

A Forrester Total Economic
Impact™ Study
Commissioned By
PagerDuty

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The Total Economic Impact™ Of PagerDuty

Cost Savings And Business Benefits
Enabled By PagerDuty

FORRESTER®

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Executive Summary

PagerDuty commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying its product. The purpose of this study is to provide readers with a framework to evaluate the potential financial and business impact of PagerDuty on their organizations.

“PagerDuty makes us more available. That is far and beyond the No. 1 benefit.”

~Engineering manager

To better understand the benefits, costs, and risks associated with a PagerDuty implementation, Forrester interviewed an existing customer (“the organization”) with multiple years of experience using PagerDuty. PagerDuty is an operations performance platform that increases reliability by connecting all people, systems, and data for visibility and actionable intelligence across global operations.

Prior to using PagerDuty, the organization relied on a variety of methods, including public exchange calendars, wiki articles, and personal scripts and tools, to identify and notify the correct person(s) when a system issue arose. The organization, a provider of online entertainment services, depends on high system availability to drive revenue growth and customer retention. With manual notification driving up mean-time-to-resolution (MTTR), the organization needed a reliable service that could automate the incident resolution handling process and improve MTTR while supporting its rapid pace of growth and introduction of new systems. In the three years since it first invested in PagerDuty, the organization has seen benefits not only in improved MTTR and customer retention, but also in end user and engineer productivity as well as quality of life and on-call experience. The organization has also realized cost savings in its ability to automate manual notification processes in the network operations center (NOC) and because PagerDuty has been a more cost-effective solution than building and managing a similar system internally. As the engineering manager noted, “Just in the last nine days, we’ve had an average of 30 incidents a day going to PagerDuty. Every one of those incidents represents an automated system automatically figuring out who the right person is and notifying them the way they wanted to be notified that something is going wrong . . . Every one of those 300 incidents is a PagerDuty success story.”

PAGERDUTY’S OPERATIONS PERFORMANCE SOLUTION IMPROVES BUSINESS RELIABILITY AND ENABLES COST SAVINGS

Our interview with an existing customer and subsequent financial analysis found that the interviewed organization experienced the risk-adjusted ROI, NPV, and benefits shown in Figure 1.¹

FIGURE 1
Financial Summary Showing Three-Year Risk-Adjusted Results

ROI:
448%

NPV:
\$1,640,000

Annual cost savings:
\$578,000 – \$938,000

Source: Forrester Research, Inc.

› **Benefits.** The interviewed organization experienced the following risk-adjusted benefits and business impact:

Nonquantified benefits:

- **Improved customer retention.** By making the notification, escalation, and scheduling process completely automated and reliable, PagerDuty improves availability and MTTR and therefore improves retention and revenue.
- **Improved end user productivity.** The NOC-based manual processes were often error-prone and time-consuming, resulting in longer periods of downtime that affected business end user productivity and led to a more disruptive and lengthy resolution that affected engineer productivity. PagerDuty's automated service eliminated these issues.
- **Improved on-call experience and quality of life.** PagerDuty allows engineers to be notified in the way they want to be notified (SMS, phone call, email, etc.) when an issue affects the systems they are responsible for. Engineers are also able to configure PagerDuty to filter alerts, allowing only the most critical through.

Quantified benefits:

- **Cost avoidance from relying on PagerDuty versus building a system internally.** The organization estimates that it would take one full-time engineer and approximately \$100,000 a year in infrastructure costs to automate processes. With PagerDuty, this means \$218,400 is saved each year on a risk-adjusted basis.
- **Cost savings from automating manual processes in the NOC.** The organization's NOC had eight full-time employees (FTEs). With PagerDuty, the organization was able to automate manual notification processes. As a result, in the first year, the NOC was reduced by four FTEs. In years 2 and 3, the NOC was completely automated at a risk-adjusted cost savings of \$720,000 per year.

› **Costs.** The interviewed organization experienced the following risk-adjusted costs:

- **Software licensing fees of \$19 per user per month for the standard plan and \$39 per user per month for the enterprise plan.** These are monthly fees paid to PagerDuty for access to its service. This represents the typical pricing for an organization of this size. The interviewed organization scaled from approximately 150 users initially to approximately 700 users by the end of Year 3.
- **Internal resources for implementation and ongoing management.** The organization spent 35 hours upfront on the required integration to connect the entire environment to PagerDuty. The organization continues to spend time on strengthening these integrations and layering on value-added services to PagerDuty.

