



# ALSTOM: Embracing Standards Yields Powerful Results

## An IDC e-business Case Study

### THE SUBJECT

With headquarters in Paris and revenues of over 22 billion euros (US\$ 19.4 billion), ALSTOM is the global specialist in energy and transportation infrastructure, providing components, services, and turnkey systems. ALSTOM employs more than 120,000 employees in 70 countries.

### THE GOAL

To build a scalable, standards-based e-business solution—running on a unified architecture—that allows customers, employees, suppliers and partners to share information and conduct transactions across the extended enterprise.

### THE SOLUTION

ALSTOM has completed several key phases of a broad-based infrastructure build-out, a key part of which is a suite of portal-based “e-business services” targeted to customers, employees, suppliers and partners. One such service allows US power plant customers to securely view power plant designs, purchase parts, and view shipping schedules online. Using advanced Web content management tools, this solution delivers personalized content, allowing a richer, more satisfying experience for ALSTOM’s customers.

### WHY IBM

*“By choosing IBM technology for such a key part of our e-infrastructure, ALSTOM has made a strong endorsement of IBM’s support for standards in its portfolio of products.”*



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## Executive Summary

### Innovation Spotlight

The Power business within ALSTOM employed the Web content management and delivery solution of IBM Business Partner divine, inc. to create a contact locator application that enables customers to choose a product, select an application, and find an associated contact anywhere in the world. Prior to its implementation, the process of finding such a contact was unstructured, highly inefficient and heavily reliant on an informal network of "experts."

One of the world's largest providers of power and transportation services and systems, ALSTOM recently launched a sweeping e-business initiative targeted to customers, employees, suppliers and partners. While an early e-commerce innovator—it launched a successful B2B portal in 1997—ALSTOM's current efforts are more far-reaching and central to the company's core business strategy. Specifically, the company has begun to retool its e-infrastructure within a framework of standards-based technologies (e.g., XML and J2EE) and tools. By following a standards-based approach to its infrastructure investments, ALSTOM hopes to shorten its development cycle, reduce its costs, and ultimately get closer to its customers.

At the heart of ALSTOM's emerging e-infrastructure is WebSphere Application Server and MQSeries (IBM's core middleware technology) and Content Server Enterprise Edition (CSEE), a Java and XML-based Web content management and delivery platform from IBM Business Partner divine, inc. Led by its Power unit, ALSTOM has begun quickly rolling out new e-business services, leveraging the speed, flexibility and efficiency of development afforded by the IBM/divine solution.

### ALSTOM's Solution at a Glance

- ▶ **e-business State** Internal Integration
- ▶ **Core Functionality** B2B e-commerce (online purchasing); personalized content delivery to customers via industry-specific portals (view power plant designs, price lists, inventory levels, and shipping schedules online); advanced Web content management capabilities (allows decentralization of Web content management, with non-technical ALSTOM employees assuming the role across all units of the company).
- ▶ **Software** WebSphere Application Server, Advanced Edition 3.5, MQSeries 5.1, divine Content Server Enterprise Edition 3.5, Lotus Notes R5, Click Commerce Extranet Manager 4.2
- ▶ **Business Partner** divine, inc. (formerly Open Market, Inc.)
- ▶ **Key Benefits**
  - ▶ An improved ability to share a common Internet/Intranet framework is expected to yield a 50 percent reduction in portal development costs.
  - ▶ Ongoing Web content management costs are expected to decline by 75 percent within ALSTOM's Power sector.
  - ▶ ALSTOM's e-business services have lowered administrative costs, mainly through a reduced need for multiple telephone calls, copying, and physical mailing.
  - ▶ By providing personalized information to customers, ALSTOM has nurtured stronger, deeper, and more durable customer relationships.
  - ▶ ALSTOM's initial B2B offering, well-received by customers, contributed to a significant increase in its US market share.

