Bayer Coatings and Colorants:
An IBM Solution Streamlines the Information Pipeline for Customers

An IDC e-business Case Study

THE SUBJECT

Based in Leverkusen, Germany, Bayer AG is one of the largest chemical manufacturers in the world, with 117,000 employees and total company revenue of EUR 30 billion. Bayer's highly diversified product offerings include healthcare products, agricultural products, chemicals and polymers.

THE GOAL

By creating a Web-based portal through which customers could access virtually all product and order-related data, Bayer sought to deliver better service to customers and reduce administrative costs. Bayer also sought to simplify and consolidate content management processes and shift content management duties to nontechnical personnel.

THE SOLUTION

Developed by IBM Business Partner TIMETOACT Software & Consulting GmbH, Bayer's solution is a B2B customer self-service and content management platform targeted to technicians and chemical engineers within companies that purchase its coating and colorant products. The Lotus Domino-based solution, which integrates with Bayer's backend ERP and document management applications, was completed in less than three months.

WHY IBM

"Domino was the clear choice for us because it delivered on both of our key criteria—the robustness of the application development environment and its ease of integration. We saw Domino as ideal for its ability to extend the platform's functionality quickly and at low cost."

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Executive Summary

As a provider of complex industrial products, Bayer's Coatings and Colorants division faced the challenge of effectively communicating highly technical product information to a broad audience. Providing a convenient information delivery channel for customers was seen as essential to maintaining strong customer relationships, and to making it as easy as possible to do business with Bayer as a supplier. Bayer's previous system for storing and retrieving product information was highly fragmented and inefficient, relying on paper-based brochures and loosely organized text-based files. Bayer sought to replace it with a unified, Web-based infrastructure tightly integrated with backend systems.

Bayer selected Lotus Domino as the core platform for the new solution because of its strong application development capabilities, easy integration with backend systems, and ease of administration and maintenance (the latter reflecting Bayer's need to perform content management in-house). Since the solution's rollout in 4Q2000, Bayer has been able to shift 40 percent of its customer services resources to higher value-added tasks and reduce its faxing, printing, and mailing costs by nearly 50 percent.

Bayer's Solution at a Glance

e-business Stage	Enterprise Integration
Core Functionality	Bayer's solution, known as the Bayer Coatings Portal, is a Web-based customer self-service platform designed to deliver product and order-related information. Product-related data available on the site includes product data sheets, Material Safety Data Sheets, product brochures, and a list of applications by product.
Software	Lotus Domino Application Server R5, Lotus Domino Designer R5, Lotus Enterprise Integrator, Lotus Connector LotusScript Extension, Lotus Notes R5, IBM DB2 Universal Database
Servers	IBM eServer zSeries
Business Partner	TIMETOACT Software & Consulting GmbH
Key Benefits	• Over 1,000 registered users from 500 Bayer customers use the Bayer Coatings Portal, generating over 35,000 unique visits per month. • Bayer has been able to shift 40 percent of its customer service resources to higher value-added activities. • The Bayer Coatings solution has enabled the company to reduce its faxing, printing, and mailing costs by nearly 50 percent. By 2005, Bayer expects this percentage to increase to 90 percent. • By making it easier to do business with Bayer as a supplier, Bayer's customer self-service solution is expected to support the retention of, and generate more business from, existing customers.

Situation Analysis

Background

Based in Leverkusen, Germany, Bayer AG is one of the largest chemical manufacturers in the world, with 117,000 employees and total company revenue of EUR 30 billion. While Bayer operates 350 companies on all continents, the majority of Bayer's business activities are centered in Europe, North America and the Far East. Perhaps best known for its aspirin products and such strong consumer healthcare brands as Alka-Seltzer™ and One-A-Day™, Bayer's highly diversified product offerings also include pharmaceuticals, diagnostic equipment, agricultural products, chemicals and polymers. The focus of this case study is Bayer's Coatings and Colorants division, a unit of the Bayer Polymers group that sells resins and bindings to manufacturers of paints and other industrial coatings. These coatings manufacturers in turn sell to automobile manufacturers, packaging companies and other industrial customers.

