

A Forrester Total Economic Impact™  
Study Commissioned By Microsoft  
October 2019

# The Total Economic Impact™ Of Microsoft Azure Analytics With Power BI

Improved Analytics And A Lower TCO

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## ABOUT FORRESTER CONSULTING

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## Benefits And Costs



Lower total cost of ownership:  
**25.7%**



Faster time to insights:  
**27%**



Increased customer satisfaction:  
**60%**

## Executive Summary

Microsoft's Azure Analytics and Power BI offerings include a wide range of data management, data warehousing, data storage, and business intelligence solutions, which help its customers effectively handle ever-increasing and varied datasets to improve insights. Microsoft commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential ROI enterprises may realize by deploying Azure Analytics with Power BI. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of these solutions on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed four customers and surveyed 364 others who are currently using a mix of Azure Analytics and Power BI solutions. These solutions are largely built on the Azure platform and make it easy to combine and process data from disparate data stores, such as cloud-based repositories, on-premises servers, Excel files, and so on. Microsoft's solutions also include business intelligence (BI) and analytics tools to effectively and efficiently turn data into actionable information. This study also found that moving to Microsoft's solutions resulted in a lower total cost of ownership (TCO) compared to previous solutions.

Prior to using Microsoft's analytics and BI offerings, the customers in the study typically had a mix of homegrown solutions and solutions from other vendors, deployed primarily on-premises. However, these solutions were becoming too costly to maintain and grow as the amount of data increased, and they were also limited in terms of integrating all data and completing meaningful analyses in a timely manner.

## Key Findings

**Quantified benefits.** The following risk-adjusted present value (PV) quantified benefits are representative of those experienced by the companies interviewed and applied to a composite organization with 20,000 employees:

- › **Improved analytics delivers tangible business benefits.** Companies experience a wide range of business benefits due to better and more timely analyses and decision making as a result of using Azure Analytics with Power BI. These benefits include increased revenues, decreased operating and supply chain costs, and faster entry into new markets. The financial model includes increased operating income from a combination of revenue growth and lower supply chain costs. The total risk-adjusted benefit over three years is \$9.2 million.
- › **Moving to Microsoft results in a 25.7% lower TCO.** The TCO includes all efforts to implement and manage the solutions, as well as the solution costs. Interviewees report that alternative solutions cost as much as four times what they wind up spending by moving to Microsoft. A sizable component of the savings is realized by moving large portions of the infrastructure to the cloud. This study finds that \$8.0 million in other solution costs are replaced by Microsoft with a total cost of \$6.0 million over three years, delivering a net savings of \$2.0 million.
- › **IT staff and business users are more productive.** A wide range of IT professionals, including database administrators (DBAs), data scientists, and infrastructure support become more efficient as a result of the time savings that Azure Analytics with Power BI provides with its better tools



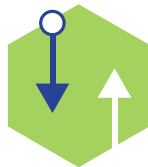
**ROI**  
**271%**



**Benefits PV**  
**\$22.1 million**



**NPV**  
**\$16.1 million**



**Payback**  
**9 months**

“Azure analytics gave me the capability to bring all countries’ data together in a common platform and to enable sharing and self-service. We used to be able to delivery data once a day, but now we populate our data warehouse every 5 minutes. We’ve done all this with a lower TCO.”

*General manager – advanced analytics, beverage industry*



and automation. Across the board, the average time savings is 1.73 hours per week. Business users include power users such as business analysts as well as consumers of business intelligence. The average time savings is 1.75 hours per week. The total risk-adjusted savings in effort over three years is \$4.9 million.

**Unquantified benefits.** The interviewed organizations experience the following benefits, which are not quantified for this study:

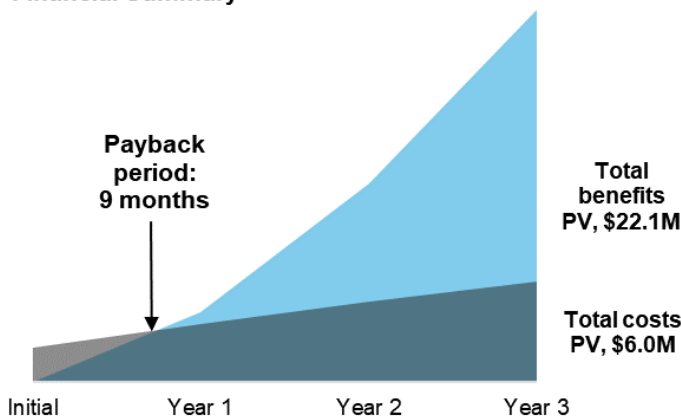
- › **Overall system performance improves in absolute terms and on a performance per dollar basis.** Interviewees and survey respondents say that overall system performance has improved, in terms of processing time and scalability. In an apple-to-apple comparison, the cost for a comparably performing solution is much less with Microsoft. The Microsoft solutions also deliver uptime improvements and reductions to business continuity risk.
- › **Security and compliance improvements.** These improvements are achieved through a mix of solution features at the data level as well as role-based access control (RBAC) user permission capabilities. Additionally, the Azure data centers are viewed as very secure, and deploying to them eliminates a lot of internal overhead and headaches.