### ► Background

With headquarters in Paris and revenues of over 22 billion euros (US\$ 19.4 billion), ALSTOM is the global specialist in energy and transport infrastructure. A truly global enterprise—the company employs more than 120,000 employees across 70 countries—ALSTOM operates as five separate business units, or “sectors,” defined as:

- *Power*—provides power equipment and systems, turnkey plants and related services ([www.power.alstom.com](http://www.power.alstom.com))
- *Transmission and Distribution*—provides equipment, systems and services for the power transmission and distribution market ([www.tde.alstom.com](http://www.tde.alstom.com))
- *Transport*—manufactures passenger trains, locomotives, rolling stock, and signaling equipment and provides related services ([www.transport.alstom.com](http://www.transport.alstom.com))
- *Power Conversion*— Provides equipment and services related to power conversion ([www.powerconv.alstom.com](http://www.powerconv.alstom.com))
- *Marine*—manufactures luxury cruise ships, large high-speed ferries, liquefied natural gas carriers and other sophisticated ships ([www.marine.alstom.com](http://www.marine.alstom.com))

“It has become increasingly clear in both the transportation and energy sectors that the ability to rapidly deliver information across the value chain is a key source of competitive differentiation. This means making accurate, fresh information readily available to customers, partners, suppliers and employees worldwide—all the time.”

— John Diekmann, Web Team Manager, ALSTOM

This highly diversified product and service portfolio, coupled with the decentralized nature of ALSTOM’s operations, has made the management and sharing of information a complex and strategically vital issue. John Diekmann, ALSTOM’s Web Team Manager, notes that while the inherent benefit of sharing knowledge across ALSTOM’s enterprise has been a key driver, a number of external, industry-level factors have also combined to make information sharing a strategic imperative. “It has become increasingly clear in both the transportation and energy sectors that the ability to rapidly deliver information across the value chain is a key source of competitive differentiation,” says Diekmann. “This means making accurate, fresh information readily available to customers, partners, suppliers and employees worldwide—all the time.”

Other industry factors have also proven important. For instance, in the power generation industry, one of the key factors driving power plants to seek more collaboration with equipment and turnkey systems suppliers (including ALSTOM and its key rivals GE and Siemens) has been the steady tide of deregulation worldwide. Indeed, deregulation’s tendency to favor the lowest cost provider has forged closer relationships across the value chain. While deregulation has been a catalyst to collaboration, consolidation in the power industry has in contrast made it more challenging by increasing both the heterogeneity of IT infrastructures and the proliferation of content sources throughout the enterprise—thus making integration of companywide data resources more difficult.

## ► The Need: A Standards-based Approach to e-Infrastructure

By the end of 1999, ALSTOM's top management had fully recognized the strategic importance of strengthening the company's information sharing capabilities. Likewise, the fact that Web-based technology had matured into a viable platform for secure, broad-based collaboration provided further momentum to the company's e-business initiative. While the late 1999/early 2000 timeframe was a watershed for ALSTOM's e-business activities, its roots in fact extend back to 1997. At that time, the company's Power unit launched a Web site that allowed its customers better access to power plant data including the ability to view inventory and purchase parts online. Although this early solution contained a mix of online and offline components, it was nonetheless deemed a major success by ALSTOM's customers. Moreover, this positive endorsement was backed up by a 20 percent annual increase in revenues. As Diekmann points out, these early successes fueled management's conviction in the value of Web-based technology as a core strategic tool and laid the groundwork for a broader e-business strategy. "The measurable success of the parts site convinced management that e-business was more than just glitter," says Diekmann. "It provided credible evidence of the bottom-line value of e-business that proved critical as we sought to broaden our activities."

"ALSTOM now runs so many different ERP implementations that integrating information is almost unmanageable. Adhering to a standards-based Web strategy allows us to control our cost, and to leverage experience and best practices across the organization."

— John Diekmann

One of ALSTOM's first actions was to create a series of internal teams to formulate a coherent technology strategy that would provide a framework for the company's general e-business activities. Underlying the planning process was a fervent belief in the value of a standards-based infrastructure; it is a belief borne of some hard lessons, notes Diekmann, who views ALSTOM's experience with ERP systems as a potent example of the value of standards. "ALSTOM now runs so many different ERP implementations that integrating information is almost unmanageable," explains Diekmann. "Adhering to a standards-based Web strategy allows us to control our cost, and to leverage experience and best practices across the organization."

ALSTOM's vision, now in the process of being implemented, is to build the technological foundation required to introduce a wave of Web-based applications across the company—touching employees, customers, suppliers and partners. Plans in various states of execution include portals, extranet-based services (e.g., e-purchasing) and intranet-based services (e.g., e-procurement). For the sake of focus, this case study examines the activities of ALSTOM's power generation unit, where e-business solutions have established an early foothold within the company.

