

A Forrester Total Economic  
Impact™ Study

Commissioned By  
Microsoft

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# Business Value Realization With Office 365

A Total Economic Impact™ Analysis  
Of Microsoft Office 365

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## Executive Summary

Microsoft commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the business transformation opportunity and potential return on investment (ROI) enterprises may realize by deploying Microsoft Office 365. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Office 365 on their organizations as well as how user productivity and business outcomes can improve.

To better understand the benefits, costs, and risks associated with an Office 365 implementation, Forrester conducted a series of in-depth interviews with an existing customer, Advocate Health Care (Advocate), which is a Chicago network of hospitals with multiple years of experience using Office 365.

Prior to Office 365, Advocate had a variety of on-premises solutions (Microsoft and non-Microsoft) that were difficult to access, lacked all the capabilities that the organization needed, and were time-consuming to manage. With Office 365, Advocate improved coordination and collaboration, more quickly integrated new hospitals, streamlined back-office operations, and provided better information access to healthcare providers. This enabled Advocate to meet its business objectives, increase productivity, and keep costs in check. Said one interviewee: “We were developing a unified communications strategy, and Office 365 fit perfectly. There are so many benefits we’ve realized with Office 365 that have touched all parts of the organization.”

**Microsoft Office 365 significantly increases worker productivity and improves enterprisewide visibility and coordination.**

**The costs and benefits for the interviewed organization, based on customer interviews, are:**

- **Upfront investment costs: \$8.4 million.**
- **Annual costs: \$10 million.**
- **Annual savings and benefits: up to \$26.1 million.**

### OFFICE 365 DIGITALLY TRANSFORMED ADVOCATE, IMPROVING COLLABORATION AND SAVING MONEY

Through six interviews with associates at Advocate Health Care and subsequent financial analysis, Forrester found that the organization experienced the risk-adjusted ROI, benefits, and costs shown in Figure 1.<sup>1</sup>

The analysis points to present value benefits of \$1,448 per user versus costs of \$889, resulting in a net present value (NPV) of \$559 per user. With Office 365, workers became significantly more productive, which contributed to better coordination across healthcare facilities, resulting in internal and external cost savings.

#### FIGURE 1

#### Financial Summary Showing Three-Year Risk-Adjusted Results

**ROI / IRR:  
63% / 124%**

**NPV:  
\$20.7 million**

**Payback:  
fifteen  
months**

**Hours saved:  
2.0 million  
over three  
years**

Source: Forrester Research, Inc.

Microsoft positions Office 365 as a solution for “reinventing productivity for digital transformation.” Transformation is achieved across four areas, each of which is underpinned by Office 365 solution components (see the Microsoft Office 365: Overview section). These four areas are collaboration, mobility, intelligence, and trust. In interviews with Advocate, Forrester learned of many benefits realized. These benefits were achieved through a combination of solutions that sit across the four areas. For example, more clinical worker time could be spent on patient care because of increased collaboration, better mobility, and the necessary trust for information to be made available anywhere and at any time.

This study presents Advocate’s experiences and business results. After a general discussion around each of the four areas, the benefits that could be quantified, as well as the associated costs, are shown. The reader can apply these detailed financial examples to calculate the potential impact of Office 365 on their organization.

› **Benefits.** Advocate experienced the following risk-adjusted benefits:

- **Reduced knowledge worker administrative effort.** At Advocate, knowledge workers include employees in administration as well as managers of clinical staff. These workers saved up to 2 hours per week on administrative activities due to faster access to information and people, as well as improved coordination across multiple departments and facilities. This time could be better spent on higher-value activities without increasing total hours worked. The total risk-adjusted savings over three years was \$53.8 million.
- **Less travel between facilities.** Advocate operates many healthcare facilities across the Chicago area. With Office 365, various workers, such as IT, HR, and nursing managers, could conduct more meetings online instead of driving the busy streets of Chicago. On average, the affected workers made two fewer trips per month, saving time and transportation costs. The risk-adjusted savings over three years was \$2.2 million.
- **Reduced procurement costs.** Using the intelligence and collaboration tools in Office 365, Advocate had greater visibility into spending and sourcing across the entire organization. This resulted in harmonized sourcing as well as project prioritization. The risk-adjusted sourcing savings over three years was \$3.0 million.
- **Cloud versus on-premises technology savings.** In addition to quantified business transformation benefits, Advocate saved money by moving from on-premises to cloud-based Microsoft solutions. This delivered IT infrastructure and labor savings. Furthermore, the organization eliminated legacy solutions that were expensive and did not fully meet the business requirements. The risk-adjusted savings over three years was \$6.6 million.
- **Better patient outcomes.** At the end of the day, the most important thing for Advocate is to send patients home healthy. Through better patient care coordination, better access to nonpatient information such as standards of care policies, and tracking of outcomes, patient care has improved. This benefit was non-quantified for this study. Additionally, the 22,000 clinical workers save time by streamlining processes such as patient transfers and through improved access to all of the information they needed regardless of location: patient room, nursing station, etc. Because the time savings varies so widely by role and location, there was no simple formula to apply across all clinical workers. Therefore, this benefit was also non-quantified in the study.
- **Easier IT security and HIPAA compliance.** Moving to Office 365 has made it easier and less expensive for Advocate to keep in place the necessary IT security, such as document and email security. The financial impact of this is captured in the technology savings category described above. Office 365 also made Health Insurance Portability and Accountability Act (HIPAA) compliance easier through better IT security and monitoring. HIPAA compliance benefits were not quantified in the study.

While collaboration, mobility, intelligence, and trust can each contribute to the above benefits being achieved, Forrester identified the areas that had the greatest impact on each benefit. Figure 2 below shows these intersection points as well as a fifth area, technology, which includes IT savings from moving to the cloud.

