

# **DATA CROSS-CURRENTS: 2011 SURVEY ON CROSS-PLATFORM DATABASE ADMINISTRATION**

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## EXECUTIVE SUMMARY

The rise of “Big Data”—terabytes and gigabytes of bits and bytes—may be overwhelming many database sites, but not simply due to sheer volume. With the proliferation of information, many new types and brands of databases are also springing up across organizations, creating new headaches for the data professionals who then must step in and properly manage these solutions.

As a result, there are many data sites now being informally administered by “accidental database administrators”—managers and professionals from other parts of the business with no formal DBA training. A new survey of data and IT managers finds that companies are only beginning to grasp the complexities that are arising with this proliferation of databases. The survey gathered input from 289 qualifying data managers who are subscribers to *Database Trends and Applications*, and was conducted by Unisphere Research, a division of Information Today, Inc., in partnership with Quest Software in March and April of 2011. Responses documented in this report are based only on those data managers who indicated that they manage one or more employees and have two or more database management systems on their premises. In total, 423 professionals responded to the survey.

Survey respondents represent a range of database sites in terms of size. A total of 17% are in companies at the upper end of the spectrum, with more than 500 instances on site. Another 11% have between 100 and 500 databases on site, and 28% have between 25 and 100. In 13% of the cases, respondents report that they directly administer more than 100 databases themselves, and 19% oversee between 25 and 100.

Three out of 10 of respondents come from very large organizations with more than 10,000 employees. But there is also a sizable contingent of small-to-medium-size businesses represented in the survey as well. In terms of industry groups, the largest segment seen in this survey consists of organizations involved in IT services and consulting, identified by 17% of respondents. The government sector is also heavily represented, with 11% of respondents representing federal, local or state agencies and organizations. Another 10% are with financial services firms. (See Figures 27-30 at the end of this report.)

### **The survey uncovered the following findings:**

- Respondents run a variety of database brands within their enterprises, led by Oracle, Microsoft SQL Server, and IBM DB2. Close to half run open source databases, and at least one-third run a variety of other brands.
- Integrating the data moving between multiple databases is considered the biggest challenge within multi-database management system environments. In most cases, home-grown solutions are used to manage across different brands.
- Most companies have databases under their roofs which are managed informally by someone other than a trained database professional. In many cases, these are single-purpose or edge databases, and companies simply don't have enough DBAs to go around to properly manage these environments.
- Most respondents support applications that can run across multiple databases—but licensing costs hold back multi-database adoption.
- Companies are forced to use a variety of database management tools to address each of their database environments. In most cases, this is only marginally effective.
- More than one-fourth of responding companies already have databases in the cloud—in most cases, private clouds. However, most respondents do not know if new tools or skills will be required to manage these new types of environments.

Part of the challenge being felt within many overworked, overstressed database operations is the need to support the additional sources and systems that are continually being added to the mix. “Every year we’re administering more and more databases but retiring less,” says a DBA with a large software house. “The challenges are mainly around the increased complexity of having more databases and even larger databases. Also keeping up with new features and functionality in the latest releases while still being able to support older releases that can’t be retired due to lack of vendor support for these legacy yet mission-critical applications.”

## DATA ENVIRONMENTS

**Respondents run a variety of database brands within their enterprises, led by Oracle, Microsoft SQL Server, and IBM DB2. Close to half run open source databases, and at least one-third run a variety of other brands.**

Responses to this survey were filtered on the basis of respondents' management responsibilities—if they were responsible for one or more people on staff (See Figure 1), and whether they supported more than one type of database management system. (See Figure 2.)

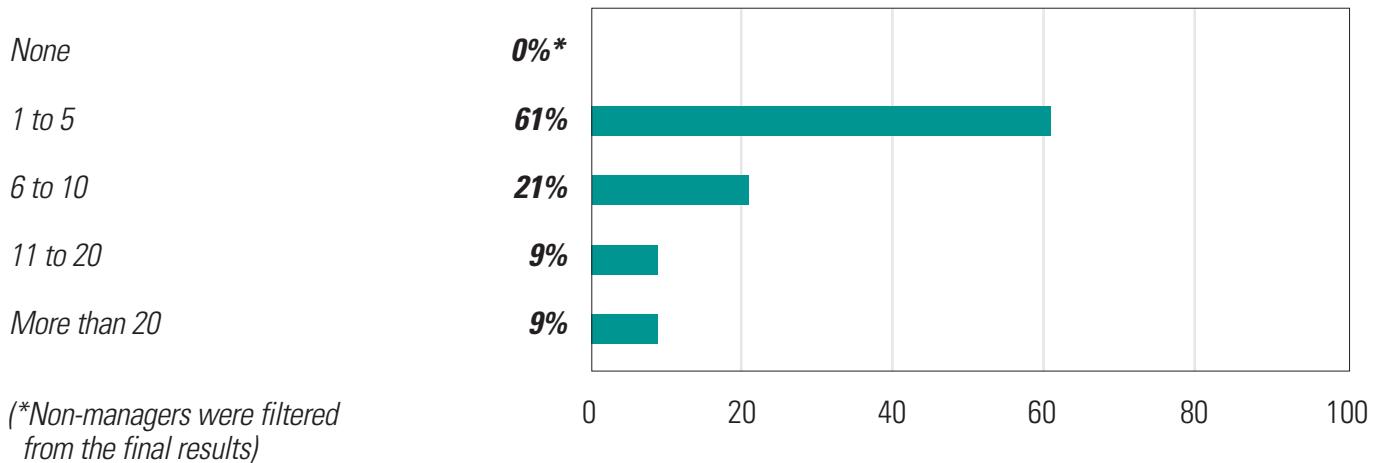
Among the 289 members of this group, there is a variety of database brands represented across their sites, from Microsoft SQL Server (76%) and Oracle (67%) to MySQL (38%) and DB2 (34%). (See Figure 3.) In terms of database environments viewed as "mission-critical" by respondents, Oracle leads the other brands

at 60% of respondents' sites, followed closely by SQL Server at 58%. DB2 z/OS—the mainframe implementation of IBM's DB2 database—ranks third on the list at 26%. (See Figure 4.)

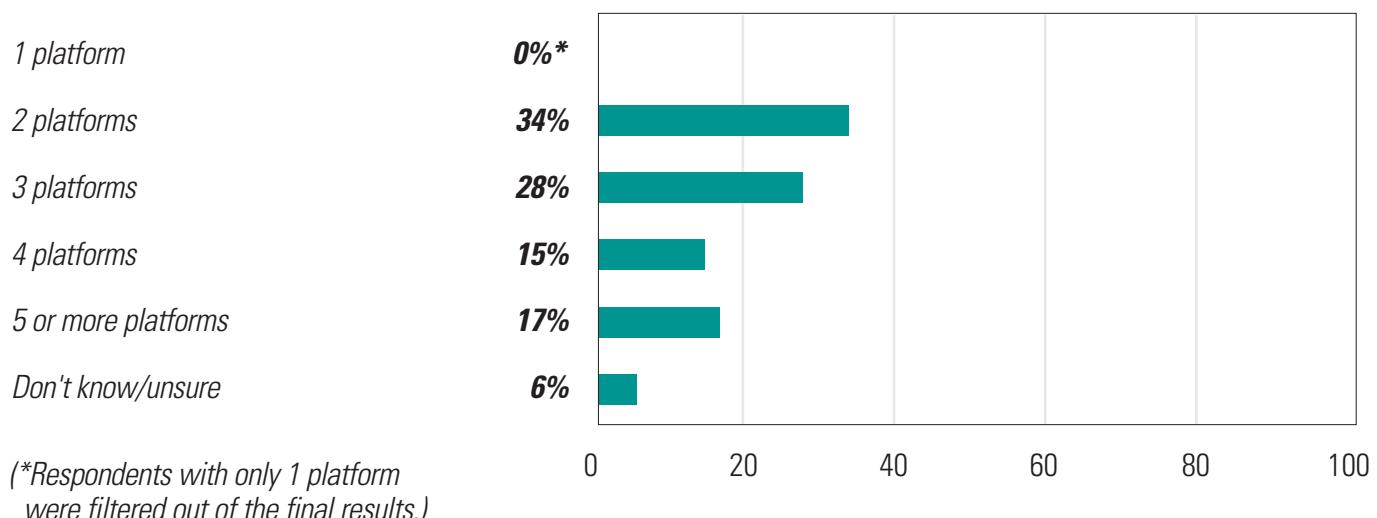
The largest segment of respondents in this survey consists of database administrators, as identified by close to one-fourth of the group. Another 16% are IT managers, and 11% identified themselves as database managers. (See Figure 5.) Accordingly, then, when asked where they focus most of their management efforts, close to half of the group indicated that they spend most of their time with database administration. (See Figure 6.)

In close to two-thirds of the cases, respondents report they oversee DBAs in their work. Forty-three percent also oversee programmers and developers, while roughly one-third manage systems analysts, architects, and administrators. (See Figure 7.)

