database Express Editions 7.1 and 8.1, and IBM Customer Information Control System Transaction Server for z/OS® Version 2.3. The hardware component includes IBM eServer zSeries 900, and the Linux operating system is included.

The third strategic decision was the most far-reaching. The company wanted everything to evolve along a coherent architectural path that would allow for the most up-to-date functionality quickly, at low cost, and with maximum flexibility. That would entail what is called "service oriented architecture" (SOA).

SOA is an application framework that takes every day business applications and breaks them down into individual business functions and processes called services. An SOA lets you build, deploy and integrate these services independent of applications and the computing platforms on which they run, making business processes more flexible.

"We're working closely with IBM on a number of new technologies that impact our SOA buildout. That includes adding IBM WebSphere Portal to our middleware mix, and that means additional support for SOA," Clifton said. "SOA is phenomenally important to enable us to continue making our systems more user friendly."

First big test

The first project for the IBM and Bowstreet solution was building a set of agent portlets, including ones for document searches, new-business processing and inquiries for claims, billing and policy information. Before participation by Bowstreet, Citizens and Hanover anticipated that building the portlets would take about a year. "Instead, we had it all designed, built, tested and in production within six months," Clifton said.

Key Components of the Citizens and Hanover Solution

Software

- Bowstreet Portlet Factory for WebSphere
- IBM WebSphere Application Server -- Express
- IBM DB2 Universal Database Express Editions 7.1 and 8.1
- IBM CICS Transaction Server z/OS Version 2.3
- IBM WebSphere MQ
- IBM WebSphere Studio Application Developer (now known as Rational Application Developer for WebSphere)
- IBM WebSphere Portal for Multiplatforms
- Linux operating system

Hardware

- IBM eServer zSeries 900

Benefits have been dramatic. Scott, the agent, said it would usually take him 45 minutes to an hour under the old system to move a policy transaction "from quote to underwriting to issuance. Today, it's around 15 minutes," he said.

Impressive boosts in customer service have been seen as well. As Clifton explained, the customer-service reps at agencies formerly had to gather different types of information (e.g., policy, billing, or claim-status) in different ways. They typically would spend five to 20 minutes getting an answer to a customer inquiry. "Now, they can access any kind of information

via one system and have an answer within two minutes," he said.

As for customer satisfaction, if the average daily number of unique log-ins by agents and other end-users is any indication, that's up dramatically as well. Dick Lavey, vice president of operations for Citizens and Hanover, said end-user traffic on the agency portal has doubled in the first 12 months after its launch.

Management gets boost

The next development project after the agency portal was a management dashboard. Again, only half the expected time was needed to get it online. The dashboard replaced a spread-sheet and paper-based system that had kept managers abreast of order flows through each agency on each product and each line of business. Most of those reports had been available only monthly. "Now, managers come in every morning and see what kind of business was closed the previous night," Lavey said.

The partnership factor

Bowstreet is actively involved in IBM PartnerWorld Industry Networks, Web-based communities that integrate and organize the PartnerWorld experience for ISVs by industry. The initiative offers ISVs industry expertise, technical assistance, networking opportunities and marketing and sales support.

Bowstreet participates in the insurance industry network and enjoys "optimized" status. That means it has developed further specialization by optimizing its applications with IBM on demand technologies, achieving success with its own on demand solutions and other criteria.

Other networks are automotive, banking, education and learning, fabrication and assembly, financial markets, government, healthcare and life sciences, media and entertainment, retail, telecommunications and wholesale.

Brian Chaput, partnership director at Bowstreet, appreciates the association. First, it is a "means of closer integration" with IBM, he said. "But the opportunity to network with other ISVs is there, too. We're going to focus mainly on those ISVs that want to portal-enable their applications for WebSphere," Chaput said.

For more information

Please contact your IBM sales representative or IBM Business Partner. Visit us at: **ibm.com**/e-business

For more information about ISV resources from IBM PartnerWorld, visit: **ibm.com**/partnerworld/isv

To learn more about Bowstreet, visit: bowstreet.com

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9-05

WebSphere software

New Holland grows higher customer satisfaction with IBM solution.

Overview

- ***Challenge***
  Provide better service to dealers by enabling them to place and manage orders faster and more conveniently, and reduce the inefficiencies of a telephone/fax ordering system
- ***Why IBM?***
  IBM was able to quickly offer a proof of concept and a solution that provided software and software services
- ***Solution***
  WebSphere HATS solution provides Internet connectivity to host applications, making it easy for dealers to access applications and place orders
- ***Key Benefits***
  77% increase in dealer satisfaction for whole-goods ordering processes among New Holland Agricultural dealers as well as New Holland and Kobelco Construction dealers; thousands of dollars saved by reassigning call center employees to higher value work; accelerating inventory improves dealers' bottom lines; receiving orders faster improves cash flow for New Holland; solution launched on time and under budget

New Holland streamlined its order entry system by providing a Web-based, self-service solution that dealers can use instead of tying up resources in the company's call center.

Tracing the history of the New Holland brand and its parent company, CNH America LLC, is like watching the invention and development of mechanized agriculture. One of the world's largest agricultural and construction equipment manufacturers, CNH makes harvesters, balers, tractors, combines and other types of farm equipment and construction machinery.

"We've provided a modern, Web-based order system that makes life easier for our dealers, and thanks to IBM Services and IBM WebSphere HATS, it has been a tremendous success. In fact, dealer satisfaction is up by 77 percent among New Holland dealers for whole-goods ordering processes."

– Tim Lyon, Operations Director, New Holland

Key Components

Software

- IBM WebSphere® Host Access Transformation Services (HATS)
- IBM WebSphere Application Server – Express
- IBM Rational® Web Developer for WebSphere Software

Server

- IBM @server® iSeries™

Services

- IBM Software Services for WebSphere

Business Partner

- Beaver Creek Solutions

The $12 billion CNH has grown by acquiring other businesses such as the Pennsylvania-based New Holland brand, as well as many other names that are associated with the history of modern agriculture, such as Flexi-coil and the tractor division of Ford Motor Company. New Holland consists of several vertical industry divisions and familiar brand names that have flowed into the giant CNH umbrella. And just as industrialization made less work for farmers, New Holland is adopting innovation in the information technology (IT) industry to make less work for its employees and dealers.

Previously, CNH's Information Technology Division had provided 1,200 North American dealers of New Holland Agriculture, New Holland Construction and Kobelco Construction equipment with a rudimentary system for tracking orders on J.D. Edwards enterprise resource planning (ERP) back ends. Powered by the IBM AS/400® (predecessor of the IBM @server iSeries system), the system required dealers to call or fax in their orders to the New Holland field sales managers or the dealer service center, lowering productivity at both ends. By extending access to host applications through the Internet, New Holland would be able to reduce dependence on their field sales managers and call center by giving the dealers the ability to create, configure, and check the status of orders and cancel them online.

Harvesting savings and better customer relations

A new wave of innovation hit New Holland's IT infrastructure with the company's "Web-to-host-screen revitalization" project—an initiative for replacing dial-up terminals and plain green screens with the colorful and easy-to-use screens that can be built once, enhanced and published over and over on the Web.

A longtime IBM customer for software and servers, New Holland chose IBM WebSphere Host Access Transformation Services (HATS) instead of an integration product for the iSeries provided by Lansa. The deal was clinched when IBM demonstrated that, with just a few hours of development, New Holland could provide access to its iSeries applications on the Web in a new and more user-friendly format. "The WebSphere HATS demonstration blew us away," says Tim Lyon, operations director, New Holland. "From that moment on, we knew we had a winner."

"What was amazing to me was how quickly our New Holland support team and solutions delivery could run the application without assistance, after making use of the expertise of IBM and Beaver Creek Solutions."

– Tim Lyon

Fast learning curve

Dealers use the new system to order inventory, display and print invoices, track orders, and navigate the supply chain process. The WebSphere HATS software recognizes the iSeries green screens and transforms them into HTML and Java™ technology-based Web pages with all the modern conveniences that Web users expect, such as push buttons, drop-down menus and the use of color.

New Holland worked with Beaver Creek Solutions, an IBM Business Partner specializing in Web-to-host integration, and IBM Software Services for WebSphere to develop the applications with IBM Rational Web Developer for WebSphere Software (formerly known as IBM WebSphere Studio Site Developer). IBM WebSphere Application Server – Express powers the Web-based transactions and interacts with the ERP back end.

"What amazed me was how quickly our New Holland support team and solutions delivery could run the application without assistance, after making use of the expertise of IBM and Beaver Creek Solutions," says Lyon.

By reassigning call center employees to higher value work, New Holland is saving thousands of dollars. The new solution, called iLogNet, is helping to accelerate dealer inventory, which in turn improves the dealers' ability to manage their bottom lines. New Holland is also receiving orders more quickly, accelerating cash flow.

"We've provided a modern, Web-based order system that makes life easier for our dealers, and thanks to IBM Services and IBM WebSphere HATS, it has been a tremendous success," says Lyon. "In fact, dealer satisfaction is up by 77 percent among New Holland Agriculture dealers for whole-goods ordering processes."

Corporate recognition confirms success

Beaver Creek Solutions helped implement the solution and train the staff to work with the software. Working with Beaver Creek Solutions and IBM, New Holland produced a working prototype in just two months, and the entire project went live one month later.

Originator of many agricultural innovations, New Holland is transforming the way it does business with a Web-to-host revitalization project based on IBM WebSphere HATS.

"We plan to improve our speed to market in terms of developing seamless flows of information to integrate end to end with our business partners. IBM, WebSphere and the service oriented architecture will be the key components of our ability to do that."

– Ted Post, System Integrator, CNH

CNH recognized the effort put forth by the IBM, Beaver Creek Solutions and New Holland team by awarding the project its annual CEO Circle of Excellence Award, citing the cross-functional New Holland team for work embodying the company's core values: customer satisfaction, value creation and people involvement. The award citation also makes clear that "The iLogNet online order management project was launched on time and under budget."

Planting the seeds of future excellence

One success begets another: Other New Holland units have signed up to use the WebSphere HATS solution for other systems. These projects will leverage IBM WebSphere Business Integration Server, IBM WebSphere MQ and WebSphere HATS.

"In terms of the foundation that's been laid as a result of the success of the iLogNet project, the impact has been tremendous," says Ted Post, system integrator, CNH. "We have set a clear direction for the technology that's going to be used for projects in the future and for the development of tools to use for those projects."

New Holland is already laying the groundwork for a service oriented architecture by reusing their existing legacy IT assets that they can treat as flexible services. "WebSphere Application Server and the IBM WebSphere Business Integration portfolio will be key to this project because of their flexibility and adherence to open standards," says Post. Right now the group is programming point to point, but the direction of the future is building reusable code for Web services that can interact without custom integration. This will greatly improve New Holland's agility in the marketplace.

"We've done a lot of custom integration with joint ventures, and we know that without a centralized, open, service oriented architecture that allows us to layer on services, we are slowing the business process," says Post. "We plan to improve our speed to market in terms of developing seamless flows of information to integrate end to end with our business partners. IBM, WebSphere and the service oriented architecture will be the key components of our ability to do that."

For more information

Please contact your IBM sales representative or IBM Business Partner.

Visit us at: **ibm.com**/websphere

For more information on CNH, visit: *www.cnh.com*

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DaimlerChrysler builds a “proactive infrastructure” to become more flexible and responsive.

Overview

- ***Challenge***
  DaimlerChrysler knew that competitive strength in today’s dynamic global auto industry came not only from efficiency, but also from the ability to adapt the business quickly to changes in its environment.
- ***Why Become an On Demand Business?***
  DaimlerChrysler needed to be able to sense everything from shifting customer preferences to changes to shipment dates, and have the built-in means to respond dynamically. But this required flexible systems and processes integrated from end to end.
- ***Solution***
  DaimlerChrysler engaged IBM to design and build an integrated infrastructure solution that provides a standardized, “ready-made” environment for developing, deploying and running applications.

Key Benefits

- *Significant reduction in overall application lifecycle costs*
- *Fundamental reduction in average application development cycle*

>> **On Demand Business defined**
“An enterprise whose business processes—integrated end-to-end across the company and with key partners, suppliers and customers—can respond with speed to any customer demand, market opportunity or external threat.”

Based in Auburn Hills, Michigan, and Stuttgart, Germany, DaimlerChrysler generated $192 billion in revenues on sales of 4.7 million vehicles, making it the world’s number three auto manufacturer. The company, whose brands include Mercedes-Benz, Chrysler, Jeep®, Dodge and Freightliner, employs 384,723.

With manufacturing facilities in 17 countries and products sold in 200, few companies are more global in scope than DaimlerChrysler. The company (www.daimlerchrysler.com) has made this strong global presence a key part of its business strategy as a way to gain the most leverage from its operations and its global brand. Underlying and driving this strategy is the auto industry’s intense competition, which has made efficiency and cost control absolutely essential. While the merger that created DaimlerChrysler established the potential for scale-driven efficiency, realizing that

“The solution we built with IBM provides us with a flexible and efficient means to break down silos across DaimlerChrysler, and in so doing has established the foundation for us to become a nimbler, more responsive company.”

– *Dr. Seshu Bhagavathula, Director for Technology Strategy, DaimlerChrysler*

ON DEMAND BUSINESS™

On Demand Business Benefits

- Reduction in overall application lifecycle costs
- Reduction in average application development cycle time
- Nearly 50% reduction in installation costs for applications deployed via the new application development platform
- Nearly 30% reduction in ongoing operations costs (based on Gartner Group study)
- Reduced technical risks in deployment and operations phase for applications developed using the new solution
- Improved ability to standardize and optimize business processes across the company resulting in increased responsiveness as a company

potential required the company to consolidate and integrate its operations. Only then could the company unleash the valuable synergies on which the merger was predicated.

As IT investment exploded in the late 90s, the competitive demands on auto manufacturers increased still further. While cost control remained important, flexibility and speed—in the form of shorter cycle times and rapid time to market—had also become key operational requirements. But for DaimlerChrysler, the pervasive growth of technology had also presented a challenge. Still in the early stages of integrating its operations, DaimlerChrysler—like many large firms—grew into a complex patchwork of products and technologies running on a variety of IT infrastructures across the company. The operational implications were significant. For one, the fact that business units—and sometimes departments—ran different systems and applications posed a major obstacle to cross-functional integration and contributed to the formation of business process silos across the company.

Driving toward adaptability

DaimlerChrysler knew that competitive strength in today's dynamic global auto industry came not only from efficiency, but also from the ability to adapt the business quickly to changes in its environment. This meant being able to sense everything from shifting customer preferences to changes to shipment dates, and having the built-in means to respond dynamically. But the company also knew that to achieve such a sense-and-respond capability required flexible systems and processes integrated from end to end. DaimlerChrysler recognized the need to break down its silos and saw its IT strategy as an effective medium for achieving this.

"IBM knows about building open infrastructures and about the way global organizations like DaimlerChrysler work. There are not many companies that can make that claim."

– *Wilfried Reimann, Senior Manager for Technology Integration, DaimlerChrysler*

Within DaimlerChrysler, the prevailing view was that its IT capabilities should facilitate—not thwart—its business strategy. The most fundamental of these capabilities was the application development. Under the previous framework, IT complexity and a lack of standards made the application development and deployment process slow and inefficient and made applications prone to unpredictable performance. For each application, developers had to address not only business logic but also technical issues like integration, security and performance testing. Once applications were developed, the lack of standards also precipitated operational problems. With no standardized infrastructure, data center staff were often ill-prepared to configure, integrate and manage the new applications. This added to the overall time, cost and

burden required to bring new applications online. In sum, cumbersome application development made DaimlerChrysler less responsive.

A new infrastructure solution

With the assistance of IBM, DaimlerChrysler addressed this problem by reinventing the way it developed and supported applications across the enterprise. At the core of this new application framework is a standardized, integrated platform employing a Service Oriented Architecture (SOA) approach. Known as the Pro-Active Infrastructure (PAI), the platform was designed as an efficient, "ready-made" environment for deploying and running enterprise-wide Java applications. Its core benefit is simplification, which it achieves by encapsulating most of the technical aspects of application development—such as security, directory services and integration—into modules that can be readily accessed and reused by developers, thus enabling them to focus their efforts on business logic. Moreover, because the new system was designed to be inherently robust and scalable, performance testing requirements are drastically reduced, enabling developers to focus on high value added tasks.

The final and arguably most innovative attribute of the PAI is its built-in flexibility. Built on a firm foundation of standards such as J2EE, XML and Web Services, the new platform can modularly add new products and technologies with no or minimal impact to the applications running on top of it. By simplifying the application infrastructure, DaimlerChrysler has increased its flexibility to capitalize on new technologies while at the same time reducing the cost of maintaining its applications within its data centers. In this way, the PAI acts as a bridge between application development and data center operations. An even truer measure of the PAI's flexibility is the model DaimlerChrysler and IBM used to deploy it. While traditional engagements generally have a clear beginning and an end, DaimlerChrysler treats the PAI as an ongoing series of product releases subject to constant evolution. Under this model, the company's distributed base of internal customers—its application development and data center teams—gain access to the leading edge technology built into the platform, while development efforts as a whole are bounded by a common set of standards.

Designed with the support of IBM Business Consulting Services and IBM Global Services – Integrated Technology Services, the PAI is comprised of a series of specialized, well integrated modules like the portal, J2EE, process integration, business information broker, security and directory platform, supplemented by selected 3rd party products. Each of these platforms has one or more standard products as its foundation, but also includes add-on functionality to standardize development and operation and to integrate with the DaimlerChrysler computing and network infrastructure. For instance, developers relied on the PAI portal platform to develop its highly successful employee and supplier portals and to build workflow-oriented business applications as well as applications that share business process data across or within business units within an SOA framework.

