

A Forrester Total Economic Impact™
Study Commissioned By Microsoft
October 2018

The Total Economic Impact™ Of Microsoft Azure SQL Database Managed Instance

Cost Savings And Business Benefits
Enabled By Microsoft Azure SQL
Database Managed Instance

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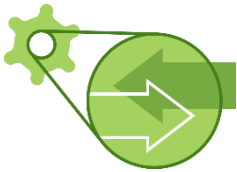
Executive Summary

Three-Year Key Benefits



Avoided hardware, network, storage, and ongoing maintenance costs

\$1.8 million



40% improved productivity for in-house DBAs

\$688k



20% improved productivity for IT team

\$698K

Microsoft Azure SQL Database Managed Instance is a new deployment option that provides organizations the ability to migrate their on-premises SQL Server applications and databases onto a fully managed SQL Server in the Azure cloud. 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 SQL Database Managed Instance. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of migrating on-premises SQL Server Databases to Azure SQL Database Managed Instance. To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed several customers who have migrated their SQL Server data onto a managed instance. Azure SQL Database Managed Instance is a fully governed and managed PaaS (platform-as-a-service) with built-in intelligence that enables easy migration onto the Azure cloud. It offers high availability and a transparent pay-per-use pricing model that allows customers to reduce annual hardware capital expenses and boost employee productivity. In addition, organizations can quickly scale up and down capacity, integrate with other Azure services, automatically back-up data and receive security patches and version upgrades without any additional charge.

Prior to migrating to Azure SQL Database Managed Instance, interviewed organizations were managing their SQL Server database environment on-premises. This model involved annual capital investment in purchasing new hardware and an increase in both storage and networking costs to align with business growth and capacity requirements. This model also increased the burden on in-house database administrators (DBAs) and IT teams to constantly provision, deploy, and manage their SQL Server database environment.

Ultimately, the four interviewed organizations indicated key benefits of increasing capacity without large infrastructure costs and improving IT productivity among others. Interviewed customers noted that Azure SQL Database Managed Instance was in line with their business objective to transition applications and workloads onto the cloud to have a more flexible solution that allows them to quickly scale based on their business need without putting extensive burden on their IT teams. In addition, developers would not have to spend time re-architecting applications, and organizations could use instance level capabilities without changing their application design. The director of storage systems at a large technology service provider stated that: "We operate in multiple countries and our objective is to keep our data at a local-level. With Managed Instance not only is it much faster to deploy and manage our databases, but we have also saved a lot from building out our data centers."

Key Findings

Quantified benefits. The following risk-adjusted present value (PV) quantified benefits are representative of those experienced by the companies interviewed:



