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Business Value Highlights**256% return**
on investment**Six months**
to breakeven**47% reduced**
total cost of operations**69% more**
efficient IT infrastructure staff**73% reduction**
in unplanned downtime**40% reduction**
reduction in IT infrastructure costs**\$479,000**
additional new revenue gained
per year**\$1.93 million**
total average benefits per year**40% faster**
time to market

Exadata Cloud at Customer Optimizes Database Performance, Reduces Operational Costs, and Contributes to Better Business Results

EXECUTIVE SUMMARY

The transformation of businesses and entire industries through the expanded use of digital technologies is expected to scale dramatically in the coming years.

Data — its generation, delivery, concentration, and exploration — is at the center of this major shift in how organizations connect with customers in new ways, develop new revenue sources, and improve operational efficiency. While many information technology (IT) organizations struggle to simply survive the ongoing data deluge by focusing on containment and control, leading IT organizations are making investments in solutions that improve business agility, enable faster adoption of new technologies, and dramatically reduce the costs of deploying and maintaining data-centric services across the entire organization. These investments make it possible for enterprises to capitalize on their data and thrive in this new digital business landscape.

Oracle Exadata Cloud at Customer is a service designed to combine the Exadata database platform with the agility and elasticity of the cloud deployed in the customer's datacenter. In September 2019, Oracle introduced a new generation of Oracle Exadata Cloud at Customer services, called Oracle Gen2 Exadata Cloud at Customer, that leverages the next generation of compute, memory, and network technologies. It also includes software enhancements that improve local and remote operational scale and agility.

IDC conducted research that explored the value and benefits of customers using the initial Oracle Exadata Cloud at Customer services over the past several years to optimize the standardized array of tasks and processes performed in their IT and database infrastructure. IDC interviewed multiple Oracle customers using the service and found that they were realizing significant benefits by leveraging its capabilities to help IT teams be more productive and responsive to business needs. Based on IDC's calculations, these organizations realized average benefits worth \$1.93 million per organization per year, a 256% return on investment (ROI), and a break-even point of six months by:

- » Improving the efficiency of IT infrastructure teams by 69% through optimizing tasks and processes related to database provisioning and operations
- » Providing better support to lines of business (LOBs) by increasing transaction rates by 59%, improving time to market by 40%, and increasing end-user productivity by 22%
- » Reducing IT infrastructure costs by 40% and unplanned downtime by 73%

SITUATION OVERVIEW

In just a few short decades, IT has moved from the back office to the front office and is now embedding itself into nearly every aspect of people's business and personal lives. We are entering an era where the technologies and the processes that businesses deploy are so tightly linked to their customers and markets that the boundary between the enterprise's internal operations and the enterprise's external ecosystem (e.g., customers, markets, competitors, partners, and regulators) is rapidly disappearing.

The IT organization is at the center of this major shift in how organizations connect with customers in new ways, develop new revenue sources, and improve operational efficiency. The demands of gathering, protecting, and rapidly leveraging a deluge of data are a challenge for all IT organizations across all industries, especially when it comes to the infrastructure required to use and analyze all that data.

Furthermore:

- » Organizations are often prevented from taking full advantage of new technologies due to traditional procurement/asset amortization practices (technical debt).
- » They continually struggle to ensure that systems are available and performant, secure, and up to date due to staff resource limitations.
- » They are being asked to deliver new capacity and capability in "cloudlike" time frames in their own datacenters.

To thrive in the new data-driven digital economy, today's enterprises expect that their organizations can:

- » Ensure the proper use and custodianship of data from customers and about customers across clouds and internal datacenter environments to meet regulatory requirements.
- » Leverage infrastructure, which is always available and performant, ready to meet expanding workloads, and able to handle new real-time, data-driven workload requirements.
- » Reduce the operational investments required, ensure that organizations' database and analytic systems are up to date, and continually optimize through the use of the most modern technologies.

Local Clouds: The Platform for Modern Data Solutions

IDC believes that a new generation of cloudlike solutions will play a key role in driving even greater levels of data use across enterprises. The close integration (and pre-bundling) of modern engineered hardware and a full software-defined infrastructure/cloud orchestration software stack is at the core of these new solutions, but IDC finds that this is not enough to meet the requirements of a growing number of customers. IT teams around the world plan to modernize or roll out cloudlike assets in their own facilities and want the ability to acquire such assets via a "pay as you use" subscription model.

Consumption/subscription-based systems such as Oracle Exadata Cloud at Customer address all the previously noted limitations and requirements. This local cloud as a service (LCaaS) enables rapid deployment and expansion, continuous enhancement, and a dramatic reduction in the time/effort required for patches, upgrades, and migrations. The rest of this white paper provides an assessment of the business value, which organizations have already gained from the deployment of the Oracle Exadata Cloud at Customer solution to provide enhanced data capabilities to local communities of users and in centralized internal datacenters.

ORACLE EXADATA CLOUD AT CUSTOMER PRODUCT OVERVIEW

Oracle Exadata Cloud at Customer is a set of offerings designed to bring a cloud experience to customers in their own datacenters. Key elements that shape this set of offerings include:

- » Oracle infrastructure products
- » Oracle managed services
- » Oracle Cloud services (software as a service [SaaS] and PaaS)
- » Subscription and consumption-based pricing

A customer deploying Oracle Exadata Cloud at Customer is responsible for providing and maintaining the datacenter infrastructure (power, cooling, network), while Oracle does the heavy lifting of delivering, deploying, and managing all Oracle infrastructure at a customer datacenter. A customer gets access to Oracle Cloud service offerings, which run not in the public cloud datacenter but on Exadata systems deployed on-premises behind a corporate firewall. The contract between a customer and Oracle lasts four years, after which the equipment can be refreshed, and a new contract would be initiated.