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

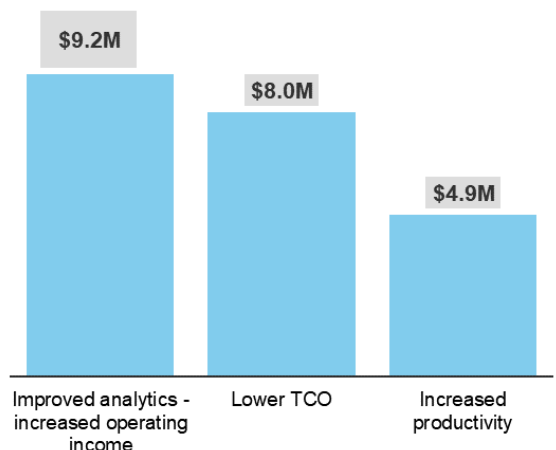
- › **The internal effort to implement the solution and continually roll out new projects over three years was \$2.8 million.** It took 15 FTEs eight months in the initial effort to move the enterprise to Azure Analytics with Power BI and deliver some early wins. A smaller team continues to roll out new features and support the business in new data projects over the next three years.
- › **All Azure Analytics with Power BI solution costs total \$3.1 million.** This includes usage fees for various Azure database management, storage, and machine learning solutions, as well as Power BI licenses and professional services.

Forrester’s interviews with four existing customers as well a survey of 364 other customers and subsequent financial analysis find that an organization based on these interviewed organizations experiences benefits of \$22.1 million over three years versus costs of \$6 million, adding up to a net present value (NPV) of \$16.1 million and an ROI of 271%.

**Financial Summary**



**Benefits (Three-Year)**



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 Analytics with Power BI.

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 Analytics with Power BI can have on an organization:



### **DUE DILIGENCE**

Interviewed Microsoft stakeholders and Forrester analysts to gather data relative to Microsoft Azure Analytics with Power BI.



### **CUSTOMER INTERVIEWS AND SURVEY**

Interviewed four organizations and surveyed 364 others using a mix of Azure Analytics and Power BI solutions to obtain data with respect to costs, benefits, and risks.



### **COMPOSITE ORGANIZATION**

Designed a composite organization based on characteristics of the interviewed and surveyed 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 Analytics with Power BI'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 Analytics with Power BI.

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 Analytics With Power BI Customer Journey

## BEFORE AND AFTER THE ANALYTICS WITH POWER BI INVESTMENT

### Interviewed Organizations

For this study, Forrester conducts four interviews with customers using Microsoft's Azure Analytics and Power BI solutions. Interviewed customers include the following:

INDUSTRY	REGION	INTERVIEWEE	NUMBER OF EMPLOYEES
Networking equipment	European HQ, global sales	Enterprise architect	90,000
Retail pharmacy	North America	Applications manager	200,000
Outdoor wear	US HQ, global sales	Sr. manager – enterprise data	6,000
Beverage	Asia Pacific	General manager – advanced analytics	6,500

### Surveyed Organizations

Forrester also conducts a survey of 364 companies currently using a mix of Azure Analytics and Power BI solutions. They had the following profile:

- › Average number of employees: 20,500.
- › Average number of Power BI users: 1,895 (79% of respondents plan to increase the number of users).
- › Location of respondents: 55% United States, 45% Europe.
- › Role of respondents: 54% business, 46% IT.
- › Top five industries (out of 23 total): professional services, financial services and banking, retail, manufacturing and materials, and transportation.

### Key Challenges

- › **Previous data analytics solutions were impeding business transformation initiatives.** Interviewed companies were seeking to transform their companies through increased use of data analytics. The prior solutions could not provide users with the information they needed to be successful in their jobs. Transformation also required a culture change to become a data-driven organization. "Our business transformation included streamlining internal operations and improving customer-facing services. That was the goal of our enterprise data enablement program."
- › **Previous solutions were too costly to maintain and expand in support of new use cases.** The on-premises infrastructure was very costly in terms of money and effort. This included purchasing and managing hardware, updating systems, managing databases, etc. The costs to implement new solutions in order to handle anticipated growth and expanded use cases would have been prohibitive if traditional approaches were used. "If we would not have changed our approach, we would have spent three times the amount on implementation. The total cost for buying hardware, professional services, internal effort,

"Our previous solutions were aging and replacing them with traditional approaches would have had a very high cost. Scalability was also a big factor and why we looked at a platform-as-a-service solution."

*Enterprise architect, networking equipment*





licenses, etc., would have been \$4 million. Instead, we spent \$1.25 million [on the Microsoft solutions].”

