

The Wall Street Journal Online Builds on Vignette Software to Reap Benefits From Personalization and Performance.

Customer Business Profile: The Wall Street Journal Online, at www.wsj.com, is the most highly trafficked Web property of Dow Jones & Co., the pre-eminent publisher of business and financial news and information. Introduced in 1996, the online publication developed a highly successful pay-for-content model on the Internet. More than 640,000 subscribers (as of March 2002) make WSJ.com the largest paid subscription news site on the Web. The site provides continuously updated, around-the-clock, in-depth coverage and analysis of business news drawn from the 1,600-plus journalists who work for The Wall Street Journal and Dow Jones Newswires around the globe. The Online Journal's extensive, award-winning editorial content is served up to readers at a rate of up to 2.5 million page views a day, demonstrating WSJ.com's value as a daily resource to business people worldwide.

Customer Profile

Industry:

New Media/Publishing

Technology:

- Vignette® Content Management Server (including Lifecycle Personalization Server)
- Operating System: Sun Solaris
- Database: Oracle
- Web Server: IBM HTTP Server
- Application Server: IBM WebSphere Application Server

Live Sites:

www.wsj.com

Customer Online Initiatives: Dow Jones, WSJ.com's parent company, traces its leadership in electronic publishing back to the development of the first electronic news ticker in 1897. In 1995, well before the Internet saw widespread commercial use, Dow Jones recognized an opportunity to capitalize on The Wall Street Journal's strengths in editorial content by introducing a compelling online news product.

The WSJ.com site earned a reputation for successfully meshing the superior writing and reporting of one of the world's most prestigious print publications with a winning online subscription model. Five years after its debut, however, WSJ.com came in need of an overhaul, driven by changing requirements and the desire to boost subscriptions and advertising revenue. The revamped site launched in January 2002 with a scalable new architecture anchored by Vignette content management software and an IBM e-business infrastructure.

Benefits:

- Visitor-empowered personalization offers WSJ.com subscribers better access to content, more relevant content and consistent, 24-by-7 service tailored to individual needs.
- A dynamic, engaging site strengthens the Online Journal's customer relationships, expediting its ability to reach its goal of a million subscribers and boosting advertising revenues.
- New architecture streamlines the number of vendors and technology elements powering WSJ.com, enabling IT staff to operate efficiently and shortening new product time-to-market.

- Updated technology provides a sound development platform, increased system capacity, scalability to support higher traffic loads as WSJ.com's customer base grows and adaptability to deliver content on devices like personal digital assistants (PDAs), pagers and phones.

Adapting to a Changing World. Since its inception, The Wall Street Journal Online has been shaped by the need to blend technologies, product requirements, business requirements, editorial content and the news interests of customers. In its first incarnation in 1996, the WSJ.com site was based on a "build-it-in-house" philosophy dictated by the immature state of Web publishing tools at the time. But as it grew over the years to include a collection of home-grown systems, multi-vendor technologies and sophisticated but hard-to-maintain code, the site became difficult and costly to support and slower to adapt to users' evolving requirements than desired. Driven by the need to present content more dynamically, flexibly and efficiently — and thus build subscriptions and boost advertising revenue — WSJ.com came due for a vital technology makeover.

The Online Journal's parent company, Dow Jones, embarked on reconstruction efforts in March 2000 when it began working with IBM Corp. to develop key business requirements. In August 2000, Dow Jones tapped Vignette to power the re-tooled WSJ.com site, following a thorough competitive analysis of enterprise software vendors. The decision hinged not only on the technical functionality and scalability of the various offerings, but also on vendor stability, third-party partnerships, time to market and the ability to deliver high return on investment. In the end, Vignette was selected for strategic reasons. Among the factors that influenced the decision was Vignette's ability to bring a broader approach and vision to a project of this magnitude.