ROI
212%



Benefits PV
\$3.2 million



NPV
\$2.2 million



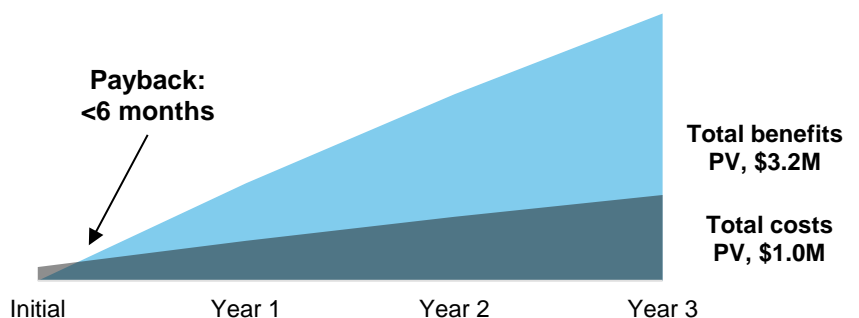
Payback
<6 months
post migration

- › **Avoided hardware, network, storage, and ongoing maintenance costs of \$1.8 million.** Migrating SQL Server data and workloads onto a managed instance has significant capex and opex benefits. Organizations noted that they avoided capital expenses in new servers and hardware and reduced associated networking, storage, and maintenance costs. Conservatively, organizations estimated approximately \$800,000 in avoided costs, resulting in three-year PV savings of \$1.8 million.
- › **Forty percent (40%) improvement in DBA productivity.** In moving to SQL Database Managed Instance, organizations were able to drive significant efficiencies for their in-house DBAs who were constantly managing and provisioning new infrastructure and capacity. Customers noted that they were able to see a 40% improvement in DBA productivity by moving to Microsoft Azure SQL Database Managed Instance, resulting in three-year PV savings of \$688,000.
- › **Twenty percent (20%) increase in IT productivity.** Customers noted that with the key features of Azure SQL Database Managed Instance, i.e., automatic data backups, automated security patching, application compatibility, version upgrades, and integration with other PaaS services, customers were able to see a 20% increase in productivity across their IT management and security teams. In addition, developers did not have to spend time re-architecting applications, resulting in three-year PV savings of \$698,000.

Costs. The interviewed organizations experienced the following risk-adjusted PV costs:

- › **Annual license costs.** As a PaaS product, Azure SQL Database Managed Instance is priced based on a vCore-based usage model. This gives organizations the flexibility and transparency to scale their compute, memory, and storage needs to meet their capacity requirements. The customers interviewed migrated business critical and general-purpose applications and workloads across four instances with four terabytes of storage per instance. Over the course of three years, the estimated average license cost is approximately \$25,000 per month, resulting in a three-year PV cost of \$858,000.
- › **Migration and deployment costs.** In moving to Azure SQL Database Managed Instance, organizations need to migrate their existing on-premises SQL Server data. Typical deployment lasts four to six months which includes migration, integration, and testing. These are one-time initial costs, resulting in a PV cost of \$165,000.

Three-Year Financial Summary: Microsoft Azure SQL Database Managed Instance



The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing Microsoft Azure SQL Database Managed Instance.

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 Microsoft Azure SQL Database Managed Instance can have on an organization:



DUE DILIGENCE

Interviewed Microsoft stakeholders and Forrester analysts to gather data relative to Azure SQL Database Managed Instance.



CUSTOMER INTERVIEWS

Interviewed four organizations using Microsoft to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the 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 Microsoft Azure SQL Database Managed Instance's impact: benefits, costs, flexibility, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Microsoft and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Microsoft Azure SQL Database Managed Instance.

Microsoft reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

Microsoft provided the customer names for the interviews but did not participate in the interviews.

The Azure SQL Database Managed Instance Customer Journey

BEFORE AND AFTER THE AZURE SQL DATABASE MANAGED INSTANCE INVESTMENT

Interviewed Organizations

For this study, Forrester conducted four interviews with Azure SQL Database Managed Instance customers. All the interviewed customers managed their SQL Server environment on-premises prior to migrating to Azure SQL Database Managed Instance. Interviewed customers include the following:

INDUSTRY	REGION	INTERVIEWEES	KEY OBJECTIVE
Technology	Global	Director of storage systems	Scalability and consistent database performance across their global footprint
Wholesaler	North America	Data science architect	Improve governance of managing and deploying databases across business units
Technology	North America	IT product manager	Expansion of capacity without large infrastructure investments
Technology	Europe	Head of development	Strategic decision to move all applications and services to Azure Cloud and improve employee productivity

Key Challenges

Prior to their investment in Azure SQL Database Managed Instance, the interviewed customers had the following challenges:

- › Increased burden to align IT infrastructure and operating model to support business demands and growth.
- › Long lead time to expand current capacity without investing into the on-premises infrastructure.
- › Inconsistent governance model across business units and geographic locations for managing capacity and investing in more on-premises hardware.
- › Increased burden on DBAs and IT overhead to deploy and manage new IT infrastructure.
- › More developers and development time required to re-architect applications.
- › Lack of flexibility to quickly scale capacity based on market conditions.
- › Increased pressure on IT capex budgets and minimal flexibility in pricing options.
- › Identifying a long-term solution to map to organizations' strategic direction of moving applications, databases, and workloads to the cloud.

“Azure Managed Instance is part of our strategic mandate to move all of our application, database, and services footprint to the Azure cloud. We can quickly integrate and are more nimble and more efficient as a result.”

*Head of development,
technology company*



- › Reduced/removed the burden on IT management around continuous capacity planning.