### ► The Decision: Laying the Groundwork for "e-Applications"

By early 2000, ALSTOM's planners had articulated the core elements of its e-business infrastructure strategy, comprising both technology-level and business-level requirements. In addition to a commitment to standards-based technology, the company also embraced a unified approach to e-infrastructure, such that all internal and externally-focused content and services would reside on the same IT architecture. Diekmann sees ALSTOM's embrace of a unified approach to architecture planning as a complement to its focus on standards as well as a statement about the company's future growth intentions. "Our central criteria for choosing a core infrastructure technology was the ability to start small and grow without limit," says Diekmann. "Selecting a modular, scalable platform ensures our ability to do this."

"While we were clearly impressed with IBM WebSphere's capabilities, the range of major application software supporting WebSphere made it a good fit within our standards-based framework."

— John Diekmann

While the issue of architectural scalability spoke to a long term need, ALSTOM also identified a number of more immediate factors that had a strong bearing on its technology selection process. For instance, the company placed a high priority on providing users with "single sign-on" capability, such that users can access a variety of different applications during a single session without having to repeatedly log on. This key criterion related to the application server technology that would serve as the core of ALSTOM's e-business services platform.

At the application level, enterprise-wide Web content management was seen as one of the most critical pieces of ALSTOM's near-term e-business strategy—a function of its highly decentralized operations and the fragmented state of its Web content management processes. In selecting a Web content management vendor, ALSTOM's most important criteria were:

- *Ease of use*—such that non-technical employees (e.g., marketing staff) in the various business units could maintain their own content, all the while preserving a consistent "look and feel" across all company Web sites.
- *Flexibility of presentation*— allowing ALSTOM to integrate dynamic content with offline business logic and data, and allowing ALSTOM to present personalized content to customers.

Within the ALSTOM organization, the vendor selection process was driven by the Architecture and New Technologies team (a unit of IT), working in conjunction with line-of-business staff from each of the company's units. Focusing first on its core infrastructure platform, ALSTOM selected IBM WebSphere Application Server early in 2000. In addition to WebSphere's single sign-on capability, Diekmann points to WebSphere's overall functionality, support from third parties and ease of integration as key parameters in ALSTOM's selection process. "While we were clearly impressed with WebSphere's capabilities, the range of major application software supporting WebSphere made it a good fit within our standards-based framework," notes Diekmann. By choosing IBM

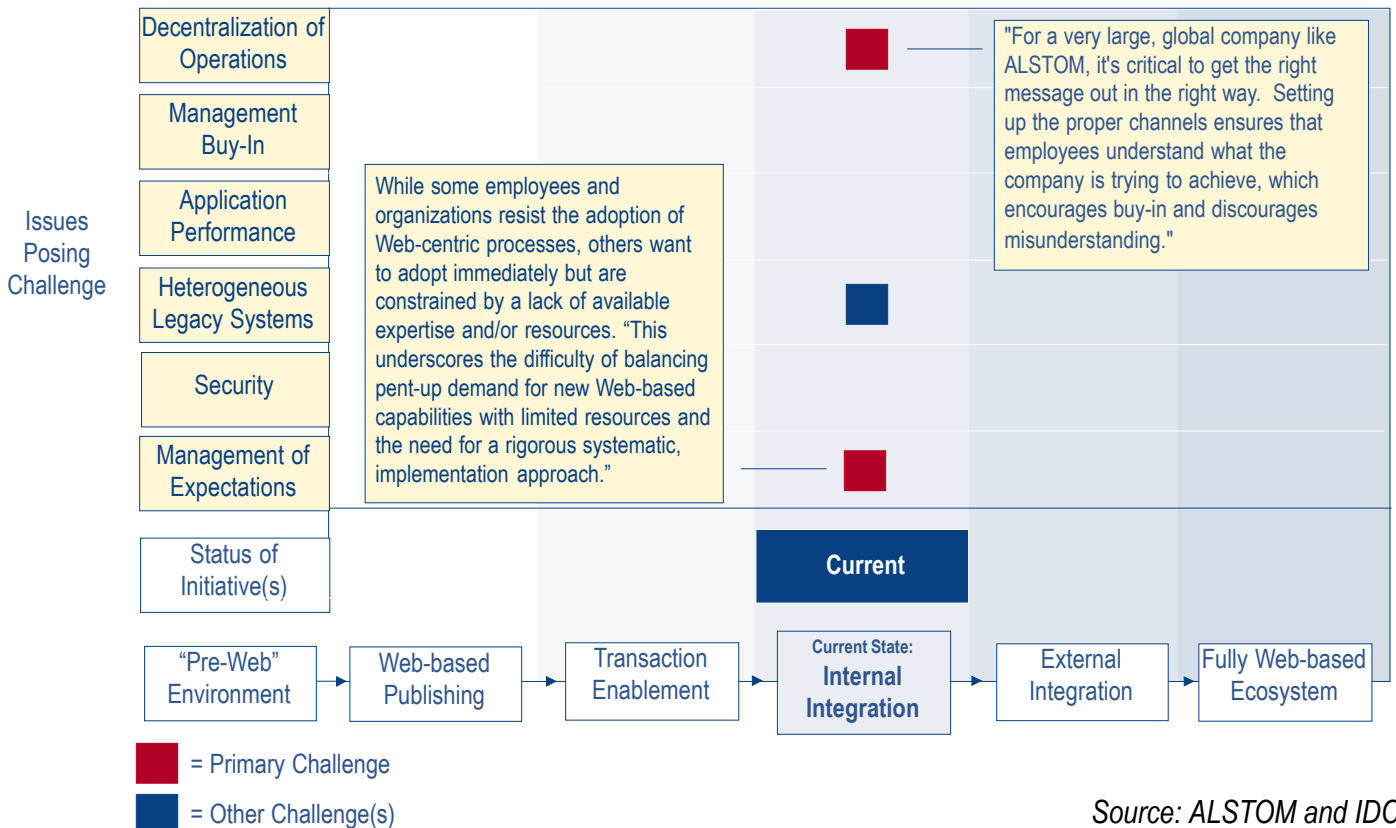
technology for such a key part of its e-infrastructure, ALSTOM has made a strong endorsement of IBM's support for standards in its portfolio of products.

