

# The Need for Speed:

## Faster BI Means Better Business Decisions

New business intelligence tools enable users to leverage data in more productive ways.



**An exclusive report from BusinessWeek Research Services**

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## Executive Summary

- Huge increases in the number of users, the volume of data and the complexity of queries are putting intense pressure on data warehouses and business intelligence systems.
- New technology delivers dramatically improved performance—gains of factors of 300 and more in query response times are possible.
- Better performance means that users ask more questions and delve more deeply into the data.
- New technology can be deployed and implemented in a relatively straightforward manner, with reduced costs and without user training.
- Improved business intelligence performance leads to users doing their jobs better.

## Methodology

BusinessWeek Research Services (BWRS) launched a research program in the summer of 2007 to study the operation and benefits of a dedicated appliance to improve the performance of existing and/or new business intelligence/analytics systems. This report is designed to help senior information technology and business decision-makers to better understand the technology and its benefits.

This paper includes content from various conference presentations given by adopters and potential users of SAP's BI Accelerator. Among the organizations included in the research for this report are:

- A U.S.-based specialty chemical company (Rohm and Haas Company)
- A European telecommunications provider (T-Mobile UK)
- An international steelmaker
- A global beverage manufacturer, distributor and marketer
- A multinational consumer products company
- A multinational pharmaceuticals company
- A U.S.-based pharmaceuticals company

Leading industry analysts and consulting firms also provided context, background, and recent and relevant reports. In addition, this report includes information from the May 2006 BWRS report titled "Seizing the BI Opportunity," available at:

[http://mediakit.businessweek.com/pdf/research/Seizing\\_the\\_BI\\_Opportunity\\_Whitepaper\\_20061.pdf](http://mediakit.businessweek.com/pdf/research/Seizing_the_BI_Opportunity_Whitepaper_20061.pdf)

Triangle Publishing Services Co. Inc. supported BWRS in the research, writing, editing and production of this report. BWRS and the author of this report, Joe Mullich, are grateful to the executives who provided their time and insights for this project.

This research project was funded by a grant from SAP but was written independently of this sponsor. The editorial department of *BusinessWeek* Magazine was not involved in this project.

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# Introduction

Companies have a growing desire to put business intelligence (BI) tools in the hands of more workers at all levels of the organization, giving them the information they need to overcome challenges and seize opportunities. At the same time, many companies are concerned about whether their current BI systems can maintain adequate performance when their user base leaps from hundreds to thousands or even tens of thousands.

Furthermore, the rise of e-commerce has generated a tsunami of transaction data flowing into corporate systems. Executives are eager to capture and analyze this data in myriad ways that create exponentially larger challenges for computer processors and storage.

The increasing sophistication of both the queries and the analytical tools introduces additional challenges to the processors. Many organizations want near-real-time analysis of their data. Others are keen for their systems to provide insights about trends via predictive analytics software, which requires massive number-crunching abilities.

## No More Tradeoffs

Traditionally, the technology solutions to gain faster business insights have required a tradeoff between speed and flexibility. The SAP NetWeaver BI Accelerator, a computer appliance to quicken OLAP queries, effectively eliminates these compromises by leveraging key technical advances—including in-memory processing, smart compression and search-engine-based parallel processing. In this way, the BI Accelerator allows more users to run more detailed queries much more quickly than BI systems tuned for high performance with traditional optimization techniques.

The first wave of companies to take advantage of this new technology—including a global beverage manufacturer, distributor and marketer, a multinational consumer products company and a multinational pharmaceuticals company—report performance gains of a factor of 300 and more, coupled with higher user satisfaction, greater user adoption and lower maintenance costs. Other companies experienced, and independent testing verified, similarly dramatic performance increases.

“When employees spoke to colleagues who were using the BI Accelerator and heard what results they were getting, they would immediately come to us and ask why the Accelerator hadn’t been switched on in their area yet,” says Andy Bruce, formerly the head of MIS Delivery at T-Mobile UK, the 7,000-employee communications company located in Hatfield, Hertfordshire, with \$3.3 billion in sales. “We were taken by surprise in how much positive response we got from the business so quickly.”