Solution Requirements

The interviewed customers searched for a solution that could:

- › Provide a flexible pricing and economic model that could easily align with their business needs.
- › Easily migrate both business critical and general-purpose applications and workloads to the cloud with minimal application changes and low work effort requirement from DBAs, developers, and IT management.
- › Easily manage multiple instances of their SQL Server applications and databases with increased storage and processing capabilities.
- › Include all the benefits of a PaaS model including automatic upgrades and patching, automatic data backups, high-availability for business continuity, data redundancy across locations, and global reach.
- › Reduce the need to continue to invest in IT infrastructure hardware and take advantage of cloud services.
- › Reduce the burden on internal resources to continually update and manage databases, develop and re-architect applications to ensure compatibility, and IT overhead time with managing underlying infrastructure.

Key Results

Key results from the Azure SQL Database Managed Instance investment for the interviewed customers include:

- › Migrating large number of business critical and general-purpose applications from on-premises and IaaS with low effort and high compatibility. Customers utilized Azure Data Migration Service (DMS) to migrate their workloads at scale.
- › Realizing capex savings from budgeting from new infrastructure hardware and opex savings from reduced network and storage costs.
- › Improved DBA resource productivity from managing on-premises SQL Database environment.
- › Improved IT productivity across security, system administrators, developers, and additional management resources from managing on-premises SQL Server Database environment.

Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated 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 that Forrester synthesized from the customer interviews has the following characteristics:

“We needed the flexibility and the agility to scale our cloud services quickly and efficiently. We have operations across almost 200 countries and needed to have consistent, data that is secure and highly available across our global locations.”

*Director of storage systems,
global technology company*



“We’ve seen a significant improvement in our DBA productivity from doing routine manual tasks to now having time to manage the environment. Azure SQL Database Managed Instance comes with resource manager and integrated portal so that our DBAs can scale and provision quickly. These were tasks that often took many hours and now they are completely automated.”

Data science architect,

*North American wholesale
company*



Description of composite. This organization is headquartered in North America and operates internationally across 150 countries. The organization has successfully transitioned over 500 customer databases and 300,000 customer records from its on-premises environment onto Azure cloud. The composite organization has deployed 4 instances of business critical and general-purpose applications and workloads with 40 cores of computing power per instance and 4 terabytes of storage per instance.

The composite organization has grown both in revenue and customer counts especially across new international markets. As the organization expands, it faces increased burden from planning, purchasing, provisioning, and maintaining all of their IT infrastructure and software to support innovation and their customers. It became very difficult to hire IT and DBAs to continuously support their business growth and requirements. Other technology service providers considered mainly offered only infrastructure-as-a-service (IaaS) which still requires a lot of IT staff and overhead to manage the environment. In addition, the composite organization needed the flexibility to quickly provision and scale new infrastructure to support and improve time-to-value to its customers.

In addition, it's a strategic priority for the composite organization to transition its on-premises environment to the cloud and focus on their core competencies.

Deployment characteristics. As the organization began deployment of Microsoft Azure SQL Database Managed Instance, it began using Azure Database Migration Service to migrate databases onto the cloud. The migration to a fully managed instance took six months which included deployment, integration, testing, and rollout across all 4 of their SQL database instances. Following the initial transition period of six months, the organization was able to start experiencing the benefits of their fully managed SQL database environment.



Key assumptions:

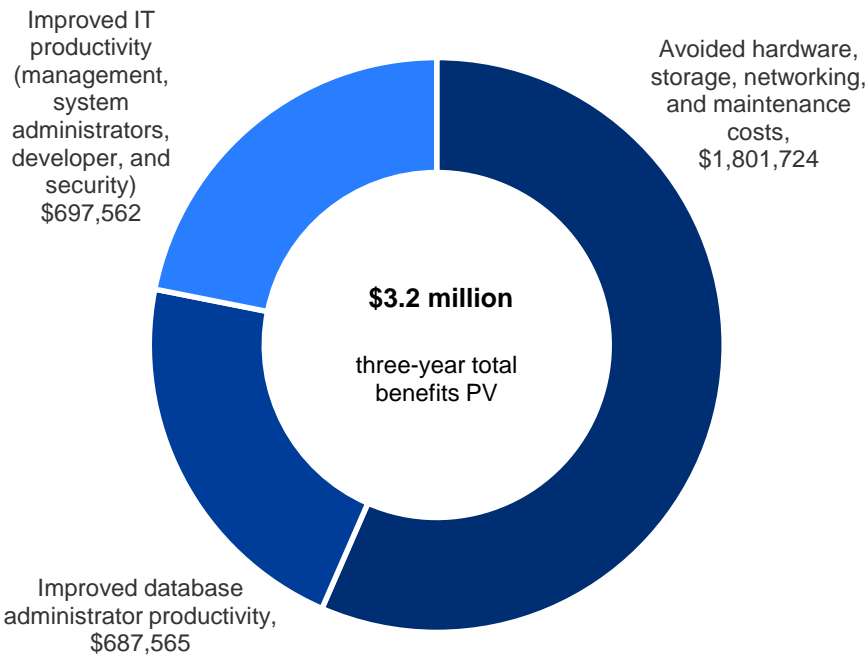
- Global operations across 150 countries
- Over 500 customer databases
- 300,000 customers transitioned onto Azure cloud
- Transitioned both business critical and general-purpose applications and workloads across 4 instances.