ALSTOM completed the selection of its Web content management solution provider in September 2000, choosing IBM Business Partner divine, inc., whose product offering—Content Server Enterprise Edition (CSEE)—is built in Java and XML. According to Rob Jones, IT Services Development Director (UK), the tight integration between CSEE and WebSphere was one of the key reasons for its selection over competing Web content management platforms. “We selected divine’s Content Server because it simply performs better natively in a WebSphere environment than any other platform—while at the same time delivering a powerful array of features,” says Jones. “It gave us the features and performance we need, and fit in perfectly with our standards-based architecture.”

### ► Challenges

As ALSTOM's e-business initiative gathered steam in late 2000, a number of challenges became apparent to its planners. Among the most significant challenges was that of effectively communicating the goals and benefits of the initiative throughout the organization. As Diekmann points out, the sheer size and diversity of ALSTOM's operations makes the systematic dissemination of accurate information all the more critical, while at the same time more diffi-

## Challenges at Various States of ALSTOM's e-business Evolution



cult. “For a very large, global company like ALSTOM, it’s critical to get the right message out in the right way,” says Diekmann. “Setting up the proper channels ensures that employees understand what the company is trying to achieve, which encourages buy-in and discourages misunderstanding.”

The need to manage expectations—and deliver on them—has also emerged as a critical challenge for ALSTOM’s e-business team. Indeed, Diekmann has found that while some employees and organizations resist the adoption of Web-centric processes, others want to adopt immediately but are constrained by a lack of available expertise and/or resources. “This underscores the difficulty of balancing pent-up demand for new Web-based capabilities with limited resources and the need for a rigorous systematic, implementation approach,” adds Diekmann.

