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Case Study

Office Depot: A Destination for Office Supplies and e-business Expertise

Building Multi-Touchpoint Relationships with Customers and Vendors by Integrating Business Processes

By Geoffrey E. Bock
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Prepared for IBM Corporation

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EXECUTIVE SUMMARY

Founded in 1986, Florida-based Office Depot has grown into one of the world's largest office supplies retailers, with 47,000 employees and customers in the US and 20 other countries. But in a maturing marketplace, Office Depot was facing rising costs and low margins. Opening and managing office supply superstores was an expensive strategy; more to the point, many customers were looking for more efficient ways to buy, particularly large organizations that preferred to buy in bulk.

Management realized that they could clearly differentiate the company by becoming more responsive to customer needs for greater flexibility in how they buy office products: by providing a seamless customer experience across multiple channels, Office Depot could move from being a vendor to being an integral part of a customer's supply chain. This kind of transformation would require a new level of integration across the company, one that encompassed people, processes and systems.

Office Depot decided the best way to proceed was to build on its existing capabilities in logistics, distribution and in-depth customer relationships. That could be accomplished by leveraging and enhancing its existing back-office systems—product availability, pricing, shipping—by completely integrating them into the different areas of the company's customer-facing environment.

IBM Global Services analyzed aspects of Office Depot's e-business operations and showed how they could substantially improve customer responsiveness using an open-systems approach. As a result of an in-depth technical evaluation, Office Depot selected IBM WebSphere Application Server as its strategic platform for building Web applications, based on its support for open standards and its scalability.

These efforts have allowed Office Depot to dynamically customize the shopping experience for customers, whether a corporate account with company-specific pricing and business rules, a small business or an individual. This multi-channel approach has been fast-growing and profitable for Office Depot. The company estimates that, by the end of 2002, 60 percent of its delivery business was conducted via the Web. The number of large companies buying office supplies through com-

pany-specific Web-based accounts has grown from 11,000 in December, 1998 to nearly 200,000 in December, 2002. And the number of small and medium-sized businesses buying via officedepot.com has increased from 64,000 to more than 1.5 million during the same period.

The changes also have positioned Office Depot for continued growth. The company is now positioned to integrate with customer e-procurement systems. It is managing content across its supplier network. And Office Depot can now respond quickly to promising market opportunities, as demonstrated by its September, 2002 agreement to distribute office and computer supplies through Amazon.com.

BUSINESS CONTEXT: DELIVERING VALUE FOR A COMPLETE CUSTOMER EXPERIENCE

Competing in a Maturing Market

"When I accepted leadership of Office Depot 20 months ago," Bruce Nelson, Chairman and Chief Executive Officer of Office Depot, candidly observed in his annual message to shareholders in March, 2002, "our Company faced significant challenges. Growth in the U.S. office supply superstore industry was beginning to mature, and we had not responded effectively to the changing competitive environment." In fact, after more than 10 years of steadily rising revenues, Office Depot's sales in 2001 had slipped 3.9 percent from the year before to $11,154,080,000 and net income was down 4.8 percent. More was at stake than simply an economic downturn. Under Nelson's new leadership, the company was seeking to return to its basic business principles: delivering value for a complete customer experience.

Office Depot Is One of the Pioneers of the Office Supply Superstore Industry, Founded in Florida in 1986

Office Depot grew rapidly by opening new stores and acquiring competing companies. By 1990, it had 173 retail locations in 27 states and had merged with The Office Club to become the largest office products retailer in North America. In addition, in the early 1990s, the company began penetrating international markets.

Launching the Business Services Group

As it continued to expand its retail outlets around the world, Office Depot also realized that corporate customers would not always have the time and wherewithal to shop in its superstores and that it needed to foster additional selling channels. Savvy buyers within corporations were also interested in bulk ordering capabilities, which, in turn, led Office Depot to begin selling direct to divisions of large businesses.

Also in the early 1990s the Company began to address the procurement processes of large businesses for office supplies. It entered the contract stationary business in 1993 with the acquisition of Wilson Stationery & Printing Company and Eastman Office Products Corporation. Following the acquisition of an additional six contract stationer companies, the Company formed its Business Services Group with 18 domestic customer service centers and a professional outside sales force.

These acquisitions allowed Office Depot to broaden its ability to sell office products and services to contract and commercial (primarily catalog) customers serviced by a dedicated sales force via its retail delivery channel, which includes a private-fleet of trucks.

Significantly, rather than create a separate telesales division with parallel business systems, Office Depot consistently integrated the management of non-store distribution channels with its core logistics and inventory control systems. Key to its operating principles, the company recognized and was an early adopter of the value e-business opportunities represented as simply another channel to reaching its core markets and increasing its customer base.

Office Depot also continued to diversify beyond the superstore format. It began to emphasize contract procurement solutions for large companies as well as small businesses and continued to invest in logistics systems and distribution infrastructure.

Objectives for a Changed Business Climate

But the business climate at the end of the 1990s was not the same as 10 years before. Opening new superstores proved to be an expensive business strategy, where the rising costs that accompanied the growing revenues led to low marginal returns. When profits once again dipped, the board of Office Depot decided that the company needed new leadership and a new business strategy. It turned to Bruce Nelson, then President of Office Depot International and previously President of Viking when it merged with Office Depot, and appointed him CEO in July, 2000.

Under Nelson's leadership, Office Depot established a new culture that engaged the Company's more than 45,000 employees based on three key company values:

- Respect for the individual
- Fanatical customer service
- Excellence in execution

Nelson also assessed Office Depot's options from a fresh perspective and focused on reigniting growth. In an effort to conserve resources and emphasize operational effectiveness, Office Depot closed more than 70 retail stores during the next 12 months and took a $300 million charge against earnings.

Responding to the challenging business environment and recognizing that the office supply industry needed differentiation. Nelson understood that the company could build upon its considerable expertise in distribution, logistics and in-depth customer relationships to create an integrated, multi-channel selling experience for business-to-business transactions that would clearly differentiate the Office Depot in the marketplace.

AN INTEGRATED SOLUTION FOR BUSINESS-TO-BUSINESS TRANSACTIONS

Betting on Electronic Connections

As a company, Office Depot has always depended on integrating information technology with other aspects of its business operations. It built its business primarily on AS/400 systems running RGP applications and connecting to various IBM databases for data storage. Even in its earliest days, when it relied exclusively on centralized systems, Office Depot emphasized its ability to exchange electronic product information with manufacturers and suppliers. Managing inventory was essential. The more that the company could keep the wide range of its products in stock and rapidly reorder specific items as needed, the more successful it would be.

