Oracle Ups its Game with Gen 2 Exadata Cloud at Customer

By David Floyer
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PREMISE

Updated Wikibon research shows the business case for deploying Oracle Gen 2 Exadata Cloud at Customer is overwhelmingly positive. Wikibon finds this platform to be by far the best solution to deploy large-scale mission-critical Oracle Database applications in a hybrid cloud environment. Wikibon financial and technical research finds Gen 2 Exadata Cloud at Customer provides 37% more business value than Microsoft Azure Stack over four years, when running Oracle Database 19c.

We believe this system is also a prerequisite and the fastest path to deploying the next generation of integrated business applications. Our research shows that generally, deploying this platform will eliminate expensive and risky do-it-yourself (DiY) component assembly and conversion projects as well as extend the business value of existing application portfolios.

Wikibon believes the strong business case and increased speed to develop next generation applications justifies the risk of an Oracle-only strategy.

BUSINESS CASE IN A NUTSHELL

Wikibon's previous research in January 2019 on the "Business Value of Oracle Cloud at Customer" found significant benefits for Gen 1 Exadata Cloud at Customer. This report assumes the reader has some knowledge of the previous research, and focuses on the financial value assessment of the long list of new features available in Gen 2 Exadata Cloud at Customer.

The comparison methodology is the same as the original research. It compares traditional best-of-breed do-it-yourself (DiY) IT datacenter infrastructure, Microsoft Azure Stack hybrid cloud, and Gen 2 Exadata Cloud at Customer hybrid cloud, all running Oracle Database 19c. It uses the same techniques to look at the financial impact on IT budgets, and the financial benefit to the lines of business.

This research focuses on systems running an Oracle infrastructure stack and Database software. We are not, for example, comparing Exadata Cloud at Customer with Azure Stack running Microsoft SQL Server.

AWS (both native & VMware options) and Google were not selected in January 2019, because they have not shipped the hybrid cloud hardware and/or have not shipped enterprise mission-critical Oracle Database services. The same reasons for platform selection still apply for this research (September 2019).

In that original research we said that the addition of operational AI together with Autonomous Database would significantly increase the value of Exadata Cloud at Customer. The announcement of Gen 2 Exadata Cloud at Customer has radically increased the potential benefits.

The short-term benefits stem from reducing the costs of running existing systems, and releasing resources to develop increased business value in a $2B enterprise. These overall benefits are shown in Figure 1 below.

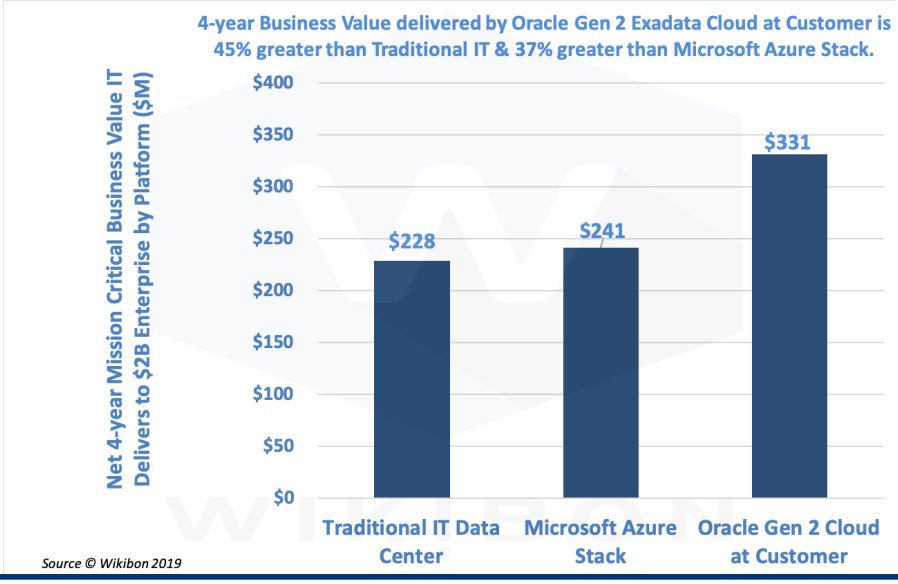


Figure 1 - Business Value from IT for Migrating to a Cloud-first On-premises Hybrid Cloud

Source ©Wikibon 2019. See Figure 4 below and Table 1 in Footnotes 1 for Detailed Data.