## Solution Profile and Implementation Strategy

### ► The Project: ALSTOM Builds Out its Infrastructure

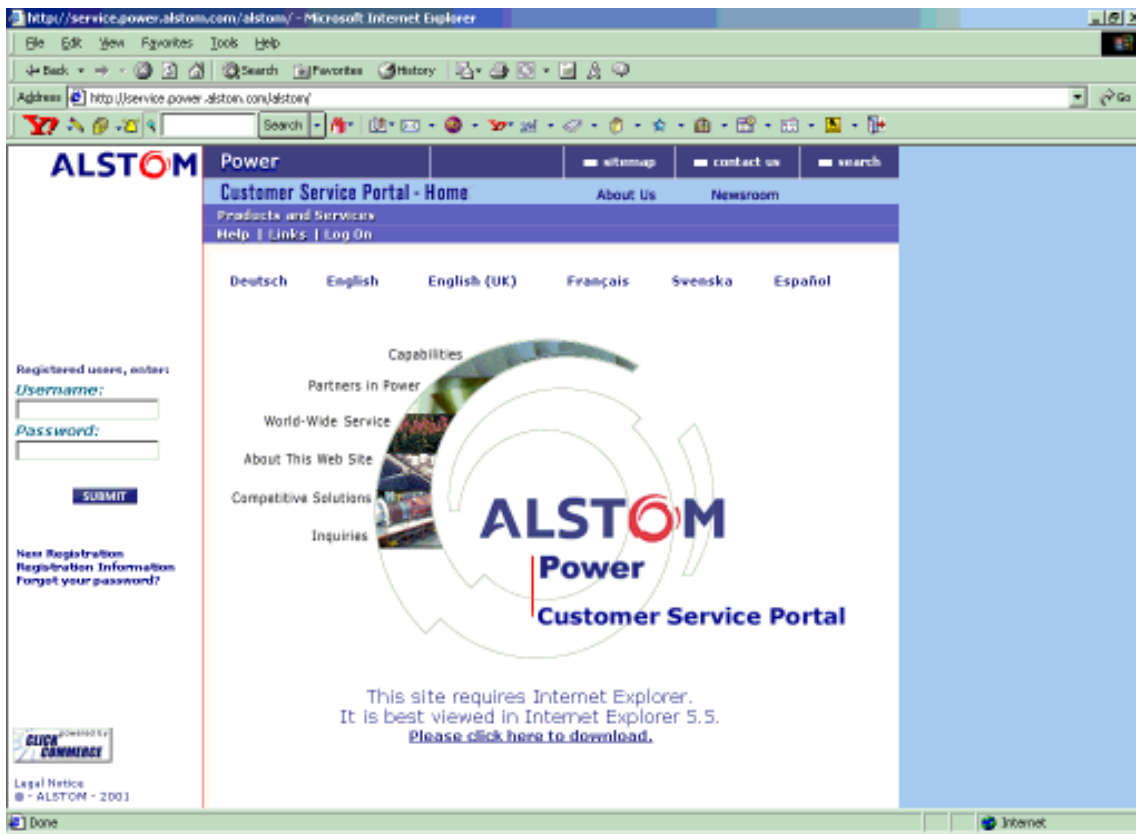
ALSTOM’s e-business initiatives, which are known internally as “e-applications,” were developed through the collaboration of ALSTOM’s internal IT and business staff, technology partners like divine and IBM, and other third party developers. In the first part of 2000, prior to the implementation of the solution, ALSTOM assembled a series of skill-specific teams or “competency areas” whose task was to drive the process, work with external developers and ensure compliance with the company’s standards guidelines. ALSTOM’s general deployment strategy has been to develop a series of pilot implementations on a limited scale, which serve as a learning tool for subsequent solu-

### Development Timetable for the ALSTOM Solution

	1997	1Q00	2Q00	2H00	1H01
ALSTOM’s power unit launches its first B2B solution, a transactional platform targeted to US-based customers (mainly power plants).	■				
ALSTOM articulates an e-infrastructure strategy based on standards-based technology and a unified companywide architecture.		■			
IBM WebSphere Application Server and MQSeries chosen as the core of ALSTOM’s next-gen IT environment.			■		
divine selected as Web content management vendor; development of e-service portal begun.				■	
Production version of e-service application rolled out (1Q01); development of e-purchasing begun (2Q01).					■

Source: ALSTOM and IDC





tions. Moreover, as additional solutions are brought online over time, ALSTOM's strategy has been to gradually shift development responsibility from third party developers to internal staff. By maintaining control over most phases of the development process, ALSTOM seeks to develop and maintain a knowledge base (e.g., lessons learned) that it can leverage going forward.

Beyond basic business portals, ALSTOM's initial focus has been on the development of Web-based applications targeted to its specific customer groups. Development of the first of these—a customer service portal called "e-Service"—was begun in September 2000, completed as a pilot in January 2001, and released as a production application to US customers in February 2001. The company is currently deploying this solution in Europe. Development of ALSTOM's second portal-oriented offering, known as "e-Purchasing" was begun in late 2001. In addition to its Internet-based initiatives, ALSTOM has also begun migrating its highly fragmented corporate intranet to the WebSphere/divine platform.