Exadata Cloud at Customer is Oracle's most advanced Oracle Database platform available as a cloud service in customer datacenters, enabling customers to benefit from the same database innovations, services, and pricing as they would in the Oracle Cloud. All services delivered to a customer location as part of Oracle Exadata Cloud at Customer's portfolio are managed from a shared control plane. For Exadata Cloud at Customer deployments, customers can choose from four configurations of the Oracle Exadata hardware: base system (one-eighth rack), quarter rack, half rack, and full rack.

There are no acquisition costs for a customer associated with purchasing or leasing hardware systems or software licensing for running Oracle Exadata Cloud at Customer. A customer pays a subscription fee covering hardware, software, and all services (management and support). In managing Oracle Exadata Cloud at Customer infrastructure, Oracle gets access to the hardware platform and functionality needed for platform management, while the customer has access to the cloud service instances running Oracle Database. So, while customers don't have control of the underlying hardware, they do retain full control of their databases, which is secured behind a corporate firewall. Shared cloud services offerings provided by Oracle as part of the Exadata Cloud at Customer include cloud account management, cloud services entitlement and metering, identity management, monitoring service, and regions management.

With Exadata Cloud at Customer deployment, end users get access to the full range of Oracle's database options and Exadata Database Machine features including hybrid columnar compression, columnar flash cache, storage indexes, automatic indexing, I/O, and network resource management. Customers can scale up or scale down in metered usage of compute capacity by dynamically adding or reducing the number of Oracle compute units (OCPU, a CPU capacity equivalent to one physical core of an Intel Xeon processor with Hyper-Threading enabled). Separated from fixed monthly payments for Exadata infrastructure usage, payments for OCPU are consumption based (i.e., customers pay for what they use, billed on an hourly basis).

Deployed in the customer datacenter, Oracle Exadata Cloud at Customer is compatible with Exadata systems deployed in the Oracle Public Cloud, ensuring continuation of the end-user experience and flexibility in resource usage. Oracle is a leader in developing and delivering architectural identical services across on-premises deployments to public cloud deployments.

There are a number of inherent benefits customers gain with Oracle Exadata Cloud at Customer:

- » As Oracle operates the Exadata Cloud at Customer infrastructure, as with other cloud services business models, customers don't need to invest resources in system management and maintenance.
- » As Exadata Cloud at Customer utilizes a subscription-based payment model, customers don't overpay for resources they don't use while having the flexibility to scale up or down resource utilization without incurring penalty for overutilization or underutilization.
- » As Exadata Cloud at Customer is deployed on the customer premises, end users have all the security provided by their own firewall settings and don't need to deal with potential risks of transferring and keeping data in a public cloud datacenter — whether it's related to technical/security risks associated with data migration or risks of being uncompliant with regulatory requirements.
- » As Oracle Exadata Cloud at Customer is compatible with Exadata systems deployed in the Oracle Public Cloud, customers have the flexibility of developing, deploying, and managing workloads on a single platform while being able to use Exadata Cloud Services with no changes to applications or data sets to optimize cost structure.

THE BUSINESS VALUE OF ORACLE EXADATA CLOUD AT CUSTOMER

Study Demographics

IDC conducted research that explored the value and benefits for organizations of using Oracle Exadata Cloud at Customer to optimize their IT infrastructure. The project included interviews with eight organizations that had experience with or knowledge about Oracle’s first-generation cloud-based service and its benefits and costs. During the interviews, companies were asked a variety of quantitative and qualitative questions about the impact of the solution on their IT and database operations, businesses, and costs.

Table 1 presents study demographics and profiles. Organizations interviewed had a base average of 28,865 employees, indicating the presence of several large companies in the mix. Of those, 16,478 employees were using IT services, supported by an IT staff of 660. Their IT teams are responsible for the operation of an average of 489 business applications serving 2.83 million external customers.

From a geographic standpoint, these study participants came from the United States, China, Brazil, India, and Turkey. These organizations represented the manufacturing, financial services, healthcare, information technology, mining, and retail sectors. (Note: All numbers cited represent averages.)

TABLE 1

Study Firmographics		
Firmographics	Average	Median
Number of employees	28,865	5,000
Number of IT staff	660	350
Number of IT users	16,478	2,450
Number of external customers	2.83 million	2,775
Number of business applications	489	300
Revenue per year	\$8.75 billion	\$2.17 billion
Countries	United States (3), China (2), Brazil, India, and Turkey	
Industries	Manufacturing (2), financial services (2), healthcare, information technology, mining, and retail	

Source: IDC, 2019

Choice and Use of Oracle Exadata Cloud at Customer

The companies surveyed described usage patterns for Oracle Exadata Cloud at Customer and provided a snapshot of their overall IT and business environments. They also discussed both the value proposition and the rationale behind their choice of the Oracle offering. Customers cited many benefits including having the flexibility to cost effectively increase or decrease demand capacity on an as-needed basis, integration with existing cloud migration strategies, and increasing performance without a corresponding increase in licensing costs. Also cited was the ability to use the service to re-architect and update IT infrastructure. Study participants elaborated on these benefits:

- » **Enabled a modernized IT organization:** *“As our company grew over the past 30 years, our IT was lagging behind and were still in a 2000s kind of structure. A lot of things could not meet current business requirements. For example, in terms of delivering app services to customers, we just didn’t have the right infrastructure to be able to do that. It all comes down to business needs. We use Oracle Exadata Cloud at Customer to refresh and re-architect the entire IT backbone.”*
- » **Cost-friendly scalable Exadata expansion:** *“Our former Exadata system was not enough for our transactional database. We needed more performance without expanding licensing costs. When we considered licensing costs and all the good features of Exadata Cloud at Customer, we decided to use it. It also had the capability of a bursting option, which was important for us on days when we launch campaigns and have peak transactions on our database. I can now assure our company that we have 15% faster database transactions.”*
- » **Cutting-edge and cost-efficient solution:** *“We had two main motivations for the purchase. One was needing a cutting-edge solution and the second was cost savings. We were looking for what was best in terms of those two factors. We were more comfortable going with Oracle Exadata Cloud at Customer because it met our cloud migration strategy.”*
- » **The ability to scale up and down as needed:** *“Our business is very dynamic, and we are seeing growth of 70-80% a year. What we’re doing is not sufficient to meet that growth in terms of planning and budget requirements. Sometimes, there are huge peaks, such as festivals, and very high demand on our infrastructure that we’re not able to sustain. We need the flexibility to increase the infrastructure if needed, and when there is no peak usage, be able to reduce compute power.”*

Table 2 describes the IT environments that characterized surveyed companies. On average, there were 23 servers operating with 141 cores. These resources supported the use of 21 applications and 37 databases on average. Additional usage patterns are presented in Table 2.

TABLE 2

Organizational Usage

Current Oracle Exadata Environment	Average	Median
Number of Oracle Exadata Cloud at Customer machines	5	4
Number of servers	23	7
Number of cores	141	122
Number of applications	21	20
Number of databases	37	15
Number of terabytes needed to support databases	297	90
Number of internal users supported	6,214	760

Source: IDC, 2019

Table 3 provides granular data on all the Oracle Exadata systems in the companies surveyed. Most of the Oracle Exadata usage in these organizations (84%) involved the use of Oracle Exadata Cloud at Customer.

TABLE 3

Current Oracle Exadata Environment

	Average (%)
On-premises	15
Oracle Exadata Cloud at Customer	84
Other Oracle cloud-based services	1

Source: IDC, 2019

Table 4 provides data on Oracle Exadata Cloud at Customer environments in terms of overall capacity. Business applications made up 37% of the overall capacity. In addition, data warehousing functions required 36% of capacity, and development and test required an additional 18% of capacity.

TABLE 4

Oracle Exadata Cloud at Customer Environment by Capacity

	Average (%)
Business applications	37
Data warehousing	36
Development and test	18
Backup and recovery/disaster recovery	9

Source: IDC, 2019

Business Value and Quantified Benefits

IDC's Business Value model expresses the quantified benefits for organizations using Oracle Exadata Cloud at Customer services to support their Oracle Database workloads. Survey data from Oracle customers was applied to this model to arrive at an array of quantified post-deployment benefits. Using this methodology, IDC found that these customers realized significant value and were able to maximize their return on investment in Exadata database usage.

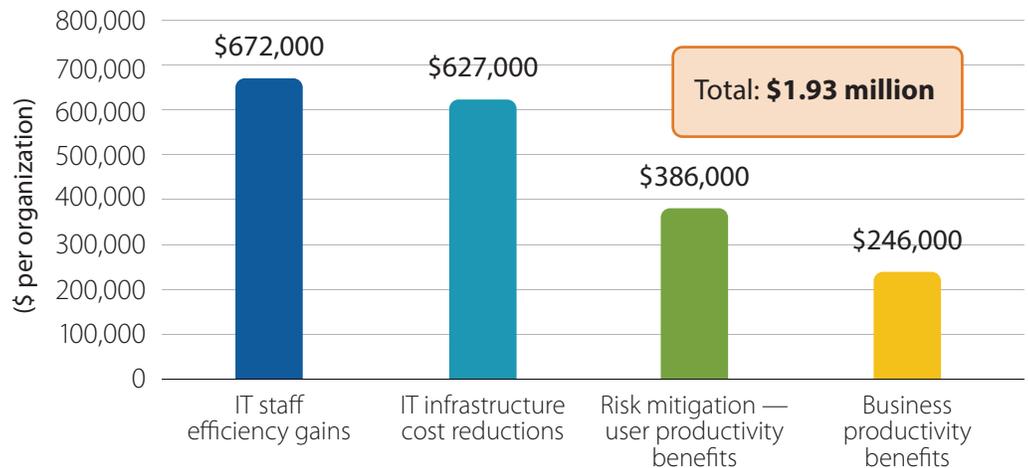
These benefits fostered more efficient IT database infrastructure by increasing the productivity of IT and database teams and optimizing the tasks and processes they undertook on a daily basis. The efficiencies achieved included better supporting lines of business by reducing the time to provision databases and increasing transaction rates as well as overall performance. Other benefits centered on reducing IT infrastructure costs and the effects of unplanned downtime on business users, thereby contributing to greater productivity and faster time to market for business operations. In the aggregate, these benefits ensured that IT resources could help LOB units operate more effectively in pursuit of business goals. Study participants discussed how they are using Oracle Exadata Cloud at Customer to achieve these benefits:

- » **Ease of management:** *"We don't have to manage Oracle Exadata Cloud at Customer. Although it's on-premise, from the database stack to below, it's all managed by Oracle. So, it's really like a cloud in your house."*
- » **Improved performance:** *"Exadata Cloud at Customer provided stability and performance because it's an engineered system, and the hardware and software are working perfectly together. That's why we don't want to use any other systems. In engineered systems, we're seeing great performance with storage and software. Exadata Cloud at Customer offers really important features such as in-memory database. Those kinds of features are very important for our business because performance is very important for our conversion rate. That's why Oracle Exadata Cloud at Customer is the best choice for our business."*
- » **Flexibility to support environments:** *"We have flexibility whenever we have peaks because we can increase processing power. We now have more powerful machines, as well as better storage and data RAM because the RAM and the flash are much faster. IT can relax whenever there's a peak because we can increase the CPU and handle the processing."*
- » **Lower costs and more efficient IT:** *"One key benefit is low cost of ownership because we do not have to spend any capital on that. It's all opex. The second part is that, with Exadata Cloud at Customer, we get the option to use all the database licenses we need and don't have to procure additional ones. This provides more value for business or application needs over adding capex, which could take longer. The other benefit is there's a lot of automation and orchestration built into Oracle Exadata Cloud at Customer. We can save time on our side for operational activities and put it toward value-added activities."*