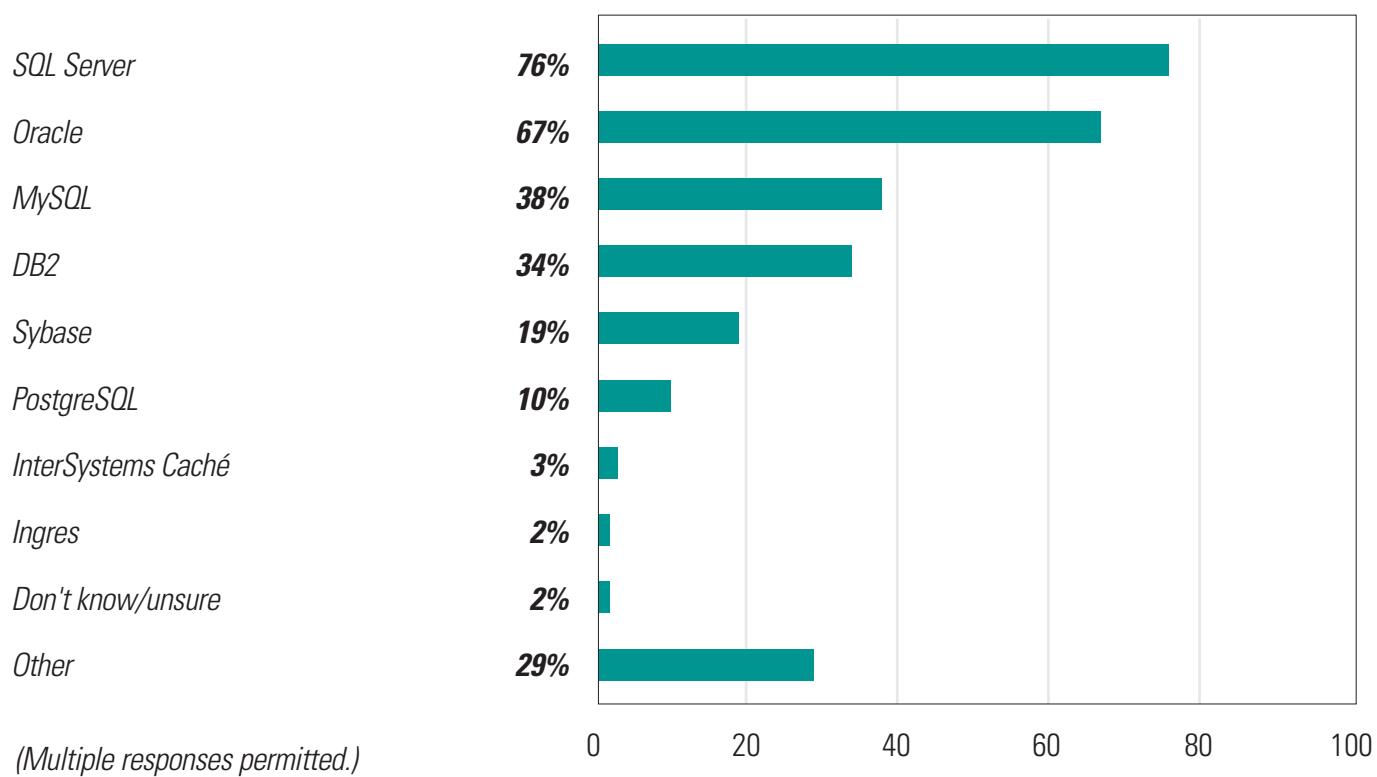
**Figure 1: Number of People Managed by Respondents**



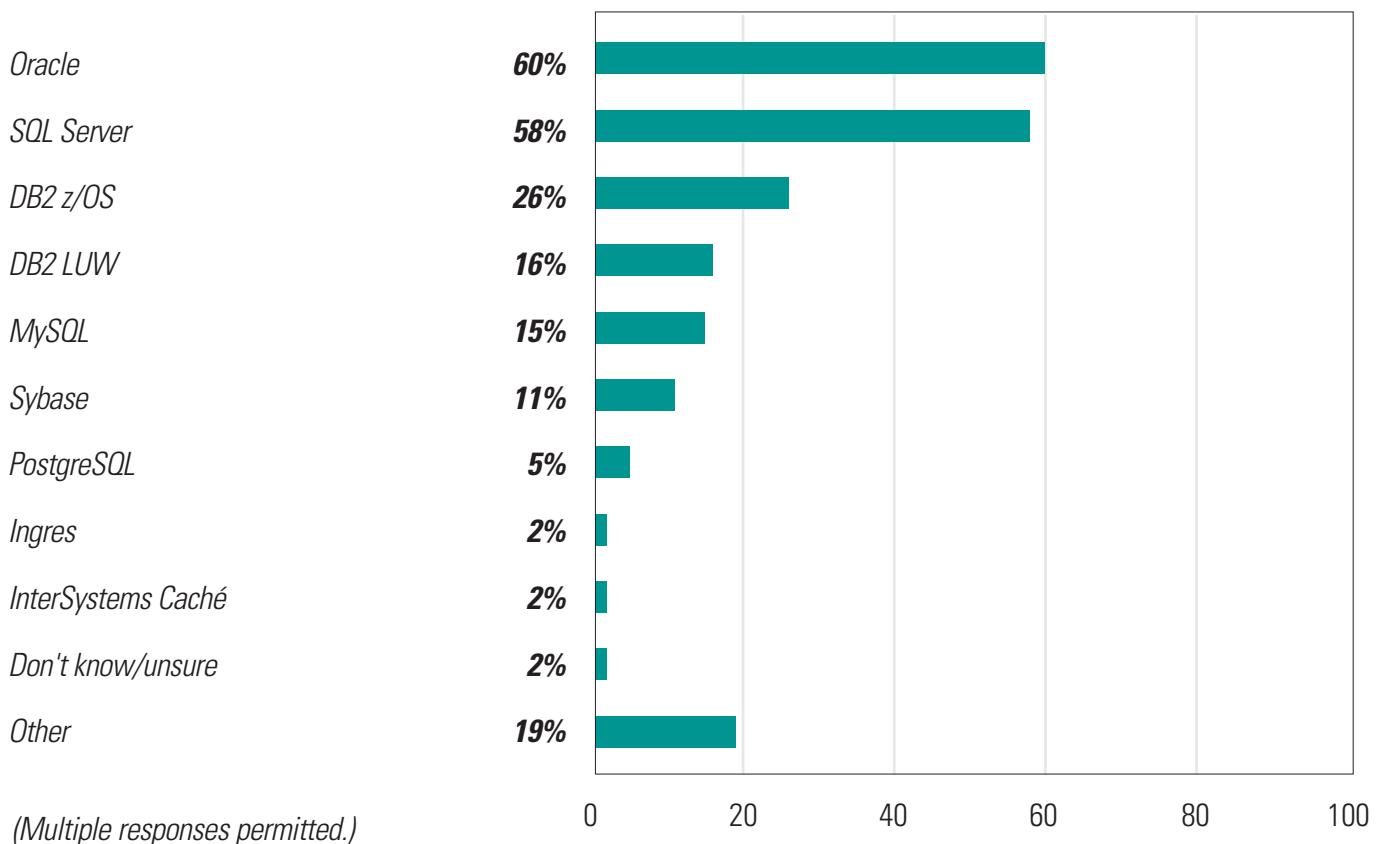
## Figure 2: Number of Database Platforms at Respondents' Sites



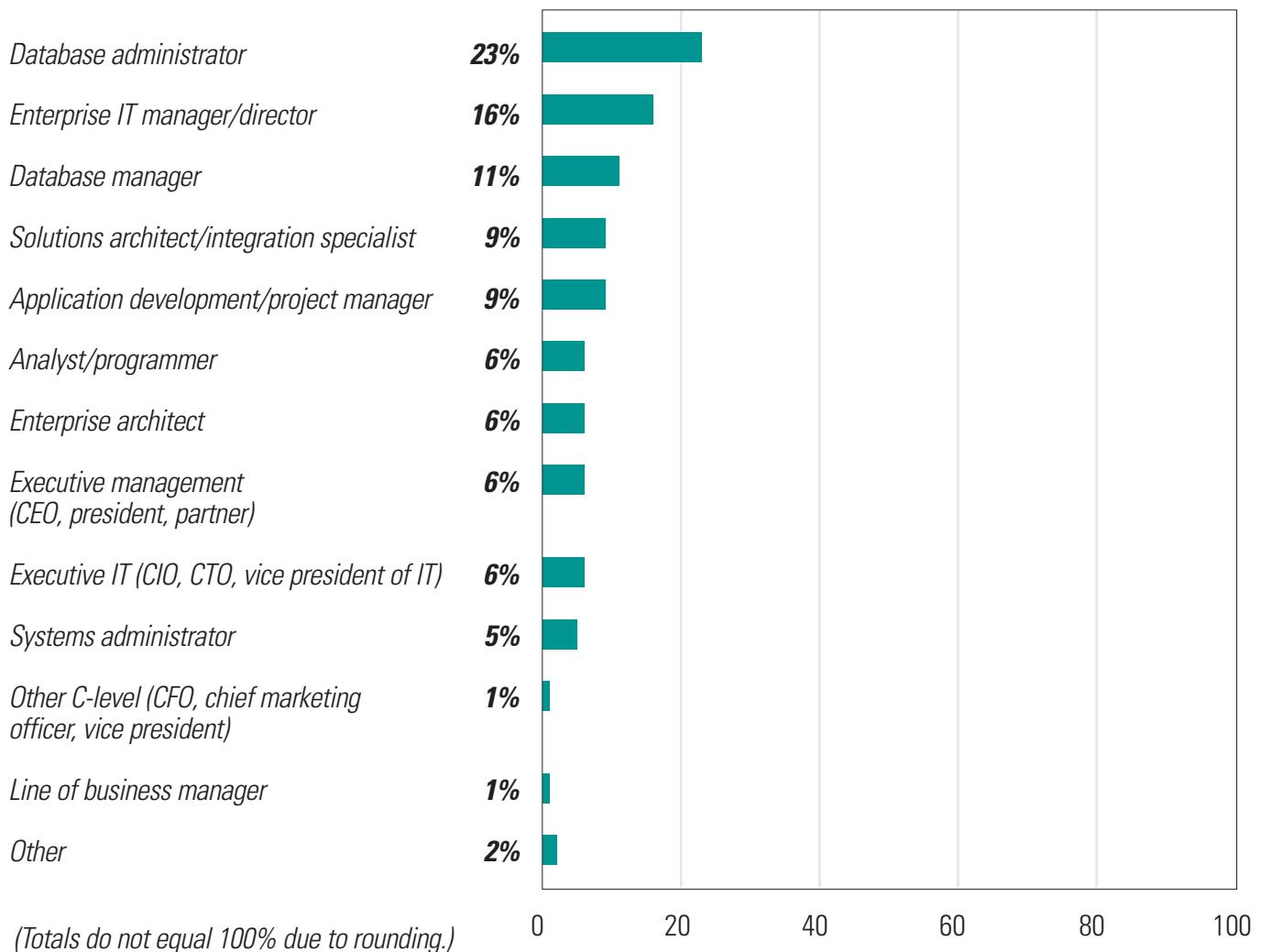
## Figure 3: Database Platforms Managed at Respondents' Sites