Disclosures

The reader should be aware of the following:

- › The study is commissioned by PagerDuty 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 PagerDuty.
- › PagerDuty 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.
- › PagerDuty provided the customer name for the interview but did not participate in the interview.

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 PagerDuty. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

APPROACH AND METHODOLOGY

Forrester took a multistep approach to evaluate the impact that PagerDuty can have on an organization (see Figure 2). Specifically, we:

- › Interviewed PagerDuty marketing, sales, and/or consulting personnel, along with Forrester analysts, to gather data relative to the use of and the marketplace for PagerDuty.
- › Interviewed one organization currently using PagerDuty to obtain data with respect to costs, benefits, and risks.
- › Constructed a financial model representative of the interview using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interview.
- › Risk-adjusted the financial model based on issues and concerns the interviewed organization highlighted in the interview. Risk adjustment is a key part of the TEI methodology. While the interviewed organization provided cost and benefit estimates, some categories included a number of outside forces that might have affected the results. For that reason, some cost and benefit totals have been risk-adjusted, and this is detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling an investment in PagerDuty: 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 B for additional information on the TEI methodology.

FIGURE 2
TEI Approach



Source: Forrester Research, Inc.

Analysis

INTERVIEWED ORGANIZATION

For this study, Forrester conducted one interview with a representative from the following PagerDuty customer:

- › The organization is a global entertainment company that provides online content to over 45 million customers worldwide. In the prior fiscal year, revenue was over \$4 billion. The organization currently has over 2,000 employees, with approximately 700 engineers and over 150 on-call schedules managed with PagerDuty.
- › The organization began using PagerDuty three years ago. Prior to using PagerDuty, the organization had built out monitoring and alerting systems, but the notification process (identifying the right person to address a system issue) was still very manual. This process resulted in lengthy delays between the time an issue arose and when it was resolved.
- › As an organization that provides online entertainment services to customers, availability is a crucial metric to monitor business success. The delay in resolving critical system issues due to the manual notification process was significantly impairing customer experience and retention. With the introduction of PagerDuty, the organization saw improvements in overall availability, customer satisfaction, productivity, and engineer quality of life.

“We live and die by whether or not our service is available. There’s literally nothing we can do, there is no part of our business that works, if IT services are not working.”

~Engineering manager

INTERVIEW HIGHLIGHTS

The organization indicated the importance of having a cost-effective and reliable service like PagerDuty to help solve key notification challenges and enhance business results.

Situation

The organization considered a number of key initiatives and challenges leading up to the decision to invest in PagerDuty.

- › The most important business initiative was enhancing customer experience and retention (and ultimately revenue) through providing highly available services. This meant reducing MTTR when critical system issues emerged. The complexity involved in the manual notification process increased the time it took to reach the correct person(s) to solve the problem.
- › The organization’s previous notification process was as follows:
 - When a new alert came through, the operators in the NOC would need to figure out which system was actually at fault, what team was responsible for that system, how that team managed its on-call schedule, and who was the appropriate person to contact at that time. With more than 700 different applications, and with each development team responsible for several applications each, locating the correct team was itself a very cumbersome process.
 - Each team then had various ways of managing on-call schedules, from public exchange calendars to wiki articles to team-specific tools. Further, each team member had differing amounts of contact information available. If operators didn’t get a response, they would have to find the team’s escalation policy and who to reach out to next. This process was very time-consuming and lengthened MTTR.
- › The organization was also in the process of migrating its systems to the cloud to better support its rapid pace of growth. As part of this transition, the organization wanted to automate as many processes as possible. As the engineering manager noted, “Internally, as we’re moving to the cloud, we really wanted to do operations right. That meant anything that’s manual

has to go away.” This meant that the NOC and its processes would need to be automated by a system that could route notifications to the correct person.