From its earliest days, Office Depot also had one eye on the impact of technology on customer experiences. Prior to the Internet explosion in the mid-1990s Office Depot launched a number of bulletin board applications to communicate directly with its technically-savvy customers who, at the time, were running Windows 3.1 applications through dial-up modems. Many prospects, however, encountered support issues which were difficult (and time consuming) to fix. In this pre-Web era, interacting directly with customers online did not appear promising.

THE ON DEMAND PROPOSITION

Office Depot realized that to create a responsive system for today's customer needs and also provide a platform for growth tomorrow, it needed to rely on a high level of integration. Not only would Office Depot need to provide real-time inventory and pricing updates to employees, it would need to extend this information out to customers and suppliers, as well.

The most effective and efficient way to accomplish that, the company decided, would be to leverage its existing technology investments—both its legacy back-office systems and its e-business initiatives—by integrating them to create a seamless, end-to-end solution. The tools the company selected to enable this change were IBM WebSphere Application Server and IBM WebSphere MQ.

Nevertheless, Office Depot continued to invest in augmenting customer connections, particularly through its Business Services Division. The number of office products available through its catalog operations steadily expanded. Always willing to consider innovations that would improve customer relationships, the company began to gain experience with end-user oriented information delivery mechanisms.

Effective marketing was essential for building brand, competing for market share, and deploying new technologies, regardless of whether people walked into individual superstores or received their goods directly in their workplaces. Office Depot had a holistic view of business operations, where stocking, ordering, selling,

and shipping processes within one customer-facing channel reinforced those within other channels.

IBM SOLUTIONS AND TECHNOLOGIES

SOLUTION: This case study describes how Office Depot has steadily expanded its e-business infrastructure and is now beginning to widely deploy IBM WebSphere Application Server across its enterprise. By creating a responsive environment to customer and supplier needs, Office Depot is laying the foundation for becoming an On Demand business.

SOFTWARE:

- IBM WebSphere Application Server
- IBM DB2
- IBM WebSphere Studio Application Developer (formerly called VisualAge for Java)
- IBM WebSphere MQ

SERVERS:

- AS/400
- IBM eServer zSeries (formerly called S/390 Parallel Enterprise Server)

SERVICES:

- IBM Global Services provided strategic consulting services and technology expertise about the capabilities and design of WebSphere.

BUSINESS BENEFITS: The integrated, multi-channel approach has re-ignited growth and profits for Office Depot. Online sales reached $2.1 billion in fiscal 2002, or 18 percent of total sales. The number of businesses buying office supplies through company-specific Web-based accounts has grown from 531 firms in January, 1998, to 120,000 firms in January, 2002.

Creating a Web Presence with MIT

Office Depot began its Web-based e-commerce initiative with a promising sales opportunity. In 1995, faced with an enormous cutback in its Federal research funding, the Massachusetts Institute of Technology (MIT) sought to substantially reduce operating costs by reengineering key aspects of its internal procurement processes. Doing business on the Web was a promising, albeit nascent, strategy for substantially improving operational effectiveness.[1] The sector was theoretically promising, yet technologically immature. As one might expect from a major research institution, MIT decided to learn from experience by launching a pilot project.

MIT solicited bids from suppliers in a number of functional areas, including one that would allow its faculty and research staff to purchase office supplies online. Office Depot stepped up to the table, bid on the project, and was selected to be the office products supplier. MIT became the first customer for its e-business-oriented Web site. Together, both MIT and Office Depot began to recognize and understand the power of the Internet.

A Catalyst for Innovation

Behind the Office Depot initiative at MIT was an entrepreneurial executive, Monica Luechtefeld. Then Vice President for Contract Marketing and Sales Administration, she was responsible for Office Depot's customer-facing activities. She recognized the opportunity to "webify" a promising and potentially lucrative distribution channel and build upon Office Depot's considerable investments in IBM systems and solutions.

Luechtefeld was no stranger to building innovative enterprises. She had joined the company two years before, after leading the furniture division of an office supply company in Los Angeles, which was acquired by Office Depot. She then broadened her management skills by managing the company's massive distribution operations in Southern California. On the strength of this success, she was tapped for a strategic marketing position and moved to corporate headquarters in South Florida. She intuitively understood both how the office supplies business worked and what it took to build a new business channel.

The MIT project proved to be the catalyst for Luechtefeld to spearhead a then state-of-the-art Web presence—one that combined browsing and searching through an electronic catalog with online ordering. Customers would not only search for supplies online

[1] The first-generation e-commerce server companies, such as Netscape and Open Market, were just launching their initial products.

using Office Depot's electronic office supply catalog, they would also be able to order office products over the Web and receive confirmation that the supplies were indeed available by exchanging information with the back-office applications running on AS/400 systems. "We knew from day one that, if we were going to launch something of value, we had to access real inventory," Luechtefeld observed. "We had to build a system that would scale and save customers both time and money," by cost-effectively delivering high-volume, low-cost items.

Moreover, like all of the other investments in computer systems that the company had made since its inception, this environment also had to be profitable. "The value in the technology had to make financial sense to the company," Luechtefeld emphasized. Even cost-justifying the initial investments in systems and networks "were not substantially different from the ways we considered other capital investments." In recognition of the importance of her initiative for continued growth at Office Depot, Luechtefeld became Executive Vice President for Electronic Commerce in August, 2000.

Scaling a Supportable Environment

Luechtefeld and the other e-business staff quickly realized that their key to success depended upon building not simply a scalable but also a supportable environment. The reasons were simple.

In the mid-1990s, procurement managers at a growing number of firms were intrigued with underlying logic of business-to-business electronic commerce. Allowing employees to directly order high-volume, low-cost goods (such as office supplies) over the Web seemed like a good idea. Corporate IT managers, by comparison, usually had more important issues (such as the then looming Y2K crisis) that demanded their immediate attention and, thus, were reluctant to devote too much time to e-business initiatives. Office Depot had to develop and deploy a set of Web-based business services that would make it very easy for their customers to do business online and that would require little overhead and support from corporate IT groups.

Consequently, Office Depot did not focus simply on the enabling technologies. It also developed the e-business expertise about how firms should do business with one another online. Even as it was recruiting its initial set of customers, it emphasized the best practices and business incentives for managing an effective (and profitable) business-to-business environment.

Illustration 1 provides a timeline of overall e-business developments and transitions at Office Depot, from the beginnings at MIT in 1995 through 2002.