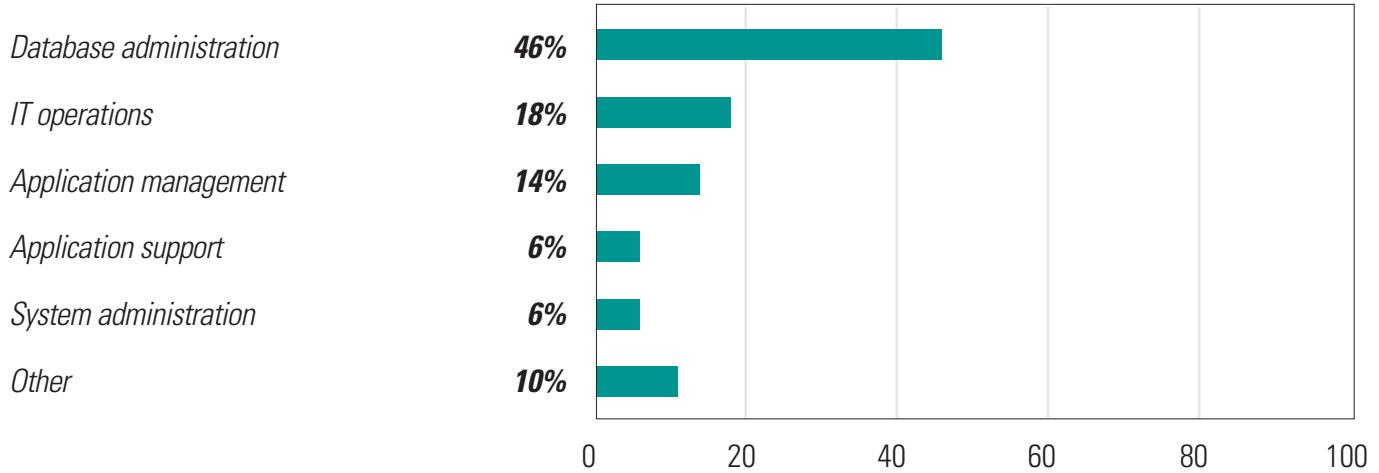
## Figure 4: Mission-Critical Database Platforms



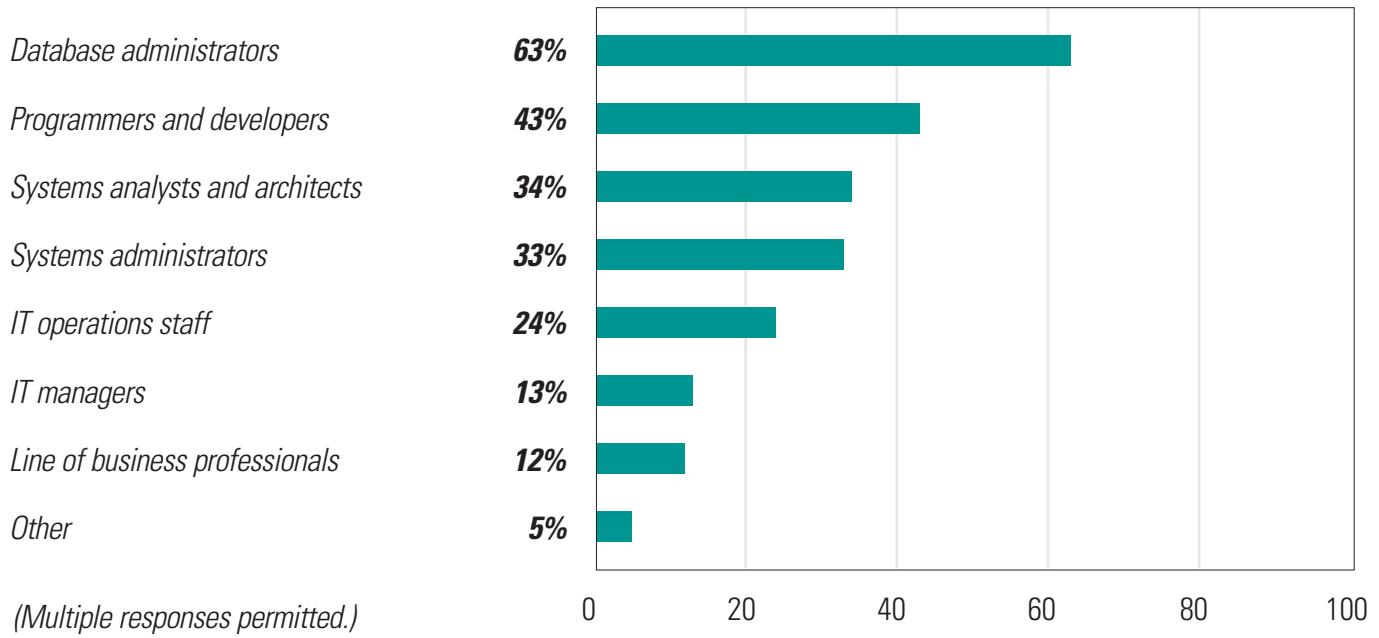
## Figure 5: Respondents' Job Roles or Functions



## Figure 6: What Respondents Are Managing



## Figure 7: Who Respondents Are Managing



## MANAGING MULTIPLES

**Integrating the data moving between multiple databases is considered the biggest challenge within multi-database management system environments. In most cases, home-grown solutions are used to manage across different brands.**

What kinds of challenges are respondents encountering in managing multiple types of databases? The largest segment of respondents, 41%, say they encounter issues with data integration. (See Figure 8.) As one respondent put it: "It's getting difficult for applications when there is data transfer from one DBMS to another. Also, when setting up multiple environments involving more than one DBMS for the same application, we run into lot of resource issues."

Another 37% report they are struggling with the costs involved in managing many different DBMS tool licenses. One-third of respondents say they simply don't have the skills within their organizations to learn and make use of the multiple tools that are required to manage each environment.

One respondent, an IT specialist with a small government agency, says his organization, in response to the growing tangle of data environments, will have to increase its training budget to keep up.

To meet the inherent challenges involved in managing multiple brands of databases, most respondents (70%) have built their own home-grown tools or engage in their own troubleshooting methodologies. (See Figure 9.) "People are hired with the appropriate skill sets, and are responsible for their area of expertise," says the president of a large IT services company. "Tools are built via agile development and are generalized as much as possible for cross-platform use."

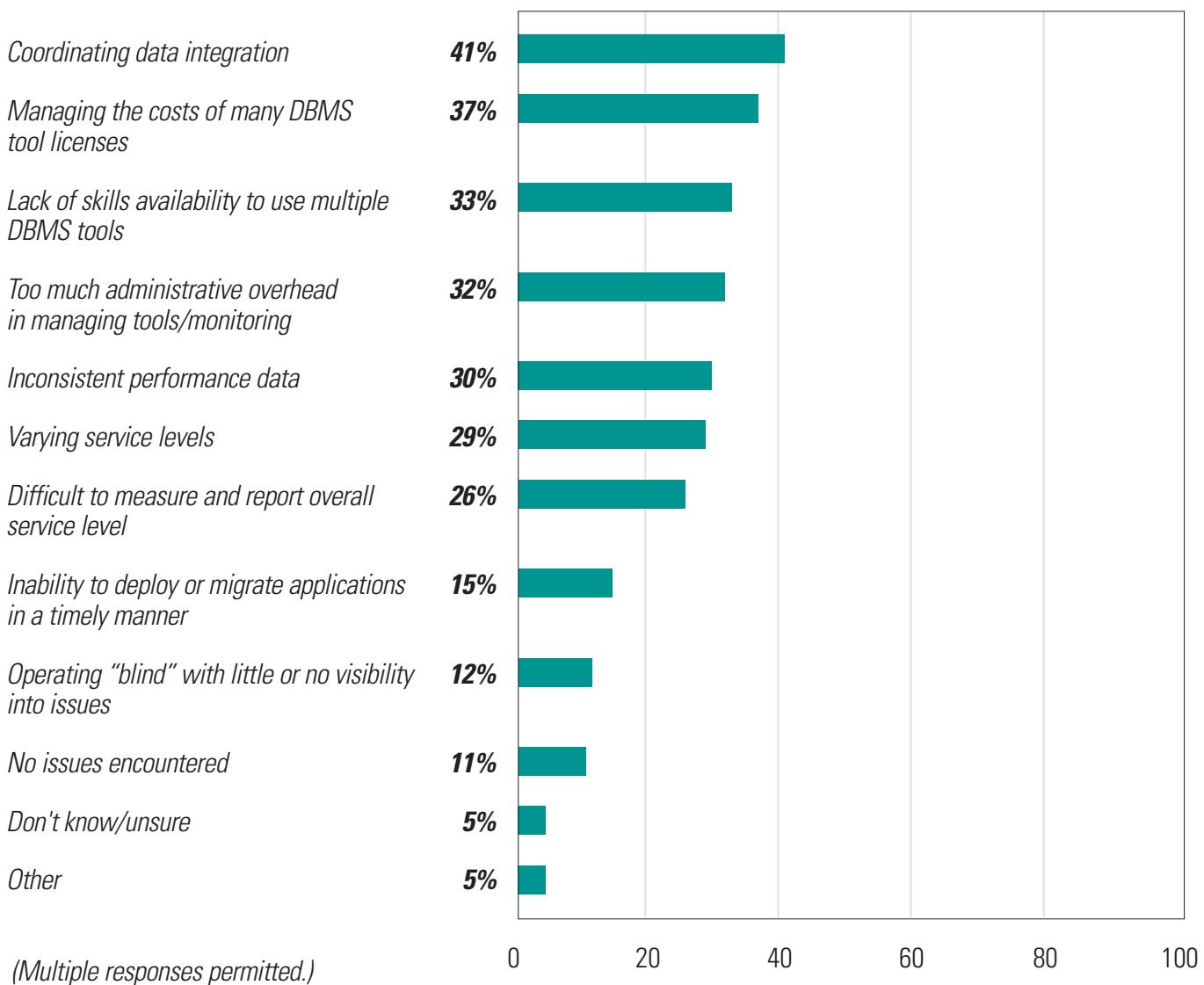
A sizable segment of respondents, 43%, also employs third-party cross-platform management tools to handle these environments. One-fourth also seek remedies through the large systems framework products, such as IBM Tivoli or CA-Unicenter. It's notable that 17% report they either take no proactive measures at all, or simply don't know what to do.

A majority of respondents, 52%, also say they are either have consolidated the number of DBMSs on their premises, or are taking steps to do so. (See Figure 10.) As one respondent, a DBA with a large state agency, explains, consolidation has been the most effective route for her organization. "We have made a concerted effort to reduce the variety of DBMSs and have been very successful. We are much less successful at reducing the number of database instances, it is growing rather than decreasing. In spite of severe budget issues we are very productively increasing the use of information technology in our organization, which is straining all of our resources including our DBAs," she relates.