Key Components

Software

- IBM WebSphere® Application Server
- IBM WebSphere Portal
- IBM WebSphere Business Integration
- IBM WebSphere MQ Workflow
- IBM DB2® Universal Database™
- IBM Rational® Development Tools

Servers

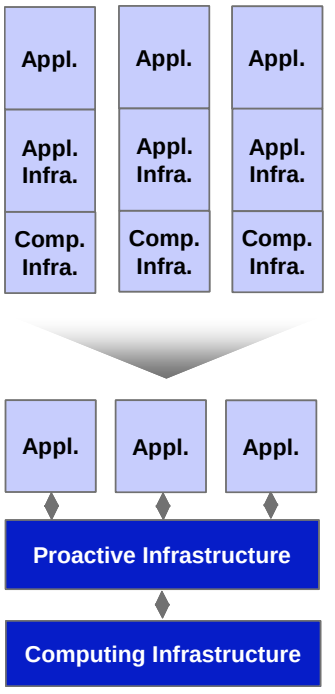
- IBM eServer™ pSeries®

Services

- IBM Business Consulting Services
- IBM Global Services - Integrated Technology Services
- IBM SWG Services

Former approach vs. PAI

Deployment Time: 18 months



A module based on IBM WebSphere Application Server is used to develop J2EE-based Java applications. IBM DB2 Universal Database serves as the PAI's standard database engine.

By standardizing its application infrastructure, DaimlerChrysler has been able to transform, simplify and streamline its application development and management processes. For the roughly 120 applications developed using the PAI so far, DaimlerChrysler expects the new processes to reduce their overall costs significantly over the course of their lifecycles. On the development side, the speed and efficiency enabled by reusable components are a big factor, with the average development cycle reduced by nearly half. Results have been equally impressive in the area of operations, where streamlined and automated processes for installing, configuring, monitoring, and troubleshooting applications have enabled DaimlerChrysler to reduce its costs by nearly 30 percent (according to a best practices study by the Gartner Group), allowing it to redeploy resources into continued optimization efforts.

But to bring the story full circle, the real acid test in assessing the solution's value is whether it helps make DaimlerChrysler a stronger, faster and more adaptive competitor in the global auto market. For Dr. Seshu Bhagavathula, Director for Technology Strategy, the answer is an unqualified yes. "The solution we built with IBM provides us with a flexible and efficient means to break down silos across DaimlerChrysler, and in so doing has established the foundation for us to become a nimbler, more responsive company," explains Dr. Bhagavathula. "It gives us the infrastructure we needed to standardize and optimize our processes across the company." Good examples of this include a common bill of materials application now under development that will serve all of the company's commercial vehicles divisions, as well as new collaborative processes that will enable business units around the world to share engineering data.

For Wilfried Reimann, Senior Manager for Technology Integration and the project's key driver, the depth and breadth of IBM's resources around the world were key factors in its selection as a provider. "It was important for us to know that IBM will be there wherever we decide to deploy," says Reimann. "IBM knows about building open infrastructures and about the way global organizations like DaimlerChrysler work. There are not many companies that can make that claim."

For more information

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IBM Case Study
March 2005

From reengineering to reinvention: the IBM journey to becoming an On Demand Business.

ON DEMAND BUSINESS™



Table of contents

Executive summary

After a highly visible fall from the heights of information technology leadership in the early 1990s, IBM is healthy and growing again. The new millennium has brought record revenue and established IBM as the leader in servers, middleware, business transformation and outsourcing services, and momentum continues to build. Of course, a transformation of this magnitude doesn't happen overnight. It entails nothing less than a reinvention of the company, and it makes for a compelling story—a story that is still unfolding.

This transformation is not an event, but a journey—one that is taking place in the midst of greater turbulence and volatility than businesses have faced in more than half a century. And although IBM's story is in many ways unique, it mirrors the aspirations and challenges faced by many leaders of businesses and institutions today. They are grappling with how to manage their organizations through what feels like a very important—perhaps even historic—inflection point.

Once every 40 to 60 years over the past three centuries, society has witnessed a great surge of business innovation, sparked by technological advances, which ushers in a revolutionary new era. There have been five such surges in modern history, according to Cambridge University researcher Carlota Perez.[1] Each of them follows a predictable pattern with two distinct periods of 20 to 30 years: The first is the period of installation, going from initial exploration, exuberance and speculation; to a bubble, an economic meltdown, its correction and a market adjustment. The second is the period of deployment, during which new ways of doing business are explored and implemented—and broad-based wealth and value are created.



As world markets entered the most recent stage of sustained innovation, it's fair to say that IBM traveled a rough road. It's no secret: the company began this journey out of necessity—and was struggling to survive. Reengineering efforts at that time were driven by the need to simplify the enormous complexity—and attendant costs—that accompanied IBM's decentralization in the early 1990s. As did most other companies, IBM leveraged the Internet and global connectivity to simplify access to information and enable simple, Web-based transactions. The company took steps to integrate processes both within the business and among a group of core clients, partners and suppliers. That was a huge effort—and yet by late 2002 it was clear that the real journey had just begun. While IBM reaped enormous efficiency gains, it had yet to challenge long-accepted practices, processes and organizational structures that limited its—and most other companies'—options in the face of globalization, industry consolidation and disruptive technologies.

The answer lay in a new computing model and in a new business architecture. IBM Chairman and CEO Sam Palmisano dubbed this *On Demand Business,* and IBM committed itself to becoming not simply a case study, but a living laboratory for On Demand Business. The company identified key business characteristics—horizontally integrated, flexible and responsive—and the IT infrastructure needed to produce its enterprise transformation—integrated, open, virtualized and autonomic. IBM focused on tackling the complex issues surrounding significant changes to essential business processes, organizational culture and IT infrastructure, and worked to find new ways to access, deploy and finance solutions. Most importantly, IBM committed to use its own experience to deliver more value to its clients.

Today, IBM is hitting a new stride. A powerful combination of innovation and value creation is driving top-line revenue growth. Client satisfaction is climbing. And the company continues to operate in a highly disciplined manner, focusing on increased productivity and IT optimization to drive bottom-line earnings. Because this is precisely the type of growth that tops the majority of CEOs' agendas, many will find IBM's story particularly timely and relevant.

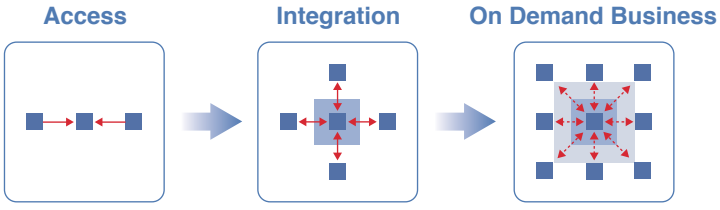
An *On Demand Business* is an enterprise whose business processes—integrated end-to-end across the company and with key partners, suppliers and customers—can respond with flexibility and speed to any customer demand, market opportunity or external threat.

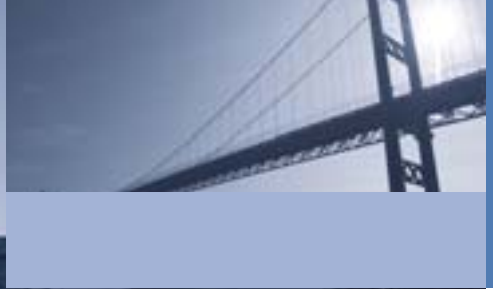
Putting IBM's journey to On Demand Business in perspective

IBM's shift to On Demand Business is not unique. The company conducts an annual worldwide tracking study with 6,000 organizations (30,000 interviews over the past five years). Through this study, IBM identified three major stages that an organization moves through as it transforms its operations through the use of the Internet and network-based technologies. Each stage has different characteristics, challenges and benefits.

- **Access —** Businesses have IT-related capabilities that tend to be limited to supporting single business units with little or no integration between them. A simple Web presence or basic e-commerce would qualify a business for this stage of adoption. The challenges? Fears about security. About financial risks. About the quality of vendor support available. About meeting demand.
- **Integration —** Businesses have begun to break down barriers by integrating and automating business processes, models and applications, and supporting infrastructure across their business units, moving them in the direction of end-to-end integration, a critical step to becoming an On Demand Business. Eventually such businesses include their ecosystem in their integration efforts, by including their suppliers, customers and other business partners. Those processes are still relatively static and inflexible, however, because they tend to build on and automate existing relationships. The benefit? Increased speed and quality, as much of the manual processing is eliminated. The challenges? Integration of disparate processes and systems built by different teams.
- **On Demand Business —** The ability to dynamically manage and reconfigure processes and relationships begins to emerge as a company becomes an On Demand Business. Relationships can be formed and dissolved on the fly, according to business need and external conditions. Processes and IT systems become increasingly modular to support reconfiguration, both internally and externally. All of this enhances the flexibility and resilience of a business, while giving it the ability to focus more tightly on its core, differentiating capabilities. For IBM, it also meant moving to financial reporting that is balanced between client and industry as well as products and services. The biggest challenge? Fostering a collaborative culture and breaking down the business and cultural barriers between internal and external teams, and then reaching out seamlessly to embrace customers, suppliers and business partners, and differentiate value.

"One thing I always tell clients is that they can take advantage of what we've learned," says Linda Sanford, IBM senior vice president, Enterprise On Demand Transformation and Information Technology. "You can learn from both our mistakes and accomplishments. We have technologies today that can accelerate the integration process, and outsourcing capabilities that can enable operations—and potentially whole organizations—to move right to On Demand Business."




Reengineering: the making of a healthy business

Let's begin at the beginning. In 1993, under the guidance of then IBM Chairman and CEO Lou Gerstner, the company began its turnaround from a near-death experience. And a big part of that was the strategic initiative to reengineer IBM's core processes. A loose confederation of independent business units had created an unwieldy management structure, redundant operations and disconnected information systems. In 1993, the company experienced a US$8.1 billion loss, and the stock price was at a 20-year low. Although he was under pressure to break up the company, Gerstner decided that the sum of IBM was more valuable than its parts, and he recognized that IBM had to change to meet its clients' needs or the company would cease to be relevant.

To realize this value, however, IBM's leadership team had to tackle some very tough issues. They started by focusing on a few core functions—customer relationship management (CRM), product development, procurement and logistics. Between 1996 and 1998, IBM reduced redundant costs associated with decentralization and, as a result, achieved US$5 billion in cost avoidance and savings.

Between 1999 and 2002, IBM's priority shifted to integrating elements of these processes to create a more horizontal flow of work across the business. So rather than optimizing processes by business unit or within functional domains—like billing—the company focused on creating processes that would make working with IBM a better experience for its clients, IBM Business Partners and suppliers. During this phase, IBM gained more than US$7 billion in new efficiencies.

Reinvention: the making of an On Demand Business

By 2002, with a solid foundation in place, Sam Palmisano reassessed the company's approach to industry leadership. Recognizing that the IT industry was splitting between commodity-like and high-value businesses, Palmisano chose to focus IBM on high value: innovation, creating unique value, new technology and new business insights and models.

"Early on, we focused on reducing cost and expense," says Sanford. "We had to in order to survive. But today, our focus has shifted from reengineering to reinventing ourselves. We continue to deliver cost and expense improvements, but now we're tackling a more complex agenda—focusing on growth and innovation as powerful ways to manage and measure our progress."

To realize this agenda, IBM has shifted its focus to integrated, unique client solutions supported by business and technology innovation; identified business processes that would require radical transformation; and analyzed technologies and business practices that would foster improvement to business performance. Based on insights from clients and a wide range of internal and external experts, the company identified and nurtured more than 20 emerging business opportunities that had the potential to become multibillion dollar businesses in three to five years. Of these, life sciences, digital media, business transformation outsourcing and pervasive computing have already become over US$1 billion businesses for IBM, and the rest are growing by an average of 40 percent, year over year. The acquisition of PricewaterhouseCoopers Consulting was aligned with a US$1 billion investment, through IBM Research, to deepen On Demand Business insights for clients, and it served to launch new business capabilities, such

as the Center for Business Optimization. The rate and pace of horizontal integration across the business and ecosystem enabled significant business improvements. It also became clear that IBM needed to change its culture in order to create the level of cross-company collaboration necessary to achieve its objectives.

Transforming the way business is done

IBM's first priority was to improve the way it sells to and serves clients. Second was the company's supply chain. Third was the way work gets done inside IBM. Improvements within each of these areas were—and still are—fueled by operational innovation and advances in technology that not only can be leveraged by IBM, but also delivered to clients.

Reinventing the way IBM sells to and serves clients and partners

First and foremost, IBM listened to the needs of its clients and Business Partners. They said it was difficult to do business with IBM. For example, clients said that they wanted to be able to find information quickly and easily so they could make informed purchasing decisions and get the appropriate support from IBM with a minimal investment of time. Business Partners told the company that it needed to be more efficient in processing their orders—so they could, in turn, better serve their clients.

The resulting objective was very straightforward: fast, easy access to IBM's products and business expertise. This makes it simple for clients and partners to engage with IBM in every way, from finding product and pricing information to IBM's contracts, terms and conditions, to ordering, reconciliation of invoices and ongoing support, to providing and supporting solutions that meet clients' needs. IBM has a number of major initiatives under way in this arena, including:

- Using ibm.com to transform the way client interactions are managed
- Working with partners to drive On Demand Business solutions and to increase IBM's presence in the small and medium business (SMB) marketplace
- Streamlining the process of development, sales support, proposal and delivery.

IBM committed itself to becoming a living laboratory for On Demand Business—horizontally integrated, flexible and responsive—and focused on tackling the complex issues surrounding significant changes to essential business processes, organizational culture and IT infrastructure.

On Demand Business transformation through the eyes of Paul Farrell, IBM Business Consulting Services principal, Ireland

I'm told that surfing is dangerous, exciting, dynamic—a real thrill. Working with our client Allied Irish Banks (AIB) has been very similar. Riding that wave of change with them has been a really great experience.

Like IBM, AIB is customer-focused, tailoring its products to meet customer needs and adapting them as those needs evolve. One of the things I like about the team from the bank is that they're brave: risk takers who are prepared to go out there and try things that are new. They believe in themselves as an organization, which maps exactly to our beliefs at IBM.

Business in Ireland had been absolutely booming, growing five to ten percent for as many as ten consecutive years. But there were indications that the economy was going to slow down. And AIB had been extremely profitable. To maintain that profitability and leadership position, the bank wanted to be able to anticipate change and proactively adapt its business to accommodate it.

Initially, our relationship with the bank staff was transactional. But we wanted them to see us as a more strategic partner. We looked across IBM and formed a team (client manager, global banking industry strategist and director, business consulting services principal) that could leverage the On Demand Business expertise needed to take AIB where it wanted to go.

You have to remember that AIB is a bank. It's run by people who have this real feel for figures. They care about how an organization can save money, improve performance and grow in double-digit leaps. To demonstrate to AIB how this could be accomplished, we used IBM's own transformation as an example. And when we did, a light went on for AIB's CIO.

Then an unexpected, unsolicited aggressive bid came from a competitor. It made us accelerate our thinking and work even harder together to develop new, insightful intellectual capital to enable us to evaluate how we could help AIB drive down costs and improve its cost-income ratio. With these recommendations, AIB's individual On Demand Business transformation was on its way.

On Demand Business has enabled IBM to integrate, to rally around one common element—our client. The thing that really excited AIB's CIO was our team. We quickly assembled a group from around the world that had the right skills and the right approach to understand and meet AIB's needs. We had to go in there as one company, with a unified approach. We came in as a technology supplier, but ultimately built the relationships needed to win AIB's business and deliver true business value to our client.

"As a result of their own on demand experience, we find IBMers—from the people we deal with every day to those at the most senior levels of the company—behave differently than their competitors. It's as if they're actually working in the mindset of their clients—not simply in their best interests."

—Michael Baume, CIO, Allied Irish Bank

The ibm.com Web site has long been recognized as a leading e-commerce environment. It is the focal point of IBM's sales interaction with enterprise and small business clients, partners, original equipment manufacturer (OEM) partners and consumers. To maximize responsiveness, IBM combines a rich online environment with global sales center operations to create a fully integrated TeleWeb sales, service and support channel. In 2004, ibm.com recorded 284.4 million net Web visits and more than 15.2 million sales calls. The ibm.com site provides this capability in 83 countries and manages online transactions in 31 currencies.

In November 2004, IBM launched a complete redesign of its public Web site. The One IBM Web Experience provides a unified Web environment that delivers relevant information to a variety of constituents. The ibm.com team is piloting innovative technologies to continue to improve the quality of client interactions—from simple features, like Call Me or Text Chat capabilities, to an instant messaging feature that alerts clients when their inside sales representatives are online. Is it working? Fifty-seven percent of clients worldwide say they prefer to do business via the TeleWeb channel. More than 65 percent of all client interactions are now Web-based, leaving more than 4,000 specialists in 39 sales centers free to respond to more complex queries.

At the other end of the client experience lifecycle, providing technical after-sales support, is My Support Portal, which provides clients with a unified view of up-to-date technical information tailored to their individual needs. When clients log on to My Support Portal, the system automatically pulls their profile from a registration database and instantly presents them with a page of relevant information based on their last session and/or previously identified interests. Clients can obtain answers on their own, empowering them to solve problems and enhancing their productivity. By streamlining support processes, My Support Portal contributed to a US$757 million 2004 cost avoidance associated with IBM's technical eSupport initiatives, while increasing overall client satisfaction.