One of the key challenges facing the Coatings and Colorants division relates to the inherent difficulty of communicating highly technical product information to a broad base of industrial customers. Much of this challenge derives from the sheer breadth, depth and dynamic nature of the information, as well as the complexity of the division's product line. For Bayer, the effective communication of technical information is strategically important because of its potential to strengthen relationships with existing customers. In addition to being a pillar of Bayer's technical support strategy, the effective presentation of technical product information also represents a powerful market development tool. In a market where performance is everything, the more Bayer can inform its base of customers, the better chance it has to sell more products into that base. Examples of this would include getting the word out to customers on a particular product's superior properties (such as high heat resistance)—or showing, for example, how well a combination of resins work for a given application.

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But as Bayer realized, providing easy access to complex technical information is but one component of a greater strategic imperative—making it as easy as possible to do business with Bayer as a supplier. This means not only easy access to product-related information, but also access to key transactional and supply-chain data such as production data, order status and ordering history. In sum, Bayer saw the need to bring together its disjointed and hard-to-access information resources to provide its B2B customers with the best possible experience.

The Need: One-Stop Information Access

At the time it established the goal of creating an integrated information portal (early 2000), Bayer's Coatings and Colorants division ("Bayer") presided over a highly fragmented and inefficient set of information dissemination processes. To request information on either products or orders, customers were required to contact their Bayer representatives directly (via telephone, fax or e-mail). Representatives would then retrieve the information from one of a number of

backend databases—each of which required a separate user interface—and then fax the information back to the customer. Bayer also periodically mailed out product information to customers on CDs. All in all, the division's methods for receiving, executing and fulfilling its customers' information requests were extremely time-consuming and costly. A substantial part of this inefficiency can be traced to the division's fragmented approach to storing and retrieving product information, which until then had relied on paper-based documents and text-only files stored in a Lotus Notes database. One particular problem was the product database itself—whose inefficient design made data management and access more difficult—as well as the fact that the electronic files were only available to internal users.

"The magnitude of potential cost and efficiency benefits [of the project] made fast deployment one of our key priorities. Our goal was to capture as much of this benefit—both for Bayer and its customers—as quickly as possible."

— Gabriele Willenbrinck, e-Business Manager, Coatings and Colorants division, Bayer

Bayer's vision for overcoming these deficiencies was three-fold. First, they would create a Web-based portal through which customers could access virtually all product and order-related data—thereby delivering better service to customers and reducing costs internally. Second, they would create a single content management platform that would simplify and consolidate processes and, in the process, enable the company to shift content management duties to nontechnical personnel. Third, they would integrate the system tightly with the various backend applications where the data reside—thus guaranteeing timeliness and accuracy.

As Gabriele Willenbrinck, e-Business Manager for the Coatings and Colorants division, explains, the overwhelming strength of the business case created "enormous" time pressure to get a solution up and running quickly. "The magnitude of potential cost and efficiency benefits [of the project] made fast deployment one of our key priorities," says Willenbrinck. "Our goal was to capture as much of this benefit—both for Bayer and its customers—as quickly as possible."

Action Plan and Decision Process

First Steps

Bayer's portal initiative was driven by an internal project team, the core of which included Willenbrinck's e-Business Group as well as representatives from both the divisional and corporate IT organizations. The team also worked closely with Marketing and Communications personnel on Web site design issues. After receiving the go-ahead for the project in February 2000, the team spent approximately one month fleshing out the basic components of the solution, completing an initial design by early March. In April, the team presented its plan to the Coatings and Colorants Board of Managers, which—after being thoroughly sold on the initiative—established September 2000 as the targeted timeframe for its introduction.

Having established a clear vision, Willenbrinck's team now needed to assemble the pieces needed to make it a reality. The first "tier" of its decision was the technology itself—specifically, what products would be used to build the platform. The second "tier," emanating from the first, was what provider would

help them build the site and content management system, and integrate it to Bayer's backend systems. The key driver hovering in the background of both decisions was the need for rapid deployment. On the product side, this meant a platform with flexible, rapid application development capabilities and easy integration with backend systems. On top of strong development and integration capabilities, Bayer sought a product which—by virtue of its ease of administration and maintenance—would accommodate the company's plans to perform content management in-house.

"Domino was the clear choice for us because it delivered on both of our key criteria—the robustness of the [Lotus Domino Designer] application development environment and its ease of integration. We saw Domino as ideal not only for our near-term goal of getting the solution up and running, but also for its ability to extend the platform's functionality quickly and at low cost."