"We were looking at everything with a fresh eye, based on where we wanted to be in five years and how we tackled the next phase," explains Neil Budde, publisher of The Wall Street Journal Online. "Clearly, this was not just a technology-driven project. It was designed around business requirements and user requirements and customer research, and we needed the right technology mix to address all that. What we saw in Vignette was a more complete solution that could address a variety of elements of the process, as opposed to being a solely content management solution."

The first implementation of Vignette focused on the redesign and re-architecture of WSJ.com — the most widely viewed and revenue-driven site in Dow Jones' stable of Web properties. The Online Journal's strategy entailed using Vignette content management software to update the site's look and feel, provide dynamic and personalized content to more than half a million paid subscribers, improve performance in terms of the number of page views delivered to readers, enhance site functionality and publish news more efficiently. The project also aimed for a new level of business agility that would empower WSJ.com to react quickly as the market changed, and to adapt smoothly as online readers focused less on the Web as their point of access for business news and more on devices such as PDAs, pagers and mobile phones.

"Our strength is in our news — not only in the content we produce, but also in being skillful in how we package it, organize it and present it," Budde says. "Vignette makes that process easier for us to manage, so we can continue to spend our time on how we do that, and on what we want to accomplish with the organization and presentation of our news, as opposed to spending time on the mechanics of getting it done."

Although the site rebuild itself took less than six months, the full WSJ.com overhaul spanned nearly two years from start to finish, including up-front research, planning and design. During that period — March 2000 to January 2002 — the dot.com industry reversed course, the economy shifted and the advertising climate chilled. In other words, says Budde, "the world changed." Despite the market volatility, the Online Journal refused to undercut a project as core as

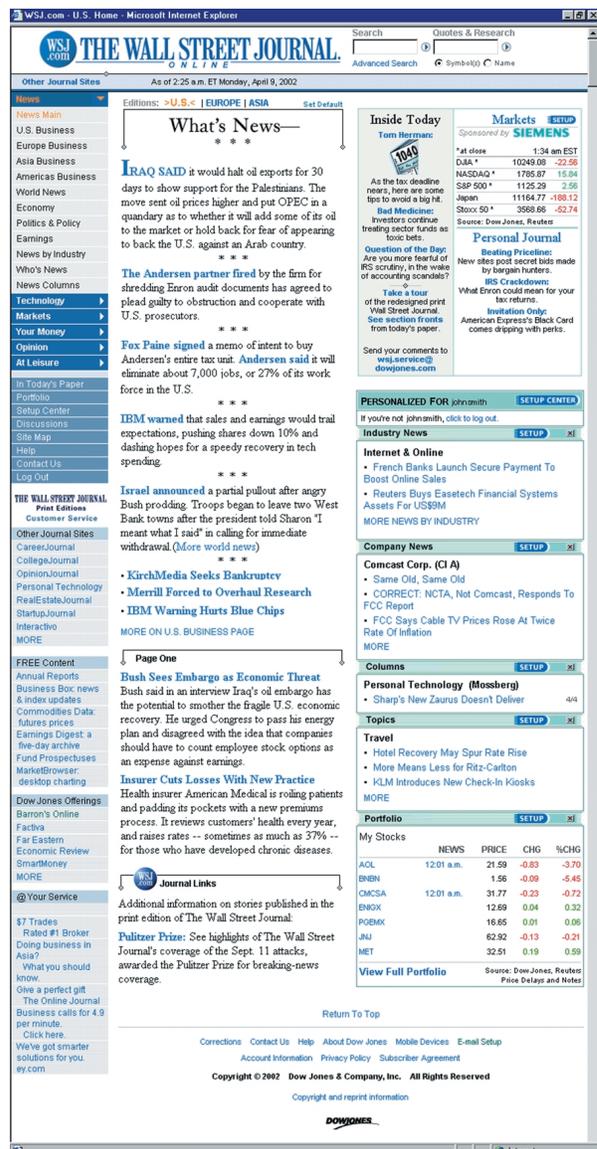
making news content easier to use. In fact, the transition to Vignette, Budde notes, better equipped WSJ.com to accommodate changes in the online advertising world. While the site was still being re-tooled, the Vignette deployment enabled WSJ.com to make late-stage design changes to adapt to the new standards for larger sizes and formats of ads. The Online Journal also initiated several sets of substantial design changes after the roll-out, deriving from customer input and the redesigned print version of the Journal.

