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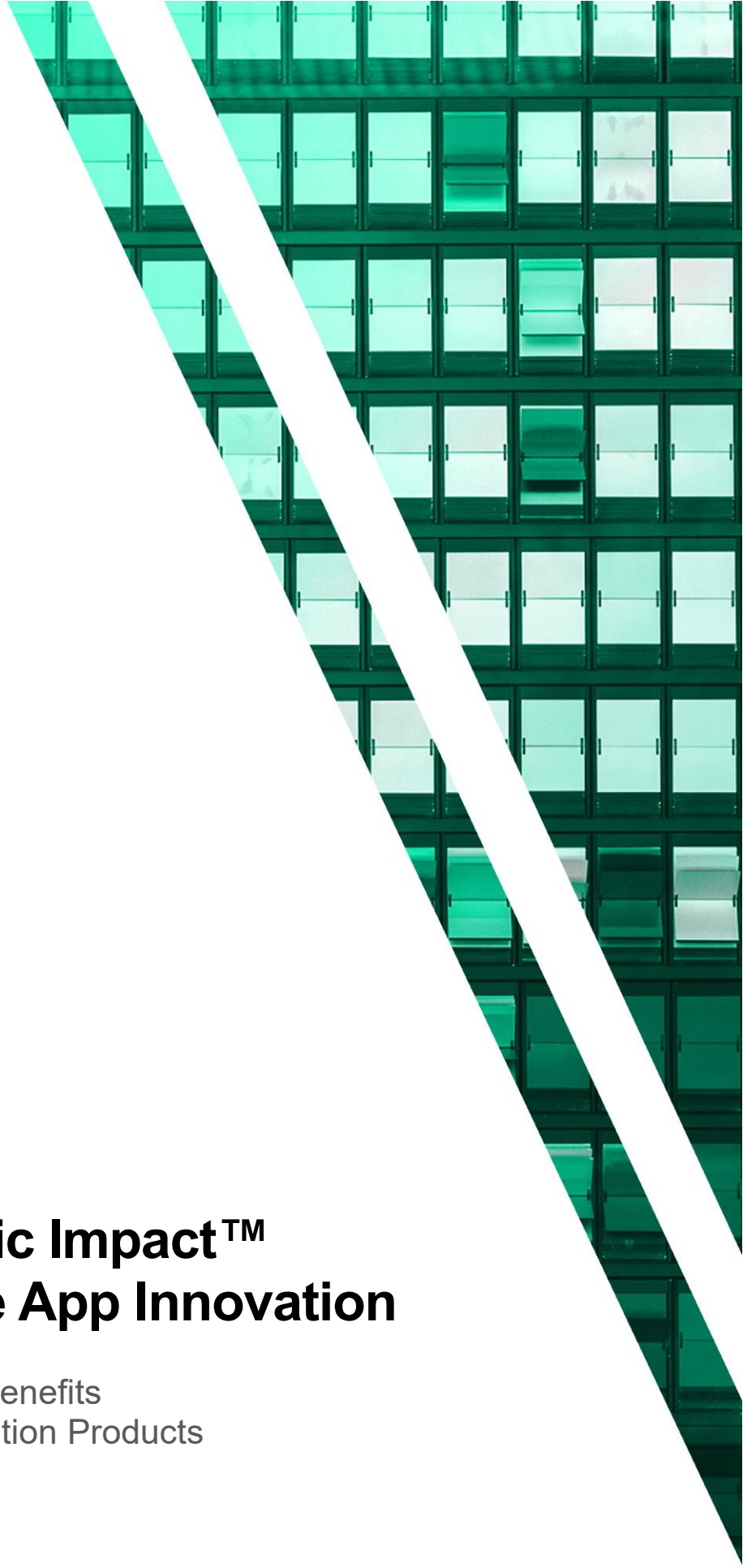

The Total Economic Impact™ Of Microsoft Azure App Innovation

Cost Savings And Business Benefits Enabled By Azure App Innovation Products

JUNE 2023

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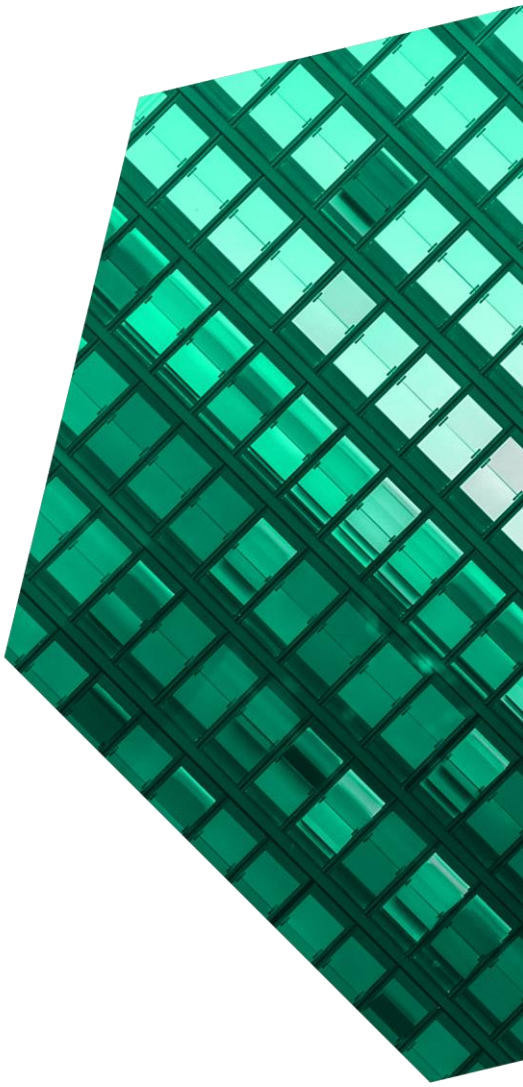


ABOUT FORRESTER CONSULTING

Forrester provides independent and objective research-based consulting to help leaders deliver key transformation outcomes. Fueled by our customer-obsessed research, Forrester's seasoned consultants partner with leaders to execute on their priorities using a unique engagement model that tailors to diverse needs and ensures lasting impact. For more information, visit forrester.com/consulting.

Executive Summary

Microsoft offers application innovation solutions for its Azure platform that enable organizations to build and deliver modern, cloud-native, intelligent applications and realize time-to-market improvements, improved uptime, legacy system cost savings, onboarding efficiencies, and cross-functional productivity gains. The Azure platform also allows software-driven enterprises to consolidate and modernize their existing technology stacks, which promotes a "do more with less" approach.

Microsoft Azure Application Innovation solutions help software-intensive organizations modernize their digital ecosystems, improve the velocity of innovation, and streamline team workflows, resulting in more efficient and intelligent business models that promote scalability, flexibility, and sustainability. With prebuilt templates, built-in code, integrated APIs, and enhanced security features, the collection of Azure App Innovation products promotes a collaborative culture across teams and drives the streamlined delivery of intelligent, cloud-native applications and the modernization of legacy solutions.

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 Microsoft Azure App Innovation solutions.[1] The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Azure App Innovation on their organizations.

Improved time to market by

1 month or more

KEY STATISTICS

Return on investment (ROI)
251%

Net present value (NPV)
$25.2M

To better understand the benefits, costs, and risks associated with this investment, Forrester conducted a panel survey commissioned by Microsoft of 191 respondents and interviewed 11 representatives from six organizations with experience using Azure App Innovation products. For the purposes of this study, Forrester aggregated the interviewees' experiences and survey data and combined the results into a single composite organization — an application-driven enterprise with 1,000 developers, $10 billion in annual revenue, and a core Azure App Innovation product collection that comprises Azure Kubernetes Service (AKS), GitHub Enterprise and Advanced Security, Azure Cosmos DB, and Azure Cognitive Services.