FIGURE 2

## Benefits Delivered Through Digital Transformation

**Reinventing Productivity For The Digital Transformation**







Cited Benefits	Collaboration	Mobility	Intelligence	Trust	Technology
Reduced knowledge worker administrative effort	✓	✓		✓	
Less travel between facilities	✓	✓		✓	
Reduced procurement costs	✓		✓		
Cloud versus on-premises technology savings				✓	✓
Increased clinical worker patient care time (non-quantified)	✓	✓		✓	
Better patient outcomes (non-quantified)	✓	✓	✓	✓	
Easier IT security and HIPAA compliance (non-quantified)				✓	✓

Source: Forrester Research, Inc.

› **Costs.** For costs, Forrester used a combination of Advocate's actual costs and estimates of what a company implementing Office 365 today should expect to spend. This includes the following risk-adjusted costs:

- **Internal implementation labor.** For this model, Office 365 was implemented over two phases. The first involved rolling out all solution components and beginning the journey to set up more than 5,000 Microsoft SharePoint Online sites. Phase 2 represents the ongoing process to deploy SharePoint Online. (In reality, Advocate had more phases, partially because of its early adopter status.) In total, this lasted 15 months, and 16.75 FTEs were involved, representing IT and the business. The total risk-adjusted cost was \$1.8 million.
- **Professional services.** Advocate used professional services throughout the implementation. Most the work was around email migration and SharePoint Online. The risk-adjusted cost was \$6.2 million.
- **Training.** Training was needed for SharePoint Online site administrators, IT staff, and end users who were new to SharePoint Online and other Microsoft solutions. End user training content was created and provided by internal trainers. The risk-adjusted training costs were \$793 thousand.
- **Ongoing Office 365 management.** Managing the cloud solutions is significantly less work than the equivalent on-premises solution would be, and this is reflected in the Benefits section of the study. There is still a need for IT staff to deal with provisioning, testing new Office 365 features being released, user administration, etc., primarily for Microsoft Exchange Online and SharePoint Online. The team of seven FTEs resulted in a risk-adjusted cost of \$2.1 million.
- **Office 365 licenses.** For this model, Forrester included Office 365 E3 licenses for all 37,000 associates in order to avoid excessive complexity. In reality, there are some users who have recently started using Microsoft Power BI, which would result in higher license costs, and most of the clinical worker users only need an Office 365 kiosk license which costs less. Additionally, the E3 license monthly list price of \$20 per user was used. The total risk-adjusted license cost over three years was \$26.6 million.

- **Additional bandwidth.** As Office 365 is deployed in the cloud, there may be a greater need for internet connectivity. For Advocate, it was estimated that an additional \$15,000 per month was spent on bandwidth. The risk-adjusted cost over the life of the study was \$709 thousand.

## Disclosures

The reader should be aware of the following:

- › The study is commissioned by Microsoft and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.
- › Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Microsoft Office 365.
- › 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.

## TEI Framework And Methodology

### INTRODUCTION

From the information provided in the interviews, Forrester has constructed a Total Economic Impact (TEI) framework for those organizations considering implementing Microsoft Office 365. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision, to help organizations understand how to take advantage of specific benefits, reduce costs, and improve the overall business goals.

### APPROACH AND METHODOLOGY

Forrester took a multistep approach to evaluate the impact that Microsoft Office 365 can have on an organization (see Figure 3). Specifically, we:

- › Interviewed Microsoft marketing, sales, and product personnel, along with Forrester analysts, to gather data relative to Office 365 and the marketplace for productivity solutions.
- › Conducted six interviews within one organization currently using Office 365 to obtain data with respect to costs, benefits, and risks.
- › Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interviews.
- › Risk-adjusted the financial model based on issues and concerns the interviewed organizations highlighted in interviews. Risk adjustment is a key part of the TEI methodology. While interviewed organizations provided cost and benefit estimates, some categories included a broad range of responses or had a number of outside forces that might have affected the results. For that reason, some cost and benefit totals have been risk-adjusted and are detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling Office 365 services: benefits, costs, flexibility, and risks.

Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

**FIGURE 3**  
TEI Approach



Source: Forrester Research, Inc.

## Analysis

### ADVOCATE HEALTH CARE

For this study, Forrester conducted a total of six interviews with associates from Advocate Health Care. Advocate is the largest health system in Illinois. It offers more than 400 sites of care, with 12 acute care hospitals, including a children's hospital with two campuses and the state's largest integrated children's network. There are more than 37,000 associates, including 6,300 affiliated physicians and 11,000 nurses.

#### Interview Highlights

In interviews with six individuals who are responsible for field IT, medical information systems, physician partnerships, intranet solutions, and analytics, Forrester could build out a full picture of why Advocate moved to Office 365 and its experiences with the solution.

#### Situation

As a fast-growing healthcare organization, Advocate continually sought opportunities to improve how it operates and to better serve patients. Some of what Forrester heard includes:

- › “At the time, we were running an outdated email system.”
- › “We knew that our total cost of ownership (TCO) was too high to build an on-premises solution. By moving to Office 365 we knew we could save more than \$1 million per year compared to an on-premises solution.”
- › “We really needed to get to central repositories of information instead of people emailing documents, putting them on thumb drives, etc.”
- › “We were growing through mergers and acquisitions. We felt we could more easily complete our M&A roadmap by moving to Office 365 due to Exchange market penetration. It is easier to integrate new users and facilities and reduced the amount of training required.”

Advocate selected Office 365 as its productivity suite solution for a variety of reasons. This included familiarity with solutions that it already had, e.g., Microsoft Word and Excel, the ability to move infrastructure to the cloud, and long-term strategic fit.

#### Results

At the highest level, Advocate achieved the following results:

- › **Users became significantly more efficient.** Office 365 has streamlined processes and made users more effective by providing them access to information and colleagues whenever and wherever they need it. “We have empowered the associates to be more productive without even thinking about it.”
- › **Cross-organization coordination and transparency improved.** Advocate is very complex in terms of number of facilities, types of users, and the services it provides. Visibility across all parts of the organization greatly improved. This allows for the sharing of best practices, consolidating purchasing and projects, and mining information for key insights. “Having greater transparency and bringing everyone together facilitates much better decision-making, and Office 365 helps achieve those aims.”
- › **IT costs were reduced.** In addition to all the business improvements, Advocate experienced substantial hard savings across multiple IT departments. This includes spending on hardware and software and avoidance of hiring additional IT resources. Over the years, savings increased as Advocate became more efficient. “We’ve gone through two iterations, and each year we are saving more in staffing, infrastructure, and licensing.”

