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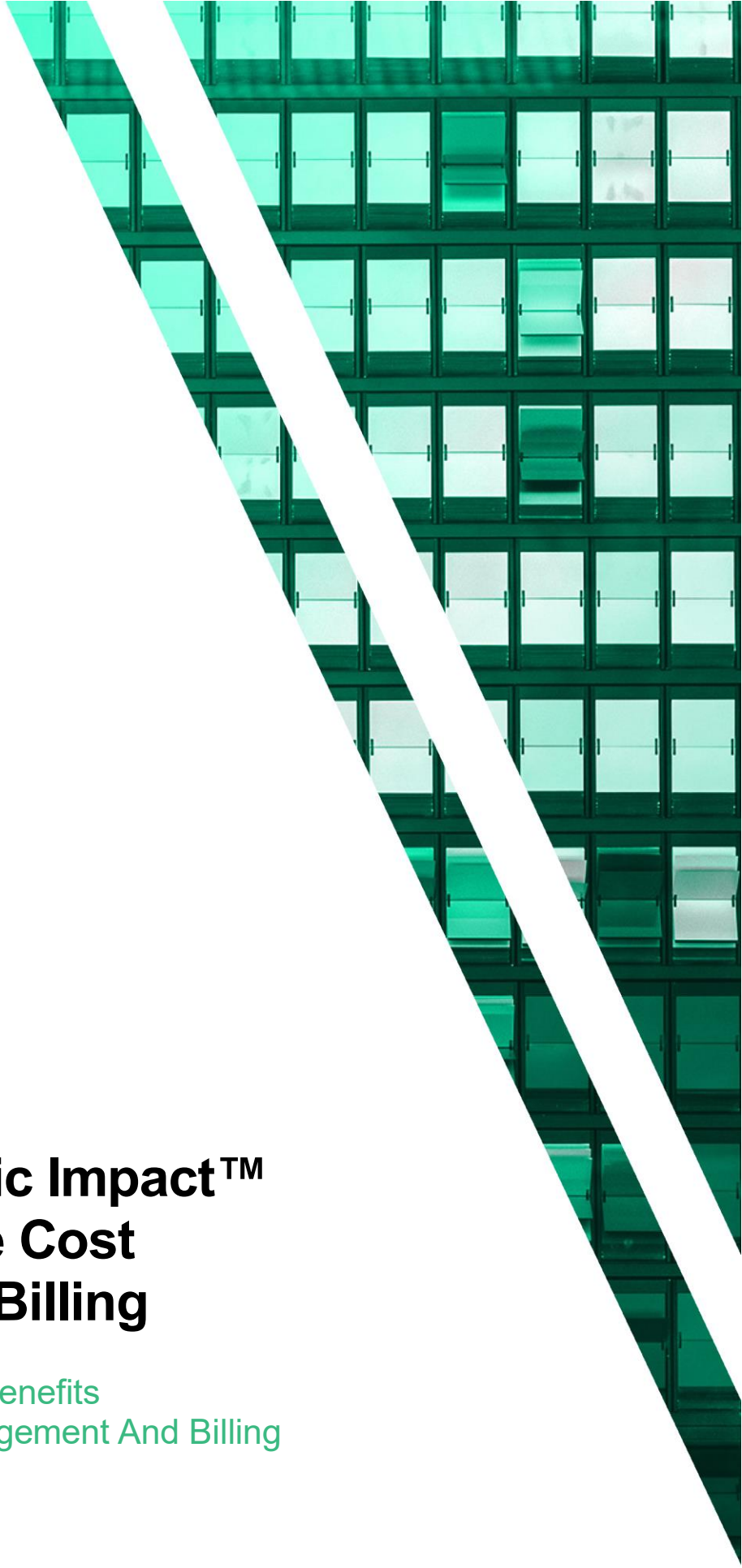

