Data Management Wish List:
IT Is Open to Big Changes

Armies may march on their stomachs, but businesses march on their data. If a company's operational, market or competitive data is old, inaccurate or simply hard to access and analyze, the consequences can be dire. On the positive side, companies able to rapidly collect and leverage meaningful data can significantly improve their battlefield prospects.

Data management, access and analysis haven't always received the same amount of consideration, or respect, as the corporate applications that generate and consume the data. In recent years, however, IT leaders have focused much more attention on their organizations' data management platforms and capabilities. The reasons for this shift are twofold:

1. An expanding collection of systems—from corporate IT systems and cloud services to smartphones and social media networks—is generating massive amounts of potentially valuable raw data.

2. The speed of doing business has accelerated, putting much more pressure on companies to find data almost instantaneously and to mine that data for valuable intelligence almost as quickly.

Beyond these fundamental business realities, other market and technology trends are putting new pressures on existing data management infrastructures. Everything has direct ramifications in the data management world, and some of those ramifications aren't pretty.

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To get a better picture of the current data management landscape and its likely evolution, IDG Research Services surveyed 100 senior-level and 100 midlevel IT managers in June 2012 regarding their data management and analysis objectives, challenges and plans. The two groups of managers largely shared the same perspectives about the topics covered, although some interesting differences did emerge. Among the survey's key findings:

■ The total cost of ownership (TCO) remains a top evaluation criterion for data management systems, and budget constraints are a major challenge.

■ Improved access to real-time data and analysis also tops the list of data management objectives.

■ Nearly half of the survey respondents expect to evaluate new data management approaches within the next two years, and more than one-quarter are considering moving to an entirely new database platform.

■ There is a strong preference for an integrated software platform for meeting data management needs.

The 200 survey respondents represented a variety of industry and government/nonprofit sectors as well as a range of organization sizes. More than half had 10 terabytes or more under management, and nearly one-quarter had 100 terabytes or more.

TCO and Access to Real-Time Data and Analysis Are Top IT Objectives

To get a sense of where the IT managers want to take their data management environments, IDG Research Services analyzed top objectives, which, of course, also often reflected areas of existing need or shortcomings in the current data management infrastructure. Given the still struggling world economy—as well as organizations' perpetual focus on the bottom line—it wasn't surprising to find respondents identifying "managing costs and efficiencies" as their top data management objective for the coming two years.

Not far behind was the need for better access to and analysis of real-time data, which was cited by 46 percent of the respondents. This need encompasses both operational data stored in relational database records as well as data aggregated in columnar databases for more-efficient trend-spotting and other real-time analysis. The real-time-data requirement actually ranked as the top objective for the coming 12 months but was eclipsed by the cost-and-efficiencies need when respondents looked out 24 months.

In today's always-connected, always-on world, customers, employees, supply chain partners and others have come to expect immediate access to the information they seek and have little patience if an organization's systems can't deliver. Likewise, companies can't afford to analyze their data for meaningful sales trends, cash flow status, inventory trends or marketplace shifts with a backward-looking batch mode approach. Even waiting until off-hours to mine operational data for such valuable insights can sometimes cause companies to miss fleeting opportunities or be unable to counter fast-emerging threats.

"There should be as little latency as possible between a the occurrence of a transaction and a company's being able to mine information from that event," says Irfan Khan, senior vice president and chief technology officer at Sybase, the data management firm that is now an SAP company. "As important, if you don't have a real-time-data platform, you won't even be able to build the next generation of applications."

FIGURE 1. **TOP DATA MANAGEMENT OBJECTIVES**

Top Data Management Objectives — Next 12 Months	Senior IT	Mid-level IT	All Respondents
Managing costs and efficiencies across a complex infrastructure	56%	55%	**56%**
Enabling better access and analysis of real-time data (both operational and aggregate data)	46%	46%	**46%**
Improved ability to support the remote/mobile workforce	44%	38%	**41%**
Enabling better customer responsiveness	38%	37%	**38%**
Increased alignment and integration with internal business partners	26%	34%	**30%**
Improving the ability to react quickly to changes in the market and identify opportunity	30%	27%	**29%**

SOURCE: COMPUTERWORLD; BASE: 200 (100 Senior IT and 100 Mid-level IT)

The strong demand for access to and analysis of real-time data is sometimes overshadowed by narrower but high-profile needs such as those resulting from the trend toward big data. However, although big data management and analysis are critical needs for some, mostly large companies, it was cited as a top objective by only one-fifth of the respondents, compared to the nearly half who want real-time-data capabilities.