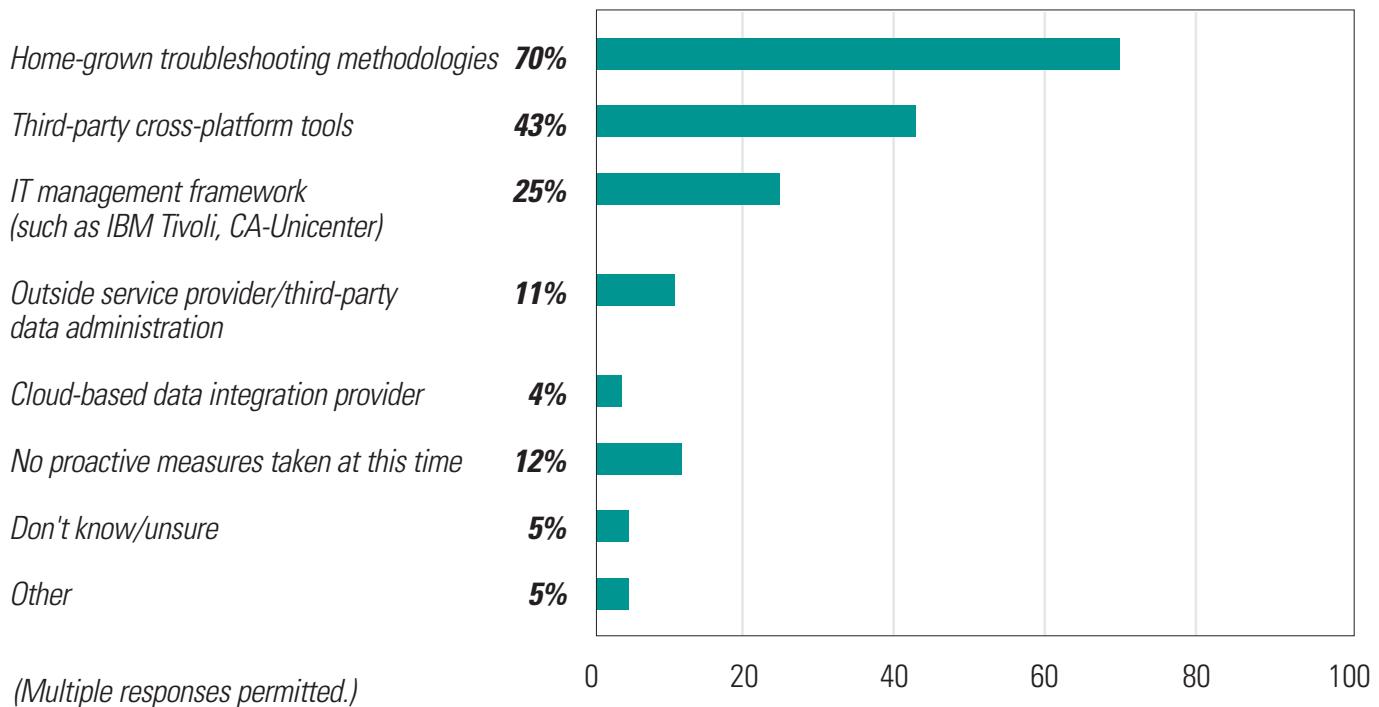
Respondents are evenly divided in terms of whether they deploy their DBA staffs to support multiple DBMSs or have them specialize in one brand. (See Figure 11.) A majority do provide at least some cross-training to their staff members to handle multiple DBMS platforms. (See Figure 12.)

Cost is always an issue in these environments, however. As one respondent, a DBA with a large manufacturing company, laments: "Our number of databases is growing slightly but the biggest challenge is managing a chaotic environment with no money to support operations. Our current environment is significantly below average and degrades daily. Backups have to be managed using USB drives, due to lack of network space and capacity."

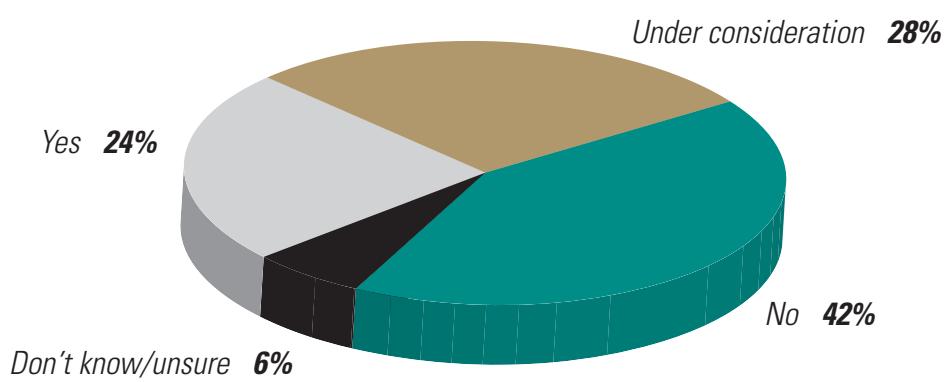
## Figure 8: Multiple DBMS Challenges



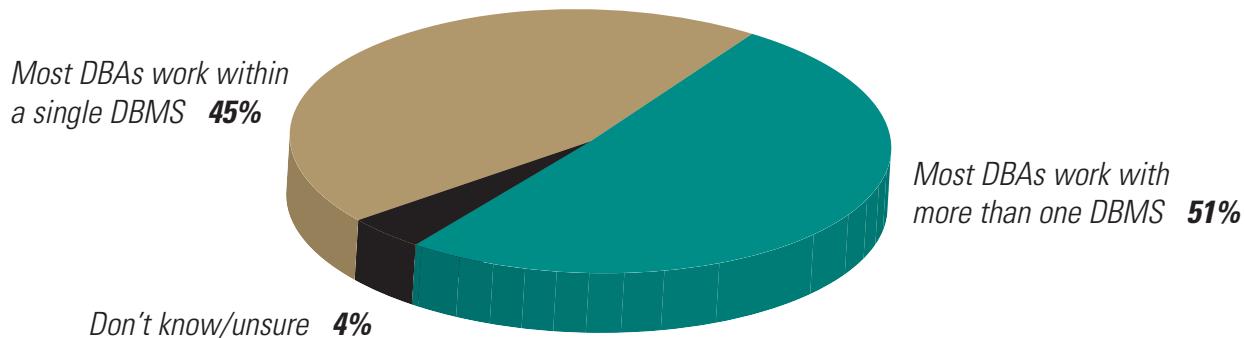
## Figure 9: How Multiple DBMS Platforms Challenges are Addressed



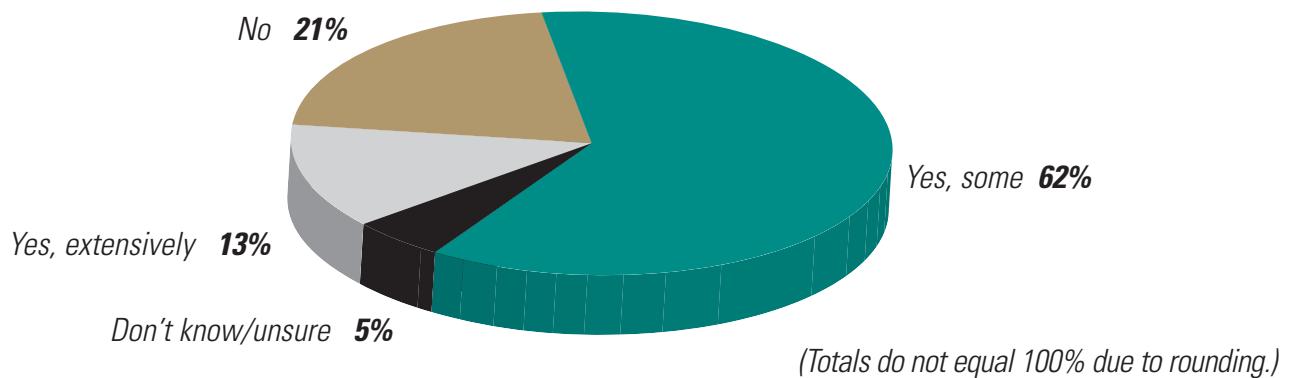
## Figure 10: Taking Steps to Reduce Number of DBMS Platforms?



## Figure 11: Do Most Database Professionals Work With Single or Multiple DBMSs?



## Figure 12: Provide Cross-Training for Multiple DBMS Platforms?



## RISE OF THE 'ACCIDENTAL DBA'

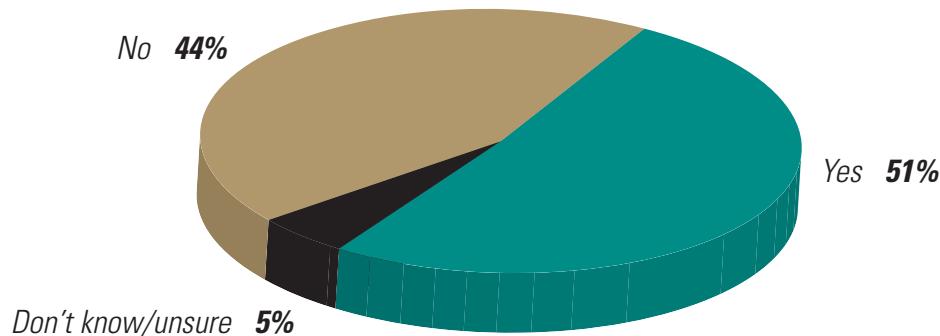
Most companies have databases under their roofs which are managed informally by someone other than a trained database professional. In many cases, these are single-purpose or edge databases, and companies simply don't have enough DBAs to go around to properly manage these environments.

A majority of respondents, 51%, report they have database platforms in their area of operations managed more informally by someone other than a dedicated DBA professional. In many cases, these "accidental DBAs" may be developers, power users, or simply generalists. (See Figure 13.) The largest segment, 39%, report SQL Server instances tend to be managed informally, with another one-third reporting MySQL is the domain of their accidental DBAs (which accounts for the bulk of MySQL sites in this survey.) Interestingly, 28% of Oracle instances—typically seen as more complex environments requiring specific, trained expertise—also are managed informally. (See Figure 14.)