— Gabriele Willenbrinck

After a thorough evaluation, Willenbrinck's team selected Lotus Domino as its information delivery platform. "Domino was the clear choice for us because it delivered on both of our key criteria—the robustness of the [Lotus Domino Designer] application development environment and its ease of integration," explains Willenbrinck. "We saw Domino as ideal not only for our near-term goal of getting the solution up and running, but also for its ability to extend the platform's functionality quickly and at low cost." To develop the solution, Bayer selected IBM Business Partner TIMETOACT Software & Consulting GmbH (based in Köln, Germany) on the strength of its Domino expertise.

Challenges

In addition to its extremely aggressive deployment timetable, the key challenge of Bayer's portal initiative was the gargantuan task of migrating its technical and product material to the Web. What made this effort particularly challenging was Bayer's long-time practice of storing product information in paper-based form—and in loosely organized text files on file servers—throughout its many departments, which made aggregation of data a slow and arduous process. Another potential challenge faced by the implementation team was its reliance on content owners within Coatings division to help gather, filter and process this information. Given the paper-bound processes that had prevailed within Bayer, the risk of coming up against cultural inertia was seen as significant. To gain the support of content owners, the team evangelized the benefits of e-business in general and the new Web-based content management system in particular. The team's efforts to gain buy-in were further strengthened by the strong degree of top-down support provided by senior management in the Bayer Coatings organization.

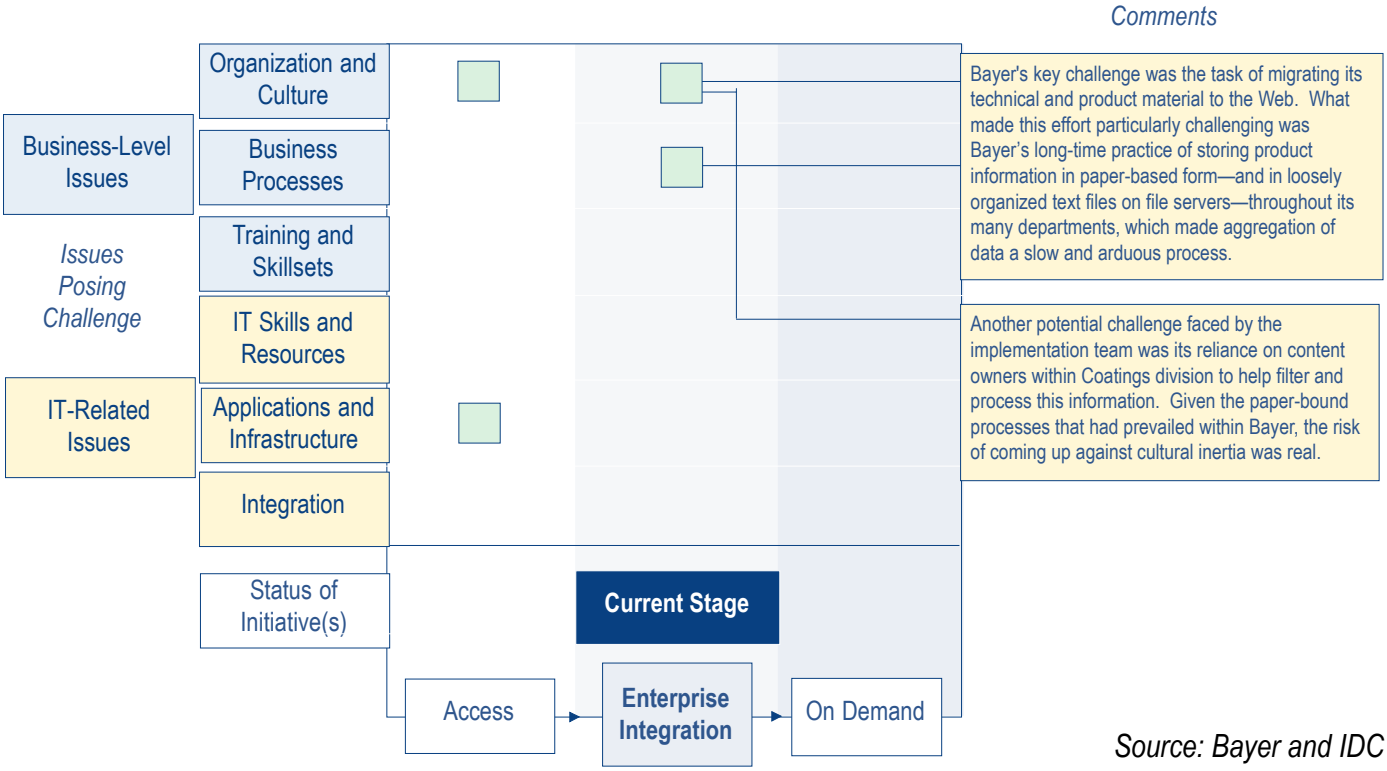
Solution Profile and Implementation Strategy