The Total Economic Impact™ Of Microsoft Azure Cost Management And Billing

Cost Savings And Business Benefits Enabled By Azure Cost Management And Billing

FEBRUARY 2021

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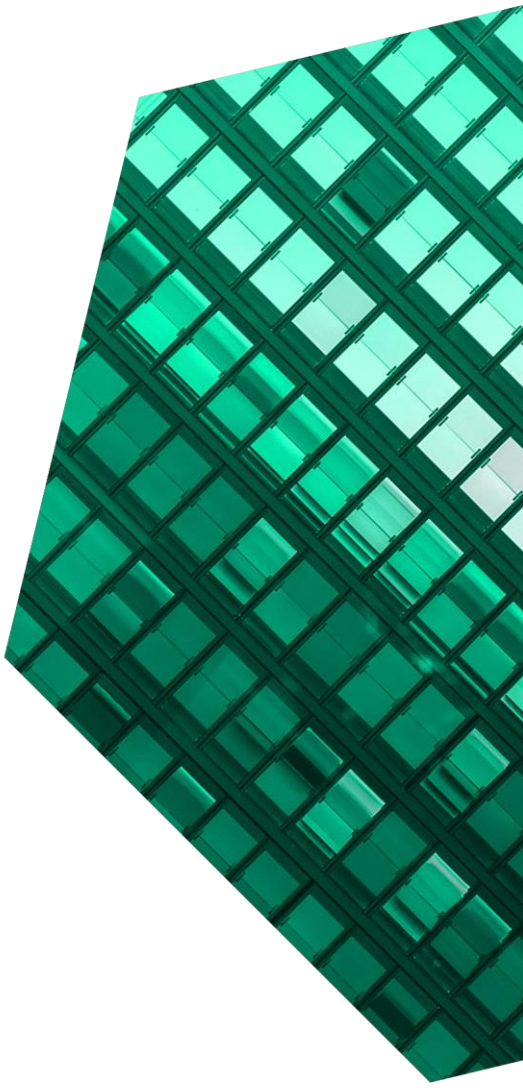


Executive Summary

As organizations move additional applications and workloads from on-premises to the cloud, they need better visibility into their cloud services spending patterns and stronger abilities to manage and optimize that spending. Embedded within the Azure environment, Azure Cost Management and Billing provides a seamless tool that enables Azure customers to gain greater insight on their spending, identify opportunities to optimize that spending, and increase organizational accountability for Azure costs.

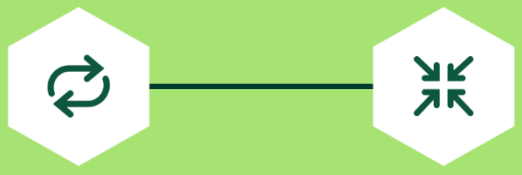
Azure Cost Management and Billing provides a full set of cloud cost management capabilities, enabling Azure customers to optimize their cloud spending and improve financial governance for that spending. It is integrated in the Azure portal, always on by default, and available at no additional cost to use for managing Azure costs.

Microsoft commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying Azure Cost Management and Billing. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Azure Cost Management and Billing on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed four customers with experience using Azure Cost Management and Billing. For the purposes of this study, Forrester aggregated the experiences of the interviewed customers and combined the results into a single composite organization with the following characteristics:

- Multibillion dollar company.
- Global operations.
- Average monthly Azure spending totaling $350,000.
- Diverse cloud-based applications and workloads.

KEY STATISTICS



Three-year benefit
$2.5 million

Total Azure spend reduction
20% to 34%

Prior to using Azure Cost Management and Billing, the interviewed organizations lacked visibility into their Azure spending patterns and inefficiencies. As that spending grew, so did the importance — and the difficulty — of determining where Azure resources and spending might be suboptimal. It required sorting through and making sense of voluminous billing details, and cloud spending patterns were a moving target because they could change significantly over a brief span of time. Even when organizations identified inefficiencies, decision-makers often didn't know how to address them, such as shutting down unused resources or rightsizing underutilized resources.

KEY FINDINGS

Quantified benefits. Risk-adjusted present value (PV) quantified benefits include:

- **Cost savings of $2.5 million on Azure services from reducing inefficiencies.** Azure

Cost Management and Billing enabled organizations to discover inefficiencies in their Azure spending and recommended ways for them to resolve those inefficiencies. The resulting percentage savings varied by Azure service but totaled 34% of budgeted spend for the first year of use and persisted at 20% in subsequent years given the inherent flexibility and evolving mix of cloud-based resources. This "found money" enabled organizations to reinvest their Azure savings in additional Azure services, accelerating their cloud transformation.

"It doesn't just report on where the excessive spending is. It actually recommends how to improve things, which is a big time-saver."

Head of technology architecture, information services company

- **Decrease of $29,898 in internal labor needed to monitor, budget, and optimize Azure spending.** Across the various roles involved with managing and optimizing Azure spend, Azure Cost Management and Billing reduced the effort needed to identify and address inefficiencies in that spend. It helped organizations detect trends and problem areas that lay hidden in voluminous billing data and understand how those could be mitigated. It automatically generated reports that identified usage spikes, and also spending alerts when Azure spending by a business unit (or other accountable unit) neared a budget threshold.

Unquantified benefits. Benefits that are not quantified for this study include:

- **Accelerated cloud transition from redeploying Azure savings on additional Azure consumption.** The "found money" generated by optimizing Azure spend enabled organizations to accelerate their move to the cloud via additional Azure resources.
- **Ability to provide varying levels of access and information.** Interviewed business leaders valued the ease of tailoring access and reports

"A core benefit of having a tool like this embedded seamlessly in Azure dashboards is that it allows you as a business leader to apply the discipline organizationally to look at it, use it, and, through that, contain costs."