Other primary objectives—supporting remote/mobile workers and enabling better customer responsiveness—represent, respectively, a need to deal with a new operational reality and a long-standing business objective. The rapid proliferation of smartphones, tablets and other mobile devices means that companies must both collect and manage data generated by these devices as well as give access to data residing in corporate stores or in the cloud. Companies often focus initially on the importance of securing mobile and cloud-based data but soon come to realize that their systems must also be able to keep mobile and centrally stored data closely synchronized and—once again—available in real time. Organizations can't afford to have their sales force or their field technicians working with data that is old or inaccurate.

Clearly, the mobile data capabilities that companies desire will also help them realize their goal of providing better customer responsiveness. Real-time access to customer data is important for employees working in central call centers, of course, but is also needed by workers in the field if they are to deliver better customer service. More globally, companies need systems that give employees not only immediate access to customer accounts but, ideally, also access to analytic systems that help companies anticipate customer needs.

The senior-level and midlevel respondents were in close agreement on most of the top objectives. One exception was in the mobile workforce category, support for which more senior managers than midlevel managers cited as a top need. This disparity may reflect the upper-level managers' greater awareness of the strategic value of supporting mobile workers.

On the flip side, more midlevel managers than senior IT managers cited increased alignment and integration with internal business partners as a top objective. Senior IT certainly understands the need for such alignment, but it is probably a higher-priority item for the midlevel managers who must deliver it.

Budget Constraints and Data Volumes Lead Data Management Concerns

Although there was generally a high degree of alignment between the senior and midlevel IT managers regarding the top data management objectives, there was more divergence when it came to identifying top challenges. The two groups did closely agree on their top challenge: cost and budget constraints, cited by approximately half in each group.

Beyond that agreement, opinions were in and out of alignment on various other issues. For example, senior and midlevel IT respondents listed increasing data volumes as their second-most-important challenge, but 50 percent of the midlevel managers cited this issue and only 39 percent of the senior IT people did.

FIGURE 2. **TOP DATA MANAGEMENT CHALLENGES AND LIMITATIONS**

	Senior IT	Mid-level IT	All Respondents
Cost and budget constraints	55%	53%	**54%**
Increasing data volumes	39%	50%	**45%**
Integrating and managing siloed data and applications	33%	32%	**33%**
Inadequate staffing for database management and maintenance	25%	32%	**29%**
Scalability	26%	31%	**29%**
Data redundancy	25%	31%	**28%**
Too many tools/interfaces	28%	27%	**28%**
Data quality	30%	22%	**26%**
Complex to use or administer	26%	26%	**26%**
Slow querying/reporting speed	18%	31%	**25%**
Difficult to maintain	24%	22%	**23%**

SOURCE: COMPUTERWORLD; BASE: 200 (100 Senior IT and 100 Mid-level IT)

Even in cases where the data management infrastructure is performing acceptably, it tends to be "meeting" expectations more than "exceeding" them.

Midlevel managers tended to be more concerned about technical challenges than their senior-level associates. In addition to the data volume issue, midlevel respondents flagged technical challenges such as scalability, data redundancy and slow querying/reporting speed in greater numbers than senior IT survey participants did. Also of more concern to the midlevel managers was inadequate staffing for managing and maintaining the data management infrastructure.

Many of the technical and staffing travails afflicting midlevel IT personnel relate to the mushrooming data volumes driven by the multitude of interconnected devices and organizations that constitute the modern IT landscape. Although falling disk and memory prices make it practical to store once-unimaginable amounts of data, this storage capacity puts significant pressures on IT for rationalizing, synchronizing, accessing or analyzing massive data volumes.

Meanwhile, in a likely reflection of senior IT's concerns about the strategic value of good data,

this group of respondents pointed more often to the data quality challenge. Why senior IT is significantly more concerned about the inability to support diverse data sources is a bit less clear. Again, it is possible that senior managers have a broader appreciation for the need to tap a wide range of information sources to remain competitive in today's data-driven world.

Current Data Management Satisfaction Levels

In addition to gauging data management objectives and concerns, the IDG Research Services survey provided a snapshot of satisfaction levels relating to respondents' current data management infrastructure. On the bright side, respondents indicated that their data infrastructure is often meeting their needs across a range of functional and operational metrics. On the not-so-bright side, a high percentage reported that their infrastructure is falling short of expectations in certain areas.