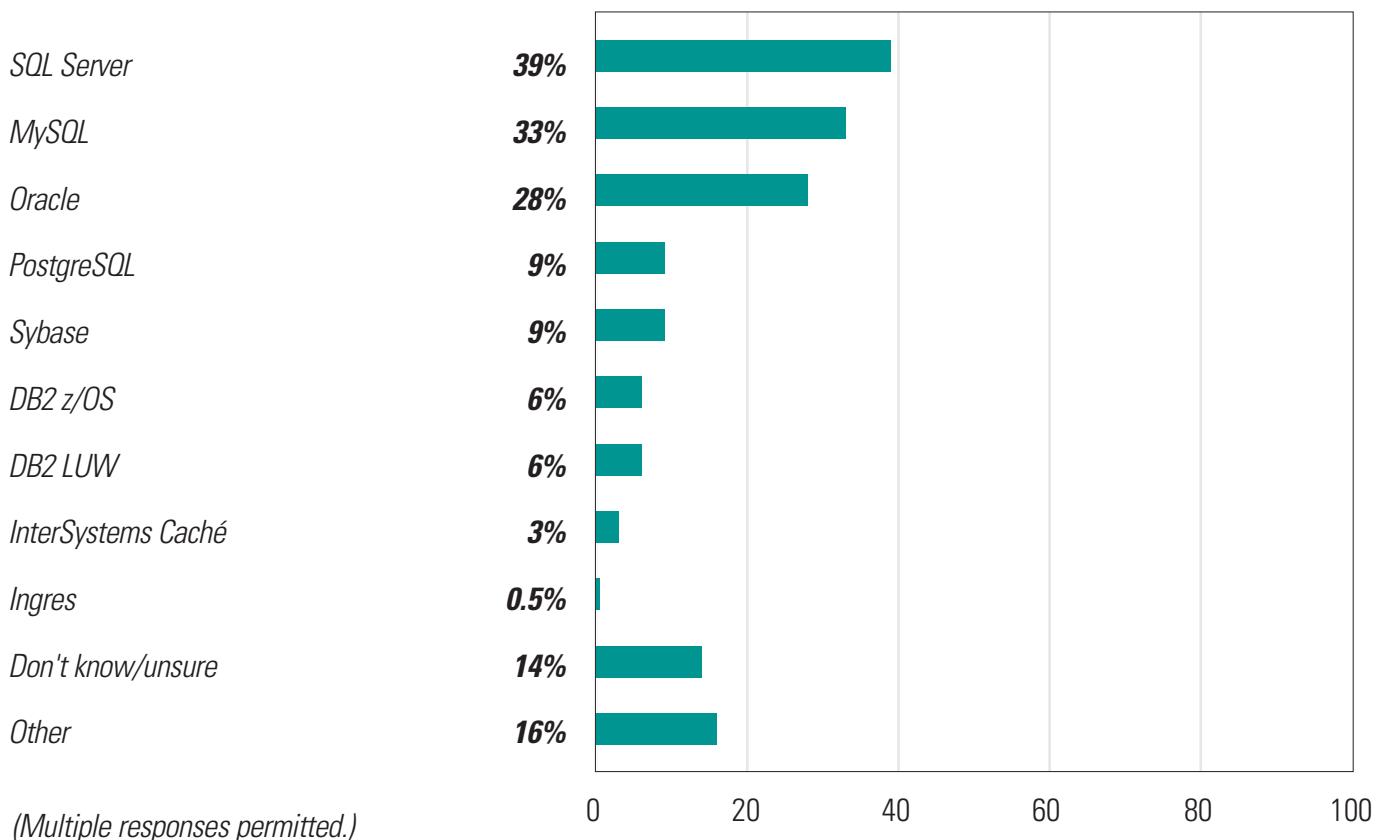
For organizations with database platforms that are managed informally, why is it out of the scope of their DBAs or data professionals? The most common response was that many of these informally administered databases are limited or single-function environments, maintained for a limited set of applications, as cited by 36%. Another 30% say they simply don't have enough DBAs or DBA time to attend to these databases. One-fourth of respondents say these databases are brought in or managed by people from outside their departments, and therefore they leave it up to them. Another one-fourth say those databases are simply not mission-critical to the operations of their enterprises. (See Figure 15.)

This creates issues, particularly in database performance and availability matters. "When systems go down, a single analyst who is responsible for multiple applications and many databases is limited in how quickly each can be verified," says one respondent.

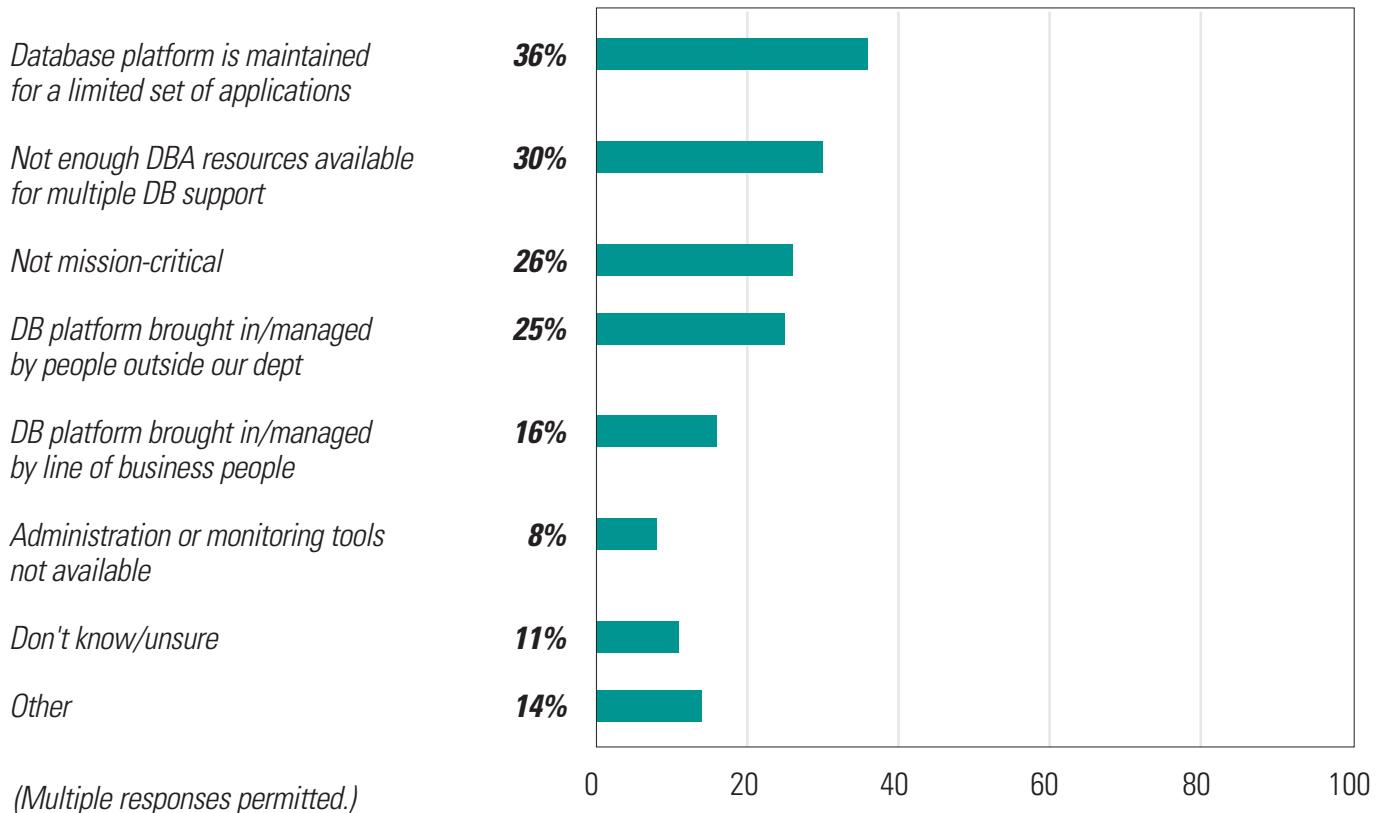
**Figure 13: Databases Managed by 'Accidental DBAs'?**



## Figure 14: Database Platforms Managed Informally



## Figure 15: Why Are Some Databases Managed Informally?



## APPLICATIONS

**Most respondents support applications that can run across multiple databases—but licensing costs hold back multi-database adoption.**

Since development can be expensive, many application vendors traditionally have had offerings tied to a particular database brand. However, as the market shifts, there is increasing pressure to natively support multiple brands of databases. A majority of respondents, 55%, report that at least some of their applications run across multiple DBMS platforms. (Fifty-two percent indicate this involves “some” applications, while another 3% say “all” applications are multi-platform. See Figure 16.)

“Our applications are increasingly needing data from multiple databases in the same programs,” says one respondent, an IT director with a non-profit agency. “This is causing the databases

to be more tightly coupled requiring that they stay in sync with each other creating challenges in all phases of administration.”

New licensing costs are the greatest factor in determining if applications will be deployed on a particular DBMS platform within respondents’ environments, the survey finds. Other driving factors include the need to run applications on standard platforms (44%), and the preferences of the software application vendor. (See Figure 17.)

Still, applications can often create new types of issues. As one respondent, a DBA with a large government agency, put it: “It is hard to standardize on a single DBMS platform because [commercial off-the shelf] applications come with many kinds of embedded databases.”