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*“There was a broad sense of dissatisfaction with the tools we had before Office 365.”*

~ Advocate Health Care

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*“We looked at where various IT vendors were going. Microsoft had the most robust vision and road map.”*

~ Advocate Health Care

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## BENEFITS

Forrester looked at how Advocate benefits from Office 365 across the four Microsoft defined areas of collaboration, mobility, intelligence, and trust — Microsoft calls this “reinventing productivity for the digital transformation.” Additionally, we looked at how technology costs are lowered by moving from an on-premises to a cloud solution.

**FIGURE 4**

### Reinventing Productivity For The Digital Transformation



**Collaboration**



**Mobility**



**Intelligence**



**Trust**

Source: Forrester, Inc.

The Benefits section will explore Advocate’s outcomes in each of the four productivity areas in broad terms and share specific examples from Advocate. It will then provide quantified examples in detailed tables that show how each benefit was calculated. The objective is that readers can apply their own assumptions to this logic to understand the benefits and costs associated with moving to Office 365.

#### *Collaboration*

Office 365 enables employees to work better together, both efficiently and effectively. This is achieved by using real-time communication tools such as Skype for Business and Yammer, the ability to see when colleagues are available in real time, and better content discovery and sharing with SharePoint Online. Improved collaboration was the area of greatest benefit Advocate experienced. The communication and collaboration tools in Office 365 transformed how people work and how the organization operates. Because Advocate has so many different locations, collaboration and coordination were historically very difficult. Now, it is easy for people in all roles to collaborate.

Advocate classifies associates into two broad categories — “knowledge workers” and “clinical workers.” Knowledge workers include all the corporate functions such as finance, HR, and IT, as well as managers of clinical staff. In total, there are around 15,000 knowledge workers. There are around 22,000 clinical workers who provide frontline patient care, half of whom are nurses.

Through six interviews with Advocate, Forrester heard the following examples of improved collaboration:

- › “We used to schedule meetings using a spreadsheet to coordinate sometimes as many as 10 calendars. Now we can get people together quickly and easily.”
- › “We leverage SharePoint Online in so many ways, each of which has helped a lot — intranet, project management, document management.”
- › “When Lync was rebranded to Skype for Business, we saw a 51% jump in usage — from 11,387 sessions per quarter to 17,193. This has freed up more of people’s time.”

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*“Not having to search emails for documents is a huge productivity gain. Both the asker and respondent can wrap up the communication faster and keep moving.”*

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~ Advocate Health Care

- › “One of the challenges that every hospital has is how to transfer patients from one department to another, for example, from the ER to the ICU. In the past, a nurse would have to walk down to the ER to speak with the ER nurse and the patient. This is very time-consuming. We are now using Skype for Business for this to improve efficiencies. The nurse can get all the nonverbal communication she needs without spending 20 minutes walking around.”
- › “We are using Skype for Business extensively. It increases my ability to get something resolved quickly. It’s an efficient way for me to fire off actions without disrupting a meeting. For example, if I need a quick clarification from the CFO, I can find him online wherever he is.”
- › “IT faced challenges collaborating beyond the four walls of a hospital and supporting 37,000 associates. The IT organization is now much more efficient.”
- › “Office 365 is a much better collaborative tool than sending emails and having meetings.”

### Mobility

Office 365 improves mobile workers’ effectiveness when on the go. Mobile workers have easy, secure access to all of their information from any place and at any time. Applications like Word Online and SharePoint Online can be used from mobile phones and tablets. A worker’s ability to be fully productive while on the go is critical for a hospital network like Advocate, where the definition of mobile extends beyond traveling between different geographic locations. At Advocate, patient care providers are always mobile within a single hospital. For example, nurses spend the entire day visiting different patient rooms and going to consult with doctors and other healthcare providers.

With Office 365, Advocate’s knowledge and clinical workers can do more without additional travel between and within facilities. And when they are on the go, having access to all relevant files, calendars, emails, and SharePoint Online sites means they can do their job quickly and well. Some specific examples that Forrester heard from Advocate include:

- › “Our workforce is very mobile. Before Office 365 we couldn’t even get email or a calendar on a mobile phone. Now people are always on email no matter where they are. There is also Skype for Business, Yammer, and SharePoint Online on the phone. From a mobility standpoint, it has been huge.”
- › “The majority of clinical workers are very mobile. The bulk of users are clinicians and nurses who are going all over the place. They mainly share workstations, and a nurse will log in and out of PCs 20 to 30 times over the course of a day. With Office 365, they have easy access to everything wherever they are.”
- › “We use Skype for Business every day from our computers and phones. We do virtual meetings with webcams. Most IT associates are benefiting from this. At my hospital alone, there are 25 of us who are saving trips of 30 minutes to 2 hours to other locations. We are also saving at least 1 hour a day walking around the hospital.”