ENABLING TECHNOLOGIES. Office Depot began in 1996 to build a then state-of-the-art e-business system. At this time, this was a single Web site that displayed electronic catalog and order processing information using electronic forms and predefined scripts to access specific databases. Customers with accounts on the system would logon, browse, and buy what they needed. From the beginning, the site handled account billing, credit card, procurement card, and purchase order transactions, and featured capabilities to support multiple ship-to addressing from a single account. It also enabled company-specific negotiated pricing and product selection.

Over time, Office Depot evolved the capabilities of this Web-centric system to accommodate both the changing technology infrastructure of Internet-related solutions as well as additional customer requirements for new functionality. In particular, Office Depot rearchitected its entire Web site two years after the initial launch with expansion into workflow approvals and user profiles to support an ever growing number of users. It decided that Microsoft-based platforms would be the most cost effective solution then available. Using Active Server Pages (ASPs) from Microsoft, Office Depot linked its customer-facing Web sites to its existing order processing systems, running on AS/400 systems and using DB2 databases.

Office Depot steadily evolved the capabilities of its Web site from being simply a destination (where people browse, select, and buy goods) to also being part of an ongoing procurement process. In so doing, it has continued to extend and enhance the capabilities of its underlying network-centric environment to incorporate connections to a range of internal and external enterprise applications and to launch a series of Web-based business services. As its popularity grew, Office Depot continued to track the scalability of the environment and the cost of operations.

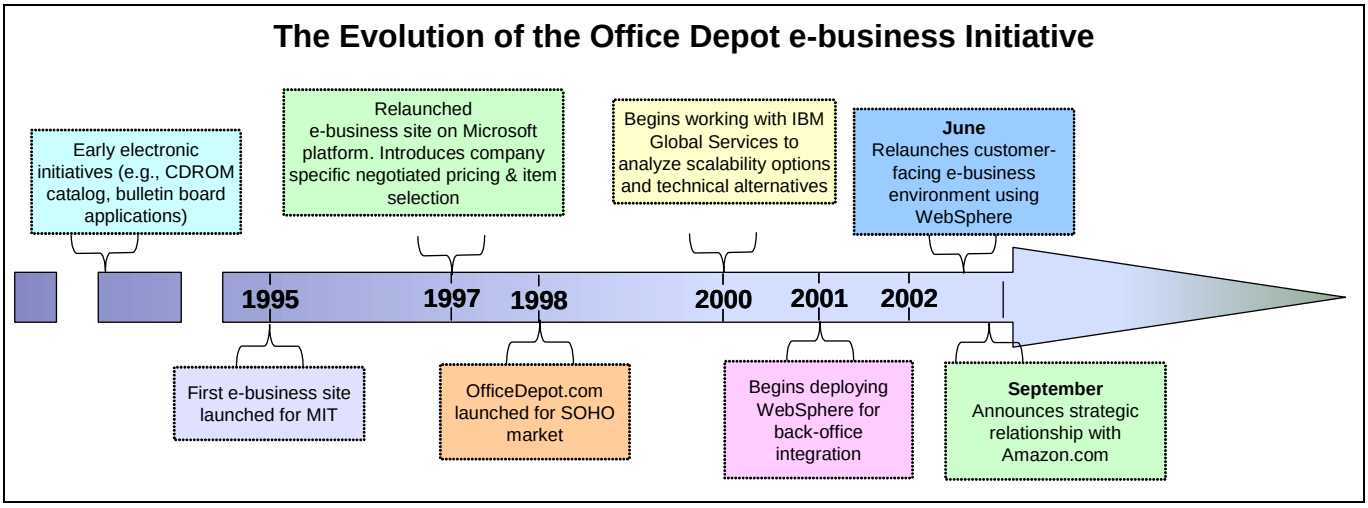

Illustration 1. Leveraging early initiatives with CDROM catalogs and electronic bulletin boards, Office Depot created its first Web presence in response to an RFP from MIT. Office Depot has developed and launched successive versions of its e-business environment. In the process, it has been able to integrate with key back-office systems as well as launch a flexible, customer-facing Web site.

Beginning in 2000, Office Depot once again began to restructure the capabilities of its underlying systems architecture to incorporate a Web application server and an application-to-application messaging system. Systems architects realized that adding additional Windows 2000 servers every time they needed to overcome performance bottlenecks was becoming an expensive, and not necessarily a scalable, value proposition. Office Depot engaged IBM Global Services to do a technical evaluation of the Web-based operations and to make recommendations for improvements.

THE ROLE OF IBM. IBM Global Services provided critical analysis and insights for a long-term technical direction. The research showed how Java would be the most promising—and scalable—way to interconnect Web servers and Web-based applications to operational applications running on AS/400 systems. Office Depot could readily capitalize on its existing investments in IBM-based applications and systems.

In particular, the research by IBM Global Services showed how back-end business applications could remain on the AS/400 systems, or they could be reimplemented in Java and run on a Web applications server—depending on the business requirements. In particular, IBM produced its Toolbox for Java as a library of classes that give Java programs easy access to zSeries or AS/400 data and resources.

Office Depot liked the flexibility of not being locked into one particular mode of deployment or one particular vendor's applications and platforms. Thus, after considering various Web application servers then coming onto the market, Office Depot selected IBM WebSphere Application Server as its strategic platform for building Web applications. (See "Evolving the Technical Infrastructure," below, for a discussion of the technical details.)

"We started to focus on scalability as we are planning for enormous transaction volumes for all aspects of our e-business infrastructure," Patricia Morrison, Office Depot's CIO observes. "Not only does WebSphere support our requirements for scalability, but IBM continues to advocate and support an open environment which could meet our needs."

BEST PRACTICES AND INCENTIVES. Office Depot has also devoted considerable effort to defining best practices and incentives to ensure that customers are able to operate successfully online.

When it first launched the Web site for its business customers, the company conducted a series of seminars to describe electronic commerce and identify how Office Depot's business-to-business connections would reduce operating costs. In these early days, customers had to apply to get accounts on the Office Depot Web site; the company screened these early adopters to ensure that they had the appropriate soft-

ware and network connections, as well as the technical wherewithal to learn how to use the system.

Office Depot also began to train its sales force about doing business electronically. It developed collateral marketing materials, organized educational conferences, and prepared user manuals. It changed the compensation goals for its sales force and provided bonuses to sales representatives when they moved businesses onto the Web. Furthermore, Office Depot provided incentives to its customers by reducing the prices of office supplies purchased over the Web.

Office Depot thus created a win/win sales, marketing, and distribution strategy. Both the individual businesses purchasing office supplies and the Office Depot sales force who manage these relationships had substantial incentives to begin doing business online.

