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2023 QUEST ORACLE COMMUNITY DATABASE PRIORITIES SURVEY:
DATABASE MANAGEMENT CONTINUES TO MOVE TO THE CLOUD

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EXECUTIVE SUMMARY

There has been no shortage of attention on the advantages artificial intelligence and generative AI bring to enterprises—from real-time customer engagement to on-the-spot analysis and remediation of issues or anomalies. Behind all the wonders that AI brings, however, is the workhorse that must be attended behind the scenes—databases and associated data environments. Data managers acknowledge that in many cases, today's current data environments inhibit progress, and improvement requires more targeted investment in automation and infrastructure. Data needs to be secure, highly available, and viable for AI and other advanced initiatives to succeed within enterprises.

A recent survey of data executives and managers identified these factors as many of their top-of-mind concerns, all well as actions they are taking to build data-driven capabilities in their enterprises. The survey of 217 companies was conducted by Unisphere Research, a division of Information Today, Inc., in partnership with Dell EMC, among members of the Quest Oracle Community. Conducted between December 2022 and January 2023, the survey includes the views and experiences of IT directors, architects/engineers, C-level executives, and database administrators. Industries represented include IT services, healthcare/life sciences, software development, and financial services. (More details about our respondents are found within the "Demographics" section at the end of this report.)

The following are key results and observations from the survey:

- **Competitiveness:** Most respondents say database management requirements still slow organizational advancement.

- **Data burdens:** Security is still the costliest activity, while more executives report cost burdens associated with maintaining uptime.

- **Abstraction:** Virtualization and Database-as-a-Service are viewed as the most promising solutions to most effectively align data to enterprises.

- **Choices and upgrades:** Performance and cost matter the most in vendor selection, and enterprises are accelerating efforts to keep ahead.

- **Security and business continuity:** For an overwhelming threatscape, more cloud, all the time.

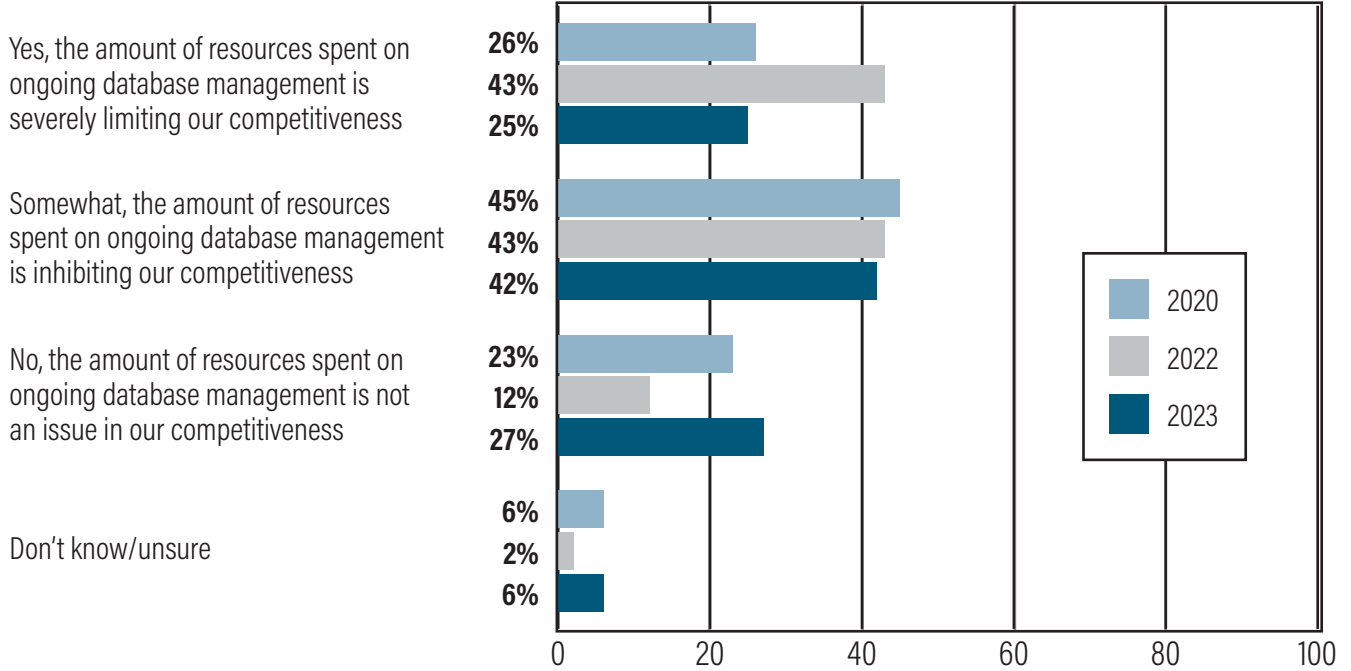*Charts may not add up to 100% due to rounding.*

COMPETITIVENESS

Most respondents say database management requirements still slow organizational advancement.

How important is a state-of-the-art and adaptable database environment to an organization's ability to compete in today's global digital economy? Extremely important. More than two-thirds of data managers, 67%, agree that the amount of time, money, and resources spent on ongoing database management— versus new project development or new initiatives—is affecting the competitiveness of organizations. However, this shows more confidence than the previous two surveys, in which 86% expressed concern about the drain on organizational advancement in 2022, and 71% in 2020. (Figure 1)

Figure 1: Do you believe the amount of time, money, and resources spent on ongoing database management—versus new project development or new initiatives—is affecting the competitiveness of your organization?

	2020	2022	2023
Yes, the amount of resources spent on ongoing database management is severely limiting our competitiveness	26%	43%	25%
Somewhat, the amount of resources spent on ongoing database management is inhibiting our competitiveness	45%	43%	42%
No, the amount of resources spent on ongoing database management is not an issue in our competitiveness	23%	12%	27%
Don't know/unsure	6%	2%	6%