Prior to using Azure App Innovation products, the 11 interviewees noted how their organizations struggled with cost-prohibitive, on-premises infrastructure contained and maintained in data centers. Due to the absence of digitized automation, this architecture

hindered development and physically limited the organizations' ability to scale according to their growing data landscapes and immediate business needs. The interviewees also commented that leadership was increasingly concerned with inadequate data security policies and permissions and feared costly compliance and audit failures in their previous environments.

After the investment in Azure App Innovation products, the interviewees' organizations experienced modernization, automation, and scalability in the creation, delivery, and operations of intelligent, cloud-first applications and the consolidation, or even elimination, of legacy infrastructure. With their embedded security features, these tools also help mitigate concerns surrounding potential compliance and regulatory issues, which led to IT audit cost savings. Other key results from the Microsoft Azure App Innovation investment include application developer and DevOps engineer efficiencies, improved time to market, and reduced downtime.

KEY FINDINGS

Quantified benefits. Three-year, risk-adjusted present value (PV) quantified benefits for the composite organization include:

- **Increased application developer productivity due to Azure App Innovation products.** The automation, prebuilt templates, built-in code, and self-service inherent in Azure App Innovation products allow application developers at the composite organization to realize significant efficiencies in creating intelligent apps. According to the commissioned survey, 77% of 144 respondents experienced increased developer efficiencies in a range of 10% to 25%.[2] Supported by this data, the application developer productivity gains are worth about $16.9 million to the composite organization over three years.
- **Net operating profit due to improved time to market of new apps.** Replacing its on-premises, manual, redundant environment with a cloud-first, innovative ecosystem, the composite organization's developer and DevOps teams gain significant time savings of one to 1.5 months when delivering new applications to market. This results in an incremental net operating profit increase of $8.3 million over three years.
- **Additional value of improved uptime**. The considerable improvement in scalability enabled by Azure App Innovation solutions for the composite organization directly relates to a notable reduction in system downtime during peak business hours. This allows application-related activities to continue without disruption. According to the commissioned survey data, after implementing these modern app technologies, downtime related to applications decreased by an average of 15% to 25%.[3] The avoided system downtime during peak times generates a value to the composite organization of $4.2 million.
- **Operations engineer efficiencies gained in app delivery and operations.** Introducing quality assurance (QA) and continuous integration/continuous delivery and deployment (CI/CD) features in Azure App Innovation products, such as AKS, enable automation and efficiency gains for the composite organization's DevOps/SecOps engineers. According to the survey, 51% of DevOps/SecOps teams experience between 15% and 25% efficiency gains from adopting Azure App Innovation solutions.[4] As a result of these gains, the composite organization realizes a benefit totaling $3.4 million over three years.
- **Additional value due to developer onboarding efficiencies.** Given the Azure products' prebuilt templates, built-in code, and comprehensive technical documentation, the composite organization realizes significant onboarding efficiencies for newly hired developers and DevOps engineers. Whereas onboarding these

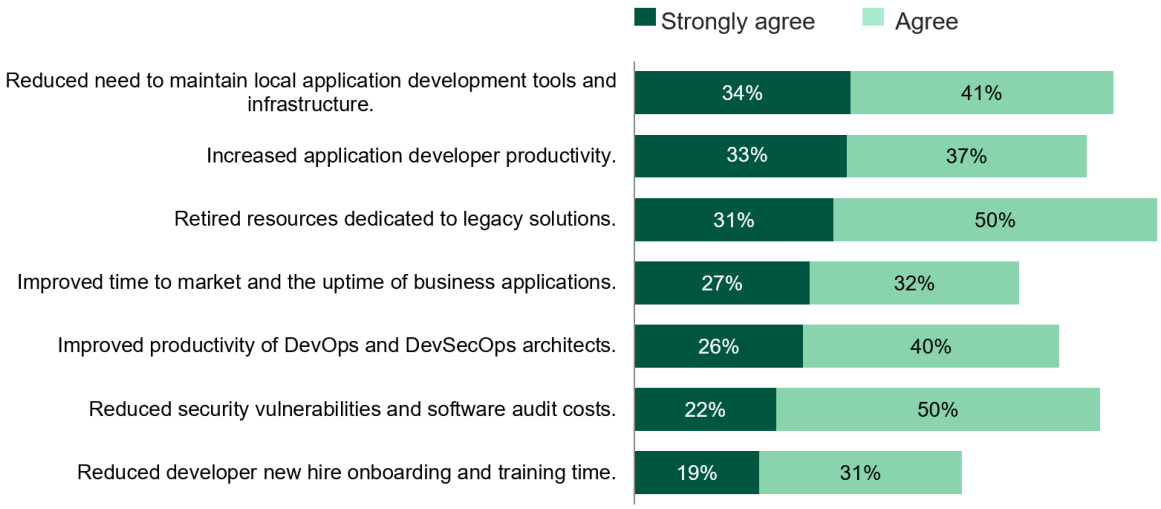
team members in the previous environment might require one month, equaling one month of lost productivity, the composite organization reduces that time to two days by Year 3. This results in a value of $1.1 million to the organization over three years.

- **Consolidation of legacy systems and solutions**. According to 41% of 155 survey respondents, the total annual cost of on-premises legacy infrastructure for application development falls between $100,000 to $500,000.[5] For the composite organization, the consolidation of legacy systems and solutions totals about $930,000 over three years.
- **IT security audit time savings.** With enhanced security features, such as the GitHub Advanced Security dashboard and secret scanning alerts, the composite organization can better identify and resolve coding errors, security vulnerabilities, and the misuse of secrets, allowing the organization to dynamically manage and react to security threats with a unified security posture.[6] Of the 191 survey respondents, 72% assert that Azure App Innovation solutions reduce the risk of security breaches, protect sensitive data, and improve regulatory compliance. Those answers translate to the composite organization saving $408,200 over three years from security audit time savings.[7]

Unquantified benefits. Benefits that provide value for the composite organization but are not quantified in this study include:

- **Improved employee experience, more successful recruiting, and reduced employee turnover.** The efficiencies created with the organization's digital transformation and deployment of Azure App Innovation technologies, specifically AKS and GitHub, directly correspond with the composite organization's cultural transformation. By eliminating manual and repetitive tasks, app-focused technical teams can now center on higher-value goals. Low-code requirements also mean that non-technical employees can now be

"Below is a list of benefits that your company may have experienced since investing in Azure Innovation products and services. How much do you agree or disagree that these are benefits your company has experience?"



Base: 191 worldwide decision-making developer managers and executives
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023

involved in app development processes, creating additional knowledge resources for the organization. This increased employee engagement leads to improved retention and lower recruitment costs since content employees are less likely to look for employment opportunities elsewhere.

- **New business opportunities with improved performance.** Azure App Innovation products can help modernize, improve, repackage, and relaunch apps in the cloud and across new channels. With reliable scalability and speed now built into its application creation and delivery, the composite organization can enhance its offerings, meet customer expectations during peak hours and peak seasons, and drive growth in its customer base. Further, app innovation tools enable the composite organization to tap into previously untapped market segments, resulting in unexpected business opportunities, increased sales, and improved bottom line net revenue.

  Additionally, recent breakthroughs in generative AI capabilities present immeasurable opportunities for software-focused enterprises. Although still in its infancy, management hopes to use AI with Azure App Innovation solutions to further personalize the overall customer experience. For example, Microsoft's strong partnership with OpenAI can unlock even greater workflow efficiencies related to customer-facing roles, such as service desk employees.