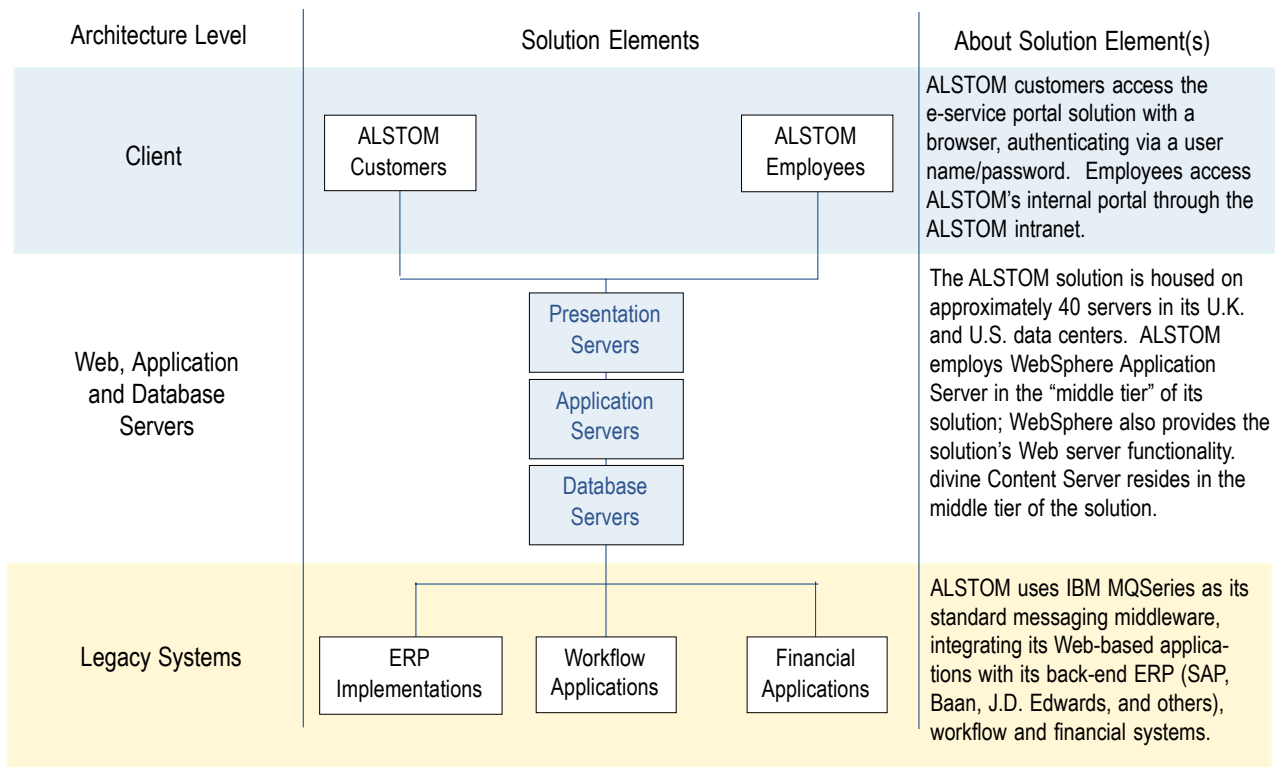
The highly structured development and project management approach conducted by ALSTOM's IT organization reflects its unique status as a self-funding unit within the company. Following an "internal ASP" model, the IT organization articulates its business case—including a clear definition of goals, metrics and deliverables. After defining the initiative's business case, the

development team commences with the design phase, during which it defines the graphic, functional and technical specifications of the solution. Improvements to this early stage of the development cycle have greatly increased the efficiency of ALSTOM's *overall* application development process—much of it attributable to divine's assistance in developing a common Internet/Intranet framework. According to Diekmann, one of the major shortcomings of the previous approaches was the constant duplication during development of core Web structure and functionality. “The duplication of effort was time-consuming and expensive,” says Diekmann. “By providing us with a shared framework of design, navigation and core applications, divine has enabled a quantum improvement in our application development efficiency.” As a result of this and other improvements, ongoing development costs are expected to decrease by up to 50%.