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	Avoided hardware, storage, networking, and maintenance costs	\$724,500	\$724,500	\$724,500	\$2,173,500	\$1,801,724
Btr	Improved database administrator productivity	\$276,480	\$276,480	\$276,480	\$829,440	\$687,565
Ctr	Improved IT productivity (management, system administrators, developer, and security)	\$280,500	\$280,500	\$280,500	\$841,500	\$697,562
Total benefits (risk-adjusted)		\$1,281,480	\$1,281,480	\$1,281,480	\$3,844,440	\$3,186,851



The table above shows the total of all benefits across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of \$3.2 million.

Benefit 1: Avoided Hardware, Network, Storage, And Ongoing Maintenance Costs

The largest benefit for the composite organization was the avoidance of purchasing and provisioning all the hardware and software needed to support their business growth. In addition, moving to Azure SQL Database Managed Instance saves the composite organization in ongoing opex expenses such as associated networking, storage, and maintenance costs. Interviewees mentioned over- and under-provisioning for capacity as a recurring issue and that the overhead to plan, budget, and decide on the investment directly hurts time-to-value. In addition, interviews noted that their on-premises infrastructure was becoming obsolete and demonstrated inferior performance. As the hardware was aging, organizations faced costly piece-by-piece technology upgrades that could cause downtime and business disruption.

By switching to Azure SQL Database Managed Instance, organizations recognized the following benefits:

- › **Avoided costs of new hardware and hardware refreshes to support business growth and maintain needed performance levels.** With Azure SQL Database Managed Instance, the organization got access to the latest technology, on-demand capacity, and new hardware which reduced the need to continually incur large capex expenses. In addition, the composite organization reduced the need to replace current hardware to maintain needed performance levels, saving additional hardware costs to organizations.
- › **Avoided costs storage, networking, and ongoing maintenance costs.** With Azure SQL Database Managed Instance, the composite organization has a flexible model that allows them to scale compute, memory, and storage based on their workload needs. This allows the organization the flexibility and control to increase workloads and applications in the cloud without incurring additional storage, networking, and ongoing maintenance costs.

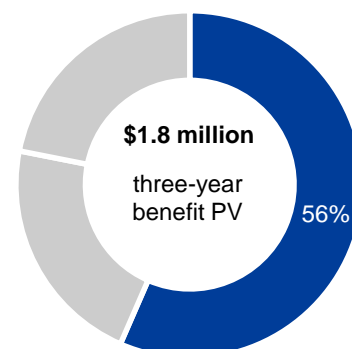
For the composite organization, Forrester assumes:

- › On average, the annual hardware capex requirements prior to Azure was \$700,000 per year.
- › On average, the composite organization spent an additional 15% of their capex budget on maintenance of their legacy on-premises environment.
- › Avoided hardware network, storage, and ongoing maintenance costs averaged a total of \$805K per year.

Reductions in average cost per contact can be influenced by:

- › The hardware costs related to business growth and expansion.
- › The need for overprovisioning for infrastructure and old hardware replacement.

To account for this, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1.8M.



