

## Bridgestone Corporation

# Adoption of marketing and distribution system by 50 distribution outlets and 500 sales offices nationwide makes this one of the largest-scale SAP R/3 systems in Japan

When Bridgestone faced the obsolescence of its old systems and saw the limits to its processing capability, the company decided to rebuild the marketing and distribution system DOT (Dealer & Branch Online Terminal) for its commercial tire business in Japan. The resulting physical distribution system, built on one of the largest SAP R/3 bases in the country, links together 1,700 client PCs in the Bridgestone head office, its 50 distribution outlets, and its 500 sales offices located throughout Japan. This involved customization geared to Bridgestone business processes as well as additional development work to avoid problems during transition to the new system. The result was a unique project, unlike any other firm's both in its scale and in the system design methods employed.

### System employs SAP R/3 with aim of global infrastructure integration

Bridgestone Corporation had been running its marketing and distribution system DOT since 1979. The company used it to manage order receipt, order placement, shipment, and related functions. When they



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upgraded their system in 1994, they also implemented business process reengineering (BPR). Since then, it has continued to incorporate feedback on problems while building up their own system.

The volumes of data processed, however, have soared. For example, the number of orders that they receive for processing nationwide exceeds 30,000 items per hour at peak times, while their monthly sales bulletin requires statistical processing of as many as 100 million transactions. The host machines they had been using had reached the limits of their processing capability.

Bridgestone therefore decided to incorporate the IBM eServer zSeries 900, which has powerful data-processing capabilities, as database servers in the new system connecting 1,700 client PCs in its head office, its 50 distribution outlets, and its 500 sales offices located throughout Japan. Various possibilities were considered regarding software, ranging from introduction of a ready-made package to putting together a new system from the ground up. It already had a financial accounting system based on SAP by region, includ-

ing its establishments overseas. In order to integrate its infrastructure globally, it decided to employ R/3 for its distribution system, as well. ABeam Consulting had proven itself as a partner when it adopted their financial accounting system, and ABeam was also given charge of the project.

Mr. Kiyoshi Murata, the Information Systems Unit Leader in Bridgestone's Tire Sales Business Office had this to say: Even if we asked a number of firms to take part in competitive bidding, we could hardly expect to find a firm with deep understanding of our business structure. We went straight to ABeam and asked them to handle it. To start, we had them carry out a study with about 20 people to determine whether we really could build the system we wanted using R/3.

### Using add-ons to raise user operability and statistical processing speed

The project started in July 2000. The main purposes of the new system were: (1) to improve the cost structure by shifting to PC-based system; (2) to deal with expanding

business; (3) to shift to paperless forms and computerization of records; (4) to centralize and share data; (5) to shorten transaction time; (6) to upgrade the company's computer processing capability; and (7) to unify the company's global infrastructure.

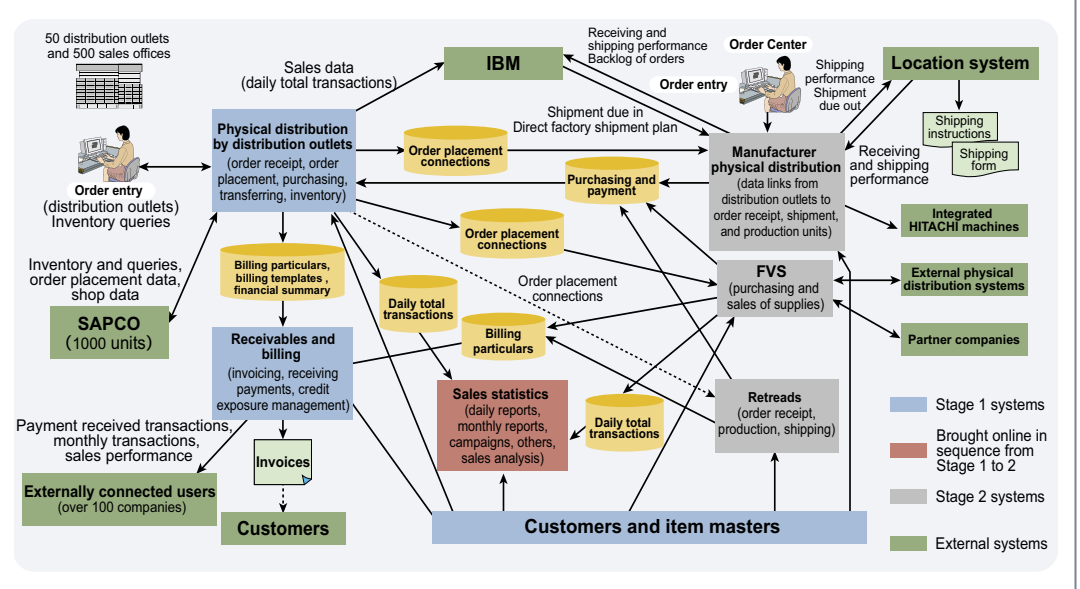
Bridgestone also placed particular emphasis on operability for users. In other words, they were concerned

