Food Giant Standardizes on HP
for Infrastructure of Champions
HP success story

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GENERAL MILLS

One of the largest food companies in the world, General Mills has one of the lowest IT spends per revenue dollar in the consumer packaged goods manufacturing industry. The company, which has long pursued a strategy of IT standardization and consolidation, operates its entire global enterprise on HP systems — from the HP Integrity servers that run its SAP ERP and Business Information Warehouse, to the HP iPAQ Pocket PCs used by its retail salesforce. In addition to cost savings, the simplified infrastructure has enabled quick response to business change — most notably when General Mills acquired Pillsbury, a company of near equal size, and integrated it into its infrastructure in just 16 months.

General Mills markets 100 of the world's best-loved food brands, including Betty Crocker, Haagen-Dazs, Pillsbury, Green Giant, Old El Paso, Wheaties and Cheerios. It holds the No.1 or No.2 market position in virtually every category in which it competes.

It also relies on a single vendor for its IT systems worldwide: HP.

"We think that we're extremely different in the way that we manage information systems at General Mills," says Vandy Johnson, senior director of I.S. Operations, who oversees the $12.3 billion-dollar company's business warehouse, data management, telecom, network, I.S. security, data center, and server and web infrastructure operations.

General Mills operates the core of its business — supply chain, product lifecycle management, finance, human resources, business intelligence and data warehouse — on SAP R/3 and an Oracle9i database running on HP-UX11i v2 on Intel® Itanium® 2 processor-based HP Integrity servers. It relies on HP for its Intel-based servers and its desktop, notebook, and handheld PCs running Microsoft Windows. It has standardized on HP ProCurve Networking solutions at its network edge, depends on proactive HP Mission Critical Support services, and uses HP OpenView software to manage it all worldwide.

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"The traditional thinking is that you bid projects and keep two or three system vendors on your floor so that they compete against one another," explains Mike Meinz, director of Information Technology. "But in the end, that costs you more, because you have multiple companies to deal with, and multiple architectures to manage."

The average General Mills IT employee has been with the company for 14 years and the average IT manager for 21 years. Employee turnover is less than 1% a year. And General Mills sees no reason to change its decades-old practice of hiring college graduates right out of school, rotating them through three different job functions in their first five years, and promoting from within. Computerworld magazine, which has repeatedly recognized the company as one of the "100 Best Places to Work," cites not only stability, but a shared sense of mission, and a generous training and development budget.

Low TCO
The payback on its long-term investments in its people and its steady reliance on just a few IT providers — SAP, Microsoft, Oracle, and HP— has come in the form of significantly lower IT costs for General Mills. While the company won't release exact numbers, surveys and benchmarks conducted by major accounting and consulting firms, SAP, and HP consistently show that, compared to its competitors, the cost of IT per revenue dollar at General Mills is among the lowest.

The reason, says Johnson, is that its standardized infrastructure requires fewer people to manage it. "As numerous TCO studies have shown, people are the big cost. And when you compare the total number of people — staff, consultants, outsourcing, contractors— we rely on far fewer people than other companies our size."

What's more, he says, in contrast to the typical 50/50 split between development and infrastructure costs, General Mills' low cost-of-ownership means it can invest significantly more of every IT dollar in innovation and development, which has enabled the company to be an early adopter in many technology areas, from data warehouse to wireless networks.

"Our one system, one platform, one architecture approach has really worked well for us," says Johnson, "not only in terms of cost, but in how we support the business— and not just here in Minnesota, but in Shanghai, China, and everywhere we do business."

2010 foresight
The journey to a more standardized and cost-effective IT infrastructure began in the early '90s, when General Mills still relied on in-house mainframe applications. The impetus for change was the company's long-range business plan, which forecast growth out to the year 2010. "We could see that our then-current systems wouldn't make it," says Johnson. "We had to do something differently."

The first step was to move a more integrated and standardized environment for core applications. By the end of the decade, General Mills had moved all of these to SAP R/2 and was operating one of the largest SAP R/2 installations on a mainframe.