Avoided Hardware, Storage, Networking, And Maintenance Costs: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	Avoided hardware, storage, and network costs		\$700,000	\$700,000	\$700,000
A2	Avoided maintenance on legacy on-premises environment (percentage of overall cost savings)		15%	15%	15%
A3	Avoided maintenance on legacy on-premises environment	A1*A2	105,000	105,000	105,000
At	Avoided hardware, storage, networking, and maintenance costs	A1+A3	\$805,000	\$805,000	\$805,000
	Risk adjustment	↓10%			
Atr	Avoided hardware, storage, networking, and maintenance costs (risk-adjusted)		\$724,500	\$724,500	\$724,500

Benefit 2: Improved DBA Productivity

All the interviewed customers experienced an improvement in database administrator (DBA) productivity. With Azure SQL Database Managed Instance, many manual and time-intensive tasks could be either automated or offloaded to Microsoft to manage. DBAs do not need to focus on re-indexing, data backups, patching, and global replications as these tasks are automatically completed. Additionally, DBAs would no longer be needed to spend considerable time provisioning new infrastructure.

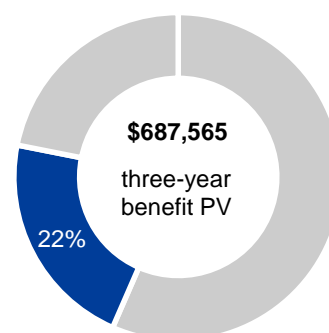
For the composite organization, Forrester assumes:

- › A team of 10 DBAs support the SQL database environment globally.
- › Forty percent improvement in DBA productivity from moving SQL Database environment to a fully managed Azure instance.
- › Eighty percent of improvement in DBA productivity gets translated into the bottom line.

The magnitude of this benefit may vary for other organizations due to:

- › The number of DBA resources and their roles and responsibilities.
- › The average annual salary per DBA resource.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of \$688K.



Improved DBA productivity accounts for 22% of the overall benefits.

Improved DBA Productivity: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Number of DBAs		8	8	8
B2	Percentage of improved efficiency for DBAs		40%	40%	40%
B3	Average annual fully burdened rate of DBA		\$120,000	\$120,000	\$120,000
B4	Percent productivity captured by organization		80%	80%	80%
Bt	Improved DBA productivity	$B1*B2*B3*B4$	\$307,200	\$307,200	\$307,200
	Risk adjustment	↓10%			
Btr	Improved DBA productivity (risk-adjusted)		\$276,480	\$276,480	\$276,480

Benefit 3: Improved IT Productivity

Interviewed customers experienced significant productivity gains across various roles in their IT organization. All the interviewees noted that managing data centers and the underlying infrastructure was not only costly and complex but it also was very time intensive to manage and maintain. With Azure SQL Database Managed Instance, the composite organization could quickly move over SQL Server workloads without having developers spend time re-architecting applications. In addition, the composite organization could take advantage of many features such as automatically creating backups, deploying latest security patches, reducing cost to provision new infrastructure, and handling multiple instances of databases across geographic locations.

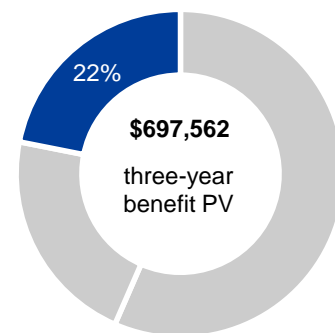
For the composite organization, Forrester assumes:

- › A team of 50 IT resources across various roles support the SQL database environment globally. These resources include management, system administrators, developers, and security resources.
- › Thirty-three percent of IT resource time is dedicated to provisioning, deploying, and managing the on-premises SQL Database environment.
- › Twenty percent improvement in productivity for these 50 resources that support the on-premises SQL Database environment.

The magnitude of this benefit may vary for other organizations due to:

- › The number of IT resources that support SQL Database environment.
- › The average annual salary of average IT resource.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted total PV of \$698K.



Improved IT productivity accounts for 22% of the overall benefits.

Improved IT Productivity: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
C1	Number of IT resources (management, system administrators, developers, and security FTEs) managing on-premises SQL Database environment.		50	50	50
C2	Percentage of time spent provisioning, deploying, and managing on-premises SQL Database environment		33%	33%	33%
C3	Percentage of improved efficiency for IT resources		20%	20%	20%
C4	Average annual fully burden rate of IT resource		\$100,000	\$100,000	\$100,000
Ct	Improved IT productivity (management, system administrators, developer, and security)	$C1 * C2 * C3 * C4$	\$330,000	\$330,000	\$330,000
	Risk adjustment	↓15%			
Ctr	Improved IT productivity (management, system administrators, developer, and security) (risk-)		\$280,500	\$280,500	\$280,500

Unquantified Benefits

Forrester's interviews and analysis of Microsoft customers pointed to additional benefits that could not be reasonably quantified but are still important to note.