Figure 1 shows that the Microsoft Azure Stack running Oracle Database 19c only delivers $13M (6%) additional business value over 4 years. This is mainly due to the greater length of time to migrate to Azure Stack (9 months), and the lack of advanced technologies such as RoCE and Autonomous Database—which Wikibon expects will be integrated into Gen 2 Exadata Cloud at Customer.

In contrast, Figure 1 shows the value of Gen 2 Exadata Cloud at Customer is $331M over 4 years, or $103M (45%) more than the traditional best-of-breed DiY IT datacenter base case.

When Gen 2 Exadata Cloud at Customer is compared with Microsoft Azure Stack, the Gen 2 advantage is$90M (37%) over Azure Stack over four years, when running Oracle Database 19c.

Figure 2 in the "Basic IT Budget Financial Model Results" section below looks at the impact on just the basic IT budget. It shows the cost of Azure Stack is 55% higher than the Gen 2 Exadata Cloud at Customer, when running Oracle Database 19c.

Figure 3 in the "Extended IT Budget Model Results" section below looks at the impact on an extended IT budget. It shows that cost of Azure Stack is 36% higher when running Oracle Database 19c than Gen 2 Cloud at Customer.

Figure 4 in the "Business Value Model in Detail" section below provides more detail into the business value components that make up Figure 1 above.

WIKIBON DETAILED FINANCIAL ANALYSIS

This section provides the detail behind Figure 1 in the "Business Case in a Nutshell" section above.

FINANCIAL MODEL DESCRIPTION

The Wikibon financial model evaluates the benefits of the features discussed above over a four-year timeframe in a $2B enterprise. Three cases are analyzed.

1. The base case is a traditional IT best-of-breed system where the components are selected and integrated by IT staff. This is commonly referred to as "do-it-Yourself", or DiY.
2. One cloud-first hybrid cloud case is an on-premises implementation of Oracle Database 19c on Microsoft Azure Stack. The hardware is supplied by Microsoft partners such as Dell and HPE to strict Microsoft specifications. HPE offers flexible acquisition options with GreenLake. The stack software is supplied by Microsoft, and the database software by Oracle. Microsoft is responsible for level 1 problem determination and resolution.
3. The other cloud-first hybrid cloud case is Oracle Gen 2 Exadata Cloud at Customer. Oracle provides all the hardware and software, and is solely responsible acquisition, deployment, maintenance of hardware and software (updates, patching), and upgrades. A "single hand to shake and throat to choke" business relationship.

The Wikibon Financial Model considers three categories of benefit analysis:

• **Basic IT budget**, including IT infrastructure costs, cost of migration to implement the solution, and the cost of the IT operational staff.
• **Extended IT budget**, including migration costs, operational staff, development staff, Oracle Database costs, IT infrastructure costs, and an "other costs" (including security, datacenter costs, etc.).
• **Business value delivered**, including all the business benefits to the line of business, including the value of maintaining existing applications and the much greater value added by deploying new IT application projects. The "negative" values include the cost of IT, the cost of downtime, and the natural depreciation in value of the applications. The net application value is the sum of these values. The detailed calculations and assumptions for this can be found in Table 2, Footnotes 2 below

The three categories above are included in a summary of the overall IT budget and business value, and is already presented and discussed in Figure 1 above.

BASIC IT BUDGET FINANCIAL MODEL RESULTS

Figure 2 shows the results of our analysis considering just the basic elements of the IT budget. These include IT infrastructure costs, staff operational costs, and the migration costs from a traditional datacenter system to a cloud-first hybrid cloud system.

The results in Figure 2 above show that the 4-year infrastructure and operational staff budgets for a traditional best-of-breed IT data center are 58% higher than Oracle Gen 2 Exadata Cloud at Customer. The cost of Microsoft Azure Stack is 55% higher than Gen 2 Cloud at Customer when running Oracle Database 19c.