Another important dimension of IBM's reinvention of the way it sells and serves clients is the IBM Business Partner program. To improve its flexibility and coverage of key markets like SMB, IBM relies on Business Partners as the primary channel for bringing IBM technology solutions to small and midmarket clients. In return, IBM delivers support and incentives to better enable Business Partners to profit from all aspects of the small and medium business opportunity. IBM Business Partners also bring value-added solutions and services to IBM's largest clients. In order to enable Business Partners to deliver the integrated solutions its clients need, IBM developed a seamless, extensive suite of collaborative tools that enables the company and its Business Partners to work securely across time and distance to coordinate tasks, discuss issues, track actions and



make better decisions—faster. In addition, IBM has initiated a set of business to business (B2B) capabilities to enable automation of sales transaction processes between Business Partner and IBM systems. IBM may receive Business Partner orders/requests, directly pass them to the appropriate internal applications to be fulfilled and return the appropriate response information back to the Business Partner—completely touchless. A single solution architecture supports IBM's XML-based B2B customer and Business Partner connections, based on E2open's multicompany process management solution. The XML messages are implemented using the RosettaNet open standards. IBM and its Business Partners can now be seamlessly integrated, handling transactions 24x7. Each of these initiatives is designed to enable IBM and its Business Partners to provide better solutions and to be more responsive to clients.

IBM also has demonstrated success in developing industry-specific solutions that help clients solve their business and IT problems, large and small. To provide high-value business benefits, IBM fuses services with industry and technology expertise to craft solutions that meet particular business needs and help companies to achieve their objectives. Recently, IBM enhanced its solutions capability, with its continuing technology investments and acquisitions of consulting expertise, furthering its trusted advisor relationships with clients. By teaming with leading independent software vendors (ISVs) to supply integrated solutions, providing differentiated insights through research and by integrating its hardware, software and services, IBM has the breadth of capabilities to support a client through business process and model redesign, application/infrastructure design and solution implementation. The results have been significant. By working closely with clients and moving toward seamless and timely access to a range of insights and hands-on capabilities through its consulting services and Business Partners, IBM has been able to offer solutions that are both responsive and flexible to meet the needs of its clients.

Although far from done, IBM is making solid progress. Client and Business Partner satisfaction numbers continue to rise. For example, according to a recent North American study from VARBusiness, IBM's commitment to business partners took center stage in the VARBusiness Annual Report Card (ARC).[2] The study ranked IBM as the overall winner or tied in business partner satisfaction in eight major categories that included software, systems, personal computing and network storage.

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More than 65 percent of all client interactions are now Web-based, leaving more than 4,000 specialists in 39 sales centers free to respond to more complex queries.

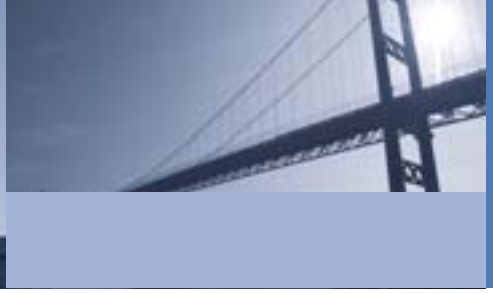
On Demand Business transformation through the eyes of Fabian von Kuenheim, president and CEO, Magirus—a leading value-added distributor of IT infrastructure in Europe and one of the largest European IBM Business Partners

Our goal was ambitious: We wanted to be more responsive to customers by slashing order cycle times from days to a matter of hours. We were convinced that achieving our goal meant that order transactions between Magirus and IBM needed to be processed completely electronically. But then, isn't that what it takes to be an On Demand Business?

Today, when Magirus logs an order into its procurement system, it's routed directly to IBM through a new, standards-based order processing system—called B2B Touchless Order System. The system uses industry standards (XML based on RosettaNet) to help enable orders to flow seamlessly, despite the differences between the Magirus and IBM order management systems.

This new system has helped improve business in two ways: by helping to reduce the costs associated with order processing, while at the same time allowing us to deliver more revenue from our existing staff. The hard benefits take three forms. First, Magirus was able to reduce the administration overhead for dealing with IBM by two people, whom we then redeployed to sales activities. This, among other things, like the Authorized Assemble Program, contributed to a 23 percent increase in Magirus' IBM @server® iSeries™ and pSeries® systems revenue in the second half of 2003. Second, we're expending less time and fewer resources on managing problems, because we've reduced the occurrence of errors in the order process. Third, we're seeing that reduced cycle time means that orders can be invoiced faster and, therefore, revenue flows in faster.

This is one of the best projects I have ever run with anyone. It was on time and on budget. I know this project touched many parts of IBM: the sales organization, the supply chain group, IBM Research and others. But instead of seeing the differences, there was a sense of partnership that went from the working level all the way up through management. The whole project took fifteen months, start to finish.


Reinventing IBM's supply chain

When IBM created its Integrated Supply Chain in 2002, the driving force behind this decision was how to harness end-to-end supply chain capabilities for competitive advantage—how to enable IBM to become the most adaptive and responsive enterprise in the industry, in order to serve clients better. IBM integrated its 30 existing supply chains into one, working across 35,000 suppliers and 45,000 Business Partners. In addition to huge cost savings—nearly US$20 billion over the last three years—another long-term benefit has been the unprecedented level of flexibility that this cross-business view provides. This approach—linking the supply chain strategy to IBM's business strategy and then assembling the right combination of skills and resources to support it—has never been more important. By creating a new model for managing the operations of the business, IBM is moving toward operating at the speed of clients' demand and becoming not only faster and more efficient, but a qualitatively different kind of enterprise.

The focus, originally on hardware, needed to align with solutions in a way that was consistent with IBM's business direction. This goal led IBM to tackle challenges at both ends of its supply chain, integrating its systems to give clients a personalized, consistent experience across all IBM brands through an enabling infrastructure that includes SAP, Siebel and IBM WebSphere® software. In addition to moving toward providing clients with a seamless view of their business relationship, IBM is applying its supply chain experience to managing its services business. A sharper focus on sourcing has reduced cost for the company's services business by more than US$700 million in 2003 and US$2.4 billion in 2004. Efforts to increase visibility of IBM Business Consulting Services resource deployment has resulted in a three to five percent improvement in utilization in 2004. Also, IBM is using its hands-on expertise in supply chain to drive new revenue growth. IBM's internal supply chain organization is collaborating with IBM Business Consulting Services in client engagements, to not only help companies transform their supply chains, but operate aspects of them, as well. In 2004, IBM's internal supply chain organization participated in more than 100 client engagements globally, with contracts valuing more than US$600 million in revenue.

In addition, the company is creating a seamless environment that can support Business Partners throughout the entire sales cycle, from opportunity to cash. Process integration is already underway. IBM has 375 business-to-business connections designed to simplify order management, including dozens of Business Partner-developed processes enabled across the network via open standards.

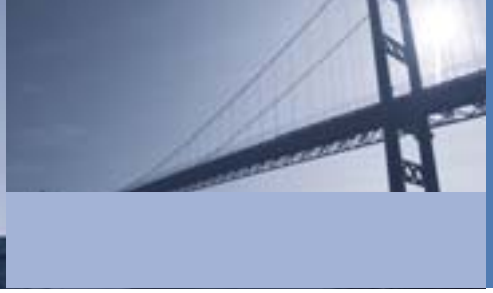


Results so far are outstanding. IBM reduced days sales outstanding (DSO), representing an improvement in rate and speed greater than in the previous five years combined, thanks to common, integrated processes with better data leading to fewer errors and fewer delays. The company is realizing historically low levels of inventory for IBM products, is continuing to improve inventory turns and has synchronized demand and supply to achieve the lowest number of unfilled orders in its history, all of which has allowed IBM to generate US$500 million in cash over the last two years.

Furthermore, IBM has improved productivity by reducing the time its sales teams spend on fulfillment and related supply chain issues by 25 percent over the last two years. To date, the IBM supply chain transformation has helped the company exceed its target for the percent of clients that are very satisfied with its delivery commitments. IBM continues to work on improvements to ensure a positive delivery experience for every transaction.

For example, IBM is overhauling its Customer Order and Analysis Tracking System (COATS)—a shared order entry application supporting 20 manufacturing plants worldwide—to translate sales orders into manufacturing materials lists and instructions for manufacturing hardware, such as iSeries and IBM @server zSeries® servers. COATS is an aging legacy application that required up to six months for new capability delivery. Rather than a very costly replacement of the entire system, IBM's flexible and scalable service oriented architecture is enabling rapid, incremental, implementation of component-based Web services with rule-driven workflows. Using the same approach that IBM Business Consulting Services recommends to its clients, the company is creating reusable, high-return-on-investment, process and IT assets. It is doing so by implementing the IBM Enterprise Component Based Architecture methods and standards, while focusing on the cultural change aspects of the project. As a result, and thanks to development and deployment support from IBM Business Consulting Services, the IBM COATS team is now realizing up to 25 percent faster development cycles, reduced development costs and easily adaptable operational workflows, capable of responding to On Demand Business needs.

At IBM, an on demand supply chain ripples outward to all aspects of the enterprise. It's about having an unwavering focus on building flexibility and responsiveness into the systems and processes used to run the entire business, not just the supply chain. This has required major changes in how departments conduct their work and relate to one another. It entailed getting down to the nuts and bolts of business processes, and finding innovative ways to get work done for sustainable improvements in productivity, to ignite growth.


Reinventing IBM's work environment

Given its focus on delivering higher value through innovation and integration, intellectual capital and services expertise are priceless to IBM. In an information intensive business, productivity is a function of how liquid these assets are across the enterprise. Leveraging them to maximum advantage requires tools, processes and a culture that make knowledge transfer and information sharing as seamless and friction-free as possible.

Achieving maximum productivity can be challenging, considering that nearly 40 percent of IBM's nearly 330,000 employees don't go to an IBM facility every day. In fact, tens of thousands of the company's employees may never work in a traditional office location. On top of that, more than half of IBM employees have been working for the company for five years or less. How do you ensure that a decentralized workforce of this magnitude knows what resources are available, how they can connect with the people they need to support clients and each other, and then act on the information they receive?

The IBM On Demand Workplace addresses many of those challenges. Created a decade ago as a vehicle for employee communications, IBM's intranet has been transformed into a 24x7 interactive platform connecting a global workforce serving clients in 170 countries. Since 2003, the On Demand Workplace has saved the company more than US$680 million by Web-enabling processes for travel reservations, procurement, software installations and employee help desk calls, among others. But the savings are just the beginning.

On Demand Workplace is becoming the platform for how work gets done within IBM—providing a personalized, customizable user experience, specific to geography, business unit, function or interests. And we're taking the lessons learned from our own implementation and offering our expertise to clients in the form of the IBM On Demand Workplace suite of software, hardware and services for On Demand Business.

To enhance employee productivity, IBM is shutting down outdated and redundant Web sites and portals (over 900 in 2004 alone). Eventually, most content on individual business unit and organization Web sites will be integrated into the On Demand Workplace, which will feature role-based portlets and will eliminate the need for employees to go to multiple places for relevant information, avoiding conflict in content across the intranet.

On Demand Workplace boosts employee satisfaction and cost savings

- 81% of IBM employees access the On Demand Workplace daily.
- 50% of IBM's employee training is delivered through On Demand Workplace.
- 9 out of 10 U.S. employees enroll for health benefits via On Demand Workplace.
- An estimated 30 minutes per employee are saved each month as a result of the ability to quickly locate and engage colleagues who have the needed expertise.
- Since 2003, IBM has realized more than US$680 million in savings as a result of Web-enabling processes to the On Demand Workplace.



In late 2004, the first global, role-based portlet on the On Demand Workplace was launched. The Manager Resources Portlet provides a consolidated view of corporate, geography-specific and local manager resources and human resources (HR) policy information based on the On Demand Workplace profile. By integrating the Manager Resources sections of 40 global Manager Portals into the On Demand Workplace, 30,000 managers across the business have faster access to tools, policies and practices that they need to work more effectively.

Another new portlet, called Learning@IBM, provides employees with personalized learning recommendations based on the roles and interests they specify in their On Demand Workplace profile. This portlet centralizes learning activity management and execution for each IBM employee, allowing individuals to manage their planned learning activities, identifying education based on need while effectively and efficiently completing the learning activities they have selected.

To further improve productivity, IBM is making it easier to find subject matter experts wherever they exist within the company. Using IBM's BluePages, employees have searchable access to a vast array of information about their colleagues—everything from skills and expertise to interests to client relationships. More than just a corporate directory, BluePages, used in conjunction with talent solutions and tools, provides one view of expertise and skills across IBM. This comprehensive view of employees helps IBM connect talent to opportunities, whether it is securing subject matter experts to fulfill client needs or internal business unit requirements. Building off that talent management capability is the ability for employees to have job opportunities presented to them rather than searching for a job, and conversely a manager with a job opportunity will receive qualified candidates with their profiles.

Information technology that enables fundamental transformation

The way IBM sells to and serves clients, the way it manages its supply chain and the way the company works internally have all seen profound improvements, made possible by technology. But far from promoting technology for technology's sake, IBM's IT strategy is built around a view of using technology to achieve business objectives—as a way to support and accelerate the On Demand Business transformation. IBM looks at IT through two different lenses—how IT can be used to *run* the business and how IT can be used to *transform* the business. By making more effective use of the dollars spent to operate the business, IBM frees up money to invest in transforming it. IBM's spending on what might be termed "maintenance IT" has declined steadily since 1999, while its spending on transformation-enabling IT has increased by 54 percent.

In addition to devoting a higher percent of its IT budget to transformation and keeping flat or lowering its overall costs, IBM is satisfying a growing internal demand for services. For example, since 2003 network usage has risen by 38 percent, client seats by six percent and audio conference volume by 16 percent.

"Where once our focus was simply reducing cost through IT simplification and consolidation, today our challenge is to deliver the infrastructure, applications, data and insights needed to support IBM's business objectives," says Brian Truskowski, vice president and CIO, IBM. "To achieve this, we are investing in component and service-oriented architecture, and an open, virtualized and autonomic infrastructure. In 2004, this allowed us to reduce overall IT spending while supporting more employees and delivering more function."



IBMers Value

Dedication to every client's success.
Innovation that matters—for our company and for the world.
Trust and personal responsibility in all relationships.

In-the-moment collaboration leads to ongoing innovation

Engaging a global employee population in a conversation about best practices or critical company direction may seem like nothing more than a metaphor. But thanks to the capabilities of the On Demand Workplace, for IBM employees it's a real-time event. IBM has held a series of online "WorldJam" events that engage employees worldwide in mass collaboration—from uncovering and ranking new business opportunities, to ideas on how to overcome obstacles to achieving goals, to helping its 33,000 managers work more effectively. This has changed the company in significant ways. In 2003, for instance, the honest, thoughtful, free-flowing views and experiences of tens of thousands of participants in "ValuesJam" produced a set of definitions of what IBM employees most fundamentally value, and a follow-up event in 2004 then developed an action plan to make it real.

As Sam Palmisano told the *Harvard Business Review,* "There is a collective impatience that we've been tapping into to drive the change needed to make IBM everything that all of us aspire for it to be. I'm convinced that we wouldn't have gotten to this point if we hadn't found a way to engage the entire IBM population in a genuine, candid conversation."[3] WorldJam is now a key component of IBM's ongoing operations—both a tool and a new management approach for a more open, democratic age.

A secure foundation

Worldwide threats have heightened security requirements and risks to IBM information. Its strategic direction here is clear: continue to increase security and enhance the resilience of its operating environment.

This is a problem shared by all businesses. IBM knows this, because it monitors network security for businesses and governments in 134 countries. A 2004 IBM report shows that attacks on networks surged 17 percent—in one month. And stopping these attacks takes more than rigorous security policies alone. The IBM Global Services account team collaborates with their client, the IBM CIO organization, to ensure service integrity and infrastructure availability, in part by automating and monitoring processes and using network security analysis software to detect and close security vulnerabilities on more than 1,800 Internet servers and 17,000 internal network servers in real time.

IBM is migrating to a comprehensive identity-management solution and a single sign-on access authorization solution for employees to access a wide range of internal business



systems and applications. Through penetration testing and security health check services, IBM evaluates its own security capabilities across its ecosystem to ensure that it is able to deliver solutions that meet its security standards and those of its clients. Workstation management efforts have increased security compliance at the employee level and resulted in fewer potential threats within the borders of the IBM network. IBM also has real-time security compliance tracking throughout the organization, security software metering and required application detection. For example, in 2004 IBM has avoided approximately US$9.6 million in lost productivity that could have resulted from virus infections.

Based on open industry standards

Fundamental to IBM's own On Demand Business strategy is a deep and abiding commitment to open industry standards. Its internal deployment of open industry standards-based technologies not only reflects its principles, but also provides proof of the value that standards bring.

As of year-end 2004, there were more than 2,900 servers running on the Linux® platform within IBM's corporate infrastructure, up from nearly 1,300 in 2002. With Linux technology, IBM has more flexibility, better system performance, lower costs and a secure operating environment for many mission-critical applications on its infrastructure, spanning customer order support, chip manufacturing, sponsorship Web events and antivirus and antispam solutions. Integration is made easier, and new capabilities are deployed faster. IBM also has moved more than 100,000 users to Voice over IP (VoIP) telecommunications.