about usability for staff members in sales offices. These staffers had to be able to receive orders from local tire stores by telephone, enter the orders onto sales slips, and then conduct the series of operations from checking inventory to arranging shipment. They had to be able to do all this promptly from their desks. The usual approach is to standardize operations around R/3 as much as possible in order to take maximum advantage of the package's strengths. The DOT project,

however, was not constrained by the functionality of R/3 alone. The objective instead was to customize R/3 to match existing business processes. Those actual business procedures that were evaluated as good were kept. The reasoning was that Bridgestone's business system had to make sense in the 21st century. Those items that needed further reform or innovation, therefore, were layered over the existing procedures. Various different functions ended up requiring additional development. For example, the ter-

minals were set up to automatically invoke R/3 distribution and the program for the operation at hand, so that operators would no longer have to log in when they powered on. For the user interface, we also followed the design that users were already familiar with. As Mr. Murata commented: People say that making users accustomed themselves to the standard R/3 operations is the best way to reduce development costs. Sales, however, is an activity where every moment is critical. Not only that, but introducing a system that required more

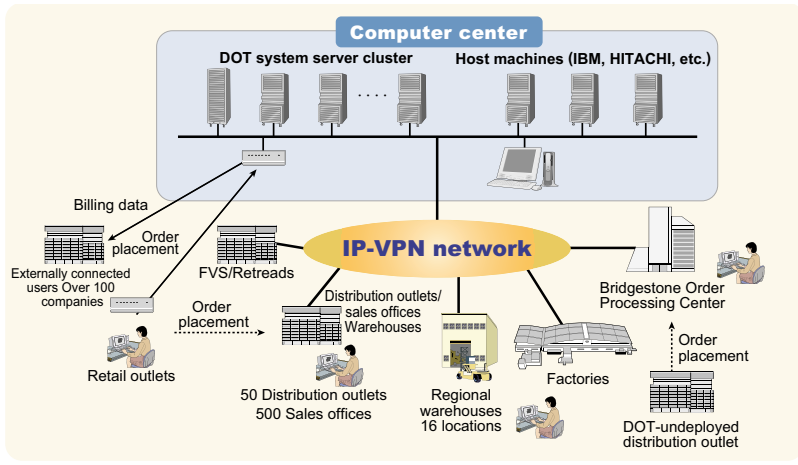
Overview



Schedule: July 2000-December 2003 (Including Post Go-live Support)

Action Items	2000 2nd half					2001 1st half					2001 2nd half					2002 1st half					2002 2nd half					2003 1st half					2003 2nd half																	
	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12						
1.BPR (1) R/3 suitability analysis • Create DOT reform proposal																																																
2.Business design (1) Business process definitions • Overall system design																																																
3.System development (1) Stage 1 (sales, manufacturer, sales statistics partial) • Design, development, unit testing • Integration testing																																																
(2) Stage 1 (SAPCO connection, externally connected users, sales statistics partial) • Design, development, unit testing • Integration testing																																																
(3) Stage 2 (FVS, retread, manufacturer, sales statistics remainder) • Design, development, unit testing • Integration testing																																																
(4) Concurrent process development, integration test • Current system side, R/3 side																																																
(5) Interface development, integration testing • Current system side, R/3 side																																																
4.Integration testing, migration																																																
5.Training																																																
6.System deployment (distribution outlets deployment, concurrent processes)																																																
7.System deployment (SAPCO, externally connected users, etc.)																																																
8.System deployment (final deployment)																																																
9.Infrastructure improvement (1) Server hardware installation, working environment preparation (2) Network construction, PC working environment preparation																																																
10.Stabilization measures, improvements (functionality, performance)																																																