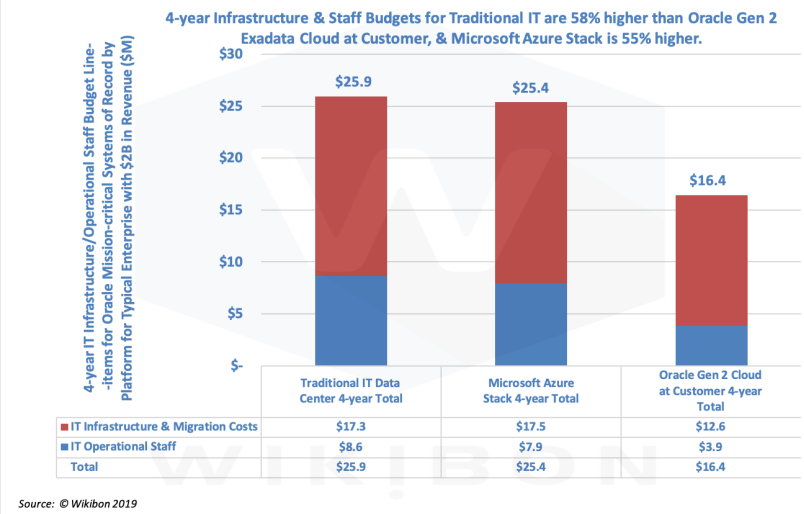


Figure 2 - Wikibon Financial Model of Operational IT Staff and Infrastructure costs for the base case (Traditional IT Data Center), the Cost of Microsoft Azure Stack, and the cost of Gen 2 Exadata Cloud at Customer.

Source ©Wikibon 2019. See Table 1 in Footnotes

The reasons for these results are that the new Oracle solution is more efficient and requires less hardware than alternatives. In addition, Wikibon believes the Oracle Exadata X8M base for Gen 2 Exadata Cloud at Customer will require far fewer operational staff, as a result of offloading work to the control plane, and greater automation from the Autonomous Database and the Autonomous Linux.

The downsides of this strategy are lock-in to Oracle, Capex commitment over a number of years, the difficulties of matching IT expenditure with business value created, and the difficulties of adapting to changing business volumes.

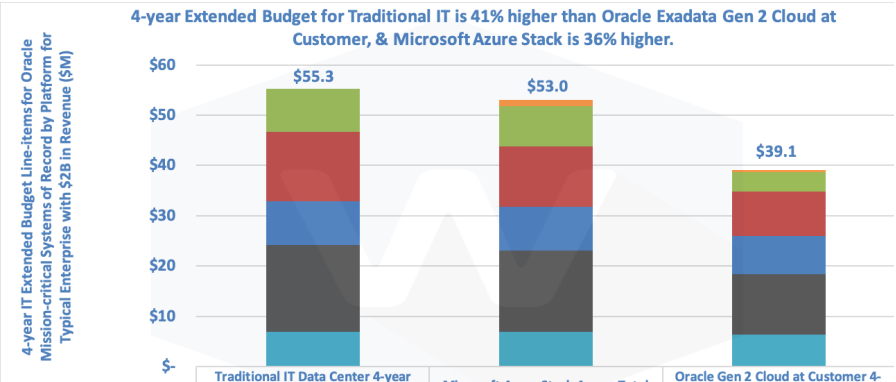
EXTENDED IT BUDGET MODEL RESULTS

The table in Figure 3 below shows a more detailed break-out of most other budget line-items and calculates the extended budget savings.

Figure 3 shows the 4-year extended budget for Traditional IT is 41% higher than Oracle Gen 2 Exadata Cloud at Customer while Microsoft Azure Stack is 36% higher. In addition, Figure 2 shows that Gen 2 lowers infrastructure and staff costs by $16.2M relative to Traditional IT, and by $13.9M relative to Azure Stack.