DATA BURDENS

Security is still the costliest activity, while more executives report cost burdens associated with maintaining uptime.
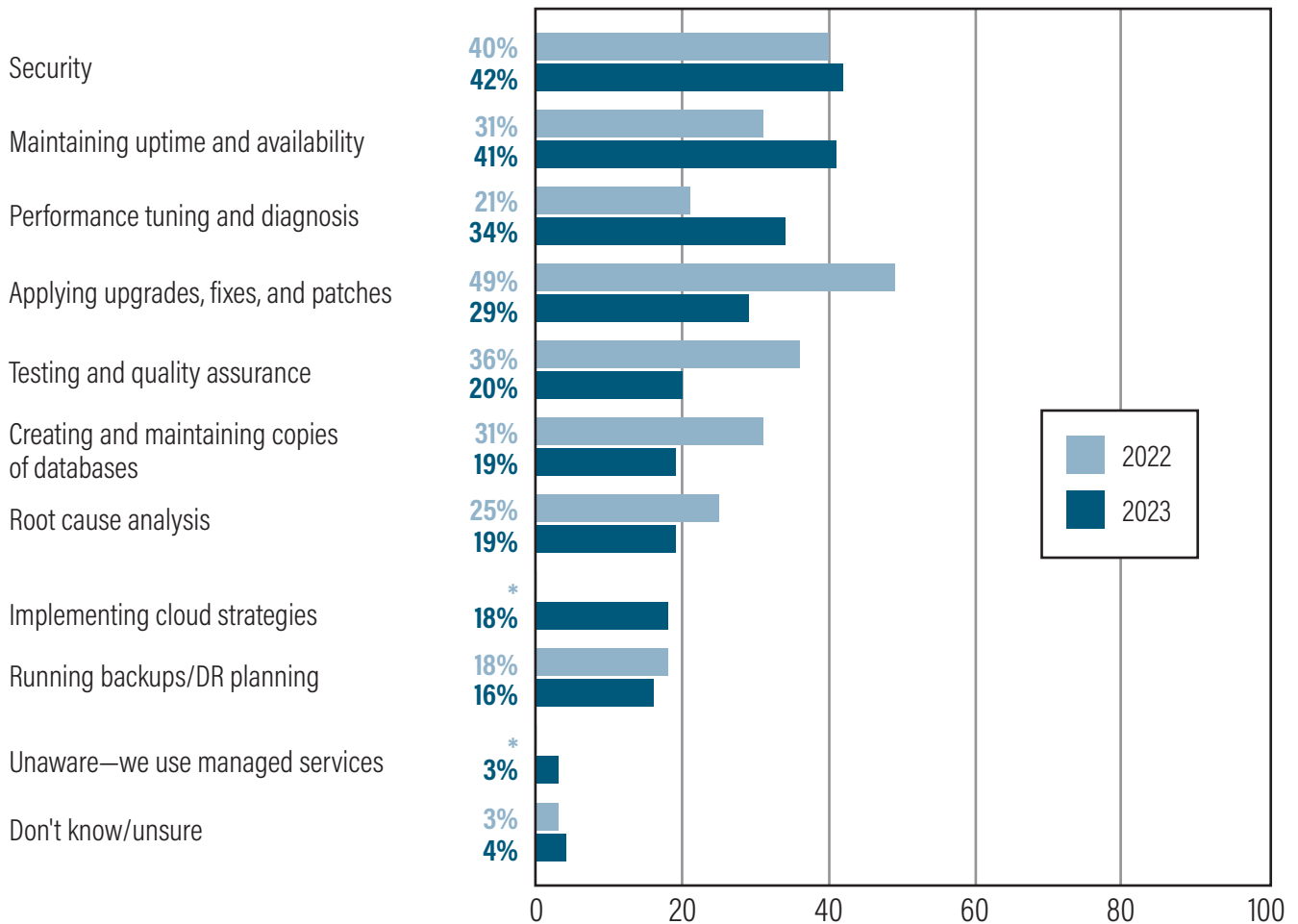
Building a data-driven enterprise is a team sport, involving business leaders and employees well beyond the bounds of the data management or IT departments. While data executives and managers need to work closer to their business partners than ever, they are encumbered by many operational concerns that take up the bulk of their time and resources.

Data security is one of those areas that requires a great deal of attention yet will likely go unnoticed and underappreciated—until a data breach occurs, of course. Security tops the lists of costliest and most time-consuming operational activities. Along with security, maintaining uptime and performance are considered

the three costliest database management activities from an operational standpoint. Interestingly, maintaining uptime and availability has intensified as a concern over the past year, rising from 31% of respondents to 41%. (Figure 2)

When it comes to the most resource-intensive tasks—which includes time spent by data teams—security tops the list. Applying upgrades, fixes, and patches ranks second, which isn't the costliest from an operational standpoint, as cited in Figure 2, but is nonetheless time-consuming for database managers. Performance tuning and diagnosis is ranked third as a time sink. (Figure 3)

Figure 2: What are the costliest database management activities from an operational standpoint?

Activity	2022	2023
Security	40%	42%
Maintaining uptime and availability	31%	41%
Performance tuning and diagnosis	21%	34%
Applying upgrades, fixes, and patches	49%	29%
Testing and quality assurance	36%	20%
Creating and maintaining copies of databases	31%	19%
Root cause analysis	25%	19%
Implementing cloud strategies	*	18%
Running backups/DR planning	18%	16%
Unaware—we use managed services	*	3%
Don't know/unsure	3%	4%

Figure 3: What are the most pressing database management activities that take up most of your resources?

Activity	%
Security	46%
Applying upgrades, fixes, and patches	39%
Performance tuning and diagnosis	38%
Maintaining uptime and availability	37%
Testing and quality assurance	28%
Creating and maintaining copies of databases	25%
Root cause analysis	22%
Running backups/DR planning	16%
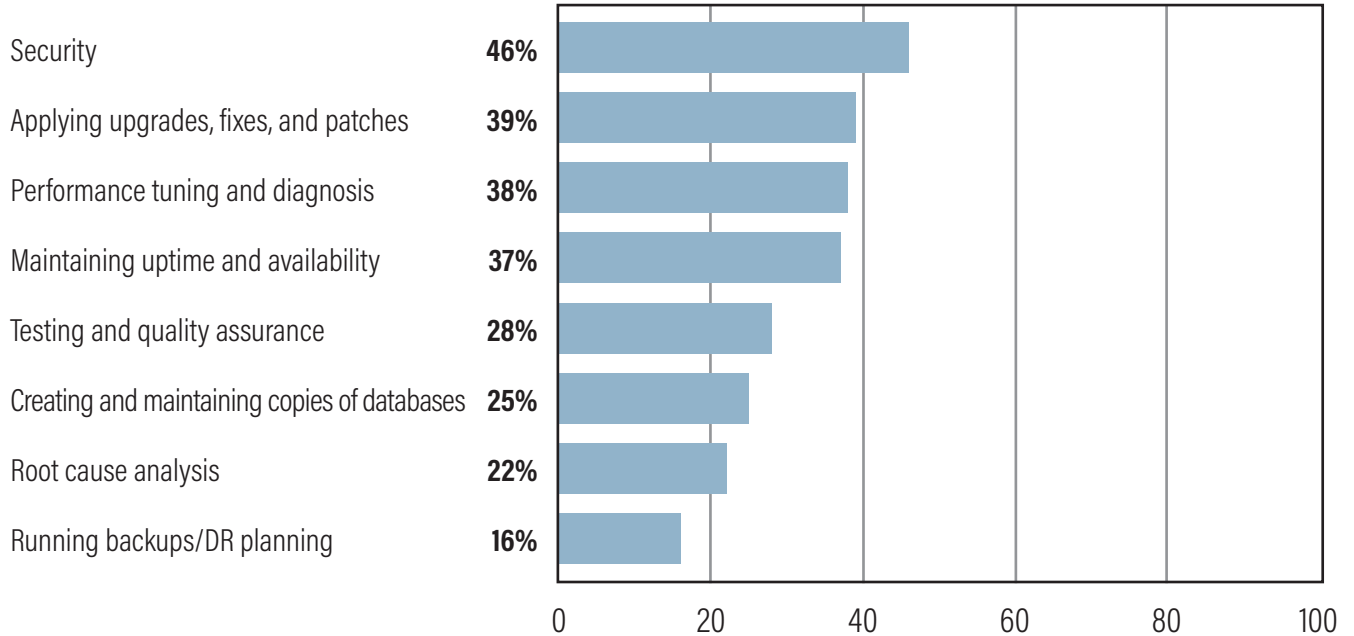
ABSTRACTIONS

Virtualization and Database-as-a-Service are viewed as the most promising solutions to most effectively align data to enterprises—particularly in today's increasingly complex and heterogeneous environments.

