FORRESTER®

The Total Economic Impact™ Of Microsoft Azure PaaS

Cost Savings And Business Benefits
Enabled By Azure PaaS

NOVEMBER 2022

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Executive Summary

Application modernization has gained new urgency in the post-pandemic era as enterprises rush to take advantage of advanced cloud technologies. Microsoft Azure PaaS delivers on-demand access to a fully managed, cloud-hosted application development platform that developers can build on and use for developing, running, maintaining, and managing applications, which gives them freedom to concentrate on application innovation rather than cloud management.

Microsoft Azure is an open and flexible cloud platform that enables organizations to quickly build, deploy, and manage applications across a global network of Microsoft-managed data centers, which supports the deployment of applications close to customers and users in addition to on-premises and hybrid options.

Microsoft Azure services like Azure App Service, Azure Spring Apps, Azure Logic Apps, Azure Functions, and Azure API Management provide customers with a fully managed application platform as a service (PaaS) for building, deploying, and managing applications of all kinds — from the simplest website to the most complex business solution.

Microsoft commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by leveraging Azure PaaS for application modernization.[1] The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Azure PaaS on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed five representatives with experience using Azure PaaS for application modernization. For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single composite organization that is a multinational, industry-agnostic organization managing operations

KEY STATISTICS

Return on investment (ROI)
228%

Net present value (NPV)
$30.03M

and serving customers with 500 applications, the majority of which are on-premises.

Prior to adopting Azure PaaS, these interviewees' organizations had varied development environments, and most but not all of which were on-premises. The interviewees noted several common factors that drove their organizations' decisions to adopt Azure PaaS to host their development environments for modernizing applications. These include being part of a broader strategic initiative, the potential for cost savings, limitations with existing architectures, wanting to take advantage of cloud capabilities, the tight market for tech talent, and prior experience using the Azure PaaS platform.

The interviewees' organizations took different approaches to deployment. Efforts to modernize and migrate applications also varied depending on the organization's readiness in terms of framework type and technology stack, complexity, and need for refactoring. While all of the organizations were still in

> **"Indeed, the entire developer experience has completely changed."**
>
> *Head of IT strategy, insurance*

various stages of their application modernization journey and hadn't achieved full benefit, the interviewees concluded that the investment in Azure PaaS was worthwhile.

KEY FINDINGS

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

- **Reduced application-development-related infrastructure costs by 40%.** The composite organization reduces the infrastructure used for application development over time. It has a multiyear migration plan, and it stages retirements after ensuring migrated applications are fully up and running in the Azure PaaS environment. This saves the composite organization more than $19.1 million over three years.

- **Reduced related administration costs.** Azure PaaS does not require as many resources as on-premises or IaaS implementations on an ongoing basis. Microsoft handles virtually all server administration tasks (e.g., OS, language patching) in the cloud, which reduces the administrative burden on the composite organization so it can focus on more productive activities. This saves the composite organization $10.3 million over three years.

- **Improved development efficiencies.** The Azure PaaS platform and access to related Azure DevOps services enable the composite's developers to work much more efficiently, saving

the organization $7.2 million over three years. Because Azure PaaS provides a more structured environment for modernizing applications, developers spend more time on value-added activities.

- **Improved application uptime.** The composite organization perceives Azure PaaS as a more resilient platform than on-premises platforms, and developers leverage cloud-native patterns to ensure greater resiliency for their applications. The improvement in application uptime saves the composite organization $3.8 million in avoided revenue losses over three years.

- **Faster application and feature development.** After deploying to Azure PaaS, the composite's developers work in an integrated DevOps environment. The composite organization increases the speed of application development to production and improvement cycles by 50%, enabling its business to serve customers better. The improved time to market saves $2.8 million over three years.

> **"While investing in [Azure] PaaS, you save time. There's no more time dedicated to infrastructure. It's an infrastructure available on demand. This allows you to reduce the time to market for applications. … It's the same number of people working on development, but those people can be dedicated to more valuable actions."**
>
> *Service cloud manager, transportation*

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

- **Internal transformation.** The shift to the Azure PaaS platform and a DevOps approach to development transforms the composite organization's internal IT and development teams as work moves off on-premises development environments. More automation and tasks managed by Microsoft Azure means more time for these teams to work on other, more value-added activities.

- **Reusability.** Access to Azure DevOps via the Azure PaaS platform enables developers to reuse code more efficiently.

- **Auto-scaling.** The composite organization can easily scale up or down and only pay for what it uses, giving it the agility to experiment more freely in its development activities while avoiding costs from overprovisioning IT infrastructure.

- **Business impact of modernized applications.** Because Azure PaaS relieves developers of infrastructure responsibilities, the composite organization's developers can focus more intently on application-based innovations that meet customer needs and benefit the business.

> **"We want to be a best-in-class technology company in the insurance space and, to do this, [we] need the innovation capability of an Azure cloud or other cloud providers. It's the enablement of getting the right tech talent. It has a cost aspect, but if you do it right, it's a key cornerstone."**
>
> *Chief technology officer, insurance*

- **Security, policies, and controls.** The composite organization benefits from the more visible development environment Azure PaaS provides. Logs and audit trails make compliance with coding practices easier, and the Azure PaaS platform makes it easier to roll out and enforce policies and controls.

- **Cost management.** The composite organization takes advantage of Microsoft's Cost Management + Billing to monitor and manage cloud costs.

- **Attraction/retention.** The composite organization attracts and retains talented developers excited to work with cloud technologies on the Azure PaaS platform.

- **Keeping up with the new.** One benefit of having Microsoft manage the platform is gaining access to the latest technology. The composite organization no longer has to worry about out-of-date development infrastructure, applying software updates, or incorporating latest features.

- **Access to Microsoft resources and support.** The composite organization takes advantage of Microsoft's comprehensive resources, architecture best-practice guidance, and technical support to make the most of all that Azure PaaS offers.

> **"[Azure] PaaS allows us to dedicate our resources to the final goals of our application and development. Cloud computing in general has been easier to manage during the [COVID-19] pandemic than our on-prem data center."**
>
> *Service cloud manager, transportation*

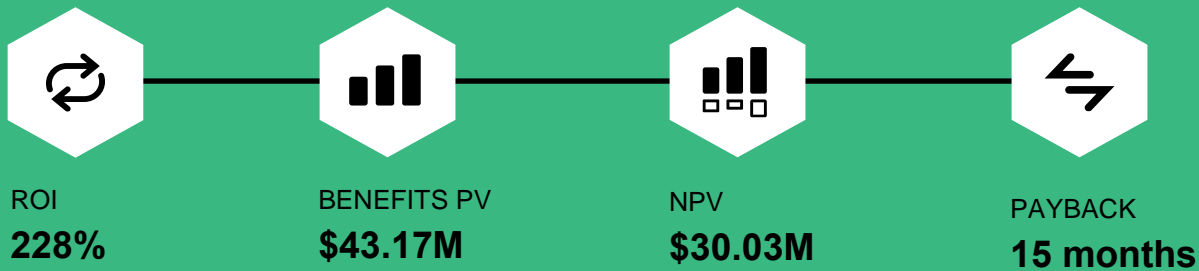> **"We have embraced an 'all-in PaaS' approach."**
>
> *Principal technical architect, professional services*

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

- **Azure PaaS costs.** Microsoft offers several pricing options for Azure PaaS services, including a pay-as-you-go model where the organization only pays for what it needs and can quickly scale up usage during busy times. One-year and three-year savings plan and reserve pricing is also available at a discounted rate for organizations willing to commit to a term agreement. The composite organization commits to a three-year term and pays $1.6 million over three years.

- **Planning and landing zone development.** The composite organization spends two months on the planning process and six months developing a landing zone for the Azure PaaS platform, contracting with a professional services firm for advice and assistance in developing the landing zone. The three-year, risk-adjusted PV for these costs comes to $538,000.

- **Application migration costs.** The efforts required to migrate and modernize applications vary widely, depending on their readiness for migration, complexity, and need for refactoring. In the scenario where 70% of applications of varying complexity are migrated to the Azure PaaS platform and modernized, the composite organization spends $12.0 million.

- **Training costs.** The composite organization's developers take advantage of Microsoft's Enterprise Skills Initiative (ESI) e-learning platform and Expert Days to upskill. The skills the composite organization's developers learn benefit the organization on other projects in subsequent years. The three-year, risk-adjusted PV for training time comes to $1.3 million.

The representative interviews and financial analysis found that a composite organization experiences benefits of $43.17 million over three years versus costs of $13.15 million, adding up to a net present value (NPV) of $30.03 million and an ROI of 228%.