Launching an e-business Site for the SOHO and Medium-Sized Company Market

Office Depot's decision to begin to do business with customers in general over the Web was a direct outgrowth of its initial MIT initiative. Three months after the SEC blocked Office Depot's planned merger with Staples, in October, 1997, Office Depot began planning to launch a public site, targeting the small office/home office (SOHO) and medium-sized company marketplace.

Office Depot rapidly increased its market presence. This public site (www.officedepot.com) used Microsoft's new (at the time) Active Server Page architecture rather than the CGI-based infrastructure that was supporting large enterprises and business-to-business connections. The audience was different—customers who did not have a direct sales representative calling on them for their business. The SOHO-oriented/medium-sized company site went live in January, 1998, as a distinct venue for small groups and individuals to buy what they need online.

RESULTS: OPERATING AN INDUSTRY-LEADING E-BUSINESS ENVIRONMENT

Steady Growth and Continued Acceptance

Office Depot has found a winning formula for steady growth and continued customer acceptance. By December, 1998, less than three years after launching its first business-to-business connections with MIT, roughly 11,000 large companies had signed up to do business electronically with Office Depot through its Business Systems Division. As shown in Table A, the number of large business customers increased dramatically to approximately 190,000 firms (involving 882,000 individual buyers) in December, 2002. The increase in the number of customer accounts and individual buyers for small and medium firms was similarly dramatic.

From an operational perspective, Office Depot determines its success by the quality of its customers' experiences. In addition to customer e-mail messages, "There are three things I look at every morning," Luechtefeld notes. "These are our sales numbers, the Keynote number, (a measure of Web-wide performance), and BizRate (a rating for customer satisfaction) customer emails from the prior day."

Financial Results

Doing business on the Web is a fast-growing and profitable channel for Office Depot. Worldwide e-commerce sales in fiscal 2002 grew 34 percent to $ 2.1 billion. E-commerce sales accounted for 18 percent of total sales for the year of $11.4 billion.

Growth in Number of Customer Accounts and Individual Buyers

		Dec. 1998	Dec. 1999	Dec. 2000	Dec. 2001	Dec. 2002
Large Firms	Customer Accounts	11,000	39,000	96,000	120,000	190,000
	Individual Buyers	53,000	195,000	625,000	750,000	882,000
Small & Medium Firms	Customer Accounts	64,000	283,000	723,000	1,324,000	1,531,000
	Individual Buyers	65,000	288,000	727,000	1,331,000	1,536,000

Table A. The number of active customer accounts and individual buyers is rapidly increasing as the popularity of doing business over the Web catches on.

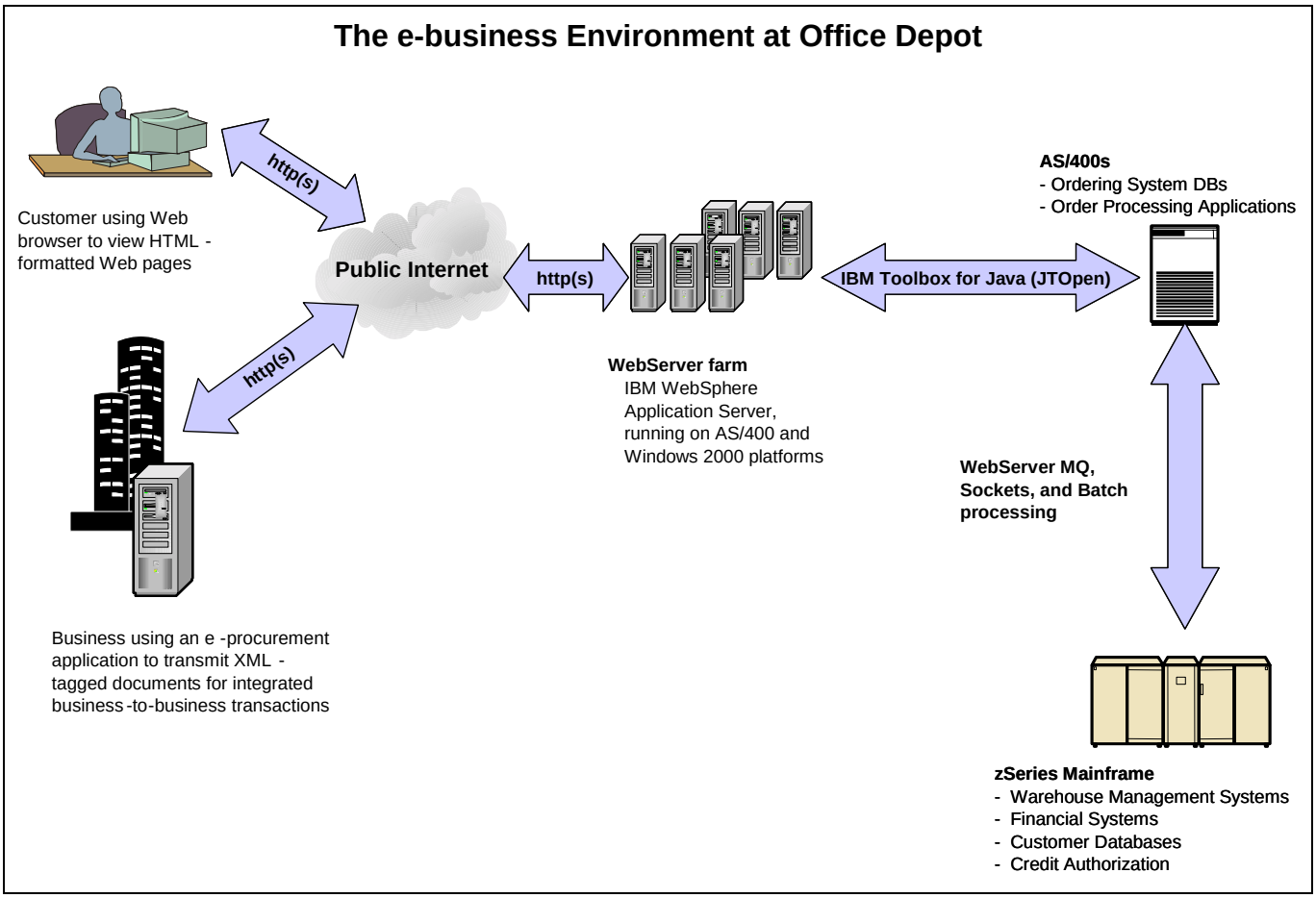

Illustration 2. Individual customers connect to the Office Depot Web site over the public Internet—usually using their own Web browsers. Individual businesses that have installed an e-procurement application can interact automatically by exchanging XML-tagged business documents. IBM WebSphere Application Server is running at the Web site and uses J2EE-compliant servlets to connect to back-office enterprise applications—such as inventory and order processing—running on AS/400 systems. When necessary, these applications use MQ Sockets and other batch processing operations to connect to mainframe applications, financial systems, and customer databases.