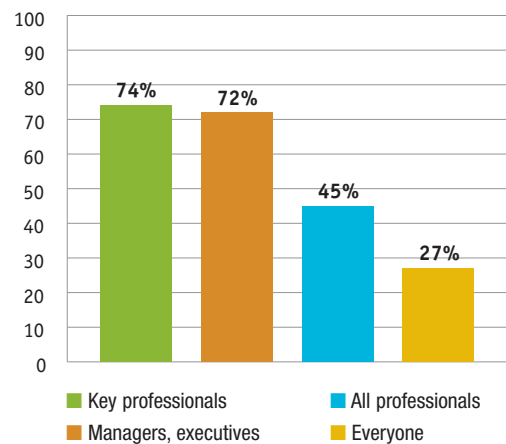
## “Everybody” Wants BI

The desire for better decision-making and more agility has made companies appreciate that BI tools need to move beyond the highest levels of the C-suite and provide insights to front-line managers and workers, as well. A recent study by BusinessWeek Research Services (BWRS) demonstrated the extent

Chart 1

### Widespread Expansion of BI

When it comes to their company’s BI distribution plans, on a scale of 1 to 10 with 10 being extremely important, 27 percent of survey respondents said it was important that everyone have access to BI tools.



Source: BusinessWeek Research Services

to which companies want to expand the use of BI tools. Nearly three-quarters of the C-level officials responding to the online questionnaire in 2006 said they want BI tools in the hands of key professionals and managers. Almost half of the companies want all professionals to have access to these tools. And a whopping 27 percent of the executives said BI access should be provided to “everybody” (see chart 1, “Widespread Expansion of BI,” on page 5).

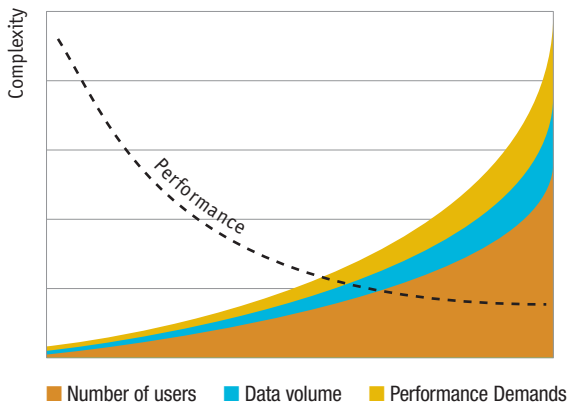
In a fast-changing business environment where users have become accustomed to a Google-like response, the need for speed radiates throughout all aspects of the decision-making process, especially when it comes to access to crucial data. “No one is happy if a query takes 30 seconds anymore,” says Andreas Bitterer, vice president of research at information technology research and advisory firm Gartner Inc.

Whether or not they use these technology terms, users now demand BI systems that provide fast response time, low latency, interactivity, flexibility and, most of all, accuracy. “It doesn’t help if you get information on their computer screens faster if it’s the wrong information,” Bitterer points out. These ever increasing demands are complicated by rapidly growing data stores where “terabytes are nothing anymore,” the analyst notes.

Chart 2

### Increasing Data Warehouse Pressure

*The benefit of data to users depends on the back-end of the BI system—the data warehouse.*



Source: Gartner Business Intelligence Summit 2007, “In-Memory Technologies for Business Intelligence,” Andreas Bitterer, March 2007

The pressure on data warehouses to perform better is coming from many sources, not just the larger number of users and growing mounds of data, according to Gartner (see chart 2, “Increasing Data Warehouse Pressure,” on the left).

And performance pressure is only going to become more intense as companies look for new ways to leverage insights from new kinds of data. Like many large organizations, Philadelphia-based Rohm and Haas Company, the \$8.2 billion maker of specialty materials, is trying to incorporate its unstructured data into its data warehouse. Adding information outside of databases, such as e-mails, text documents and presentations, to the data warehouse has the potential to exponentially increase its size.

“We want enterprise-search capabilities to mine data better than we do today,” says Mike Masciandro, director of business intelligence at Rohm and Haas, which recently completed a proof-of-concept pilot test of the BI Accelerator. “The ability to query large sets of data is the backbone of what this BI Accelerator technology is.”