A highly varied data environment—incorporating many data environments and requirements—cannot rely on a single brand of type of database. There needs to be a service layer and a common, standardized interface that will simplify access to and maintenance of increasingly complex data environments.

Data managers are increasingly turning to abstraction strategies and technologies to better and more cost-effectively manage data environments. The leading strategy being undertaken to mitigate time devoted to administrative overhead is virtualization or cloud solutions, which is occurring at half (50%) of respondents' sites. Another 37% are adopting Database-as-a-Service options, while 31% employ Infrastructure-as-a-Service. (Figure 4)

When looking at enterprise/ERP applications supported within these data environments, Oracle E-Business Suite rates as the most pervasive environments. SAP follows with 32%, and PeopleSoft and SAS compete for a distant third place with 21% and 20% respectively. (Figure 5)

Consider all the environments supported by data executives and managers responding to this survey. There are a range of Oracle database editions that data managers employ in their data environments. Oracle 19c Enterprise Edition reigns supreme, employed at 34% of the sites covered. Oracle's latest version, 21c, is now installed at 13% of sites for Enterprise Edition and 5% for Standard Edition (see Figure 6).

While survey respondents are primarily Oracle enterprise environments, they also incorporate a wide range of non-Oracle database technologies to address their burgeoning business requirements. Microsoft SQL Server is the platform most frequently seen within most Oracle-centric data environments (54%), but many open source and cloud databases are also seeing widespread adoption as well (see Figure 7).

There is no single dominant platform on which data managers run mission-critical Oracle at this time. Amazon Web Services, Microsoft Azure, and Microsoft Windows are considered as the top environments seen within Oracle sites. (Figure 8)

Figure 4: What are the top strategies you are using or planning to use to reduce time and money spent on ongoing database management activities?

Strategy	Percentage
Virtualization or cloud solutions	**50%**
Database-as-a-Service	**37%**
Infrastructure-as-a-Service	**31%**
Faster storage (e.g., NVMe, SCM, etc.)	**29%**
Platform-as-a-Service	**28%**
Upgrading or modernizing hardware and processors	**27%**
Leveraging managed services	**22%**
Develop database/data center automation (e.g., Chef, Puppet, Ansible, etc.)	**19%**
Containers-as-a-Service	**18%**
Purchase off-the-shelf automation tools (Delphix, Actifio)	**10%**
PMEM for Oracle databases	**6%**
Don't know/unsure	**6%**

Figure 5: Which, if any, enterprise/ERP applications do you use?

Application	Percentage
Oracle E-Business Suite	**34%**
SAP	**32%**
Peoplesoft	**21%**
SAS	**20%**
Hyperion	**17%**
EPIC	**11%**
JD Edwards	**11%**
Banner	**6%**
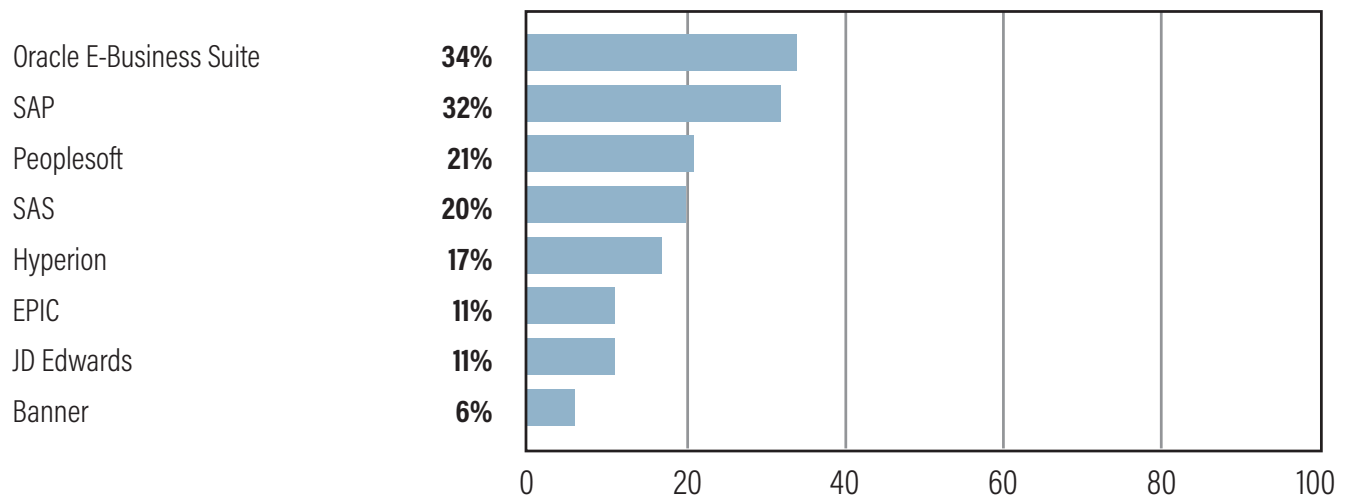
Figure 6: What Oracle database technologies do you use in your data environment?

Technology	%
Oracle 21c Enterprise Edition	13%
Oracle 19c Enterprise Edition	34%
Oracle 18c Enterprise Edition	14%
Oracle 12c Enterprise Edition	20%
Oracle 11g Enterprise Edition	10%
Oracle 21c Standard Edition	5%
Oracle 19c Standard Edition	10%
Oracle 18c Standard Edition	4%
Oracle 12c Standard Edition	9%
Oracle 11g Standard Edition	7%
Oracle database pre 11g	7%
Active Dataguard	9%
Multi-Tenant/Pluggable databases	7%
ACO/Advanced Compression	4%
ASO/Transparent Data Encryption	2%
Oracle RAC	13%
Oracle In-Memory	10%
OEM	14%
Cloud Control	8%
Partitioning	10%
GoldenGate	7%
TimesTen	1%
None of the above	17%
Other	1%

Figure 7: What non-Oracle database technologies do you use (or plan to use) in your data environment?