“That was always one of the goals of the project — to reach a point of being much more flexible,” Budde says. “The ability to make those kinds of design changes quickly, easily and efficiently demonstrates that the Vignette solution is in fact as flexible as we hoped it would be.”

Personalized, Dynamic Content: News You Can Use. The Wall Street Journal Online had two fundamental business objectives in revamping WSJ.com. One, it sought to deepen the relationship with current subscribers by giving them reason to visit the site more frequently and to stay longer at each visit. Two, the Online Journal wanted to attract new visitors to its site and build toward the goal of a million paid subscribers. Both goals are tied to the Online Journal’s financial success; in 2001, WSJ.com derived about 60 percent of its \$37 million in revenue from subscriptions and 40 percent from advertising.

The personalization capabilities of Vignette software have helped drive the Online Journal’s strategy to strengthen customer relationships. New tools at WSJ.com invite subscribers to customize their content preferences with the click of a button on the home page. Subscribers can set up the home page to track their stock portfolios, follow indexes and view news headlines, articles and other information on the companies, industries and topics that interest them most. International entry points, which were hosted and managed separately in the past, are now integrated in the site. Thus, European and Asian subscribers, for example, can choose the regional edition of The Wall Street Journal they want presented to them, and establish a profile to display the news content they prefer on the front page.

Although the original WSJ.com site included some personalization tools, they were rudimentary and complex. And, personalization was isolated from the main news pages



due to the performance implications of having the site’s single-most heavily trafficked page be built dynamically for each customer at log-in. The new system has ample technical performance to integrate personalization at the visitor’s front door. Customers clearly like the change. Just six weeks after launch, the re-tooled site saw a 39 percent increase in the number of subscribers who personalized, and those using personalization are viewing up to 50 percent more pages than those without established personal settings.

The new system also enables more dynamic content across the site. For example, every news story published at WSJ.com typically integrates a current stock quote on any companies mentioned. In the past, all articles were essentially static; in other words, the HTML page was created the

moment a story was published, and users simply retrieved that page when they called a story up. With Vignette technology, the content is published but the page is built “on the fly” each time someone calls it up. This allows up-to-the-moment stock quotes to be inserted so information is always current.

“One of the challenges we faced was to make the WSJ.com site more timely,” Budde says. “Features like personalization and the dynamic stock quotes on pages make it clear to our customers that the site is being updated around the clock.”

Early Results Demonstrate Benefits. Budde points to market studies which indicate that personalization leads to greater usage, and notes the Online Journal noticed improvement along such lines within six weeks of relaunch. As of mid-March 2002, WSJ.com was showing a 7 percent increase in the number of unique weekday users. (The Monday-through-Friday focus reflects the Journal’s business emphasis.) Budde also notes improvement early on as far as the percentage of page views that derive from full articles vs. summary levels, indicating readers are “drilling deeper” into the site.

“We are starting to see a greater frequency of use based on the number of daily visitors, and the increased number of page views indicates the average visitor is looking at more content,” Budde says.

WSJ.com measures its success largely by what percentage of subscribers log in on a typical business day. Modeling shows that even a modest gain in this rate — from 19 to 23 percent, for example — can cause a huge swing in the number of ad impressions WSJ.com delivers. This translates directly to increased revenue as advertisers are charged by the impression. Advertisers today also benefit from more flexible ad formats, more targeted ad placement options and new sponsorship opportunities. Over time, Budde says, the value that visitors ascribe to the site will also be a factor in subscriber retention rates, customer satisfaction levels and the publication’s ability to raise prices without seeing a dip in renewal rates.