The Oracle Database line item for Oracle Gen 2 Exadata Cloud at Customer is lower because of the greater efficiency from the upcoming use of RoCE, RDMA, persistent storage layer, and columnar cache improvements. There is also an opposite impact because of the requirement to purchase additional licenses for specific features, including Enterprise Edition options such as Database In-Memory and cloud management packs. The net result is an overall small reduction in database license costs.

The downsides of this strategy are the same as those discussed in the basic IT financial model in the previous section. These are lock-in to Oracle, Capex commitment over a number of years, the difficulties of matching IT expenditure with business value created, and the difficulties of adapting to changing business volumes.



	Traditional IT Data Center 4-year Total	Microsoft Azure Stack 4-year Total	Oracle Gen 2 Cloud at Customer 4-year Total
Migration Costs	$0.0	$1.3	$0.4
Operational Staff	$8.6	$7.9	$3.9
Development Staff	$13.8	$12.1	$8.8
Oracle Database	$8.6	$8.6	$7.5
IT Infrastructure	$17.3	$16.2	$12.1
Other Costs (security, etc.)	$6.9	$6.9	$6.3
Total Extended IT Budget	$55.3	$53.0	$39.1

Source: © Wikibon 2019

Figure 3 - IT Extended Budget Savings and Budget for Migrating to Cloud-first Onpremises Hybrid Cloud

Source ©Wikibon 2019. See Figure 4 below and Table 1 in Footnotes 1 for Detailed Data.

BUSINESS VALUE MODEL IN DETAIL

Applications running in IT support the fundamental mission of the business. In a for-profit company, this translates in some way to revenue, either in the form of direct additional revenue or employee productivity. The Wikibon methodology for calculating this is given in the previous research, and Table 2 in Footnotes 2 below.

The table inside Figure 4 breaks out the 4-year sum for each component of Net Business Value delivered by IT in a Traditional IT Data Center, in a cloud-first Microsoft Azure Stack, and in a cloud-first Oracle Gen 2 Exadata Cloud at Customer.

The "initial value" line item in Figure 4 represents the base value of the applications being delivered to the business at the beginning of the 4-year analysis for a $2B enterprise. The detailed assumptions and calculations of business value are shown in Table 2 in Footnotes 2.

An investment in modernizing infrastructure (IT Budget Expenditure in Figure 4) should deliver benefits in the form of lower IT expenditure (Figures 2 and 3), faster deployment of new function (Maintenance and New Project Values, less Application Depreciation in Figure 4) and a reduction in Revenue Loss from Downtime (Figure 4). These sum to the Net Business Value above and represent the 4-year value delivered by the mission critical applications on each alternative platform in Figure 4.

The reductions in IT budget for Gen 2 Exadata Cloud at Customer derive mainly from staff savings and database licensing cost reductions. These are offset by some additional database licensing costs for additional Enterprise Edition Database In-memory options required to drive some upcoming 19c functionality, and the cloud management pack.

The IT Budget expenditure line item in Figure 4 remains the same across all alternatives, because we assume in the model that IT budget savings are reinvested to enhance application functionality. This value is reflected in the New Project Value line item. The implementation time and cost for the