ROI
228%

BENEFITS PV
$43.17M

NPV
$30.03M

PAYBACK
15 months

Benefits (Three-Year)

Benefit	Value
Application development-related infrastructure cost savings	$19.1M
Application development-related infrastructure administration efficiencies	$10.3M
Application development efficiencies	$7.2M
Revenue loss avoided from improved application uptime	$3.8M
Revenue gains from improved time-to-market	$2.8M
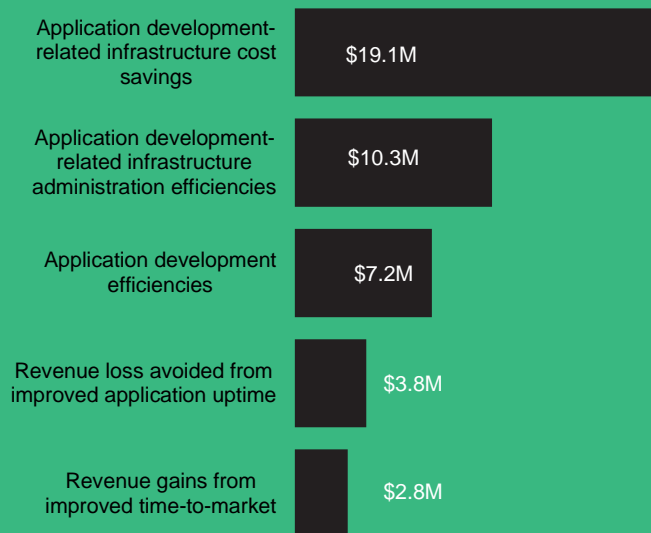
"Having [Azure] PaaS [and] having serverless architecture ... means it's less painful to maintain our system [and scale] up and down. Having this PaaS approach means we can use infrastructure that basically deploys itself."

— Head of IT strategy, insurance

TEI FRAMEWORK AND METHODOLOGY

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

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Azure PaaS used for application modernization 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 PaaS.

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.

DUE DILIGENCE
Interviewed Microsoft stakeholders and Forrester analysts to gather data relative to Azure PaaS.

INTERVIEWS
Interviewed five representatives at organizations using Azure PaaS 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.

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.

Interviews				
Role	**Industry**	**Revenue**	**Region**	**Applications**
Principal technical architect	Professional services	$1B to $5B	Primarily US	100
Head of IT strategy	Insurance	$10B to $25B	Asia	600
Chief technology officer	Insurance	$25B to $50B	Global	2,500
VP of enterprise architecture	Technology	$1B to $5B	Global	50
Service cloud manager	Transportation	$25B to $50B	Europe	N/A

KEY OBJECTIVES FOR APPLICATION MODERNIZATION

Prior to migrating to Azure PaaS, the interviewees' organizations had varied development environments, and most but not all of which were on-premises and mainly supported Windows and Linux applications built using .NET and Java. One organization had already migrated to an IaaS solution hosted on a private cloud and another developed on a mix of on-premises, Kubernetes, virtual machines (VMs), and cloud environments.

The interviewees noted several similar factors that drove their organizations' decisions to adopt Azure PaaS and modernize their applications, including:

Broader strategic initiative. Several interviewees described their organization's quest to modernize its applications as part of a more comprehensive strategic initiative.

- A principal technical architect for a professional services firm said: "The goal was to modernize our legacy systems, modernize our office footprint, and — from a finance perspective — to lower the cost of operations for our retail footprint with a large technology hardware investment in those offices as well as allow us to invest more efficiently in modern systems instead of

maintaining several different legacy systems. In addition, there was a goal to create an omnichannel approach where our customers could start their experience with us as a continuum in any different channel. Being able to do that — which wasn't really possible with distinct and disparate legacy systems — was the initiator."

- A VP of enterprise architecture for a technology firm framed their organization's drive toward application modernization in terms of customer needs. They said: "We live in a connected world, and our industry is no different. Our customers need easier and faster connections to their vendors and suppliers. Traditional applications that connect to various systems aren't good enough. We are embarking on a modernization strategy that provides easier connections between various applications within our applications as well as partner applications. Azure PaaS is an integral part to this effort, enabling native connectivity between the apps in ecosystems instead of the traditional custom-built integrations."

Cost saving. Cost saving, including the financial benefits of shifting from capex to opex, was an

important goal for several interviewees' organizations.

- The principal technical architect at the professional services firm explained: "The goal was to rewrite [applications] in the microservices architecture — purely web-based — that allows us to dramatically reduce the technical costs of all the offices. The idea that we would no longer have to have that expensive server, that expensive operating system, [and] all of the maintenance and overhead related to that. Basically, that is the final goal: to simplify the office footprint and take those savings and either invest in other modernization projects or give them back to the business."

- A chief technology officer in the insurance industry whose organization migrated from an IaaS solution hosted on a private cloud to Azure PaaS confirmed that the expected cost saving was a big part of the original calculus to make the change. They said: "From the business benefit point of view, we expected cost saving. There was a business case presented in favor of moving a part of our portfolio of applications — around 300 applications — into the public cloud itself. There was a business case we did where the most benefits were on the cost savings. Of course, there is the element of innovation capabilities, but a big focus was on that cost saving by going into the public cloud."

Limitations with the existing architecture. Three interviewees noted that infrastructure architecture held their organizations back, mainly regarding release cycles.

The VP for enterprise architecture at the technology firm explained: "There are limitations within our existing client-server-based architecture. We release upgrades to most of our applications once a quarter. These upgrades take longer time to implement as they need to be coordinated between multiple teams across two organizations. It was a hassle. Migrating

to PaaS mitigated some of these pain points as we have more control over the hosted network."

Cloud capabilities. A service cloud manager for a transportation company listed several benefits of the cloud that drove their organization's decision to migrate and modernize its applications, including performance (e.g., reliability, stability, agility), maintainability, elasticity, scalability, and lower cost.

- The service cloud manager said: "We wanted to innovate and experiment more quickly. The processing data stream apps were the first deployment to Azure PaaS. We wanted to take advantage of the benefits of cloud computing, such as elasticity and on-demand service." For this organization, "lift and shift" was not the target migration model.

- The chief technology officer at an insurance company echoed this sentiment. They said: "We also learned if you just do lift and shift from private cloud into the public cloud, there is a big risk that costs actually increase, not decrease. You really need to transform the applications."

- The elasticity and scalability of the cloud was also attractive to the principal technical architect at the professional services firm. They said: "Our business model [is] very parabolic in the sense that some of our systems have dozens of users at certain times of the year, and 120,000 concurrent users at other times. We felt that the cloud and its ability for us to use the cloud's elasticity and very large compute footprint was a perfect paradigm for a company such as ours."

Prior experience with PaaS. The speed and ease of deployment were primary drivers for an interviewee who had joined their organization's technology operations to effect change after working for a startup that benefitted from the PaaS approach.

The head of IT strategy for a different company in the insurance industry said: "The main factor was speed. Because when I was at the startup, I knew how fast I

"We were highly virtualized using VMware, but it was still a lot of racking and stacking of physical servers [and] managing very large storage area networks and storage from network appliances. [It was] probably a traditional data center model where we were doing capacity planning from a hardware perspective on a yearly basis or multiple times a year to understand capacity from an operating system perspective."

Principal technical architect, professional services

could deploy the system, how easy it was, and the quality of the service and the flexibility and scalability. I can just rely on the [Azure] PaaS platform and reduce the amount of workload without thinking too much about handling infrastructure."

Difficulty sourcing tech talent. The chief technology officer of an insurance company said upskilling requirements drove their organization to move from IaaS in a private cloud to Azure PaaS. The interviewee said: "You find a lot of Azure engineers. You don't find engineers for the private cloud."

SELECTION PROCESS AND CONSIDERATIONS

After extensive research and POCs evaluating multiple vendors on features, functionality, and costs, the interviewees' organizations chose Microsoft Azure PaaS.

- The principal technical architect at the professional services firm described how their organization first spent time understanding the marketplace and its players and investigating how sensitive workloads performed under pressure. This enabled the organization to

shortlist three vendors including Microsoft Azure for a formal RFP. The organization also did informal experimentation and exploration. While one vendor scored higher in terms of the breadth of its offering at the time, the organization ultimately selected Microsoft as the more natural fit given the organization's current investment in people. According to this interviewee: "Most of our apps were in that .NET area, and we had made a strategic investment to move to SQL over [another vendor] due to some cost modeling that we did and some relationships we had. We had fairly recently moved to Office 365 [and] Azure Active Directory and, in the end, we were able to leverage those relationships. Microsoft was able to provide discounts to those as well as our Windows workloads and simplified licensing of Windows workloads and SQL workloads in the public cloud that made sense and made for a good offer."

- Prior experience with Microsoft was a factor for other interviewees' organizations, as was Microsoft's relationships with its customers and other entities. The VP of enterprise architecture at the technology firm said: "For the most part, we have been a Microsoft shop. We have their technologies for application development, deployment, and monitoring. It was easier for developers to use Azure without much of a learning curve. Not to mention, most of our customers also use Microsoft technologies, including Azure, so it was relatively easier for us to integrate our solutions with theirs."

- The chief technology officer at the insurance company also said that their prior experience with Microsoft and Microsoft's relationship with the insurance regulator in their home country were key factors in their organization's decision. The interviewee said: "Microsoft was the only vendor that had official regulatory approval because they were the first to promise to build a data center in [our home country], which might — from a

regulatory point of view — be much easier for us. There was a bit of assessment of functionality, what the offering are, etc., but I think [experience and relationships] were the key ones."

- The head of IT strategy at another insurance company said their organization compared contenders on price and market presence in its industry. The interviewee said: "Insurance is a very conservative industry [and] very protective. When [insurance companies] evaluate technology, they look to see whether other insurers are also using it; otherwise, they don't take the first step." The interviewee added that the quality of documentation and support were also important considerations for their organization.