**Figure 16: Portion of Applications Supporting Multiple DBMS Platforms**

*Some applications*

**52%**

*None, all our applications are tied to a single DB platform*

**21%**

*About half of our applications*

**10%**

*Most applications*

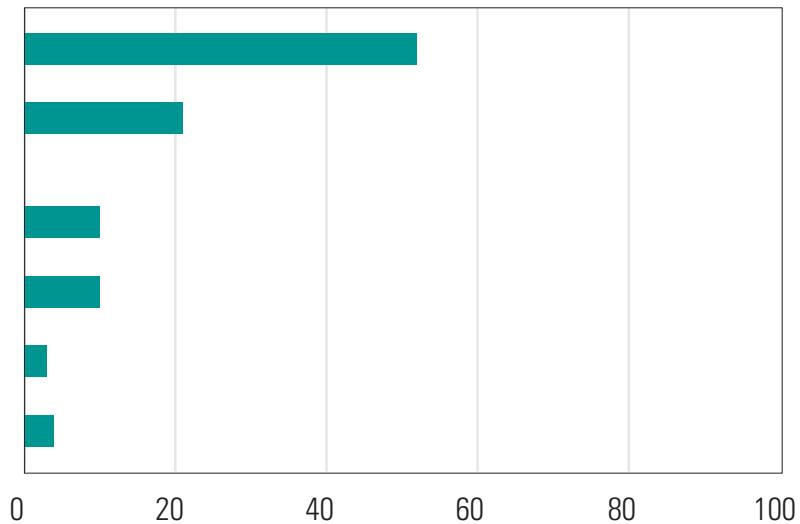
**10%**

*All of our applications are multi-platform*

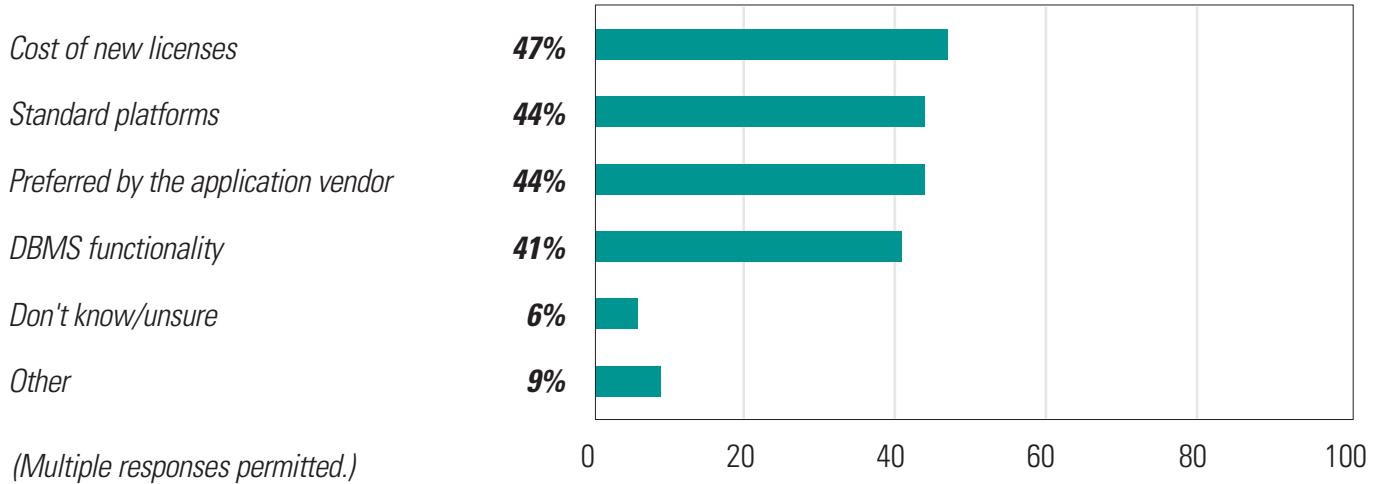
**3%**

*Don't know/unsure*

**4%**



## Figure 17: Factors Determining Application Choices on a Particular DBMS Platform



## DATABASE PERFORMANCE TOOLS

**Companies are forced to use a variety of database management tools to address each of their database environments. In most cases, this is only marginally effective.**

Respondents have varied DBMS systems, and with it, also are forced to employ a variety of tools for each. More than three-fourths, in fact, say they use different tools for each platform. (See Figure 18.) The use of such differing tools may only be marginally effective in managing critical databases. Only 16% would consider this practice to be “extremely” effective, versus a majority of respondents, 53%, that consider it to be only “somewhat” effective. Another 16% say the practice of using different tools for different DBMSs is ineffective. (See Figure 19.)

Respondents are split on the deployment of DBMS vendor-supplied tools for administration and monitoring across the databases within their environments. Close to half, 46% say they use vendor tools most or all of the time, versus 36% who never or rarely use such tools, or simply don’t know if they do. (See Figure 20.)

But relying on specific database vendor tools may not cut it for some respondents, who run into database ownership issues in multi-platform environments. “Many vendor applications are

shipped with their preferred DBMS, and while they are not supposed to require any separate administration, we are finding that this is not true,” says one. “There have been issues trying to determine who actually owns and maintains these ‘embedded’ databases—whether it is the DBA’s responsibility or that of the system administrator who installed the vendor application.”

As noted earlier in this report, most respondents use home-grown tools and solutions to manage their complex database environments. Here, too, there is a split among respondents in terms of how frequently these solutions are put into action. A total of 38% respondents employ home-grown troubleshooting methodologies (e.g., scripts, command line, etc.) most or all of the time to address multi-platform administration and monitoring. Another 43% say they rarely or never use such resources, or simply don’t know if they do. (See Figure 21.)

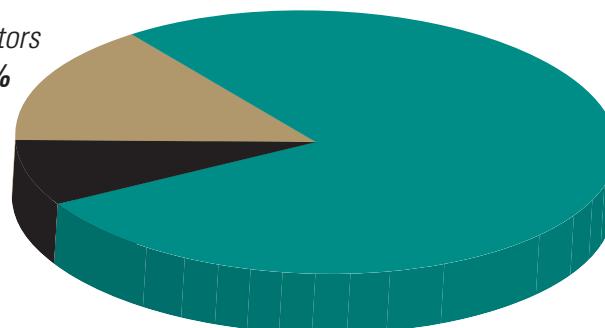
There is a dearth of third-party tools employed to address-platform tools to address multi-platform administration and monitoring, the survey also finds. About 16% say they use third-party tools most or all of the time, versus 69% only using such tools some of the time, if at all. (See Figure 22.)

**Figure 18: Employ Same Tools Across Multiple Database Platforms?**

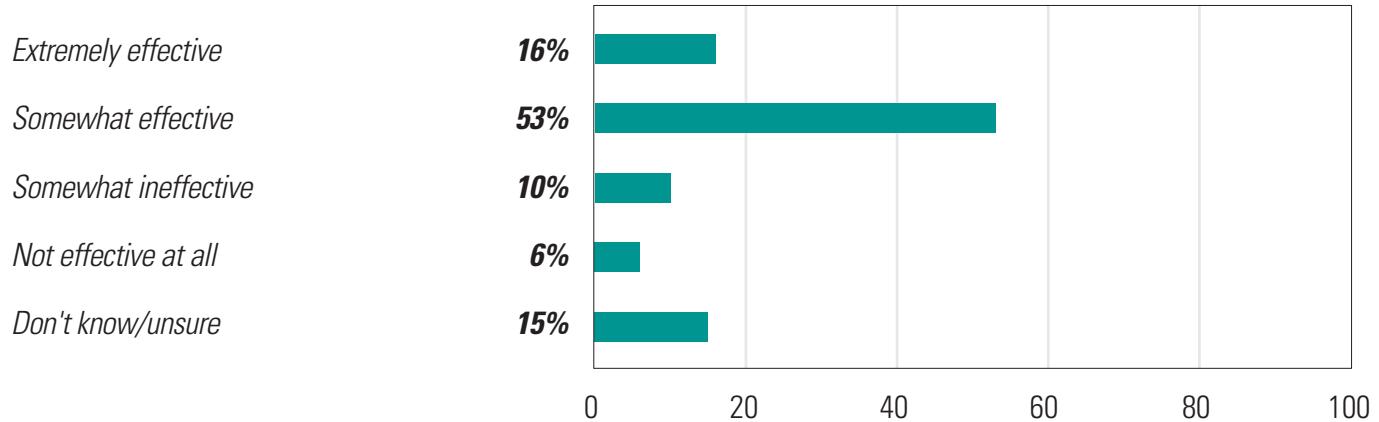
*Yes, the same toolset monitors all database platforms* **15%**

*Don't know/unsure* **8%**

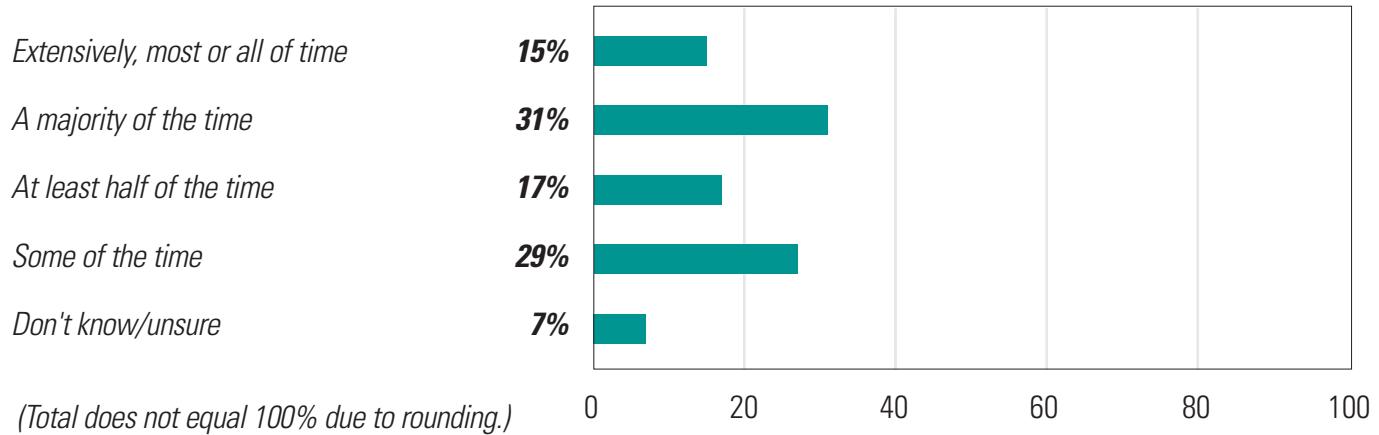
*No, we use different tools for each DBMS platform* **77%**



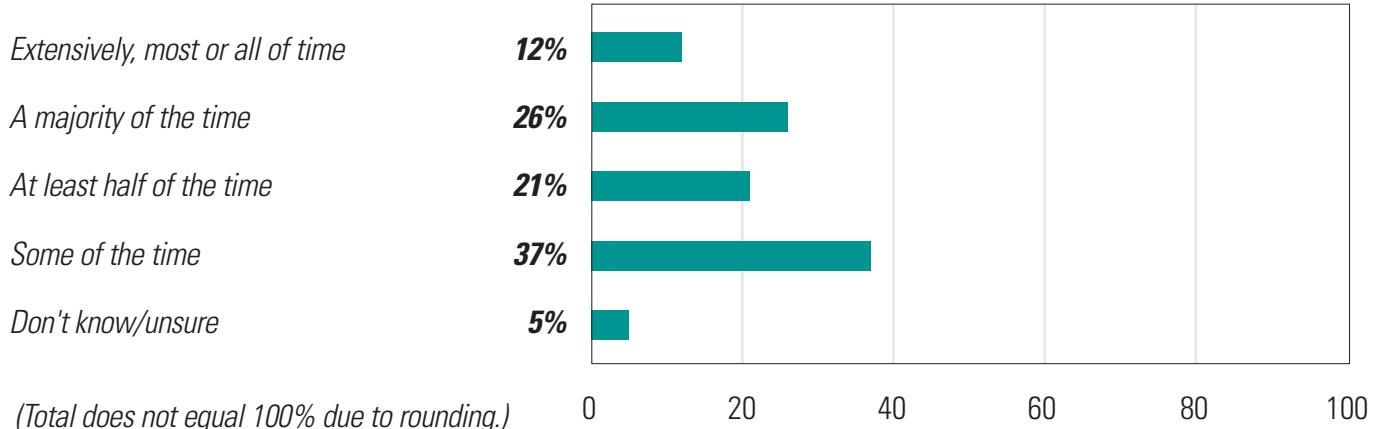
## Figure 19: Effectiveness of Multi-Tool Approaches for Monitoring Performance Across Multiple DBMS Platforms



