CMS Software's Multi-Tier Architecture Changes the (Inter)face of ERP on the iSeries

Company realizes strong ROI, high customer satisfaction, and rapid development environment on rock-solid IBM eServer iSeries platform.

Overview

Solution provider profile

CMS Software
- Headquarters: Toronto, Canada (other offices in U.S., Germany, Belgium, China)
- 20-year-old provider of integrated ERP software
- 2500+ plants worldwide

Challenge

Create more graphical and flexible user interfaces to extend applications
- 10 million lines of code and 2500 menu options (green-screen interfaces)
- 600 man-years of work (representing 10 to 15 years of code development)

Needed:
- Transition plan
- Increased skill sets
- Development tools

Solution

- Incremental re-architecting approach
- Leverage RPG ILE backend
- Multi tiered architecture (client/presentation/backend)
- Graphical Java front end (industry's best solution)

Key components
- Java Swing User Interface
- Java and XML
- IBM HTTP Server, SOA, and CGI
- RPG ILE

Benefit to solution provider

- Experienced record year
- Engaged in bigger projects
- Reduced deployment, training, and support costs
- Protected investment in skills and code
- Retains larger clients
- Develops new functionality quickly and cost-effectively

Benefit to customer

- No 3rd parties
- Lightweight, rich client
- Platform independence
- Enterprise scalability
- Low bandwidth requirements
- Highly stable proven code base

CMS moves steadily to extend and enhance its applications:

Reaping strong ROI, happier customers, and rapid development environment on rock-solid IBM eServer iSeries platform

CMS Software, a 20-year-old ERP provider headquartered in Canada (with additional offices in four other countries), long relied on its expertly designed, green-screen applications to close deals. But as considerations surrounding GUI interfaces became more critical to buying decisions the software provider found itself in the unenviable position of asking prospects to compromise “look and feel” in favor of superior functionality - not always an easy sale. Today, however, with the launch of jGORich CMS’ iSeries-based ERP application, CMSi5, sports a visual “WOW” factor and new business process flexibility, allowing the company to compete in larger engagements, compete head-to-head with Windows-based applications on the User Interface battlefield and achieve record sales for fiscal 2005.

Business rationale

Paul Craven, CMS’ Vice President of Development, explains that CMS’ record performance is the result of an ongoing commitment to a three-phased modernization effort that began in 1998 with CMS’ push to move 10 million lines of RPG code to RPG ILE. “Getting ready for Y2K was only one of our considerations,” Craven says. “But this one step [of separating business logic, database logic, and display logic] became foundational to the literal transformation of our application set over the next five years.”

The CMS management team knew that a more graphical user interface had to be developed in order to win new customers over the long term. They also understood the need to move quickly toward Web technologies to support their customers’ growing requirement for supply-chain (B2B) applications. But, as Craven mentions, “In the late 1990s, when we started down this path, seemingly no one in the industry had it figured out.”

The considerations were as complex and interconnected as a Rubic’s cube. The selection of stable, competitively priced tools were not what they are today. There were issues regarding fat or thin client interfaces. There were concerns with training, deployment, and support for thousands of users who would ultimately interact with the new interfaces. Other factors included performance, scalability and investment in RPG and the iSeries platform. Internationalization was also a rising concern, especially as manufacturing facilities began looking at Asian geographies to save operational costs.

As CMS management developed a strategy to sustain the company’s leadership position in functionality, while also incorporating graphical, Web, and B2B innovation, three clear priorities were set. CMS would:

- Leverage existing skills, while embracing new graphical, object, and Web technologies
- Seek short-term ROI where possible, while also focusing on long-term returns (resulting from a better designed infrastructure)
- Incorporate enterprise scalability, while sustaining reliability and security.
- Avoid disruptions and inconveniences to existing customer base.

Process

Ultimately, CMS embarked on a three-vectored approach (Figure 1). The first priority was to improve the user experience. The second was to transform the applications to support business partner relationships. The third was to innovate through the creation of new and differentiated solutions.