Technology	Percentage
Microsoft SQL Server	54%
MySQL	39%
Amazon Cloud Databases	31%
PostgreSQL	23%
MongoDB	22%
Apache Hadoop	19%
IBM DB2	17%
SAP HANA	16%
Cassandra	13%
Teradata	13%
Sybase	11%
CouchDB	9%
Redis	6%
Memcached	3%
SingleStore	3%
None of the above	7%
Other	5%
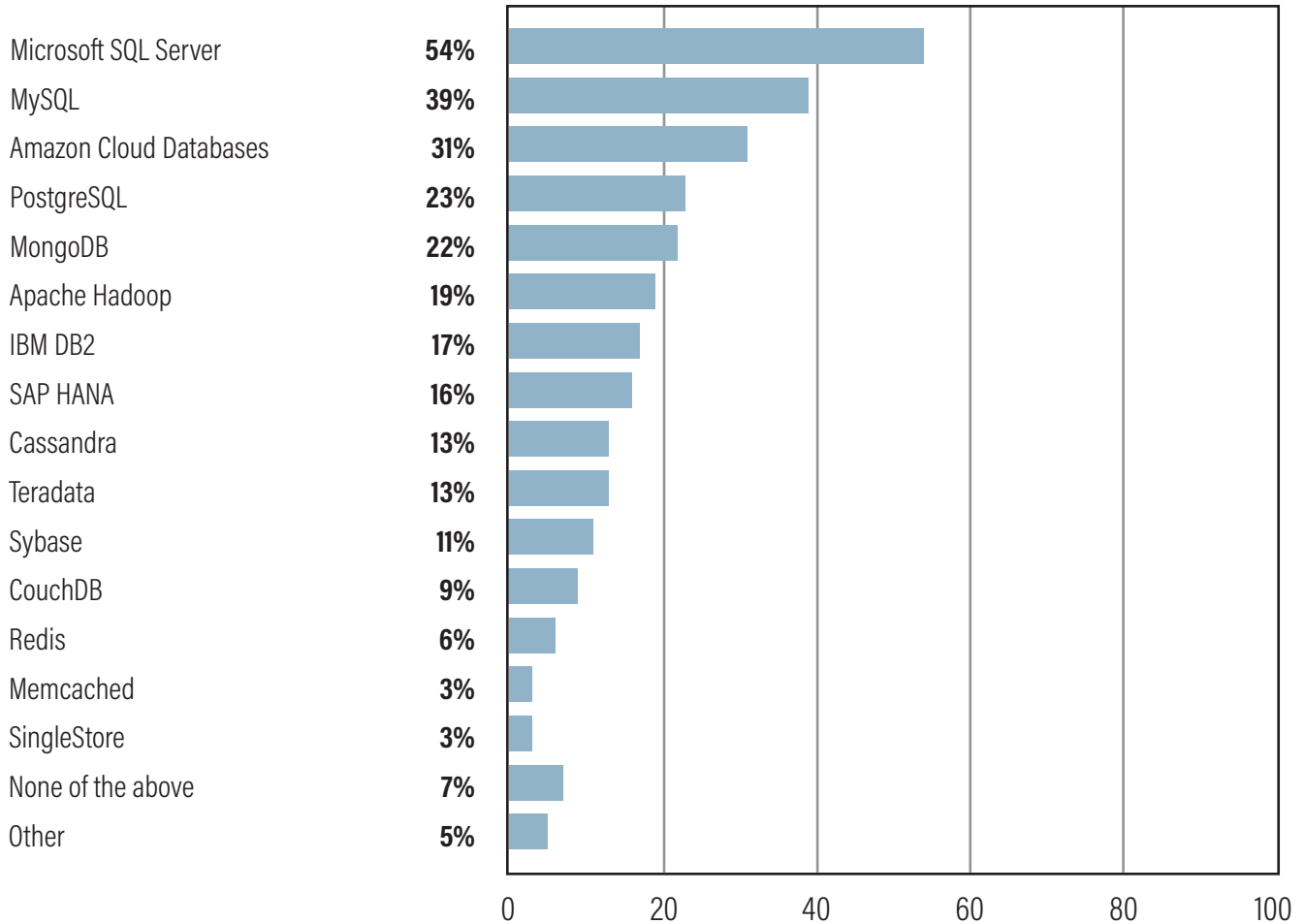
Figure 8: What platforms do you run mission-critical Oracle on today?
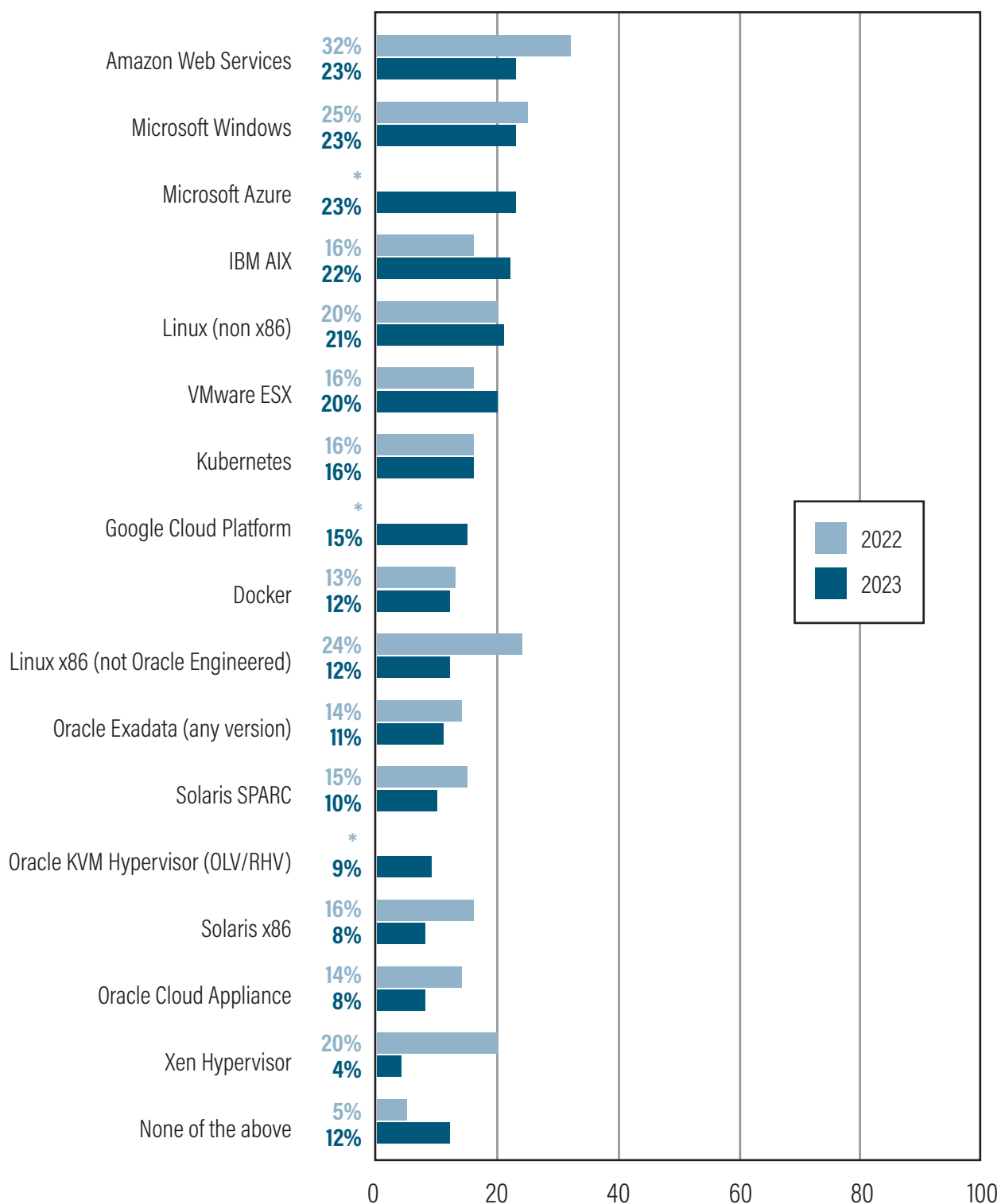
Platform	2022	2023
Amazon Web Services	32%	23%
Microsoft Windows	25%	23%
Microsoft Azure	*	23%
IBM AIX	16%	22%
Linux (non x86)	20%	21%
VMware ESX	16%	20%
Kubernetes	16%	16%
Google Cloud Platform	*	15%
Docker	13%	12%
Linux x86 (not Oracle Engineered)	24%	12%
Oracle Exadata (any version)	14%	11%
Solaris SPARC	15%	10%
Oracle KVM Hypervisor (OLV/RHV)	*	9%
Solaris x86	16%	8%
Oracle Cloud Appliance	14%	8%
Xen Hypervisor	20%	4%
None of the above	5%	12%

SECURITY AND BUSINESS CONTINUITY

For an overwhelming threatscape, more cloud, all the time.