- › **The needed scalability and agility could not be achieved with previous solutions.** Previous solutions could not be upgraded easily and quickly to handle increasing workloads. There were long lead times to add hardware, and the IT organization could not keep up with user requests. Increased scalability and agility were desired to meet user’s needs, promote data democratization, and create a data-driven culture. “We were increasing the number of stores, which meant a lot more data and the need to increase capacity. We knew it would be a lot easier with cloud services than our existing on-premises solution.”

## Key Results

The interviews revealed that key results from implementing Azure Analytics with Power BI include:

- › **The business had better and faster analytics, which improved business outcomes.** The most important thing for companies was better analytics to improve decision making and increase agility. This took many forms including increased sales, faster time-to-market with new products, lower operating and inventory costs, and increased customer satisfaction. “Because of increased compute, our delivery time SLA has improved. Data is available to the business three times faster than before by increasing to 5,000 cDWUs when we need to. We scale up and down as needed.”
- › **Data-related performance per dollar increased.** Moving to Microsoft’s cloud-based analytics and BI solutions deliver comparable performance at a lower cost. “Achieving the same KPIs cost less than in the past. Beyond that, we can deliver much better performance and better align KPIs to the business.”
- › **Data democratization empowered users.** Putting data in the hands of more users and giving them the ability to create their own analyses and reports was very valuable. This removed IT bottlenecks and increased creativity and agility. “End user empowerment is key. Everyone in the company is able to produce better data visualization and get access to the data faster.”

High-level findings from the survey included:

- › Eighty-five percent of respondents agreed or strongly agreed that having well-integrated analytics databases and storage, data management stack, and BI tools have been beneficial for their organization. Another 13% were neutral because it was too early to form a conclusion.
- › The average reduction in the overall costs of the Microsoft’s analytics and BI offerings compared to alternative solutions was 21.9%.
- › Ninety-one percent of respondents agreed or strongly agreed that the benefits created by their investment in Azure Analytics with Power BI will be greater than the costs.
- › Eighty-five percent of respondents agreed or strongly agreed that performance per dollar has improved. Ten percent were neutral because it was too early to decide.

“Having all solutions in one place and in the cloud makes this very successful. Elasticity and an integrated infrastructure is what really drew me to Microsoft.”

*Applications manager, retail pharmacy*

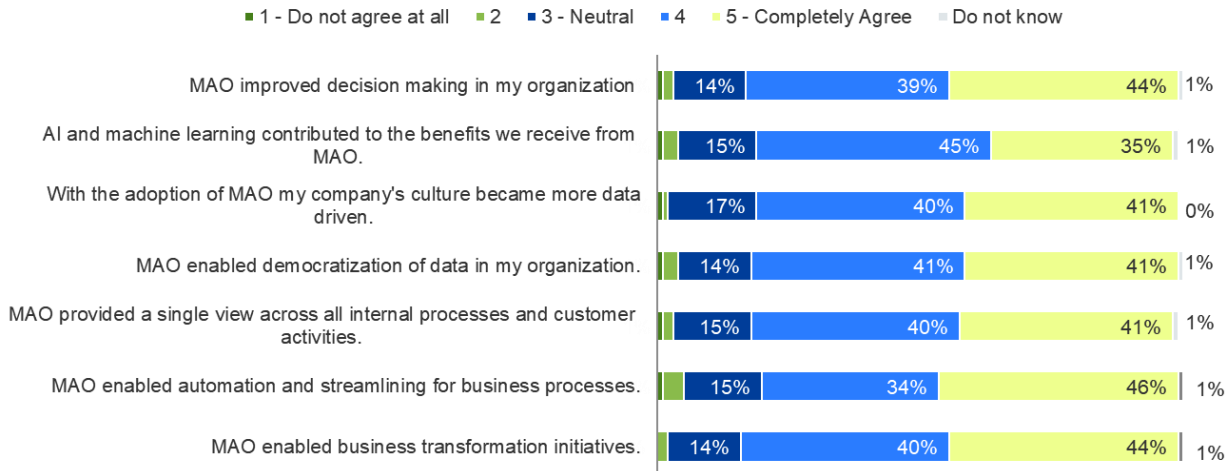


“I was at a Microsoft conference and was telling everyone how great the analytics solution is. It’s easy to give new users the tools they need, our security model is rock solid, and we have access to all of our data via the data lake.”

*Sr. manager – enterprise development, outdoor wear*



**On a scale of 1 to 5, how much do you agree with the following statements about the capabilities Microsoft Analytics with Power BI offerings (MAO)?**



Base: 364 Microsoft Analytics with Power BI Users

Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, August 2019

## Composite Organization

Based on the interviews and survey, 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 interviewed and the 364 others who Forrester surveyed, and it is used to present the aggregate financial analysis in the next section.