The Solution: Core Functionality and Architecture

Bayer's solution, known as the Bayer Coatings Portal, is a B2B customer self-service platform designed to deliver product and order-related information. Product-related data available on the site (presented in German, English, Spanish, French, Italian and Mandarin Chinese) includes:

- *Product data sheets*—Approximately 2,500 documents containing basic product specification information.
- *Material Safety Data Sheets*— Approximately 2,000 documents related to the safe handling of the product.

Challenges Encountered in Bayer's e-business Evolution



Source: Bayer and IDC

- *Recipe information*—Extensive documentation listing which Bayer products can be mixed to create different formulations.
- *Product-based Contact information*—Listing of product-specific "experts" by product and region.
- *Data sheets for trial products*—Specification information for products not yet released.
- *Product applications*—An extensive listing (1,000 pages in each of six languages) of applications where specific Bayer products can be used.

Order-related data* includes:

- *Pricing*—Customer-specific pricing on Bayer products.
- *Order tracking*—Detailed information on all open orders.
- *Product Availability*—Information of when specific products will be available (based on existing inventory and planned production runs).
- *Order history*—Information on orders 90 days to 24 months old.
- *Certificates of analysis*— Approximately 300 documents containing information on a product's properties (boiling point, purity level) within a particular production run.

**Note: As of April 2002, the solution's order management functionality was shifted to a new Web platform based on its new deployment of SAP, on which all order processing applications have been consolidated. While order-related functionality of the Domino solution has been migrated to the SAP solution, it is (for the purpose of simplicity) described in the present tense throughout the case study.*

The Bayer solution employs a three-tiered architecture. At the front end of the solution are two Windows NT servers running Domino Application Server R5. One Domino server (located behind the innermost firewall) functions as an intranet server and also replicates data out to the other (located in the DMZ behind the outermost firewall) which delivers "external" content to customers. The second tier of the solution is comprised of two core elements. The first element is a database server (running IBM DB2) whose core function is to download Material Safety Data Sheets from the division's proprietary ERP and document management applications (running on an IBM eServer zSeries), and to provide access to this data to the Domino Internet Server. The second element is a Lotus Enterprise Integrator (LEI) server that downloads product availability, pricing, order tracking and order history data from the ERP applications and replicates it to the intranet server—which in turn replicates it to the Internet server.

The legacy ERP platform—the third tier of the solution—is comprised of a suite of home-grown applications (e.g., manufacturing, production, order entry, order management, fulfillment, logistics, and financials) that integrate with Bayer's backend business processes. Bayer's proprietary document management system is used to manage Material Safety Data Sheets. Both the ERP and

Basic Architecture of the Bayer Coatings Solution

Architecture Level	Solution Elements	About Solution Elements
End Users	Bayer Customers	After logging into the site, customers are presented with a personalized welcome screen, which includes contract information and the ability to send messages to a Bayer representative.
	Firewall	
Application Server	Database Server running IBM DB2 Lotus Domino Internet Server Firewall Lotus Domino Intranet Server	At the front end of the solution are two Windows NT servers running Domino Application Server R5. One Domino server (located behind the innermost firewall) functions as an intranet server, and replicates data out to the other (located in the DMZ) which delivers "external" content to customers. Connected to the Domino Internet Server is a database server that downloads Material Safety Data Sheets from the zSeries.
Database Server	Lotus Domino LEI Server	A Lotus Enterprise Integrator (LEI) server runs on the database server separated by a firewall. LEI collects data from the DB2 database at the core of Bayer's proprietary ERP system (see below) and replicates it to the Domino intranet server.
Legacy Systems	IBM eServer zSeries	Specific applications within the ERP platform include manufacturing, production, order entry, order management, fulfillment, logistics, and financial applications. Bayer's proprietary document management system, used to generate Material Safety Data Sheets, also run on the zSeries server.