### Intelligence

Office 365 improves organizational intelligence by providing tools like Excel Online and Power BI to quickly analyze vast amounts of data. The findings can then easily be shared with everyone on SharePoint Online. Intelligence has been an area of huge benefit for Advocate. Associates who synthesize data are now able to do it much faster, and the insights gleaned from better access to information and visibility across the organization deliver hard savings. A small number of employees are starting to work with Power BI, which is delivering new, added benefits. All the interviewees shared examples of how they and Advocate have benefited, including:

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*“The value of Office 365 is that when I go someplace else, I still have access to all the information I need. I’m more efficient by far.”*

~ Advocate Health Care

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- › “We built a new, highly automated project approval process in SharePoint Online. One of the biggest advantages is that there is a central queue where everyone can go to see all requests. This visibility has streamlined the process, and requesters can look for synergies across the organization.”
- › “Advocate runs more than 1,000 applications. We are now able to look across all hospitals to see who is running what. We coordinate this via SharePoint Online. Previously we would mail around spreadsheets, which did not work very well. If one hospital wants to implement a new 3D ultrasound system, for example, we can point out that other hospitals already have a similar system and suggest they use the existing one. This saves us money.”
- › “Previously we were using [another vendor’s] solution for business intelligence. The information couldn’t easily be consumed by users who needed it. Now we use SharePoint Online for the business intelligence presentation layer. In the near future, we want to take all of this to the next level and create more meaningful dashboards in Power BI.”
- › “My team is more advanced and focused on data. Being able to more easily access information and make it available has been very good for us. We don’t need to get someone to write something in JavaScript for us anymore. That layer of complexity has gone away, and users can now present their own data.”
- › “We are better at finding trends now.”
- › “A local medical director can now go into SharePoint Online and see how different physicians are charging for procedures. This helps to identify miscoding, which saves us millions of dollars a year.”
- › “We post a lot of information on SharePoint Online so that there is a common source of truth. This is used for our monthly operations reviews and helps us make better decisions.”

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*“Our team is starting to use Power BI. Everyone is very excited by it even though we are early on the journey.”*

~ Advocate Health Care

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A very specific area in which Advocate has seen benefits is improved patient care and outcomes. Having access to the necessary nonpatient information enables associates to make better decisions. Additionally, Advocate’s 22,000 clinical workers could spend more time on patient care by reducing the time spent on administrative activities. This is mainly from having easy access to information, such as standard of care best practices; being able to communicate and consult in real time with other patient caregivers; and reducing travel around the hospital. Some of what Forrester heard for this area includes:

- › “There has been a lot of success from combining Power BI and SharePoint Online. Nurse managers survey patients using SharePoint Online to determine patient satisfaction while they are in the hospital. It is also used to track hand washing compliance and identify where language carts need to be. It helps ensure that the right resources are at the right hospital.”
- › “The fact that the physician can use Skype for Business to have face-to-face consultations with family members, other clinicians, and the patient’s GP while still sitting in the ICU helps with relationships. It reduces errors if the family members better understand what is required of them. Skype for Business also makes multidisciplinary rounds easier, reduces costs, and gets patients out of the ICU faster.”
- › “Our clinical workers now have better access to policies and procedures. If there is a change in nursing practices, everyone has immediate access to it. This contributes to better patient care.”
- › “Pretty much anyone who has to update a document benefits from Office 365. Think about how much time they would spend going through emails to find the correct version, having to do rework because they used the wrong version, and synthesize feedback from multiple people. Now they just go to the central document repository. They are each easily saving 3 hours a week.”

## Trust

Trust within the Office 365 context means better IT security and compliance with a wide range of policies. This can be achieved at lower costs because the infrastructure is in the cloud and solutions like Office 365 Advanced Threat Protection protect against zero-day threats that a company would likely have no defense against.

Because of Office 365, it is easier and less expensive for Advocate to have the level of IT security that it requires. Additionally, having information available in secure repositories demonstrates a commitment to the privacy and confidentiality of patients. Some examples from Advocate include:

- › “Half of my team is very mobile, and everyone is much more productive when traveling. I don’t think any more about what information I will need and email it to myself or put everything on a thumb drive. That eliminates a lot of risk.”
- › “A very recent example of how things improved is Advanced Threat Protection (ATP). A breach would create significant problems for any healthcare organization. With zero-day attacks, there is no virus detection possible. Microsoft helps to eliminate this risk. Ultimately, it improves HIPAA compliance.”

## Quantified Benefits

From all the benefits discussed above, Forrester could quantify four of them. The benefits that Advocate experienced and Forrester could quantify included:

- › Reduced knowledge worker administrative effort.
- › Less travel between facilities.
- › Reduced procurement costs.
- › Cloud versus on-premises IT savings.

These benefits are achieved through a combination of collaboration, mobility, intelligence, and trust, as well as savings associated with moving technology into the cloud. Figure 5 shows the key linkages that Forrester identified.

**FIGURE 5**

### Quantified Benefits Mapping

**Reinventing Productivity For The Digital Transformation**



Quantified Benefits	Collaboration	Mobility	Intelligence	Trust	Technology
Reduced knowledge worker administrative effort	☑	☑		☑	
Less travel between facilities	☑	☑		☑	
Reduced procurement costs	☑		☑		
Cloud versus on-premises technology savings				☑	☑

Source: Forrester Research, Inc.



### Reduced Knowledge Worker Administrative Effort

As discussed above, Advocate’s knowledge workers are now much more efficient. Many factors contributed to this, such as faster scheduling of meetings, better access to information and people, and better coordination with colleagues. Advocate said, “Across the organization, each knowledge worker is saving 2 to 3 hours per week in administrative effort.” This means that they can get done all the value-add work needed without working extra hours that would result in higher overall labor costs.

For the ROI analysis, Forrester included 1 hour per week in time savings in the first year of the study. This increases to 2 hours per week as users become more familiar with these new ways of working and more information is available on SharePoint Online. Because not all time savings result in additional work being completed, this benefit was cut by 50%.

Forrester further risk-reduced this benefit by 15% since the level of gains varies across organizations. The risk-adjusted total benefit over the three years was \$53,868,750.

**TABLE 1**  
**Reduced Knowledge Worker Administrative Effort**

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
A1	Number of knowledge workers			15,000	15,000	15,000
A2	Hourly fully burdened cost			\$32.50	\$32.50	\$32.50
A3	Weekly reduced administrative effort (hours)			1	2	2
A4	Weeks per year			52	52	52
A5	Percent of benefit realized			50%	50%	50%
At	Decreased knowledge worker administrative effort	$A1 \times A2 \times A3 \times A4 \times A5$		\$12,675,000	\$25,350,000	\$25,350,000
	Risk adjustment	↓15%				
<b>Atr</b>	<b>Decreased knowledge worker administrative effort (risk-adjusted)</b>			<b>\$10,773,750</b>	<b>\$21,547,500</b>	<b>\$21,547,500</b>

Source: Forrester Research, Inc.