Managing an Integrated Customer Experience for Big Business Customers

Since individual companies contracted with Office Depot to purchase office supplies, which ranged from pens and paper to computers and office furniture; Office Depot recognized that emphasizing an integrated customer experience for business-to-business transactions would clearly differentiate the company in the office supply industry. Web-based applications communicate directly with back-end business applications for real-time updates of product availability, pricing, and shipping. The back-office environment, which has been running on IBM systems for many years, is an integral part of the overall solution and of Office Depot's success with business-to-business relationships.

Companies consequently provide their employees with a robust, industrial-strength, self-service experience. Illustration 2 shows the overall e-business environment at Office Depot.

When employees decide to purchase office supplies, Office Depot displays the company-specific home page, which includes the company logo, an introduction to company employees, contact information, and customized messages from the company or from Office Depot. Employees can then

- Browse through the product categories or search by specific item numbers
- View the company-specific item prices
- When permitted by company business rules, purchase goods up to the limit of their authorization

Office Depot needs to have the technical infrastructure in place to support the wide variety of company-specific procurement policies and business rules to connect the customer-facing Web-centric experiences to the back-office systems. IBM's WebSphere Application Server and its foundations as a J2EE environment (running Java) is being used to provide the connecting middleware layer for linking the customer-facing and back-office systems. Office Depot is steadily rolling out Web applications that use WebSphere, while also carefully incorporating these applications into its existing infrastructure. For instance, employees at some companies are only allowed to buy stationery supplies, using their company's contracted supplier. IT staff members at other firms are allowed to buy computer products from a previously-selected list of vendors and component parts, and to pay for them using a specific payment account number. Research staff members at a third group of companies can only request items for purchase on the Office Depot site, and then forward their requests to people authorized to buy the goods for their organizations. These corporate buyers, in turn, must correctly identify the "ship-to" addressees for each employee requesting an order.

When customers have problems with buying products online, Office Depot needs to have the answers.

Thus, Office Depot must support:

- Authorization and authentication so that employees from the contracting companies are able to connect to the Office Depot Web site
- The dynamic display of product catalog content, enabling these people to find the items they need and that they are authorized to purchase
- Company-specific pricing, based on the business terms that company purchasing managers have negotiated beforehand
- Shopping cart capabilities that are integrated with internal business policies, ranging from simple credit card transactions to complex procurement process-driven workflows

Consequently, Office Depot must dynamically customize the page views and interactions for individual users who work for various companies. As employees select items for purchase and add them to their shopping carts, their options change, depending upon their company-specific business rules.

Supporting Customer Accounts

When customers have problems with buying products online, Office Depot needs to have the answers. "If business customers at first cannot connect to our site or find the products they want," explains James Morris, Director, Systems Development at Office Depot, "they assume it is our problem. Consequently, we take on entirely different relationships with our customers. We help them with things such as browser settings, and give them information that they could be getting from their IT departments. We explain the business rules that their companies have set up, how they work, and what they need to do to when they cannot purchase various items."

In fact, many small and medium-sized enterprises do not have IT specialists in-house. Buying office supplies over the Web is the first experience that employees in many firms have had with business-to-business interactions. Office Depot thus delivers not only the goods, but also delivers on their brand promise of "What You Need to Know" expertise for doing business online. In its pursuit of fanatical customer service and excellence in execution, Office Depot has invested in an extensive customer support organization that is capable of responding to a wide range of problems over the phone or online.

Once Office Depot signs up a new corporate account, it has a formal implementation planning process for connecting the account's employees to the Office Depot business-to-business environment. Office Depot representatives work with company staff members to:

- Specify the names of employees authorized to browse and buy various kinds of office supplies over the Web. Depending upon names or roles, different peo-

ple can have varying levels of purchasing authorization, determined by expense limits or product categories.

- List the various ship-to addresses. An individual company can have hundreds or thousands of ship-to addresses.

- Specify payment terms and conditions, including account billing or procurement card numbers.

From time to time, Office Depot support specialists help new accounts organize and compile all of the employee-specific information they need to do business electronically.

Office Depot stores this information within its own environment in a company-specific master file. Office Depot is careful to distribute the administrative responsibilities. An account administrator at each company has access control privileges to update the company-specific information as needed.

Integrating with Customers' E-Procurement Applications

Finally, large companies that have deployed their own enterprise e-procurement applications can integrate directly with Office Depot when electronically purchasing office supplies. Employees can browse through the Office Depot catalog, add items to their shopping carts according to the predetermined business rules, and then incorporate their orders into their company-specific e-procurement applications. Behind the scenes and transparent to the individuals buying office supplies, Office Depot automatically transfers the list of selected items back to the company's e-procurement application and then, at some later time, receives the electronic authorization to complete the order.

Office Depot realizes that many of its largest accounts are implementing e-procurement applications using the emerging standards of the Internet for business-to-business transactions. It has invested in defining and building a series of external programmatic interfaces so that these companies can automatically interact with the Office Depot environment. Office Depot maintains its own customer integration and testing team to make sure that these companies can:

- Automatically connect to the Office Depot environment

- Accurately interpret the order-request information (defined as an XML-formatted business object) that the Office Depot environment sends back

- Accurately transmit the order-processing information (defined as another XML-formatted business object) to the Office Depot environment to complete the order

As a result, Office Depot is able to accelerate the momentum of business-to-business integration. It has the support infrastructure in place to rapidly connect new customer accounts to its e-business environment in a highly-scalable manner.

E-commerce is critical to Office Depot's future growth and profitability.

"We are continually looking at the knowledge base around our customers' abilities to do e-procurement," Patricia Morrison, Office Depot's CIO observes. "This is very important to our customers, and we have to help them understand how they can connect to our e-business environment. We have extensive expertise as we have had to deal with so many e-procurement platforms." In her role as CIO, Morrison takes this knowledge base and leverages it across all of Office Depot channels.