As shown in Figure 1, IDC quantifies the value that study participants are achieving through their use of Oracle Exadata Cloud at Customer at an average of \$1.93 million per organization per year over five years. This can be broken out into the following areas:

- » **Business productivity benefits:** Study participants have improved productivity levels for employees and contributed to better business results. IDC puts the value of higher revenue and increased productivity at an annual average of \$246,000 per organization.
- » **IT staff productivity gains:** Interviewed organizations have substantially improved IT and database team productivity levels. IDC calculates the value organizations have realized in higher productivity at an annual average of \$672,000 per organization.
- » **Risk mitigation — user productivity benefits:** By deploying a more robust and reliable database platform, interviewed customers have reduced the impact of outages on their users and businesses. IDC quantifies the value of this form of higher productivity at an annual average of \$386,000 per organization.
- » **IT infrastructure cost reductions:** Interviewed organizations were able to operate more efficiently and scale down the cost of operation by leveraging the cloud. IDC calculates that they will realize average annual value of \$627,000 per organization.

FIGURE 1
Average Annual Benefits Per Organization



Source: IDC, 2019

Improvements in IT Efficiencies and Performance

Oracle Exadata Cloud at Customer is designed to help Oracle Database customers that wish to take advantage of cloud economics and operational benefits but that can't move their databases to the public cloud due to sovereignty laws, industry regulations, security requirements, network latency, or other factors. Companies use the service for data management and analytics as well as adopting or extending a SaaS capability while gaining better control over regulatory issues, data privacy, and governance by tightly integrating network security. The Oracle Exadata Cloud at Customer service is designed to provide low latency for on-premises applications and databases.

Study participants spoke with IDC about the benefit of agility and elasticity of leveraging a cloud-based deployment. They reported that Oracle Exadata Cloud at Customer deployments resulted in faster database performance, which enabled IT projects to be completed in less time, thereby freeing up staff time to work on more strategic projects that supported the business. Study participants focused on automation benefits such as not having to do patching tasks. The availability of a strong Oracle support function was cited as a time-saving resource for IT staff. Study participants elaborated on these and other benefits:

- » **Time freed up to focus on strategic projects:** *"We moved on from day-to-day troubleshooting to more strategic projects. We put day-to-day tasks on appliances, so we don't have to worry about routine outages. That allows our team to work on more strategic enhancements."*
- » **Simpler management of infrastructure:** *"Stability is the key for us. We don't have to spend time on maintaining our environment for operations. With automation and orchestration, IT can spend time on other value-added projects."*
- » **More efficient database management:** *"Oracle Exadata Cloud at Customer is helping our DBAs because a lot of things are automated. Oracle has given them everything they need. If there is an issue, there is automatically someone from Oracle minding it and contacting the DBA to alert him. Our DBA is more relaxed because of getting automatic alerts. Without Exadata Cloud at Customer, DBAs have to spend a lot of time managing Exadata by rebuilding of indexes and doing a lot of fine-tuning. Our DBA is saving at least 50% of this time."*
- » **Faster performance:** *"In the previous environment, we had a critical financial report that took 12 minutes to run. When we switched to Exadata Cloud at Customer, we didn't have to tune anything because of the code amendment. It takes 41 seconds now."*
- » **Easier patching:** *"We have the capability to roll out patching systems more easily. This means you don't need to shut down the whole system in order to patch the hardware and the software one instance at a time."*

Table 5 shows the accrued benefits for IT infrastructure management in terms of productivity impacts using FTE equivalent as the primary metric. Overall productivity showed a substantial improvement (69%). In addition, time spent "keeping lights on" reduced by 56%, meaning more time could be devoted to more strategic tasks that supported the business.

TABLE 5

IT Infrastructure Management Impact				
	Before Oracle Exadata Cloud at Customer	With Oracle Exadata Cloud at Customer	Difference	Benefit (%)
Management of IT infrastructure productivity impact (FTE equivalent)	5.2	1.6	3.5	69
Time spent keeping lights on	36%	16%	20%	56
Salary cost per year per organization	\$517,000	\$162,000	\$354,000	69

Source: IDC, 2019

IDC then looked at how IT efficiencies affected routinely performed IT management tasks (see Table 6). The time required to deploy new server resources was reduced from over 9 days to under 2 days, representing an 81% improvement. In addition, the time required to deploy new storage resources was reduced from approximately 10 days to 4 days, representing a 59% improvement.

Table 7 shows quantified IT team efficiencies associated with routine database administrator (DBA) tasks. The staff time required to deploy a new database was dramatically reduced from 34.5 hours to 4.4 hours, representing an 87% improvement. In monetary terms, overall staff time costs saved annually by using Oracle Exadata Cloud at Customer averaged \$179,000.