## Shifting to Innovative Technologies

In moving forward with broader distribution of business intelligence, the top concern has been whether the software could handle the additional workload as well as support a large number of users and exploding data repositories, according to the BWRS survey. When users increase from hundreds to thousands or more, would performance drag? Would server and desktop capacity be sufficient as BI spreads like wild-fire through an organization? Indeed, in the BWRS survey, C-level executives said they were more concerned about performance issues than the value of insights, the ease of use and the ROI of BI systems.

Traditionally, companies have tried to accelerate query performance primarily with a performance-tuning feature called aggregates. Aggregates are subsets of InfoCubes, which are multidimensional data storage containers for reporting and analysis of data. The challenge is that defining, building and maintaining aggregates are rigorous and time-consuming processes that do not always provide a benefit. A fundamental issue is that aggregates must be developed and tuned for each scenario. Because BI is increasingly dynamic and the type of information users will want is unpredictable, aggregates are not flexible enough to keep up with demands.

The SAP NetWeaver BI Accelerator takes a different approach, one that avoids many of the problems associated with traditional BI optimization techniques. It is a device preinstalled on 64-bit Intel Xeon processor-based blade servers from IBM, Hewlett-Packard or Fujitsu-Siemens. The BI Accelerator's in-memory technology loads detailed data into memory for reporting and analysis. This eliminates the need to read data from disks, thereby dramatically improving response time and flexibility.

Current performance optimization has constraints, because of the amount of time it takes to aggregate data. "With the BI Accelerator, this is not a problem, because the indexing time is very fast," says the project leader of IT Finance at a multinational pharmaceuticals company that has implemented the technology. "In our case, this provides a single point of access to all information very easily. There are also possibilities to combine information into a single repository."

As the first group of users can attest, the BI Accelerator brings four key benefits:

**Instant response:** One billion records can be analyzed in three seconds.

**Affordability:** The off-the-shelf hardware setup and appliance setup lower deployment and management costs.

**Agility:** Companies enjoy consistent response with no tuning and fast loading.

**Full integration:** The BI Accelerator is built for SAP NetWeaver BI—SAP's platform for business intelligence, analytical, reporting and data warehousing—providing a seamless and transparent BI system.

## Too Many Time Outs

The growth of business intelligence is being spurred by the desire to wring more true insight from corporate data. A global beverage manufacturer, distributor and marketer, for instance, implemented the BI Accelerator as part of a move away from mere historical views of data to trending and what-if analysis. The challenge was the complexity of the company's "system," which depends on partner companies to bottle and deliver its products and creates huge amounts of data movement.

"We don't have the biggest data warehouse in operation, but it's probably the most complex," says the company's global business intelligence architect.

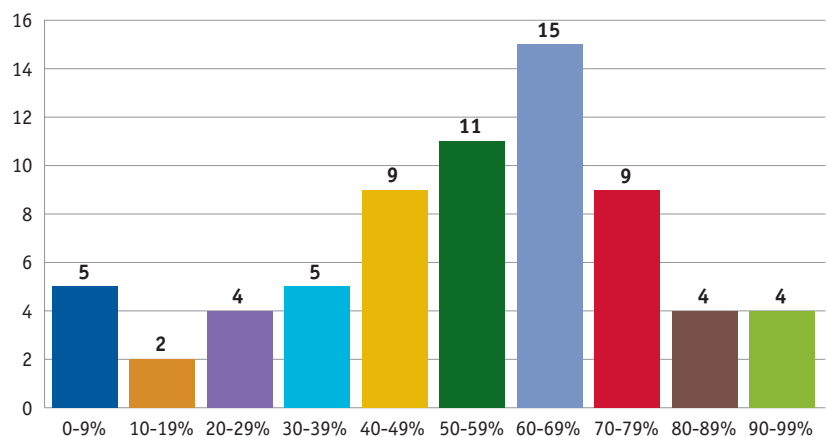
Although the data warehouse has only 1.5 terabytes of data in six billion rows, some of the cubes have up to 50 hierarchies. And some of the hierarchies have eight levels. And some of the levels have tens of thousands of nodes. "The typical OLAP product has challenges with that level of complexity," he says. The BI system at the beverage giant is running 5,600 load jobs a week, and the cube row growth is more than 440 million per week.