— CIO, consumer packaged goods company

> **Every dollar that we save can be reinvested in other Azure resources, and that expedites our cloud migration.**
>
> — CIO, professional services firm

for the diverse Azure Cost Management end users.

- **Identifying workloads best suited for cloud migration.** Better visibility to historical cloud usage patterns of existing applications informed decisions around what else to migrate.
- **Ease of incorporating Power BI for alternate views and reports.** By using Power BI in conjunction with Azure Cost Management and Billing, organizations expanded their forecast and reporting options (including visualizations) and accessed additional detail behind the recommendations.
- **Improved understanding of and ability to plan for Azure budgeting and spending.** Azure Cost Management and Billing made it easier to stay within projected spend and enabled decision-makers to be more confident of estimates of future Azure usage and spending.

Costs. Risk-adjusted PV costs include:

- **Internal labor costs of $55,074 for implementation, management, and support.** Internal implementation and training costs included cloud lead, finance, and business unit manager time. Ongoing costs included oversight and end-user support provided by a cloud lead.
- **No charge for Azure Cost Management and Billing.** Microsoft provides this product at no charge for use with Azure services.

The customer interviews and financial analysis found that the composite organization experiences benefits of $2.54 million over three years versus costs of $55K, adding up to a net present value (NPV) of $2.48 million.

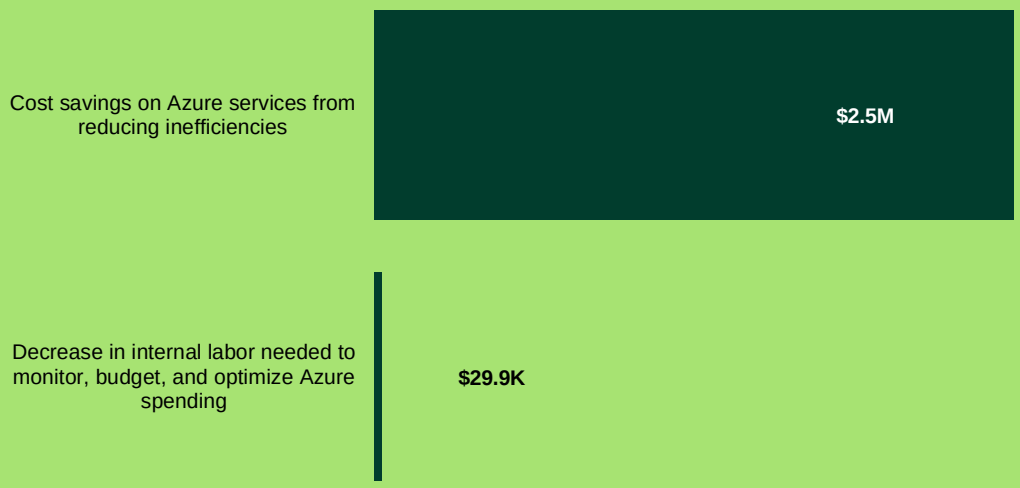
BENEFITS PV
$2.5 million

TOTAL AZURE SPEND REDUCTION
20% to 34%

REDUCED STAFF EFFORT
10% to 15%

VM SAVINGS
Up to 50%

Benefits (Three-Year)



TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in Azure Cost Management and Billing.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Azure Cost Management and Billing can have on an organization.

DUE DILIGENCE

Interviewed Microsoft stakeholders and Forrester analysts to gather data relative to Azure Cost Management and Billing.

CUSTOMER INTERVIEWS

Interviewed four decision-makers at organizations using Azure Cost Management and Billing to obtain data with respect to costs, benefits, and risks.

COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the four interviewed organizations.

FINANCIAL MODEL FRAMEWORK

Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewed organizations.

CASE STUDY

Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester's TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

The Microsoft Azure Cost Management And Billing Customer Journey

Drivers leading to the Azure Cost Management and Billing investment

Interviewed Organizations

Industry	Region	Interviewee	Monthly average Azure spend
Professional services	Global	Chief information officer	$2,000,000
Consumer packaged goods	Global	Chief information officer	$325,000
Information services	Global	Head of technology architecture	$250,000
Media	Global	Vice president, information technology	$100,000

KEY CHALLENGES

All interviewees' organizations were in the process of transitioning appropriate applications and workloads from on-premises to the cloud. By their own estimates, that process ranged from 20% to 90% complete. Critical parts of that transition included establishing accountability for the organizations' growing cloud expenditures, determining the best Azure cost structure for a constantly shifting set of needs, and improving their abilities to monitor and optimize Azure spending. Business leaders needed to gauge how efficiently they were using their Azure resources by comparing how much idle Azure capacity they had versus what they had provisioned, then resize workloads if needed.