The composite organization is a US-based company with global sales and operations. Total revenues equaled \$5 billion and grew at 5% per year. There were 20,000 employees, and Power BI was used by 2,000 users by Year 3 of the study. The organization decided to move its enterprise data and analytics infrastructure over to Microsoft's cloud-based solutions to support business transformation initiatives. The multi-year program included some early win projects to build momentum and adoption.

The main solution components included Azure Data Factory, SQL Server Integration Services, Azure Databricks, Azure SQL Data Warehouse, Azure Data Lake Storage, SQL databases and other data repositories, Power BI, and Azure Machine Learning. They also used built-in connectors for ERP systems. There were approximately 20 terabytes of data which was growing annually. Usage ranged from Azure SQL Data Warehouse cDWU500 to cDWU5000 depending on the time of day and what processes were running.



### Key assumptions:

- \$5 billion company revenue
- 2,000 Power BI users



# 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	Improved analytics	\$0	\$4,095,000	\$7,717,500	\$11,812,500	\$9,182,569
Btr	Lower TCO	\$4,187,700	\$2,577,960	\$2,775,465	\$9,541,125	\$8,022,793
Ctr	Increased productivity	\$323,487	\$2,632,723	\$3,238,503	\$6,194,714	\$4,903,019
	Total benefits (risk-adjusted)	\$4,511,187	\$9,305,683	\$13,731,468	\$27,548,339	\$22,108,381

## Improved Analytics

All of the interviewed companies report better analytics since moving to Microsoft. There are many factors that contribute to this success, including: the ability to integrate all data sources; improved performance in making reports available sooner; data democratization that empowers users to create their own analyses and easily consume others'; and avoiding very long waits for additional infrastructure to be purchased and installed.

The result is a set of meaningful improvements to overall company performance. Examples include increased revenues, more efficient business processes, faster time-to-market, lower inventory and supply chain costs, and increased customer satisfaction. Interviewees shared the following examples:

- › “We now deliver all store sales data at 9 a.m. instead of 11 a.m. Those 2 hours are very important for our purchasers because they have so much they need to do. This improves forecast accuracy, managing inventories, and ordering the right products to sell.”
- › “Our supply chain benefits a lot. Demand planners no longer do manual calculations because they trust the data.”
- › “Our analytics team said that the new solutions are fantastic. It gives them much better information on things like returns, which help them spot trends earlier.”
- › “Azure Analytics has helped with a culture change at our company. We are expanding into other areas so that everyone can make informed business decisions.”
- › “Power BI was a huge success. We’ve added 25,000 users organically in three years.”
- › “Azure Analytics has improved our DevOps, which enables better analytics. Now someone doesn’t have to wait three months for a database to be provisioned. It’s easier for IT to prove value instead of being a roadblock.”
- › “There used to be six-to-nine month provisioning delays before the business could start a new analytics project. Now we have them fully up and running in a couple of weeks. This means better, faster completion of new business initiatives.”

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 more than \$22.1 million.

“End user empowerment is key. Everyone in the company can now produce better data visualizations and can access the data faster. Collaboration, communication, and visibility on analytics have greatly improved.”

*Enterprise architect, networking equipment*



The survey revealed:

- › Average time-to-insights is 27% faster.
- › Companies using Net Promoter Score report an average increase of 60%.<sup>1</sup>
- › Ninety-seven percent of respondents report at least a 1% increase in revenues — the average was 2.8%.
- › Seventy-four percent of respondents say that improved analytics made it possible for them to enter new markets.
- › Average time-to-market with new products or services is reduced from 12 months to 9 months, a 25% improvement.

For the financial analysis, Forrester made the following assumptions:

- › The composite organization’s annual revenue is \$5 billion and grows 5% per year.
- › Beginning in Year 2, analytics adds additional revenue growth from better sales, customer, and store analytics.
- › An operating income margin is applied to isolate bottom-line improvements to the company. This margin increases over the life of the study because analytics contributes to improved supply chain and inventory management.

This benefit can vary widely depending on the types of initiatives that analytics are being used for, as well as existing revenues and margins. To account for these risks, Forrester adjusts this benefit downward by 20%, yielding a three-year, risk-adjusted total PV of \$9,182,569.

“This enabled me to do things I couldn’t do before from an AI and machine learning perspective. These help us analyze customer churn, demand planning, and promotional effectiveness.”

*General manager – advanced analytics, beverage*



Impact risk is the risk that the business or technology needs of the organization may not be met by the investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for benefit estimates.

### Improved Analytics – Increased Operating Income: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	Baseline revenues	Growing at 5% per year	\$5,000,000,000	\$5,250,000,000	\$5,512,500,000
A2	Analytics-related increased revenue %		0	0.75%	1.25%
A3	Analytics-related increased revenues	A1*A2	\$0	\$39,375,000	\$68,906,250
A4	Operating margin		12%	13%	14%
At	Improved analytics – increased operating income	A3*A4	\$0	\$5,118,750	\$9,646,875
	Risk adjustment	↓20%			
Atr	Improved analytics – increased operating income (risk-adjusted)		\$0	\$4,095,000	\$7,717,500

### Lower TCO

Interviewees and survey respondents say that the improved analytics and BI previously mentioned come with a lower TCO compared to their previous solutions. Contributing factors include: 1) the elimination of other solutions which become cost prohibitive at scale; 2) cloud-related benefits such as the elimination of hardware and its management; and 3) better integration between solutions due to single vendor source.