TABLE 6

IT Agility Impact				
	Before Oracle Exadata Cloud at Customer	With Oracle Exadata Cloud at Customer	Difference	Benefit (%)
Server resources				
Time to deploy new server resources (days)	9.2	1.7	7.4	81
Staff time to deploy new server resources (hours)	10.2	1.9	8.4	82
Storage resources				
Time to deploy new storage resources (days)	10.3	4.2	6.1	59
Staff time to deploy new storage resources (hours)	20	10.5	9.5	48

Source: IDC, 2019

TABLE 7

Database Administrator Impact

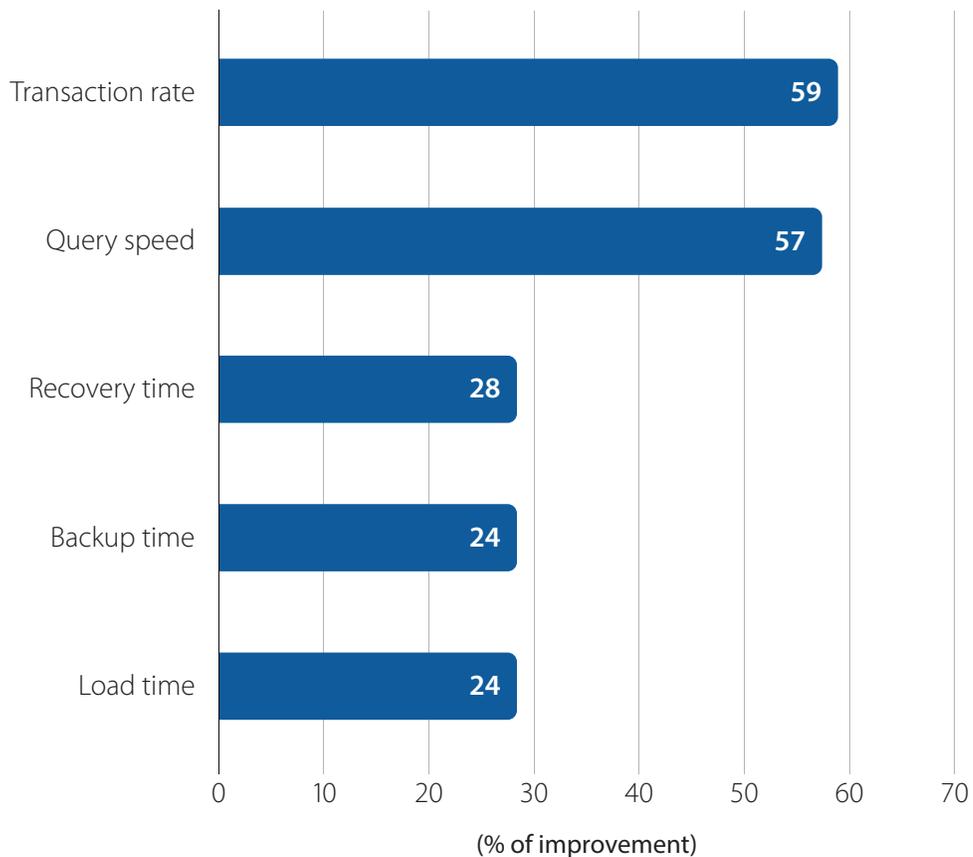
	Before Oracle Exadata Cloud at Customer	With Oracle Exadata Cloud at Customer	Difference	Benefit (%)
Database administrator (FTE equivalent per organization per year)	7.2	5.5	1.8	25
Staff time to deploy new database (hours)	34.5	4.4	30.1	87
Staff time cost per year	\$724,000	\$545,000	\$179,000	25

Source: IDC, 2019

As described previously, the use of Oracle Exadata Cloud at Customer offered a set of specific benefits for database administrators and teams. Figure 2 quantifies these benefits by zeroing in on a group of routine tasks in their purview. While improvements were realized in all areas, the greatest improvements were identified in the areas of transaction rate (59%), query speed (57%), and recovery time (28%). Additional metrics are presented in Figure 2.

FIGURE 2

Database Performance Impact



Source: IDC, 2019

Table 8 shows similar post-deployment IT staff efficiencies for database security. Both FTE equivalent per organization per year and annual staff time costs showed a 67% improvement after deployment of Oracle Exadata Cloud at Customer.

TABLE 8

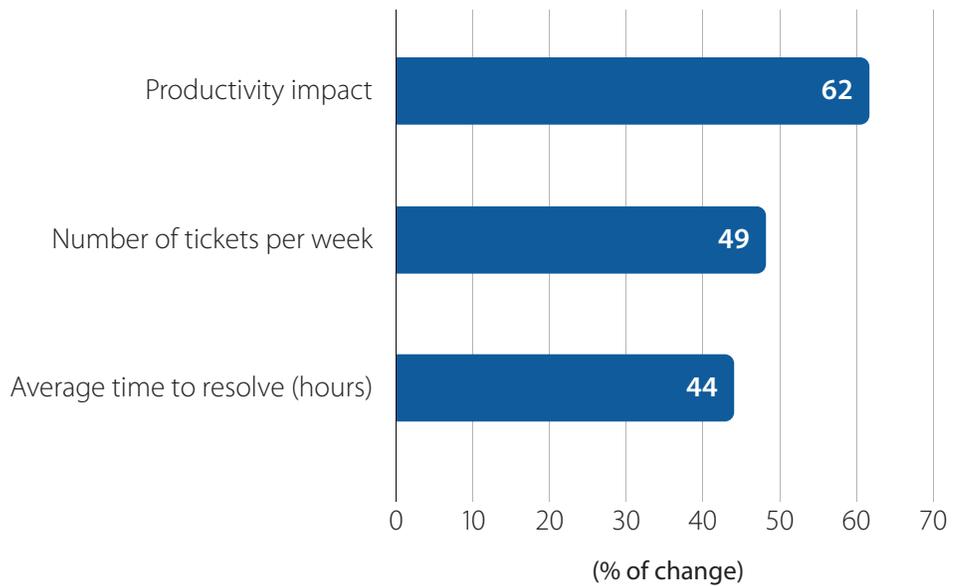
IT Database Security Staff Impact				
	Before Oracle Exadata Cloud at Customer	With Oracle Exadata Cloud at Customer	Difference	Benefit (%)
IT database security staff (FTE equivalent per organization per year)	1.8	0.6	1.2	67
Staff time cost per year	\$180,000	\$60,000	\$120,000	67

Source: IDC, 2019

The previously described IT team efficiencies also translated into less disruption for lines of business and the teams themselves. One practical outcome was that help desk functions not only received fewer calls, but when calls were made, they were more quickly resolved, and overall productivity showed a 62% improvement (see Figure 3).