FUTURE DIRECTIONS: CONSOLIDATING MARKET LEADERSHIP

Profiting from e-business Interactions

E-commerce is critical to Office Depot's future growth and profitability. Luechtefeld estimates that, at the end of 2002, 60 percent of its delivery business will have been conducted over the Web. Moreover, the natures of the business customers shopping online are changing. "Our first customers were the early adopters," Luechtefeld recounts. "They were very technology savvy and were willing to change their behaviors. Today's customer is a multi-channel shopper, who will continue to order by phone and visit a retail store, and also use the Web. The Web is a timely and effective customer retention tool that is essential for building our brand."

To be successful, Office Depot is redoubling its efforts to implement a multi-channel selling environment, one that delivers a seamless customer experience. "We expect to

drive value to our customers and stay ahead of what they expect of us," Morrison explains. For instance, Office Depot is beginning to integrate wireless devices into its clicks and mortar operations. In the future, customers will be able to order supplies and check their shipments from their PDAs. Superstore managers will be able to access sales and inventory information via wireless hand-held computers.

Managing Product Content for Multi-Channel Distribution

Managing product content for multi-channel distribution is emerging as a critical issue that requires attention. When customers walk into an Office Depot superstore, they can touch and see the products. When they have questions, they can ask a trained store employee. Office Depot has created comparable experiences for its online customers.

Continuing to focus on the quality of the customer experience is only one measure of success. A second critical area is deploying the middleware for vendor extranets to create tight connections with suppliers.

Office Depot is beginning to produce sets of electronic solution guides on such topics as buying the right ink-jet printer or choosing the right ink for particular kinds of printing jobs. Increasingly, it needs to bundle product descriptions for different audiences, such as home-office consultants or mobile sales professionals, to create self-contained resource centers. Individual customers can then access these sets of Web pages either from their own Web browsers or from an in-store kiosk. Office Depot is finding that it needs to expand the sets of product categories that it uses to classify various items. Moreover, it needs to add new kinds of content to make the product information relevant for different audiences and different needs.

Online shoppers need more than just short product descriptions and SKU numbers—the shelf-space in cyberspace is very different from the aisles of individual superstores. Office Depot is working with its vendors to produce the additional information required for effectively marketing items over the Web. "Manufacturers have to be more compelling in their descriptions of their products," Luechtefeld observes. When customers can buy three different kinds of business envelopes online and pay three different prices, they want to know the differences. Consequently, Office Depot is developing training materials and workshops for its vendors about how to write informative product information for electronic distribution. "A product manager cannot simply describe all of the envelopes the company sells as 'high quality' and hope that online customers will understand the differences. Vendors have to learn a new skill to write product content for the Web," Luechtefeld concludes.

Developing Vendor Extranets

Continuing to focus on the quality of the customer experience is only one measure of success. A second critical area is deploying the middleware for vendor extranets to create tight connections with suppliers. "Most companies that have integrated their supply chains have used EDI to transmit purchase orders and other structured business documents," Michael Kirschner, Vice President eCommerce Development, explains. "But now we want to share point-of-sale data, product descriptions, and other kinds of customer-related content."

This extranet initiative relies on the Web-centric infrastructure provided by WebSphere and the J2EE architecture.

Flexibility for New Business Initiatives

In fact, with WebSphere as its Web application server, Office Depot has been able to quickly demonstrate the flexibility of its enabling infrastructure for rapidly launching new business initiatives.

- In July, 2002, Office Depot launched a new marketing initiative to sell school supplies through a co-branded site, school.com. Currently, this site merchandises Office Depot products for an educational audience. For instance, links to backpacks, crayons, and pencil cases are directly accessible from the home page. In the future, Office Depot will be able to create customized pages for individual schools so that parents and children can find the recommended school supplies from individual teachers online and buy what they need.

- On September 6, 2002, Office Depot announced a strategic e-commerce alliance with Amazon.com. It now offers more than 50,000 office products through the

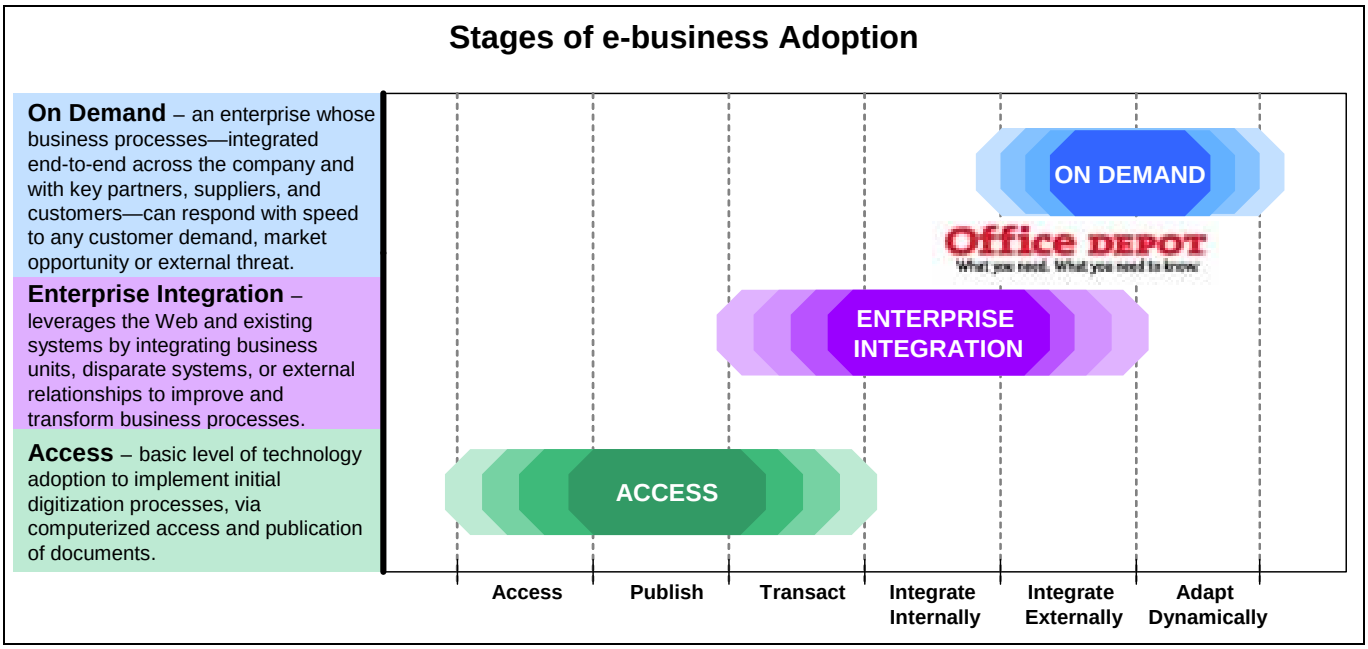

Illustration 3. The e-business environment at Office Depot builds on a major initiative to foster internal integration as well as external integration. The company integrates its customer-facing environment with relevant enterprise applications for real-time inventory updates, shipping, and in-store pickups. It is beginning to offer On Demand capabilities by integrating with customers' procurement applications.