As mentioned at the beginning of this report, security tops the lists for costs and time spent by today's database executives and managers. From a security standpoint, ransomware is a concern for many data managers in this survey as well. Only 7% of respondents indicate they are "not concerned" or not considering preventative or remedial actions for possible ransomware incidents against their Oracle data environments. (Figure 9)
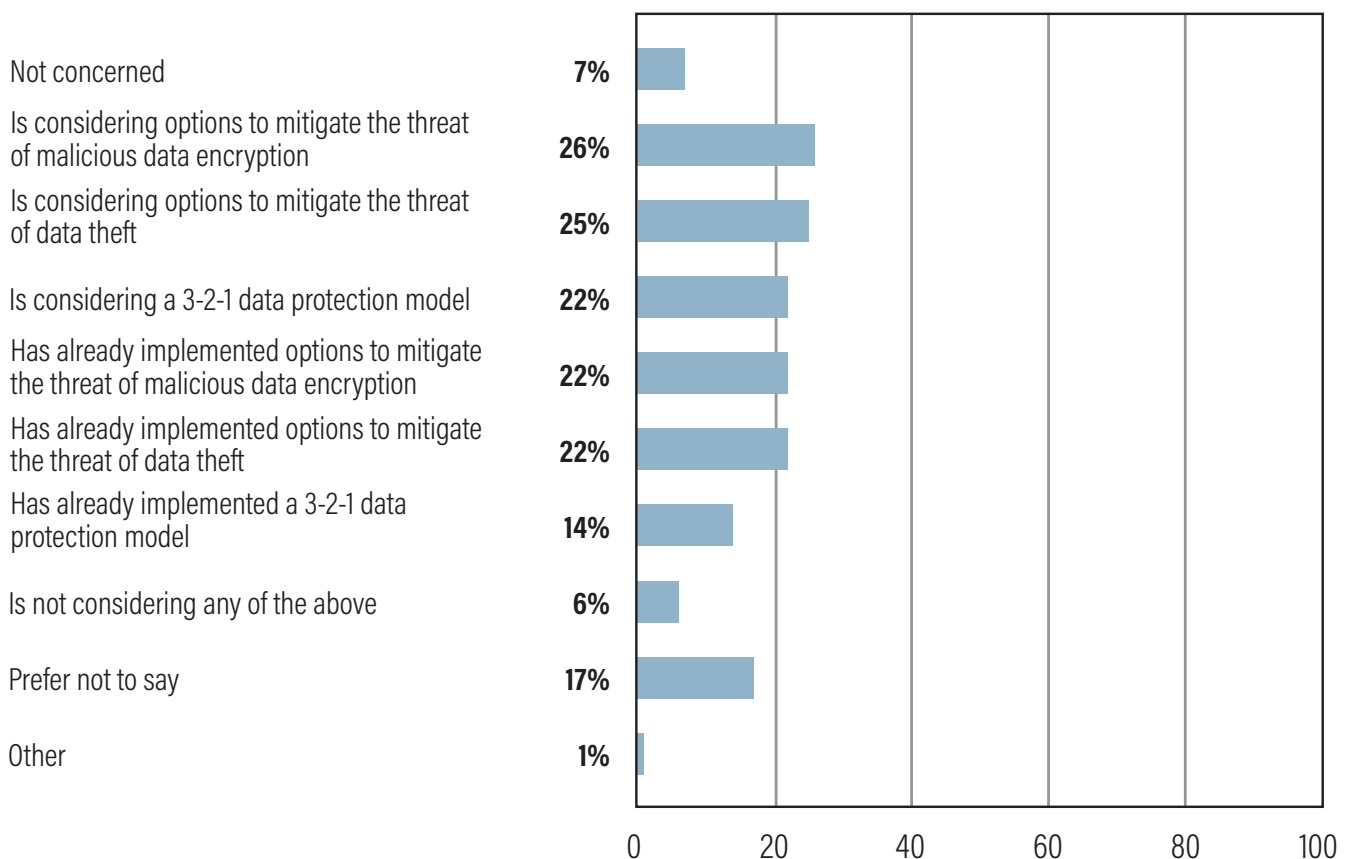
To ensure business continuity in case of a major failure—such as a ransomware attack—backing up data is the key. The most oft-cited solution is replication of data to an offsite data center

or partner location, cited by 46%. It's also notable that public cloud is now the second-ranked backup choice—25% now look to public clouds as backup sites for their data. Related to that is hypervisor replication, cited by 15%. Oracle's traditional RMAN environment is the third-ranked method. (Figure 10)

Data managers are turning to several technologies to back up their Oracle databases today. The top choice is SAN replication, cited by one-third, followed by storage snapshot, seen at 28% of sites, and RMAN at 27%. (Figure 11)

Figure 9: With respect to the threat of ransomware targeting Oracle databases, your organization is:

Category	%
Not concerned	7%
Is considering options to mitigate the threat of malicious data encryption	26%
Is considering options to mitigate the threat of data theft	25%
Is considering a 3-2-1 data protection model	22%
Has already implemented options to mitigate the threat of malicious data encryption	22%
Has already implemented options to mitigate the threat of data theft	22%
Has already implemented a 3-2-1 data protection model	14%
Is not considering any of the above	6%
Prefer not to say	17%
Other	1%

Figure 10: How are you ensuring business continuity in case of a major failure?

Backup replication offsite	**46%**
Backup to the public cloud	**25%**
RMAN	**21%**
Stretched RAC clustered databases across two data centers	**19%**
RAC clustered databases in a single data center	**18%**
Logical replication (e.g., Goldengate, Shareplex, Streams, etc.)	**18%**
Dataguard or Active Dataguard replication to a remote data center	**16%**
Hypervisor replication	**15%**
BC in the Cloud	**15%**
SAN replication to a remote data center	**14%**
None of the above	**9%**
Other	**1%**

Figure 11: What technologies are you using to back up your Oracle database today?

Technology	%
SAN replication	33%
Storage snapshot	28%
RMAN	27%
Veam	21%
Datapump	20%
Exagrid/Tivoli/Netbackup	20%
Data Domain	18%
Avamar	8%
Other	9%

2023 QUEST ORACLE COMMUNITY DATABASE PRIORITIES SURVEY: DATABASE MANAGEMENT CONTINUES TO MOVE TO THE CLOUD *was produced by Unisphere Research and sponsored by Dell EMC. Unisphere Research is the market research unit of Unisphere Media, a division of Information Today, Inc., publishers of* Database Trends and Applications *magazine and the* 5 Minute Briefing *newsletters. To review abstracts of our past reports, visit www.unisphereresearch.com. Unisphere Media, 121 Chanlon Road, New Providence, NJ 07974; 908-795-3702.*

CHOICES AND UPGRADES

Performance and cost matter the most in vendor selection, and enterprises are accelerating efforts to keep ahead.