- The service cloud manager at the transportation company explained that their organization made a deliberate choice to select two cloud providers to avoid vendor lock-in. The interviewee added, "Having different cloud providers offers a wider range of services."

COMPOSITE ORGANIZATION

Based on the interviews, 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 five interviewees, 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 is a $20 billion services organization serving businesses and customers worldwide. A team of 1,500 developers is responsible for developing and maintaining 500 applications performing various internal and client-facing functions. Most applications are simple or standard with a steady load of transactions, but 5% are complex and run highly variable workloads with high peak usage during certain times.

Deployment characteristics. After evaluating the IaaS and PaaS offerings of different cloud providers, the composite organization signs a multiyear contract for Microsoft Azure PaaS. The organization invests several weeks into initial planning, working with Microsoft and an external service provider to develop a five-year migration plan. This plan includes an assessment of applications and the development of a landing zone for migrating applications to the cloud. The organization modernizes and migrates 15% of its applications in Year 1, an additional 25% in Year 2, and 30% in Year 3.

Key Assumptions

- **$20 billion in revenue**
- **1,500 developers**
- **500 applications and 5% are complex and run highly variable workloads**
- **70% of applications ported to the cloud in the first three years of the modernization initiative**

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	Application-development-related infrastructure cost savings	$0	$6,750,000	$18,000,000	$24,750,000	$19,102,179
Btr	Application-development-related infrastructure administration efficiencies	$1,004,063	$3,748,500	$8,434,125	$13,186,688	$10,347,401
Ctr	Application-development efficiencies	$0	$2,008,125	$7,363,125	$9,371,250	$7,191,632
Dtr	Revenue loss avoided from improved application uptime	$567,000	$1,512,000	$2,646,000	$4,725,000	$3,753,020
Etr	Revenue gains from faster application production	$420,000	$1,120,000	$1,960,000	$3,500,000	$2,780,015
	Total benefits (risk-adjusted)	$1,991,063	$15,138,625	$38,403,250	$55,532,938	$43,174,247

APPLICATION-DEVELOPMENT-RELATED INFRASTRUCTURE COST SAVINGS

Evidence and data. The interviewees' organizations were able to reduce the infrastructure used for application development over time. Many had multiyear migration plans and staged retirements after ensuring migrated applications were fully up and running in the Azure PaaS environment.

- The service cloud manager for the transportation company said their organization started the closure program for its data centers in 2019. They said: "The smallest one has already been migrated and shut down. The next is planned to be shut down next year. The last is expected to be shut down in 2025. Data-center closing is a big program and requires a lot of effort." This interviewee also said their organization is doing at least the same with fewer systems. They said, "That's the fundamental benefit of [Azure] PaaS."

- The principal technical architect of the professional services firm said their organization removed one data center and dramatically reduced the footprint and investment in another

facility. They said: "All of that has been or will be depreciated in the calendar year 2023. As long as we can meet our goals, we will prevent investment in that captive data center, and we'll start seeing savings in investments. These things have a five-year lifecycle. That's not really quick savings, but it will prevent investment in our captive data center starting in calendar 2023."

- The chief technology officer of an insurance company confirmed payback was not immediate due to the overlap in time when both platforms were in use. They said: "It will pay off in a few years. There is always the parallel cost of the infrastructure. You don't shut it down on Day X. You always have a little parallel phase that you need to keep as close as possible. There is always three [or] six months [when things run in parallel], and that has an impact on the budget."

- The head of IT strategy for another insurance firm also discussed the need to run the two environments in parallel. They said: "As we retire more and shut down the existing on-premises server, we need to make sure that the cloud server is running properly for at least three to four

months' time. In that period of time, the cost is going up — not going down — because we have to keep the on-premises system running at the same time as we have the expenses in the cloud. We're taking another year to shut down three of our data centers."

- The VP of enterprise architecture at the technology company echoed this and said: "We have our own data center with VMs to host applications for our customers. We are currently in the process of migrating these applications to Azure managed cloud."

Modeling and assumptions. Forrester assumes the following about the composite organization:

- The composite organization spends $50 million per year ($100,000 per application on average) for infrastructure related to application development and hosting.

- After deploying Azure PaaS and migrating 15% of its applications to the new platform by the end of Year 1, the composite organization retires infrastructure commensurate with this amount the following year.

- The composite organization migrates an additional 25% of its applications in Year 2 (representing 40% of the total), and it retires infrastructure commensurate with this amount in the following year.

Risks. Operational differences that may impact the financial benefit associated with application development-related infrastructure cost savings include:

- The cost of prior infrastructure used for application development and hosting.

- The extent to which the organization can effectively plan, prepare, and migrate applications to the Azure PaaS platform.

- The order and pace at which the organization migrates applications to Azure PaaS, including time spent refactoring applications if needed.

- The organization's policies for retaining backup infrastructure in order to mitigate risk associated with migrating applications.

- The speed and ability of the organization to decommission environments.

- Migrating from other cloud infrastructure solutions, which may result in lower cost savings.

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 $19.1 million.

Application-Development-Related Infrastructure Cost Savings

Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Total on-premises infrastructure cost dedicated to application development	Composite	$50,000,000	$50,000,000	$50,000,000
A2	Reduction in on-premises infrastructure cost as applications are migrated to Azure PaaS	Interviews	0%	15%	40%
At	Application-development-related infrastructure cost savings	A1*A2	$0	$7,500,000	$20,000,000
	Risk adjustment	↓10%			
Atr	Application-development-related infrastructure cost savings (risk-adjusted)		$0	$6,750,000	$18,000,000
	Three-year total: $24,750,000		**Three-year present value: $19,102,179**		

APPLICATION-DEVELOPMENT-RELATED INFRASTRUCTURE ADMINISTRATION EFFICIENCIES

Evidence and data. Interviewees said Azure PaaS does not require as many resources as on-premises or IaaS implementations on an ongoing basis. Microsoft handles virtually all server administration tasks, so organizations can focus on other activities.

- The principal technical architect at the professional services firm said: "The things that people focus on are now dramatically different. Before, our database teams spent a lot of time managing versions and patching and all of those other things. There's the operating system and the firmware and all those other things. With Azure PaaS services, those are all entirely managed, so those groups that are running full platform and service don't have to maintain that equipment."

  The interviewee continued: "I think that the operating-system patching — because we still asked for it — is probably maintained by one or two people. Whereas, before, it was probably [maintained by] a whole team of maybe 10. If you think about every capability and service, there was someone or some people managing that lifecycle that no longer has to be managed." All in all, this interviewee estimated their organization

went from 25 to 30 people managing all aspects of application infrastructure down to three.

- The head of IT strategy at an insurance company echoed this, saying: "[Before,] if we needed to set up a Windows server, it would take them one day to set up the Windows server plus another week to establish network connectivity, making sure that the lines are all connected for those browsers and hardware. Deploying a simple website — just the infrastructure setup — took one FTE around two months' time to get the hardware purchased and set up. With Azure PaaS and DevOps, we can do it within one week."

- The service cloud manager for the transportation company said, "More automation and tasks managed by the cloud provider means more time available for the internal teams to work on other tasks."

Modeling and assumptions. Forrester assumes the following about the composite organization:

- The composite organization has 150 systems administrator FTEs responsible for supporting application-development-related infrastructure.

- After deploying Azure PaaS, the composite organization migrates 15% of its applications to the new platform by the end of Year 1, an

> **"The idea is those people are now doing higher value-added work. It's not like the story is you can slash the workforce. The idea is that there's always work to be done, and the idea is that they're operating on different things that are thought to be of higher value-add."**
>
> *Principal technical architect, professional services*

additional 25% of applications in Year 2, and 30% of applications in Year 3.

- As applications are migrated, support of the legacy infrastructure for those applications is reduced by 50% in Year 1, by 70% in Year 2, and by 90% in Year 3.

- The average fully burdened annual compensation for a systems administrator is $140,000.

- Systems administrators recapture 75% of the time saved to put toward other work efforts.

Risks. Operational differences that may impact the financial benefit associated with application-development-related infrastructure administration efficiencies include:

- The size and maturity level of the team responsible for support of infrastructure used for application development.

- The extent to which the organization can effectively plan, prepare, and migrate applications to the Azure PaaS platform.

- The order and pace at which applications are migrated to Azure PaaS, including time spent refactoring applications if needed.

- The organization's policies for retaining and supporting backup infrastructure in order to mitigate risk associated with migrating applications.

- Prevailing local compensation rates for systems administrators.

Results. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV of $10.3 million.

	Application-Development-Related Infrastructure Administration Efficiencies				
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
B1	Systems administrator FTEs supporting application-development-related infrastructure	Composite	150	150	150
B2	Percentage of applications migrated to Azure PaaS (cumulative)	Composite	15%	40%	70%
B3	Reduction in infrastructure support after migrating to Azure PaaS	Interviews	50%	70%	90%
B4	Fully burdened annual compensation for a systems administrator	TEI standard	$140,000	$140,000	$140,000
B5	Productivity recapture rate for salaried employees	TEI standard	75%	75%	75%
Bt	Application-development-related infrastructure administration efficiencies	B1*B2*B3*B4*B5	$1,181,250	$4,410,000	$9,922,500
	Risk adjustment	↓15%			
Btr	Application-development-related infrastructure administration efficiencies (risk-adjusted)		$1,004,063	$3,748,500	$8,434,125
	Three-year total: $13,186,688		**Three-year present value: $10,347,401**		

APPLICATION-DEVELOPMENT EFFICIENCIES

Evidence and data. Interviewees said the Azure PaaS platform and having access to related Azure DevOps services enabled developers to work much more efficiently.