■ Architecture (PC Based New Technology)



training every time the operators changed would actually push our costs higher. Therefore, we aimed for a level of simplicity where any of our employees could look at the screen and know what to do. Another major issue was how to increase the statistical processing speed, given the enormous demands on the capacity. On-line processing is directly linked to the productivity of order receipt processes. The speed of the response is key here, so they gave the system the capability to deal with operators very speedily in realtime in the foreground and implement remaining processes in the background while able to immediately take on the next foreground task. They programmed it to look as though the process is in realtime, but the system is actually batch processing in one-minute cycles. Bridgestone refers to this as pseudo-realtime processing to distinguish it from an actual realtime mode.

The question of how to increase the statistical processing speed was also a major issue, which must handle enormous volumes of up to nearly 100 million transactions. Here again, they were able to realize significant improvements in processing performance after a process of trial and error. This development work was in the area of add-ons. We sought to reduce processing times through the cumulative effect of improvements in detail while at the same time constantly assuring the integrity and stability of the

data. In this way, we succeeded in raising performance to target levels. The development team, which was composed primarily of ABeam personnel, expanded at its peak to several hundred members in order to satisfy the client's requirements at the level of fine-tuned detail. The team completed the new system in about 18 months.

**Seven-month concurrent operation of old and new systems averted risk of problems**

Another distinctive feature of the DOT project was the method used for migration from the old system to the new. The seven months from November 2002 to the following May were designated the concurrent operation period. The new and old systems were both operated concurrently during the period while the changeover was implemented in stages.

Once testing of all the parts had finished, the Stage 1 migration was begun at the two distribution outlets and 20 sales offices in Ibaraki and Chiba prefectures. There every effort was made to identify business procedures and system problems for correction. After that, the number of operational locations was expanded by 100-150 locations each month, until the system was gradually deployed to sales offices throughout the country.

Bridgestone's DOT constitutes mission-critical infrastructure for the domestic replacement tire business, which is one of the company's core businesses. It was conceivable, therefore, that problems occurring during the system migration could have drastic consequences. Therefore, they adopted the method known as concurrent operation to avoid such risk. When the data were gradually migrated from the old to the new system, then even if problems occurred in the new system, the old system would be still there as a backup. This approach also made it easier to uncover incompatibilities in the new system, and it had further advantages in that it could be used instead of verification tools. After the new system was deployed in all of Bridgestone's distribution outlets and sales offices, the last step was to migrate its physical distribution system. This was accomplished, and the cutover took place without incident in June 2003.

■ Hardware & Tools

Category	Specifications & Description
Central servers (Database servers)	Model: IBM zSeries 900 host machine
	O S: Z/OS USS (UNIX service)
	CPU: 30 CPU 10 CPU/unit × 3 units (integrated operation by means of SYSPLEX)
	1 CPU: 200 MIPS (scalable to maximum 13 CPUs/unit × 256 units)
Database	DB2 (allows online database reorganization)
	Memory capacity: A and B units 32 GB, C unit 40 GB
	Disk capacity: 5.1TB×2
(AP server)	Model: IBM xSeries × 23 units (PC servers)
	O S: Windows2000
	CPU: Intel Xeon 1.6GHz×8CPU
Clients	O S: Windows2000
	Application package: SAP R/3 (developed using ABAP, a programming language for R/3)
Main software	Forms output: HITACHI EUR and JP1, BO
	Electronic forms: Canon Report Viewer
	File conversion: webMethods
	External connection protocol converter: ACMS
	Application management software: JP1
	File transfer: HULFT

The timetable for introducing a new system might be staggered a month at a time, but system managers who had 500 sales offices to deal with would still not have the free time to form caravans and go from location to location training the users. The personnel expenses, travel costs, and other in-house costs associated with user training made up a considerable problem when a corporation on a nationwide scale revamped its IT infrastructure. The solution in this case was to contract with the PC suppliers to implement everything from installation to introductory training themselves.