Interviewees provided the following examples:

- › “We are currently moving an old reporting and analytics data warehouse to Azure. It is 18TB, and we will spend €140,000 per year

with Microsoft. Previously, we were spending €1.5 million on things like hardware, software, hosting, and support. Additionally, the old solution was out of support, so we were facing a costly upgrade.”

- › “If we stayed with our previous solution, the TCO for maintenance of hardware and compute costs would have been two times the current \$300,000 we are spending with Microsoft.”
- › “We used to spend €15 million on analytics across all of IT. Now we are spending 15% of that. We are in the process of decommissioning the old systems, which will take four years.”

The survey finds that the average TCO reduction is 36%. The average time to decommission previous solutions is 7.5 months, and 80% of the respondents say everything has been decommissioned within one year.

For the composite organization, Forrester assumes that:

- › An upgrade to another solution and its ongoing management and expansion over three years would have required 50% more internal effort than for Azure Analytics with Power BI.
- › Other solution costs, including hardware, licenses, maintenance and support, professional services, hosting, etc., would have cost two times what was spent with Microsoft.
- › To understand the net benefit, the Microsoft costs (rows Dtr and Etr in tables below) that replaced the ones shown here need to be subtracted out. The net benefit, or TCO savings, was \$2.0 million over the life of the study.

This benefit will vary depending on which Microsoft solutions are in use, what the alternative solutions were, and the overall size of deployment. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of \$8,022,793.

“We evaluated three options. Sticking with our previous on-prem solution would have cost \$2.4 million last year as well as a major upgrade every five years. Moving to another cloud-based solution would have cost \$1.0 million. Going with Microsoft cost us only \$500,000.”

*Sr. manager – enterprise development, outdoor wear*



### Lower TCO: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Eliminated other internal effort	Dtr*1.5 (Year 1 includes Initial and Year 1)	\$3,234,000	\$693,000	\$693,000
B2	Eliminated other solution costs	Et*2.0 (Year 1 includes Initial and Year 1 — 50% in Year 1)	\$1,419,000	\$2,171,400	\$2,390,850
Bt	Lower TCO	B1+B2	\$4,653,000	\$2,864,400	\$3,083,850
	Risk adjustment	↓10%			
Btr	Lower TCO (risk-adjusted)		\$4,187,700	\$2,577,960	\$2,775,465

### Increased Productivity

Interviewees also see improved productivity for various IT roles as well as business users being engaged in analytics and BI activities. For IT, this comes from not having to manage on-premises infrastructure, better system performance, and increased automation. Business users see improvements from increased usability, less downtime in waiting for analyses to complete, and increased self-service. Interviewees provided the following examples:

- › “Server support is a shared resource at our company. We no longer have to pay internally for their services.”

- › “We removed three DBAs from the operations team because all of the access-related activities have been automated.”
- › “We have been able to take on a lot more data and projects since moving to Microsoft. We could not have done that with the other solutions we were considering.”
- › “We had a 12-person team dedicated to building and managing our data platform. We moved everything over to Azure, so these people no longer have these responsibilities and will be reassigned to other areas. They can focus on business outcomes rather than maintaining a platform.”
- › “The bigger impact is on the business side. The lines of business have hundreds of people who are now more efficient.”

The survey asked respondents if they were able to reduce the number of FTEs in different technical roles. These resources can be reassigned and their growth supported with fewer additional hires, due to the spare capacity.

Reduced number of FTEs required to support retired systems and applications as a benefit of your investment in Microsoft's analytics and BI offerings:

Role	Reduction
Database administrators	10.20%
Application developers and managers	7.80%
IT administration and support	14.30%
Data scientists	14.70%
Base: 134 Azure Analytics and/or Power BI users who reduced the number of FTEs	
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, August 2019	

The survey also found that the average time saved per week is 1.73 hours for IT resources and 1.75 hours for business resources. The savings for any individual will vary based on their role, with power users such as analysts who work with data all day saving a lot more time than people who mainly consume reports.

For the financial analysis, Forrester makes the following assumptions:

- › The number of business users who have access to Power BI increases as more analytics projects are rolled out, as well as organic growth from users asking for Power BI.
- › They save 1.75 hours per week as per the survey results. Only 25% is realized in Year 1 as users become familiar with the solutions.
- › Ninety FTEs in different IT roles save 1.73 hours per week. For simplicity, the 90 FTEs are held constant over three years — 25% of this is realized in Year 1 as well.
- › As not all time savings results in additional productive work being completed, a 50% productivity capture is applied.