Costs. Three-year, risk-adjusted PV costs for the composite organization include:

- **Fees to Microsoft.** The composite organization incurs a per-user cost for GitHub Enterprise and Advanced Security, totaling $77,000 per year, as well as a consumption-based cost totaling approximately $2 million per year for AKS, Azure Cosmos DB, and Azure Cognitive Services. The total risk-adjusted, three-year Azure fee cost to the organization equals $5.2 million.
- **Initial and ongoing costs.** Initial costs for the composite organization include the internal resources required to implement the selected products, professional services fees, and training costs for half of the existing developers. Additional deployment resources, training for the remaining and newly onboarded developers, ongoing professional services, and dedicated management time represent total ongoing costs. The initial and ongoing costs required for the adoption of the four Azure App Innovation products total $4.8 million over three years at the composite organization.

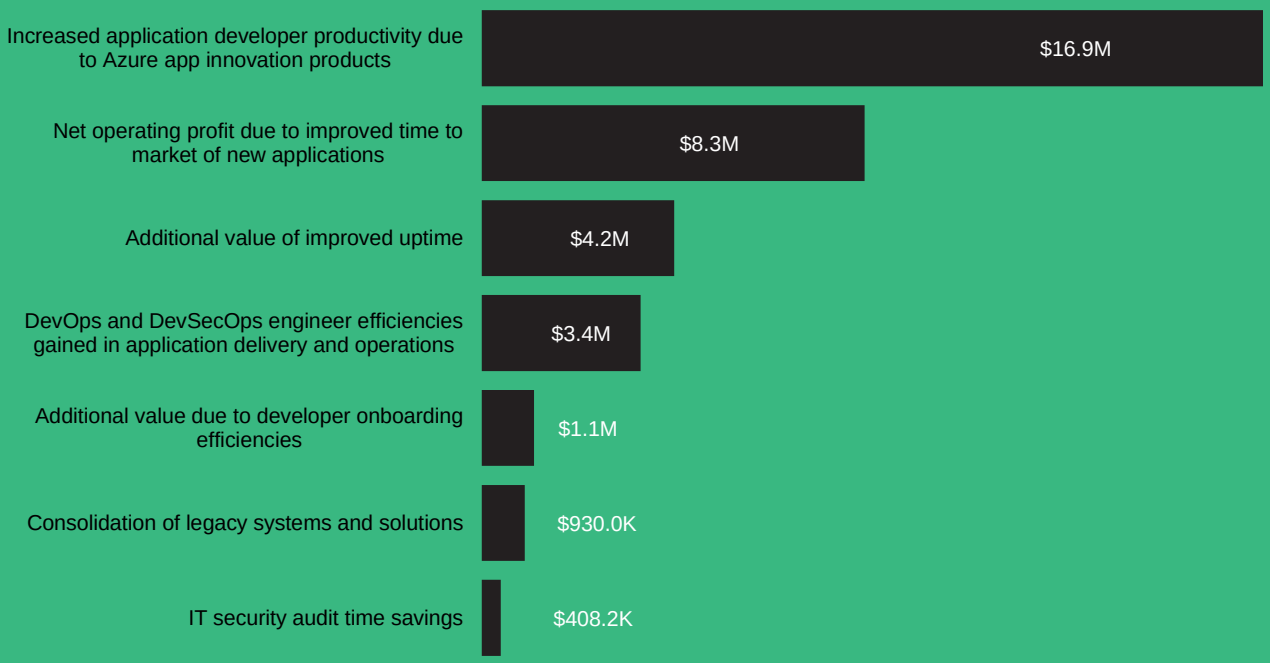
The representative interviews and financial analysis found that a composite organization experiences benefits of $35.3 million over three years versus costs of $10.1 million, adding up to a net present value (NPV) of $25.2 million and an ROI of 251%.

ROI
251%

BENEFITS PV
$35.3M

NPV
$25.2

Benefits (Three-Year)



“With AKS prebuilt templates and built-in code, developers are self-sufficient, engaged, and empowered. And there’s no waiting on deployment time. Now it’s just a matter of hours to get something into production, not days, weeks, or even months, like before.”

— Cofounder, AI

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 Microsoft Azure App Innovation solutions.

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 App Innovation solutions can have on an organization.

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 study to determine the appropriateness of an investment in Azure App Innovation solutions.

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.

Forrester fielded the double-blind survey using a third-party survey partner.

DUE DILIGENCE

Interviewed Microsoft stakeholders and Forrester analysts to gather data relative to Azure App Innovation solutions.

INTERVIEWS AND SURVEY

Interviewed 11 representatives at six organizations and surveyed 191 respondents using Azure App Innovation solutions to obtain data with respect to costs, benefits, and risks.

COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewees' 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 interviewees and survey respondents.

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 App Innovation Customer Journey

Drivers leading to the Azure App Innovation investment

KEY CHALLENGES

The interviewees commented on their organizations' manual, redundant, repetitive work environments, frequently experienced with limited, on-premises architecture. They noted how their organizations struggled with common challenges, including:

- The inability to scale up or down depending on peak usage, data needs, and business objectives caused unacceptable latency, system downtime, and consumer frustration**.**
- Inadequate, immature data and security policies resulted in audit and regulatory issues and exposed the organizations to unnecessary security vulnerabilities.
- The lack of internal developer expertise required tasks to be outsourced. This limited system visibility exposed organizations to reputation risk and hindered application time to market.
- A poor relationship with software vendors left the organizations with little negotiating power or control of price changes**.**
- The lack of agility and flexibility in the existing toolset resulted in missed business opportunities and lost revenue.

COMPOSITE ORGANIZATION

As part of this TEI study, Forrester interviewed 11 Microsoft Azure App Innovation customers from six organizations and augmented this data with custom research commissioned by Microsoft surveying 191 developer managers and executives. To further align some assumptions for the composite organization, Forrester included findings from several TEI studies Microsoft had previously commissioned that focused on related solutions. Based on this research, Forrester constructed a TEI framework, a composite company, and an ROI analysis that illustrates the areas financially affected. The composite organization is representative of the interviewees and survey respondents, and it 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 global, application-intensive enterprise reporting $10 billion in annual revenue. It has 1,000 application developers and 100 DevOps/SecOps engineers with 13% developer turnover and a 12% operating profit margin.

Deployment characteristics. Following its digital transformation to the cloud from its on-prem environment, the composite organization implements four Azure App Innovation tools and services, including GitHub Enterprise and Advanced Security, Azure Kubernetes Service, Azure Cosmos DB, and Azure Cognitive Services. In order to remain industry-relevant and competitive, the composite organization strives to transform, modernize, and automate its application building, delivery, and operations.

Key Assumptions

- **$10 billion annual revenue**
- **Software-intensive**
- **1,000 app developers**
- **100 Dev/SecOps engineers**
- **Adoption of 4 core Azure App Innovation products**

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	Increased application developer productivity due to Azure app innovation products	$3,510,000	$7,020,000	$10,530,000	$21,060,000	$16,903,907
Btr	Net operating profit due to improved time to market of new applications	$2,700,000	$3,375,000	$4,050,000	$10,125,000	$8,286,627
Ctr	Additional value of improved uptime	$1,140,000	$1,710,000	$2,280,000	$5,130,000	$4,162,585
Dtr	Operations engineer efficiencies gained in application delivery and operations	$1,053,000	$1,404,000	$1,755,000	$4,212,000	$3,436,161
Etr	Additional value due to developer onboarding efficiencies	$369,360	$461,700	$554,040	$1,385,100	$1,133,611
Ftr	Consolidation of legacy systems and solutions	$285,000	$380,000	$475,000	$1,140,000	$930,015
Gtr	IT security audit time savings	$164,160	$164,160	$164,160	$492,480	$408,242
	Total benefits (risk-adjusted)	$9,221,520	$14,514,860	$19,808,200	$43,544,580	$35,261,148

INCREASED APPLICATION DEVELOPER PRODUCTIVITY DUE TO AZURE APP INNOVATION PRODUCTS

Evidence and data. With Azure App Innovation tools, developers at the interviewees' organizations could complete work more quickly as a result of already-developed, standard templates, modules, connectors, and the ability to better apply development best practices like the Agile methodology. This improved communication and reduced coding and development errors. Interview and survey experiences include:

- The senior VP of the professional sports organization highlighted improvements in delivering and supporting applications on tight deadlines. They stated: "We have immovable deadlines based on tentpole events during our season. So, capacity planning and delivery planning are critical. With Azure app solutions, we can deliver in advance of those tentpoles."
- Developers were able to focus on coding and reduce or eliminate repetitive tasks. The senior product manager at the home goods retailer mentioned: "We can create an app, publish it, then make changes and publish again without having to go through large-scale change request processes."
- Of 134 survey respondents at the developer manager and executive level, 83% reported that developer productivity had improved by at least 10% due to adopting Azure App Innovation products.[8]

Modeling and assumptions. Azure App Innovation tools simplify building cloud-native, intelligent applications and improving existing legacy solutions for internal employees and external customers.