At that point, says Meinz, SAP R/3 had matured enough and offered features, notably Advanced Planning and Optimization (APO), to warrant transition. The only question was, which of the company's two system architectures would the new SAP R/3 installation run on: the mainframe or HP-UX?

"Experience has taught us that we always want to be in the mainstream," says Meinz. "The mainstream is where new features and fixes come out first, and where people have the skills."

When his research showed that there were less than 100 companies running SAP on mainframe MVS systems and DB2 databases — and more than 15,000 on HP-UX and Oracle databases, the decision should have been easy. The problem was that the HP machines at the time performed just at the edge of what General Mills needed.

"We were really concerned that we would be the world's largest SAP instance — without a machine to run it on," says Johnson.

"That's when our HP rep told us about the new HP 9000 Superdome," recalls Meinz.

Just in time for Pillsbury

The new PA-RISC based HP Superdome server promised the performance General Mills was looking for, and it purchased two of the first servers off the manufacturing line.

The Superdome servers were installed in an HP Serviceguard failover configuration to host the new SAP R/3 database and central instance (CI), and surrounded with 10 smaller HP PA-RISC servers to host the SAP R/3 application servers.

The transition to SAP R/3 on the HP servers went smoothly, enabling the company to retire its mainframe architecture just a few months before its acquisition of Pillsbury was approved by regulators.

The new infrastructure provided the company with a simpler, more powerful platform to implement the business change.

"In just a few months, we were able to combine all of our customer orders onto our SAP system running on the Superdome," says Johnson. "Overnight, we went from about a six-billion-dollar net sales business to about an 11-billion-dollar business — without any change to our architecture at all."

True to its standards, General Mills replaced the entire Pillsbury infrastructure, migrating its ERP; replacing Sun and IBM servers; and replacing the networking infrastructure, from the LAN edge to the backbone, with its standard HP network infrastructure.

"We took this company of equal size and integrated it into our information system in about 16 months," says Johnson.

Championship performance

Within a few years after the merger, the size of the General Mills SAP system had doubled again. Its Business Warehouse grew to be one of the largest instances in the world and the number of SAP users grew to more than 7,000.

The number of HP Superdome servers grew, too — from two to five. Still, the company needed more power, headroom and simplicity.

"We really needed to grow our capacity," says Meinz. "Once again, it was great timing on HP's part to deliver the new Itanium-based Integrity servers and HP-UX11i support for Large File Systems when we needed it."

General Mills bought its first HP Integrity Superdome server in May 2004 and put it into production in July. Taking advantage of the ability to run SAP in a mixed PA-RISC and Intel Itanium microprocessor environment, the company completed the transition of its entire SAP environment to Integrity servers in spring of 2005.

"The HP Integrity servers gave us the power and computer resources that we needed right off the bat," says Meinz. "Online transaction performance improved 32% and the elapsed time on SAP batch jobs was cut in half."

Moving to the more powerful Integrity platform also enabled General Mills to reduce its total number of Superdome machines from five to three.

Doing it differently

Given the large memory and processing power of the Integrity platform and support for up to 32TB File Systems on HP-UX11i v2, General Mills saw and seized the opportunity to consolidate its SAP ERP and SAP Business Warehouse database servers and central instance (CI) in a single instance, on a single server, in a single partition.

"We still have separate sub-storage systems," explains Johnson, "but we run SAP ERP and Business Warehouse in one large partition on a 32-processor Integrity machine, and the performance is just super."

"As far as I know, we're a pioneer in this area," says Meinz. "There may be no other HP or SAP customers that have configured their systems in this way. But we did extensive modeling and decided we can do this, and it has paid off for us."

"Every server General Mills can eliminate means one less machine to purchase, pay maintenance on, and manage," he says. "Plus, the combination of Large File Systems on HP-UX 11i v2, the auto-extend capability of Oracle9i database, and the ability to stripe and mirror everything delivers better performance — with almost zero administration."