This benefit will vary based on how many business users there are as well as the number of affected IT workers. To account for these risks, Forrester adjusts this benefit downward by 20%, yielding a three-year, risk-adjusted total PV of \$4,903,019.

“We are now nimbler and allow developers to maintain their own environments. That frees up DBAs to work on other projects. We also save a lot of time on maintenance and upgrades since that has all gone away.”

*Applications manager, retail pharmacy*



## Increased Productivity: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
C1	Number of BI/analytics users		750	1,600	2,000
C2	Time saved	50 weeks*1.75 hours (25% in Year 1)	21.0	87.5	87.5
C3	Hourly fully burdened cost	\$90,000/2,080 hours (rounded)	\$43.27	\$43.27	\$43.27
C4	Business user productivity gain	C1*C2*C3	\$681,503	\$6,057,800	\$7,572,250
C5	Number of affected IT FTEs		90	90	90
C6	Time saved	50 weeks*1.73 hours (25% in Year 1)	21.0	86.5	86.5
C7	Hourly fully burdened cost	\$140,000/2,080 hours (rounded)	\$67.31	\$67.31	\$67.31
C8	IT productivity gain	C5*C6*C7	\$127,216	\$524,008	\$524,008
C9	Productivity capture		50%	50%	50%
Ct	Increased productivity	(C4+C8)*C9	\$404,359	\$3,290,904	\$4,048,129
	Risk adjustment	↓20%			
Ctr	Increased productivity (risk-adjusted)		\$323,487	\$2,632,723	\$3,238,503

## Unquantified Benefits

There are also two additional benefits not included in the financial analysis. System performance improvements (per dollar), linked to the TCO savings, are excluded to avoid double counting. Security and compliance benefits vary greatly, and interviewees are not able to quantify the benefit.

### Improved Performance Per Dollar

All interviewees say that their Azure Analytics with Power BI solutions perform better than the previous solutions, in terms of scalability, compute power, and availability. They also report that performance per dollar is better than before:

- › “We cut costs by 50% but were able to increase usage by five times.”
- › “In the past, if there was a power outage at the stores, we could do the data analytics afterwards. There was just too much data to onboard. Now we can scale up to ingest all the data and complete the analytics.”
- › “Performance is not a concern anymore. If we want better performance, we can use more resources. It is a cost-benefit consideration.”
- › “Before I couldn’t process data fast enough for it to be relevant for anybody. This allows me to give people what they want when they need it.”
- › “One of the key points is that we don’t have to plan for the worst case anymore. The Azure solutions provide the business continuity we need.”

### Improved Security And Compliance

Interviewees say that security and compliance have improved due to features like encryption as well as better separations of duty using RBAC.

“Our TCO has been cut in half and our performance is three times faster. That comes out to a six times improvement in performance per dollar.”

*Applications manager, retail pharmacy*



- › “Previously, people would use their credit cards to buy public cloud resources. We are seeing a lot less of that and have better control and visibility, which is good for security.”
- › “Systematic encryption has improved.”
- › “One of the key compliance requirements was the ability to provision in many geographies.”
- › “Authentication has been greatly improved thanks to Azure Active Directory integration.”
- › “Security is better because the data is encrypted on the way in and out.”
- › Seventy-three percent of survey respondents say that threat detection has improved.

“Security is better now and something we are always focusing on. We created a governance model as part of our rollout to facilitate better security.”

*Sr. manager – enterprise development, outdoor wear*



## 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 Microsoft Azure Analytics with Power BI and later realize additional uses and business opportunities. Some examples provided by interviewees include:

- › Adding new data sources and launching new business-focused analytics projects on top of the platform.
- › One interviewee is looking to retire an on-premises Hadoop environment, which would save an additional \$300,000 per year.
- › Implementing new Azure Databricks features as they come out. This interviewee tries to stay closely aligned to the Databricks road map.
- › Increased use of the artificial intelligence and machine learning capabilities.

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A). None of these potential benefits is included in the financial analysis.

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.



# 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	Internal effort	\$1,540,000	\$616,000	\$462,000	\$462,000	\$3,080,000	\$2,828,926
Etr	Microsoft Azure Analytics with Power BI costs	\$495,000	\$924,000	\$1,085,700	\$1,195,425	\$3,700,125	\$3,130,413
	Total costs (risk-adjusted)	\$2,035,000	\$1,540,000	\$1,547,700	\$1,657,425	\$6,780,125	\$5,959,339

### Internal Effort

There are two broad approaches to rolling out Azure Analytics with Power BI. One is an enterprisewide strategic initiative that covers all data sources and infrastructure. The second is a project-based approach that focuses on high-value analytics projects and data sets. With regard to Power BI, some companies have a formal rollout to all users, and others rely on organic growth.