Measuring productivity for the composite organization involves:

- Incorporating customer interviews with survey results from 134 developer managers and

Increase in application developer productivity of

5% or more

executives. This leads to modeling for the composite organization's developer productivity increases to be 5% in Year 1, 10% in Year 2, and 15% in Year 3, according to adoption levels and product familiarity.

- The productivity gain impacts 1,000 application developers with an average fully burdened annual salary of $156,000.
- Forrester assumes that not all time saved is directly related to work tasks. A standard 50% recapture rate is applied to most productivity metrics in a Forrester TEI.
- The salary and recapture values used here align with TEI studies focused on related solutions that Microsoft previously commissioned.[9]

Risks. Productivity results varied across survey and interviewee participants, and readers may see different results than the composite organization. Variances in measuring productivity across a large group depend greatly on individual user adoption, the maturity (or lack of maturity) in previous tools and processes, salary inflation, and other factors.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $16.9 million.

Increased Application Developer Productivity Due To Azure App Innovation Products

Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Total number of application developers	Composite	1,000	1,000	1,000
A2	Percent increase in application developer productivity	Composite	5%	10%	15%
A3	Fully burdened annual salary of an application developer	TEI standard	$156,000	$156,000	$156,000
A4	Percentage of time recaptured	Forrester assumption	50%	50%	50%
At	Increased application developer productivity due to Azure app innovation products	A1*A2*A3*A4	$3,900,000	$7,800,000	$11,700,000
	Risk adjustment	↓10%			
Atr	Increased application developer productivity due to Azure app innovation products (risk-adjusted)		$3,510,000	$7,020,000	$10,530,000
	Three-year total: $21,060,000			**Three-year present value: $16,903,907**	

NET OPERATING PROFIT DUE TO IMPROVED TIME TO MARKET OF NEW APPS

Evidence and data. Azure App Innovation tools helped developers complete work faster and with fewer errors and apply updates faster and more reliably. In addition, Azure's architecture supported common development best practices. Microsoft Azure services also largely handled infrastructure needs, such as security and networking.

- The CTO of the artificial intelligence solution developer highlighted direct revenue improvement as a result of faster time to market with Azure App Innovation. They observed: "Because we are now faster, that means we can offer new solutions faster. This has led to a 10% or 15% improvement in revenue."
- The CTO of the training organization highlighted how Azure App Innovation tools help their business. They shared: "Customers are astounded with how quickly we can respond."
- Of 114 survey respondents at the developer manager and executive level, 49% reported that revenue improved between 1% and 5% due to adopting Azure App Innovation products, and 24% said that revenue improved between 5% and 15%.[10]

Modeling and assumptions. For the composite organization, a subset of revenue is directly impacted by new and updated applications that are easier to use, more responsive, more available, completed sooner, and easier to update. For the composite organization, this means:

- New and updated applications developed with Azure App Innovation tools affect $100 million per year in gross revenue for the composite organization.
- Three of the new or updated applications are released each year.

> **"Onboarding new clients is faster and more streamlined."**
>
> *Engineering director, financial services*

- With Azure App Innovation, new applications are delivered to customers one month sooner in Year 1. This increases to 1.5 months by Year 3. Forrester bases these findings on customer interviews and survey responses from 114 developer managers and executives.
- While increased revenue is important, the composite organization derives business value from net-new profit enabled by the solution. For the composite organization, these apps impact a market with a 12% profit rate.

Risks. This benefit is based on several assumptions that may vary greatly for readers developing their business case, including:

- The actual amount of revenue impacted by new and updated applications may be challenging to differentiate accurately from all other revenue.
- Profit margins may vary greatly by organization.
- The development time-to-market improvement may be less for organizations with application teams already implementing some best practices.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $8.3 million.

Net Operating Profit Due To Improved Time To Market Of New Applications					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
B1	Gross revenue impacted by time to market improvement	Composite	$100,000,000	$100,000,000	$100,000,000
B2	Number of new revenue-generating applications released per year	Interviews	3	3	3
B3	Months gained bringing new apps to market	Composite	1.00	1.25	1.50
B4	Operating profit margin	TEI standard	12%	12%	12%
Bt	Net operating profit due to improved time to market of new applications	B1*B2*(B3/12)*B4	$3,000,000	$3,750,000	$4,500,000
	Risk adjustment	↓10%			
Btr	Net operating profit due to improved time to market of new applications (risk-adjusted)		$2,700,000	$3,375,000	$4,050,000
	Three-year total: $10,125,000			**Three-year present value: $8,286,627**	

ADDITIONAL VALUE OF IMPROVED UPTIME

Evidence and data. Microsoft Azure App Innovation solutions provided a more reliable and stable platform than most on-premises solutions for the interviewees' organizations. Microsoft could apply tested standards across many customer implementations. It could also implement expertise and training that could be hard to find for many of these organizations to have independently.

Any reliability and stability issues for these organizations resulted in unexpected downtime — and if that downtime occurred with systems that support customer-facing or revenue-impacting applications during business hours, the lost revenue could be significant. Customer examples included:

- The professional sports organization was able to scale significantly with Microsoft Azure App Innovation solutions. Its senior VP reported: "We can scale up at game times and premier events with resiliency, uptime, and availability that we did not have before. Before, outages would impact our subscription revenue."
- The CEO of the artificial intelligence organization explained they had issues delivering their solution to customers before, which impacted revenue: "We couldn't deliver to our customers faster because we had issues with the old platform. We would have delays going to production because our environment was unstable."
- Survey respondents reported reliability as a key benefit of Azure App Innovation solutions. Additionally, 112 of 191 surveyed developer managers and executives reported reduced downtime.[11]

"We doubled our performance with new features and services and have not experienced a full outage."

Senior VP, professional sports

Flexibility. Forrester traditionally views flexibility benefits as future supplemental value enabled by

longer-term added investments. But flexibility can also be applied to nearer-term scenarios when considering the potential of investment decisions outside the benefit category that may be relevant to readers. For example, some may measure downtime improvement in terms of reduced support, remediation, and other IT costs. Survey respondents also reported reduced downtime-related support tickets: 86% said these support tickets were reduced by at least 10% with Azure App Innovation (114 responses).[12]

M**odeling and assumptions.** Applications are not only completed sooner, but they are also more reliable and available for the composite organization's customers to access when needed. For the composite organization, this means:

- Some medium and high-priority support tickets each year equate to several hours of downtime.
- A subset of these tickets are related to apps that impact revenue and are now developed and managed using Azure App Innovation solutions.
- For the composite organization, 12 tickets are now avoided in Year 1, equating to 12 hours of avoided downtime. The number of avoided hours increases to 24 hours by Year 3.
- For the composite organization, one hour of downtime during business hours impacts profitability by $100,000.