- The head of IT strategy for an insurance firm described how their organization's development team is deploying to the cloud in a much faster way. They said: "It's four to five times faster. For us to implement a single feature, originally it may have taken us two to three weeks. Now, it's two to three days." The interviewee explained that their organization is able to take advantage of microservices and APIs so that if one part of an application is broken, it doesn't affect the entire application. They said, "We're getting 90% benefit."

- The service cloud manager for the transportation company said: "Due to the greater reliability and availability of the [Azure] PaaS platform, developers are working faster [and] more efficiently than they were before." This interviewee could not quantify this benefit, but they feel their organization is now twice as efficient because it has fewer incidents and less downtime. Because Azure PaaS provides a more structured environment for modernizing applications, developers spend more time on value-added activities.

- The principal technical architect for the professional services firm explained: "For some of our application PaaS platforms, the teams by design are able to focus on the code and not the platform management itself. They're not configuring and tweaking the web server, for example. They're really focusing on the code. And I would say that would be a big [benefit]: the idea that there is less need for some of these ancillary teams like database administrators because you're able to use and interact with the service. Maybe [it's] in a more constrained way

than you would have an on-premises deployment, but it pushes you into a direction that's more supportable."

- The VP of enterprise architecture for the technology firm noted that resource provisioning is much simpler with Azure PaaS. They said: "It's very easy for our engineering teams to provision new technologies for exploration purposes. This enables rapid prototyping and quicker customer feedback. The DevOps team also found Azure PaaS to be valuable to build new deployment pipelines. This drastically reduces our time to build and market solutions."

Speaking more generally about development efficiencies, this interviewee distinguished more efficient development practices from the actual time spent developing. They said: "Development times are exactly the same, but the process is easier. [With] the traditional model where we developed with the clients or applications, managing those dependencies across the teams was messy. … The development process is more efficient working on cloud."

> **"The DevOps approach itself just helps you to deliver faster. It comes with an investment and, of course, requires automated testing and security scanning, dynamic and static, etc. But that's how DevOps helps you to obey how you deliver software itself. That is definitely a transformation happening within the developer team."**
>
> *Chief technology officer, insurance*

Modeling and assumptions. Forrester assumes the following about the composite organization:

- The composite organization has 1,500 FTEs responsible for application development.

- After deploying to Azure PaaS, the composite organization migrates 15% of its applications to the new platform by the end of Year 1, an additional 25% of applications in Year 2, and 30% of applications in Year 3.

- Productivity improvements impact developers working with applications migrated the previous year and roughly 50% of applications migrated the current year, which equates to 30% of applications in Year 2 and 55% in Year 3.

- After applications are migrated to the Azure PaaS environment, developers working with those applications experience an improvement in productivity from DevOps automation and reuse of code and architecture, growing to 5% in Year 2 and to 10% in Year 3.

- The average fully burdened annual compensation for an application developer is $140,000.

- Application developers recapture 75% of the time saved to put toward other work efforts.

Risks. Operational differences that may impact the financial benefit associated with application development efficiencies include:

- The size and maturity level of the application development team, including developers' experience, capabilities, and effective use of DevOps for cloud-native development.

- The extent to which the organization can effectively plan, prepare, and migrate applications to the Azure PaaS platform.

- The order and pace at which applications are migrated to Azure PaaS, including time spent refactoring applications if needed.

- Prevailing local compensation rates for application developers.

Results. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV of $7.2 million.

Application-Development Efficiencies

Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Application developer team size	Composite	1,500	1,500	1,500
C2	Percentage of applications migrated to Azure PaaS (cumulative)	Composite	15%	40%	70%
C3	Percentage of migrated applications impacted by improved productivity (cumulative)	Composite	0%	30%	55%
C4	Improvement in productivity due to DevOps automation and reuse	Interviews	0%	5%	10%
C5	Fully burdened annual compensation for an application developer	TEI standard	$140,000	$140,000	$140,000
C6	Productivity recapture rate for a salaried employee	TEI standard	75%	75%	75%
Ct	Application-development efficiencies	C1*C3*C4*C5*C6	$0	$2,362,500	$8,662,500
	Risk adjustment	↓15%			
Ctr	Application-development efficiencies (risk-adjusted)		$0	$2,008,125	$7,363,125
	Three-year total: $9,371,250		**Three-year present value: $7,191,632**		

REVENUE LOSS AVOIDED FROM IMPROVED APPLICATION UPTIME

Evidence and data. The interviewees said the Azure PaaS platform is a more resilient development environment compared to on-premises. Developers leveraged cloud-native patterns to ensure greater resiliency for their applications.

- The service cloud manager for the transportation company said the Azure PaaS platform provided a more reliable and more available environment for application development. In their view, this was the most valuable benefit because it provided more flexibility and gave more time back to the developers. They said: "There are fewer incidents joining applications running on the Azure PaaS platform. There's more uptime. It's one of the fundamental benefits of Azure PaaS, that it's more reliable, easier to maintain. It's a better performance for the same price."

- The head of IT strategy for an insurance company estimated the uptime for their organization's on-premises development environment was somewhere between 92% and 93%. They said ,"With Azure PaaS and DevOps, it's now 99.99%."

- The principal technical architect of the professional services firm noted that improved uptime and reliability came after working in the cloud for a while. They said: "In the beginning, Azure was known to have more reliability events. And then maybe we also had to mature, too, to understand the idea that the cloud may have more blips and brown outs. We had to make our applications more resilient to those things."

- The VP of enterprise architecture for the technology firm said their organization's customers gained a huge performance boost after the company migrated applications into the cloud. They said: "We redesigned one of our critical components in the client server app by

> **"On balance, after five years, our resiliency is far greater than it was on-premises."**
>
> *Principal technical architect, professional services*

developing it in the cloud. The fact that we were able to use an event-driven architecture made the overall solution highly scalable and resilient. This is only possible using cloud-based systems."

- The chief technology officer of an insurance company agreed that reliability is better with Azure PaaS, but they do not consider it an important benefit for their organization. They said: "To be honest, we don't have super high reliability requirements, especially for commercial insurance payments. If you send the policy out 2 hours later, it's okay. It's very rare that downtime is an issue."

Modeling and assumptions. Forrester assumes the following about the composite organization:

- 5% of the organization's revenue is impacted by application downtime.

- Prior to deploying to Azure PaaS, the organization experienced an average of 7.5% downtime per year related to applications.

- After deploying to Azure PaaS, the composite organization migrates 15% of applications to the new platform by the end of Year 1, an additional 25% of applications in Year 2, and 30% of applications in Year 3.

- After the migration to Azure PaaS, application downtime is reduced 90% for those applications migrated to the platform.

Risks. Operational differences that may impact the financial benefit associated with revenue loss avoided from improved application uptime include:

- The size and maturity level of the application development team, including developers' experience, capabilities, and effective use of the Azure PaaS platform for development.

- The amount of downtime experienced prior to Azure PaaS and the impact of that downtime on the organization's revenue streams.

- The extent to which the organization can effectively plan, prepare, and migrate applications to the Azure PaaS platform.

- The order and pace at which applications are migrated to Azure PaaS, including time spent refactoring applications if needed.

- The organization's operating margin.

Results. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year, risk-adjusted total PV of $3.8 million.

Revenue Loss Avoided From Improved Application Uptime					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
D1	Total revenue	Composite	$20,000,000,000	$20,000,000,000	$20,000,000,000
D2	Percentage of revenue impacted by application downtime	Composite	5%	5%	5%
D3	Percentage of downtime per year prior to Azure PaaS	Interviews	7.5%	7.5%	7.5%
D4	Reduction in downtime with Azure PaaS	Composite	90%	90%	90%
D5	Percentage of applications migrated to Azure PaaS (cumulative)	Composite	15%	40%	70%
D6	Revenue loss avoided from improved application uptime	D1*D2*D3*D4*D5	$10,125,000	$27,000,000	$47,250,000
D7	Operating margin	Composite	7%	7%	7%
Dt	Revenue loss avoided from improved application uptime	D6*D7	$708,750	$1,890,000	$3,307,500
	Risk adjustment	↓20%			
Dtr	Revenue loss avoided from improved application uptime (risk-adjusted)		$567,000	$1,512,000	$2,646,000
Three-year total: $4,725,000			**Three-year present value: $3,753,020**		

REVENUE GAINS FROM FASTER APPLICATION PRODUCTION

Evidence and data. Most of the interviewees' organizations were able to increase the speed of application development to production and improvement cycles as a result of migrating to Azure PaaS, enabling their organizations to better serve customers. Although, for some, this is still a work in progress.

- The principal technical architect at the professional services firm said that before using Azure PaaS, delivery of infrastructure delayed their organization's development teams. They said: "Someone says, 'I need a server,' and maybe three months later, they would get it. Right now, someone says, 'I need an application platform and a database ready,' and they can have that in a few hours. ... Now, they can start developing on their own, which has had a dramatic impact on our ability to meet customer and business objectives and allowed us to execute on those [projects] with higher revenue, [provide] better client experience, and [be] able to move faster against our competitors than before."