The company needed to do more granular analysis of those data stores, because everything at the firm was speeding up: Tasks that had been done quarterly were shifting to monthly. Monthly analyses were moving to a weekly timetable. However, slow response from the BI system was frustrating users' desire for data—the company portal had a 10-minute timer and queries often would time out.

Chart 3

### Huge Performance Improvement

*Both system performance and user adoption increased dramatically once the global beverage manufacturer, distributor and marketer upgraded SAP NetWeaver BI to 7.0 and added the BI Accelerator. Each column represents the number of queries that experienced a specific level of performance improvement. For example, 15 queries experienced a 60 to 69 percent improvement.*



Source: Company report

“We were thinking about investing in more hardware to try to get performance out of the old architecture,” the company’s BI architect says, “but that wasn’t viable.” Instead, the beverage giant implemented a phased approach by upgrading existing installations of SAP NetWeaver BI to 7.0 and then adding the BI Accelerator.

Result: Complex analytics, which had timed out after an hour with the old system, were returning within one to two minutes. Overall response time improved for 92 percent of queries. More than a third of queries improved by 50 percent or more. And all of that, the company’s BI architect quickly points out, was without the use of aggregates (see chart 3, “Huge Performance Improvement,” on page 7).

## Old Solutions Do Not Suit Dynamic Users

For the multinational pharmaceuticals firm, traditional performance tuning—such as aggregates—was not flexible enough to allow users to do efficient analysis as the BI infrastructure grew in concert with the company. “We have been opening up the system, rather than having just a set of standard queries or a few dashboards where we can anticipate users’ behavior,” says the company’s project leader of IT Finance.

Over the past several years, the company has built six regional SAP Business Information Warehouse systems around the globe. Beginning in 2005, the pharmaceuticals giant began developing several global applications, which led to the vast stores of data in the six systems being consolidated into one global reporting and analytics infrastructure based on SAP NetWeaver. The enterprise data warehouse included 50 InfoCubes, 70 data store objects, 400 daily loads and a terabyte of data.

However, with more than 1,000 users performing ad hoc reporting and analysis, the company could not optimize the consolidated global system with typical methods. “Traditional performance optimization would have required a lot of work with little guarantee of success,” the project leader of IT Finance says. “We could have hundreds of aggregates, but not be sure the user would hit the aggregate he needed.”

This would not permit truly efficient ad hoc analysis. The pharmaceuticals company needed a better system to ensure users could respond quickly to changing market needs, have faster availability of month-end data and gain single access to all information without calling for multiple reports.

The BI Accelerator met those needs, providing performance gains of a factor of 300 and overall very good response times. The global consolidated brands sales cube, for instance, required only three minutes of indexing for 0.9 gigabytes of information. The global consolidated finance cube required five minutes to consolidate records in 1.1 gigabytes.

Table 1

### BI Workloads

Leading companies turn to BI Accelerator to accommodate more users and growing volumes of data.

#### T-Mobile UK

- 7,000 employees
- 500 users of SAP BI
- 5 terabytes of data
- analyzing data from 17 million customers

#### International Steelmaker

- 320,000 employees
- 4,500 users of SAP BI
- 3.5 terabytes of data

#### Multinational Consumer Products Company

- 63,900 employees
- 4,500 users of SAP BI
- 4.5 terabytes of data
- 350,000 queries per month

#### Multinational Pharmaceuticals Company

- 100,700 employees
- 4,000 users of SAP BI
- 1 terabyte of data
- 400 daily data loads in global system

Sources: Company reports

## Easy Deployment and Maintenance

The BI Accelerator “snap-in” device, which combines transactional and analytical capabilities into a single process, has been easy for IT departments to deploy and maintain, thus simplifying the IT infrastructure. One multinational consumer products company performed the proof of concept of the BI Accelerator in only five days and went into production within six months. In addition to material dollar savings in infrastructure and a large increase in user adoption, the system performance improved significantly: 87 percent of all queries run in less than a second, and 98 percent run in less than 10 seconds.