Better use of IT resources

For IBM, performance improvements initially require moving workloads to fewer, higher performing servers and storage devices. IBM is continuing to consolidate and therefore simplify its server and storage infrastructure, especially in its deployment of IBM Lotus® Workplace™ Messaging™ (IBM Lotus Sametime®) and IBM Lotus Notes® software, the backbone of its employee communications and collaboration environment. Since 2000, the company has reduced the number of IBM Lotus Domino® mail servers from 1,200 to 240. Not only has this consolidation reduced its costs, it has also resulted in higher availability and performance. By year-end 2004, more than 320,000 Lotus Notes users were on clustered servers—ensuring systems are available when employees need them. In fact, availability for Notes users on clustered servers averaged 99.97 percent in 2004. IBM also is consolidating storage and processing power to enable efficient sharing and rapid scaling, and has already consolidated 31 separate internal networks to a single internal network.

But consolidation is only one piece of the utilization equation. Virtualization is another. Virtualization improves the utilization of human resources, IT and information assets by allowing IBM to pool resources, accessing and managing them by effect and need, rather than by physical location. IBM is leveraging the virtualization capabilities built into IBM servers and storage systems, and its expertise in managing those capabilities, to dramatically increase the flexibility and utilization of its infrastructure, reduce costs and improve availability and scalability. IBM is moving toward eliminating application-specific dedicated servers and storage. Instead, applications will acquire resources on demand from a virtualized infrastructure pool. In

On Demand Business transformation through the eyes of Jesse Stein, Power Architecture marketing manager, IBM Systems and Technology Group

After 15 years at Apple as a Power Mac® product manager, I joined IBM in 2001. When I arrived, there were two separate teams in Systems Group and Technology Group. Our priorities were driven by the organizational structure, not by trying to jointly leverage the capabilities of the full spectrum of IBM Power Architecture™ flexibility.

From its beginning, the IBM PowerPC® platform was used for collaborative innovation. It delivered Power Architecture technology server performance at a lower cost and continues to push the technology edge at IBM today. Initially, Systems Group was responsible for building servers based on the IBM POWER™ family of chips. Technology Group was focused on embedding the PowerPC processor family into solutions from other companies.

Those artificial, internal boundaries no longer exist. Now, everything we do is holistic—looking across the whole spectrum of Power Architecture capabilities. We're working as a whole with industry innovators to leverage Power Architecture processor-based solutions in all types of devices, from gaming consoles to some of the fastest supercomputers in the marketplace today.

Clearly, this shift is good for our clients. Now, we're encouraged to find ways to apply what one team has learned in completely new areas. We joined to offer Apple next-generation, mainframe server-class performance within workstation heat and power constraints in the PowerPC 970 (G5) processor. This processor is currently used in both IBM and OEM products, including Apple Power Mac systems.

In line with IBM's values and dedication to supporting the development of open standards, IBM has taken the next great step by cofounding Power.org, a community movement to develop, enable and promote Power Architecture technology as the preferred open standard hardware development platform for the electronics industry and to administer qualification programs that optimize interoperability and accelerate innovation for a positive user experience. Community members and developers will represent a variety of industries from all corners of the globe and parts of the electronics value chain.

Systems and Technology Group also collaborated to deliver the processors used to build the IBM Blue Gene® Computer. The Blue Gene prototype is approximately 1/16th the physical size of machines of comparable computing power, uses 512 of these embedded microprocessors and rocketed the first stage of the Blue Gene project into the top 100 of the world's fastest supercomputers. This accomplishment could not have been achieved if we had not all worked together. Our collaboration is a prototype of the new IBM, where people work across divisional boundaries, and the result is incredible innovation.

2003, IBM migrated more than 20 terabytes of stored files—the equivalent of 20,000 copies of *Encyclopedia Britannica*—to a new global storage environment that provides virtualized access for end users worldwide. In addition, by the end of 2004, IBM moved 200 applications to On Demand Centers supported by its UMI (Universal Management Infrastructure) delivery platform. This provided a framework for improved resource utilization, reduced deployment time and significantly reduced hardware and operating costs, by up to 40 percent in 2004.

Consolidation and virtualization lay the groundwork for grid computing. As in most companies, there are pockets of IBM that have an unlimited appetite for processing power. One such area is IBM Systems and Technology Group, where product development teams require extensive computation to support chip design and chip verification simulation. Although these teams are widely dispersed, a grid infrastructure enables them to prioritize their workloads and make sure processing capacity is available for the most important jobs at any one time.

Through a connected grid infrastructure, this team has access to processing resources totaling approximately 7,000 processors from all locations. By having these resources managed in a grid, processor utilization averages above 70 percent since 2Q04, compared with typical industry average utilization rates of 20 percent.

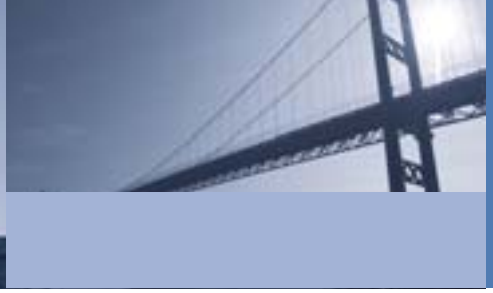
The result? The additional computing capacity enables more comprehensive testing, yielding lower error rates in microprocessor designs, enabling IBM to deliver higher-quality offerings, reduce development cycle time and avoid costs as a result of fewer chip re-spins. And this doesn't have to cost a lot. In fact, IBM's efforts to optimize similar resources at its Boeblingen Lab in Germany delivered 100 percent payback in one year (2002–03) due to savings and accelerated revenues. Maintenance of the grid is now covered within normal IT operations without additional funding.

Some IBM competitors advise clients not to accept the so-called "bells and whistles" the company keeps adding to its offerings. But IBM's experience with its own On Demand Business transformation demonstrates that advanced technologies are far from bells and whistles. These advanced technologies are fundamental to helping achieve business objectives. They help improve responsiveness, increase productivity and enable deeper collaboration among extended teams.

A collaborative culture for innovation and growth

Although business process and technology are both keys to On Demand Business, neither can contribute its full potential without an organization that enables, encourages and rewards transformative change. Culture is a broad phenomenon that encompasses many things—but one crucial element in any healthy organizational culture (especially for a business based on innovation) is collaboration.

Of course, collaboration has always been important in business. But in today's complex, interconnected global marketplace, the need for collaboration has reached a whole new level. For an IT company selling servers or software 20 years ago, the degree of internal and partner collaboration was relatively modest. Today, clients' need for integrated solutions creates very different demands.


Suppose a retail store is interested in creating a more personalized shopping experience for its customers. Management would like to explore the possibility of deploying some type of wireless device that can access data from its loyalty program and feed customers personalized shopping lists, manufacturers' coupons and special offers that keep perishable items from sitting on the shelves for too long. Management needs a proposal by the end of the week.

The team required to respond to an opportunity like this will come from across IBM. It will include retail industry specialists who understand what works and what doesn't. It will include people with technical experience in pervasive hardware and software. It will include people with deep expertise in data mining and customer loyalty programs.

On the surface, this scenario is challenging because of its operational and systems complexity. Now think about the cultural aspects. IBM, like most other large companies, was once structured to focus employees' attention and efforts on the objectives of their own particular business unit. Compensation was tied to business-unit performance. The only risks that were encouraged were the ones that would directly impact the revenues or profits of the unit itself.

IBM's solution-based value proposition, and the resulting focus on collaboration, is intended to change that culture. The goal is to create a worldwide workforce unencumbered by geography, processes or business unit structures—so it can efficiently and effectively work across boundaries to share whatever knowledge and skills are needed to bring new value to its clients and to IBM.

Why is this so important? Because part of what enables IBM to deliver the innovation that its clients can't find elsewhere is its ability to bring together people who have industry-specific knowledge, consulting skills, deep technical expertise and in-the-trenches operational experience through their work with clients and in solving similar challenges in support of IBM's own On Demand Business journey. That expertise doesn't live in any one individual or even within a single division. It is distributed across IBM and its partners, among people who may not yet have had occasion to meet, talk or work together.

So how does a large, complex, global company change its culture and create a more collaborative environment? By enabling people to quickly identify, contact and engage the experts who have the complementary skills required. By recognizing and rewarding collaborative behaviors. By reshaping its compensation strategy to weight business unit and IBM performance equally. By changing management behavior: training managers to create a climate that encourages both staff and client-facing teams to collaborate outside of their job-specific silos. And by celebrating the heroes who create innovative and broadly applicable solutions by collaborating with others from across the company.

On Demand Business transformation through the eyes of Jim Ackerman, corporate account director, Solectron—a longtime IBM supplier and leading global provider of electronics manufacturing and integrated supply chain services

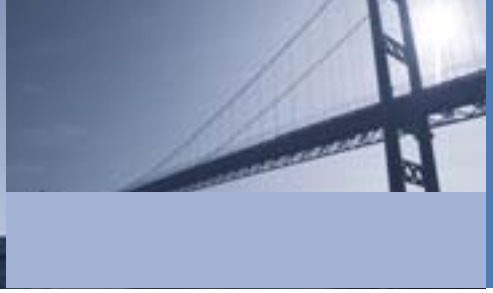
The environmentally safe disposal of computing assets has become a very real issue in today's world. Servers, desktops, laptops, printers—every day, thousands of reusable assets hit Solectron's docks around the world. And the clock is ticking. For many of these recovered assets, there's already demand—another organization that is willing to buy them, extending their useful life dramatically.

Asset recovery is one of Solectron's core businesses, and it's a critical service that IBM is committed to providing to its clients. IBM Global Asset Recovery Services has worked with companies like Solectron to deliver the IT industry's first seamless, worldwide, end-to-end solution encompassing the acquisition, remanufacturing and final disposition of used equipment.

Solectron has been a longtime supplier of IBM, providing PC circuit board and subassembly manufacturing since 1977. In 2002, we had an opportunity to extend our relationship, when IBM decided to divest itself of its remanufacturing facility in Raleigh, North Carolina. The deal closed in February 2003. Since that time, we have worked closely with IBM to streamline the processes and systems we use to support IBM Global Asset Recovery Services. Although at least three or four companies are involved at any one time, the process actually operates seamlessly.

For example, when a large client has assets—say laptops—coming off an IBM Global Financing lease, a return date is scheduled and an advance-ship notice comes to Solectron. The notice includes information about each asset, such as the serial number and current configuration. At the same time, the equipment-trading organization is notified that the assets are available. The equipment trader's job is to find buyers for the assets—and to let us know what needs to be done in order to maximize the value of the machines. This includes everything from erasing the hard drives and reloading with a certain configuration—operating system, applications, etc.—to complete remanufacturing to bring the asset to a "like-new" state.

As an analogy, we're dealing with very ripe fruit that has to be moved before it spoils and loses all value. Used equipment is basically a commodity. We have to get these assets in, refurbished and out quickly to maximize value in the marketplace. To achieve the level of integration and transparency required, we've worked very closely with IBM to leverage and standardize business processes across multiple regions, allowing IBM to get what it needs, when it needs it, on demand. As a result, we've streamlined everything about the process—and reduced costs to IBM by approximately 30 percent for PC refurbishment based operations from 2003–05. We've also worked with IBM as it expands the program for non-IBM hardware—a rapidly growing offering and something its clients find very attractive. To me, this is a great example of what On Demand Business is all about.


In all of these transformation efforts, the technological changes are integral with the process and cultural changes. They're not "parallel" workstreams, but different aspects of the same management system. The On Demand Workplace, for example, is integral to turning IBM into a learning organization—and in turn, continual, just-in-time learning is integral to process transformation, to the changing role of the manager and to the employee empowerment required for on demand client responsiveness. This fusion of technology and insight is, in the end, a manifestation of IBM's business model, portfolio and long-term strategy: delivering innovation by integrating invention and insight.

A business model built on accountability

For IBM, the On Demand Business model has three core pillars: governance, performance measurements and reinvestment.

- **Governance —** To guide the transformation process and track its progress, IBM formed an executive advisory group with representation from every business unit. This team's mission is to identify, prioritize and staff cross-IBM initiatives that will contribute to an increased level of productivity and top-line growth within the organization. Team members are responsible for incorporating productivity measures into their business unit management systems. There are milestones and checkpoints, and regular progress reports to IBM's chairman and senior leaders. Finally, IBM formed advisory panels comprising clients, employees, Business Partners and suppliers to keep IBM focused on issues pertinent to improving its own business performance and that of its clients and partners.

- **Performance measurements —** To understand the impact of its investments, IBM tracks various transformation metrics. IBM measures results through growth and innovation performance measures tied to its annual compensation program. The company can measure specific growth commitments for each of its business units and reward employees for innovation that drives that growth.

  One of these growth and innovation metrics is productivity improvement. IBM views productivity as one of the most important measures of progress in its transformation to becoming an On Demand Business. IBM can track productivity gains by assessing how much revenue it generates for every dollar it invests in total labor costs. Annual targets for productivity improvements are created for each business unit, and roadmaps are developed that specify the actions necessary to reach the target. Diagnostic metrics and milestones are utilized to track whether the actions are being accomplished. Employee compensation is based, in part, on whether the annual targets are achieved.

- **A cycle of reinvestment —** From the beginning, one of the thorniest issues IBM had to grapple with in its journey to On Demand Business was funding. No one authorized a big bucket of money and said, "Let's go make all of this change right now." Fundamental to IBM's approach was the concept of value creation and reinvestment—tracking the savings and productivity gains and then reinvesting a large portion of these savings in its transformation initiatives. And continuing the cycle in an iterative fashion.

  This is a highly disciplined process, especially when it relates to planned IT savings. In fact, these savings are incorporated into IBM's own outsourcing agreement with IBM Global Services, something that more and more organizations are opting to do.



Proven results to date

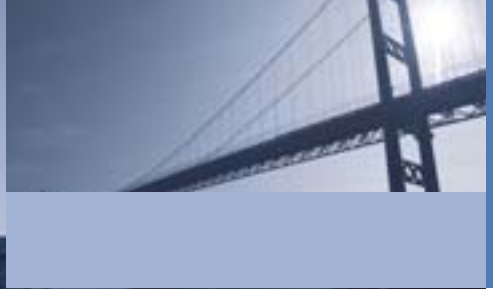
IBM has begun to see results from its On Demand Business focus. Not simply the discrete results of each individual initiative, but systemic gains that have produced increased revenue and share improvement across all of the company's core business units in 2004.

In keeping with IBM's strategy to lead in driving industry innovation, IBM has increased its revenue in business and technology consulting services, infrastructure services and infrastructure software and hardware, all of which generate superior value for its clients, as evidenced by improving client satisfaction worldwide. IBM used the insights of clients and internal and external experts to identify emerging opportunities that had the potential—in three to five years—to become multibillion dollar businesses. So far, life sciences, digital media, business transformation outsourcing and pervasive computing have become US$1 billion businesses for IBM, while year-over-year growth of the other identified opportunities has averaged 40 percent. Coupled with this growth is a concerted effort to ensure that the execution of IBM's own On Demand Business strategy is equal to its vision.

While the genesis of IBM's reengineering efforts had to do with simple business survival, the commitment to make IBM an On Demand Business showcase has been about something else entirely. It's been about ensuring that IBM can demonstrate to its clients both the why and the how of On Demand Business. It continues to be a journey that's founded on IBM's core values—dedication to client success, innovation that matters, and trust and personal responsibility in all relationships.

Today, when clients talk about customer relationship management, they're not interested in having a software discussion—or a call center discussion. They're looking for new business insights, for experience and for integrated process and technology innovations that can improve client satisfaction and increase revenue flow from existing relationships. Whether their intent is to manage a stream of discrete improvements themselves or find a partner that can provide a comprehensive solution—clients want real-world know-how.

The same is true of clients who want to talk about improving their supply chains. They know the subject is complex, and they're looking for a partner that can bring to the table not just world-class products, but hard-won expertise.


For every client that still wants to talk about the speed of a new microprocessor, hundreds more want insights about simplifying the complex infrastructure that they're trying to manage. They want proof that it's possible to spend fewer resources on running the business—in order to free up the capital necessary to improve it.

And no matter where the discussion starts, it eventually comes around to culture and organizational change. How do you influence people to behave differently? How do you work behind the scenes to modify the way they work, eliminating the ingrained thought pattern that says the objectives and metrics of my business unit come before all else? Clients recognize that this is an issue, and they want to talk to someone who knows what works and what doesn't.

The ability to offer fresh insights and to prove that the impact of change will far outweigh the investment—these are two big reasons this journey is so important to IBM. IBM is passionate about tackling the tough business, cultural and IT issues critical to business success in the 21st century. The company is using its hands-on expertise and insights to shape its products, offerings and solutions. IBM is committed to sharing what it has learned, so that others can benefit from its experience. And it is devoted to collaborating across its extended ecosystem to develop new insights, disciplines and methodologies that deliver outstanding business value to its clients.

The journey continues.

For more information

To learn more about how your organization can become an On Demand Business, visit:

ibm.com/ondemand

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Kookmin Bank heightens customer responsiveness with IBM software.

Overview

- ***Challenge***
  Following a merger with a rival bank, Kookmin wanted to reduce telephone waiting times at its call center facilities, be able to locate customer information across multiple accounts and deliver fast, accurate responses
- ***Why Become an On Demand Business?***
  To ensure the success of the merger, the bank needed to give its contact center agents instant access to customer information, which would allow them to work more productively and identify new sales opportunities
- ***Solution***
  Kookmin built an integrated, knowledge-powered customer service solution that lowers costs, manages customer requests from multiple channels in realtime and delivers relevant information to agents located in a centralized contact center
- ***Key Benefits***
  Full payback expected in less than one year following full implementation; 20% decrease in call handling time; additional revenues due to ability of call center agents to cross-sell services; improved responsiveness to customers

Kookmin is driving profitable, long-term customer relationships with a business system based on IBM technology.