► **The Solution in Action**

ALSTOM has one of the world's largest installed bases of power generation equipment, representing approximately 20 percent of all power plants worldwide. ALSTOM's power plant customers have a wide range of information needs related to the construction, maintenance, and operation of their power plants. To serve this need, ALSTOM's e-Service portal allows US customers of the Power business unit to log onto a secure site where they can find and view power plant designs online, purchase parts online, view shipping schedules, price lists and inventory levels online. The solution also allows customers to locate product-specific experts within the company, replacing a time-consum-

**Basic Architecture of the ALSTOM Solution**



Source: ALSTOM and IDC

ing, telephone-based process. Diekmann sees one of the key functional aspects of the e-Service initiative (developed using IBM and Click Commerce technology) as the ability to receive personalized content—customized to each customer’s needs and preferences. “The e-Service portal provides our Power customers with a personalized, value-added engagement,” says Diekmann. “In addition to saving our customers time, services such as these strengthen and broaden our customers’ relationships with us.”

## ► Solution Architecture

All of ALSTOM’s e-business solutions (for all sectors) run on infrastructure housed in data centers located in the UK and US. The system’s architecture follows a three-tier model, with presentation servers at the front end, application servers in the middle tier, and database servers in the back end. Approximately 40 servers are currently housed in the data centers. Behind this, ALSTOM employs a directory server and a certificate management server for its core security services.

“WebSphere clustering has provided us with a cost-effective means of gaining resilient scalability. Clustering servers is a complex and expensive business. Load balancing with WebSphere allows us to avoid these costs, reduce complexity and provide a more appropriate service to our customers.

— Rob Jones, IT Services Development Director (UK), ALSTOM

Within this architecture, ALSTOM employs WebSphere Application Server Advanced Edition v3.5.2 in the middle tier, deployed as an application server cluster. According to Jones, deploying WebSphere in a cluster configuration has allowed ALSTOM to take full advantage of WebSphere’s inherent load balancing and fail-over capabilities. “WebSphere clustering has provided us with a cost-effective means of gaining resilient scalability,” says Jones. “Clustering servers is a complex and expensive business. Load balancing with WebSphere allows us to avoid these costs, reduce complexity and provide a more appropriate service to our customers.”

Also running within the architecture’s middle tier is divine Content Server v3.5.1, which is tightly integrated with WebSphere Application Server. At the front end of the solution, ALSTOM employed WebSphere’s built-in Web server functionality. By employing WebSphere’s Web server functionality, the company’s architects sought to leverage the inherently tight integration between WebSphere’s Web server and application server functionality, thus improving performance and simplifying the development of the solution.

While much of its focus has been on getting its customer-facing applications up and running, ALSTOM has also begun integrating its e-Service platforms with its back-end systems. ALSTOM uses IBM MQSeries as its standard messaging middleware, linking its Web-based applications with its back-end ERP systems, which include implementations of SAP, Baan, J.D. Edwards, and other platforms. By integrating its Web-based solutions with its legacy ERP systems, ALSTOM is able to offer its customers richer, more up-to-date information, including realtime inventory and shipment tracking data. In the future, ALSTOM plans to integrate with a wider range of back-end applications and databases, including a number of Lotus Notes-based applications. The company currently employs Lotus Notes as its standard platform for e-mail and groupware, with over 80,000 users worldwide.

## Business Results

While a relatively early-stage implementation, ALSTOM's new e-business services infrastructure has already begun to yield sizable benefits, including significant cost reductions, process improvements and strengthened customer relationships. Given the scope and scale of ALSTOM's e-business plans, notes Diekmann, such improvements will have a dramatic impact on its IT costs over the next few years. "Reducing the time and cost of portal development will allow us to deploy our scarce resources more productively," says Diekmann. "It also means we can get services out to our customers and our business units faster."

Rob Jones also points to WebSphere's seamless support for the diverse solution as a critical element of its support for a common Internet/Intranet framework. "WebSphere is crucial here because it allows us to port the development environment virtually unchanged to WebSphere, eliminating the need for re-work or modification," says Jones. "So our developers can complete projects with no work wasted—and that's the key thing here for us."

Web content management costs—or what it takes to design, author, approve, and publish content on a Web site—is expected to decline by up to 75%.