28 + 8 = 5

For Johnson, one of the best ways to gauge the extent of consolidation at General Mills is to consider that before the merger, Pillsbury Company had a 28,000-square-foot data center and General Mills had an 8,000-square-foot data center. Today, the single data center for the new company is 5,000 square feet.

Meinz is proud that, while employee turnover in the IT department at Pillsbury was about 15% a year before the merger, its now back to less than 1% for the combined organization.

Both are pleased by the return on General Mills' investment in people and trust in a few IT providers. Recently, says Meinz, the company did issue a competitive RFP for desktop PCs, just to make sure that HP's price was competitive. HP, in fact, offered the best pricing.

Choosing the right supplier for the journey

While pricing is the concern he hears most often about the decision to standardize on a single vendor, Johnson says the far more important question is: how do you pick the right provider? "If you pick the wrong company, you might not get the strategic advantage to separate you from your competitors."

"That's why HP's history of and commitment to future innovation is so important to us," he says. "When you look at the HP logo, there's the little tag line: "invent." We really see that. We see the resources that HP puts in R&D. We see the innovation in Superdome, blade servers, tablets, printers and iPAQs — and we use it."

Collaboration is the other crucial ingredient, says Johnson. "HP listens and has produced what we need when we need it. HP also shares their vision of what's coming. So early on we were aware of the Superdome. Today we know the upgrade path and can plan for that three-year horizon."

"Everyone preaches collaboration, but HP practices it," agrees Meinz. "It's valuable to me to have a long-term relationship with people who understand General Mills' business and really look out for General Mills' best interests."

A provider's ability to collaborate well with others is also valuable, he adds. For example, HP has worked closely with Microsoft to develop and implement strategic .NET and mobility solutions with General Mills. And the Mission Critical Support that HP provides to General Mills includes critical support for SAP, which proved especially useful during the transitions from the mainframe and to the Itanium-based servers. "If we ran into an issue, our HP support engineer would call his HP contact at SAP headquarters in Walldorf, Germany and get us the answer," says Meinz. "HP was extremely diligent in resolving issues with SAP — and with Oracle as well."

"Mission Critical Support is a phenomenal service from HP," says Johnson. "The HP folks who support us are spectacular when it comes to very large SAP on Oracle on HP."

"It's actually unusual to find a company that collaborates with other companies as well as HP," he adds. "We also have separate support contracts with Oracle and SAP, but HP's ability to collaborate across all three companies and come to a solution provides us with an enormous benefit, one we wouldn't get from each of the three companies alone."

Outside the data center

Standardization on HP solutions extends out beyond the HP Integrity servers in the data center that host the SAP environment at General Mills.

"HP is our trusted supplier from hand-held iPAQ to Integrity Superdome and everything in between," says Johnson.

More than a thousand HP ProLiant servers run Microsoft server applications worldwide, including Windows, Exchange, SQL, .NET and Active Directory — and host nearly 50 consumer web sites, including Bakeoff.com, BettyCrocker.com, Cheerios.com, GeneralMills.com, Pillsbury.com and Yoplait.com.

For its some 27,000 employees in approximately 300 sites and 30 countries, General Mills has standardized on one model each of HP desktop, notebook, ruggedized notebook, sub-notebook, hand-held and tablet.

For application functionality not found in SAP, or where it seeks a proprietary competitive edge, the company develops its own applications on the HP-UX11i operating system. These applications range from the firm's Ingredient Labeling application which, among other things, determines the "Nutrition facts" published on General Mills' food products — to the warehouse management software that directs forklift operators on how to pack the maximum number of pallets into each truck, without crushing the Cheerios under heavier boxes of Betty Crocker cake mix.

"We've been extremely satisfied with HP-UX, both in the way that it supports SAP and in the way that it supports a wide variety of applications," says Johnson. "Our core application is SAP, but our company runs on HP-UX."

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    Director of Information Technology,
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Headroom into the future

It is SAP on the HP Integrity servers, however, where General Mills expects to grow the most. Right now, for example, the company is considering SAP CRM, which includes a function for managing coupons. While it might not have all the features of General Mills' own software, it would have the advantage of being integrated into the SAP Finance system.