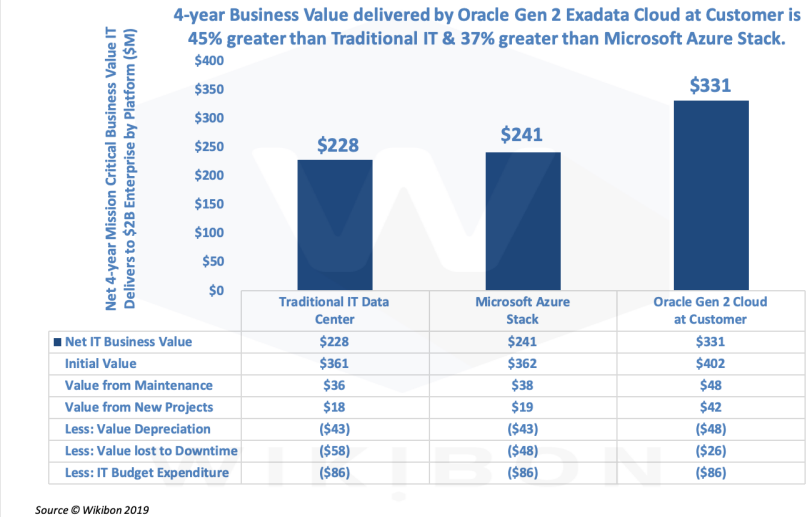


Figure 4 - Wikibon Financial Model of Operational IT Staff and Infrastructure costs for the base case (Traditional IT Data Center), the Cost of Microsoft Azure Stack, and the cost of Gen 2 Exadata Cloud at Customer.

Source ©Wikibon 2019. See Table 1 in Footnotes

integrated Exadata Cloud at Customer (4 months, $0.4M) are significantly lower than the less integrated Microsoft Azure Stack (9 months, $1.3M), and lead to greater value delivered earlier from new projects. The greater integration and higher volumes of business lead to significantly less revenue or productivity lost from downtime.

In summary, Figure 4 shows that the 4-year Business Value delivered by Oracle Exadata Cloud at Customer is 45% greater than traditional best of breed, do-it-yourself IT projects and 37% greater than Microsoft Azure Stack for mission-critical workloads running on Oracle Database 19c. Figure 4 also shows the absolute business value of Gen 2 Cloud at Customer is $103M greater than traditional best-of-breed, do-i--yourself IT projects and is $90M greater than Microsoft Azure Stack, when running Oracle Database 19c.

CONCLUSION: GEN 2 CLOUD AT CUSTOMER IS IN A CLASS OF ITS OWN

Our analysis concludes that there is no equivalent to the Oracle Gen 2 Exadata Cloud at Customer offering available currently from other vendors. Wikibon believes that the functionality, bandwidth, and ultra-low latency integrated with the Oracle Database 19c code is second to none.

Wikibon's research reveals that the two current alternatives (Traditional best of breed IT approaches and Azure Stack) to Gen 2 Exadata Cloud at Customer are more expensive, take longer to implement, offer lower availability, and deliver less business value to the lines of business. The underlying assumption is that most mission-critical systems of record are deployed on Oracle Database Enterprise Edition.

The good news for CXOs is that there are multiple Cloud-first hybrid cloud solutions in the marketplace with varying degrees of functionality and sophistication, and there will be additional offerings in the future. Microsoft Azure Stack is a good solution for workloads that run on Microsoft enterprise software such as Microsoft SQL Server. With the announcement and expected shipment of AWS Outposts, AWS can offer Aurora (based on MySQL open source) in a hybrid cloud solution, for applications that only need this basic level of database functionality. VMware can offer Cloud-first hybrid cloud solutions on AWS, using the VMware Cloud Foundation control plane. VMware and AWS are working to provide AWS Relational Database Services (RDS) on VMware, and are planning to include basic levels of database functionality in this offering. For enterprises with VMware systems already running Oracle Database, this can be a solid and low-cost migration route. Recognizing this, VMware has entered into an agreement with Oracle to make it easier for customers to run VMware workloads on Gen 2 Oracle Cloud Infrastructure.

The downsides of this strategy discussed in the sections above are lock-in to Oracle, Capex commitment over a number of years, the difficulties of matching IT expenditure with business value created, and the difficulties of adapting to changing business volumes. Oracle is sometimes difficult to do business with.

Wikibon points out it is difficult to avoid lock-in, whatever choice of vendor, hardware, database software, or application package. The cost of migration from one platform to another or one database system to another is extremely high, and is very rarely undertaken in large organizations. Oracle Database is, for mission-critical systems of record, still the leading high-performance, high-availability database for function and support–and it runs on nearly any hardware platform and any cloud service.

From a data portability perspective, Oracle Database can transfer to another platform choice. AWS databases only work on AWS cloud services. Oracle continues to invest strongly in the Oracle Database and supporting platforms. IBM DB2 is very good and Microsoft SQL Server is third. Other databases from open source origins, including those from AWS, do not in our opinion provide the same levels of functionality and support.