### Less Travel Between Facilities

Many knowledge workers and clinical workers travel between facilities. In particular, interviewees discussed how IT, HR, and leadership resources were most likely to travel. One interviewee said that with Office 365: “Our team does a lot less local travel. Upwards of 25% less, and we were previously making five trips per month.” A subset of clinical workers is traveling between locations on a regular basis for training, coordination meetings, etc. One interviewee said that these workers were “avoiding travel for five to 10 meetings a month to different locations” with Office 365.

For the financial analysis, Forrester assumed that 1,000 associates have been able to reduce the number of trips between facilities. The actual number is likely higher, but it was difficult to ascertain an accurate count. It was further assumed that each of these associates is making two fewer trips per month with an average travel time of 1.5 hours. The benefit includes the downtime while driving as well as mileage reimbursement. The total benefit was reduced by 50% since not all productivity gains translate into additional work being completed.

Forrester further risk-reduced this benefit by 15%. The risk-adjusted total benefit over the three years was \$2,201,288.

**TABLE 2**  
**Less Travel Between Facilities**

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
B1	Number of workers affected		1,000	1,000	1,000
B2	Number of eliminated trips	2*12 months	24	24	24
B3	Average travel time (hours)		1.5	1.5	1.5
B4	Total reduced travel time	B1*B2*B3	36,000	36,000	36,000
B5	Average fully burdened salary	Average of clinical and knowledge workers	\$40.625	\$40.625	\$40.625
B6	Percent of benefit realized		50%	50%	50%
B7	Eliminated travel time labor	B4*B5*B6	\$731,250	\$731,250	\$731,250
B8	Eliminated travel mileage reimbursement	B1*B2*10 miles*\$0.55	\$132,000	\$132,000	\$132,000
Bt	Less travel between facilities	B7+B8	\$863,250	\$863,250	\$863,250
	Risk adjustment	↓15%			
<b>Btr</b>	<b>Less travel between facilities (risk-adjusted)</b>		<b>\$733,763</b>	<b>\$733,763</b>	<b>\$733,763</b>

Source: Forrester Research, Inc.



### Reduced Procurement Costs

One example of how Advocate has benefited from improved intelligence is reducing procurement costs through better visibility and analytics. “The supply chain folks have created a dashboard to help them see when someone is picking products outside of the standard ones for Advocate. Real-time data is being provided to operations leaders at each hospital, and they can make instant decisions on where to save money. This is saving us between \$1.2 and \$1.4 million per year.”

Forrester included this specific example in the financial analysis. Reduced savings were included in the first year of the study because the systems and policies were being implemented. Forrester risk-reduced this benefit by 10% because it may not be fully applicable at readers’ organizations. Readers are encouraged to think about ways their organization can financially benefit from having real-time access to information that can easily be shared with everyone who needs it. The risk-adjusted total benefit over the three years was \$3,015,000.

**TABLE 3**  
**Reduced Procurement Costs**

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
C1	Reduced procurement costs		\$750,000	\$1,300,000	\$1,300,000
Ct	Reduced procurement costs	= C1	\$750,000	\$1,300,000	\$1,300,000
	Risk adjustment	↓10%			
<b>Ctr</b>	<b>Reduced procurement costs (risk-adjusted)</b>		<b>\$675,000</b>	<b>\$1,170,000</b>	<b>\$1,170,000</b>

Source: Forrester Research, Inc.



### Cloud Versus On-Premises Technology Savings

The last area Forrester looked at sits partially outside the four Microsoft productivity areas. We looked at the savings associated with using cloud technologies versus building out and maintaining a comparable on-premises solution. This includes purchasing and maintaining physical infrastructure, eliminating non-Microsoft solutions that Office 365 now handles, and maintaining on-premises infrastructure.

Advocate shared the following examples:

- › “Back in 2009, we had three IT resources supporting 20,000 associates for our previous email solution. We now have 37,000 associates and still have three resources managing the technology plus a lot of new technologies. If everything was on-premises we would need 20 to 25 FTEs to support it.”
- › “It allowed us to better deploy our IT field support organization without adding people or work.”
- › “Since Office 365, the IT team has more time to devote to key organizational goals. Service levels have gone up, and we freed up resources to work on other projects.”
- › “We are saving \$750,000 a year compared to how we previously were buying Microsoft Office licenses.”
- › “Our previous intranet solution lacked the capabilities and advantages of SharePoint Online. Eliminating the other solution saves us \$400,000 in infrastructure every four years plus the annual maintenance.”

For the quantified benefits, Forrester included the examples given above. In reality, the actual savings are probably considerably higher for avoided on-premises infrastructure costs, since no estimate for Exchange Online and other solutions was available. The labor savings was phased in over time as the Office 365 solution areas increased. The IT savings were risk-adjusted down only 5% since there is good certainty around this benefit. The risk-adjusted total benefit over the three years was \$6,671,375.

**TABLE 4**  
**Cloud Versus On-Premises Technology Savings**

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Avoided on-premises SharePoint Online infrastructure	\$400,000 (Initial) + 15% maintenance	\$400,000	\$60,000	\$60,000	\$60,000
D2	Reduced Microsoft licenses			\$750,000	\$750,000	\$750,000
D3	Avoided IT team growth (FTEs)			8	15	20
D4	Reduced IT team size	D3*\$97,500 fully burdened cost		\$780,000	\$1,462,500	\$1,950,000
Dt	Cloud versus on-premises technology savings	D1+D2+D4	\$400,000	\$1,590,000	\$2,272,500	\$2,760,000
	Risk adjustment	↓5%				
<b>Dtr</b>	<b>Cloud versus on-premises technology savings (risk-adjusted)</b>		<b>\$380,000</b>	<b>\$1,510,500</b>	<b>\$2,158,875</b>	<b>\$2,622,000</b>

Source: Forrester Research, Inc.