FIGURE 3. **EFFECTIVENESS OF THE CURRENT DATA MANAGEMENT ENVIRONMENT**

Effectiveness of Current Data Management Environment in Each Area	Exceeding expectations	Meeting expectations	Falling short of expectations	Not applicable	Unsure	Top 2 (NET)
Fit with existing infrastructure	15%	68%	12%	2%	4%	**83%**
High availability/reliability	13%	66%	13%	3%	3%	**79%**
In-house expertise	16%	62%	20%	1%	3%	**78%**
Scalability	10%	67%	18%	2%	4%	**77%**
Availability of data management tools	9%	66%	21%	2%	3%	**75%**
Ability to use the database as a foundation for other in-house applications	14%	59%	21%	4%	3%	**73%**
Ability to handle complex queries	12%	57%	24%	4%	4%	**69%**
Ease of training/certifying on the solution	9%	59%	26%	4%	3%	**68%**
Ease of management/maintenance	8%	59%	26%	3%	5%	**67%**
Ability to deal with diverse data sources	9%	58%	25%	5%	4%	**67%**
Total Cost of Ownership	13%	53%	29%	2%	4%	**66%**
Querying/reporting speed	9%	57%	28%	3%	5%	**65%**

SOURCE: COMPUTERWORLD; BASE: 200 (100 Senior IT and 100 Mid-level IT)

Companies often focus initially on the importance of securing mobile and cloud-based data but soon come to realize that their systems must also be able to keep mobile and centrally stored data closely synchronized and—once again—available in real time.

The bottom line: Even in cases where the data management infrastructure is performing acceptably, it tends to be "meeting" expectations more than "exceeding" them. The top-ranked "exceeding expectations" category was in-house expertise. The fact that in-house expertise ranked high says more about the staffing capabilities of the respondents' companies than it does about the quality of the data management infrastructure itself. And in an environment of ever-increasing data management demands and real-time-data dependencies, simply meeting old expectations won't make the grade.

Meanwhile, the two areas in which expectations have come up the shortest proved critically important. TCO, the top-ranked objective, is also the area of the greatest shortcoming, with 29 percent noting unmet expectations. Querying and reporting speed—another top objective—was cited as falling short by 28 percent of the respondents. It isn't too big of a leap to assume that this shortfall is one of the main factors behind the earlier ranking of access to and analysis of real-time data as the second-most-important data management objective.

When assessing the ability of existing data management environments to meet a diverse set of needs, midlevel IT managers were more prone than senior IT to see shortcomings. That higher degree of criticality makes sense, given that midlevel IT must deal directly with any operational and functional problems. Once again, however, the senior and midlevel IT respondents found common ground on TCO.

The combination of persistent needs and "wish list" objectives has many organizations planning to evaluate new data management solutions and approaches. Nearly half of the respondents said they plan to do so in the next 12 to 24 months. Senior IT proved more bullish on that planning, which suggests that it is highly likely that such evaluations will come to fruition.

Database Change Among Data Management Options

When it came to evaluating new data management solutions, the survey respondents expressed their opinions on three different approaches or initiatives:

- 55 percent reported that they would aim to provide increased access to real-time data, a top objective in data management.

- 51 percent said they would consider consolidating their existing database platforms.

- 50 percent suggested that building out applications on an existing database platform is a consideration.

These three areas of consideration aren't mutually exclusive, of course, and could in many cases be complementary to one another.

Most telling of the shortcomings in existing data management infrastructure—and/or the pressing need for more functionality and better economics: Roughly one-quarter of the survey respondents cited a willingness to move to an entirely new database platform.

"I'm not surprised that 27 percent overall are willing to move to a new data management infrastructure," says Steve Lucas, executive VP and general manager of SAP's Database and Technology organization. He cites several data management trends and challenges—including the rise of big data applications, the growing popularity of the Apache Hadoop distributed application solution, the growth of social media and other unstructured data and the need for real-time analysis—as catalysts for making a change. "Many companies are weighed down by legacy database infrastructures that can't marry all these trends and concepts," he adds.

Despite the incentives to considering a database change, the survey highlighted several barriers to following this path. Economic issues come into play here, as do strong concerns about data migration. However, aside from these two issues, all the other database change challenges—such as data integration, time constraints and ROI justification—garnered mention by only 35 percent or less of the respondents. These relatively low percentages suggest that, overall, the challenges of moving to a new database platform aren't seen as overwhelming by a majority of the respondents.

Beyond the challenges specifically associated with moving to a new database, the survey explored the top criteria organizations would use when evaluating new data management solutions. These criteria need to reflect more than the organizations' current data management activities. They must also address the demands presented by ever-escalating data volumes and the requirements of newly emerging real-time applications.