Risks. The value of an hour of profitability can vary greatly depending on the time of day and seasonality of a downtime event. If most downtime events happen during prime shopping hours during holiday seasons, revenue will be more significantly impacted.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of $4.2 million.

Additional Value Of Improved Uptime

Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Downtime-related tickets avoided per year during peak hours with Azure App Innovation	Interviews	12	18	24
C2	Average hours of downtime per ticket	Composite	1	1	1
C3	Avoided hours of system downtime	C1*C2	12	18	24
C4	Hourly impact of system downtime during peak hours	Composite	$100,000	$100,000	$100,000
Ct	Additional value of improved uptime	C3*C4	$1,200,000	$1,800,000	$2,400,000
	Risk adjustment	↓5%			
Ctr	Additional value of improved uptime (risk-adjusted)		$1,140,000	$1,710,000	$2,280,000
	Three-year total: $5,130,000			**Three-year present value: $4,162,585**	

OPERATIONS ENGINEER EFFICIENCIES GAINED IN APP DELIVERY AND OPERATIONS

Evidence and data. With Azure App Innovation, developers writing code saw efficiencies, and the operations and security engineers (DevOps and DevSecOps) managing development platforms and environments also saw improvements. In addition, much of the security and networking infrastructure is included in Azure's services, which allowed engineers to focus on more critical tasks that focus on the business.

- The director of engineering at the financial services organization highlighted how the architecture and features of Microsoft Azure make their jobs easier, commenting: "We can secure our environments very easily using Azure-supported controls that allow us to ensure our clients' data is highly isolated and protected."
- The training organization's interviewees reported that developers can try things without bothering the DevOps team with ad hoc requests. This saves time and reduces tedious tasks, improving DevOps morale. The CTO said: "Using modern technologies, we can move very fast. We can immediately try something versus taking DevOps' time to build something. These small things reduce friction."

Modeling and assumptions. In addition to applications that are faster to develop and more reliable, applications that leverage Azure App Innovation are easier to deliver and manage. For the composite organization, this includes:

- A 15% improvement in efficiency in app delivery and management is measured in Year 1. This improves to 25% by Year 3.
- An impact on 100 developer operations and developer security operations employees with an average fully burdened salary of $156,000.
- Hours saved from productivity improvements are assumed to not all be used for additional work tasks. Forrester applies a standard 50% recapture rate to most productivity benefits.

Risks. Like the first benefit, productivity results greatly depend on individual user adoption, and improvement is an average representing all DevOps and DevSecOps employees. With greater or lesser adoption, these percentages may vary.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $3.4 million.

Operations Engineer Efficiencies Gained In Application Delivery And Operations

Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	Number of DevOps and DevSecOps engineers	Composite	100	100	100
D2	Fully burdened annual salary of a DevOps and DevSecOps engineer	TEI standard	$156,000	$156,000	$156,000
D3	Percent efficiency gained in app deployment	Composite	15%	20%	25%
D4	Percentage of time recaptured	Forrester assumption	50%	50%	50%
Dt	Operations engineer efficiencies gained in application delivery and operations	D1*D2*D3*D4	$1,170,000	$1,560,000	$1,950,000
	Risk adjustment	↓10%			
Dtr	Operations engineer efficiencies gained in application delivery and operations (risk-adjusted)		$1,053,000	$1,404,000	$1,755,000
	Three-year total: $4,212,000			**Three-year present value: $3,436,161**	

ADDITIONAL VALUE DUE TO DEVELOPER ONBOARDING EFFICIENCIES

Evidence and data. Microsoft Azure could scale up or down as needed for the interviewees' organizations, so adding more developers meant simply expanding current consumption rather than licensing, purchasing, and building additional dev infrastructure. The senior VP of the professional sports organization mentioned: "It took about a month to get an engineer up and running while we build their own dev environment. With Azure App Innovation, onboarding isn't much more than giving them their new machine."[13]

Modeling and assumptions. With Azure App Innovation at the composite organization, development tools are easier to use, based on common standards, more straightforward for new employees to understand, and easy to set up. Training time is reduced, and the time needed for setup and infrastructure updates is avoided. For the composite organization, this benefit is measured as the increase in profitability for each developer onboarded more quickly, including:

Average reduction in training hours per hire

23 hours

- A reduction of 12 days of onboarding time avoided for 150 developers in Year 1. This reduction increases to 18 days saved by Year 3.
- A day of a fully-onboarded developer value is measured as $1,800 of organization revenue.
- The same profit margin as in earlier benefits is applied.

Risks. The necessary time required to onboard a developer can vary based on their total experience and specific experience using Microsoft development tools.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of $1.1 million.

Additional Value Due To Developer Onboarding Efficiencies

Ref.	Metric	Source	Year 1	Year 2	Year 3
E1	Number of developers onboarded per year	Composite	150	150	150
E2	Productive time gained due to faster onboarding (days)	Interviews	12	15	18
E3	Per day value generated by an onboarded developer (rounded)	Composite	$1,800	$1,800	$1,800
E4	Operating profit margin	TEI standard	12%	12%	12%
Et	Additional value due to developer onboarding efficiencies	E1*E2*E3*E4	$388,800	$486,000	$583,200
	Risk adjustment	↓5%			
Etr	Additional value due to developer onboarding efficiencies (risk-adjusted)		$369,360	$461,700	$554,040
	Three-year total: $1,385,100			**Three-year present value: $1,133,611**	

CONSOLIDATION OF LEGACY SYSTEMS AND SOLUTIONS

Evidence and data. Azure App Innovation solutions replaced legacy systems, including developer platforms, databases, and other hardware and software resources. Based on a survey conducted as part of the TEI study of 191 developer managers and executives, 81% identified retiring legacy solutions as a key benefit of Azure App Innovation.[14] From the same survey, the average legacy cost savings was more than $28 per employee.[15]

Modeling and assumptions. With Azure App Innovation tools, the composite organization can reduce or retire legacy development and infrastructure tools. It saves $300,000 in Year 1, $400,000 in Year 2, and $500,000 in Year 3. Savings are from avoided hardware and software costs and associated management and maintenance costs.

Legacy cost savings enabled by Azure App Innovation relate to many of the same tools included in "The Total Economic Impact of Microsoft Developer Tools And Cloud Services." In addition to interview and survey responses, this previous TEI Study commissioned by Microsoft was reviewed when making assumptions for the composite organization.[16]

Risks. The exact amount of reduced or avoided legacy costs is hard to measure. It can be spread across several departments, and reduction and retirement dates will vary for each tool or resource.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of $930,000.

> **"With our old on-premises environment, we had to deal with system downtime and lacked scale. Before Azure we were in the business of running these farms rather than helping the business scale."**
>
> *Director of engineering, financial services*

Consolidation Of Legacy Systems And Solutions

Ref.	Metric	Source	Year 1	Year 2	Year 3
F1	Annual cost of legacy tools (infrastructure, software, labor)	Composite	$300,000	$400,000	$500,000
Ft	Consolidation of legacy systems and solutions	F1	$300,000	$400,000	$500,000
	Risk adjustment	↓5%			
Ftr	Consolidation of legacy systems and solutions (risk-adjusted)		$285,000	$380,000	$475,000
	Three-year total: $1,140,000			**Three-year present value: $930,015**	

IT SECURITY AUDIT TIME SAVINGS

Evidence and data. Interview and survey participants highlighted how Azure App Innovation streamlined their compliance and audit processes. Microsoft's regular testing — and public distribution of these test results — demonstrated that compliance standards were met in a way that made these customers and business partners comfortable working with applications deployed on Azure or having their data stored in Azure resources. Examples include:

- The director of engineering at the financial services organization highlighted how work that Microsoft has already done makes their job easier: "SOC [Security Operation Center] 2 compliance, third-party penetration tests, and more are freely published for the public to consume. This helps us provide evidence to client security or assurance teams to demonstrate we are meeting industry and government compliance standards."
- The CEO of the training organization shared: "There's a huge burden that's lifted with Azure from an audit and a security standpoint. There are countless security audits we used to go through with our customers; being able to say that we are now in Microsoft Azure goes a long way because most enterprises have already reviewed and feel comfortable with the Azure cloud. So that carries a lot of weight."