- The VP for enterprise architecture for the technology firm said: "I can definitely see us releasing more versions than four a year, but we are not doing that today because we are still in this journey of modernizing our existing suite of applications. Releasing more frequent upgrades is a goal."

- The chief technology officer for an insurance company said their organization's time to market had improved but that it wasn't at full scale yet. They said: "That's just part of the transformation journey. It has slightly improved, and it will dramatically improve over the next months because we have invested heavily in using DevOps tools [and] rolling this out globally. We have a few teams that piloted this where we can see the benefit, and now we are really scaling

> **"[Azure PaaS] has had an incredibly dramatic impact on the velocity of delivery, and our teams to be able to react to changing business needs. Right now … from my vantage point, that's by far the greatest benefit we have."**
>
> *Principal technical architect, professional services*

this through the organization, mandating or onboarding everyone on DevOps, [and] following certain standards we defined. And, through that, we can see big benefits."

Modeling and assumptions. Forrester assumes the following about the composite organization:

- 0.5% of the organization's revenue is enhanced by improved time to market associated with application releases, updates, and upgrades.

- After deploying to Azure PaaS, the composite organization migrates 15% of its applications to the new platform by the end of Year 1, an additional 25% of applications in Year 2, and 30% of applications in Year 3.

- After deploying to Azure PaaS, time to market is reduced by 50% for those applications migrated to the platform.

Risks. Operational differences that may impact the financial benefit associated with revenue gains from faster application production cycles include:

- The size and maturity level of the application development team, including developers' experience, capabilities, and effective use of the Azure PaaS platform for development.

- Development timelines experienced prior to using Azure PaaS.

- The extent to which the organization can effectively plan, prepare, and migrate applications to the Azure PaaS platform.

- The order and pace at which applications are migrated to Azure PaaS, including time spent refactoring applications if needed.

- The value that faster and richer application feature sets contribute to the organization's revenue streams.

- The organization's operating margin.

Results. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year, risk-adjusted total PV of $2.8 million.

Revenue Gains From Faster Application Production

Ref.	Metric	Source	Year 1	Year 2	Year 3
E1	Total revenue	Composite	$20,000,000,000	$20,000,000,000	$20,000,000,000
E2	Percentage of revenue enhanced by time to market improvements	Composite	0.5%	0.5%	0.5%
E3	Percentage of applications migrated to Azure PaaS (cumulative)	Composite	15%	40%	70%
E4	Time to market improvements with Azure PaaS	Interviews	50%	50%	50%
E5	Revenue gains from faster application production	E1*E2*E3*E4	$7,500,000	$20,000,000	$35,000,000
E6	Operating margin	Composite	7%	7%	7%
Et	Revenue gains from faster application production	E5*E6	$525,000	$1,400,000	$2,450,000
	Risk adjustment	↓20%			
Etr	Revenue gains from faster application production (risk-adjusted)		$420,000	$1,120,000	$1,960,000
Three-year total: $3,500,000		**Three-year present value: $2,780,015**			

UNQUANTIFIED BENEFITS

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

Internal transformation. Interviewees said the shift to the Azure PaaS platform and an integrated DevOps approach to development had a profound impact on their organizations' internal IT and development teams as work moved off on-premises development environments. More automation and tasks managed by Microsoft Azure meant more time available for these teams to work on other, more value-added activities.

- The VP for enterprise architecture at the technology firm said: "It's fully automated with reporting and end-to-end visibility to our developers. It was a game-changer because the developers don't worry much about deployments anymore. The DevOps teams help the engineers through the deployment journey including setting up monitors, etc. In the traditional deployment model, the engineers don't have too much visibility beyond delivery. In the newer model, the developers get to see how their applications respond and behave in various situations. They can proactively identify and work on issues instead of being manually notified by the end user or a support agent."

- The principal technical architect for the professional services firm described how day-to-day work has changed. They said: "It's been a big cultural shift. One of the things that we Instituted at about two-and-a-half or three years ago was a self-service model. They're maintaining a platform that allows the application teams to deploy their own cloud infrastructure, their own SQL servers, their own VMs, [and] their own platform-as-a-service app services. They have shifted more to enabling technologies versus doing the work of building platforms, like monitoring platforms and cloud delivery services,

and then helping enable the teams to be self-sufficient."

This interviewee summed it up by saying: "It is a dramatic difference. Now you're now focusing at a higher level of operations. The database team, for those that are running all on [Azure] PaaS, can be focused entirely on database performance, tuning, [and] indexing. Application teams are not worrying about the runtime version. They can use any of the runtime versions by invoking them and, then once a month, they'll just get patched for them. You really focus your effort on automation and repeatable deployment in the best practice and far less on the day-to-day maintenance."

- Interviewees said developers needed to learn new ways of working in the PaaS environment. The chief technology officer of an insurance company said: "[Before,] we had a central team providing services, which the business applications team used. None of the business applications teams had to worry about security or infrastructure stuff. The moment we went into Azure PaaS with a full federated model as we initially did, all of the teams were suddenly on the hook for the security aspects and some infrastructure-related aspects regarding the use of database services, etc."

Reusability. Access to Azure DevOps via the PaaS platform enabled developers to reuse code more efficiently. The head of IT strategy for an insurance company explained: "With Azure DevOps, we are able to do more reuse of code [and] reuse of architecture. We are trying to see how we can avoid reinventing the wheel again and again. We improve the infrastructure and then we think about how we can reuse our existing architecture or reuse existing code."

Reuse of code was also a key objective for the chief technology officer at another insurance firm. They said: "We want to modernize everything we bring into

the public cloud [and] really reengineer it in a way to make it API-first to make sure whatever we build is only built once and can be reused. The cloud helps with that reusability."

Auto-scaling flexibility. Interviewees liked the fact that their organizations could easily scale up or down and only pay for what they use, giving them the agility to experiment more freely in their development activities while avoiding overprovisioning costs.

- The principal technical architect at the professional services firm explained the appeal of auto-scaling in economic terms. They said: "If you own your data center, you have to buy for that peak, and then it sits unused even though you already own it and are deprecating or depreciating it. In the cloud, you would pay for what you need, and you would be able to expand out to what you needed and then contract back down. Scalability has been key."

- The VP for enterprise architecture of the technology firm confirmed their organization took advantage of auto-scaling to avoid overprovisioning in the cloud. They said: "Absolutely yes. As we run into peak loads, it will auto-scale out and then scale back in [automatically]."

- The chief technology officer at an insurance company indicated their organization had a limited use for auto-scaling but still found it beneficial. They said: "We have a few applications where there is a high peak of usage — [for example] during peak renewal season of our business where we just need to scale up our infrastructure there. We could actually see that we had a big benefit. But for most of our applications, we have a steady load of transactions. It's fixed capacity or consumption we need."

Business impact of application modernization. Because Azure PaaS relieves developers of

> **"Between a few minutes and a couple hours, we can get to whatever capacity we need. That was just not something that was practical or even possible on-premises."**
>
> *Principal technical architect, professional services*

infrastructure responsibilities, the composite organization's developers can focus more intently on application-based innovations that meet customer needs and benefit their business.

- For the chief technology officer at the insurance company, "It's the innovation capabilities you get through all the parts coming together, which enables you to focus on the business applications. You don't have to worry about infrastructure topics. We still have to worry a little bit about security, although the environment helps us."

  This interviewee explained: "Digitalization eventually arrived in the insurance industry. While a lot of our applications we are building for our in-house clients, more and more there are software offerings we make to the outside world, to our clients, to our brokers, et cetera, so a lot of the concepts like multi-tenancy or API-first has become super relevant for us. And definitely, let's also make sure we can offer it to the outside world as an investor-published API or service, for instance. That is, of course, where Azure PaaS platform helps us find the time to do this technically and securely, by providing access management in the right way."

- The VP of enterprise architecture at the technology firm also described an initiative to integrate applications to facilitate information exchange for their organization's customers, and

> **"Our vision is for our customers to have their applications running in the cloud, either in a cloud-hosted model or cloud-native model."**
>
> *VP of enterprise architecture, technology*

they credited Azure PaaS with helping to make that happen. They said: "Azure provides Power Automate, a low-code/no-code tool where you can drag and drop connectors and then easily write information into an API. I don't have to have a developer hand-coding these connectors. I can just simply drag and drop and, with some simple configuration, share information in any format. That is very key … It's basically enabled the teams. If we decide to invest in a concept, we can find what works and [what] doesn't work much faster. … As you move to these autonomous squads, the teams can do experimentation. They can find out if something in the market works a lot faster. Instead of making two moon shots every year, you're able to get out there with 10 or 15 or 20. It does pay off in the long term, having the ability to find out what works. If you think about how that can manifest itself in meeting business challenges and needs, what I can tell you is that's an easily measurable outcome of our cloud journey."

Security, policies, and controls. Some but not all interviewees agreed that Azure PaaS provides a more secure environment for development. While audit trails make compliance a more straightforward process, cloud-based security requires a change in mindset that some interviewees' organizations struggled with.