Amazon site through two-way integration. Amazon customers navigate through the Office Depot product catalog with an Amazon-like look and feel. Amazon handles transactions and checkout while Office Depot fulfills the orders.

- In November, 2002, Office Depot began to offer its customers the option to pick up online orders at a near-by retail superstores.

- In January, 2003, Office Depot launched a Spanish language Web site for Spanish-speaking markets both within the United States and abroad. It is beginning by translating more than 14,000 items in its product catalog, including the extended product descriptions and related marketing collateral. In view of the company's presence in many international markets, this site represents the start of a broadly based globalized e-commerce initiative.

WebSphere provides the foundations for easily integrating the business logic of third-party systems.

Prospects for Continued Growth

Office Depot is poised to reap considerable business benefits from its ongoing investments in e-business strategies and solutions. Not only is it building momentum by its ability to meet and exceed customers' expectations, it is also transforming the ways in which it links suppliers into its retailing and distribution operations. Over the long term, Office Depot is well on its way towards responding to the clicks-and-bricks challenges of the marketplace. By creating seamless customer experiences, it is changing the competitive environment of selling office supplies both through superstores and through cyberspace.

STAGES OF e-business ADOPTION

Office Depot is investing steadily in its e-business infrastructure and is achieving considerable success. As shown below in Illustration 3, it is well into the enterprise integration stage, connecting enterprise applications with its customer-facing environment. Moreover, with its support for its customers' online procurement systems (using XML and automatic business-to-business integration—b2bi—techniques), Office Depot is beginning to

deploy a fairly sophisticated environment to support an On Demand stage of e-business evolution.

EVOLVING THE TECHNICAL INFRASTRUCTURE

Building for Scalability

Office Depot has designed its e-business environment for scalability and flexibility, up to the limits of the available technology. It is continually extending the capabilities of its existing enterprise infrastructure and incorporating innovative capabilities as the underlying technologies mature. As a long-standing IBM customer, Office Depot has extensive expertise managing databases of product-related information.

Office Depot launched its initial Web site to support MIT and the first generation of customers who wanted to do business over the Web. This site ran on Netscape Commerce Servers and Windows NT 3.5 platforms. It featured sets of CGI scripts that accessed existing product databases (DB2 databases running on AS/400 systems) as well as an electronic catalog application running on RS/6000 systems with AIX. It relied on Kerboros for single sign-on and authentication across multiple platforms.

When the popularity of its Web site began to accelerate in 1996 and 1997, and employees at more companies wanted to buy office supplies online, Office Depot realized that it did not have the network-centric expertise to manage the server farm running its Web site. The company decided to outsource the management of its NT Servers to IBM Global Network, an IBM-run Web hosting services provider, until it could build the expertise in-house.

In 1998, as IBM was exiting from its Web hosting business, Office Depot resumed the direct management of its Web-based environment. At the same time, it implemented a second, more extensible Web-based environment, this time running on Microsoft Commerce Server 3.0 and Windows NT 4.0. The development team at Office Depot relied on sets of .COM objects, embedded in .ASP pages, to add new features to support session persistence, customized pricing, profile-driven item selection, and individual users' personal profiles, using sets of .COM objects. Their solutions required programming in Microsoft's Visual Basic.

As it developed this environment, Office Depot also had to be sure that its solutions would be compatible with its customers' underlying computing environment. "When you are dealing with corporate customers, you have to be aware of their inherent policies and practices," Kirschner explains. "For instance, we knew right away we could not rely on cookies [for session management] as more than 10 percent of our customers have them disabled. We cannot assume that they have the latest Web-based technologies installed and deployed. We try to meet and anticipate the changes in technology to ensure that the Office Depot environment will function correctly.

The Need for Middleware and a J2EE Platform

Faced with growing customer acceptance, Office Depot has had to design and deploy a Web-based environment that can scale exponentially and handle thousands of simultaneous user sessions as well as an extended transaction sets. The company realized that it could no longer afford to simply add new systems to its existing server farm every time it needed to increase its systems throughput. Its then current Microsoft-based infrastructure would only scale in a linear fashion. Office Depot's growth projections required exponential scalability and a reduction in the number of actual systems that it needed to maintain. After extensive research and analysis, assisted by IBM Global Services, Office Depot concluded that it required a component-based application layer to rapidly process customers' requests, transform the queries to access existing databases, return the results, and produce the dynamic page displays.

In 2000, Office Depot began to rearchitect its e-business environment a third time and added an all-important middleware layer. Adapting a Java-based architecture would substantially accelerate development while also reduce implementation costs, thus speeding the deployment of new features and functions. The Office Depot technical staff concluded that Enterprise Java Beans (EJBs) running on a J2EE platform would be best architectural alternative. They then considered a number of competitive products and decided to adopt the IBM WebSphere Application Server to fulfill Office Depot's middleware requirements. "We wanted to embrace our existing investments running on AS/400 systems," Kirschner observes. WebSphere allows us to do this and also provides the flexibility to migrate to other platforms." In addition, moving to WebSphere running on both Windows 2000 and AS/400 systems resulted in a big improvement in scalability—reflected by the necessity to run substantially fewer actual systems.

