RETAIL

BEST BUY

KEEPING CUSTOMERS HAPPY

Highlights

Company
Best Buy

Industry/Market
Retail

Applications/Solutions
- MicroStrategy Suite
- Oracle 7.3.4 database

Products/Services
- Two Sun Enterprise™ 3000 (2-way and 4-way) servers
- Sun Enterprise 6000 server
- Sun Enterprise 10000 server

Key Business Challenges
- Equip business analysts and retail store managers to make smarter retailing and inventory decisions
- Improve inventory replenishment efficiency by providing daily sales snapshots of every store, product, and region
- Deliver market basket analyses that improve cross-selling opportunities

Key Business Results
- Data warehouse helps Best Buy improve supply chain efficiency and customer loyalty
- Sun Enterprise server architecture supported 500% growth of data warehouse to multiple terabytes
- With usage tripling over past year, Best Buy's data warehouse was nominated for several industry best practice awards

"We chose Sun three years ago because it offered the best price, performance and reliability of any UNIX server architecture."

Weimin Lu
Vice President of Technology
Best Buy

Best Buy, the nation's largest and one of the fastest growing consumer electronics retailers, succeeds based on a strategy that combines low prices and high-quality customer service with fun and entertainment. It has done so with a unique, no-commission sales policy that motivates sales associates to sell customers only what they need. Customers have responded by coming back again and again. In the past five years, Best Buy's sales have grown by a factor of 10. Today, Best Buy operates over 300 stores in 36 states, and is adding roughly 50 stores annually.

In 1997, Best Buy realized that its decision support systems were not keeping pace with its growth. With the right information, for instance, it could fine tune inventory management to ensure that each store carried the right mix of goods, or it could identify cross-sales opportunities.

At that point, Best Buy began building new analytic systems to help it master its growth. The challenge was huge, given that Best Buy wanted visibility down as far as the point-of-sale transaction, in order to get the big picture. It required a mix of platform, application, and database technologies with true scalability. Best Buy looked to Sun to provide the server architecture to turn is analytic application goals into reality.

Branching Out

From its beginnings in selling stereo systems, Best Buy has branched out into appliances, compact disks and videos, computers, and home office equipment. The company also carries a large selection of accessories, such as batteries, film, photographic equipment, and blank audio and video tapes. With such a large product mix, there are enormous opportunities for cross-selling, as long as store managers have the right information.

"We needed better market basket applications," said Weimin Lu, Best Buy's vice president of technology. Store managers needed tools that told them what products tended to be purchased together. In retailing circles, this is often known as the "beer and diapers" phenomenon, where studies have found that young parents stocking up on six packs on their way home from work often bought products for their infants as well. In Best Buy's case, it might mean stocking enough batteries to accompany CDs, because the more CDs people bought, the more that they would use their portable CD players.

Yet, deciphering these patterns takes enormous computing power which can mine data from through millions of point of sale transactions, then produce clear trend analyses for business analysts and store managers alike. Guess right, and millions of dollars quickly flow to the

bottom line. Guess wrong, and retail sites will soon find themselves stocked with millions of dollars of useless inventory.

When Best Buy began its data warehousing project in 1997, it knew that it would have to build a system that could scale adequately to capture enough data to deliver the big picture. And, since the chain was growing at a rate well in excess of 10% annually, it required a system architecture that could scale even further to meet future needs.

Building the Infrastructure

Best Buy designed a series of data mining and reporting applications for a wide internal audiences, ranging from sales associates and store managers to regional managers, product and brand managers. It was based on an Oracle-based operational data store, which serves as the master repository for transaction data covering point-of-sale transactions, post-sales warranty and service, inventory movements, purchasing data, and accounts payable and receivable, and other data.

The result is an enormous storehouse of data. Best Buy currently stores over two years of data, and ultimately plans to store at least four years worth. By the end of 1999, that should amount to 4 terabytes, drawn from two production systems: customer sales and inventory replenishment. Using the MicroStrategy suite, Best Buy users gain a single, consolidated view of any slice of data, regardless of the number of tables or Oracle instances that are joined to generate the views. The goal is learning, not only what's selling, but to whom, how well the supply chain is tuned to demand, and which products are delivering the best reliability and fewest repairs.

Best Buy chose Sun to provide the server infrastructure for delivering the application. "It was a pretty obvious choice for us," said Lu. "Sun has very reliable hardware and a solid architecture. We had a number of people who recently joined our staff that had good experience running very large Oracle database on Sun in previous jobs," Lu noted.

Several Sun servers are used to power the data warehouse. There are two Sun Enterprise 3000 servers, including a dual-processor and four-way unit, that are used for the test environment. Additionally, they are transitioning from an 8-way Sun Enterprise 6000 production server to a 36-way Sun Enterprise 10000 machine, which will handle both production and quality assurance.

According to Lu, the Sun Enterprise 10000 server's domaining features will enable Best Buy to dynamically allocate resources on an as needed basis. Initially, they have partitioned the Sun Enterprise 10000 server into four domains. This feature should come in quite handy during the Christmas shopping season, when Best Buy rings up nearly half of its annual sales. "The Christmas season is huge for us. With the domain feature, we can allocate more processor and memory away form QA to production without taking the server down." Lu adds that the domain feature is especially poplar with UNIX administrators because it greatly simplifies the process of running emulations.

Geometric Growth

Best Buy's enterprise data warehouse has proven a top seller within the company. Over the past twelve months, usage has tripled, while the database quintupled in volume. Usage took off after inventory bottlenecks generated red ink in 1998. "That really raised awareness about the need for this system," said Lu.

Today, the system is used to slice and dice sales figures, track supplier performance, provide merchandising portfolio management, and has recently added a balanced scorecard that correlates in-store sales with factors such as advertising and promotions, inventory levels, and customer satisfaction. "Every Monday morning, our stores have business process management meetings where everybody looks at the scorecard to see how well they are doing," said Lu.

Although Best Buy has not yet performed an ROI analysis on the effectiveness of the analytic system, it has already been nominated for several best practice awards at data warehouse conferences. "Contributing to the system's value is the reliability and scalability of the Sun Enterprise server architecture," noted Lu. "We chose Sun three years ago because it offered the best price, performance and reliability of any UNIX server architecture. Three years later, we think we made a pretty good choice."

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