- The principal technical architect at the professional services firm said: "Everything is visible and logged in the public cloud, [which] means that we have a dramatically more secure

environment with higher visibility to the environment. Right now, our ability to deploy things uniformly every time [and] our visibility into what's connecting and trying to be connected means a dramatic reduction in the likelihood of an attack being successful. … Because of the visibility and the logs and the audit trails, compliance is a fairly straightforward process. We can look inside the code and see if someone's compliant with certain code practices. We can look into the access logs to see if we're compliant there. We can audit those sorts of things."

- The chief technology officer of an insurance company confirmed certain aspects of security and compliance were easier. They said: "Certain central services are still required, but [Azure] PaaS makes it much easier to roll out policies and controls. We immediately know which resources are impacted. We immediately know which resources and which teams are out of policy. It makes it much easier than before. … There is still a lot that we have to do ourselves. Security always has these different layers protecting the data center [and] protecting the servers up into all these software layers. Of course, the cloud takes on some compared to when we were on-prem with a data center in the lower layers. When it comes to the software layers and how you build software and set user management, it is the same as before. There is still a lot we need to be secure. To be fair, you don't have to worry about patches on your database and servers. That's definitely a benefit from being in the cloud."

- The service cloud manager for the transportation company noted: "[Azure] PaaS allows us to define the basis of compliance, but the level of compliance requested by our company doesn't always fit with the Azure compliance rules. [On the other hand,] the Azure PaaS platform is quite easy to work."

- In contrast, the head of IT strategy at an insurance company said their organization struggled to set up role-based controls in the new environment. They said: "The security team still has the mindset of running the security in an on-premises way. I fear that it'll become more dangerous because no one is actually taking control of the governance part and the security part."

Cost management. The interviewees' organizations relied on a combination of tools, including Microsoft's Cost Management + Billing to monitor and manage cloud costs.

- The chief technology officer for an insurance company noted that working in the Azure PaaS environment required their organization to become "super rigid" about cost management. They said: "That's the ultimate mindset change our teams needs to get. In earlier times, this was a yearly planning process where cost was distributed as pay per plan, not pay per use. Now, in the public cloud, you need to do daily housekeeping, where what you reserve today is less cash out today, not next year or later. That's a mindset change we've made. We invested a lot into giving a full infrastructure cost overview to the application teams."

- The principal technical architect for the professional services firm indicated their organization used a combination of Microsoft tools and other tools to keep development teams focused on costs. They said: "We have a fairly new synapse model that allows us to provide reporting and better chargeback capabilities to the lines of business. There are some tools that we use on the finance side, but most of it is driven by data and reporting available in Azure that we expose through things like Power BI reports, so the teams know where their costs are. [Before], it was fairly opaque, and it was kind of a best guess. Now, it's absolute. There's no

guesswork. This is exactly what you're spending as a squad and by application. Chargeback is not that practical with a captive data center, but it is easily possible with the public cloud because the teams are in control to some degree of their excess spend."

- The service cloud manager for the transportation company found Azure's cost management system easier to use compared to a competitor's tool, and the VP for enterprise architecture at the technology firm said they like that Azure's reports offer advice and recommendations for managing costs, such as decreasing consumption without sacrificing requirements.

Keeping up with the new. Interviewees said one benefit of having Microsoft manage their organization's platform was gaining access to the latest technology, which one interviewee felt was harder to do when their company managed its environment itself.

The principal technical architect of the professional services firm said: "[We now have the] ability to take advantage of those things that are released in monthly life cycles by the cloud providers. [We] don't have to do anything. [We] just get it, whether it be something kind of boring — like new backup capabilities or new cost reduction opportunities to new capabilities — that allow us to do things that we couldn't do before. Of all the things [and] the biggest picture, that's the biggest benefit. We can talk about auto-scale and other business attributes, but the idea that we get to take advantage of these enormous, probably historic, investment scales is pretty great."

Attraction/retention. All of the interviewees felt the Azure PaaS platform had a positive impact on their organization's ability to recruit and retain developers.

- The principal technical architect at the professional services firm said: "Because we're doing more interesting things related to cloud-native technologies, it has helped measurably in

our company's HR scores and surveys. ... That's absolutely part of the retainment, and it has made it easier to have a global workforce."

- The VP for enterprise architecture at the technology firm noted: "The fact that we were migrating into a cloud [and] building cloud applications [has played a big role]. … We trained some of the development teams on the cloud and they are super excited. They are excited about the fact that they work in the newer environment. ... There was a learning curve, but once we brought the developers into this new way of developing applications, it was eye-opening. It actually helped us a lot [with] retaining our employees, encouraging them, [and] showing them a career path."

- The head of IT strategy for an insurance company said that Azure PaaS made recruitment easier. They said, "It's very easy to ask a few questions and know whether [candidates] actually have used Azure before."

- The chief technology officer at an insurance company said they believe Azure PaaS helped attract and retain development staff. They said, "It does because it's an exciting journey for a lot of people."

- The service cloud manager for the transportation company noted: "When we hire someone, [Azure] PaaS makes it easier for these people to learn on the job. And they can work on a wider range of activities and applications. They have a wider range of paths [career options] because [Azure] PaaS is easier to work with."

Reliable service and support. Interviewees had good things to say about Microsoft's support services.

The VP of enterprise architecture for the technology firm said: "We get great support from Microsoft. Our account manager has been excellent. We usually get in touch with the right resources within a day to

> **"The initial hurdle was the learning curve. It took a while for developers coming from traditional application development to understand the newer deployment pipelines. Once they understood the process, they started realizing the value. Working on developing cloud-based applications became easier and a lot more interesting than [working on] client server applications."**
>
> *VP of enterprise applications, technology*

discuss any problems or new ideas we may have. In addition, we have a standing biweekly meeting to discuss and bounce ideas for new product development successes. It has tremendously helped us build products faster."

FLEXIBILITY

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

Continued innovation. The interviewees anticipated future benefits of their organizations' investments in Azure PaaS to come from innovation.

- The chief technology officer of an insurance company said, "It gives us the ability to profit from the innovation happening with the technology."

- The VP of enterprise architecture for the technology firm echoed this. They said: "Our investment in Azure PaaS is going to help the company sustain our growth rate in the future. If we don't do this now, then we may have a big issue in the future in terms of supporting our existing customers who are looking for cloud-based answers, the connections, and the different market channels for selling our products.

I would probably say if we don't do this, then we are going to be behind the curve in the future."

Continued migration to cloud. The interviewees said their organizations were still in the process of migrating applications to the cloud.

- The principal technical architect at the professional services firm said their organization was between 95% and 90% complete, while the head of IT strategy estimated their organization would be 90% migrated by the end of 2022 and hoped to be 100% migrated by the end of 2023.

- The chief technology officer for the insurance company said that despite some initial missteps, their company remained committed to its migration and modernization strategy. They said: "We stopped a lot of the things we started doing over the past two years because the cost savings were not coming through in that sense. We still believe we need to continue that journey on the public cloud for a lot of good reasons [and] finding the right talents. There are now more reasons for wanting to have the latest technology. Cost saving is only one of the factors in the revised business case."

Exploring multicloud strategies. Some of the interviewees' organizations had already deployed or were actively exploring how to operate in multiple clouds to augment their core applications running on Azure PaaS and to avoid lock-in effects.

- The principal technical architect for the professional services firm said: "We have done an evaluation of what multicloud means to us and we will start investing now that our cloud practice is fairly mature. … In the foreseeable future — let's say [in] five years — we intend to have our primary compute and storage footprint to be in Azure, but [to] leverage other clouds to augment applications that are not necessary."

- The chief technology officer of an insurance company noted: "We are actually having a lot of

discussion on lock-in effects. How much cloud-agnostic should we develop versus [embracing] the lock-in and go for all the cloud-native stuff that Microsoft gives us because that's where the innovation comes in? That's an interesting topic we are discussing right now. ... As of now, Microsoft is still the preferred vendor where we really build up the expertise at this point in time."

- **Extending PaaS to other infrastructure.** The head of IT strategy for an insurance company mentioned that their organization is exploring options for migrating AS 400 mainframes in Azure.

- **Further use of automation.** The head of IT strategy for an insurance company said: "Our next step is trying to automate with [Azure] PaaS. The ability to optimize and automate most processes and reduce manual work is definitely a good way to go."

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

> **"I'm the one telling everyone it's nonnegotiable whether we need to do this or not if we want to continue to be in the tech space. I find [Azure] App Service super helpful. I find that DevOps, the pipelines, [and] everything you can build on [it] is super helpful. There are a lot of good things … across all these services which are there. It's just how we adapt to it. It's not whether we do it, it's just how we do it."**
>
> *Chief technology officer, insurance*

Analysis Of Costs

	Total Costs						
Ref.	**Cost**	**Initial**	**Year 1**	**Year 2**	**Year 3**	**Total**	**Present Value**
Ftr	Azure PaaS costs	$0	$249,997	$642,040	$1,136,352	$2,028,389	$1,611,639
Gtr	Planning and landing-zone development costs	$538,462	$0	$0	$0	$538,462	$538,462
Htr	Application migration costs	$0	$2,635,190	$4,127,254	$5,235,568	$11,998,012	$9,740,140
Itr	Training costs	$0	$331,650	$552,750	$663,300	$1,547,700	$1,256,665
	Total costs (risk-adjusted)	$538,462	$3,216,838	$5,322,043	$7,035,220	$16,112,563	$13,146,906

AZURE PAAS COSTS

Evidence and data. Microsoft offers several pricing options for Azure PaaS services. One is a pay-as-you-go model where the organization only pays for what it needs and is able to quickly scale up at busy times. One-year and three-year savings plans and reserve pricing are also available at a discounted rate for organizations willing to commit to a term agreement.