FIGURE 3

Help Desk Impact



Source: IDC, 2019

Unplanned Downtime Impact

Interviewed companies spoke with IDC about the impacts of Oracle Exadata Cloud at Customer on unplanned downtime and business productivity. Organizations described how they were able to reduce the incidence of unexpected outages and how this benefit extended to LOB operations.

Interviewed organizations reported an 81% reduction in the annual number of unplanned incidents, while the time to resolve those issues saw a 72% reduction. Overall, IDC determined these organizations were gaining back about 73% of lost end-user productivity, which is worth an average of \$378,000 per organization (see Table 9).

Unplanned downtime can also create lost revenue opportunities. IDC quantified these benefits in monetary terms. The average total additional revenue per year was calculated at \$224,616 (see Table 10).

TABLE 9

Unplanned Downtime Productivity Impact				
	Before Oracle Exadata Cloud at Customer	With Oracle Exadata Cloud at Customer	Difference	Benefit (%)
Frequency of incidents per year	6.3	1.2	5.1	81
Time to resolve (hours)	1.8	0.5	1.3	72
FTE impact lost productivity due to unplanned outages	7.4	2.0	5.4	73
Cost of unplanned downtime per year	\$516,000	\$138,000	\$378,000	73

Source: IDC, 2019

TABLE 10

Unplanned Downtime Revenue Impact	
	Per Organization
Total additional revenue per year	\$224,616
Assumed operating margin	15%
Total recognized revenue per year — IDC model*	\$33,692

* IDC model assumes a 15% operating margin for all additional revenue

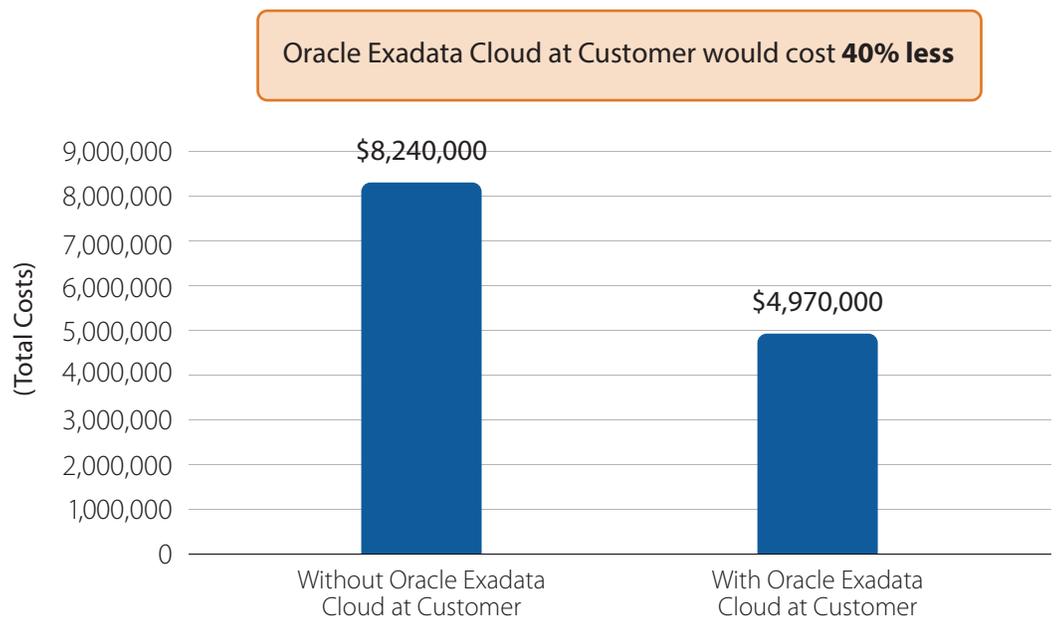
Source: IDC, 2019

Cost Reduction in IT Infrastructure

Study participants spoke with IDC about how Oracle Exadata Cloud at Customer represented a more cost-effective solution than either previous infrastructure-based approaches or other commercial alternatives considered. They attributed this in part to being able to shift to the opex consumption model that underlies it. Other cost savings came from reductions in the use of costly database licenses. Figure 4 presents metrics related to IT infrastructure savings comparing pre-deployment environment with post-deployment environment, and as a result, infrastructure cost savings were significant.