“This dramatically improves the decision-making and maximizes the value of the transactional system,” says the company’s senior manager of data warehousing. “In the pre-BI Accelerator days, the response time was never consistent and predictable.”

Some 4,500 users send out 20,000 queries a day at this firm, leveraging 5.5 terabytes of data. “Business intelligence has always been a part of our culture,” the IT executive says. “We need tools that provide capabilities rapidly with a pleasant user experience.”

The consumer products company had been on a steady trend of purchasing extra capacity to maintain the performance of its mainframes before installing the BI Accelerator. “After we put the BI Accelerator in place, that dropped off immediately,” the executive says, “and we continued to take off aggregates, allowing us to put those [personnel] resources somewhere else.”

Other companies that have adopted the BI Accelerator echo that experience. “We have saved a huge amount of time on maintenance, tuning, tweaking, design and turnaround time for the end users,” says the director of enterprise technology at a U.S.-based pharmaceuticals company.

## Delving Deeper Into Data

The performance increase from the BI Accelerator does not just let users perform tasks faster; it allows them to perform data analysis at the most granular layers. “One of our dashboards has 30 queries associated with it; users can slice and dice data in more ways than ever before,” says the pharmaceuticals executive. If, for instance, the CFO wants to see any part of 100 rows of summary data, he can drill down quickly.

In addition, data can be looked at in new ways. For example, the pharmaceuticals company purchases massive amounts of data about competitors that the firm keeps in a standalone data warehouse with a separate team of analysts. The volume of information—hundreds of millions of rows of data—was such that the company could not marry that third-party data to its own transactional data.

“We have had a problem since day one with handling large amounts of data, and the BI Accelerator will give us a way to do this very simply,” the IT executive says. “This will give us a better foothold on what the trending is, letting us know whether a sales call actually results in a prescription and whether we are purchasing the right data.”

Increasing the speed of business intelligence systems also lets users think of ways to make better use of the BI system. “It used to be people ran a lot of detailed BI reports,” says Masciandaro of Rohm and Haas Company. “Now, half go through dashboards, where the response time is three to five seconds instead of 30 to 40 seconds. They push the button, get an immediate response and can really get into the data.”

That means the company will be able to make greater use of the data once the system is fully installed. “We hadn't thought about the increase in usage,” he says. “If the response time is faster, people click more.”

Table 2

### BI Accelerator Performance Boosts

*Leading companies turn to BI Accelerator to accommodate more users and growing volumes of data.*

Company	Performance Increase
T-Mobile UK	Increased flexibility, analytical detail
Global beverage manufacturer, distributor and marketer	Performance increase in 92% of queries
International steelmaker	Response time duration divided by 3 to 200. Database read time access for 1 million rows went from up to 90 seconds to less than 4 seconds
Multinational consumer products company	87% of all queries take less than 1 second, 98% less than 10 seconds
U.S.-based pharmaceuticals company	100 to 300 times faster performance

*Sources: Company reports*

Companies are just beginning to appreciate the value of those extra clicks—and how meaningful quicker availability of information can be to end users. An international steelmaker, for example, runs 10 SAP BI installations, serving 4,500 BI users.

“If a user is asking for information from a transactional system, that could take three to four seconds,” says the company’s lead of BI Architecture. “However, the data from the BI system could make them wait for 10 to 30 seconds. When they are waiting for this answer, it costs a lot.”

The IT executive is speaking not just about the cost of user time from waiting. An even more detrimental effect of the delays is keeping users from giving their full attention to the topic they are researching. “When people are using or navigating within a BI report, every time the wait is more than 10 seconds, they tend to switch to another application, like opening mail,” he says. This leads to reduced usage of BI tools and a less thorough analysis of the information using those tools.

One of the biggest surprises to the beverage manufacturer’s BI architect was how quickly users gravitated toward the BI system after the BI Accelerator was introduced. On the very first day it was implemented, queries increased dramatically on an hour-by-hour basis. Once users realized the long waits for information had been significantly reduced, they delved deeper into the data—precisely what the company wanted.

“As soon as they saw that a query that took 20 minutes yesterday only took two minutes today, they immediately opened up their queries and began filtering less,” he says. Queries per week rose 61 percent, and the data executed per query increased 370 percent.