As discussed in the previous section, there is a wide variety of choices—often bewildering—available to today's data executives and managers. When looking to purchase new database systems and other infrastructures, performance and cost matter the most. Close to 60% cite performance as the driving factor for their purchasing decisions or recommendations. Another 54% seek to keep costs down, while close to half are concerned with the reliability of their infantries. Performance, cost, and reliability also ranked as the top three considerations in last year's survey. (Figure 12)

The largest number of sites, 43%, acquire their Oracle licenses through Oracle Enterprise Edition. Interestingly, 19% now license Oracle through Microsoft's Azure cloud service. (Figure 13)
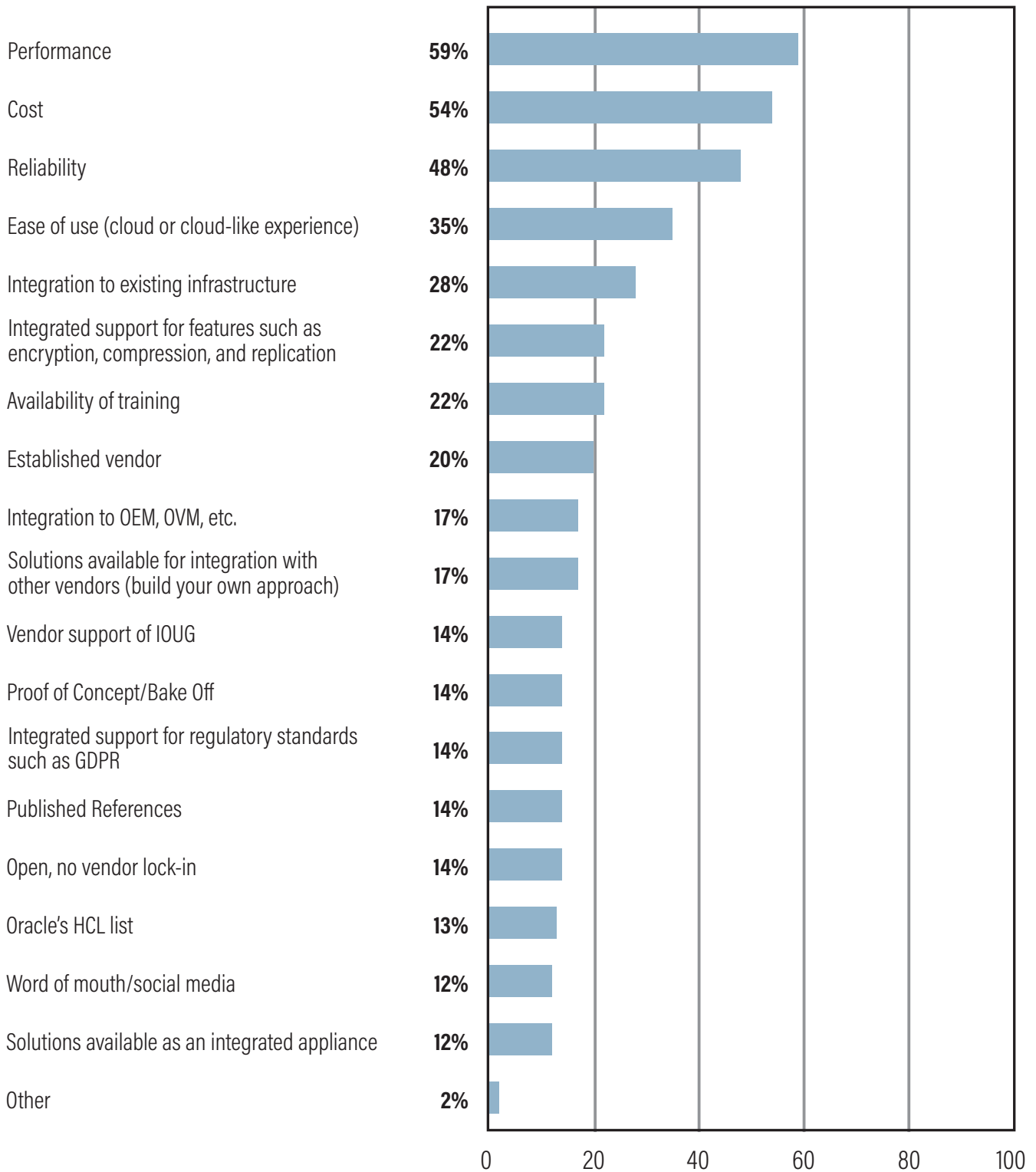
Is Oracle still a top choice among enterprise Oracle managers? Not overwhelmingly. In a world rimming with databases for every purpose, it's notable that only about one-third of Oracle customers, 34%, are fully on board with the idea of buying Oracle for new projects. Significantly, 56% are either not likely or only somewhat likely to purchase Oracle for new initiatives. (Figure 14)

Data managers working with production Oracle databases tend to see large volumes of data maintained within their environments. More than one-quarter, 28%, have data environments exceeding 25 TB in size. (Figure 15)
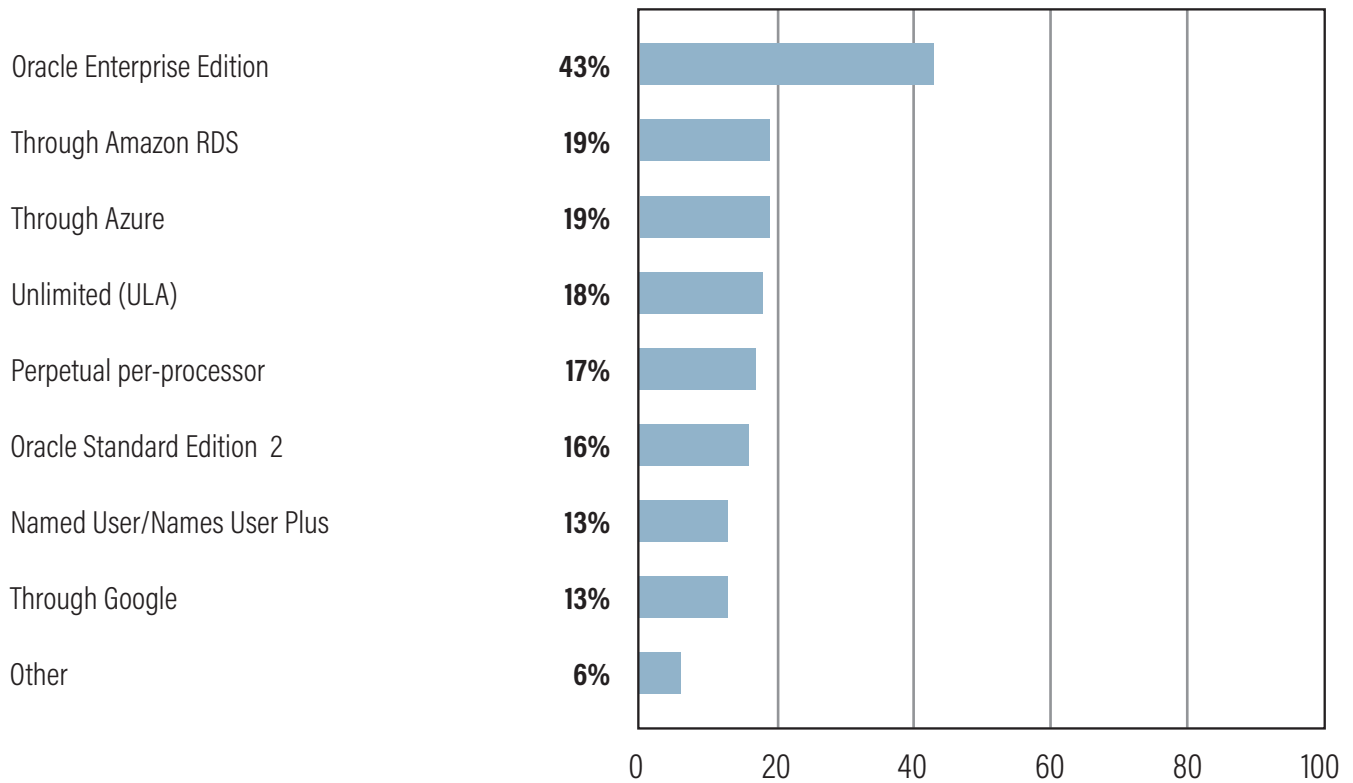
As was the case with last year's survey, keeping up with database upgrades continues to take time, the survey shows. At the same time, there has been a quickening of these upgrades. About 45% of data managers report that they anticipate periods of six months or more after a major release until they begin the upgrade process. Last year, 55% reported such lag time. (Figure 16)

Figure 12: What factors do you consider when selecting infrastructure for your Oracle environment?