According to interviewees, Azure costs typically rolled up to and were paid by an IT cost center. A de facto cloud lead oversaw the total Azure budget (with that title or a broader IT role), but accountability for those costs lay with individual business units that were responsible for doing their part to manage Azure spending.

Interviewees described a range of challenges that drove their organizations to deploy Azure Cost Management and Billing:

- **Lack of visibility into their Azure spending patterns and inefficiencies.** As Azure spending grew, so did the importance — and the difficulty — of determining where Azure resources and spending might be suboptimal. Although the interviewed organizations wanted to identify and address inefficiencies as quickly as possible, the challenge of sorting through voluminous billing details made that difficult. One interviewee said, "We just weren't reading the bills at all until the finance team told us, 'Your budgeted amount is not going to be enough.'"

In addition, spending patterns were a moving target since they could change significantly over a brief span of time as implementations and initiatives were spun up or concluded. Sometimes resources were orphaned, as one interview noted: "People had tried out multiple services just to see what they were, or for proofs of concept that went nowhere, and then forgot to shut them down."

> **"All this cloud migration helps us create things fast, but are we doing that cost-effectively? That's what we needed to answer."**
>
> *Head of technology architecture, information services company*

> **"As our cloud spending grew, we were having more and more surprises. We needed better visibility into what was causing our spending increases."**
>
> *Vice president, information technology, media company*

- **Limited insight into their best current actions for optimizing Azure resources and spending.** Even when organizations identified inefficiencies, decision-makers often didn't know how to address them and the likely economic impact of doing so (e.g., shutting down unused resources or rightsizing underutilized resources).

COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and a ROI analysis that illustrates the areas financially affected. The composite organization is representative of the four companies that Forrester interviewed and is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

Description of composite. The composite organization is a multibillion dollar company with global operations. It is an Enterprise Agreement customer of Microsoft and on average spends $350,000 each month on Azure. Its Azure use spans multiple environments (e.g., development and production) and a diverse set of applications and workloads across multiple geographies. With its Azure use growing as it moved additional workloads from on-premises to the cloud, the organization needs better visibility to its Azure spending patterns and stronger abilities to manage and optimize that spending. Embedded within the Azure environment, Azure Cost Management and Billing provides a seamless tool for that.

Deployment characteristics. Over approximately one month, the organization leverages internal staff and informal assistance from Microsoft to set up its infrastructure around Azure Cost Management and Billing (such as provisioning accounts, establishing governance and cost allocation policies, and determining reporting) and to train the IT and business staff who would work with it.

Key assumptions

- **Multibillion dollar company**
- **Global operations**
- **Average monthly Azure spend totaling $350,000**
- **Diverse cloud-based applications and workloads**

Analysis Of Benefits

Quantified benefit data as applied to the composite

Total Benefits						
Ref.	**Benefit**	**Year 1**	**Year 2**	**Year 3**	**Total**	**Present Value**
Atr	Cost savings on Azure services from reducing inefficiencies	$1,285,200	$810,810	$891,891	$2,987,901	$2,508,545
Btr	Decrease in internal labor needed to monitor, budget, and optimize Azure spending	$12,022	$12,022	$12,022	$36,067	$29,898
	Total benefits (risk-adjusted)	$1,297,222	$822,832	$903,913	$3,023,968	$2,538,443

COST SAVINGS ON AZURE SERVICES FROM REDUCING INEFFICIENCIES

Evidence and data. After their organizations began to use Azure Cost Management and Billing, the interviewees all reported savings in their Azure spend. The percentage savings varied across Azure services but totaled 34% of budgeted spend for the first year of use and 20% in subsequent years. Savings were greatest for virtual machine (VM) — as high as 50% in Year 1 — given the scope and nature of VM usage and range of options for reducing VM costs. The organizations had development environments where VM needs fluctuated based on current projects and production environments where VM needs changed depending on workload and user volumes.

Total Azure spend reduction

20% to 34%

Across VMs, storage, and other Azure services, the percentage savings were the largest in the first year of using Azure Cost Management and Billing as organizations identified and shut down orphaned compute resources and disk storage and addressed other inefficiencies. In subsequent years, however, the savings persisted at approximately 50% of Year 1 levels, reflecting the inherent flexibility with which cloud-based resources can be deployed and subsequently adjusted. Rightsizing and other actions remained necessary. As the interviewees' organizations' cloud usage evolved and grew, they continued to reap substantial benefits from their use of Azure Cost Management and Billing.

The organizations used a full range of Azure Cost Management and Billing's capabilities. The Billing component of the tool enabled them to efficiently review invoiced costs and payments and manage access to billing information. They continuously monitored Azure spend via the tool's dashboards and used that input to forecast Azure spending. They established budgets, set up budget threshold alerts, and automated the distribution of alerts and Azure Advisor cost optimization recommendations to the accountability groups that could act on those. (Azure Advisor is a service accessible at no charge from within Azure Cost Management and Billing that provides recommendations on cost optimization and other aspects of managing infrastructure.)