### Total Benefits

Table 5 shows the total of all benefits across the five areas listed above, as well as present values (PVs) discounted at 10%. Over three years, the interviewed organization expects risk-adjusted total benefits to be a PV of more than \$53.5 million.

**TABLE 5**  
**Total Benefits (Risk-Adjusted)**

Ref.	Benefit Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Atr	Reduced knowledge worker administrative effort	\$0	\$10,773,750	\$21,547,500	\$21,547,500	\$53,868,750	\$43,791,125
Btr	Less travel between facilities	\$0	\$733,763	\$733,763	\$733,763	\$2,201,288	\$1,824,759
Ctr	Reduced procurement costs	\$0	\$675,000	\$1,170,000	\$1,170,000	\$3,015,000	\$2,459,617
Dtr	Cloud versus on-premises technology savings	\$380,000	\$1,510,500	\$2,158,875	\$2,622,000	\$6,671,375	\$5,507,323
	<b>Total benefits (risk-adjusted)</b>	<b>\$380,000</b>	<b>\$13,693,013</b>	<b>\$25,610,138</b>	<b>\$26,073,263</b>	<b>\$65,756,413</b>	<b>\$53,582,824</b>

Source: Forrester Research, Inc.

## COSTS

For the costs section, Forrester used a combination of costs incurred by Advocate and estimates of what a new customer today could expect to pay, since Office 365 has evolved since Advocate's initial deployment. This was done because Advocate was an early adopter, and some of the features of Office 365 were rolled out in subsequent phases because they were not originally available. The costs include:

- › Internal implementation costs.
- › Professional services.
- › Training.
- › Ongoing Office 365 management.
- › Office 365 licenses.
- › Additional bandwidth.

These represent the mix of internal and external costs experienced by the interviewed organization for initial planning, implementation, and ongoing management associated with the solution.



### Internal Implementation Costs

For this model, the deployment was broken into two phases. The first phase consisted of deploying the Office 365 solutions — Exchange Online, Office 365 ProPlus, Skype for Business, Yammer, OneDrive for Business, and SharePoint Online. During this phase the process of creating approximately 5,000 SharePoint Online sites and workflows began. The SharePoint Online migration work was completed in a second phase that continued on immediately after the first.

Together, this effort lasted 15 months. The internal team consisted of 16.75 full-time equivalents (FTEs) — 10 IT resources and 57 business resources, all working 25% on the deployment. An average salary across all roles was used in the calculation.

This cost was risk-adjusted up 5% to allow for possible overruns. The risk-adjusted cost of software over the two phases was \$1,786,230.

**TABLE 6**

**Internal Implementation Costs**

Ref.	Metric	Calculation	Initial	Year 1
E1	Number of months		9	6
E2	Number of FTEs		16.75	16.75
E3	Blended fully burdened monthly cost	\$81,250/12 months	\$6,771	\$6,771
Et	Internal implementation labor	$E1 * E2 * E3$	\$1,020,703	\$680,469
	Risk adjustment	↑5%		
<b>Etr</b>	<b>Internal implementation labor (risk-adjusted)</b>		<b>\$1,071,738</b>	<b>\$714,492</b>

Source: Forrester Research, Inc.



### Professional Services

Organizations typically make extensive use of professional services when deploying Office 365. This is especially true for the SharePoint Online and communication solutions. For the financial analysis, it was assumed that a company deploying Office 365 today would use a professional services team of 15 FTEs for the entire 15 months. A blended rate of \$150 per hour was used.

This cost was risk-adjusted up 5% to allow for possible overruns. The risk-adjusted cost was \$6,237,000.

**TABLE 7**  
**Professional Services**

Ref.	Metric	Calculation	Initial	Year 1
F1	Number of months	= E1	9	6
F2	Number of consultants		15	15
F3	Monthly cost per consultant	22 workdays*8 hours* \$150	26,400	26,400
Ft	Professional services	F1*F2*F3	\$3,564,000	\$2,376,000
	Risk adjustment	↑5%		
<b>Ftr</b>	<b>Professional services (risk-adjusted)</b>		<b>\$3,742,200</b>	<b>\$2,494,800</b>

Source: Forrester Research, Inc.



### Training

Advocate trained 75 SharePoint Online site administrators. There is also a seven-person IT team that is responsible for ongoing management of Office 365 that needed training. Forrester assumed that an organization of this size would have three internal trainers creating training content and providing training to end users for any completely new solutions, e.g., SharePoint Online being added for the first time.

This cost was risk-adjusted up 5% since the amount of training required will vary from one organization to the next. The risk-adjusted cost over three years was \$793,643.

**TABLE 8**  
**Training**

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
G1	SharePoint Online site administrators training	75 site administrators*\$300	\$22,500			
G2	IT staff training	7 staff*\$300	\$2,100			
G3	Ongoing trainers	3 FTEs*\$65,000 (initial period less than whole year)	146,250	195,000	\$195,000	\$195,000
Gt	Training	G1+G2+G3	\$170,850	\$195,000	\$195,000	\$195,000
	Risk adjustment	↑5%				
<b>Gtr</b>	<b>Training (risk-adjusted)</b>		<b>\$179,393</b>	<b>\$204,750</b>	<b>\$204,750</b>	<b>\$204,750</b>

Source: Forrester Research, Inc.



### Ongoing Office 365 Management

The benefit of reduced effort to support these solutions was covered in the Benefits section. Advocate still has seven people in the IT organization responsible for the ongoing management of Office 365, primarily Exchange Online and SharePoint Online. Their responsibilities include testing and deploying new features, provisioning, testing performance, and dealing with new SharePoint Online sites.

This cost was risk-adjusted up 5% because some organizations may need more ongoing management based on the Office 365 solutions deployed and the IT team's efficiency. The risk-adjusted cost over the three years was \$2,149,875.

TABLE 9

Ongoing Office 365 Management

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
H1	Number of IT FTEs		7	7	7
H2	Annual fully burdened salary		\$97,500	\$97,500	\$97,500
Ht	Ongoing Office 365 management	H1*H2	\$682,500	\$682,500	\$682,500
	Risk adjustment	↑5%			
<b>Htr</b>	<b>Ongoing Office 365 management (risk-adjusted)</b>		<b>\$716,625</b>	<b>\$716,625</b>	<b>\$716,625</b>

Source: Forrester Research, Inc.