When Kookmin Bank (Kookmin) joined with rival Housing & Commercial Bank (HCB), it was the largest corporate merger in Korean history. Kookmin emerged from the consolidation with the highest market capitalization of any Asian bank outside of Japan and China. Today, the Seoul-based institution is ranked 68th in the world with 180 trillion won (US$155 billion) in assets and 26,000 employees.

To ensure the success of the merger, Kookmin set out to streamline its business operations and establish new benchmarks for customer service. As part of that goal, the bank decided to revamp its existing Seoul and

"We operate in a very competitive marketplace and the contact centers are our face to the customer. We had costly procedures in place that were preventing employees from doing their jobs effectively."

– Youngho Lee, Managing Director, Kookmin Contact Center

On Demand Business Benefits

- Full payback expected in less than one year following full implementation
- 20% decrease in call handling time has improved customer responsiveness
- Additional revenues due to ability of call center agents to cross-sell services
- 70% reduction in customer calls to branch offices
- Newly streamlined, integrated business processes allow agents to work more productively, lower costs and respond to customer requests in realtime
- Open and scalable IT solution is both resilient and flexible, paving way for seamless future growth without having to rebuild infrastructure

Daejeon telephone customer contact centers, with an eye toward improved profitability and efficiency. In addition, the bank wanted the customer contact centers to take over the customer service calls handled by branch offices, allowing branch staff to concentrate on marketing and sales activities. "We operate in a very competitive marketplace and the contact centers are our face to the customer," says Youngho Lee, managing director, Kookmin Contact Center. "We had costly procedures in place that were preventing employees from doing their jobs effectively."

Service agents at both call center facilities were struggling to reduce telephone wait times, locate customer information across multiple accounts and deliver fast, accurate responses—problems that threatened the success of the merger if they weren't quickly resolved. The difficulties started after the two banks were merged, when customer calls increased dramatically and the bank had no central way to manage customer information. Compounding matters, the high turnover of the call agents led to a low skill level, further lengthening call handling times.

As a result, the centers had a high call abandon rate and customers were phoning the branch offices directly for information. This not only resulted in delays for the customer, it also was preventing branch office staff from focusing on their core responsibilities. "We wanted our key branch personnel to concentrate on marketing and sales, not answering routine customer questions," says Lee.

The call center as revenue generator

To raise employee productivity and customer service levels—and help assure the viability of the new company—Kookmin recognized that it needed to consolidate its two distributed contact centers into a single operation that would help it keep pace in an increasingly competitive marketplace. Specifically, Kookmin needed to integrate its disparate business processes and enable its agents to quickly locate customer information. In doing so, Kookmin hoped to transform its contact center into a revenue-generating department. The bank also needed to empower customers with the ability to access account information themselves.

Says Lee, "If we didn't find a way to streamline our operations and respond to customers with more timely information, we risked jeopardizing our position in the marketplace."

Powering customer service with knowledge

Working with IBM Business Partners KANA and Genesys, Kookmin built a solid and scalable business system foundation to drive profitable, long-term customer relationships. The knowledge-powered customer relationship management (CRM) solution provides a unifying integration of processes that empower agents with relevant CRM information in realtime. In doing so, the solution—which manages customer requests in one universal queue—ultimately minimizes situation

resolution time with both agents and customers. It also includes a self-service option for customers who want to address issues themselves. Key to the success of the project was IBM Business Consulting Services that guided Kookmin through the implementation process. IBM Business Consulting Services not only developed the contact center architecture, but also conducted external benchmarking and project ROI analysis and helped the bank refine its CRM strategy.

"Not only have we improved information sharing among our employees, we also have unlocked the information about our customers contained in our back-end systems," says Lee. "This allows us to improve our customer response time while lowering costs."

At the same time, Kookmin has empowered customers with the ability to resolve issues on their own by providing them with instant, easy access to their account information over the Web. Customers also have the ability to e-mail Kookmin staff members for problem resolution. This has helped Kookmin not only lower its operating costs and take the burden off the call center staff as well as the branch offices, but also to decrease its call handling time by 20 percent.

By providing contact center staff with immediate access to customer information, agents can work more productively and answer customers' questions in realtime. Now when a customer calls, the service agent can see all of the customer's accounts and immediately address questions by pulling up information directly from his or her desktop system.

This new system has generated a process for cross-selling and up-selling, allowing agents to leverage profit-generating opportunities connected with other departments throughout the bank. For example, a caller inquiring about the status of his or her mortgage can be notified about new rates for auto loans or special credit card offerings.

At the same time, customers can initiate service requests, review the history of their interactions across multiple communication channels, receive important service bulletins and manage their profiles and accounts—without the assistance of a call center agent.

WebSphere family provides foundation for success

The multi-channel solution is based on WebSphere® software from IBM, and includes a CRM application from KANA and a telephony system from Genesys. The KANA IQ eCRM application is powered by IBM WebSphere Application Server and runs on a resilient IBM @server® pSeries®. Employees access the system to manage customer contacts and customers interact with it as a Web self-service portal.

Key Components

Software

- IBM WebSphere Application Server
- IBM WebSphere Edge Server
- IBM WebSphere MQ
- IBM DB2® Universal Database™
- Genesys Enterprise Routing
- Kana IQ eCRM

Servers

- IBM @server pSeries
- IBM @server xSeries®

Services

- IBM Business Consulting Services

"Banking solutions rise and fall on their ability to integrate multiple systems. We chose IBM because its open standards-based products allow financial institutions to connect various technologies to create cohesive, enterprise-wide systems."

– Youngho Lee

WebSphere Application Server serves as the runtime engine for the Java™ technology-based KANA applications that provide the highly responsive services and information available to Kookmin employees and customers. "WebSphere software and Java are crucial components," says Lee. "They allow us to leverage the contact center for reuse in other channels, which we believe will be the key to the success of our new company." IBM DB2 Universal Database serves as the back-end information management system providing seamless access to company and customer information.

At the core of the system is the Genesys Enterprise Routing application, a call routing solution that can simultaneously handle routing requests for voice calls, e-mails and Web interactions. It uses VoIP as a communication channel for voice calls between the call centers located in Seoul and Daejeon. The solution routes incoming requests to the most appropriate agent, evaluating each interaction type and origination to assure proper treatment and priority according to the company's business rules. A channel gateway provides integration between the KANA and Genesys systems, providing agents with a 360-degree view of customer information.

The solution also includes IBM WebSphere Edge Server running on a pSeries system. WebSphere Edge Server provides caching, load balancing and content-based routing support to enhance the CRM system's availability, scalability and performance. In addition, Kookmin's IT infrastructure uses IBM WebSphere MQ, running on IBM @server xSeries, to provide efficient data transaction control between the various system components.

Standards-based solution paves way for future growth

To enable future expansion, Kookmin's new integrated, open and scalable IT solution is both resilient and flexible and will easily scale as Kookmin's business grows. "Banking solutions rise and fall on their ability to integrate multiple systems," says Lee. "We chose IBM because its open standards-based products allow financial institutions to connect various technologies to create cohesive, enterprise-wide systems."

Kookmin expects the system to pay for itself in less than one year once it is fully implemented. In fact, the company anticipates additional annual revenues due to the ability of call center agents to cross-sell services. It also expects to reduce customer calls to branch offices by 70 percent, allowing branch staff to work more productively and remain focused on their core sales and marketing activities. And because it can respond to customers in realtime, Kookmin is confident that it can provide the best customer service of any bank in Korea.

"By consolidating our customer-facing communication channels, we are able to provide cost-effective self-service solutions that improve customer satisfaction and allow us to deliver better service less expensively and more quickly," says Lee. "Now we can compete against some of Asia's biggest banks and better ensure the success of our merger."

For more information

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Ministry of Justice takes e-government to the next level with Web services

Customer: Ministry of Justice

"Converting to an open-standards-based technology such as Web services gave us the flexibility we needed for future e-government initiatives."

— Dr. Martin Schneider, Director, Austrian Ministry of Justice

Challenge	Connect multiple application service providers to proprietary government databases to improve public online access to judicial records
Solution	A Web services interface powered by IBM e-business infrastructure to enable application integration
Why IBM?	Enterprisewide commitment to Java™-based infrastructures to support Web services, industry know-how and IBM jStart expertise in object-oriented programming
Business benefits	Increased operational efficiency, enhanced functionality, improved customer service and a solid foundation on which to base future e-government initiatives

Expanding horizons

Many governments today implement government-to-government (G2G) and government-to-employee (G2E) solutions to help improve operational efficiencies within or between agencies. The Austrian Ministry of Justice has taken e-government one step farther. By partnering with the BundesRechenZentrum GmbH (BRZ) and IBM, the Ministry has gained Web services functionality, enabling it to go outside its walls and deliver effective government-to-business (G2B) and government-to-citizen (G2C) services.

As head of the Directorate for Central Administration, Dr. Martin Schneider is responsible for the administration and coordination of public relations and information technology (IT) at the Ministry of Justice. "We've always been at the forefront, adopting innovative technology solutions to make justice more efficient," says Dr. Schneider. Since 1980, the Ministry has worked closely with its service provider, the BRZ, which

was privatized in 1997, and global technology leaders such as IBM, to stay the course on its innovative e-government initiatives.

IT takes teamwork

"The goal of the BRZ is to deliver efficient and comprehensive IT service to all government bodies in Austria," says Mr. Christian Adorjan, Project Manager at BRZ. That mission often includes supporting Web-based application service providers (ASPs), such as those that enable legal professionals to query the Austrian Ministry of Justice 's judicial databases, which are located in the Ministry's back offices.

Dr. Schneider emphasizes the importance of access providers. "The ASPs are responsible for the online relationship between our organization and legal professionals. All Austrian attorneys work directly through an ASP to get to us," he says. As payment for handling the administration, authorization, customer service and billing for online delivery of Ministry documents and records, the ASPs assess a usage-based query fee — a portion of which is then passed on to the Ministry of Justice.

Sentenced to integration woes

Connecting external users to the Ministry of Justice's backend systems wasn't easy. It typically took anywhere from several weeks to two months for an ASP to establish a connection through the firewall to the Ministry. This is largely due to the fact that its interface technology dates back to 1986. According to one engineering consultant familiar with the organization's architecture, the Ministry is constructed more or less like a medieval town — a little piece here, a little piece there — with no easy way of integration.

The data transferred between the online query applications and the Ministry's backend systems were in a proprietary format. As such, the format couldn't be easily changed since it was deeply embedded in all of the supporting systems. "Updating any business process meant changing all the applications involved, which is extremely impractical, time consuming and costly," reports Mr. Adorjan. Consequently, updates weren't made, despite some pressing business needs.

Aside from negotiating difficulties on the backend, the ASPs also had to adhere to their clients' proprietary applications, which meant distributing and maintaining query applications at customer sites. Given the significant time and expense required on both the client and server sides, new functionality was rarely introduced.

The remedy: Web services

In touch with technological advances, the Ministry of Justice and the BRZ soon identified Web services as a unique opportunity to fix what had become a complex technical integration scenario. "Converting to an open-standards-based technology gave us the flexibility we needed for the future," says Dr. Schneider. It also gave us staying power, which was a big selling point for Mr. Adorjan. "The big players are behind them. For example, IBM is building Web services into its infrastructure. Web services are guaranteed to be around for the long term," he says.

Furthermore, it made sense for the Ministry and the BRZ to develop an integration solution that was inherently tied to the Web, since the ASPs operated through Internet-based portals. Web services technology could easily be adopted by all parties. With

Web portals, the Ministry could quickly add new functionality, the ASPs could avoid the delays and expense associated with building one-of-a-kind application program interfaces to proprietary technologies, and legal professionals would be better served.

Help from a global technology leader
IBM has been a major partner in the adoption of Java™ technology at the Austrian Ministry of Justice. Over the past several years, the Ministry and the BRZ have partnered with IBM on several automation initiatives, such as electronic filing — which allows an annual 1.6 million cases to be filed electronically — and process-oriented learning. “We saw Java as the best platform to build and invoke Web services,” says Mr. Adorjan. With IBM driving industry standards and practices for Web services via organizations such as the W3C and WS-I, as well as leading the way in Java-based development through programs like IBM developerWorks™, it was natural for the Ministry and the BRZ to seek a partnership with IBM.

“Basically our choice was not so difficult,” says Dr. Schneider about the Ministry’s selection of a Web services vendor. “We really had no experience with Internet technology or object-oriented programming, so it was necessary to get a partner on board who had the required expertise and proven infrastructure to exploit these new technologies,” he says. The BRZ needed a partner that was equally capable of training its engineers. “We wanted to work cooperatively with a vendor, to receive training as the project went forward so we could handle future Web services implementations by ourselves,” says Mr. Adorjan. By supplementing its team’s knowledge with the help of key players and infrastructure from IBM, the BRZ was able to press forward with an integration solution.

Key Components

Software	✍ IBM WebSphere® Application Developer ✍ IBM S/390®
Technologies	✍ SOAP ✍ XML ✍ WSDL
Services	✍ IBM jStart

IBM Web services solution
The IBM team started working with the Ministry of Justice and the BRZ in the summer of 2002. By October, a Web services interface powered by IBM was in production. Out of the five ASPs authorized by the Ministry to provide electronic services to the legal community, three are currently establishing connections through the new Web services-based interface.

The Web services solution currently runs on an Apache Simple Object Access Protocol (SOAP) application server located in a demilitarized zone (DMZ). The Apache server connects to the Ministry’s backend systems, consisting of IBM S/390® mainframes, and fields SOAP requests that originate from the ASPs. It then requests data from the Ministry ’s systems, which respond via Extensible Markup Language (XML) format to the ASPs, enabling them to satisfy the initial requests from their business software individual clients. The Web services solution requires only that the ASPs support Web Services Description Language (WSDL) and XML schemas, significantly increasing the

speed of implementation and allowing the ASPs to use the tools of their choice. Plans are in place to migrate the Web services architecture onto IBM WebSphere® to further enhance the solution.

Real results benefit all

"Today, we're able to expose a lot of data in an efficient way through Web services," says Mr. Adorjan. He also applauds the success of the Ministry's first G2B effort. The BRZ now has a lot more power to enhance the interfaces and better serve the Ministry's ASP providers. Austrian Telecom, one of the three ASPs committed to the Web services approach, has reduced integration implementation time by more than 60 percent. "This clearly constitutes a major argument for looking at future e-government scenarios involving Web services," Dr. Schneider declares.

"With increased flexibility, we can implement changes and add functionality to better service the needs of the legal community," says Dr. Schneider. With the Web services solution, the amount of data flowing between the Ministry and its end users has increased. "By adding forms, for example, we instantly improve communication between the court and attorneys," he adds.

According to Mr. Adorjan, the Web services solution is just the tip of the iceberg. He believes that Web services technology powered by IBM e-business infrastructure will be applied everywhere that the Ministry of Justice currently relies on proprietary interfaces, thus spanning all the disciplines, from G2G to G2C.

"Web services have proved to be very reliable, very cheap and very fast to implement," says Dr. Schneider. The Directorate and the IT team are looking forward to future Web-services-enabled e-government initiatives built on IBM e-business infrastructure.

For more information

To learn more about the Web services solution from IBM, please visit:
ibm.com/software/webservices

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Produced in the United States of America
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National Australia Group UK increases business flexibility with IBM Tivoli identity management solution.

Overview

- ***Challenge***
  A U.K. banking group needed to accelerate its ability to respond to regulatory requirements and market opportunities, while ensuring the security and privacy of customer and financial data
- ***Why IBM?***
  IBM delivered a standards-based solution that could ensure the consistent application of security policies and facilitate a smooth interaction with partners, suppliers, customers and bank employees
- ***Solution***
  A centralized identity management model that rigorously protects financial and customer information and reduces the time and cost of security management
- ***Key Benefits***
  Anticipated savings of over £6 million (US$11 million) annually through improved process efficiencies; ability to rapidly respond to new market opportunities and regulatory requirements; greater customer satisfaction through fast and secure access to financial data

National Bank Group UK delivers retail banking, corporate banking and wealth management services to 2.1 million customers in the U.K. through two regional banks—Clydesdale Bank and Yorkshire Bank.

In the world of international banking, it pays to be flexible. The National Australia Group UK (NAG UK), a division of the National Australia Bank Group (*www.nabgroup.com*), provides banking services to 2.1 million customers through two regional banks, Clydesdale Bank and Yorkshire Bank. With the growing demand for improved Web-based services by both customers and staff, NAG UK had to respond. The organization has almost 200,000 customers accessing Internet banking services and 12,000 employees accessing branch-based applications in the retail environment.

"Our goal is to be a leading international financial services company that is trusted by its clients and renowned for getting it right. IBM software solutions enable us to adapt quickly to market changes and closely control access to financial information so we can achieve this goal."

–Stephen Swann, Manager, Access Control and Integration (ACI) Engineering Room, European Business Systems, National Australia Group UK

ON DEMAND BUSINESS™

To improve staff productivity and reduce help-desk costs, NAG UK will soon provide branch staff with self-service capabilities that enables them to quickly reset or update their passwords through a Web-based interface.