Factor	Percentage
Performance	59%
Cost	54%
Reliability	48%
Ease of use (cloud or cloud-like experience)	35%
Integration to existing infrastructure	28%
Integrated support for features such as encryption, compression, and replication	22%
Availability of training	22%
Established vendor	20%
Integration to OEM, OVM, etc.	17%
Solutions available for integration with other vendors (build your own approach)	17%
Vendor support of IOUG	14%
Proof of Concept/Bake Off	14%
Integrated support for regulatory standards such as GDPR	14%
Published References	14%
Open, no vendor lock-in	14%
Oracle's HCL list	13%
Word of mouth/social media	12%
Solutions available as an integrated appliance	12%
Other	2%

Figure 13: How do you license Oracle?

Oracle Enterprise Edition	**43%**
Through Amazon RDS	**19%**
Through Azure	**19%**
Unlimited (ULA)	**18%**
Perpetual per-processor	**17%**
Oracle Standard Edition 2	**16%**
Named User/Names User Plus	**13%**
Through Google	**13%**
Other	**6%**

Figure 14: If you were to start/deploy a new project today that required an RDBMS, how likely would you be to choose Oracle?

Not likely at all	**19%**
Somewhat likely	**37%**
Likely	**20%**
Very likely	**14%**
Don't know/unsure	**9%**
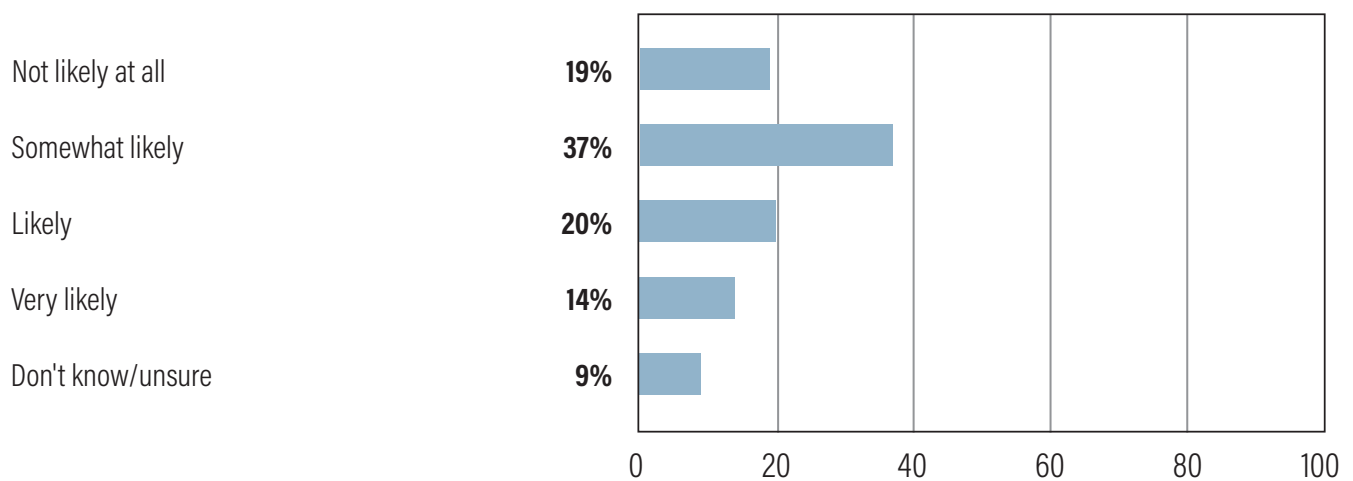
Figure 15: How large is your largest production Oracle database?

Category	Percentage
Less than 1TB	12%
1TB to 5TB	16%
5TB to 25TB	26%
25TB to 50TB	14%
Greater than 50TB	14%
Don't know/not sure	19%
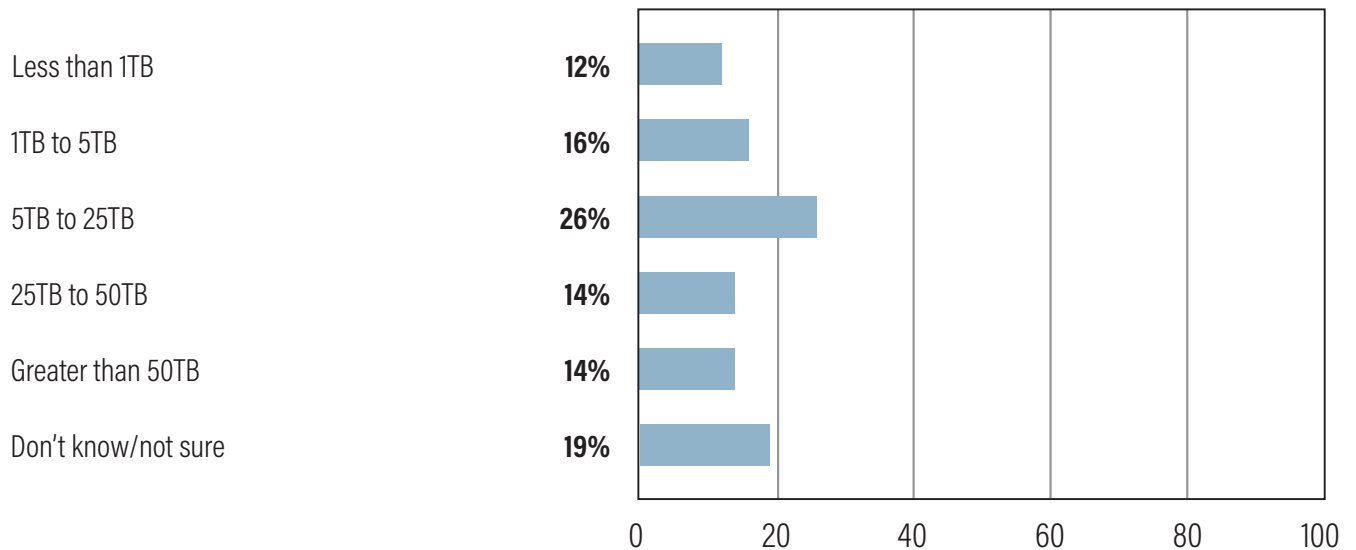
Figure 16: How long after a major release (e.g., 12cR1, 19c) do you expect to have most of your mission-critical databases upgraded to the current release?