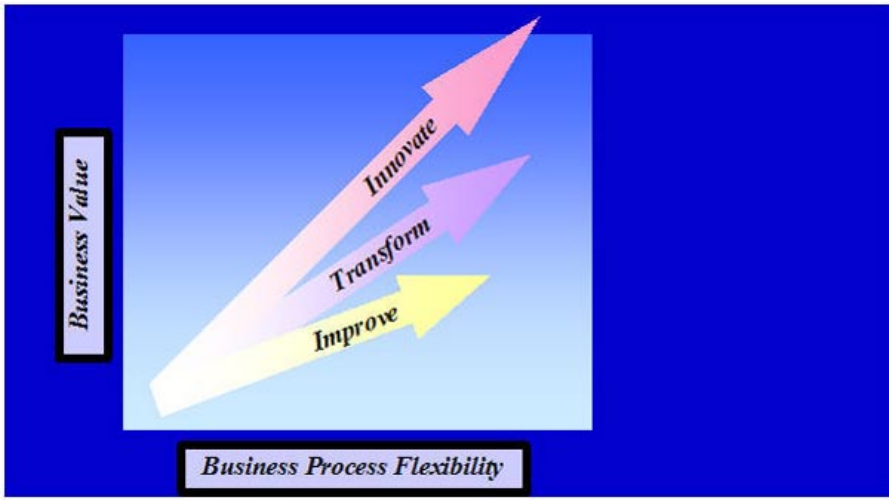

Figure 1: 3-vectored modernization approach

Improve: Focusing on the user experience

A prudent business executive will concern himself first with ROI, and that is precisely what CMS management did. In 1998, the company committed one man-year of effort toward building a screen-scraper in Microsoft® Visual Basic®. Its ability to dovetail directly with RPG code and data definition specifications (DDS) to produce html output was similar in functionality to the more recently announced IBM Host Access Transformation Services (HATS). In 1999, this interface was converted (with half a man-year of effort) to produce a Java graphical user client, which CMS named jGO.

This transition to a graphical interface dramatically improved the aesthetic appeal of CMSi5 in initial presentations and demonstrations to prospects, and provided a much friendlier conduit into various applications. End users were essentially self-trained because of the ubiquity of the browser interface.

It's worth noting, however, that given the choice of using the graphical interface or remaining with the familiar, and highly efficient, green screens, users tended to stick with what they knew. CMS faced the same situation many iSeries-based solution providers do — you can't get green screens out of the users' hands, yet you can't sell green screens! CMS knew it had to make jGO even better, and the next generation, jGO II, was introduced in 2003.

The tree-like maneuverability delivered with jGO II succeeded in dramatically reducing most users' reliance on green screens by allowing them to quickly and intuitively navigate directly between tasks. To accommodate those who embraced change more slowly, CMS supported both the new and existing presentation interfaces for one release.

Transform: Building support for B2B relationships

Brian Angle, CMS' Vice President of Marketing and Sales comments, "B2B was one of those trendy IT terms in the late 1990s that sustained a huge and positive impact on the way businesses interoperate with their suppliers. Almost every manufacturing dynamic has evolved into a global teaming effort, and CMS made a commitment to support these relationships by providing best- of-breed processes within our software." CMS responded by enhancing its existing purchasing, accounts payable, resource planning, and job scheduling applications in a fully integrated real-time B2B collaboration tool, called the Easy e-Business Suite.

This suite includes both a customer and supplier component and enables them to place and review orders, check production schedules and perform many other business critical tasks in an efficient and secure setting. The Easy e-Business Suite also supports 830/862 XML automotive data format standards. With just two man-years of effort, these applications were reassembled—incorporating new Java classes with CGI and existing RPG business logic. (For more details on the technologies used, see "Innovate: Creating new, differentiated solutions.")

Innovate: Creating new, differentiated solutions

Craven explains, "We simply ran out of real estate using the traditional RPG/client architecture. We needed to support Web services and SOA (service-oriented architecture)." Therefore, the mammoth task of redesigning the CMSi5 solution to exploit the promise of true multi-tier application architecture became a necessary and fundamental investment of CMS' development time and resources. (Figure 2): the client tier (or view), the presentation tier (or controller), the backend tier (or model), and the legacy tier.