When SAP certifies it, says Meinz, the company also plans to move to Oracle 10*g* to take advantage of new features for even greater simplicity and manageability.

"The HP Integrity platform gives us headroom for growth and the future things that we may decide to do on SAP," says Meinz. "We're very confident in Itanium for the high-end. We see that companies are using Integrity Superdomes running Windows for their large SQL Server implementations. For large applications, like SAP, on both Windows and UNIX, Itanium is where it's at."

"SAP likes faster bigger processors, not more processors," agrees Johnson. "SAP is a great example of an application that scales up better than it scales out."

"The EPIC architecture in the Itanium chip gives General Mills a growth curve for the future that is beyond what PA RISC and Pentium can do," says Meinz. "Obviously, HP is very committed to Itanium. We've seen the road maps, and we've got the machines here to prove it."

"If we double again tomorrow, with the HP Integrity platform, we're ready," says Johnson. "From an architecture standpoint we won't have to change a thing. And that's a very comforting thought."

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Powering the SAP landscape

General Mills runs its core SAP system on two HP Integrity Superdome servers running HP-UX11i v2, with six Integrity rx7620 servers hosting the SAP application modules.

The SAP database server is a 32-processor Integrity Superdome in an HP Serviceguard automatic fail-over configuration with a second 32-processor Integrity Superdome that acts as the primary application server for SAP.

All 32 of the processors in the database server are active, but 16 of 32 processors on the application server are held in reserve. Using instant capacity on demand service from HP, General Mills can access this additional processing power if it's needed.

A third 32-processor Integrity Superdome server is located in a separate R&D facility and used for development, testing and quality assurance, or, in the event of a disaster, for recovery.

"With all of our eggs in one SAP basket, we take testing very seriously," explains Meinz. Each project undergoes extensive testing and analysis and QA, including tests with real business users, before anything goes into production.

The test server runs 32 instances of SAP for testing in one very large 32 TB file system. It is connected to the production machines via fiber optic cable, and all production transactions are mirrored in the R&D facility's storage system as they occur. General Mills can convert the development Superdome to the production database server and use the mirrored data to restore SAP operations in about 15 minutes. Currently, 16 of the 32 processors on the test and development server are in reserve and can be purchased and turned on if the server needs to run production for an extended time.

"The reality is that if a disaster happens, you would quickly forget about testing new features and put all of your efforts into getting production back up and running," says Meinz. "So we thought why not use the development system for recovery? We test it regularly and it works."

Challenge	Solution	Results
• Deliver a flexible, cost-effective enterprise-wide IT infrastructure with the performance, reliability, and simplicity to support business change today and tomorrow	• Hardware: - HP Integrity Superdome servers - HP Integrity rx7620 servers - HP Integrity rx4640 servers - HP ProLiant DL380 / DL580 servers - HP DC7100 PC systems - HP NC6000 Notebook systems - HP Compaq TC 1100 Tablet systems - HP NR3610 Ruggedized Notebook systems - HP COMPAQ nc4010 SubNotebook systems - HP iPAQ Pocket PC systems - HP Printers - HP ProCurve Switch 5300xl series • Software: - HP-UX11i v2 (Mission Critical Operating Environment Bundle) - HP Serviceguard - HP OpenView Operations - HP OpenView Network Node Manager - HP OpenView GlancePlus - HP OpenView Reporter - HP OpenView Performance Manager - SAP R/3 modules: ERP Operations (SD, MM, QM, PP, WM), ERP Finance (FI, CO, COPA, PS, FA, TR), SEM, HR, APO DP and SNP, PLM, BW, Enterprise Portal, XI, KPRO, TREX - Oracle9i Database - Microsoft Server and Microsoft Office software • Services: - HP Mission Critical Support for the SAP infrastructure	• Achieved low cost of IT per revenue dollar • Quickly integrated operations when the business doubled through acquisition • Consolidated five PA-RISC Superdome servers to three HP Integrity Superdome servers and an HP Integrity rx7620 server • Reduced data center size by factor of seven • Gained headroom and capacity for future growth and performance

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