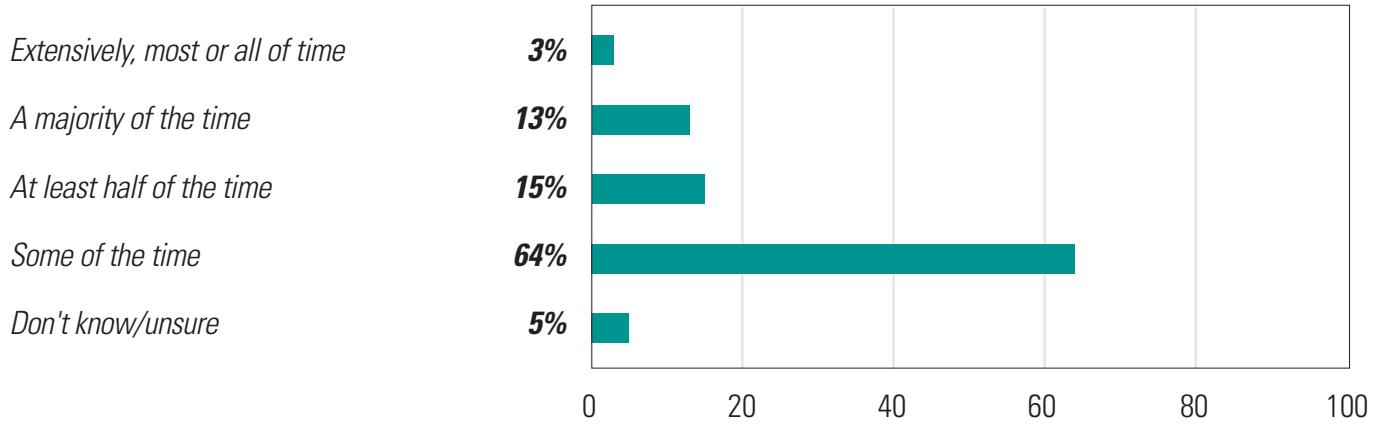
## Figure 20: How Often are DBMS Vendor-Supplied Tools Employed?



## Figure 21: How Often are Home-Grown Methodologies Employed?



## Figure 22: How Often are Third-Party Cross-Platform Tools Employed?



## DATABASES IN THE CLOUD

More than one-fourth of responding companies already have databases in the cloud—in most cases, private clouds. However, most respondents do not know if new tools or skills will be required to manage these new types of environments.

Currently, 27% of respondents indicate that they have deployed database instances via cloud technology, with another 12% considering a cloud strategy. Among cloud users, the majority (17% of the 27%) are going the “private cloud” or virtualization route, with another 10% using public clouds. (See Figure 23.)

Among the cloud deployers, more than one-third report they are positioning relational database systems within clouds, while another 12% are putting other types of databases (such as “Not Only SQL” databases) into the cloud. Another one-third simply are not aware at this time what is going into the cloud. (See Figure 24.)

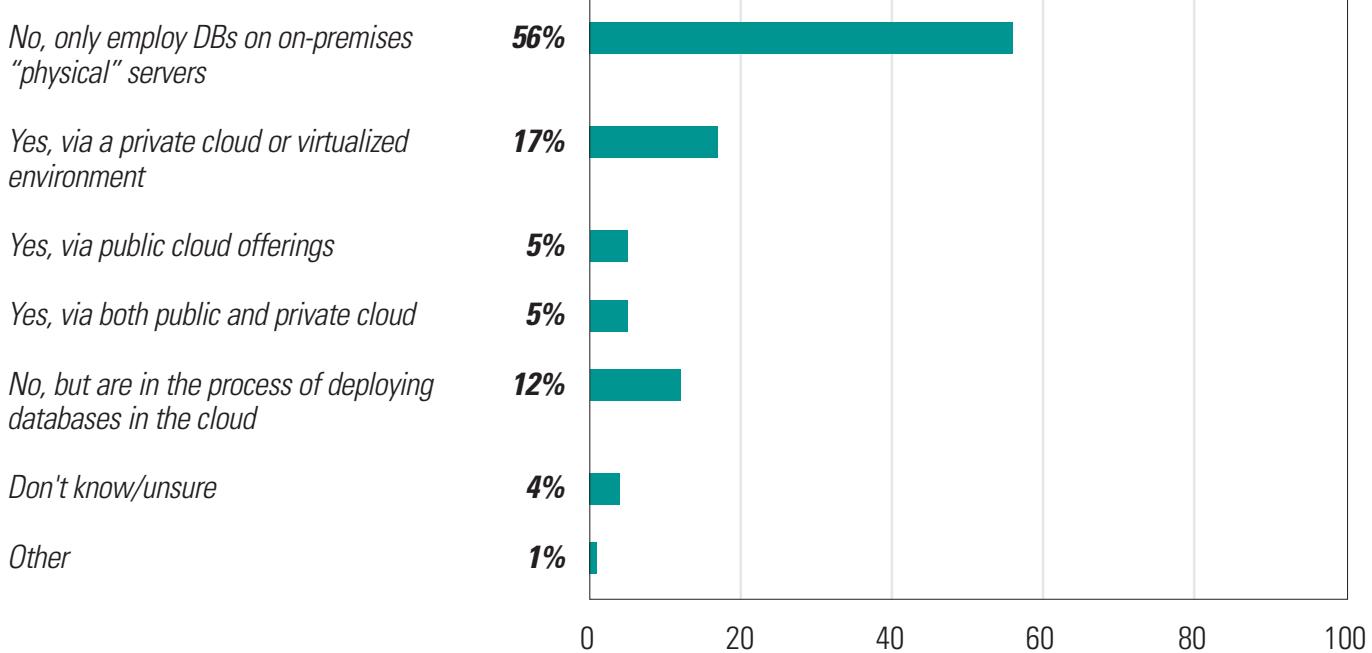
Respondents are divided—and for the most part unsure—as to what the impact of cloud databases will be on their choice of administration and monitoring tools for managing these environments. (See Figure 25.) Likewise, respondents are evenly

split on the types of skills they may need for managing cloud databases. Thirty-six percent expect no impact on their skills requirements for managing cloud database environments, but 31% expect these requirements will ramp up. Another one-third simply don't know what to expect. (See Figure 26.)

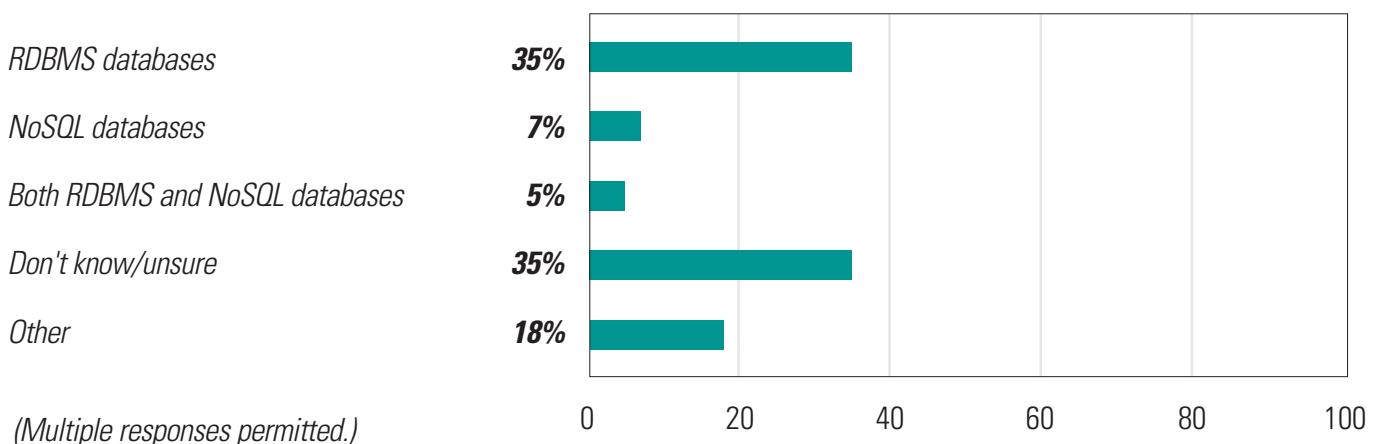
For some respondents, the cloud may offer an opportunity to streamline and consolidate their database operations. “While the variety of databases we manage has been increasing, our steps toward the cloud also are intended to reduce the variety of different databases,” says the IT director of a small services firm.

Still, others may even look to cloud providers for greater support with data management. “If your database goes to public cloud, I would expect the cloud vendor to furnish appropriate management and performance tools,” says one respondent, a DBA with a large government agency. Another has had a positive experience already in terms of administration, observing that “we are fortunate that it is simple to administer our database in a distributed, including ‘cloud,’ environment and has all the complex data-types we need, and pretty good administration tool for the cluster.”