Source: Bayer and IDC

document management applications employ IBM DB2 for core database functionality.

Security Profile

IT security is a critical issue for Bayer, with the need to protect customer-specific data—such as pricing and discount schedules—a key security driver. Another key issue is the need to provide authenticated access to data sheets for trial products and/or products under development (for which only a select group of customers are approved). The security architecture for the Bayer Coatings Portal is comprised of two firewalls. The first firewall is between the Internet and the Domino Server located in the DMZ. The second is between the DMZ server and the intranet server. The solution employs SSL-based encryption. The solution provides highly granular rights management, with access rights defined at the document and field level, as well as by the user's name, group and role.

The Solution in Action

After logging into the site, customers using the Bayer Coatings Portal are presented with a personalized welcome screen that includes a summary of their company's contract information as well as the company's overall account history. The welcome page also offers users the opportunity to e-mail or upload information to—or download information from—their Bayer representative. To check the status of an order or view their order history, customers select the function at the Customer Center site (a sub-home page within the Bayer Coating Portal's main page) thereby submitting a request to the Lotus Notes database where the order information resides. This database is populated by

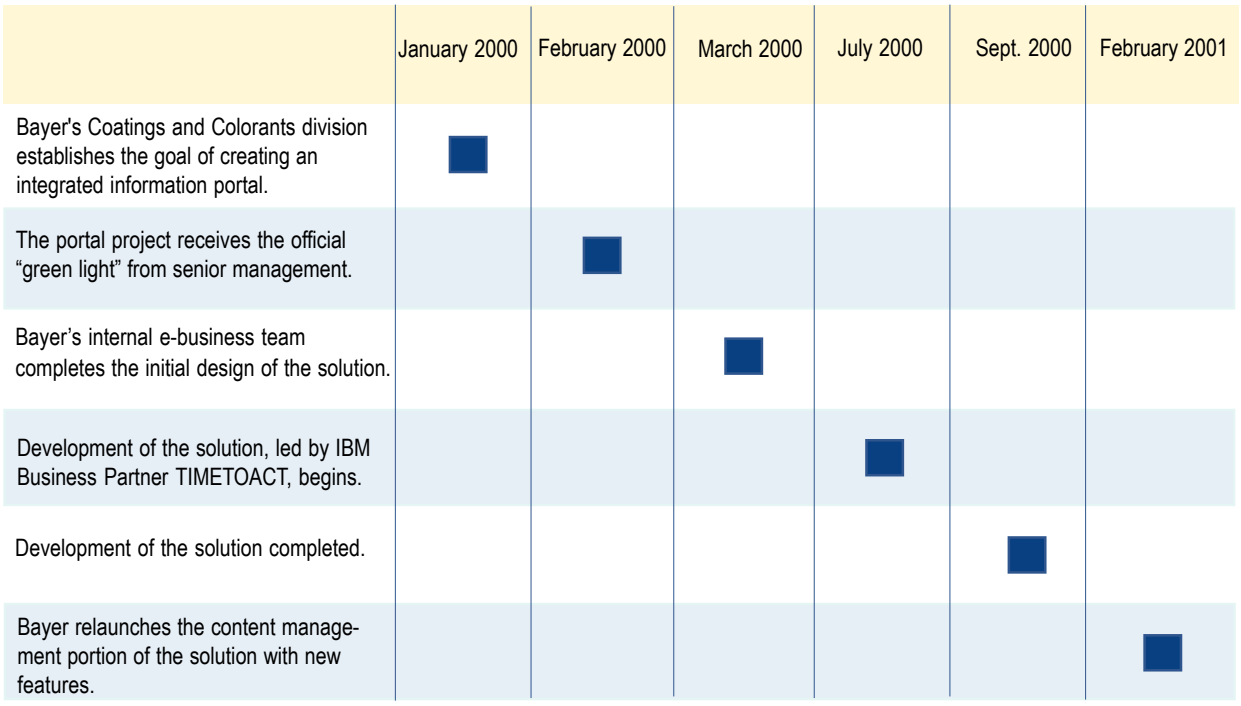
LEI (running on the LEI server), which pumps the data from the backend ERP system to the Domino intranet server, which in turn replicates it to the Domino Internet Server, where it can be viewed by the customer. To view Material Safety Data Sheets, customers specify a product and submit a request from the main Portal page. The submitted request then triggers a LotusScript agent call which in turn invokes a Java servlet running on the Domino server. The function of the servlet is to provide the user with realtime delivery of Material Safety Data Sheet information from Bayer's proprietary document management system to the Domino Server for viewing by the customer.