Modeling and assumptions. The composite organization saves time completing security compliance audits. Assumptions include:

- The IT security compliance team includes 20 analysts that spend about 10% to 40% of their time on IT security audits.
- Each analyst saves 240 hours per year working on IT security audits and has an average hourly salary of $45.
- 80% of this time is recovered for other tasks.

Risks. The time each analyst spends on IT security audits and the time they save with Azure App Innovation varied greatly across the interviewees' organizations. Hours saved and the percentage of time may be overestimated.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of $408,200.

IT Security Audit Time Savings

Ref.	Metric	Source	Year 1	Year 2	Year 3
G1	Number of IT security compliance analysts	Composite	20	20	20
G2	Time saved per analyst performing IT security audits per year (hours)	Interviews	240	240	240
G3	Fully burdened hourly rate for an IT security compliance analyst	TEI standard	$45	$45	$45
G4	Percentage of time recaptured	Forrester assumption	80%	80%	80%
Gt	IT security audit time savings	G1*G2*G3*G4	$172,800	$172,800	$172,800
	Risk adjustment	↓5%			
Gtr	IT security audit time savings (risk-adjusted)		$164,160	$164,160	$164,160
	Three-year total: $492,480			**Three-year present value: $408,242**	

UNQUANTIFIED BENEFITS

Interviewees mentioned the following additional benefits that their organizations experienced but were not able to quantify:

- **Improved employee experience, more successful recruiting, and reduced employee turnover.** Interviewees' organizations invested in modernizing IT and development tools that helped enhance the employee experience. Recruits are more interested in working at these organizations — and employees are more interested in continuing to work there. The platform engineer at the insurance company reported, "Becoming a more modern technology company is good for recruiting new people, which we have seen throughout the last year."

  Specific contributions to these improvements are hard to measure, but organizations may see several improvements related to employee hiring and retention due to modernizing their development environment with Azure App Innovation tools. Specific areas of improvement include:

  - Reduced training costs with a more skilled and experienced recruiting pool.
  - Improved employee experience as measured by reduced employee turnover and/or non-financial satisfaction metrics.
  - Reduced recruitment costs with candidates accepting and starting positions at higher rates.

- **New business opportunities with improved performance.** Organizations have been able to leverage their modern applications to gain new insights. Data from user, client, and customer interactions are available and more detailed, leading to faster and better business decisions. Based on a survey conducted as part of the TEI study of 191 developer managers and executives, 65% agree that Azure App Innovation services have enabled faster response to opportunities, and 56% say decision-making is more informed.[17]

  The value of new business opportunities may be measured in a variety of ways, including as the value gained from new business partnerships or acquisitions, additional revenue from improved marketing and sales efforts, and more.

FLEXIBILITY

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

Ability to leverage artificial intelligence. Several organizations shared how they are starting to test artificial intelligence capabilities to augment their applications. They plan to leverage Microsoft's continuing investment in generative AI to improve current applications and develop intelligent applications in the future. Applications will better help users complete tasks more quickly by anticipating common next steps and help people make better decisions with additional insights, leading to further efficiencies, new business opportunities, and driving more and more significant sales. This is a *future* opportunity for organizations for several reasons:

- **Legal and privacy concerns.** The director of engineering at the financial services organization relayed: "Our clients have tremendous amounts of financial data. To give them greater insights and be able to produce AI-infused capabilities, our legal and tax quality teams need to review and approve implementation."
- **Not ready for monetization.** The professional sports organization uses AI to display data that helps fans make sense of a complex play. The senior VP stated: "We use artificial intelligence to break down player locations and aggregate positional information to identify and display

common plays and strategies." This may indirectly influence customer satisfaction, viewership rates, and advertising revenue, but using AI in direct revenue opportunities is planned for the future.

New and expanded market opportunities. Faster time to market and uptime benefits leading to increased revenue can be extended as organizations grow existing markets or move into new ones. The cloud-first focus of Azure App Innovation tools provides more options to expand and scale quickly. For example, the senior VP at the professional sports organization noted: "It's about the flexibility to expand services and bring more to our customers." Additional sales and marketing efforts and investment in Microsoft Azure services — either growing existing implementations or replicating implementations in additional global zones — can lead to even greater revenue and profit growth.

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

“We had outsourced a lot of our development operations, so that was a big black box for us as developers. We didn't know what was going on in production or testing. Now we have control of the whole value stream.”

— Director, platform team, insurance

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**
Htr	Fees to Microsoft	$0	$2,105,700	$2,105,700	$2,105,700	$6,317,100	$5,236,564
Itr	Initial and ongoing costs	$1,522,395	$2,124,360	$1,000,755	$722,295	$5,369,805	$4,823,373
	Total costs (risk-adjusted)	$1,522,395	$4,230,060	$3,106,455	$2,827,995	$11,686,905	$10,059,937

FEES TO MICROSOFT

Evidence and data. Microsoft charged the interviewees' organizations license or subscription costs for many services, including GitHub, AKS, Azure Cosmos DB, and Azure Cognitive Services.

Modeling and assumptions. Assumptions for the composite organization include:

- GitHub Enterprise and Advanced Security licensing, based on per-user subscriptions as shown through monthly cost per user, may vary based on the specific services and subscription level desired.
- Other Microsoft services are consumption-based and have more complex pricing that involves company size, transactions, data and database needs, compute consumption, service level options, and other factors. The composite organization's monthly estimated totals are listed for each service in the table.

Risks and results. Many factors go into pricing for online services, and estimated costs across organizations will vary. To account for this, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $5.2 million

Fees To Microsoft						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
H1	Number of Azure App Innovation users	Composite		1,100	1,100	1,100
H2	Monthly cost per user GitHub (Enterprise Cloud and Advanced Security)	Composite		$70	$70	$70
H3	Total monthly cost of GitHub (Enterprise Cloud and Advanced Security)	H1*H2		$77,000	$77,000	$77,000
H4	Total monthly consumption cost of AKS, Azure Cosmos DB, and Azure Cognitive Services	Composite		$98,475	$98,475	$98,475
H5	Total monthly cost of Azure App Innovation products	H3+H4		$175,475	$175,475	$175,475
Ht	Fees to Microsoft	H5*12	$0	$2,105,700	$2,105,700	$2,105,700
	Risk adjustment	0%				
Htr	Fees to Microsoft (risk-adjusted)		$0	$2,105,700	$2,105,700	$2,105,700
	Three-year total: $6,317,100			**Three-year present value: $5,236,564**		

INITIAL AND ONGOING COSTS

Evidence and data. Initial and ongoing costs include planning, implementation, development, training, migration, and additional services.

Modeling and assumptions. Ongoing and implementation cost assumptions for the composite organization include:

- Application developer and DevOps time to implement and maintain Azure App Innovation services.
- Some third-party services to fill experience and knowledge gaps — particularly during up-front implementation.
- Initial and ongoing training.
- Ongoing resource time and resources required for ongoing management and support.
- Implementation is assumed to start six months before a rollout to all developers and other users — but also continues six months into Year 1. This is reflected in some higher cost estimates in Year 1 but reduced in Years 2 and 3, which primarily include ongoing management and maintenance costs.