- › **Faster time-to-market.** Interviewed organizations noted faster application development cycles than their on-premises database environment.
- › **Reduced downtime.** Fewer cases and database issues that arise in unplanned database downtime.
- › **Strategic Alignment.** Azure SQL Database Managed Instance fits in with their overall cloud-first strategy to enable faster growth and international expansion.
- › **Improved productivity leads to innovation.** Freeing up DBA and IT resources from manual tasks allows them to focus on higher value business priorities driving innovation.
- › **Built-in, high availability.** With Azure SQL Database Managed Instance, organizations get 99.99% availability of their database and applications.



Unquantified benefits:

- Faster time-to-market
- Reduced downtime
- Strategic alignment
- Innovation
- High availability

Flexibility

The value of flexibility is clearly unique to each customer, and the measure of its value varies from organization to organization. There are multiple scenarios in which a customer might choose to implement Azure SQL Database Managed Instance and later realize additional uses and business opportunities, including:

- › **Capacity to take on new business initiatives.** With infrastructure planning, implementation, and support burden lifted from their shoulders, IT professionals at interviewed organizations could dedicate their time to new business projects they previously could not take on, including new product and service launches, enhancements to existing products, and improvements to customer experience.

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for a future additional investment. This provides an organization with the "right" or the ability to engage in future initiatives but not the obligation to do so.

- › **Reduce the risk of over- or under-provisioning.** This allows the organization to optimally manage their budget and infrastructure capacity. The risk of over- or under-provisioning has direct business impacts.
- › **Standardization.** With Azure SQL Database Managed Instance, organizations can standardize their SQL Database environment across regions and business units. This provides IT leadership with a consistent view of their IT footprint and provides organizations with the flexibility to adhere to local regulations without having to manage multiple SQL Database instances.

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
Dtr	Azure SQL Server Database Managed Instance license cost	\$0	\$345,000	\$345,000	\$345,000	\$1,035,000	\$857,964
Etr	Migration and deployment	\$165,000	\$0	\$0	\$0	\$165,000	\$165,000
	Total costs (risk-adjusted)	\$165,000	\$345,000	\$345,000	\$345,000	\$1,200,000	\$1,022,964

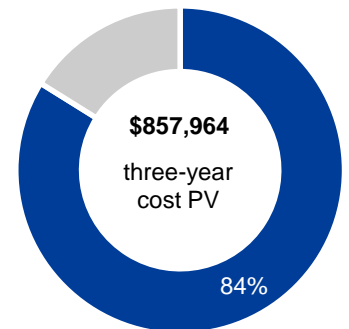
Cost 1: Azure SQL Database Managed Instance Annual License Cost

Azure SQL Database Managed Instance license costs is determined by usage and varies based on the infrastructure size and configuration. The annual license costs are determined by the number of instances, computing power, storage, and performance requirements. It can fluctuate from month to month based on usage peaks and lows.

The composite organization referenced in this study has 4 instances deployed with 40 cores of compute and 4 terabytes of storage per instance. Forrester uses an average monthly cost of \$25,000 for this configuration and requirements. The cost may vary due to contract terms as well as the volume of storage and compute used.

To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year risk-adjusted total PV of \$858K.

The table above shows the total of all costs across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total costs to be a PV of \$1.02 million.



Azure SQL Server Managed Annual License Costs: 84% of total costs.