Interviewees described the ability to review and act on those cost optimization recommendations

provided via Azure Advisor as a critical driver of their Azure spending reductions. In addition to indicating organization-specific actions that could reduce that customer's Azure spending, those recommendations noted the potential cost savings from taking each recommended action.

Azure Cost Management and Billing enabled monitoring, reporting, recommendations, and communications to be generated at levels ranging from individual developers or teams up through aggregations at the business unit level. End users saw what they needed to, based on their access rights. The organizations typically made extensive use of tagging to improve the specificity of Azure Cost Management and Billing's reporting and forecasting, determine what the impact of an Azure spending change would be, and drive accountability at a granular level. (Although tagging is done during the provisioning process, not within Azure Cost Management and Billing, that tagging enables organizations to benefit from additional filters that maximize the impact of using Azure Cost Management and Billing.) Organizations used management groups to organize subscriptions and establish and execute cost allocations and chargebacks or "show backs."

The Azure efficiency improvement recommendations that interviewees' organizations received and acted upon were varied, in line with their diverse usage of Azure. Examples included:

- Shutting down unused resources.
- Rightsizing underutilized resources.
- Employing reserved instances (instead of "pay as you go") for certain long-running Azure services with relatively consistent usage.

An interviewee noted that Azure Cost Management and Billing was particularly helpful in understanding and managing the organization's egress costs. (Egress costs, which are fees charged by cloud services providers when data leaves the cloud, can be significant for customers that have many integrations outside Azure, whether on-premises or with other third-party services.) Simple review of billing statements had not readily indicated why the egress was so high or what was causing a spike. However, by using Azure Cost Management and Billing to categorize and consolidate billing details, that organization could better pinpoint which Azure subscriptions were generating an increase in egress, e.g., by adding new services that move data out of Azure on a regular basis.

> **"We now have a much better ability to follow the trail and figure out why those costs changed."**
>
> *Vice president, information technology, media company*

Other insights shared by interviewees**:**

- "We use auto-scaling to scale highly variable compute resources up and down. Azure Cost Management and Billing helps us manage that efficiency because we use it to plan throttle points for when to scale up and down."
- "The tagging has proven to be one of the better mechanisms for containing costs. If you don't know exactly what's happening, you can't really contain costs."
- "We extensively use its tagging capabilities. It's very hard to trace all of your various cloud resources unless you tag them clearly."
- "It kind of becomes a competition among the business units, to go look at Azure Cost Management and Billing and say, 'Well, I have more improvement than you do.'"

Modeling and assumptions. For the composite organization, Forrester assumes that:

- Total annual Azure budgeted spend prior to cost reductions enabled by Azure Cost Management and Billing is $4,200,000 in Year 1, increasing 10% annually for a Year 2 total of $4,620,000 and a Year 3 total of $5,082,000.
- Of the total amount, the organization spends 50% on VMs, 30% on storage, and 20% on diverse other Azure services.
- Use of Azure Cost Management and Billing enables:
    - A 50% reduction in VM spend in Year 1 and a 30% reduction in each of Years 2 and 3.
    - A 10% reduction in storage spend Year 1 and a 5% reduction in each of Years 2 and 3.
    - A 30% reduction in other Azure spend Year 1 and a 15% reduction in each of Years 2 and 3.

Risks. Risks that may impact cost savings on Azure services from reducing inefficiencies include:

- The extent to which leadership mandates use of Azure Cost Management and Billing and enforces accountability for Azure costs.
- How dynamic an organization's cloud environment is.
- How accurately a cloud service had originally been sized.
- How extensively an organization uses tagging to improve specificity.
- The prior state, e.g., the maturity of an organization's cloud operations (especially cost optimization) before deployment of Azure Cost Management and Billing.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $2.5 million.

Cost Savings On Azure Services From Reducing Inefficiencies					
Ref.	**Metric**	**Calculation**	**Year 1**	**Year 2**	**Year 3**
A1	Total annual Azure budgeted spend prior to cost reductions enabled by Azure Cost Management and Billing	Increasing 10% YoY	$4,200,000	$4,620,000	$5,082,000
A2	VM spend as percentage of total		50%	50%	50%
A3	Percentage reduction in VM spend		50%	30%	30%
A4	Azure VM cost savings	A1*A2*A3	$1,050,000	$693,000	$762,300
A5	Storage spend as percentage of total		30%	30%	30%
A6	Percentage reduction in storage spend		10%	5%	5%
A7	Azure storage cost savings	A1*A5*A6	$126,000	$69,300	$76,230
A8	Other Azure spend as percentage of total		20%	20%	20%
A9	Percentage reduction in other Azure spend		30%	15%	15%
A10	Other Azure cost savings	A1*A8*A9	$252,000	$138,600	$152,460
At	Cost savings on Azure services from reducing inefficiencies	A4+A7+A10	$1,428,000	$900,900	$990,990
	Risk adjustment	↓10%			
Atr	Cost savings on Azure services from reducing inefficiencies (risk-adjusted)		$1,285,200	$810,810	$891,891
Three-year total: $2,987,901		**Three-year present value: $2,508,545**			