### Grappling with difficult challenges leads eventually to unshakable bonds of trust

For the conclusion of this report, we asked leading figures at both Bridgestone and ABeam where the key to this project's success lay. Mr. Murata said: No particular problems occurred at all after the cutover, even with such a massive system involved. The reason is

■ Client Data		
Company Profile	Company name	Bridgestone Corporation
	Head Office	10-1 Kyobashi 1-chome, Chuo-ku, Tokyo, Japan
	Established	March 1, 1931
	Description of business	Tire Division: Tires and tubes for passenger vehicles, trucks, buses, construction vehicles, industrial vehicles, agricultural machinery, aircraft, and two-wheeled vehicles, tire-related products, motor vehicle maintenance and repair, raw materials for tires, and so on
	Capital	126,354 million yen (As of December 31, 2003)
Project Profile	Number of employees	12,480 (As of December 31, 2003)
	System designation	DOT system
	Business category	Domestic replacement tire business
	Cutover time	June 2003
	In-house development staff	Approximately 50 members (including Bridgestone Software personnel); development was fully outsourced
	Partners	ABeam Consulting, HITACHI, Ltd., others
	Period	July 2000 to December 2003 (including post go-live support)

that all the project members joined together to carry out painstaking analysis and verification, testing, modifications to the specifications, and checking. They did these things repeatedly, improving the quality, and this was the result.

Mr. Matsuo, who directed the ABeam effort, said: Consultants frequently mouth the fine-sounding term "customer satisfaction", but the question is how much they are actually able to satisfy their customers. With

the DOT project, Mr. Murata took a thoroughly consistent stance and exercised strong leadership. Under him, we thought very seriously about what kind of system should be created, and how, from the perspective of the actual users. Then, we were able to learn the answers to those questions as a matter of real experience. The experience with Bridgestone will no doubt be nourishing the younger members of our firm well into the future.

The notion of building a system of the desired quality within the desired timeframe may appear too obvious to state in words. The greater the scale of the system involved, however, the more difficult this is to achieve. It is precisely because they teamed up for a single focused purpose over a period of some three and a half years, and so overcame those difficulties, that their unshakable bonds of trust were formed.

### Solid relationships of mutual trust with customers built up over many years

We cannot know whether we should team up with a firm in a system development project until we actually try working with them. As we went through a continuing process of trial and error with ABeam, we built up a relationship that was closer than with practically anybody else, even in our own company. We received hardly any complaints from users regarding the DOT project after the cutover had passed, and we were able to disband our in-house project team after just three months. That is how smoothly everything worked. The fact that a system this massive could go into operation as it has, without running into problems, is without question thanks in very large part to the abilities of everyone at ABeam Consulting. (Mr. Kiyoshi Murata)

### Record Awards of SAP Award of Excellence

The SAP Award of Excellence is awarded to companies with a high level of customer satisfaction, based on SAP's customer satisfaction study. ABeam consulting has been awarded the "Service Partner Award" eight years in a row since its founding in 1998 (a record high in Japan). In addition, ABeam has been awarded the "project of the year" award for three projects, an award reflecting the highest level award in the "project category" rating the project size, difficulty and accomplishment; it has also been awarded the "Project award" and for an additional three projects, awarded for successful achievement of outstanding performance.

"Project of the Year": Bridgestone Sports (2001), TEAC (2002), Kao (2005)

"Project Award": Nissan Chemical Industries (2003), Otsuka Pharmaceutical (2004), JR West (2004)

### Case Study

## Manufacturing Integrated Solutions

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