### Office 365 Licenses

It was assumed that all 37,000 employees require Office 365 licenses and that all of them are using the E3 license. This was done to simplify the financial example and to make it more applicable to readers' organizations that are not in the healthcare industry. If reality, most clinical workers at Advocate are using an Office 365 kiosk plan which costs less, and some employees may not use Office 365 at all, e.g., cafeteria workers. Additionally, some users are starting to use Power BI, which requires a different license. Forrester used the E3 list price of \$20 per user per month in the calculation. The reader is encouraged to work with Microsoft to understand the mix and quantity of licenses required as well as company-specific per-license pricing.

Since list price was used, there was no risk adjustment applied. The total cost over the three years was \$26,640,000.

**TABLE 10**  
**Office 365 Licenses**

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
I1	Number of users		37,000	37,000	37,000
I2	Office 365 E3 license cost	\$20*12 months	\$240	\$240	\$240
It	Office 365 licenses	I1*I2	\$8,880,000	\$8,880,000	\$8,880,000
	Risk adjustment	0%			
<b>Itr</b>	<b>Office 365 licenses (risk-adjusted)</b>		<b>\$8,880,000</b>	<b>\$8,880,000</b>	<b>\$8,880,000</b>

Source: Forrester Research, Inc.



### Additional Bandwidth

Forrester assumed that a company adding Office 365 would need additional bandwidth, especially for SharePoint Online, video calls using Skype for Business, and OneDrive for Business. For an organization the size of Advocate, we estimated that this would cost \$15,000 per month.

This cost was risk-adjusted up 5% because some organizations may require more bandwidth based on how they are using Office 365 and how much bandwidth they had before. The risk-adjusted cost over the three years was \$708,750.

**TABLE 11**  
**Additional Bandwidth**

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
J1	Additional bandwidth	\$15,000 per month (initial less than whole year)	\$135,000	\$180,000	\$180,000	\$180,000
Jt	Additional bandwidth	= J1	\$135,000	\$180,000	\$180,000	\$180,000
	Risk adjustment	↑5%				
<b>Jtr</b>	<b>Additional bandwidth (risk-adjusted)</b>		<b>\$141,750</b>	<b>\$189,000</b>	<b>\$189,000</b>	<b>\$189,000</b>

Source: Forrester Research, Inc.

### Total Costs

Table 12 shows the total of all costs as well as associated present values (PVs), discounted at 10%. Over three years, the interviewed organization expects total costs to be a PV of a little less than \$33.0 million.

**TABLE 12**  
**Total Costs (Risk-Adjusted)**

Ref.	Cost Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Etr	Internal implementation labor	(\$1,071,738)	(\$714,492)	\$0	\$0	(\$1,786,230)	(\$1,721,277)
Ftr	Professional services	\$3,742,200	\$2,494,800	\$0	\$0	\$6,237,000	\$6,010,200
Gtr	Training	\$179,393	\$204,750	\$204,750	\$204,750	\$793,643	\$688,575
Htr	Ongoing Office 365 management	\$0	\$716,625	\$716,625	\$716,625	\$2,149,875	\$1,782,140
Itr	Office 365 licenses	\$0	\$8,880,000	\$8,880,000	\$8,880,000	\$26,640,000	\$22,083,246
Jtr	Additional bandwidth	\$141,750	\$189,000	\$189,000	\$189,000	\$708,750	\$611,765
	<b>Total costs (risk-adjusted)</b>	<b>(\$5,135,081)</b>	<b>(\$13,199,667)</b>	<b>(\$9,990,375)</b>	<b>(\$9,990,375)</b>	<b>(\$38,315,498)</b>	<b>(\$32,897,203)</b>

Source: Forrester Research, Inc.

## FLEXIBILITY

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for some future additional investment. This provides an organization with the “right” or the ability to engage in future initiatives but not the obligation to do so. There are multiple scenarios in which a customer might choose to implement Office 365 and later realize additional uses and business opportunities. Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

Office 365 makes organizations more agile. Users can quickly move from one task to the next since they have easy access to all of their information. Additionally, companies can more quickly launch new products and initiatives since employees can effectively collaborate. There are also future opportunities and benefits that arise as new Office 365 features are launched. For example, Advocate is very interested in making wider use of Power BI and Microsoft MyAnalytics. None of these future flexibility benefits were included in the ROI analysis.

## RISKS

Forrester defines two types of risk associated with this analysis: “implementation risk” and “impact risk.” Implementation risk is the risk that a proposed investment in Office 365 may deviate from the original or expected requirements, resulting in higher costs than anticipated. Impact risk refers to the risk that the business or technology needs of the organization may not be met by the investment in Office 365, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

Quantitatively capturing implementation risk and impact risk by directly adjusting the financial estimates results provides more meaningful and accurate estimates and a more accurate projection of the ROI. In general, risks affect costs by raising

the original estimates, and they affect benefits by reducing the original estimates. The risk-adjusted numbers should be taken as “realistic” expectations since they represent the expected values considering risk.

The main risks that Advocate felt may apply were storing data outside of its own data centers and user adoption. Advocate did an extensive review of Microsoft data storage security policies and ensured that all Advocate data remained in data centers in the US. In addition, Advocate required a BAA with Microsoft as part of the contract with Office 365.