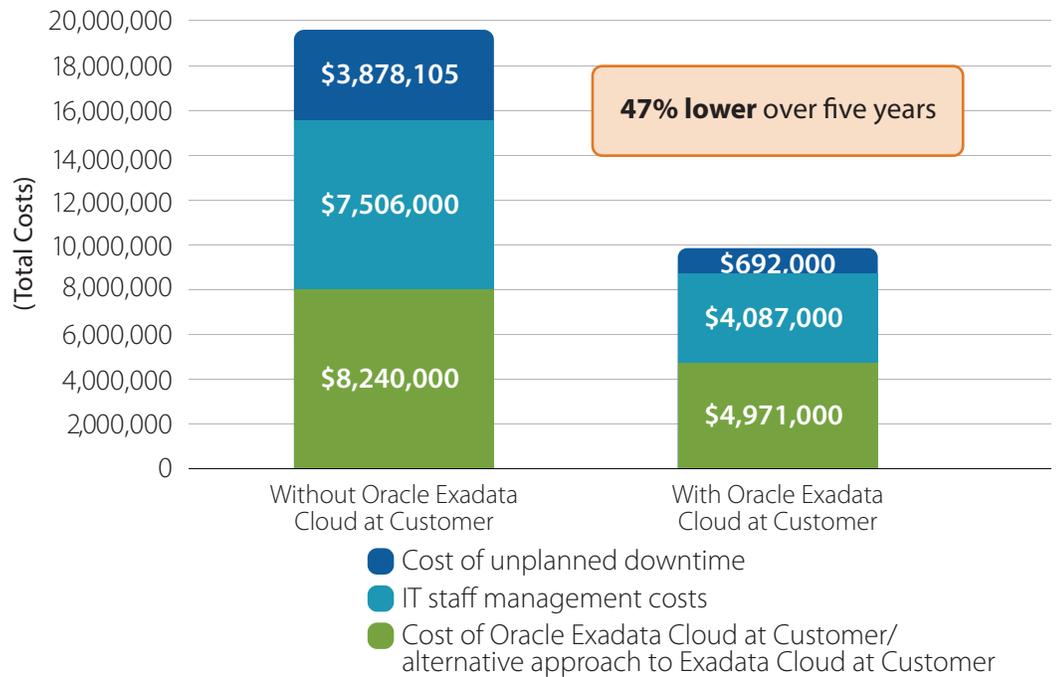
IDC took into account multiple factors when analyzing the five-year total cost of operations these organizations were realizing with Oracle Exadata Cloud at Customer. One factor was the previously mentioned IT infrastructure cost reduction, and two other factors are the overall IT staff time required to manage Oracle Exadata Cloud at Customer compared with a comparable infrastructure and unplanned downtime impacts. After accounting for all three factors, IDC calculates that Oracle Exadata Cloud at Customer clients would be saving an average of 47%, as illustrated in Figure 5.

FIGURE 4
Five-Year IT Infrastructure Savings



Source: IDC, 2019

FIGURE 5
Five-Year Total Cost of Operations



Source: IDC, 2019

Business and Productivity Benefits

As described previously, interviewed companies discussed how using Oracle Exadata Cloud at Customer led to optimized performance for the core IT and database operations and processes supporting their business operations. They described how this resulted in higher levels of employee productivity and better business results.

Study participants underscored the value of having greater processing power for their database operations. This meant that databases could be deployed more quickly and, when deployed, could provide better agility than what was possible with a pure on-premises solution. As a result, in addition to all of the other IT and database team efficiencies described thus far, organizations were able to generate more business opportunities, leading to improved business results. One intangible benefit noted was that LOB end users seemed pleased with these new capabilities afforded by the database team. Study participants elaborated on these benefits:

- » **Helped generate more business:** *“If we didn’t have Exadata Cloud at Customer, we would’ve lost a business offer worth \$10,000 to \$200,000 per day. That’s a value we’re already giving to our business. Now, we’re expecting within the next year more and more of those kinds of customers because of the capabilities we have created for the business.”*
- » **Meet business needs faster:** *“I would say speed to business is the biggest benefit. When business users ask for a database, we can respond quickly. Database and application performance are faster than what we had on-premise.”*

- » **Able to handle more data:** *“Business needs are all about processing more and more data. They receive most of the data in the beginning of the month, and they can handle it now because we have more processing power.”*
- » **More satisfied end users:** *“Our business end users are happy because of the performance and also the reliability of Oracle Exadata Cloud at Customer.”*

Table 11 presents quantified benefits for business end users after companies deployed Oracle Exadata Cloud at Customer. On average, there were 99 users affected across all organizations. These users gained 6,000 hours of productive time. When quantified in monetary terms, this resulted in an average gain of \$225,000.

Figure 6 shows several business key performance indicators (KPIs). After deployment of Oracle Exadata Cloud at Customer, organizations were able to bring products and services to market 40% faster and improve overall business processes by 16%.

Organizations reported they were able to capture more revenue as a result of being faster to market with Oracle Exadata Cloud at Customer. IDC calculated the total additional revenue per year at \$250,000 (see Table 12).

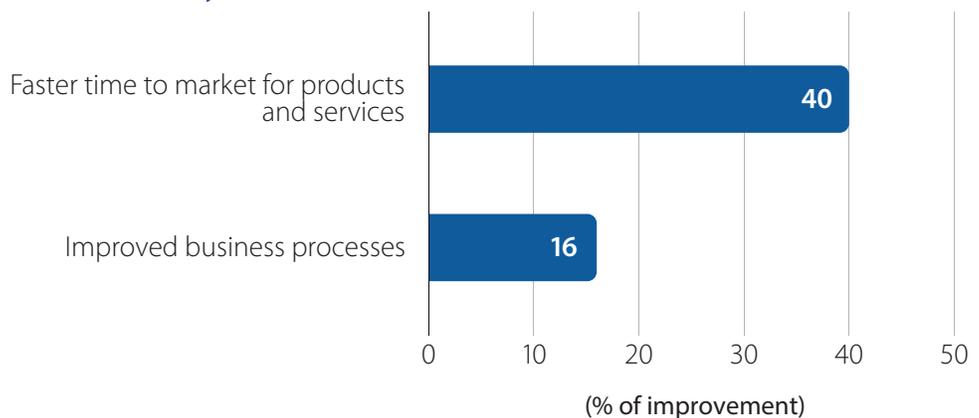
TABLE 11

Enhanced User Productivity	
	Per Organization
Number of users impacted	99
Gross productivity gains	22%
Net productivity gains	3%
Productive hours gained	6,000
End-user impact (FTE equivalent per organization per year)	3.2
Value of end-user time	\$225,000

Source: IDC, 2019

FIGURE 6

Business Key Performance Indicators



Source: IDC, 2019

TABLE 12

Business Impact — Revenue from Better Addressing Business Opportunities

	Per Organization
Total additional revenue per year	\$250,000
Assumed operating margin	15%
Total recognized revenue per year — IDC model*	\$37,500

*IDC model assumes a 15% operating margin for all additional revenue

Source: IDC, 2019

ROI Summary

Table 13 presents IDC’s analysis of the financial and investment benefits related to study participants’ use of Oracle Exadata Cloud at Customer. IDC calculates that, on a per-organization basis, interviewed organizations will achieve total discounted five-year benefits of \$7.02 million based on IT staff efficiencies, increased user productivity, improved cost of operation, and other factors.