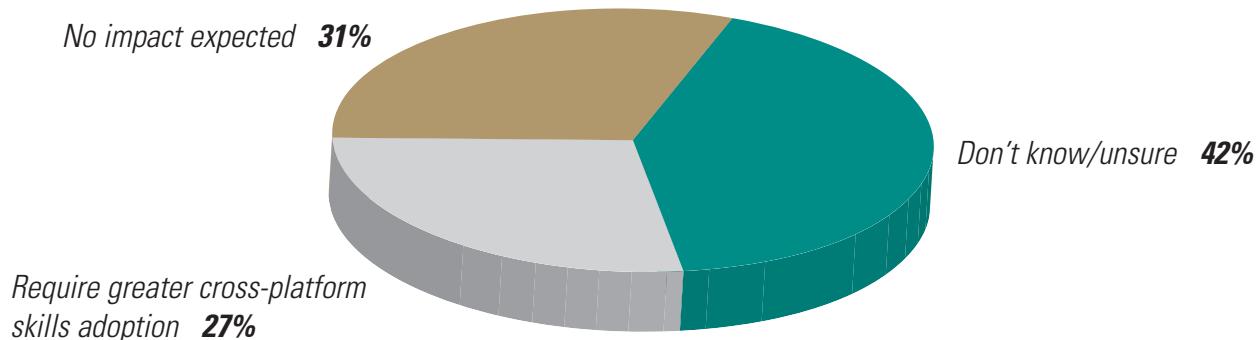
**Figure 23: Currently Deploying Database Instances via Cloud Technology? (Public or Private Cloud)**



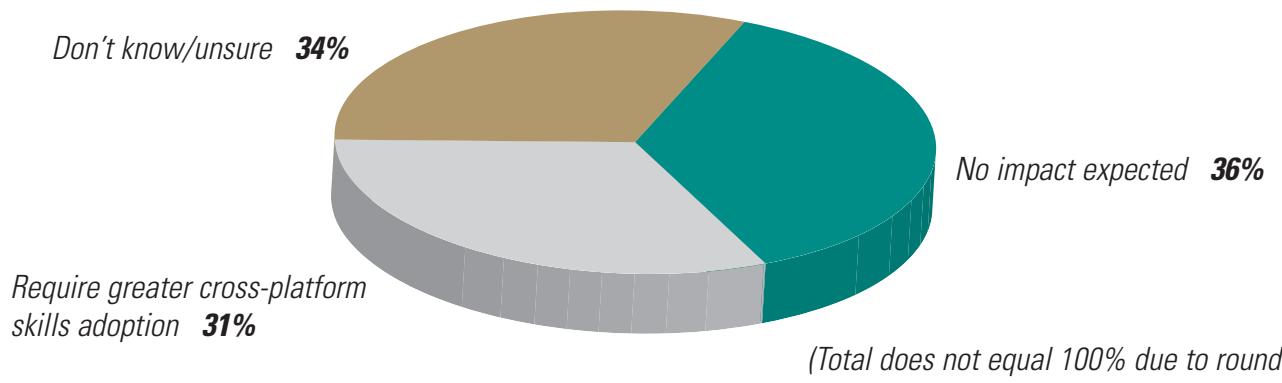
## Figure 24: Types of Databases Deployed in the Cloud?



## Figure 25: Cloud Impact on Database Administration and Monitoring Tool Required?



## Figure 25: Cloud Impact on Skill Requirements?

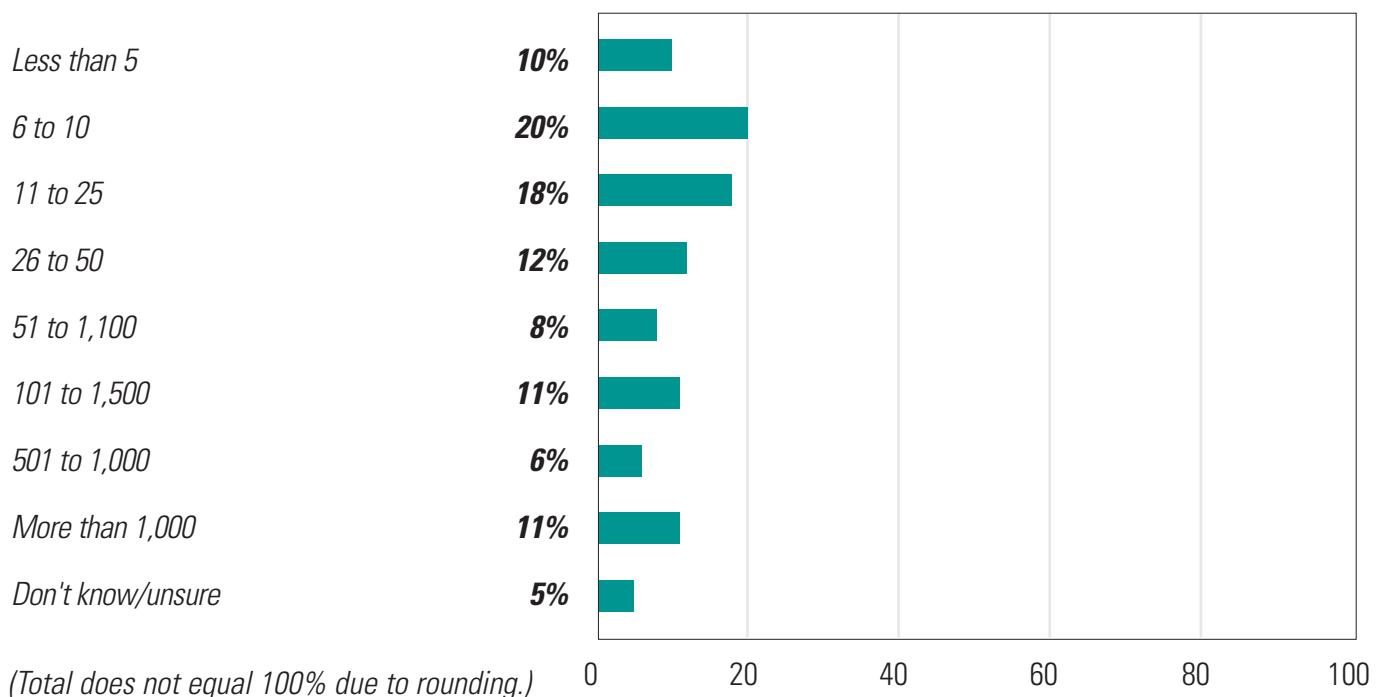


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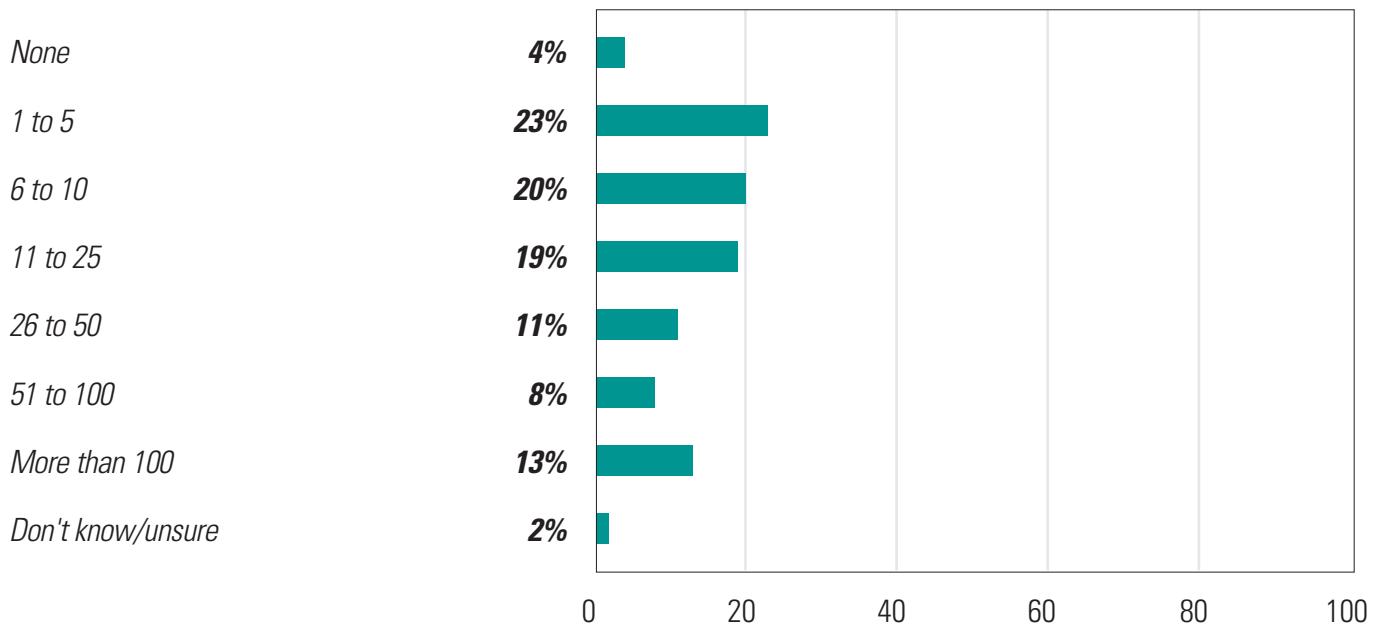
Data collection and analysis performed with SurveyMethods.

## DEMOGRAPHICS

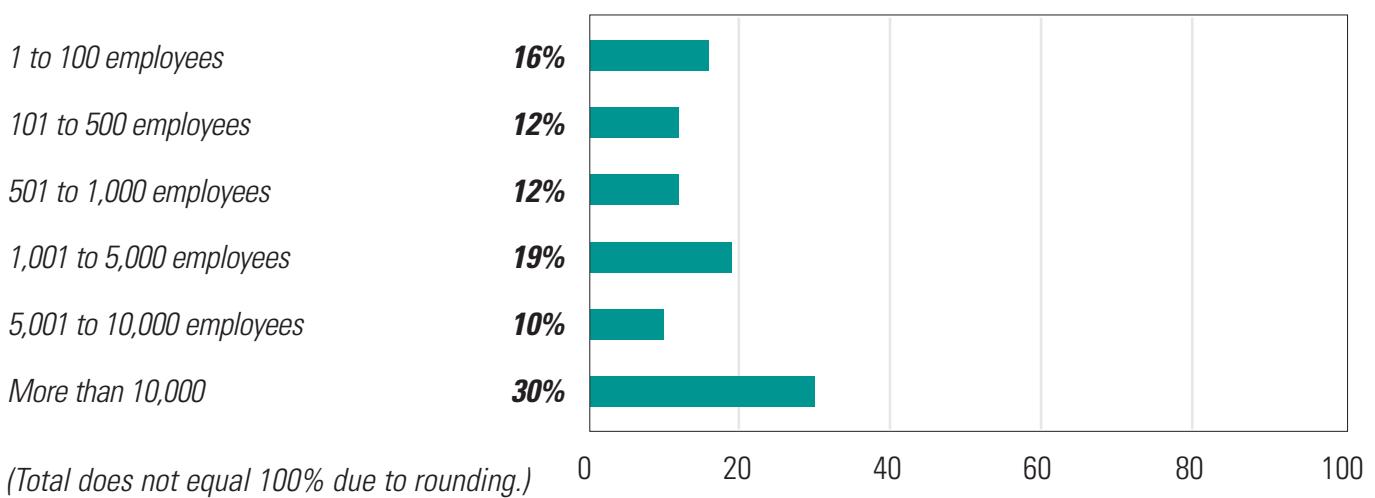
**Figure 27: Number of Server-Based Database Instances in Respondents' Companies**



## Figure 28: Number of Server-Based Database Instances Directly Overseen by Respondents



## Figure 29: Company Size—By Number of Employees



## Figure 30: Respondents' Primary Industries