A more engaging site is also having a positive effect on conversion rates. The Online Journal measures the number of visitors who register for a 14-day trial subscription, then later become paid subscribers. This rate typically runs at 90

percent, but a more intriguing pattern has begun to emerge. Since WSJ.com relaunched, Budde reports, the Online Journal has enjoyed a 3 percentage point improvement in its cancellation rate among trial users. He predicts even better results as his team begins relying on “the power of Vignette” in marketing efforts — thereby expanding on the gains that WSJ.com has realized from the news-side deployment of Vignette content management and publishing.

“Using the Vignette content management solution for managing our marketing offers will even further accelerate our ability to take advantage of non-subscriber traffic and convert more visitors to subscribers,” Budde says.

Performance and Scalability Assure Connections to New Generations of Customers. Besides personalization, the Web site aspect that likely affects Online Journal subscribers most is performance. Thus, along with making WSJ.com more engaging and customizable, the company knew it needed to update technology to become more efficient, and it needed the scalability to support increased traffic loads as the customer base grows.

Because news is the Online Journal’s primary business, content is king. The online publication needed a system that could scale during peak times in the news industry, typically a five-hour window. At these times, site traffic would reach up to three times its average 1.5 million daily page views. The revamped WSJ.com site is built to support enormous amounts of peak hourly traffic. In its current configuration, the site can handle in excess of 2.1 million page views per hour — roughly four times the Online Journal’s typical hourly traffic. On average, the site runs at about 40 percent of capacity.

“We established high benchmarks going into the project, assuming we wanted the system to be able to grow to a million subscribers with ramped-up usage,” Budde explains. “So while we overbuilt the system for today, we know we have room for peak, and we won’t have to turn around and scale again soon.”

In addition to the Vignette Content Management Server, the technology powering WSJ.com includes 50 Sun servers running Solaris 2.7 as the operating system, Oracle 8.1.6 as the database platform, IBM HTTP Server powered by Apache

and IBM WebSphere Application Server. The deployment team included Dow Jones staff, IBM Global Services, Vignette Professional Services and other vendors.

The overall rearchitecture provides a platform that enables the Online Journal to continue evolving its product efficiently, and an environment in which it provides consistent, around-the-clock service to customers.

Building on Vignette to Sustain WSJ.com's Appeal. The Online Journal expects to address more business needs in the future by capitalizing on Vignette software, thereby increasing its return on investment. For example, the publication recognizes that it can shorten the time to market for additional revenue-generating products and services by re-using and repackaging the content stored in its database-driven Vignette system. One key near-term area of expansion will be developing mobile access packages. According to Budde, Vignette will play a role in making sure the content delivered to mobile devices is appropriately tailored to users in those environments.

The Online Journal also intends to use Vignette technology to improve the way it syndicates content. WSJ.com licenses and syndicates content to a variety of recipients today through home-grown approaches that are often not easy to use or effective.

"We see the increased use of syndication as a way to continue growing the business, but we need to be able to support it more efficiently and economically, and some of Vignette's capabilities will help with that," Budde says.

The Online Journal is also exploring the increased use of e-mail to deliver content off the platform. This service today is supported by a patchwork of systems and third-party vendors. By moving it into Vignette, Budde says, the Online Journal could better integrate e-mail delivery in the production process, making it easier for editors to manage content production. And, bringing all e-mail offerings under the same umbrella would increase the number of customized delivery options that the publication could offer customers. For example, Budde says, the publication could e-mail Walt Mossberg's "Personal Technology" column as a service to subscribers who request it.

Farther down the road, Vignette technology may help address enterprise-wide challenges, Budde says. Moving to a single, standardized platform for a variety of online products offers the potential to leverage content, best practices and infrastructure across the company — and even across the Dow Jones publishing group. If internal and external Web sites currently running on other vendors' software and proprietary solutions ultimately move to Vignette, Budde says, the company will clearly benefit from reduced cost and an operation that's easier for IT to manage.

In the meantime, Vignette is successfully helping Online Journal staff meet the end of better news delivery by enabling them to use technology, not invent it.

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