As a result, when the Financial Services Authority (FSA) updated its requirements for how U.K. banks sell mortgages, NAG UK found a vehicle for delivering a new architecture for its Web-based applications to customers and staff. The organization's existing services were based on outdated technologies that placed unnecessary constraints on deploying new business processes. By modernizing all its services—not simply its mortgage services—and building an architecture that could support an array of innovative Web-based banking applications, NAG UK could increase its overall responsiveness and improve customer satisfaction.

Making this change required a new approach to securing NAG UK Web-based applications. NAG UK executives knew that the time and cost of security administration and service development could be greatly decreased. The company's existing processes involved duplication of effort as each bank department built its own security components within new applications and independently maintained access rights for bank staff. Employees needed many different user IDs and passwords to access all the systems required to do their jobs. Additionally, the isolated management of employee access rights between departments created significant delays in providing access to services and made it difficult for IT staff to reliably enforce security policies and remove access rights for departing employees.

Corporate and regulatory policies drive big changes

Without modernizing its identity management processes, NAG UK would face difficulties in adapting to changing market conditions and increasing operational risk. "We needed to rapidly deploy new services across our banks while still closely controlling access to customer information," explains Stephen Swann, manager, Access Control and Integration (ACI) Engineering Room, European Business Systems, NAG UK. "To achieve this, we had to fundamentally change our approach to identity management."

To meet its goals, NAG UK needed a foundation that would integrate, automate and synchronize security processes across the group's various lines of business and centralize security controls for all Web-based banking services. These important steps were part of the organization's effort to build a service-oriented architecture (SOA) to help it rapidly

> *"With IBM Tivoli software, we can simplify and streamline identity management processes while creating a robust SOA that vastly improves our efficiency and helps us easily adjust to evolving business needs."*
>
> *–Stephen Swann*

respond in an on demand world. By removing security code from the applications themselves, the company's development group could more quickly and easily add or adapt services. Providing branch staff and customers with a single sign-on to authorized services would improve user satisfaction. Offering NAG UK staff self-service capabilities would improve employee productivity, reduce help desk costs and ease the burden of daily administration on help-desk and IT staff. Streamlining and automating identity management processes would help increase staff productivity and ensure the consistent application of security policies. "With IBM Tivoli software, we can simplify and streamline identity management processes while creating a solid SOA that vastly improves our efficiency and helps us easily adjust to evolving business needs," says Swann.

Protecting customer privacy

As part of its move to provide branch staff and customers with Web-based access to services, NAG UK deployed IBM WebSphere Application Server software to provide a reliable, high-performance environment for running newly developed banking services. In addition, IBM WebSphere MQ software enabled application integration between newly developed applications and data stored in the company's mainframe environment.

To protect customer information, NAG UK selected IBM Tivoli identity management software. Working with IBM Global Services, the NAG UK IT staff has implemented Tivoli Access Manager for e-business to remove the security code from individual applications, manage access based on business policies, and provide branch staff and customers with single sign-on capabilities to the organization's essential sales, productivity and collaboration services.

Ultimately, Tivoli Access Manager for e-business will help secure access for more than 12,000 employees and 200,000 customers across numerous services, including a Siebel customer relationship management solution; IBM Lotus Notes and IBM Lotus Domino-based applications for e-mail and collaboration; and internally developed Internet banking services running on IBM WebSphere Application Server software. "IBM WebSphere Application Server is critical in enabling us to quickly launch new branch services," says Swann. "The integration of Tivoli security management solutions with WebSphere software helps ease our transition into the Web-based world. As a bank, we can't afford to have our customers or branch staff unable to access services. There's no doubt that IBM software solutions help us deliver highly available and scalable services."

Key Components

Software

- IBM Lotus® Domino®
- IBM Lotus Notes®
- IBM Tivoli® Access Manager for e-business
- IBM Tivoli Identity Manager
- IBM Tivoli Directory Integrator
- IBM Tivoli Directory Server
- IBM WebSphere® Application Server
- IBM WebSphere MQ

Services

- IBM Global Services

"IBM Tivoli identity management software provides us with the flexibility to automate workflow based on our unique business processes. Using this powerful, policy-driven approach helps us improve service delivery while reducing costs."

– Stephen Swann

Next, the NAG UK IT staff will leverage IBM Tivoli Identity Manager, IBM Tivoli Directory Server, a lightweight directory access protocol (LDAP) directory, and IBM Tivoli Directory Integrator. These solutions will centralize user identity management, automatically provision user-access based on business policies and provide branch staff with self-service capabilities so that they can change their passwords without the assistance of help-desk personnel. One day Swann hopes to automate the entire entry process for new employees so that everything they require to do their jobs—whether it's a laptop computer or a corporate car—is automatically ordered when they are hired.

Reducing costs and minimizing risks

According to Swann, the elimination of manual user administration processes related to password and directory administration alone will save the organization approximately £6,000 (US$12,000) a month. Once the solution is fully implemented, NAG UK executives expect potential savings to reach £6 million (US$11 million) annually as a result of increased process efficiencies. "IBM Tivoli identity management software provides us with the flexibility to automate workflow based on our unique business processes. Using this powerful, policy-driven approach helps us improve service delivery while reducing costs," says Swann.

Additionally, Swann emphasizes that the creation of a centralized identity management infrastructure provides a range of benefits that are difficult to quantify but essential to the success of any financial institution, including:

- *Improving staff productivity and customer service through faster access to customer information and services. In particular, the self-management feature of the user password will eliminate users waiting for password resets and enable staff to deliver services without interruption.*
- *Reducing the risk of unauthorized access, fraud and data theft, especially as a result of lost or stolen passwords.*
- *Facilitating smooth interaction with partners, suppliers and customers through single sign-on capabilities. Streamlining access to services in this way will help increase customer retention and customer satisfaction.*
- *Strengthening adherence to, and enforcement of, security and access policies.*
- *Reducing the time and cost of regulatory compliance through a flexible platform that can be adapted to changing requirements.*

"Our goal is to be a leading international financial services company that is trusted by its clients and renowned for getting it right," says Swann. "IBM software solutions enable us to adapt quickly to market changes and closely control access to financial information so we can achieve this goal."

For more information

Please contact your IBM sales representative or IBM Business Partner.

Visit us at:
ibm.com/tivoli

For more information on the National Australia Bank Group, visit:
www.nabgroup.com

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OAG meets the needs of the global aviation community with a modular new infrastructure.

Overview

- ***Challenge***
  With airline requirements becoming more customized and realtime, and with new services opportunities reliant on creative integration of multiple sources of data and languages, nimbleness and adaptability had emerged as critical attributes- which OAG's systems and processes were unable to deliver.
- ***Why Become an On Demand Business?***
  OAG needed a solution that would deliver the power, flexibility and efficiency that were prerequisites to process transformation.
- ***Solution***
  OAG worked with IBM to design a service-oriented architecture which streamlines and simplifies workload processing and new service development. By reducing the time required to create, customize and process new services, OAG can respond faster to changing needs and new opportunities in new segments.
- ***Key Benefits***
  - *Up to 80% reduction in application development cycle, reducing time to market for new services*
  - *Faster, more efficient processing facilitates customer decision-making by getting information into their hands faster*

OAG is a global content management company specializing in travel and transport. Privately-owned, OAG employs 450 staff based in Europe, America and Asia, serving business and consumer customers via three regional and nine local offices and an extensive distributor network.

Based in Dunstable, England, OAG (www.oag.com) operates one of the most important content systems in the commercial aviation sector. Its core business is to gather and manage enormous volumes of airline schedule and flight status information. It holds information for 1,000 airlines. Its databases store 1.5 billion records, including data for 27 million planned flight departures for the next twelve months. Historical schedules data is held for the last 9 years. It provides customized outputs that help drive all the world's Global Travel Distribution Systems and e-travel portals. It has a diverse customer base including the airlines themselves,

"Strategically and operationally, we've made a quantum leap from being rigid and reactive to being responsive and proactive across our entire business. We see the project as a complete success and a realization of our goal of becoming an On Demand Business."

– *Simon McKinnon, Chief Technology & Operations Officer, OAG*

On Demand Business Benefits

- 80% reduction in application development cycle, reducing time to market for new services
- 50% to 80% reduction in the time required to customize existing services, thus improving responsiveness to changing customer demands
- 30% reduction in overall IT costs
- More efficient processing and shorter processing cycles, eliminating bottlenecks and improving capacity utilization
- Reduced burden on IT staff resulting from simplified, standardized development processes
- Increased resiliency by virtue of load balancing, failover and automated backup capabilities

which use the data to optimize their schedules, routes and partnering programs. Travelers and travel agents use OAG's data, guides and applications for travel planning, connection optimization and flight status notification. While the "ecosystem" of travel services providers is large, diverse and growing all the time—with new entrants targeting niche services—OAG stands alone by virtue of the breadth, depth and accuracy of the data it manages and the portfolio of services it offers.

Airline competition creates opportunities…and challenges

For companies like OAG that serve the air travel industry, the intensifying competition among airlines—along with rising customer expectations for service and up-to-date information—has created a vibrant yet demanding market environment. Driven by competition, airlines have embraced a more assertive approach to their day-to-day operations and in their strategies. For instance, to optimize their route efficiency, airlines are now changing their schedules more often to adapt to changes in their passenger volumes. This is reflected in OAG's systems which receive a new schedule update every ten seconds. During 2005, OAG expects to process over 5 million flight changes, up 60 percent from 2001. A rise in strategic partnerships, designed to increase airlines' market reach and offer customers more choices, has also fueled industry dynamism. Under the most common arrangement, known as code sharing, two separate airlines sell tickets on each other's flights and—in a quirk of the industry—both airlines put the same flight on their schedules, thus magnifying the volume of flight data to be captured, stored and managed by OAG. This growing dynamism and complexity has led to explosive growth in processing demands.

"Inbound, there was an absolute deluge of data coming in from airlines and we had no flexibility to streamline the processing workload. Our priorities were less about long-term thinking and more about how to survive the next week."

–Duncan Alexander, Managing Director Business Development, OAG

But that's just the inbound side. Like their customers, airlines have also become increasingly demanding about the way OAG delivers information outbound to them. While OAG had historically delivered airline timetables in hard copy form, the company had long offered its customers electronic delivery. Over time, however, the airlines were increasingly looking for delivery options that were customized to fit their unique data, language or device requirements, and gave them more flexibility to use the data in their operations. OAG now makes over 1,000 individual product productions every month.

Lastly, OAG's needs were also shaped by its strategic goal of capitalizing on emerging service opportunities in related or complementary content areas. The crux of the plan was to pull in new kinds of travel data, integrate it with its existing content and create a new class of travel-

planning tools. A prime example would involve OAG extending its unique competency in airline schedule data to flight status, which would in turn spawn a host of downstream service offerings. What's more, the opportunity to add airline service connectivity with other modes of transport—like rail, buses and shipping—has also loomed large. This is especially true in Europe, where inter-modal travel is highly developed, and in the cargo sector where such systems do not exist.

OAG realized that its existing systems and processes had neither the robustness nor the flexibility to adapt to the new state of the industry. The most basic problem was that OAG relied on rigid, batch-based systems and processes that had been engineered for a static, predictable world. OAG's most immediate challenge was that the growing deluge of data from airlines was pushing its current system utilization well into the red zone. Relying on entrenched single-line processing resources, OAG was unable to optimize when it was most needed. This rigidity constrained OAG's ability to respond to the new dynamics of the marketplace, which required a highly flexible and efficient ability to create new services. Indeed, with airline requirements becoming more granular, customized and realtime, and with new service opportunities reliant on the creative integration of multiple data sources and languages, nimbleness, efficiency and adaptability had emerged as critical attributes—which OAG's monolithic systems and processes were unable to deliver.

The move to modular processes

OAG saw the need to transform its core processes and had a clear vision of the capabilities it wanted. But to get there, it needed to frame a technology solution that would deliver the power, flexibility and efficiency that were prerequisites to process transformation. To meet this challenge, OAG engaged IBM to design and deploy a modular, standardized platform that employs a service-oriented architecture to streamline and simplify workload processing and new service development. It does this by breaking down the overall processing workload down into approximately 20 small, specialized processing elements. Now, if an airline asks OAG for a customized report, OAG can assemble it faster with greater customisation, improving responsiveness and enabling the more efficient utilization of resources. The same basic principle holds true for new service development. To overcome its major challenge—receiving data with multiple sources and formats into OAG's core processing engines—the solution creates standardized workflows that guide all aspects of the process. With the process simplified and standardized, OAG was able to move tasks like the process scheduling, quality assurance and overall process management from IT to its operations personnel. OAG's main considerations in selecting IBM were first that it could secure the breadth of expertise necessary to implement and second that it would employ established toolsets to enable standardization and simplification. IBM Business Consulting Services, which led the engagement, performed an initial needs study, developed the high-level design of the solution and specified

Key Components

Software

- IBM WebSphere® Application Server
- IBM WebSphere Business Integration Server Foundation
- IBM Tivoli® suite of products
- IBM DB2® Universal Database™
- IBM Workplace™ Web Content Management
- IBM Rational® Software Development Platform

Servers

- IBM eServer™ pSeries®
- IBM eServer xSeries®
- IBM TotalStorage® Enterprise Storage Server®

Services

- IBM Business Consulting Services

> *"Using WebSphere Process Choreographer, we now have a very flexible way to combine processing engines together in the appropriate sequence to churn out products very quickly."*
>
> – *Simon McKinnon*

the tools, technologies and hardware to be used in the solution. IBM Software and Systems Groups assisted OAG in deploying and configuring them. To "modularize" OAG's core processes, the team employed the process choreographer, a component of WebSphere Business Integration Server Foundation to create and schedule business process workflows. The process components are J2EE applications developed with IBM Rational Rose XDE Developer for Java and running on IBM WebSphere Application Server. The primary engine at the heart of the OAG solution is IBM DB2 Universal Database, which runs its core services, while IBM Workplace Web Content Management is used to maintain Web content. The entire software stack runs on two failover-enabled IBM eServer pSeries p650 servers linked in a SAN configuration to an IBM TotalStorage Enterprise Storage Server. IBM Tivoli software, running on a pair of xSeries servers, provides a full range of infrastructure management functions.

With its core processes transformed end to end, a more flexible OAG is now on a solid footing for efficient, profitable growth. Its modular, standardized approach to new service creation has cut application development cycle time by as much as 80 percent, making OAG more responsive to its customers' escalating demands as well as emerging service opportunities. And as business and processing volumes grow, the company can easily accommodate it with an infrastructure whose remarkable efficiency has contributed to a 30 percent reduction in overall IT costs. Increased resiliency—by virtue of load balancing, failover and automated backup capabilities—is another of the solution's strong points.

Simon McKinnon, OAG's Chief Technology & Operations Officer, sees the new solution as a turning point for the company—and sees IBM as one of few providers that have the depth and breadth of resources to make it happen: "Strategically and operationally, we've made a quantum leap from being rigid and reactive to being responsive and proactive across our entire business. We see the project as a complete success and a realization of our goal of becoming an On Demand Business."

For more information

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Web services solutions
Business case study

WebSphere software

IBM

Standard Life's implementation of an SOA is a sound investment.

Overview

- ***Challenge***
  Simplify doing business with multiple channels
- ***Solution***
  Expose and deploy business services for reuse by business partners with a service-oriented architecture using XML services
- ***Key Benefits***
  Reuse of nearly 51% of its services, contributing to a savings of more than £3 million in development costs; increased transaction rate by 900% without increasing operations staff; improved responsiveness to market change and customer needs

When Standard Life, an assurance company headquartered in Edinburgh, Scotland, first opened its doors in 1825, it offered its customers a set of quality life, pension and annuity products. Now, almost two centuries later, Standard Life leads Europe's assurance industry, employing over 12,000 people and managing more than £105 billion in assets for over seven million customers worldwide. Its portfolio has expanded to include investments, banking and healthcare offerings that are delivered through four independently operated organizations within the United Kingdom: Standard Life UK, Standard Life Investments, Standard Life Bank and Standard Life Healthcare. Standard Life also has international operations in Canada, Germany, Ireland, India and China that contribute approximately 30 percent to the company's worldwide new business.

"The architecture has improved the quality and manageability of in-house applications. We are building applications on a proven framework."

—Ian Muir, senior manager for core technology, Standard Life

Doing business in the 21st century is not as straightforward as it was in 1825. In recent years, Standard Life has seen the speed and complexity of operating its business increase. The majority of its revenue is now delivered from independent financial advisors (IFAs), many of whom use industry-sponsored portals to obtain product and price comparisons from multiple providers on behalf of their customers. Pressure from competitive aggregators, which can provide IFAs with a comprehensive, single view of customer holdings, is on the rise—as are customer expectations for faster service and online access to their personal financial information. While Standard Life has always enjoyed a sterling reputation for customer service, it clearly recognized the growing need to be even more responsive to its customers and to drive loyalty within its many business channels.

Standard Life sought ways to make working with its business channels simpler and to improve customer service. But reducing costs was also a priority. For Standard Life, cost reduction had implications that went beyond contributing to its own bottom line—cost-cutting could also improve its competitive standing with IFAs. As Standard Life lowered its cost of doing business, IFAs would have an opportunity to lower theirs. And if Standard Life could help IFAs improve their margins, it could foster IFA loyalty and gain a competitive edge.

Leveraging IT assets to address new challenges

To address these issues, Standard Life sought to establish a new, more flexible architecture that would enable it to leverage its existing business process and technology assets. In 1995, Standard Life had standardized its data access and catalogued its reusable data services. Then, between 1999 and 2001, Standard Life defined its application development architecture and the framework that would support it. This became the blueprint for what is now the company's hub-centric architecture (HCA), or service-oriented architecture (SOA), which provides the foundation for Standard Life's implementation of Web services.