Organizations can pay costs as part of a variety of licensing agreements. However, an organization might pay these costs monthly, quarterly, or annually as part of a multiyear agreement or a pay-as-you-go contract. They also might pay them in advance.

- Two of the interviewees said their organization received discounted pricing from Microsoft. The chief technology officer of an insurance company said their organization's contract was linked to consumption targets with certain consumption milestones triggering discounts. This led the organization to initially prioritize applications for migration and modernization based on its ability to reach those targets instead of basing decisions on business value. The chief technology officer said: "In hindsight, I probably would have done it

slightly differently. We are still on that contract, but we threw out all the activities we did. We actually reached our consumption targets, so we are off the hook for consumption. That's why we could make the change. Our contract is coming up for renewal pretty soon. That's where we now need to figure out what is the way forward."

Modeling and assumptions. Forrester assumes the following about the composite organization:

- The composite organization has an EA agreement and pays for services the same year it consumes them.

- The organization migrates 15% of its applications (75 out of 500) in Year 1, an additional 25% in Year 2 (200 out of 500 cumulative), and an additional 30% in Year 3 (350 out of 500 cumulative).

- 5% of the applications are complex and experience high demand, requiring the ability to auto-scale between two and 30 compute instances over the course of each business day and consuming an average of four compute instances per application per year.

- 30% of the applications experience moderate demand ("standard" applications), consuming one compute instance per application over the course of the year.

- The applications are simple, shared applications that are only used occasionally but still need to be up and running for individual users where 10 applications can be deployed on a compute single instance.

- The composite's cost for Azure PaaS App Services is based on Microsoft's P2v3 three-year reserve schedule per instance.

- Additional Azure PaaS services such as Data Factory, Blob Storage, DevOps, Front Door Key Vault, Monitor Resource Manager, SQL Database, Traffic Manager, GitHub, and Visual Studio Code are estimated at 30% of total service costs and maintenance and support costs are estimated at 10% of total service costs.

- Pricing may vary. Contact Microsoft for additional details.

Risks. Operational differences that may impact the costs associated with Azure PaaS services include:

- The size and scale of deployment and consumption properties of the applications migrated to the Azure PaaS platform.

- The pricing schedule available to the organization.

- The use of additional Azure PaaS services and support.

- Enterprise licensing agreements and other volume discounts such as one-year and three-year reserve pricing.

Results. To account for these risks, Forrester adjusted this cost upward by 20%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $1.6 million.

Azure PaaS Costs

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
F1	Number of applications migrated to Azure PaaS (cumulative)	Composite		75	200	350
F2	Percentage of high demand applications	Composite		5%	5%	5%
F3	Number of high demand applications migrated to Azure PaaS (cumulative)	F1*F2		4	10	18
F4	Instances required for high-demand applications	Microsoft		16	40	72
F5	P2v3 3-year reserve pricing per instance per year	Microsoft		$3,382	$3,382	$3,382
F6	Subtotal: Azure PaaS subscription fees for high-demand applications	F4*F5	$0	$54,112	$135,280	$243,504
F7	Percentage of standard applications	Composite		30%	30%	30%
F8	Number of standard applications migrated to Azure PaaS (cumulative)	F1*F7		23	60	105
F9	Instances required for standard applications	Microsoft		23	60	105
F10	P2v3 3-year reserve pricing per instance per year	Microsoft		$3,382	$3,382	$3,382
F11	Subtotal: Azure PaaS subscription fees for standard applications	F9*F10		$77,786	$202,920	$355,110
F12	Number of simple/shared applications migrated to Azure PaaS (cumulative)	F1-(F3+F8)		48	130	227
F13	Instances required for simple/shared applications	Microsoft		5	13	23
F14	P2v3 3-year reserve pricing per instance per year	Microsoft		$3,382	$3,382	$3,382
F15	Subtotal: Azure PaaS subscription fees for simple/shared applications	F13*F14	$0	$16,910	$43,966	$77,786
F16	Other Azure PaaS services	(F6+F11+F15) *30%	$0	$44,642	$114,650	$202,920
F17	Azure PaaS maintenance and support	(F6+F11+F15) *10%	$0	$14,881	$38,217	$67,640
Ft	Azure PaaS costs	F6+F11+F15+F16+F17	$0	$208,331	$535,033	$946,960
	Risk adjustment	↑20%				
Ftr	Azure PaaS costs (risk-adjusted)		$0	$249,997	$642,040	$1,136,352

Three-year total: $2,028,389   **Three-year present value: $1,611,639**

PLANNING AND LANDING-ZONE DEVELOPMENT COSTS

Evidence and data. The interviewees' organizations took different approaches to deployment, although most started with an assessment and development of a roadmap staging the migration process. Most of the organizations involved Microsoft and, at times, they used external partners in these efforts.

- The principal technical architect at the professional services firm said: "One of the first steps we took was to put a good foundation in place. We had to get some of the boring stuff out of the way first: network design, naming conventions, and subscription design. We all got in a room and had a decision register and went through it all — everything from the mundane to the critically important — and we ended up putting a landing zone in place before we deployed any assets. That's something [that], in hindsight, was probably one of our most important decisions. … What we felt, in the beginning, was that we would have a road map in our approach to get to the cloud, which was really about migrating some workloads, making as few changes as possible, understanding how to operate into the cloud, and then starting to abstract ourselves to more and more up the stack. But we also knew that whether some services were not ready for us or we were not ready for some services, it was important for us to start with migrating workloads and getting learnings. We felt that that was key instead of simply saying, 'We're going to figure everything out before we get started.' We took the leap to do a lift and shift with a couple of applications. I'm not sure we made any application changes. I don't think we made any operating system changes."

- The chief technology officer at an insurance company said their organization also assessed its application portfolio with Microsoft at the onset of deployment, but it later came to realize the process was flawed. They said: "We assessed what we called low and medium complex applications, which we said we wanted to move into the public cloud. This assessment focused on the complexity and achieving certain consumption levels in the Microsoft cloud."

  This became a problem later when the organization realized the migrated applications were not automatically aligned to business value, and cost savings were not coming through, which forced a change to the approach. The interviewee said: "We still believe we need to want to continue that journey on the public cloud for a lot of good reasons. … We don't just count how many applications we've moved into the [Azure] PaaS platform. We now really do it where the business wants to invest. This might also include large and complex applications that we wanted to move into the public cloud in the next few years anyway. We just shifted away from counting applications into having a very clear reason for bringing something into the public cloud."

- In contrast to the other interviewees, the head of IT strategy at an insurance company said their organization dove right in with minimal preparation. They said, "In the beginning, in 2018, it was only me with one single application, which is why I didn't set up a landing zone." The organization later hired a new CTO who directed the team to embark on a broader application modernization strategy, at which point the organization brought in Microsoft and an outside partner to do an assessment and develop a migration plan that it is currently following.

Modeling and assumptions. Forrester assumes the following about the composite organization:

- The organization spends two months on the planning process, involving the equivalent of five FTEs in the process.

- Landing-zone development takes an additional six months involving the equivalent of five FTEs in the process.

- The average fully burdened annual compensation for those involved in the planning process is $140,000.

- The organization also contracts with a professional services firm to advise on the planning process and to assist with landing-zone development for an additional $25,000.

Risks. Operational differences that may impact the costs associated with planning and landing zone development include:

- The efficiency of the team responsible for planning and landing zone development.

- The use and cost of external professional services to assist in the process.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of $538,000.

Planning And Landing-Zone Development Costs

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
G1	Professional services to advise planning and landing zone development	Interviews	$25,000			
G2	Planning hours	Interviews	1,733			
G3	Landing zone development hours	Interviews	5,200			
G4	Blended fully burdened hourly compensation for those involved in planning and migration	TEI standard	$67			
Gt	Planning and landing-zone development costs	G1+(G2+G3)*G4	$489,511	$0	$0	$0
	Risk adjustment	↑10%				
Gtr	Planning and landing-zone development costs (risk-adjusted)		$538,462	$0	$0	$0
	Three-year total: $538,462		**Three-year present value: $538,462**			

APPLICATION MIGRATION COSTS

Evidence and data. The interviewees described a wide range of efforts required to modernize and migrate applications to Azure PaaS, depending on their organization's readiness, complexity, and need for refactoring.

- The chief technology officer for the insurance company said: "It took a full year and took around 60 to 90 people overall [to migrate 30 to 50 applications]. For every application, it was only half a squad [or] half a team doing it, although some had one or two teams on it. Some were easier and were done in just three months or so. Per application, [it averaged to] one team doing it. … We already figured out that you cannot leave the teams completely alone. We have sent to the teams those with deep Azure migration expertise who consultant or actively engage in the transformation. We have a group, one Center of Excellence for Azure, which has around 10 to 15 people. Then, for every domain, we enhanced that team with another five to six people who have domain knowledge. In addition to these expert teams, there is the expert application teams that review the applications. Per application, it's probably an average of three to four people, depending on the complexity of the application."