### Overview of ALSTOM's Business Results Achieved

Business Process Area	Nature of Benefit	Description or Metric
Application Development	Reduced Cost and Cycle Time	The ability to build and share a common Internet/Intranet framework is expected to yield a 50 percent reduction in portal development costs.
Web Content Management	Reduced Cost	Ongoing Web content management costs expected to decline by 75 percent within ALSTOM's businesses.
Customer Service	Reduced Administrative Costs	ALSTOM's e-business services have lowered administrative costs, mainly through a reduced need for multiple telephone calls, copying, and postage.
Sales and Marketing	Increased Customer Loyalty	By providing personalized information to customers, ALSTOM has nurtured stronger, deeper, and more durable customer relationships.
Strategic Market Development	Increased Market Share	ALSTOM's initial B2B offering, well-received by customers, contributed to a significant increase in its US market share.

*Source: ALSTOM and IDC*

Diekmann attributes a substantial portion of these savings to the robustness of the divine platform, which enables globally decentralized authors to publish content on the Web without the intervention of programmers or graphic designers. “divine’s Content Server is built to support decentralized content management without taxing the content owners in our business units.”

The benefits of the e-business services initiative have also begun to manifest themselves in the day-to-day operations of ALSTOM’s power generation business. For instance, providing customers with Web-based access to parts drawings has resulted in a significant and sustained reduction in ALSTOM’s administrative overhead, mainly through a reduced need for multiple telephone calls, copying, and physical mailings. “Eliminating all those steps—which really just fill-in gaps in the information chain with our customers—enables us to put faster, cheaper processes into place,” explains Diekmann. “It also frees up our staff resources to perform more value-added functions.”

“Providing rich, personalized information to our customers effectively expands our role from being a supplier to a partner. The result is a stronger, deeper, and more durable relationship with the customer.”

— John Diekmann

Not surprisingly, ALSTOM’s improved processes have also produced major cost reductions and efficiency improvements for customers. An outstanding example of this is a contact locator application developed using the divine platform that enables customers to choose any power generation product by application and find the associated contact person for any location in the world. Prior to its implementation, the process of finding such a contact was unstructured, highly inefficient and heavily reliant on an informal network of “experts.” By putting structured, Web-based processes in place, ALSTOM has raised the quality and consistency of customer service, while reducing costs for itself and its customers. Diekmann believes that benefits such as this have begun to strengthen customer relationships and improve customer loyalty and retention. “Providing rich, personalized information to our customers effectively expands our role from being a supplier to a partner,” says Diekmann. “The result is a stronger, deeper, and more durable relationship with the customer.”

## Case Epilogue

While still in the early stages of implementation, ALSTOM's vision—building a framework of e-business applications on a foundation of scalable, standards-based technology—has already begun to take clear shape. The customer-facing, portal-based services it has already launched have proven to be a “win-win” for ALSTOM and its customers. At the same time, the company's range of initiatives has begun to broaden into a host of other e-business domains such as intranet-based procurement.

“In terms of core technology, the success of ALSTOM's Web content management initiative owes a lot to the inherent strength of IBM WebSphere Application Server and MQSeries, which have provided the power and transportation giant with the infrastructure building blocks it needs to grow rapidly, flexibly and without limit. IBM's technology has given us the core tools we need to put our e-business vision into practice.”

— John Diekmann

Going forward, ALSTOM plans to expand both the scope and functionality of its e-business service offerings using an incremental approach—under which it deploys a range of e-business services on a unit-by-unit basis. For example, after rolling out the Power sector's e-Service offering in the US, it plans to expand the offering to power plant customers in Europe. In roughly the same timeframe, ALSTOM plans to also launch portals targeted to its power Transmission & Distribution and Transport customers.

Looking back on ALSTOM's experience thus far, Diekmann reserves praise for IBM technology, and the combination of technology and expertise provided by IBM Business Partner divine, inc.. “divine stands out because of its ability to be more than just a supplier—but a partner,” relates Diekmann. “They provided us with the resources we needed to meet our needs, and went the extra mile trying to help us maximize the benefits of using their products.”

“In terms of core technology, the success of ALSTOM's Web content management initiative owes a lot to the inherent strength of IBM WebSphere Application Server and MQSeries, which have provided the power and transportation giant with the infrastructure building blocks it needs to grow rapidly, flexibly and without limit,” says Diekmann. “IBM's technology has given us the core tools we need to put our e-business vision into practice.”

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