## Conclusion

The featured customers’ experience with the SAP BI Accelerator—BI system performance improvements of a factor of 300 or better—appear to be typical of what other large organizations can expect if they adopt the technology. These featured customers not only experienced dramatic system performance improvements, but they were able to meet their business objectives—empowering more employees with more insights to make better decisions.

Substantial performance benefits also were found when an independent lab tested a configuration. WinterCorp, an independent research and consulting firm that specializes in database scalability, ran a series of performance tests on the appliance in comparison to a system using conventional processors alone. As chart 4 (“Improved Query Response Time”) on the left shows, the appliance reduced the mean query response time by almost 75 percent. Furthermore, the appliance sharply reduced the range of response times for queries.

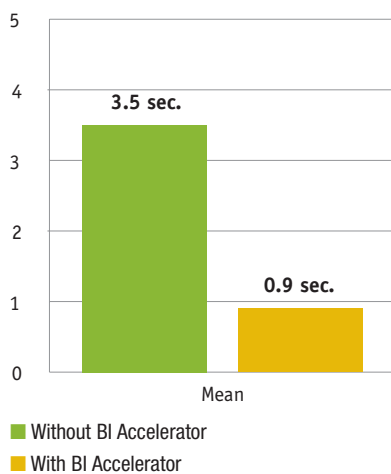
Indeed, in some cases the BI Accelerator has been so successful that it raises the bar for other applications. “Users and executives will expect that sort of performance from every system,” says the director of enterprise technology at the U.S.-based pharmaceuticals company.

That, of course, is a nice problem to have. No wonder the project leader of IT Finance at the multinational pharmaceuticals company notes that the benefits provided from the BI Accelerator have “changed the perception of business intelligence in our organization.”

Chart 4

### Improved Query Response Time

*BI Accelerator increases query flexibility and promotes predictable performance.*



Source: WinterCorp



# Intel and SAP—Innovating for the Future Today

SAP® has delivered enterprise applications that improve the visibility and control of complex operations for over 30 years. Through better resource management, information flow and business intelligence, SAP gives companies of all sizes the tools they need to think more strategically and execute more efficiently throughout their value chain.

Intel® has supplied innovative computing and communications technologies for high-end enterprise servers, mid-range processors, business desktops and mobile devices, powering business solutions everywhere.

SAP and Intel not only understand the challenges businesses face in today's volatile global marketplace, but since 1994 they've worked together to offer a powerful set of optimized solutions on innovative platforms that help companies quickly adapt their strategies and execution. Currently, more than 74 percent of new SAP installations are deployed on Intel platforms.

The collaboration continues with a proven software and hardware solution that delivers lower costs coupled with the flexibility, scalability and performance needed in today's marketplace.

## Supercharging Business Intelligence

The volume of available information is ever increasing, as is the number of consumers of business intelligence within an organization. However, the volume and demand for real-time insights strains existing resources.

To meet this challenge, SAP offers a new solution—the SAP NetWeaver BI Accelerator. This “snap-in” appliance was developed in conjunction with Intel. It enables businesses to supercharge analytic services and applications by combining high-performance software from SAP NetWeaver with an advanced hardware design from Intel that boosts analytics performance.

The SAP NetWeaver BI Accelerator processes highly complex queries in seconds rather than minutes or hours. It not only delivers actionable information faster but also dramatically reduces the amount of support that an organization's IT department must provide for analytics. Furthermore, the technology enables an entirely new breed of process-embedded analytic applications.

The SAP NetWeaver BI Accelerator runs on standard 64-bit Intel processor-equipped “blade” systems. To activate the accelerator, IT management simply connects the appliance to the existing BI infrastructure of SAP NetWeaver and performs a few easy configuration steps.

With the SAP NetWeaver BI Accelerator running on Intel processors, organizations empower their users to make the best decisions and take the best actions possible on behalf of the business. At the same time, it helps to free IT management to look for innovative ways to employ BI while keeping capital costs within budget—even while bringing on more users and finding more information sources.

For more information on the Intel and SAP alliance and our joint Business Intelligence solution (BI Accelerator), please visit: <http://www.SAPIntelAlliance.com>

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