Category	Percentage
<3 months	8%
3-6 months	30%
6-18 months	28%
>18 months	17%
Don't know/unsure	17%
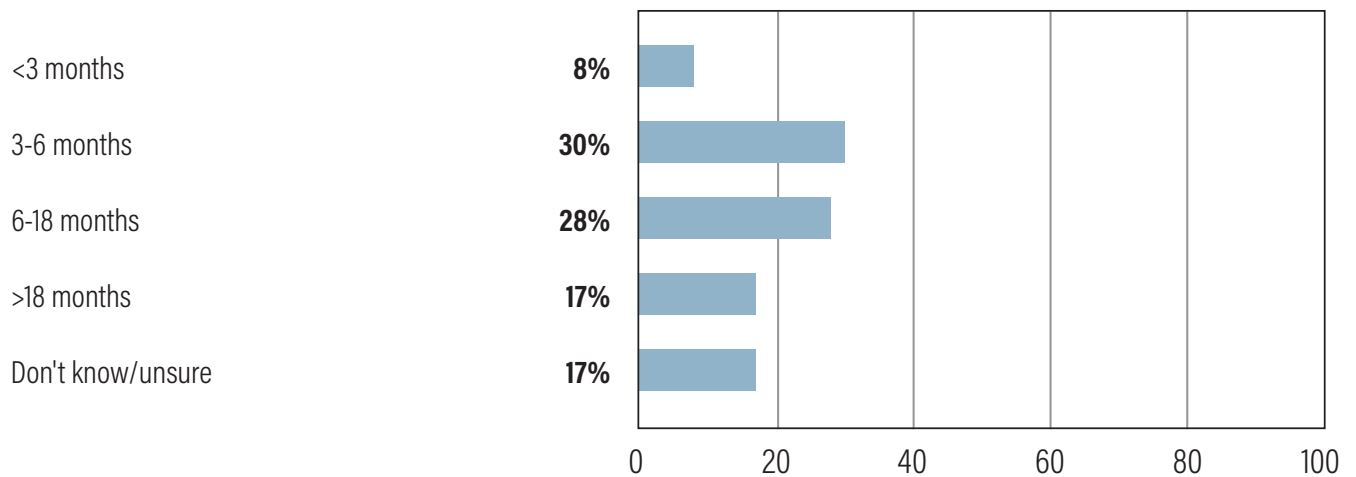
SURVEY DEMOGRAPHICS

Figure 17: What is your primary job title?

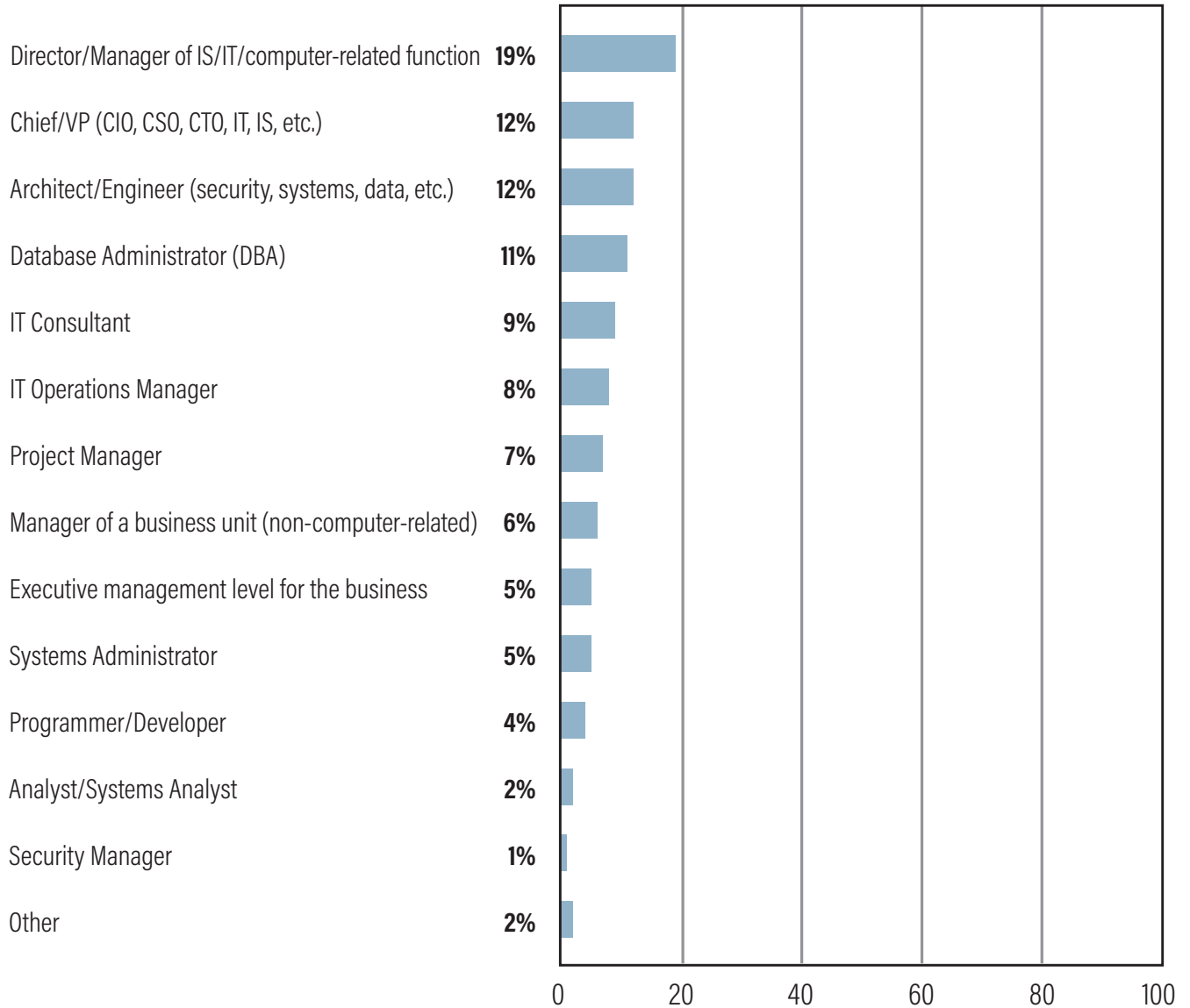| Job Title	Percentage
Director/Manager of IS/IT/computer-related function	19%
Chief/VP (CIO, CSO, CTO, IT, IS, etc.)	12%
Architect/Engineer (security, systems, data, etc.)	12%
Database Administrator (DBA)	11%
IT Consultant	9%
IT Operations Manager	8%
Project Manager	7%
Manager of a business unit (non-computer-related)	6%
Executive management level for the business	5%
Systems Administrator	5%
Programmer/Developer	4%
Analyst/Systems Analyst	2%
Security Manager	1%
Other	2%

Figure 18: What is your primary industry?

Industry	%
IT Services/Consulting/System Integration	21%
Healthcare/Medical/Life Sciences	11%
Software/Application Development	11%
Financial Services	10%
High-Tech Manufacturing	7%
Government (all levels)	6%
Manufacturing	6%
Retail/Distribution	6%
Business/Consumer Services	5%
Education (all levels)	5%
Insurance	4%
Utility/Telecommunications/Transportation	4%
Non-Profit	3%
Energy (oil, gas, etc.)	1%
Other	4%