An SOA is a technology framework that componentizes business processes and the IT functions that support them in order to extend those processes to constituents, both internally and externally. Web services are self-contained, modular applications that are designed to work together without relying on custom-coded connections. They can be combined and recombined to meet the changing needs of the business. This flexibility and reuse leads to shorter development cycles with less effort expended, resulting in substantially lower costs. The list of Standard Life's reusable business services includes *verify identity, provide life cover information* and *create outgoing document.*

In 1999, however, Web services standards were just emerging. Therefore, to best meet its internal needs, Standard Life developed internal XML standards that are analogous to today's Web services standards. As Web services standards matured, Standard Life continually evaluated them, and is now beginning to implement these new standards as XML-enabled reusable services that are available over a messaging hub to agents and business partners.

Standard Life's service-oriented approach has allowed the company to leverage its existing IT assets and applications and to align technology with its key business objectives. Today, Standard Life's SOA has been implemented across all of the major U.K. operations in the Standard Life Group, and a leading independent research firm has endorsed Standard Life's approach to the development of an SOA as best practice in many areas and close to best practice in others. At the core of the SOA is IBM WebSphere® Business Integration Message Broker software, a standardized messaging technology that allows Standard Life to integrate its various hardware, software and platform systems. Web services are enabled by IBM Rational® Application Developer for WebSphere software and IBM WebSphere Application Server software.

Standard Life chose IBM for the reliability of its middleware. IBM WebSphere Business Integration Message Broker software provides a flexible infrastructure and simplifies the real-time integration of Standard Life's legacy applications with Web services, enabling Standard Life to introduce new business services and share them with key constituents whenever necessary. IBM Rational Application Developer for WebSphere software, along with IBM WebSphere Application Server software, enables Standard Life to quickly develop and deploy its Web services in an integrated, open-standards-based development environment.

"Standard Life sees the opportunity to differentiate itself to both brokers and end customers by providing the best online experience."

—Gary Morrison, customer service director, Standard Life

Measurable business benefits

Standard Life has seen significant benefits as a result of implementing an SOA and reusing business services. Over 300 business services, such as the ability to provide agent details, produce statements and maintain addresses, are available for reuse by IFAs, agents and customers. Standard Life can easily deploy new combinations of services, thereby simplifying the process of working across its various business channels. And because Web services employ common standards, anyone, regardless of his or her technology environment, can make use of the services Standard Life has extended.

Standard Life has also seen a significant decrease in client application development times. To date, the company has been able to reuse nearly 51 percent of its services, contributing to savings in excess of £3 million in development costs. With so many services available for reuse, Standard Life's IT department can combine services to develop and deploy composite applications more quickly and as the business needs them. As such, Standard Life is more agile and responds to new business opportunities with greater speed.

By leveraging its catalog of reusable services and making them available to business partners, Standard Life has been able to improve customer service. This, in turn, differentiates Standard Life from its competitors in the eyes of IFAs and customers using aggregate sites to evaluate and select providers. In fact, Standard Life has been voted "company of the year" by U.K. IFAs for the past five years.

Since Standard Life has implemented an SOA using Web services, its transaction rates have increased by 900 percent—without the need to increase operations staff. Moreover, by sharing business functions with key constituents, the company can ensure the consistency of information that its customers receive, whether that information comes from an IFA portal, Standard Life's Web site or from a conversation with one of the company's customer service representatives. This consistency strengthens the Standard Life brand across multiple products and channels.

Combining technology with people and processes

Standard Life's SOA has evolved over a 10-year period. During that time, the company has learned an important lesson: that an effective service-oriented architecture combines technology with business processes and people. Standard Life made the important shift from having a technology-centric culture to having a service-oriented one, and enhanced the skill sets of its employees, for example by training them in XML, to support this culture shift. It also leveraged and revitalized its existing IT and applications assets to support its business processes. In this way, Standard Life's IT both supports the organization and contributes to the bottom line.

For more information

To learn more about how you can build a service-oriented architecture with IBM software, contact your IBM representative or visit:

ibm.com/soa

ibm.com/websphere

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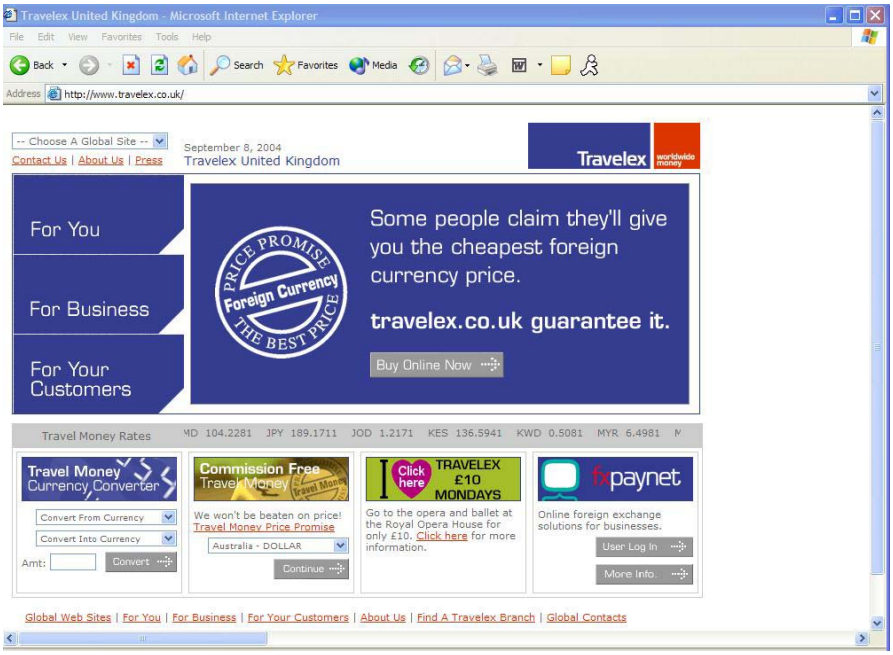
Travelex fuels business innovation by embracing open, flexible technology.

Overview

- ***Challenge***
  Travelex's ability to innovate—the key to its success—was becoming threatened by an increasingly complex and inflexible technology environment.
- ***Why Become an On Demand Business?***
  To maintain its competitive edge, Travelex needed to create a system that would both nurture business-level innovation and enable the company to respond more rapidly to new opportunities.
- ***Solution***
  Travelex teamed with IBM and IBM Business Partner Osmosis Integration to create a new, highly open platform on which Travelex developed and integrated its foreign exchange applications.
- ***Key Benefits***
  - *Employing reusable software components projected to decrease application development costs and reduce cycle time by 30%*
  - *Consolidation of application infrastructure expected to reduce application support costs by 20%*
  - *More efficient architecture expected to significantly reduce transaction processing cycle time*



Travelex operates the world's largest network of airport-based ATMs.

Since its founding in 1976, London-headquartered Travelex (www.travelex.com) has become one of the biggest names in the global foreign exchange market, with annual revenues of more than £11 billion ($20 billion) and some 6,000 employees spread across 31 countries. While its earliest roots are in the retail side of the market—Travelex operates the world's largest network of airport branches—the company has expanded aggressively into business services like commercial foreign exchange. Traditionally the province of large banks, commercial foreign

"We were the classic model of the company that had grown very large very quickly. To keep our competitive edge, we needed underlying systems that would complement—not impede—our agility as a business."

–Peter Beuken, Head of IT, Commercial Foreign Exchange, Travelex

On Demand Business Benefits

- Employing reusable software components projected to decrease application development costs and reduce cycle time by 30%
- Consolidation of application infrastructure expected to reduce application support costs by 20%
- More efficient architecture expected to significantly reduce Travelex's transaction processing cycle time
- 85 percent reduction in time required for customer processing of foreign exchange transactions
- Use of standardized application-to-application messaging technology improves delivery reliability and scalability for future growth

exchange is the backbone of global commerce, providing companies with a dependable means of paying their international suppliers in their native currency. As well as competing with banks on price, Travelex nonetheless saw a strong opportunity to leverage its agility to offer innovative, yet easy-to-use services, especially to small and medium-sized businesses (SMB). Travelex's 16,000 commercial foreign exchange clients testify to the success of its service-oriented strategy.

Having evolved into a major player in the commercial market, the company faced the realization that for its business-level innovation and growth to proceed with the same vigor, the company's systems and processes could not be allowed to pose a barrier. While Travelex's systems had largely kept pace with business requirements, they had grown in a reactive, incremental manner. This, coupled with a large number of acquisitions, led to a disparate array of systems that were complex and expensive to maintain. Complexity also undermined Travelex's ability to develop new services rapidly and efficiently—a "must-have" to sustain its intense level of innovation. The lack of a flexible, standard means of integrating with commercial customers presented a two-pronged threat. First, as the sheer number of proprietary connections grew, performance went down and cycle times went up, which delayed the processing of customer transactions. Second, non-standard integration made it harder for new SMB customers—many of whom had few, if any, in-house IT staff—to establish the necessary connections.

Growing into a more flexible company

Poised for the next stage of its evolution as a business, Travelex's commercial financial exchange unit, known as CFX, needed to establish the flexibility to respond rapidly and cost-effectively to emerging strategic opportunities. The fact that banks were beginning to turn their attention to the SMB market—and had taken steps to improve their systems—only heightened the urgency to act, notes Peter Beuken, Head of IT, Commercial Foreign Exchange. "We were the classic model of the company that had grown very large, very quickly," says Beuken. "To keep our competitive edge, we needed underlying systems that would complement—not impede—our agility as a business." To address its problem, Travelex teamed with IBM and IBM Business Partner Osmosis Integration to create a new, open platform for developing and integrating foreign exchange applications. Employing an open development environment enabled Travelex to streamline its development process,

thus removing what had been an obstacle to the rapid deployment of new services. Process-wise, the key to its success was the newfound ability to reuse core service applications—such as an exchange rate conversion engine—across an array of more specialized applications, instead of each having its own underlying engine. This led to a shorter, lower cost development cycle on the front end, as well as lower application support burden going forward. The other big benefit of an open development environment was application integration. By enabling the development of "integration-ready" applications, Travelex simplified their integration—further shortening the development cycle.

Key Components

Software

- IBM WebSphere® Business Integration Message Broker
- IBM WebSphere Application Server
- IBM WebSphere MQ
- IBM WebSphere Studio Application Developer

Business Partner

- Osmosis Integration

Embracing open standards for growth

In addition to streamlining the deployment of new services, Travelex also needed to simplify the way it managed and integrated its *existing* services—lowering the cost of supporting them and improving services to customers—and do so without having to rewrite its legacy applications. This integration governed the core of its commercial foreign exchange business, specifically the means by which Travelex exchanged transaction data with its customers' systems, as well as the way applications shared data with each other. In the former case, data transformation is critical because of the diverse data formats employed by Travelex's customers. The company's solution was to replace the proprietary scripts that had governed this integration with an open standards-based system to transport the messages, and a broker-based system to handle the transformation of customer information. Replacing what had become a cumbersome thicket of custom links with standardized connections immediately improved transaction performance. More importantly, the new system's inherent robustness and scalability laid the groundwork for a stable future growth path. The importance of system stability is beyond measure for customers seeking to lock into the best exchange rate.

"We see the new system as an enabler of future growth and continued innovation. It's a robust, flexible platform that makes everyone—on both the business and the IT side—very excited."

–Peter Beuken

Travelex points to support for standards such as J2EE as its main reason for selecting IBM technology, while Osmosis's deep experience with complex integration problems was the key reason for its selection. While IBM and Osmosis worked in parallel on the design and requirements definition for the technical solution, Travelex provided critical guidance on its business rules. On the technology side, the heart of the new application platform is comprised of IBM WebSphere Studio Application Developer (the development environment) and IBM WebSphere Application Server (the platform on which the new applications run). IBM WebSphere MQ was selected to provide the transactional messaging link due to its guaranteed message delivery capability and, says Travelex's Beuken, its status as a "de facto industry standard." To perform the critical role of message broker between customers and its backend systems, Travelex selected WebSphere Business Integration Message Broker (WBI) due to its superior flexibility. When customer transactional data is received via WebSphere MQ—whatever the format—WBI automatically transforms the data to the appropriate format and feeds it into Travelex's core financial systems. As with reusable application

components, the use of WBI enables Travelex to streamline its deployment processes, lower costs and lessen complexity—all of which are critical to a company competing on agility, service and speed-to-market.

Given his company's expected growth rate, it's not surprising that Beuken views "future-proofing" as one of the solution's biggest benefits. "We see the new system as an enabler of future growth and continued innovation," says Beuken. "It's a robust, flexible platform that makes everyone—on both the business and the IT side—very excited." In addition to enabling growth and innovation, the solution's openness and efficiency help minimize application development and support costs, putting the company on a firmer footing against its deep-pocketed competitors.

For customers, the move to a streamlined, open solution has led to an 85 percent reduction in time required to process their foreign exchange transactions, further enhancing their experience with Travelex. As a company targeting SMBs—which are known to be less "sticky" than larger companies—Travelex recognizes the importance of strengthening its customer relationships. To this end, the company is planning to roll out a suite of collaborative tools built around IBM Lotus® Domino® and IBM Lotus Instant Messaging that will enable Travelex to stay in closer contact with its customers. Beuken sees these initiatives as part of broader effort to make it easier for customers to do business with Travelex by employing open, flexible technology. "We need to stay ahead of the curve with our customers and have the systems to make it possible," says Beuken. "Osmosis and IBM have given us the building blocks to succeed."

For more information

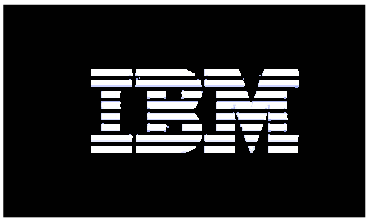
Please contact your IBM sales representative or IBM Business Partner.

Visit us at:

ibm.com/ondemand

For more information about Osmosis Integration, visit:

www.osmosisintegration.com



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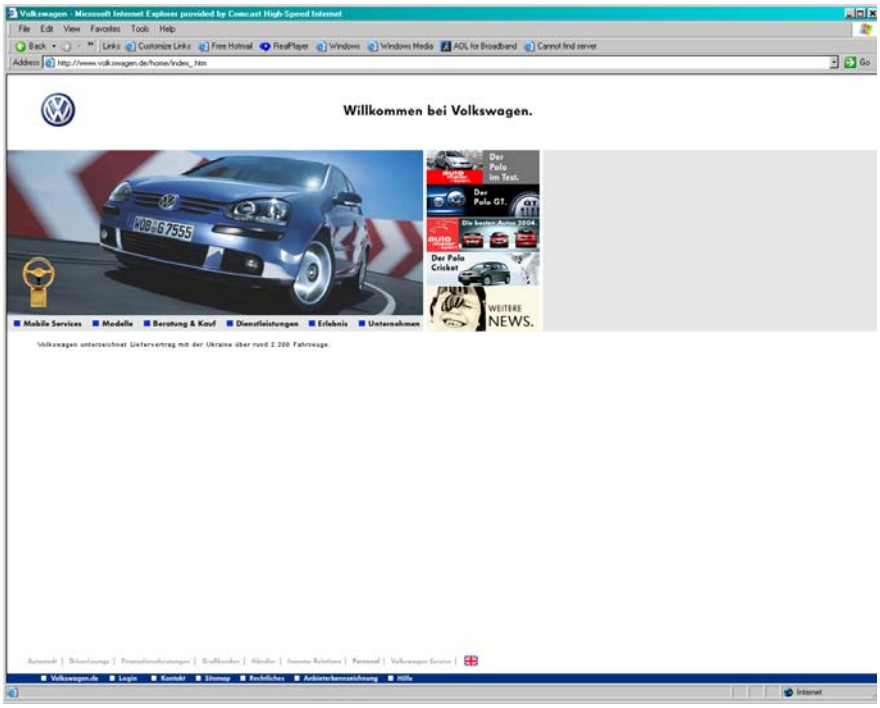
Produced in the United States of America
09-04

Volkswagen's world-class procurement strategy produces breakthrough productivity gains.

Overview

- ***Challenge***
  Faced with rising complexity within its supplier-facing processes, Volkswagen needed to make its employees more productive to stay ahead of the competition
- ***Why Become an On Demand Business?***
  Volkswagen needed to integrate its information and processes to speed decision-making and become more responsive to a rapidly changing supplier environment
- ***Solution***
  An On Demand Workplace that includes an enterprisewide portal for employees and suppliers whose sensing, analytic and workflow capabilities have radically streamlined the way employees access and act on information
- ***Key Benefits***
  - *20% increase in procurement staff productivity*
  - *Expected 100% payback within one year*
  - *Significant decreases in materials purchasing and inventory costs*



Volkswagen is the company behind such storied brands as Audi, Bentley, Bugatti and Lamborghini.

Based in Wolfsburg, Germany, Volkswagen AG (www.volkswagen.de) is Europe's largest auto manufacturer with worldwide revenues approaching $110 billion and manufacturing facilities on every continent. While perhaps best known for its VW and Audi brands, Volkswagen is also the company behind such storied brands as Bentley, Bugatti and Lamborghini. Amid the ever-increasing competition in the worldwide auto industry, Volkswagen has long set itself apart through the design and

"We need knowledgeable employees who can focus their energies on high-value activities and driving new efficiencies, spending as little time as possible seeking and wading through information."