Therefore, for mission-critical systems running on Oracle Database Enterprise Edition, Wikibon unequivocally recommends the starting point for evaluation should be Oracle Gen 2 Exadata Cloud at Customer. Oracle has proven itself with early on-premises cloud deployments over three years that now number several hundred installations to date. It is the only production-hardened platform that integrates support for full-function Oracle Database on hardware identical in the cloud and on-premises.

In addition, Wikibon believes the upcoming Oracle Exadata X8M base for Gen 2 Exadata Cloud at Customer will require far fewer operational staff, as a result of offloading work to the control plane, as well as greater automation from the Oracle Autonomous Database and Autonomous Linux.

THE STRATEGIC REASON TO ADOPT GEN 2 CLOUD AT CUSTOMER

Earlier Wikibon articulated the importance of being ready to develop next generation applications. From a strategic perspective, the most important reason for adoption of Gen 2 Cloud at Customer is not price or performance alone (which are compelling in themselves), but rather next generation applications that this technology enables.

The next generation of enterprise applications will often be the tight integration of systems of record with real-time analytic systems, together with an increasing use of advanced analytics and artificial intelligence in both. The amount and range of data accessed will increase dramatically, as the functionality and latency of hybrid clouds improves.

These systems will offer enterprises significantly greater business orchestration and automation of current business models. Even more importantly, they will enable the development of completely new and innovative business models for both new and existing enterprises. Wikibon believes that migration to Oracle Gen 2 Exadata

Cloud at Customer is an important strategic step to enable next generation applications. These have the ability to dramatically reduce enterprise cost and significantly increase competitiveness in the next decade.

ACTION ITEM

Wikibon analysis demonstrates that Oracle Gen 2 Exadata Cloud at Customer is the choice for mission-critical systems running on full-function Oracle Databases. Wikibon strongly advises CXOs to include this in RFPs, and evaluate Oracle as a strategic partner for digital transformation.

Wikibon strongly recommends the Oracle Gen 2 platform for the next generation of enterprise applications that tightly integrate systems of record with real-time analytic systems, enabling the increasing use of advanced analytics and artificial intelligence/machine learning. These systems will offer enterprises significantly greater business orchestration and business automation of current and future business models. At this time, Oracle is far ahead of everyone else in terms of deploying its public cloud in customer data center environments.

FOOTNOTES 1

Table 1 below is the main data source for Figures 1-4.

4-year Benefits of Migration from Traditional Best-of-Breed Datacenter to Cloud-first Hybrid Architecture by Platform by Business Case Type ($M). Workload is Enterprise Mission-critical Oracle DB.							
Platform	Business Case Type	4-year Budget Total	IT Budget Saved $M	IT Budget % Saved	4-year Business Value Total	Additional IT Business Value Delivered $M	Percentage IT Business Value Added
Microsoft Azure Stack	Basic IT Budget	$25.4	$0.5	2%	$238	$10	**4%**
Microsoft Azure Stack	Extended IT Budget	$50.0	$5.3	11%	$238	$10	4%
Microsoft Azure Stack	Added Business Value	$86.4			$241	$13	6%
Oracle Gen 2 Cloud at Customer	Basic IT Budget	$16.4	$9.5	58%	$279	$51	22%
Oracle Gen 2 Cloud at Customer	Extended IT Budget	$42.2	$13.1	68%	$279	$51	22%
Oracle Gen 2 Cloud at Customer	Added Business Value	$86.4			$331	$103	45%
Source: © Wikibon 2019							

Table 1 - Summary of IT Budget Savings and additional Business Value from IT after Migrating to a Cloud-first On-premises Hybrid Cloud.

Source ©Wikibon 2019.

FOOTNOTES 2

Wikibon have used this model extensively over two decades with enterprise organizations to evaluate the business value derived from application portfolios, and measuring the impact of changes in IT and business strategies on the business value delivered by IT.

Table 2 shows a summary of Wikibon financial & business value calculations and assumptions for the base case, a traditional IT datacenter DiY implementation.