The composite organization put in place key enabling technologies as part of the upfront effort as well as the governance and standards for an enterprise rollout. The initial period also includes a quick-win project, which used their largest data set. This delivered early value as well as proved that the new solutions could scale to cover the entire organization. Power BI use grew organically on a project-by-project basis, as well as by word-of-mouth demand from users.

The remaining three years were spent integrating more data sources and systems, rolling out more features, and supporting the business's analytics initiatives.

For the financial analysis, Forrester makes the following assumptions:

- › The initial effort lasts eight months and involves 15 FTEs. This includes implementing the analytics platform, processing and migrating data for the quick-win project, and setting up a governance model and standards.
- › A smaller team is responsible for managing the solutions and rolling out new features. Approximately three-fourths of an FTE were responsible for keep the lights on activities.

These costs will vary based on the size of the deployment, the available internal resources, and whether or not a big-bang rollout is chosen over a phased rollout. To account for these risks, Forrester adjusts this cost upward by 10%, yielding a three-year, risk-adjusted total PV of \$2,828,926.

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 more than \$5.9 million.

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.

### Internal Effort: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
D1	Number of months		8	12	12	12
D2	Number of FTEs		15	4	3	3
D3	Average fully burdened cost	\$140,000/12 months	\$11,667	\$11,667	\$11,667	\$11,667
Dt	Internal effort	D1*D2*D3	\$1,400,000	\$560,000	\$420,000	\$420,000
	Risk adjustment	↑10%				
Dtr	Internal effort (risk-adjusted)		\$1,540,000	\$616,000	\$462,000	\$462,000

### Microsoft Azure Analytics with Power BI Costs

Solution costs include usage fees for the various Microsoft Azure solutions and license fees for Power BI. These also include professional services. Professional services in the Initial period are used to: set up the solutions, data transformation, and migration; design analytics reports and workflow automation; and establish a governance model. Ongoing professional services are involved in supporting new business analytics initiatives, integrating additional data sources and systems, and rolling out new features.

For the financial analysis, Forrester makes the following assumptions:

- › Usage fees are based on interviewees' experiences, as applied to the composite organization's size. This grows 15% per year as more projects are rolled out and additional data sources are added.
- › Each user is assumed to have a Power BI Pro license. (Some organizations may already have these licenses as part of other Microsoft SKUs, such as Microsoft 365.)

This cost will vary based on which solution components are being used, the amount of data and compute power, and the number of users. To account for these risks, Forrester adjusts this cost upward by 10%, yielding a three-year, risk-adjusted total PV of \$3,130,413.

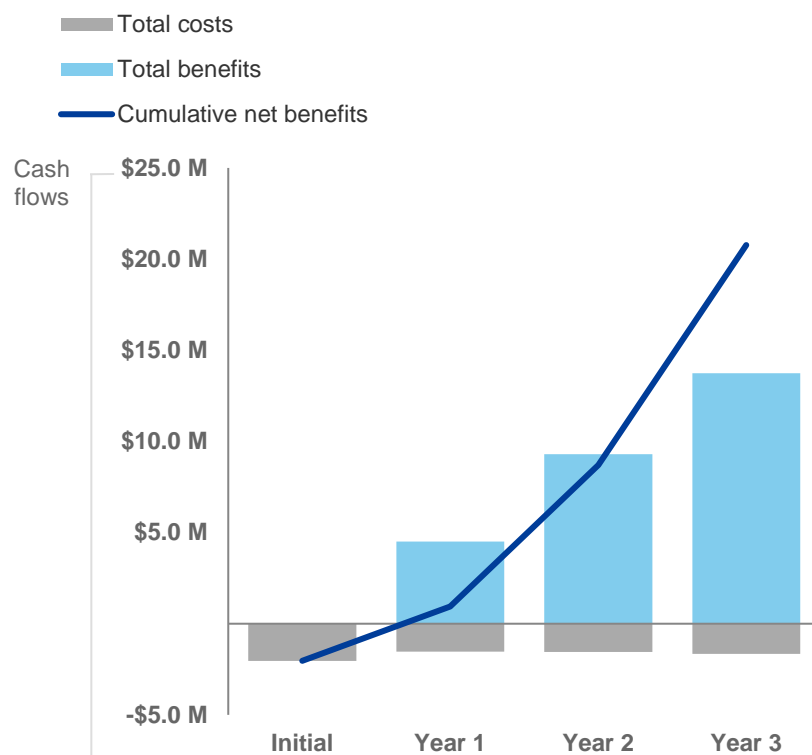
### Microsoft Azure Analytics with Power BI Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
E1	Azure database management, storage and machine learning fees	Growing 15% per year		\$300,000	\$345,000	\$396,750
E2	Power BI licenses	\$120*C1		\$90,000	\$192,000	\$240,000
E3	Professional services		\$450,000	\$450,000	\$450,000	\$450,000
Et	Microsoft Azure Analytics with Power BI costs	E1+E2+E3	\$450,000	\$840,000	\$987,000	\$1,086,750
	Risk adjustment	↑10%				
Etr	Microsoft Azure Analytics with Power BI costs (risk-adjusted)		\$495,000	\$924,000	\$1,085,700	\$1,195,425