Risks and results. To allow for underestimation, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV of $4.8 million.

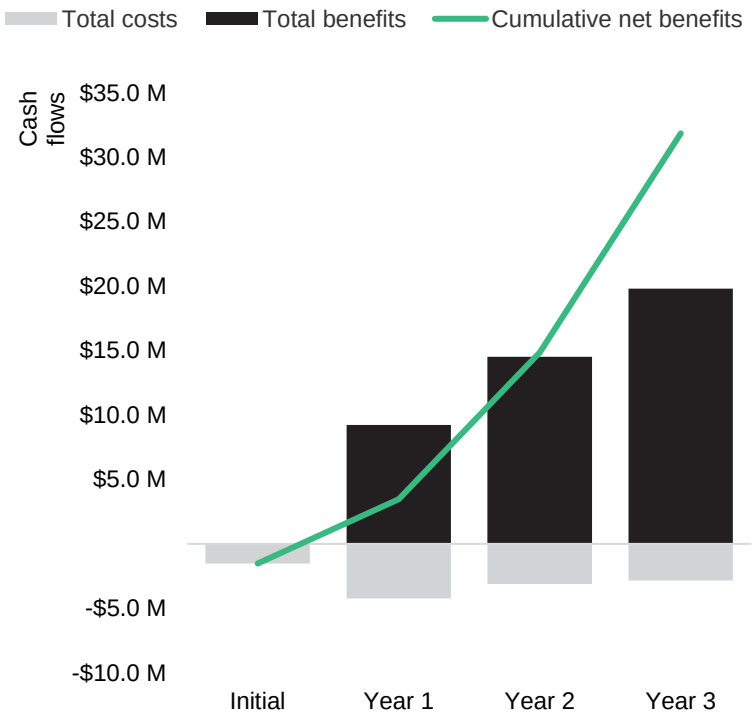
Initial And Ongoing Costs

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
I1	Application developers required for implementation	Composite	15	15	15	15
I2	Fully burdened annual salary of an application developer	A3	$78,000	$156,000	$156,000	$156,000
I3	DevOps engineers required for implementation	Composite	3	3	3	3
I4	Fully burdened annual salary of a DevOps engineer	D2	$78,000	$156,000	$156,000	$156,000
I5	Percent time dedicated	Composite	60%	40%	20%	5%
I6	Subtotal: Internal resources required for implementation	(I1*I2+I3*I4)*I5	$842,400	$1,123,200	$561,600	$140,400
I7	**Initial and ongoing professional services**	**Interviews**	**$195,000**	**$219,000**	**$48,000**	**$48,000**
I8	Number of developers requiring training	Composite	550	550	100	100
I9	Number of new hires requiring training	Composite	0	150	150	150
I10	Hours of training required	Composite	10	10	10	10
I11	Fully burdened hourly rate of a developer	TEI Standard	$75	$75	$75	$75
I12	Subtotal: Initial and ongoing training costs	(I8+I9)*I10*I11	$412,500	$525,000	$187,500	$187,500
I13	**Ongoing management costs**	**Composite**	**$0**	**$156,000**	**$156,000**	**$312,000**
It	Initial and ongoing costs	I6+I7+I12+I13	$1,449,900	$2,023,200	$953,100	$687,900
	Risk adjustment	↑5%				
Itr	Initial and ongoing costs (risk-adjusted)		$1,522,395	$2,124,360	$1,000,755	$722,295
	Three-year total: $5,369,805			**Three-year present value: $4,823,373**		

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

These risk-adjusted ROI and NPV 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	($1,522,395)	($4,230,060)	($3,106,455)	($2,827,995)	($11,686,905)	($10,059,937)
Total benefits	$0	$9,221,520	$14,514,860	$19,808,200	$43,544,580	$35,261,148
Net benefits	($1,522,395)	$4,991,460	$11,408,405	$16,980,205	$31,857,675	$25,201,211
ROI						251%

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

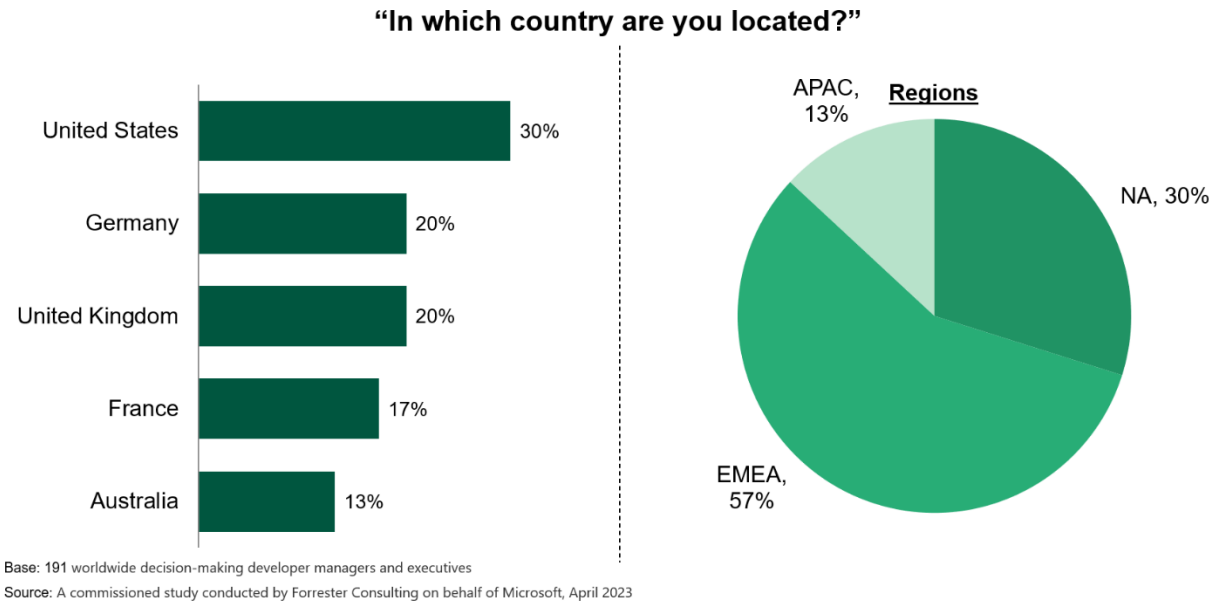
The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Appendix B: Interview And Survey Demographics

Interviews

Role	Industry	Region	Azure Modules
· CEO, cofounder · CTO, cofounder	Artificial intelligence	South America	AKS, GitHub
· Director, platform team · Platform engineer	Insurance	Scandinavia	AKS
· Director, engineering · DevOps manager · CTO	Training	United States	AKS, Azure Cosmos DB
Senior product manager	Home goods retailer	United Kingdom with international reach	GitHub
Senior VP, operations and technology	Professional sports	United States	AKS, Azure Cognitive Services
· Director, engineering · Program architect	Financial services	Europe, with global reach	Azure Cosmos DB