Notably, when the survey participants were asked about the importance of different features and issues, TCO ranked second, not No. 1. Sitting at the top of the criteria list was high availability and reli-

ability. As much as CEOs and CFOs may want IT to rein in capital expenses and operational costs, TCO can't take precedence over the fundamental need to keep systems up and running reliably. Any cost savings initially realized can quickly evaporate if a company's employees can't access the data they need in order to do their jobs or if customers can't access a Website to conduct business.

The study revealed a dramatic gap between the effectiveness of existing databases and the criteria considered to be critically or very important. Alarmingly, some of the biggest discrepancies exist in the areas of greatest importance to the survey respondents: respondents suggested that their companies are falling short in implementation to meet the highly important need for lower TCO and the top-ranked requirement for high availability and reliability. Going forward, if IT managers can't deliver to meet these critical needs, they won't be able to count on having much job security. Undoubtedly, these and other gaps are factors that motivate organizations to consider new data management solutions and even new database platforms.

An Integrated Approach to Data Management

Organizations exploring new data management solutions have no shortage of products and approaches to consider. Broadly speaking, though, most data management solutions fit within one of three main categories:

1. Turnkey hardware/software bundles

2. Custom-built solutions

3. Integrated software platforms

Each of these categories has its pros and cons. Turnkey solutions, for example, provide organizations with a prebuilt and preintegrated data management environment that contains all the hardware and software needed to get up and running quickly. Such solutions, however, can be relatively expensive and—more importantly—can sometimes lock customers into vendor-specific platforms and solutions.

Custom-built solutions—often delivered in part or in their entirety by third-party consultants—have

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FIGURE 4. **TOP CRITERIA FOR EVALUATING NEW DATA MANAGEMENT SOLUTIONS**

Importance of Criteria When Evaluating Data Management Solutions	Critical/Very Important (NET)	Critical	Very important	Somewhat important	Not very important	Not at all important
High availability/reliability	**89%**	51%	38%	11%	0%	1%
Total Cost of Ownership	**86%**	42%	44%	13%	1%	1%
Fit with existing infrastructure	**79%**	42%	51%	17%	5%	1%
Ease of management/maintenance	**78%**	25%	53%	20%	2%	1%
Scalability	**75%**	37%	38%	21%	5%	1%
In-house expertise	**75%**	28%	47%	22%	3%	1%
Ability to use the database as a foundation for other in-house applications	**74%**	24%	51%	19%	5%	2%
Querying/reporting speed	**73%**	23%	50%	25%	3%	1%
Availability of data management tools	**73%**	20%	53%	25%	2%	1%
Ability to handle complex queries	**72%**	25%	47%	23%	6%	1%
Ability to deal with diverse data sources	**62%**	21%	41%	29%	8%	2%
Ease of training/certifying on the solution	**61%**	19%	43%	31%	7%	1%

SOURCE: COMPUTERWORLD; BASE: 200 (100 Senior IT and 100 Mid-level IT)

By relying on open, integrated data management platforms, organizations can minimize their risks and maximize their rewards as their dependence on access to and analysis of real-time data skyrockets.

the potential advantage of giving customers a data management environment fine-tuned to meet their exact needs. This custom fit usually comes at a high price, however, and—as with the turnkey category—can involve proprietary elements that make it difficult to leverage off-the-shelf open data management solutions.

"Adopting the hardware-based turnkey approach seems like it would be too specific and restrictive," says Stephen Parks, IT manager at Absolute Analysis, a manufacturer of test equipment. "You'd be locked into the hardware the vendor chooses, and it would probably cost more. I also wouldn't want a huge amount of consulting involved, due to the high cost."

The concerns expressed by Parks seem to be shared by many of the survey respondents. By far the preferred approach to data management was to adopt an integrated software platform. This approach isn't tied to specific hardware and usually relies on adherence to open standards to provide a software platform that can be easily expanded and integrated with solutions from one or more vendors. Nearly two-thirds of the survey respondents found the integrated software approach to be either extremely or very appealing. This approach—which offers cost-effectiveness, flexibility and adaptability, which are greatly prized by nearly every corporate executive—proved particularly attractive to senior IT, with 70 percent of this group ranking it highly.

When it came to the custom-built category, a divergence was revealed between the respondent groups. Some 35 percent of the midlevel IT survey participants identified custom solutions as extremely or very appealing, whereas just 28 percent of the senior IT respondents gave this category one of these top two rankings. It's possible that more midlevel IT managers find the custom approach appealing because their ability to perform custom development themselves is often a central part of their job as well as an important résumé enhancer.