DECREASE IN INTERNAL LABOR NEEDED TO MONITOR, BUDGET, AND OPTIMIZE AZURE SPENDING

Evidence and data. The specific roles involved with managing and optimizing Azure spend varied across the organizations but typically included one or more cloud leads in the IT department who managed overall Azure costs, collaborated with business unit managers to set budgets, pinpointed trends and problem areas, and ensured governance; finance staff who monitored bills, analyzed cloud spending to determine what drove Azure costs, and generated reports for the business units; and business unit managers who identified and acted on opportunities to optimize their units' use of Azure services.

Reduced staff effort

10% to 15%

Across those roles, Azure Cost Management and Billing reduced the internal effort needed to manage and optimize Azure spending. It simplified access to information and analytics because end users access it through their Azure subscriptions. It enabled organizations to automate some of their manual data gathering via data exports. Azure Cost Management and Billing automatically generated weekly and monthly reports that identified major spikes in usage,

as well as spending alerts when Azure spending by a business unit or other accountability group neared a budget threshold. This reduced prior effort to try to understand and correlate numerous line items from Azure billing statements to identify inefficiencies.

> **"Previously, we needed to pull data and create reports and presentations. Now we get graphs and charts directly from Azure Cost Management and Billing, in a fraction of the time."**
>
> *Vice president, information technology, media company*

Azure Cost Management and Billing also improved efforts to address those inefficiencies by recommending actions (via its Azure Advisor capability). Its "quick-fix" feature automated execution of certain optimization recommendations, such as resizing an instance. An interviewee explained, "When it recommends 'resize D4 instance to D2,' you can say, 'Do it for me,' but also first review that automation before it's executed."

Modeling and assumptions. For the composite organization, Forrester assumes that:

- Ongoing management and optimization before Azure Cost Management and Billing required:
  - From a cloud lead: 2 hours weekly, plus an additional 2 hours monthly, plus an additional 2 hours quarterly, for an annual total of 136 hours.
  - From each of five finance staff members: 1 hour weekly, plus 1 hour monthly, plus 1 hour quarterly, for a collective annual total of 340 hours.
  - For each of 15 business unit managers: 1 hour weekly, plus 1 hour monthly, plus 1 hour quarterly, for a collective annual total of 1,020 hours.
- With use of Azure Cost Management, the time spent on management and optimization decreases by 10% for the cloud lead and 15% for finance staff and business unit managers.

Risks. Risks that may impact the decrease in internal labor needed to monitor, budget, and optimize Azure spending include the:

- Extent to which an organization capitalizes on Azure Cost Management and Billing's capabilities.
- Number of Azure Cost Management and Billing end users.
- Prevailing local compensation rates.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV of $29,898.

Decrease In Internal Labor Needed To Monitor, Budget, And Optimize Azure Spending					
Ref.	**Metric**	**Calculation**	**Year 1**	**Year 2**	**Year 3**
B1	Ongoing management and optimization by cloud lead before Azure Cost Management and Billing (hours)	(2x52)+(2x12)+(2x4)	136	136	136
B2	Percentage reduction in cloud lead effort		10%	10%	10%
B3	Ongoing management and optimization by finance staff before Azure Cost Management and Billing (hours)	((1x52)+(1x12)+(1x4))x5	340	340	340
B4	Percentage reduction in finance staff effort		15%	15%	15%
B5	Ongoing management and optimization by business unit managers before Azure Cost Management and Billing (hours)	((1x52)+(1x12)+(1x4))x15	1,020	1,020	1,020
B6	Percentage reduction in business unit manager effort		15%	15%	15%
B7	Blended hourly compensation, fully burdened	$135,200/2,080	$65	$65	$65
Bt	Decrease in internal labor needed to monitor, budget, and optimize Azure spending	((B1*B2)+(B3*B4)+(B5*B6))*B7	$14,144	$14,144	$14,144
	Risk adjustment	↓15%			
Btr	Decrease in internal labor needed to monitor, budget, and optimize Azure spending (risk-adjusted)		$12,022	$12,022	$12,022
	Three-year total: $36,067		**Three-year present value: $29,898**		

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not able to quantify include:

- **Accelerated cloud transition from redeploying Azure savings on additional Azure consumption.** As Enterprise Agreement customers, interviewees' organizations typically redirected their Azure savings into additional Azure resources to meet their contractual agreement and maintain their discount terms. This "found money" generated by optimizing Azure spend enabled them to accelerate their move to the cloud and address other high-priority initiatives.
- **Ability to provide varying levels of access and information.** In addition to the cloud lead, finance staff, and business managers mentioned above, other Azure Cost Management and Billing users mentioned by interviewees included other cloud governance staff, CFOs, DevOps administrators, individual application teams, and project-specific roles. Interviewed organizations valued the ease of tailoring access and reports. For instance, a cloud lead had 100% visibility across the entire organization while an individual application team could access or receive only information pertinent to that team.
- **Identifying workloads best suited for cloud migration.** Several interviewees indicated that having better visibility into historical cloud usage patterns of existing applications (e.g., compute-intensive versus storage-intensive, or levels of egress) informed decisions around what else to migrate. One described using Azure Cost Management and Billing to do some what-if analysis around potential cloud migrations, incorporating cost data from Azure Cost Management and Billing along with performance metrics from other sources. That interviewee

noted: “We’re still in the process of migrating more workloads to Azure cloud. Having better visibility to usage patterns helps us decide which to move.”

- **Ease of incorporating Power BI for alternate views and reports.** Organizations used Power BI in conjunction with Azure Cost Management and Billing to expand their forecast and reporting options (including additional visualizations) and access additional data behind Azure Advisor recommendations. Because the organizations had access to Power BI through their existing Microsoft agreements, they did not pay a separate Microsoft fee for using it.

“The reports we provide to business units may not have some dimension they care about. Power BI is integrated well with Azure, which makes it feasible for business units to create additional views or reports on their own. That self-service helps them and helps us.”

Vice president, information technology, media company

- **Improved understanding of and ability to plan for Azure budgeting and spending.** An interviewee said, “Now we know why a budgeted amount is not going to be enough.” Another interviewee described how Azure Cost Management and Billing made it easier to stay within its projected spend (and remain eligible for related Microsoft discounts) and do a periodic “true-up,” i.e., a comparison of committed Azure spend versus actual spending in conjunction with its Microsoft contract discussions.

The interviewee also noted that Azure Cost Management and Billing enabled the organization to be more confident in its calculations when estimating future Azure usage and spending. This was particularly important in deciding to shut down or eliminate use of a resource. That interviewee explained: “We need visibility to usage patterns over time, and the ability to detect seasonality and drill down by day or week. Azure Cost Management provides that.” The better visibility into usage patterns and potential costs also informed provisioning of new Azure resources.

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement Azure Cost Management and Billing and later realize additional uses and business opportunities, including:

- **Using Azure Cost Management and Billing in conjunction with separate but related Microsoft tools.** Organizations can gain additional insights into their Azure spending from other Microsoft tools like the Azure Total Cost of Ownership (TCO) Calculator, accessible at no charge and used to estimate the cost savings from migration of on-premises application workloads to Microsoft.
- **Development of automation scripts triggered by alerts.** One organization created automation scripts that it can trigger manually, on schedule, or when some event happens. These automations built on the spending threshold alerts provided by Azure Cost Management and Billing. For example, that organization uses the concept of a “research account” where employees can experiment with data science models and machine learning. If the organization exceeds the spending threshold for one of those

research accounts, it automatically shuts down the related instances.

- **Capitalizing on additional capabilities as they are introduced.** Organizations anticipate further utilizing Azure Cost Management and Billing as its capabilities continue to evolve.

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

Analysis Of Costs

Quantified cost data as applied to the composite

Total Costs							
Ref.	**Cost**	**Initial**	**Year 1**	**Year 2**	**Year 3**	**Total**	**Present Value**
Ctr	Internal labor for implementation, management, and support	$37,674	$6,997	$6,997	$6,997	$58,664	$55,074
	Total costs (risk-adjusted)	$37,674	$6,997	$6,997	$6,997	$58,664	$55,074

INTERNAL LABOR FOR IMPLEMENTATION, MANAGEMENT, AND SUPPORT

Initial costs. Organizations typically implemented Azure Cost Management and Billing in approximately one month. Technical implementation was minimal (since this tool is already embedded in Azure dashboards) and consisted largely of providing appropriate levels of access to end users based on their roles. However, interviewees described their full implementation in broader terms. Implementation included establishing governance policies, setting up rules to allocate costs, and formulating reports. End users received 4 hours of training conducted by internal staff with informal assistance from Microsoft, as well as informal coaching as needed.

Modeling and assumptions. For the composite organization's initial costs, Forrester assumes that:

- A total of 21 cloud leads, finance staff, and business unit managers are involved with implementation.
- Each spends an average of 5 hours a week for 4 weeks on the implementation.
- As end users, the same 21 individuals each spend 4 hours in training.