Table 13 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the interviewed organization. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

**TABLE 13**

**Benefit And Cost Risk Adjustments**

<b>Benefits</b>	<b>Adjustment</b>
Decreased knowledge worker administrative effort	↓ 15%
Less travel between facilities	↓ 15%
Reduced procurement costs	↓ 10%
Cloud versus on-premises technology savings	↓ 5%
<b>Costs</b>	<b>Adjustment</b>
Internal implementation labor	↑ 5%
Professional services	↑ 5%
Training	↑ 5%
Ongoing Office 365 management	↑ 5%
Office 365 licenses	↑ 0%
Additional bandwidth	↑ 5%

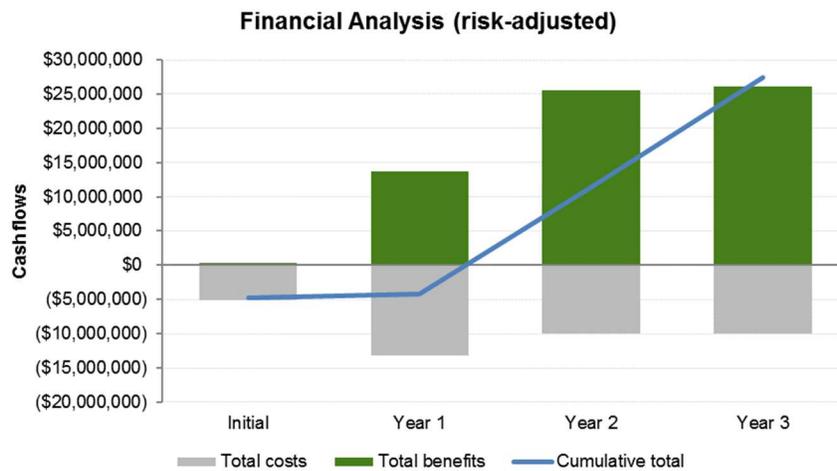
Source: Forrester Research, Inc.

## Financial Summary

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, IRR, NPV, and payback period for the interviewed organization's investment in Office 365.

Table 14 below shows the risk-adjusted ROI, IRR, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 13 in the Risks section to the unadjusted results in each relevant cost and benefit section.

**FIGURE 6**  
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

**TABLE 14**  
Cash Flow (Risk-Adjusted)

Summary	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	(\$5,135,081)	(\$13,199,667)	(\$9,990,375)	(\$9,990,375)	(\$38,315,498)	(\$32,897,203)
Total benefits	\$380,000	\$37,395,263	\$380,000	\$13,693,013	\$25,610,138	\$26,073,263
<b>Total</b>	<b>(\$4,563,128)</b>	<b>\$24,323,564</b>	<b>(\$4,755,081)</b>	<b>\$493,345</b>	<b>\$15,619,763</b>	<b>\$16,082,888</b>
<b>ROI / IRR</b>	<b>63% / 124%</b>					
<b>Payback period (months)</b>	<b>Fifteen months</b>					

Source: Forrester Research, Inc.

## Microsoft Office 365: Overview

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

Office 365 is the same Office you already know and use every day — and then some. Because Office 365 is powered by the cloud, you can get to your applications and files from virtually anywhere, such as a PC, Mac, and select mobile devices, and they're always up to date. Same goes for updates to features; you get them automatically. Business-class email and calendaring put you in sync and help you avoid communication glitches. With business-class email and shared calendars that you can get to from virtually anywhere, people stay in sync and on schedule.

Specific feature-related benefits include:

- › **Online conferencing puts everyone on the same page.** With online conferencing, distance really isn't an issue. Need to get everyone together? Host an online meeting complete with real-time note-taking and screen sharing.
- › **Extend your reach with simple, more secure file sharing.** Office 365 makes it easy to more securely share files with coworkers, customers, and partners. Work together on documents that are always current and accessible from virtually anywhere.
- › **Build your online presence, minus the hosting fees.** More effectively market your business with a public website that's easy to set up and update. It's DIY with online tools and absolutely zero hosting fees.
- › **One familiar experience, even on the go.** Office 365 mobile apps let you view and edit your Microsoft PowerPoint, Word, and Excel files and more on your mobile device. And when you get back to your desk, there they are, with content and formatting intact.
- › **Create docs from any browser.** With the touch-friendly applications of Office Online, you can create, edit, and share your Office files from any browser. You can even share and work on docs at the same time as others and avoid versioning hassles later.
- › **Security, compliance, and privacy you can trust.** Do you get security, compliance, and privacy in the cloud? Yes. And Microsoft is continually making improvements in Office 365 to earn and maintain your trust.

## Appendix A: Total Economic Impact™ Overview

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. TEI assists technology vendors in winning, serving, and retaining customers.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, flexibility, and risks.

### BENEFITS

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often, product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place 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. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

### COSTS

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the form of fully burdened labor, subcontractors, or materials. Costs consider all the investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

### FLEXIBILITY

Within the TEI methodology, direct benefits represent one part of the investment value. While direct benefits can typically be the primary way to justify a project, Forrester believes that organizations should be able to measure the strategic value of an investment. Flexibility represents the value that can be obtained for some future additional investment building on top of the initial investment already made. For instance, an investment in an enterprisewide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point. However, having the ability to capture that benefit has a PV that can be estimated. The flexibility component of TEI captures that value.

### RISKS

Risks measure the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections and 2) the likelihood that the estimates will be measured and tracked over time. TEI risk factors are based on a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the risk factor around each cost and benefit.

## Appendix B: Glossary

**Discount rate:** The interest rate used in cash flow analysis to take into account the time value of money. Companies set their own discount rate based on their business and investment environment. Forrester assumes a yearly discount rate of 10% for this analysis. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult their respective organizations to determine the most appropriate discount rate to use in their own environment.

**Internal rate of return (IRR):** The interest rate that will bring a series of cash flows (positive and negative) to an NPV of zero.

**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.

**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.

**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.

**Return on investment (ROI):** A measure of a project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits minus costs) by costs.

### A NOTE ON CASH FLOW TABLES

The following is a note on the cash flow tables used in this study (see the example table below). The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1. Those costs are not discounted. All other cash flows in years 1 through 3 are discounted using a 10% discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations are not calculated until 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.

#### TABLE [EXAMPLE]

Example Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.

## Appendix C: Endnotes

<sup>1</sup> Forrester risk-adjusts the summary financial metrics to take into account the potential uncertainty of the cost and benefit estimates. For more information, see the section on Risks.