The Project: Development Approach and Timetable

The deployment process for the Bayer Coatings Portal included four main components:

- *Interface development*—Performed by Bayer communications experts, the process included the design of an end-user interface for the Portal and content management solutions.
- *Application development*—Performed by TIMETOACT using Lotus Domino Designer, deliverables included the Portal's information delivery services and the content management platform.
- *Integration with legacy applications*— Performed by personnel from Bayer's e-Business Group, internal ERP specialists, and TIMETOACT staff, the process was focused on determining which data needed to be displayed and how to extract it from backend applications.

Development Timetable for the Bayer Solution



Source: Bayer and IDC

- *Content migration and creation*— Performed by personnel from Bayer's e-Business Group and internal content owners within the Coatings division, the process included the gathering, revision, approval and formatting of content (both text and image-based). Strong support from the top was key to the success of this phase of the project, during which nearly three thousand documents were incorporated into the system over a period of just two months.

The development process began in July 2000 and was completed in September 2000. The initial version of the application included several hundred pages of product-related content and most of the transactional services. In February 2001, the content management portion of the solution was "re-launched," with new features including a new look and feel, a personal welcome page, and richer transactional data. Since then, the information available on the site has expanded rapidly, with over 15,000 documents in six languages now available to Bayer's customers.

Business Results

The introduction of the Bayer Coatings Portal fulfilled one of the division's key goals: to maximize the ease of doing business with Bayer. Customers now have faster and more convenient access to data that is both of better quality and more timely. The perceived value of the solution is evidenced by its strong acceptance by Bayer customers: over 1,000 registered users from 500 compa-

Overview of Bayer's Business Results Achieved

Business Process Area/Issue	Nature of Benefit	Description or Metric
Customer Satisfaction	Broad Customer Adoption Increased Customer Satisfaction	Over 1,000 registered users from 500 Bayer customers use the Bayer Coatings Portal, generating over 35,000 unique visits per month.
Operational Efficiency	Increased Administrative Efficiency	Bayer has been able to shift 40 percent of its customer service resources to higher value-added activities.
Customer Service	Lower Communications Costs	The Bayer Coatings solution has also enabled the company to reduce its faxing, printing, and mailing costs by nearly 50 percent. By 2005, Bayer expects this percentage to increase to 90 percent.
Customer Service	Increased Customer Retention	By making it easier to do business with Bayer as a supplier, Bayer's customer self-service solution is expected to support the retention of, and generate more business from, existing customers.

Source: Bayer and IDC

nies use the site, generating over 35,000 unique visits per month. The result has been an increase in customer satisfaction and a further strengthening of Bayer's competitive position.

By 2005, Bayer expects the solution to reduce its faxing, printing, and mailing costs by 90 percent.

In addition to customer-centric benefits, Bayer's solution was also seen as a way of increasing internal operating efficiencies by reducing the amount of time and effort spent processing customer information requests. On this measure, the solution has been highly successful. Since the solution was rolled out, Bayer has been able to shift 40 percent of its customer service resources to higher value-added activities. The solution has also enabled Bayer to reduce its faxing, printing, and mailing costs by nearly 50 percent. By 2005, Bayer expects this percentage to increase to 90 percent.

Case Epilogue

Going forward, Bayer plans to expand the scope and functionality of the content management solution put in place by TIMETOACT, including new Internet, intranet and extranet-based services. At the same time, more and more Bayer organizations have begun using the content management platform to deliver critical data information to customers. For Bayer, this ability to easily and cost-effectively extend the solution across the organization has augmented the project's already-strong business value. As Bayer moves ahead with its portal initiatives, says Willenbrinck, IBM Business Partner TIMETOACT will continue playing a central role. "Our experience with TIMETOACT has been extremely positive from start to finish due to its speed, project management capability and Domino expertise," says Willenbrinck. "The involvement of TIMETOACT was a crucial ingredient to the success of the project."

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