Ongoing costs. Decision-makers found that Azure Cost Management and Billing needed no ongoing technical management. A cloud lead answered end-user questions, provided end-user support as needed, and ensured governance and consistent use. Interviewees noted the importance of having an overall organizational vision and discipline around cloud cost management and revisiting that regularly as cloud usage evolves. Interviewees noted that no ongoing training was needed, beyond occasionally notifying end users of some new feature.

Modeling and assumptions. For the composite organization's ongoing costs, Forrester assumes that:

- A cloud lead spends 1 hour each week on overall management and support of Azure Cost Management and Billing.

Risks. Risks that may impact internal labor for implementation, management, and support include the:

- Extent of prior governance, policies, operating processes, and organizational knowledge around Azure cost management.
- Scope of implementation and use.
- Number of end users needing support.
- Prevailing local compensation rates.

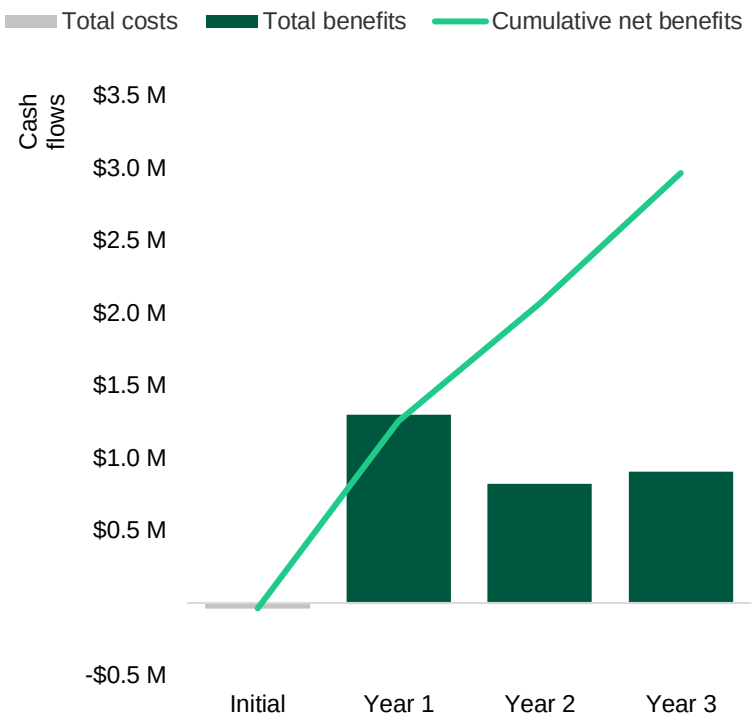
To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $55,074.

Internal Labor For Implementation, Management, And Support						
Ref.	**Metric**	**Calculation**	**Initial**	**Year 1**	**Year 2**	**Year 3**
C1	Total number of cloud leads, finance staff, and business unit managers involved with implementation		21			
C2	Average time on implementation, per person (hours)	5 hours/week for 4 weeks	20			
C3	Number of end users trained	Cloud lead + 5 finance staff + 15 business unit managers	21			
C4	Hours in training, per end user		4			
C5	Blended hourly compensation for implementation and training participants, fully burdened	$135,200/2,080	$65			
C6	Cloud lead ongoing time for management and support of Azure Cost Management and Billing (hours)	1 hour/week		52	52	52
C7	Cloud lead hourly compensation, fully burdened	$243,360/2,080		$117	$117	$117
Ct	Internal labor for implementation, management, and support	(((C1*C2)+(C3*C4))*C5)+(C6*C7)	$32,760	$6,084	$6,084	$6,084
	Risk adjustment	↑15%				
Ctr	Internal labor for implementation, management, and support (risk-adjusted)		$37,674	$6,997	$6,997	$6,997
	Three-year total: $58,664			**Three-year present value: $55,074**		

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



The financial results calculated in the Benefits and Costs sections can be used to determine the NPV and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted NPV and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	($37,674)	($6,997)	($6,997)	($6,997)	($58,664)	($55,074)
Total benefits	$0	$1,297,222	$822,832	$903,913	$3,023,968	$2,538,443
Net benefits	($37,674)	$1,290,226	$815,836	$896,917	$2,965,304	$2,483,369
Payback period						< 3 months

Appendix A: Total Economic Impact

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

TOTAL ECONOMIC IMPACT APPROACH

Benefits represent the value delivered to the business by the product. The TEI methodology places equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization.

Costs consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

PRESENT VALUE (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.

NET PRESENT VALUE (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.

RETURN ON INVESTMENT (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.

DISCOUNT RATE

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.

PAYBACK PERIOD

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.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