- In contrast, the head of IT strategy for an insurance company said: "It was 6 months, full time, for [my organization]. I fully deployed the first app in six months, including two months for setup."

  This interviewee added that migrating applications has gotten easier and faster over time. They said: "[Before], it took around four months to do such a migration, but now it's simple. We created a similar instance, and it would be ready within three days. [Now,] it takes only three days for us to migrate one gigantic project."

> **"From the landing zone to the new state probably was about six months because there was a lot of learnings along the way that we would have to get. It actually took a long time and was a slow process to move that first application and cut it over. It was a fairly white-glove experience for everyone."**
>
> *Principal technical architect, professional services*

Modeling and assumptions. Forrester assumes the following about the composite organization:

- The organization migrates 15% of its applications (75 out of 500) in Year 1, an additional 25% in Year 2 (200 out of 500 cumulative), and an additional 30% in Year 3 (350 out of 500 cumulative).

- 5% of the applications have a complex architecture and require a significant amount of refactoring, which takes the equivalent of eight FTEs working at 50% capacity during six months to migrate each application.

- 30% of the applications are fairly standard and require a modest amount of refactoring, which takes the equivalent of three FTEs working at 50% capacity for two months to migrate each application.

- The balance of applications are simple applications that require minimal code changes and still need to be quality checked in the new environment, which takes the equivalent of two FTEs working at 50% capacity for two weeks to migrate each application.

- The average fully burdened annual compensation for a developer responsible for migrating applications is $140,000.

Risks. Operational differences that may impact the costs associated with application migration include:

- The size and maturity level of the application development team, including developers' experience, capabilities, and processes for migrating applications to the Azure PaaS platform.

- The order and pace at which the organization migrates applications to Azure PaaS.

- The readiness and complexity of the applications being migrated, including refactoring.

- Prevailing local compensation rates for application developers.

Results. To account for these risks, Forrester adjusted this cost upward by 20%, yielding a three-year, risk-adjusted total PV of $9.7 million.

Application Migration Costs

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
H1	Number of applications migrated to Azure PaaS (in a given year)	Composite		75	125	150
H2	Number of high demand applications migrated to Azure PaaS (in a given year)	F3		4	6	8
H3	Average hours spent per migration for high demand applications	Interviews		4,160	4,160	4,160
H4	Subtotal: Hours spent to migrate complex applications	H2*H3		16,640	24,960	33,280
H5	Number of standard applications migrated to Azure PaaS (in a given year)	F8		23	37	45
H6	Average hours spent per migration for standard applications	Interviews		520	520	520
H7	Subtotal: Hours spent to migrate standard applications	H5*H6		11,960	19,240	23,400
H8	Number of simple applications migrated to Azure PaaS (in a given year)	F12		48	82	97
H9	Average hours spent per migration for simple applications	Interviews		87	87	87
H10	Subtotal: Hours spent to migrate simple applications	H8*H9		4,176	7,134	8,439
H11	Fully burdened hourly compensation for an application developer	TEI standard		$67	$67	$67
Ht	Application migration costs	(H4+H7*H10)*H11		$2,195,992	$3,439,378	$4,362,973
	Risk adjustment	↑20%				
Htr	Application migration costs (risk-adjusted)		$0	$2,635,190	$4,127,254	$5,235,568
	Three-year total: $11,998,012			**Three-year present value: $9,740,140**		

TRAINING COSTS

Evidence and data. Interviewees said their organizations' developers took advantage of Microsoft's ESI e-learning platform and Expert Days to upskill. Interviewees said the upskilling of the developer community will benefit their organizations on other projects in the coming years.

- The cloud services manager for the transportation company said: "The ramp-up took time to train the developers and convince them of the benefits of using PaaS versus IaaS. The ESI e-learning platform helps our employees discover and deepen their knowledge of the various [Azure] PaaS services."

- The principal technical architect for the professional services firm noted the effort required for upskilling, particularly at the beginning of the application migration and modernization initiative. They said: "The effort to upskill and train and prepare is an extra-large effort. The world is different in the public cloud, and one of the things that that had probably limited us in the beginning couple of years of our journey was people."

- The chief technology officer at an insurance company said upskilling developers remains a challenge for their organization. They said: "There's a lot of upskilling required on how to build stuff in a public cloud environment rather than on-prem and private cloud that is not to be underestimated…. There are training offerings from Microsoft, certificates, and such, which we

> **"We are educating the team [and] making sure that they attend extra training."**
>
> *Head of IT strategy, insurance*

> **"I'm expecting [the need for upskilling] to be extra large in any organization to bring [it] up to where [it needs] to be to operate at scale."**
>
> *Principal technical architect, professional services*

pushed heavily. We pay a flat fee to access Microsoft's Enterprise Skills Initiative, so we have free offerings for our employees to get certified. This was bundled into the offering, for a flat fee, open to all the employees, so everyone could do as many certificates and [as much] learning and class training as they wanted. We used gamification, who gets more certificates, and that sort of stuff. It was important and good."

This interviewee then explained that their organization created an internal Center of Excellence for Azure PaaS to help with upskilling. They said: "The certificate gives you a little bit of theoretical know-how and the context and the big picture. What we really figured out is having a central team — the Center of Excellence people who have done this before — who know it inside and out and have the expertise we need to upskill our people."

Modeling and assumptions. Forrester assumes the following about the composite organization:

- The number of developers who require training corresponds to the number of applications migrated in a given year using a 3:1 ratio.

- Developers spend an average of 20 hours per year on training related to application modernization.

- The average fully burdened annual compensation for a developer responsible for migrating applications is $140,000.

Risks. Operational differences that may impact the cost associated with training include:

- The degree to which the organization's developers require and leverage training on DevOps for cloud development.

- Prevailing local compensation rates for application developers.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of $1.3 million.

Training Costs						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
I1	Number of developers trained per year	Composite		225	375	450
I2	Average hours spent training related to application modernization	Composite		20	20	20
I3	Fully burdened hourly compensation for an application developer	TEI standard		$67	$67	$67
It	Training costs	I1*I2*I3		$301,500	$502,500	$603,000
	Risk adjustment	↑10%				
Itr	Training costs (risk-adjusted)		$0	$331,650	$552,750	$663,300
	Three-year total: $1,547,700			**Three-year present value: $1,256,665**		

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)
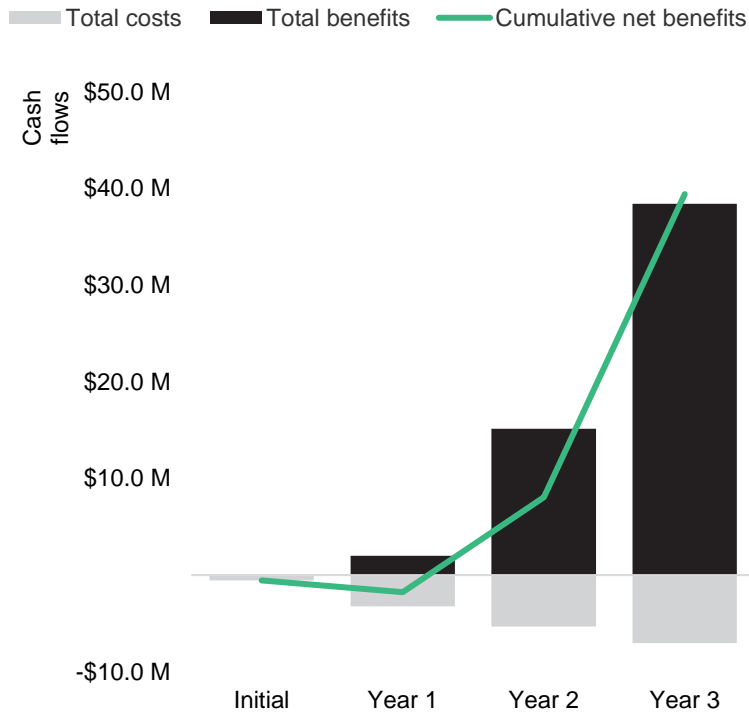
The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

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	($538,462)	($3,216,838)	($5,322,043)	($7,035,220)	($16,112,563)	($13,146,906)
Total benefits	$0	$1,991,063	$15,138,625	$38,403,250	$55,532,938	$43,174,247
Net benefits	($538,462)	($1,225,775)	$9,816,582	$31,368,030	$39,420,375	$30,027,341
ROI						228%
Payback						15 months

Appendix A: Total Economic Impact

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

TOTAL ECONOMIC IMPACT APPROACH

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

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

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

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

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: Supplemental Material

Related Forrester Research

"Forrester's Application Modernization And Migration Services Buyer's Guide, 2022", Forrester Research, Inc., August 5, 2022

"New Tech: Infrastructure As Code, Q1 2022," Forrester Research, Inc., February 14, 2022

"Monoliths Benefit From Both Containers And Microservices," Forrester Research, Inc., October 29, 2021

"Now Tech: Application Modernization And Migration Services, Q1 2021", Forrester Research, Inc., March 9, 2021

Appendix C: Endnotes

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[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.

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