Delivering on Real-Time, Integrated Data Management

In aggregate, the IDG Research Services study paints a fairly comprehensive and consistent picture of the current data management landscape and its coming evolution. Organizations will always want to keep their capital and operational expenses at a minimum, regardless of the state of the economy, but they are

willing to spend as necessary to get the functional characteristics and high availability and reliability required of their data management systems. And no single functional demand tops the growing need for access to and analysis of real-time data.

This profile of data management needs and objectives aligns well with the product portfolio of SAP. The company expanded its data management presence in a big way with its mid-2010 acquisition of Sybase Inc. At the time, SAP had already developed SAP HANA®, an in-memory database optimized for near-instantaneous access to and analysis of real-time data and is cross-pollinating those capabilities with all the elements in the extensive Sybase portfolio.

"SAP HANA represents a brand-new concept in the database world," explains VP and general manager Lucas. "It delivers a consolidated database and column-based analytics engine. Before, you had to break out analytics, warehousing and prediction from the relational database. SAP HANA enables you to collapse the data management universe into a more efficient form."

SAP's open, standards-based integrated platform approach to data management and the company's highly optimized and efficient technology provide an attractive blend of high performance, easy integration and low TCO—right in line with the needs and objectives highlighted by the IDG Research Services survey. SAP's ability to leverage both SAP HANA and the various Sybase products is equally important in providing access to and analysis of real-time data for virtually any data management applications.

The scope of capabilities SAP has marshaled proves that solutions exist to not only meet but also exceed today's data management needs. When shortcomings fall in the most critical areas and real-time, next-generation applications outpace the capabilities of many legacy data management systems, it becomes clear that the status quo just isn't good enough.

Of course, no significant IT change is without risk—and that is certainly the case when it comes to altering or even replacing essential data management systems. But, increasingly, the riskiest strategy is to do nothing or to push a legacy system beyond its comfort zone. By relying on open, integrated data management platforms, organizations can minimize their risks and maximize their rewards as their dependence on access to and analysis of real-time data skyrockets. ■

SAP Extends Its Real-Time Capabilities with Sybase Portfolio

SAP's decision to acquire highly regarded Sybase, in mid-2010, caught many observers by surprise. Given its strong marketplace presence as a leading vendor of ERP, CRM and other applications, SAP was already well integrated with every important third-party database. In evaluating the most important industry trends, however, SAP decided that it couldn't afford to sit largely on the data management sidelines.

That realization—combined with the escalating demand for real-time data and analysis among its user base—initially drove SAP to create the in-memory SAP HANA® database. By bringing Sybase into the fold, SAP immediately expanded its market presence to include virtually all the components needed for full-scope data management.

"Sybase created a very elegant OLTP [online transaction processing] engine that had very little over-head," says Irfan Khan, senior vice president and chief technology officer at Sybase, an SAP company. "The Sybase DNA was also very open and supportive of industry standards." Those design principles helped Sybase integrate its data management products with those of other companies and have also proved beneficial to SAP as it works to integrate the elements of its multifaceted portfolio.

The resulting SAP real-time-data platform provides a seamless environment for integration of applications and the management of data. The SAP products include the following:

- **The innovative SAP HANA platform** — an in-memory platform that delivers extreme real-time performance for next-generation applications

- **SAP Sybase Adaptive Server® Enterprise (ASE)** — the company's flagship relational database management system (RDBMS), capable of supporting extreme transaction processing loads

- **SAP Sybase IQ server** — a scalable, column-based, highly optimized RDBMS for complex analytics tasks, reporting and high-speed queries

- **SAP Sybase SQL Anywhere solutions** — an embedded database platform and supporting tools optimized for mobile and remote devices and applications and their data access, management and synchronization requirements

- **SAP Sybase Replication Server® software** — data replication software that can be used, among other applications, to maintain business continuity by delivering disaster-recovery data, to keep data synchronized across diverse database environments and to migrate data from old database platforms to new platforms

- **SAP Sybase Real-Time Analytics Platform (RAP)** — a platform fine-tuned for the needs of capital market trading firms that can manage massive data volumes, provide high-performance data stream capture and leverage both an in-memory transactional cache for immediate data access and a historical store optimized for analytics

- **SAP Sybase Event Stream Processor (ESP)** — a complex-event processing (CEP) platform able to process and analyze multiple streams of high-speed and high-volume data in real time

- **SAP Sybase PowerDesigner software** — a powerful modeling tool for creating data, information and enterprise solutions that can help users better align IT operations with business goals

The expanding data management capabilities from SAP give it a greater ability to provide one-stop-shop solutions that blend its business process expertise with core application, middleware and data management products. For more information, visit **www.sap.com/database-solutions**.