–Dr. Martin Hofmann, Group Executive Director for Purchasing Process and Information Management, Volkswagen AG

On Demand Business Benefits

- Expected payback within one year
- 20% increase in productivity for Volkswagen's procurement staff
- Shorter order-to-delivery cycles by virtue of more efficient processes
- Improved ability for Volkswagen procurement staff to focus on high value-added activities
- More rapid response to impending shortages and surpluses, thereby reducing bottlenecks and inventory costs
- Improved ability to leverage purchasing economies through a more unified view of Volkswagen's supply chain

engineering of its cars—yielding the mix of speed and simplicity that epitomizes "Euro" styling.

Speed and simplicity have also grown in importance for the company's underlying business processes. Driven by relentless industry competition, the need for maximum employee productivity, shorter cycles and lower costs has never been greater. At the same time, achieving these efficiencies has become an increasing challenge. One big reason is a shift in consumers' buying practices, with more and more buyers customizing their cars at the dealership—from upholstery and color to engines.

As a result of this trend, car manufacturers' business processes—already complex—have become even more so. Once an order is placed at a dealership, it flows through a variety of systems, to the production ordering system, to the production assembly system and finally to the logistics system, which closes the loop when it delivers the car to the customer. While more options means more choices for Volkswagen's customers, it also means an exponential increase in the variations of parts moving through the assembly process, each of which needs to be ordered, shipped and tracked. In many ways, this order-to-delivery cycle represents the frontline of the competitive battle being waged in the auto industry. As part of this battle, Volkswagen and its competitors need to maximize the efficiency of every stage of this cycle in order to reduce their costs and to speed delivery of new vehicles to customers. However, with Volkswagen's processes becoming more and more complex, optimizing the efficiency has in turn become even more of a challenge. The industry's incessant pressure to control cost compelled the company to face this challenge.

The order-to-delivery cycle represents the frontline of the competitive battle being waged in the auto industry. Volkswagen and its competitors need to maximize the efficiency of every stage of this cycle in order to reduce their costs and to speed delivery of new vehicles to customers.

Complexity: the looming challenge

To get on a higher plane of efficiency going forward, the company needed to fundamentally change its core processes. Within Volkswagen, the efficiency of processes is defined by how well these processes operate under "normal," predictable conditions and, perhaps more importantly, their ability to dynamically adapt to key changes in its environment and still deliver the best possible outcome. Given the sheer scale of Volkswagen's procurement activities—global purchasing volume approaches $80 billion annually—the company is constantly buffeted by external events. Forecasts change. Commodity prices rise and fall.

Suppliers go out of business. And for every one of these events, Volkswagen's ability to respond rapidly and correctly is a key measure of its process efficiency and, ultimately, its long-term competitiveness. In addressing the challenge, Volkswagen focused on a basic, yet critical, truth—that the root of business processes is the use of information to trigger action. The key to more effective procurement practices, says Dr. Martin Hofmann, VW's Group Executive Director for Purchasing Process and Information Management, was to redefine the way employees and suppliers access knowledge, thereby unleashing their potential to add value. "Knowledge management has become one of the most critical success factors in the auto industry," says Hofmann. "We need knowledgeable employees who can focus their energies on high-value activities and driving new efficiencies, spending as little time as possible seeking and wading through information."

The On Demand Workplace Defined

- A set of services and software that simplifies employee access to content, applications, people and processes.
- A secure, enterprisewide portal that enables employees to dynamically interact with integrated business processes, other employees, partners, suppliers and customers.
- A personalized workplace that becomes a single destination for employees to do work.

A number of factors stood in the way of this vision. First and foremost was a lack of common processes and information architectures. While a truly global company, Volkswagen's processes and systems are highly localized and departmentalized; each location runs a different set of processes, applications and user interfaces, operating in different languages and time zones. Having to navigate through these disparate systems bogged down decision-making in the company's procurement operations, and made it more cumbersome for suppliers, who were required to log onto as many as 20 systems to get the information they needed. Underscoring the need to act, Dr. Hofmann cited an internal study finding that purchasing agents spent 70 percent of their time in the act of searching for, retrieving, analyzing, validating and moving information, with only 30 percent spent on value-added activities like finding new potential cost savings and negotiating better prices with suppliers. "It was clear that this ratio had to be reversed," notes Dr. Hofmann. The only way to do that was to radically change the way people worked with information across organizational boundaries to make them more responsive to events that affect them."

Speed through sense and respond capability

Working with IBM, Volkswagen began putting in place a new system designed to simplify and automate the process by which employees and suppliers capture, access, analyze and use information. According to Dr. Hofmann, the aim of the new system is to reverse the current application paradigm, under which the burden of seeking information falls entirely on end users. "Our vision was to leverage technology to create a sense and respond capability that would support more effective decision-making," says Hofmann. "This means the right intelligence and workflow automatically goes to the right user in response to an outside event—the very definition of an end-to-end adaptive process." Volkswagen's new On Demand Workplace solution is comprised of four main components:

Volkswagen's new Jetta™ Wagon

Key Components

Software

- IBM WebSphere® Application Server
- IBM WebSphere Portal
- IBM WebSphere Business Integration
- IBM WebSphere MQ
- IBM WebSphere Edge Server
- IBM DB2® Universal Database™
- IBM Tivoli® Access Manager

Servers

- IBM eServer™ xSeries®

Services

- IBM Business Consulting Services
- IBM Software Group
- IBM Böeblingen Development Laboratory

- *Sensing capability*, to automatically identify and capture external events such as price changes, competitive issues or supplier-related developments
- *Personalized information delivery*, using a portal to send the right information to the right business user
- *Integrated analytics*, using business intelligence to analyze and contextualize the event-driven information
- *Business process automation*, which employs advanced workflow technology to trigger automatic actions across a range of relevant business process areas

The dramatic impact on procurement productivity is most evident when compared with the way the process had formerly been conducted. In a typical day, procurement staff are bombarded with unstructured information. Telephone calls come in about supply shortages, or a procurement officer might read about a supplier going under in the trade press. For these and other events, procurement staff need to assess what the event means for Volkswagen's production needs, what business processes will be affected and what actions will be required to work through the situation. The new system alerts Volkswagen of an event that could cause a parts shortage, and triggers an automatic checking of parts inventories, alternative sources and the impact on vehicle production, as well as the overall financial impact on the balance sheet. Tasks that used to take days or hours now take minutes. Freed of information overload, procurement staff can now focus their time and effort on producing the optimal outcome—minimizing the downside and making the most of cost-saving opportunities.

Volkswagen and IBM team up for smarter procurement

To build the solution, Volkswagen selected IBM WebSphere technology to not only connect employees and suppliers to information and applications throughout the company but also enable the kind of automated, data-enriched workflow environment it envisioned. Since the new solution would have to integrate with a wide range of systems—both off-the-shelf and home-grown—strong support for open standards was a must, as was the ability to personalize information and push it out to the right user at the right time. To meet this need, Volkswagen selected IBM WebSphere Portal to provide employees and suppliers with a single point of access to critical supply chain data and applications. To transparently integrate the procurement system with various backend systems—a

critical element of the solution—Volkswagen employed IBM WebSphere MQ. To perform the business process integration underlying the solution's automated workflows, the company chose IBM WebSphere Business Integration. Running on a cluster of IBM eServer xSeries servers, the portal solution also employs IBM DB2 Universal Database to house key information and IBM Tivoli Access Manager for authentication. Load balancing within the cluster is performed by IBM WebSphere Edge Server.

With Volkswagen's solution uniting a huge, heterogeneous infrastructure, ease of integration and standards support were immeasurably important. But with the requirement that the solution ramp from a handful of pilot users to more than 35,000 in a matter of months, Dr. Hofmann notes that scalability and resiliency were also top-tier concerns. "We felt that the overall flexibility and scalability of the WebSphere architecture would allow us to grow smoothly," says Hofmann.

IBM's role in the project was to provide the technology and the expertise needed to make Volkswagen's sense-and-respond vision a reality. IBM Business Consulting Services worked with the company's internal consulting organization on business process design and integration, while staff from the IBM Software Group defined functional requirements, designed the solution and played a key role in legacy integration. The IBM Böeblingen Development Laboratory assisted in defining the solution's future needs as well as troubleshooting. While the solution went into production a year after the start of the project, Volkswagen's strategy called for an incremental rollout, with new features and elements added continuously.

"We hope to leverage IBM's vast knowledge of industry best practices, as well as their knowledge of on demand technology to identify and implement our key processes faster."

–Dr. Martin Hofmann

The Impact: smarter employees, shorter and faster cycles

By integrating sensing capabilities with a deep knowledge base and a highly automated workflow, Volkswagen's procurement staff is becoming highly efficient. A year into deployment, the company has targeted a 20 percent rise in staff productivity—and that's just the beginning. Employees and suppliers now spend less time finding information and more time acting on it. Freed from inefficient processes, these employees can now focus on further process improvements—the kind that will reward Volkswagen in the punishing competitive climate of today's global auto industry. More efficient employees and integrated processes have also made the company more responsive to supply-related developments, and in so doing have shortened the order-to-delivery cycle, enabling customers to get their cars faster. In addition to cutting time, a tighter, more informed supply chain has also enabled Volkswagen to cut costs in a variety of ways. By keeping ahead of the curve on impending shortages and surpluses, the solution helps keep inventory carrying costs down and keeps bottlenecks to a minimum. Dr. Hofmann also sees the higher visibility across the supply chain, made possible by the solution, as a

major driver of future costs savings. "We're now better able to identify synergies that will drive costs down," says Dr. Hofmann. "The more we can coordinate our purchasing internally, the better we'll be able to capitalize on volume-based effects and reduced complexity." For the portion of the project completed thus far, he expects to achieve 100 percent payback "well within a year."

Driving toward an on demand future

After targeting the initial phase of the deployment in the procurement area, Volkswagen plans to expand its sense-and-respond On Demand Workplace framework to the company as a whole. By relying on the WebSphere platform to link all of Volkswagen's business processes—inside and beyond the enterprise—Dr. Hofmann expects similar levels of productivity improvements for the company's 300,000 worldwide employees. "Eventually, Volkswagen will be fully connected both inside and outside of the company, based on well-defined business events and business scenarios," says Dr. Hofmann. "We will be able to respond rapidly—in some cases simultaneously—to critical events in our business environment. Having a faster, more productive set of processes will also help us keep our costs down and stay competitive."

Dr. Hofmann also sees IBM playing a key role in Volkswagen's increasingly on demand future by continuing to help the company redefine and connect business processes. "We hope to leverage IBM's vast knowledge of industry best practices, as well as their knowledge of on demand technology to identify and implement our key processes faster," explains Dr. Hofmann. "This will make us much faster in terms of order-to-delivery cycles, product development and our ability to connect to the outside world."

For more information

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WebSphere software

Xerox enhances productivity with IBM enterprise service bus solution and SOA.

Overview

- ***Challenge***
  Custom coding for new and updated business applications slowed production and raised costs
- ***Why IBM?***
  Xerox wanted a vendor that would support its software with future product development, and IBM showed the SOA leadership, stability and commitment to the market that Xerox required
- ***Solution***
  Enterprise service bus (ESB) enabling the integration of back-end databases with decoupled front ends without custom coding
- ***Key Benefits***
  100% payback of investment in 24 months; savings of $720,000 per year in deployment costs; development and implementation of new applications in 25% of the time it took previously

Needing a common integration method with its various back ends, Xerox developed an enterprise service bus solution using IBM WebSphere middleware.

Best known throughout the world for replacing the blurry, messy mimeograph with the crisp, clean and sharp photocopy, Xerox Corporation (Xerox) revolutionized office work as its name became synonymous with its flagship product, the copy machine. Xerox research is also credited with many innovations that define personal computing today, including Ethernet, the graphical user interface and the mouse. Based in Stamford, Connecticut, Xerox (*www.xerox.com*) has 58,100 employees worldwide who are committed to helping people find better ways to work.

> *"With IBM's help we can move forward with a service oriented architecture that helps us respond to today's challenges and gives us a flexible architecture to respond to future challenges."*
>
> *– Ram Sunkara, Manager, Integration Competency Center, Xerox*

Key Components

Software

- IBM WebSphere® Message Broker (formerly known as IBM WebSphere Business Integration Message Broker)
- IBM WebSphere MQ
- IBM WebSphere Application Server Network Deployment
- IBM WebSphere Studio Application Developer Integration Edition

Business Partner

- Software Spectrum

While copying has been good to Xerox, the widespread duplication of efforts to custom code new business applications for its many product divisions became a bottleneck that hampered productivity. The multiple corporate divisions that produce Xerox's wide range of products and services require a steady flow of new business applications to automate manual processes, serve customers better and achieve ever more demanding marketing goals. But developing each new application from scratch was a waste of effort, especially since many applications shared common back-end databases and enterprise resource planning (ERP) and customer relationship management (CRM) systems.

To centralize these programming efforts and bring costs under control by using more efficient methods of application development and integration, Xerox created its Integration Competency Center. This group, dedicated to integrating Xerox's business applications with back-end systems, set to work to build an information technology (IT) architecture that would enable them to reuse coding assets and leverage a common infrastructure for integrating a large number of applications.

ESB delivers an infrastructure for flexible connectivity

After several years of integrating applications using CORBA code, the group found that they were writing increasing amounts of custom code, sending costs up and slowing deployment cycles. Xerox began to evaluate middleware for a new enterprise service bus (ESB) architecture—a pattern of middleware that unifies and connects services, applications and resources within a business. The ESB pattern enables the connection of software running in parallel on different platforms and using disparate programming languages and skills, allowing Xerox to more quickly and easily introduce new applications and updates to their users.

To provide the integration business logic for its ESB framework, Xerox evaluated middleware from IBM, BEA Systems and webMethods. In the end, they chose a solution providing universal connectivity—an ESB with full failover capabilities using the message-oriented, event-driven and Web services capabilities of WebSphere software. IBM WebSphere Message Broker (formerly known as IBM WebSphere Business Integration Message Broker), IBM WebSphere Application Server Network Deployment and IBM WebSphere MQ were the foundation for an advanced ESB solution to deploy its growing portfolio of business applications in the most efficient way possible. IBM Business Partner Software Spectrum provided the software solution in a timely manner to help Xerox meet its target project deadline.

"Not only did IBM meet our requirements for scalability, availability and performance, it differentiated itself from the competition with its ability to follow through with research and development to continuously enhance its portfolio of offerings."

–Ram Sunkara

"IBM was the most credible presence in the market in terms of its ability to develop middleware products and support them with related products and services," says Ram Sunkara, manager, Integration Competency Center, Xerox. "Not only did IBM meet our requirements for scalability, availability and performance, it differentiated itself from the competition with its ability to follow through with research and development to continuously enhance its portfolio of offerings."

With its new ESB solution based on WebSphere software, Xerox estimates it is saving $720,000 annually in the cost of making changes to its applications, which formerly required custom coding to reintegrate with back-ends systems. In addition, application changes take 25 percent of the time they took previously. "We achieved payback in 24 months," says Sunkara. "As for our conviction that IBM would support its software with future product development, IBM repaid that with an entire integration infrastructure for applications and data that includes new products we are considering for adoption."

With its new IBM solution for integrating new applications, Xerox can implement program changes in a quarter of the time it took previously.

Flexible, available infrastructure powers 50 solutions

Among the 50 applications that run on the new WebSphere infrastructure are Web services for looking up service providers for Xerox's customer support teams, performing credit authorizations, managing customer problem calls, fulfilling parts orders and capturing user profiles for printers. Many of these applications require 24x7 availability, and the failover capability of WebSphere Application Server Network Deployment ensures that users will have service when they need it. In addition, WebSphere Application Server plays a part in Xerox's disaster recovery plan. Also working to maximize uptime is WebSphere MQ, which provides assured delivery of more than two million messages monthly, an essential part of the integration solution that connects Xerox's back-end databases and other business systems to application front ends.

The open standards-based integration solution supports a service oriented architecture (SOA) that is compatible with multiple methods of communicating with back-end systems, including messaging with WebSphere MQ and WebSphere Message Broker. WebSphere Message Broker transforms and enriches information on the fly to conform to different message structures and formats on back ends. A J2EE and Web services application server with advanced deployment services, WebSphere Application Server Network Deployment supports Enterprise JavaBeans for creating applications that make fast work of the business logic. Xerox also uses IBM WebSphere Studio Application Developer Integration Edition to build modular applications that are designed to adapt quickly to changes.

> *"Wherever we have a need for a middleware solution to enable us to develop more flexibility or leverage our existing assets, all we have to do is ask IBM."*
>
> *– Ram Sunkara*

Developing standards for SOA

With its ESB integration solution and SOA, Xerox is moving to standardize application integration throughout its global organization. This entails creating a set of Web services for leveraging some existing mainframe information and making it accessible via the Web. "Right now we're working on tying in our European operations and establishing governance practices for continuous process improvement," says Sunkara. "We're also looking at using IBM WebSphere Host Access Transformation Services (HATS) to extend our host applications to the Web—giving our green screen applications a modern and up-to-date look. Along the way, we'll be looking at IBM WebSphere Data Integration Suite to perform extract, transform and load operations within some of our data management environments. Wherever we have a need for a middleware solution to enable us to develop more flexibility or leverage our existing assets, all we have to do is ask IBM. With IBM's help we can move forward with a service oriented architecture that helps us respond to today's challenges and gives us a flexible architecture to respond to future challenges."

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