# 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.

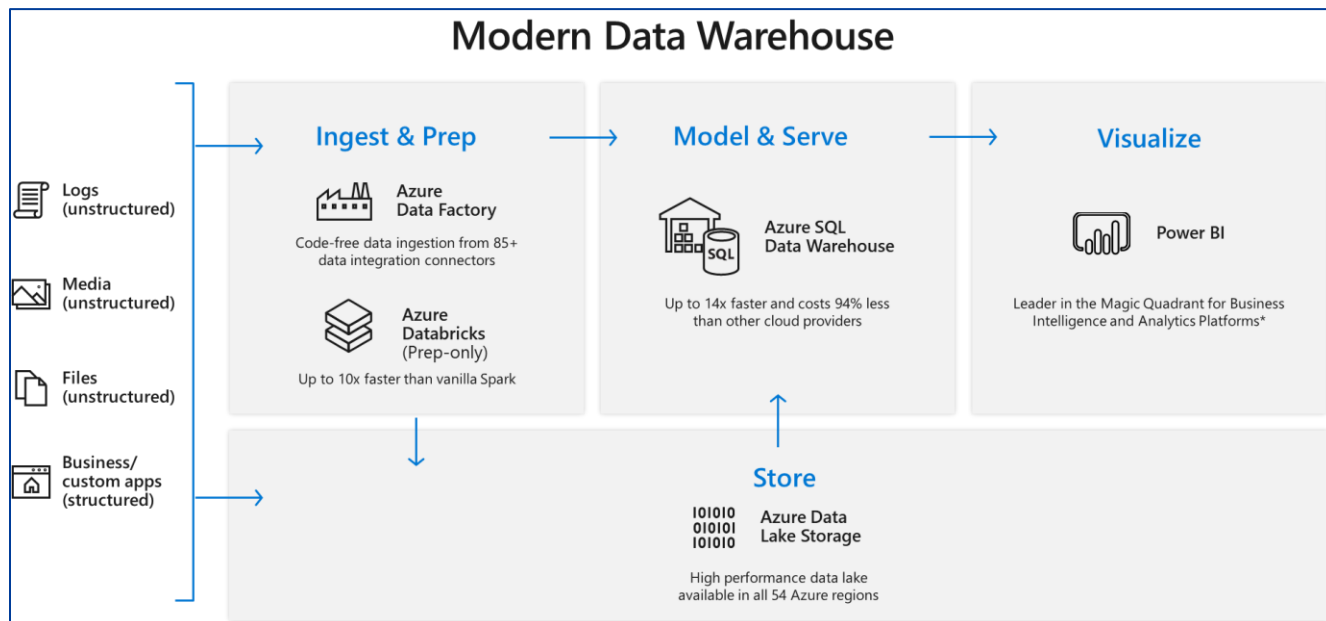
### Cash Flow Analysis (risk-adjusted estimates)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	(\$2,035,000)	(\$1,540,000)	(\$1,547,700)	(\$1,657,425)	(\$6,780,125)	(\$5,959,339)
Total benefits	\$0	\$4,511,187	\$9,305,683	\$13,731,468	\$27,548,339	\$22,108,381
Net benefits	(\$2,035,000)	\$2,971,187	\$7,757,983	\$12,074,043	\$20,768,214	\$16,149,042
ROI						271%
Payback period (months)						9.0

# Microsoft Azure Analytics With Power BI: Overview

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

A modern data warehouse lets you bring together all your data at any scale easily, and to get insights through analytical dashboards, operational reports, or advanced analytics for all your users.



Azure SQL Data Warehouse is the fast, flexible and trusted cloud data warehouse that lets you scale, compute and store elastically and independently, with a massively parallel processing architecture.

Azure Data Factory is a hybrid data integration service that allows you to create, schedule and orchestrate your ETL/ELT workflows.

Azure Data Lake Storage is a highly scalable and cost-effective data lake solution for big data analytics. It combines the power of a high-performance file system with massive scale and economy to help you speed your time to insight

Azure Databricks is a fast, easy, and collaborative Apache Spark-based analytics platform.

Azure Analysis Services is an enterprise grade analytics as a service that lets you govern, deploy, test, and deliver your BI solution with confidence.

Power BI is a suite of business analytics tools that deliver insights throughout your organization. Connect to hundreds of data sources, simplify data prep, and drive ad hoc analysis. Produce beautiful reports, then publish them for your organization to consume on the web and across mobile devices.

# 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.

## Appendix B: Endnotes

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<sup>1</sup> Net Promoter and NPS are registered service marks, and Net Promoter Score is a service mark, of Bain & Company, Inc., Satmetrix Systems, Inc., and Fred Reichheld.