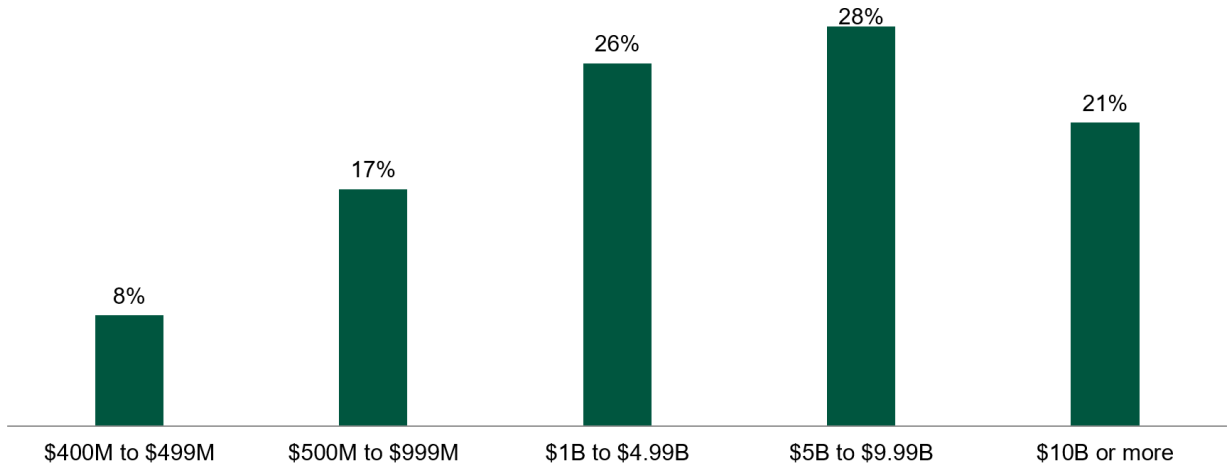
Survey Demographics



Base: 191 worldwide decision-making developer managers and executives

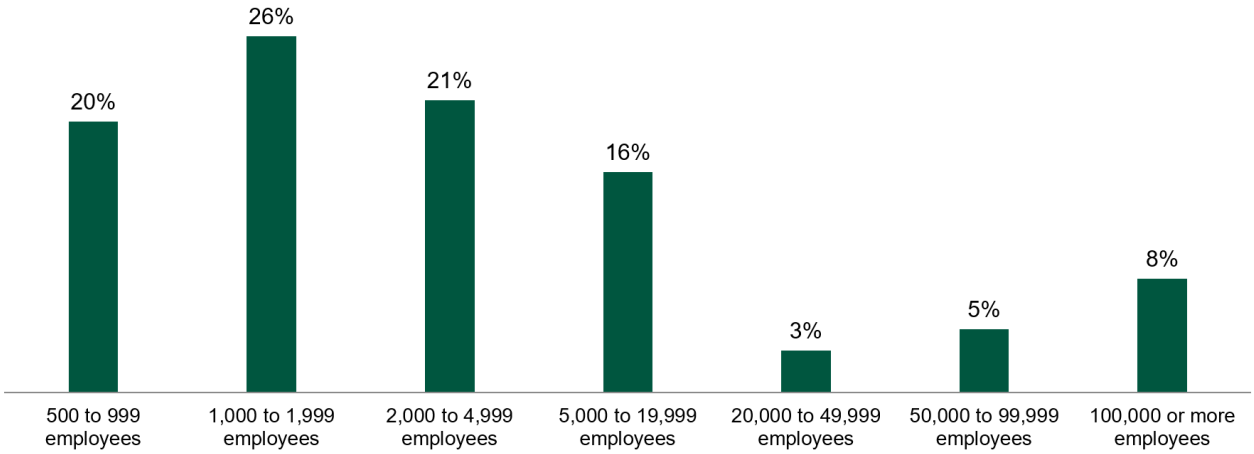
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023

“Using your best estimate, what is your organization's annual revenue (USD)?”



Base: 191 worldwide decision-making developer managers and executives
Note: Percentages may not total 100 because of rounding.
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023

“Using your best estimate, how many employees work for your firm/organization worldwide?”



Base: 191 worldwide decision-making developer managers and executives
Note: Percentages may not total 100 because of rounding.
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

Appendix C: Supplemental Material

Related Forrester Commissioned Research

"The Total Economic Impact Of Microsoft Azure PaaS," a commissioned study conducted by Forrester Consulting on behalf of Microsoft, December 2022.

"The Total Economic Impact Of Microsoft Azure Arc For Security And Governance," a commissioned study conducted by Forrester Consulting on behalf of Microsoft, August 2022.

"The Total Economic Impact Of Microsoft Developer Tools And Cloud Services," a commissioned study conducted by Forrester Consulting on behalf of Microsoft, June 2021. This study includes analysis of Visual Studio, GitHub Enterprise, and Azure.

"The Total Economic Impact Of GitHub Enterprise Cloud And Advanced Security," a commissioned study conducted by Forrester Consulting on behalf of Azure, November 2022.

Appendix D: Endnotes

[1] 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.

[2] The percentages referenced in this sentence are based on 134 developer managers and executives responding to the following question, "By what percentage did Azure Innovation products and services increase application developer productivity?" Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[3] The percentages referenced in this sentence are based on 114 developer managers and executives responding to the following question, "After deploying Azure Innovation products and services technologies, what was the percentage reduction in downtime related to applications for your organization?" Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[4] The percentages referenced in this sentence are based on 126 developer managers and executives responding to the following question, "After deploying Azure Innovation products and services technologies, what was the percentage reduction in downtime related to applications for your organization?" Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[5] The percentages referenced in this sentence are based on 155 developer managers and executives responding to the following question, "On average, what was the annual cost of legacy tools (infrastructure, software, and labor) replaced by the Azure Innovation products and services platform?" Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[6] Source: "The Total Economic Impact of GitHub Enterprise Cloud And Advanced Security, " a commissioned study conducted by Forrester Consulting on behalf of Azure, November 2022.

[7] The percentages referenced in this sentence are based on 191 developer managers and executives responding to the following question, “The ability to put security front-and-center in the application development and deployment processes has…” Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[8] The percentages referenced in this sentence are based on 134 developer managers and executives responding to the following question, “By what percentage did Azure Innovation products and services increase application developer productivity?” Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[9] Source: “The Total Economic Impact Of Microsoft Developer Tools And Cloud Services,” a commissioned study conducted by Forrester Consulting on behalf of Microsoft, June 2021.

[10] The percentages referenced in this sentence are based on 114 developer managers and executives responding to the following question, “What percentage of your organization's revenue is increased by improved time to market associated with application releases, updates, and upgrades?” Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[11] The percentages referenced in this sentence are based on 191 developer managers and executives selecting “Agree” or “Significantly agree” that reliability is a key factor when answering the following question, “How much do you agree or disagree that these are benefits your company has experienced?” and 114 responding to the question: “Prior to deploying to Azure Innovation products and services technologies, what was the average percentage of downtime your organization experienced each year related to applications?” Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[12] The percentages referenced in this sentence are based on 114 developer managers and executives responding to the following question, “By what percentage were downtime related support tickets reduced with Azure Innovation products and services?” Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[13] The data referenced in the callout are based on 97 developer managers and executives responding to the following question, “On average, how many new hire training hours per hire are saved through simplified processes with Azure Innovation products and services?” Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[14] The percentages referenced in this sentence are based on 191 developer managers and executives selecting “Agree” or “Significantly agree” that retiring legacy solutions is a key factor when answering the following question, “How much do you agree or disagree that these are benefits your company has experienced?” Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[15] The data referenced in this sentence are based on 155 developer managers and executives answering the following question, “On average, what was the annual cost of legacy tools (infrastructure, software, and labor) replaced by Azure Innovation products and services?” and scaled based on the number of employees. Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April 2023.

[16] Source: "The Total Economic Impact Of Microsoft Developer Tools And Cloud Services," a commissioned study conducted by Forrester Consulting on behalf of Microsoft, June 2021.

[17] The percentages referenced in this sentence are based on 191 developer managers and executives selecting "Agree" or "Disagree" when asked if a key benefit is of Azure is that their organizations have a more complete picture of its operations. The exact question text is, "The integration of Azure Innovation products and services with existing systems has…" Other percentages are from 191 developer managers and executives selecting "Agree" or "Disagree" when asked if a key benefit is that their organizations can respond quickly to changing business needs, answering the question, "As a low-code development platform, Azure Innovation products and services have…" Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, April, 2023.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