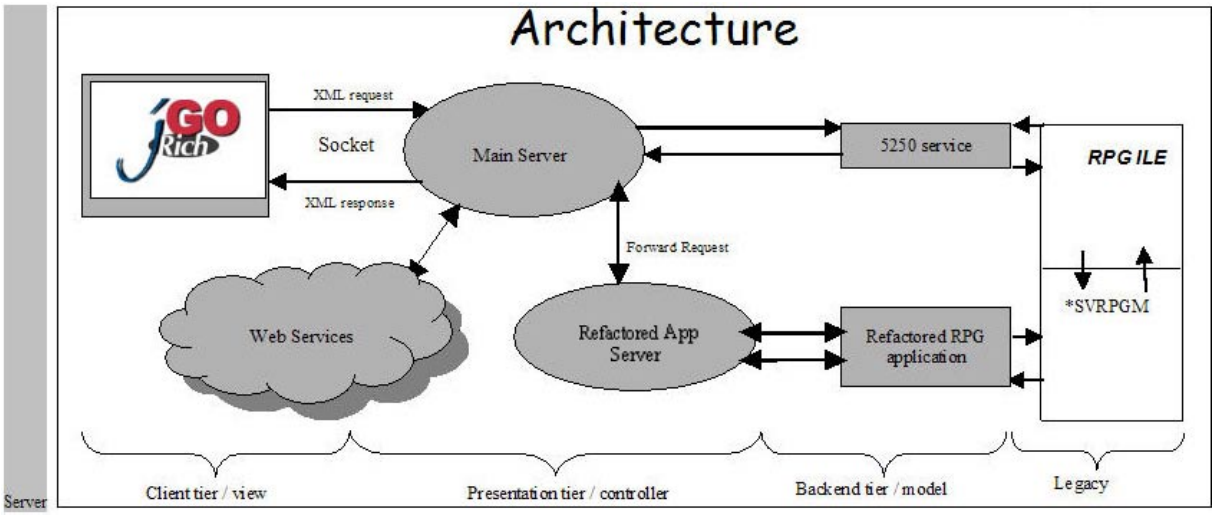

Figure 2: CMS jGoRich application architecture

The client tier: jGORich, with its newly designed, world-class user interface, acts as a presentation shell (Figure 3) to deliver browser-based, tree-like navigation between all CMS applications and functions. jGO had to be fully deconstructed and rebuilt into the much more elegant jGORich, which no longer communicates directly with RPG and DDS. jGORich dovetails with a presentation (middle) tier (Figure 2) using XML and Java. Considering the level of redesign required, it is impressive to note

that the efficient nature of using object technology allowed this new client to be fully developed in only a half man-year. And, because Java is portable, Craven states that “Linux™ enablement required ‘zero’ man-years of effort.” The practical benefit of running on Linux is that businesses have a choice of client operating system environments for their users.

It is important to understand that jGORich deploys old and new technology to users, as you will see when you read about the presentation and backend/legacy layers. This new interface offers the Microsoft .NET look and feel, with the stability, reliability, and robustness of the iSeries backend—and all interactions are in real time.

Because of this new interface, CMS is able to package its applications in containers—a scalable and easily deployable delivery vehicle.