VIEW TABLE ON NEXT PAGE.

Table 2 - Summary of Wikibon Financial & Business Value Calculations and Assumptions for the Base (Traditional IT Datacenter).

Source ©Wikibon 2019.

Wikibon Financial & Business Value Model		
Average Fortune 5000 Traditional IT Starting Point for Cloud-first Migration		
Formula (Excel Format)	**Business & IT Impact of IT Failure and Recovery**	**Initial Value from Traditional IT Data Center**
a	Annual Revenue for Average Fortune 2000 Enterprise	$2,000,000,000
b	Number of Employees	7,200
c = a ÷ b	Revenue/Employee	$277,778
d	Overhead for Fully Loaded	60%
e	Cost/Employee	$53,000
f = e × (1 + d)	Cost per Employee (loaded)	$84,800
g	Average Investment Uplift	4.0
h	Total Formal IT Budget as % Revenue	3.0%
i	Total "Dark" IT Budget as % of Revenue	0.8%
j = a × h	Total Formal IT Budget	$60,000,000
k = a × (h + i)	Total Spend on IT	$76,000,000
l = g × j	Gross IT Application Value from IT	$240,000,000
m	Percentage of Formal IT Budget for Mission Critical	36%
n = g × j × m	**Gross Mission Critical Application Value**	**$86,400,000**
o = a × h × m	**Formal IT Budget on Mission Critical Workloads**	**$21,600,000**
p	Mission Critical Application Value depreciation per year %	12%
q = n × p	**Mission Critical Application Value depreciation per year $**	**$10,368,000**
r	Percentage of Mission Critical Application Value Permanently lost	2%
s = n × (p - r) × (1 + z)	**Application Value from Maintenance & New Releases**	**$8,640,000**
t	Percentage of Development dedicated to Maintenance	75.0%
u = g	Uplift for Mission Critical Maintenance Investment	4.0
v = u × 1.25	Uplift for Mission Critical New Functionality Investment	5.0
w = (1 - t) × z × ah3	**Additional Application Value Added**	**$4,320,000**
x	Percentage Revenue Impact of Mission Critical Downtime	2.0%
y = a × x × m	**Business Cost of Mission Critical System Failure and Recovery**	**$14,400,000**
z	Improvement in Development Productivity	0%
aa	Improvement in Operational Productivity from Complete Stack	0%
ab	Improvement Network Productivity from Complete Stack	0%
ac	Improvement in Database Utilization	0%
ad	**Improvement in Infrastructure Utilization**	0%
ae	Migration Costs to Platform (% IT Budget)	0%
af	Time to Migrate (Months)	0
ag = n + s + w - q - y - o	**Net Mission Critical Application Value**	**$52,992,000**
ah1 = o × 24%	Application Software Budget (24%)	$5,184,000
ah2 = o × 10% × (1-ac)	Database Budget (10%)	$2,160,000
ah3 = o - sum(ah1-2,4-9)	Development Budget (16%)	$3,456,000
ah4 = o × 10% × (1-aa)	Operational Budget (10%)	$2,160,000
ah5 = o × 12% × (1-ad)	Infrastructure IT Budget (12%)	$2,592,000
ah6 = o × 8% × (1-ab)	Networking IT Budget (8%)	$1,728,000
ah7 = o × 12%	Device Budget (12%)	$2,592,000
ah8 = o × 8%	Budget of Other Items (Datacenter, Security, etc.) (8%)	$1,728,000
ah9 = o × 0%	Migration Costs to Cloud-first Platform	$0
SUM(AH1 - AH8)	**Mission Critical IT Budget**	**$21,600,000**
Source: © Wikibon 2019		

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David Floyer spent more than 20 years at IBM, holding positions in research, sales, marketing, systems analysis and running IT operations for IBM France. He worked directly with IBM's largest European customers, including BMW, Credit Suisse, Deutsche Bank and Lloyd's Bank. Floyer was a Research Vice President at International Data Corporation (IDC) and is a recognized expert in IT strategy, economic value justification, systems architecture, performance, clustering and systems software.