Azure SQL Server Database Managed Instance Annual License Cost: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
D1	Estimated monthly license costs			\$25,000	\$25,000	\$25,000
D2	Number of months			12	12	12
Dt	Estimated Azure SQL Database Managed Instance annual license cost	D1*D2	\$0	\$300,000	\$300,000	\$300,000
	Risk adjustment	↑15%				
Dtr	Estimated Azure SQL Database Managed Instance annual license cost (risk-adjusted)		\$0	\$345,000	\$345,000	\$345,000

Cost 2: Migration And Deployment Costs

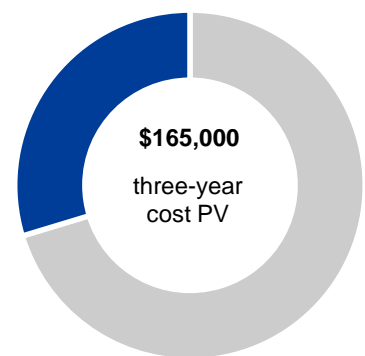
Interviewed organizations required four to six months to fully transition and start achieving benefits from Azure SQL Database Managed Instance. This time includes planning, defining requirements, migration, testing, and rollout. In addition, time to go through the organization's procurement process is also reflected in the overall implementation timeline. The number of FTEs involved in the transition was similar across the organization. In addition, some organizations may hire professional services or outside vendors to help support their implementation.

For the financial model, Forrester estimates:

- › It took six months to transition from on-premises SQL Server environment to Azure SQL Database Managed Instance.
- › Six FTEs were involved in the implementation for 50% of their time.

These costs may vary based on the scope of the business, complexity of integration, and internal IT resources.

To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of \$165K.



Internal migration and integration effort: 16% of total costs.



Four to six months: average time to complete a migration.

Implementation risk is the risk that a proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

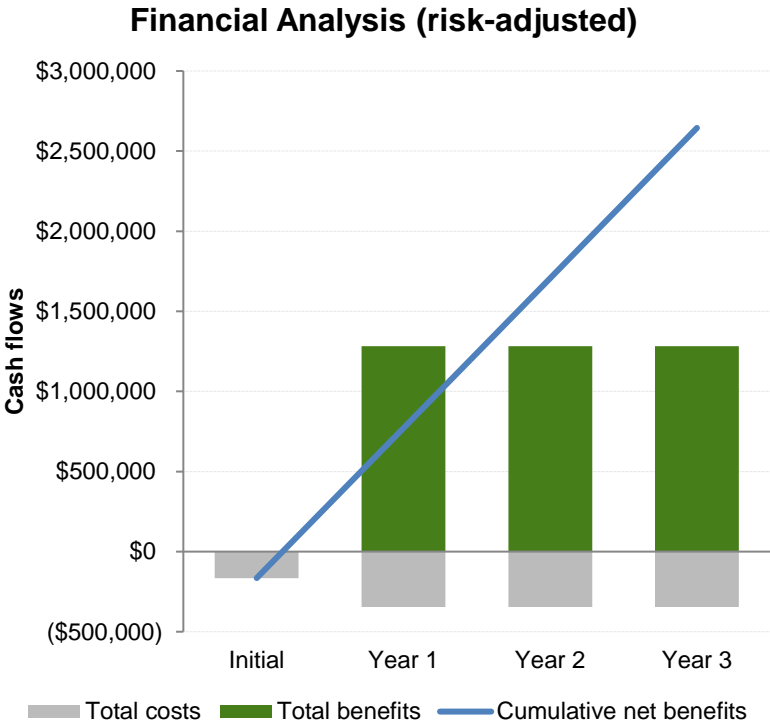
Migration And Deployment Cost: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
E1	Number of IT FTEs		6			
E2	Number of months to fully roll out migrate, test, and deploy		6			
E3	Percentage of time dedicated to Azure SQL Database Managed Instance		50%			
E4	Monthly fully burden rate of IT FTE	\$100,000 per year	\$8,333			
Et	Implementation and deployment costs	$E1 * E2 * E3 * E4$	\$150,000	\$0	\$0	\$0
	Risk adjustment	↑10%				
Etr	Implementation and deployment costs (risk-adjusted)		\$165,000	\$0	\$0	\$0

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 ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.



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

Cash Flow Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	(\$165,000)	(\$345,000)	(\$345,000)	(\$345,000)	(\$1,200,000)	(\$1,022,964)
Total benefits	\$0	\$1,281,480	\$1,281,480	\$1,281,480	\$3,844,440	\$3,186,851
Net benefits	(\$165,000)	\$936,480	\$936,480	\$936,480	\$2,644,440	\$2,163,887
ROI						212%
Payback period						<6 months post migration

Microsoft Azure SQL Database Managed Instance: Overview

The following information is provided by Microsoft. Forrester has not validated any claims and does not endorse Microsoft or its offerings.