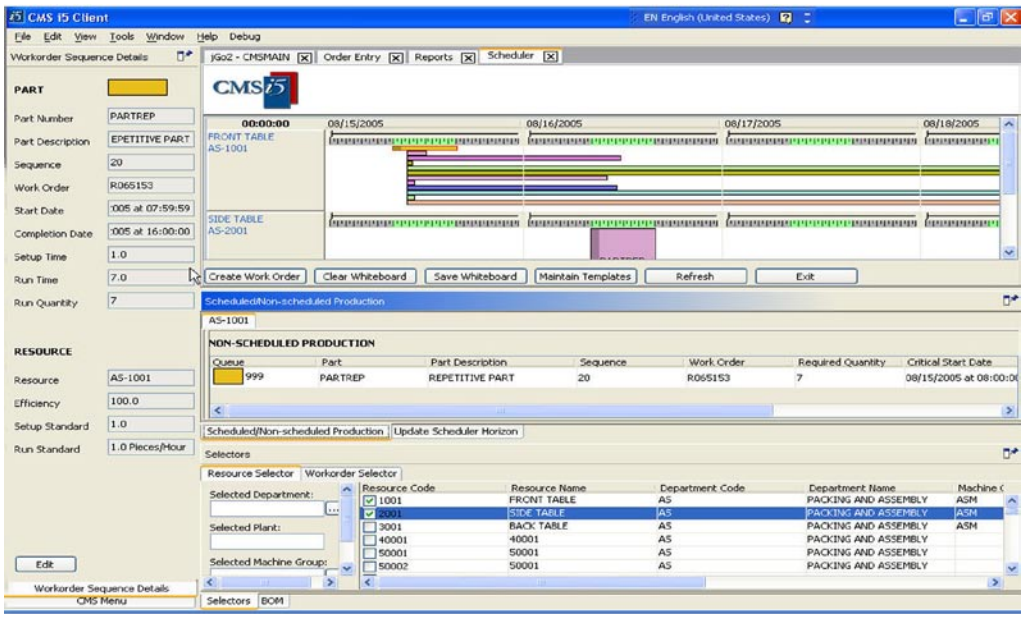

Figure 3: The jGoRich Client Manager interface (Work Order Scheduling)

The presentation tier: The presentation tier (Figure 2) primarily consists of a main server that utilizes SOA to respond to Java/XML requests from the jGO client and forwards these requests to the backend tier for action. The main server interacts with the IBM HTTP Server for this purpose. All programs used in this architecture are essentially Java classes running on the iSeries system and listening on a socket— a very lightweight implementation.

The backend tier and legacy tier: Craven explains that this architecture allows them to leverage the existing functionality of their applications. As they continue to re-factor more of their application, CMS will gain the ability to respond even more rapidly to support new features.

In regard to portability

CMS jGORich is portable—all that is needed is a browser. However, Craven explains, “By design, our application code is fully entrenched on the iSeries and i5/OS platform. This was a researched, and in our experience, prudent business decision, not just for CMS, but for our customers. In the 20 years we have been in the midrange platform world, AS/400 and now the iSeries platform consistently delivers the strongest combination of reliability, manageability, security, and scalability. This is what our customers expect us to deliver to them. In the manufacturing world, where just-in-time (JIT) supply, production, and delivery cycles are de rigueur, reliability is absolutely paramount. The iSeries platform answers this need.”

Modernizing the development team

With a project on the scale of the jGORich transformation, it became rather evident that CMS' development team would need to "morph" into a sleeker, more compartmentalized "machine" in its own right. Here's how Craven describes it, "From very early on, much of our 'improve,' 'transform,' and 'innovate' projects were going on in parallel. Two of us initially focused on the re-architecting effort, which included writing our own development tools, but we ultimately doubled our resources for this purpose to five full-time developers."

In the late 1990s, CMS developers were rich in RPG skills. The development department's skill sets have had to widen considerably in recent years. The company has one design team for the client layer, another for the presentation layer, and a third for the backend and legacy layers. The middle layer team interacts routinely with the other two, while the client team and backend team do not often need to work together. However, all developers have some understanding of the technologies used by the other teams, so there is no perception of writing code that connects to a black box. "We started training our RPG folks in object-oriented concepts in 1998, and the current development 'org' chart came into place in 2003."

ROI

CMS is now reaping the rewards of their long-term redevelopment investment. From a revenue and sales perspective, Fiscal 2005 was a record year. CMS was able to compete and win more and larger deals than in previous years.

From a development perspective, CMS can now re-craft the presentation layer without having to distribute a new business layer to its customers. CMS can also be more flexible in enhancing the product based on customer need. A recent case-in-point was a Japanese firm ready to acquire CMS' application. They had an issue only with the presentation of the customer order processing screens, and wanted to rearrange those screens and fields. Prior to jGORich, this requested change may have been cost-prohibitive and created support headaches. However, with the new jGoRich client, CMS developers were able to quickly respond and resolve the issue rapidly and at a low cost, resulting in a new customer for CMS and IBM.

Angle says, "Today's marketing touch-points include: function, value, reliability and interface. The flexible workflow model supported by jGORich is very impressive during sales presentations. Our customers are happier, because their learning curve is shorter and our support role is lessened. We have a larger prospect base, as most ERP evaluators don't worry about "platforms" provided the user interface meets their expectations. We are winning more business, with shorter sales cycles. And, thanks to the iSeries platform, our clients enjoy the best of both worlds: flexible and friendly user interfaces and a rock-solid platform."

Business partner quote

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–Brian Angle, VP of Sales & Marketing, CMS Software

For more information

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