These benefits compare with projected total discounted investment costs over five years of \$1.97 million on a per-organization basis. At these levels of benefits and investment costs, IDC calculates that these organizations will achieve a five-year ROI of 256% and breakeven on their investment in about six months.

TABLE 13

Five-Year ROI Analysis

	Per Organization
Benefit (discounted)	\$7.02 million
Investment (discounted)	\$1.97 million
Net present value	\$5.04 million
ROI	256%
Payback	6 months
Discount factor	12%

Source: IDC, 2019

CHALLENGES/OPPORTUNITIES

Solutions like Oracle Exadata Cloud at Customer that provide a cloud-based operating and consumption environment in enterprises' own facilities will play a critical role in extending new, innovative data services while reducing operational overhead. They do, however, pose challenges for many IT organizations, which Oracle minimizes as much as possible.

Oracle publicly states that it has deployed the initial generation of Cloud at Customer service nodes in hundreds of customer locations, including at the companies that IDC spoke with for this study. In September 2019, Oracle introduced a generation of Exadata Cloud at Customer solutions. Built on the latest compute, memory, storage, and network hardware foundations, these systems provide significant performance enhancements but may have power, cooling, and network connection speed requirements that may not be readily available in an existing enterprise datacenter. Oracle must deliver site assessment and remediation services to ensure that its next generation of nodes can be deployed in a timely fashion and maintained as the services' capacity and capabilities expand.

As Oracle is taking responsibility for monitoring, patching, and updating the hardware, infrastructure software, and (in many cases) database/application software, it must have the ability to remotely monitor/manage system in many enterprises' internal datacenters. As part of the September 2019 introduction, Oracle also made significant enhancements in its software and cloud control plane designed to significantly improve remote operational scalability and efficiency. Oracle needs to work closely with customers' network security teams to ensure that the necessary connectivity is secure and delivered timely to enable full use of these new control plane capabilities. As part of this enhancement, Oracle is also providing more transparent and consistent SLAs and policies when it comes to the collection and use of data about customers' systems.

CONCLUSION

A key step for any organization with aggressive digital transformation agendas is making “data” the cornerstone for enterprise IT organizations. For CIOs and their IT teams, deploying infrastructure that enables the optimal collection, distribution, protection, analysis, and reaction to data is critical. In some cases, this data may be in central cloud environments, but for many organizations, latency, availability, and governance needs require the use of leading-edge technology in corporate datacenters.

The most consistent and recurring barriers to effectively deliver the leading-edge infrastructure needed to address data needs in corporate datacenters are:

- » The time and resources required to ensure existing assets are always up to date when it comes to software and firmware patches
- » The technical debt accrued from the up-front purchase of new infrastructure that prevents quick adoption of new state-of-the-art technologies

Solutions like Oracle Exadata Cloud at Customer will play a key role in helping businesses thrive in a world where data drives business transformation, but their effective use will also require new thinking by the IT organization. The IT team must develop and continuously refine best practices for its infrastructure (across cloud internal locations), including robust service evaluation, governance, and performance monitoring practices. IT leaders must also assess themselves and their teams with respect to what it will take to develop a world-class digital organization and/or when it becomes prudent to leverage partners such as Oracle with defined LCaaS offerings that can speed the move to the next stage of data-driven innovation. Organizations that thrive in this new environment are those that master the ability to turn data into a wellspring of innovation. Those that do not will struggle to survive the ongoing data deluge.

APPENDIX

Methodology

IDC's standard ROI methodology was utilized for this project. This methodology is based on gathering data from current users of DigiCert PKI Platform as the foundation for the model. Based on interviews with organizations using the service platform, IDC performed a three-step process to calculate the ROI and payback period:

- 1. Gathered quantitative benefit information during the interviews using a before-and-after assessment of the impact of Oracle Exadata Cloud at Customer.** In this study, the benefits included staff time savings and productivity benefits as well as operational cost reductions.
- 2. Created a complete investment (five-year total cost analysis) profile based on the interviews.** Investments go beyond the initial and annual costs of using Oracle Exadata Cloud at Customer and can include additional costs related to migrations, planning, consulting, and staff or user training.
- 3. Calculated the ROI and payback period.** IDC conducted a depreciated cash flow analysis of the benefits and investments for the organizations' use of Oracle Exadata Cloud at Customer reports over a five-year period. ROI is the ratio of the net present value (NPV) and the discounted investment. The payback period is the point at which cumulative benefits equal the initial investment.

IDC bases the payback period and ROI calculations on a number of assumptions, which are summarized as follows:

- » Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and manager productivity savings. For purposes of this analysis, based on the geographic locations of the interviewed organizations, IDC has used assumptions of an average fully loaded salary of \$100,000 per year for IT staff members and an average fully loaded salary of \$70,000 per year for non-IT staff members. IDC assumes that employees work 1,880 hours per year (47 weeks x 40 hours).
- » The net present value of the five-year savings is calculated by subtracting the amount that would have been realized by investing the original sum in an instrument yielding a 12% return to allow for the missed opportunity cost. This accounts for both the assumed cost of money and the assumed rate of return.
- » Because IT solutions require a deployment period, the full benefits of the solution are not available during deployment. To capture this reality, IDC prorates the benefits on a monthly basis and then subtracts the deployment time from the first-year savings.

Note: All numbers in this document may not be exact due to rounding.

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