Azure SQL Database is an intelligent, fully managed relational database service in Microsoft Azure that supports structures such as relational data, JSON, spatial, and XML. Azure SQL Database delivers dynamically scalable performance and options such as columnstore indexes for extreme analytic analysis and reporting, and in-memory OLTP for extreme transactional processing. Microsoft handles all patching and updating of the SQL code base seamlessly and abstracts away all management of the underlying infrastructure.

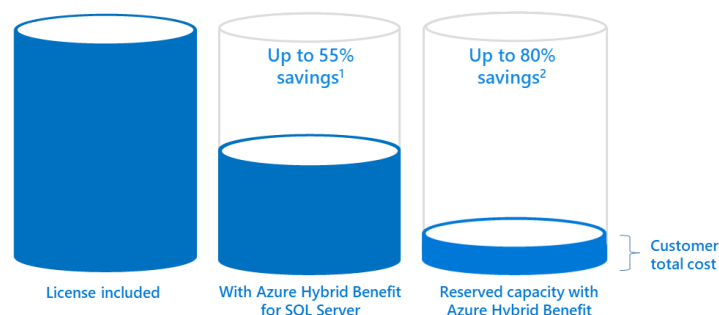
Azure SQL Database provides the following resource types:

- › As a single database with its own set of resources managed via a logical server
- › As a pooled database in an elastic pool with a shared set of resources managed via a logical server
- › As a part of a collection of databases known as a managed instance that contains system and user databases and sharing a set of resources

Azure SQL Database Managed Instance is an *instance-scoped* resource type in SQL Database that combines the rich SQL Server surface area with the operational and financial benefits of an intelligent, fully managed service. It provides high SQL Server engine compatibility (2005 through current versions), enabling on-premises SQL Server database migration while reducing or eliminating the need to re-architect applications. It also includes native virtual network (VNET) support to promote secure data communications.

As a resource type within Azure SQL Database, Managed Instance brings innovative features such as built-in high availability (HA), automated backups, and point-in-time restore to ensure business continuity. Built-in intelligent features serve to optimize and tune database performance for you, while proactively monitoring for threats and discovering, tracking and helping to remediate potential database vulnerabilities.

Microsoft offers economic incentives to maximize the return on investment of migrating SQL Server workloads to Azure and provide a competitive total cost of ownership for building new apps in the cloud. The Azure Hybrid Benefit helps you maximize the value of your on-premises SQL Server license investments for discounted rates in Azure SQL Database. SQL Database reserved capacity pricing provides further discounts for prepaying upfront for a one- or three-year term commitment. When combining these incentives, you can experience savings of up to 80 percent versus license-included pricing.



Azure SQL Database Managed Instance combines the best of SQL Server and built-in intelligent capabilities with the benefits of a fully managed service, enabling you to focus more on driving growth for your business, efficiently and cost-effectively. For more information on Azure SQL Database Managed Instance, please visit <https://aka.ms/managedinstance>.

Organizations can accelerate migrations to SQL Database Managed Instance by using Azure Database Migration Service (DMS) — a fully managed service that streamlines the tasks required to move existing databases to Azure. DMS enables seamless migrations from heterogeneous database sources to Azure Database platforms with minimal downtime. For more information, please visit <http://aka.ms/databasemigration>.

¹ Savings based on eight vCore Managed Instance Business Critical in East US Region, running 730 hours per month. Savings are calculated from full price (license included) against base rate (applying Azure Hybrid Benefit for SQL Server), which excludes Software Assurance cost for SQL Server Enterprise edition, which may vary based on EA agreement. Actual savings may vary based on region, instance size and performance tier. Prices as of December 2017, subject to change.

² Savings based on eight vCore SQL Database Managed Instance Business Critical in East US Region, running 730 hours per month. Savings are calculated from on demand full price (license included) against base rate with Azure Hybrid Benefit plus three-year reserved capacity commitment. Savings excludes Software Assurance cost for SQL Server Enterprise edition, which may vary based on EA agreement. Actual savings may vary based on region, instance size and performance tier. Prices as of May 2018, subject to change.

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."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.



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.