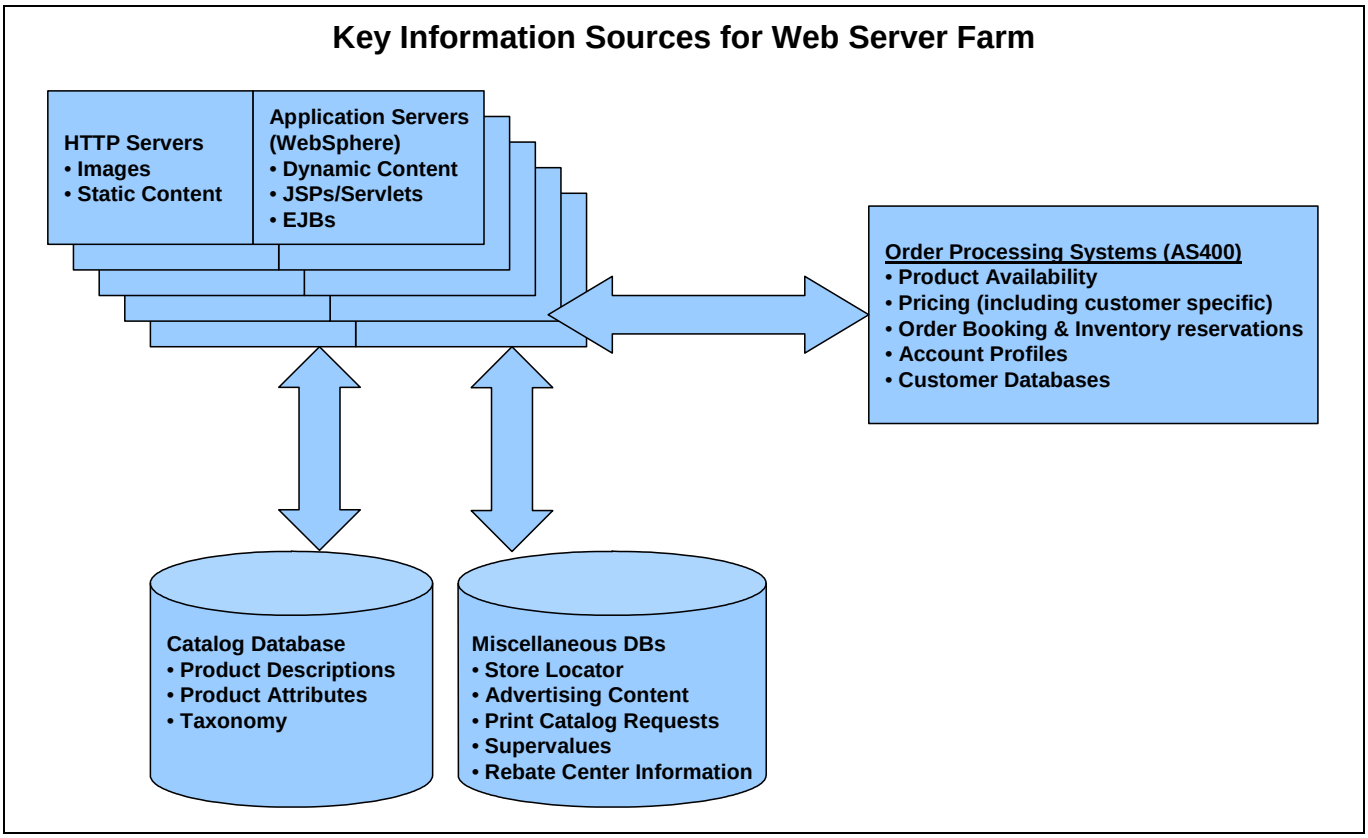

Illustration 4. IBM WebSphere application server is able to integrate disparate information resources into a single online experience. Using JSPs, servlets, and Enterprise Java Beans (EJBs), it is able to access and manage a wide variety of dynamic content. This content includes catalog content stored in structured databases, various kinds of semi-structured and unstructured content stored in file systems, content management environments, and other repositories, as well as transactional information, such as product availability and pricing, obtained from enterprise applications.

Illustration 4 provides a technical overview of the key components for managing the flow of information and business transactions between the content originators and those that consume it.

WEBSPHERE APPLICATION SERVER IN OPERATION

Under Kirschner's technical leadership, in late 2000, Office Depot began a phased implementation to incorporate WebSphere into its Web-centric environment and to deploy a comprehensive e-business solution. Initially, the company sought only to enhance the interactivity and performance of its back-end business systems. For instance, using WebSphere, Office Depot integrated its logistics system and its call center operations—both of which were running on AS/400 systems—into its overall e-business environment. This enabled customers to track Office Depot deliveries over the Web and customer service representatives to respond to customer inquiries about their Web-based transactions.

Speed of deployment, scalability, and implementation costs remain critical considerations. Office Depot adopted VisualAge for Java as the development environment—this supported a critical development and testing environment: developers could write code and bring a live copy of the Web site onto their own systems for debugging.

Furthermore, Java provided the integration path with AS/400-based applications to overcome the barriers of legacy systems. WebSphere Studio Application Developer (formerly VisualAge for Java) supports native access to AS/400 applications from any Java platform. IBM also provides its Toolbox for Java, a library of Java classes that supports both the client/server and the Internet programming model to a zSeries or AS/400 system.

Thus, Java developers at Office Depot had a great deal of flexibility when designing their integration activities. They could easily access the company's core business systems using either Java classes or AS/400 data queues, depending on the legacy application or desired functionality. For instance, they would readily integrate WebSphere with the existing inventory management and logistic applications—coded in RPG and running on AS/400 systems. Developers only relied on WebSphere MQ (formerly MQSeries) messaging-oriented middleware when communicating between AS/400 business applications and zSeries, running large-scale warehouse applications on DB2 databases.

As the Office Depot technical team became familiar with the capabilities of a Java-based application server in general and WebSphere in particular, they realized that they could substantially transform their customers' experiences while also improving their overall system performance and reducing their operational expenses. "Mike [Kirchner] put together three things that tipped the scale in favor of WebSphere and J2EE," Luechtefeld explained in her role as the executive responsible for electronic commerce strategies. "First was the speed to market. Java made things faster. Second was the improvement in the number of concurrent users we could support. This would have a huge impact on our operations. And third was pricing. That opened the door and justified the business decision."

"We went with WebSphere to reengineer our back-end processes that run on AS/400 systems," Kirschner explained. "We are starting to write EJBs that replace RPG and Cobol code—and hence modernize our back-end systems. We have had our own messaging-oriented middleware, but now we are leveraging the Java toolkit to update and read the databases directly instead of updating message sets." Office Depot is therefore able to extend and convert the logic of its AS 400 business systems to run on its Web application servers.

In mid-2001 Kirschner and the technical team began to reimplement the customer-facing aspects of the Office Depot e-business environment using WebSphere to generate the actual page displays and replacing .ASPs with .JSPs. They introduced site-wide analytics in January, 2002, and a substantially revised, interactive look-and-feel in June.

WebSphere now serves as the critical server for producing an interactive customer experience. It generates dynamic content for customer-facing page displays from the catalog database, miscellaneous databases, and enterprise-wide order processing systems. Frequent customer activities, such as the time required to query the SKU database and return a part number, declined more than four-fold from a couple hundred milliseconds to 50 milliseconds. Fast response times lead to improved customer satisfaction.

"What counts for us is openness," Morrison concludes from her perspective as CIO, responsible for all of Office Depot's systems. "IBM continues to advocate and support an open environment with WebSphere. The performance is critical. WebSphere now handles our 1,300 person call center and our fax environment, as well as our Web environment."

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