Solution

The organization knew it needed a reliable solution to streamline problem resolution. The choice was between using internal resources to build a system like this or looking externally. The organization felt that PagerDuty could meet its needs and brought PagerDuty in for a proof of concept (POC). Shortly after seeing how well PagerDuty was working, they extended use to the entire engineering organization:

- › The organization initially piloted PagerDuty with two teams. Within about three months, the organization had everybody who operated production systems tie those systems to PagerDuty. When new engineers are hired, they get on PagerDuty within their first week.
- › Currently, there are over 150 on-call schedules and approximately 700 users on PagerDuty. Of the over 700 applications, nearly all of them are tied to the PagerDuty service.
- › The initial integration took about 35 hours. Since then, the organization has continued adding more integrations between PagerDuty and its systems and building additional value-added services, such as dashboards and interfaces, on top of the PagerDuty operations performance platform.

“PagerDuty is an absolutely critical component of our notification set of services.”

~Engineering manager

Results

The ability to improve incident resolution-handling with PagerDuty yielded the following key results:

- › **PagerDuty impacted the business in a significant and positive way.** The reliability, ease of use, and automation brought to the incident resolution life cycle by PagerDuty’s service helps the organization in several key areas. It: 1) increases customer retention due to improved system availability; 2) enhances productivity for business end users and engineers; 3) reduces MTTR for critical issues; 4) makes the on-call experience less painful because of configurability; and 5) lets engineers take full responsibility for maintaining their systems.
- › **The organization realized cost savings through its use of PagerDuty.** PagerDuty allowed the organization to completely automate all manual notification processes in its NOC. In addition, compared with developing and maintaining a similar system using internal resources, PagerDuty provided a cost avoidance benefit thanks to its cost-effectiveness. These internal resources are now able to focus on more innovative systems and process changes.
- › **PagerDuty has provided a reliable service that the organization can depend on.** The organization relies on PagerDuty first and foremost to reliably notify the right engineers as soon as a system issue emerges. The organization has been very happy with the quality of service it has received and trusts PagerDuty to perform every time. PagerDuty has provided additional value by quickly developing its own application programming interfaces (APIs) for better integration with the organization.

“When I talk to people who aren’t PagerDuty users, I rave about the completely different way we run operations when we have something like PagerDuty. It is a night and day difference.”

~Engineering manager

BENEFITS

The interviewed organization experienced a number of quantified benefits and nonquantifiable benefits in this case study:

- › Benefit No. 1. Higher customer retention from improved availability.
- › Benefit No. 2. Improved business end user and engineer productivity.
- › Benefit No. 3. Improved on-call experience and quality of life for engineers.
- › Benefit No. 4. Cost avoidance from not automating notifications internally.
- › Benefit No. 5. Cost savings from automating manual processes in the NOC.

+ Higher Customer Retention From Improved Availability (Nonquantified)

One of the most important benefits that the organization identified as a result of PagerDuty is a boost to customer retention due to the improved availability of systems. Availability is the most critical metric to the success of the organization's business. The organization's rapid growth, and the resulting amount of changes to the environment and release of new systems, means that the probability of having availability-interrupting events is high. When these critical issues arise, customer experience deteriorates, and engineers have to divert attention to resolving these issues instead of focusing on more productive, business-enhancing work. Prior to PagerDuty, the manual process in the NOC to identify and contact the right people to resolve critical issues was lengthy and increased the MTTR.

With PagerDuty, the process to notify the correct people quickly and reliably is automated, leading to a reduced MTTR. As a result, customer experience and brand image are improved, and that leads to higher customer retention. As the engineering manager noted,

"We know that availability has a direct relationship to customer retention. And customer retention is directly relevant to our success. So if our site is always down, customers will leave us and we'll lose money . . . PagerDuty makes us more available."

"We know that availability has a direct relationship to customer retention. And customer retention is directly relevant to our success."

~Engineering manager

While the interviewed organization has not been able to isolate metrics to quantify this benefit, it feels strongly that the impact is significant. Forrester encourages readers who have metrics tied to increased availability to include these calculations in their business case.

+ Improved Business End User And Engineer Productivity (Nonquantified)

Prior to investing in PagerDuty, the organization's incident resolution process was often error-prone and time-consuming. Operators in the NOC would have to tie system alerts to the appropriate application from the set of 700, tie that application to the correct development team, and then locate the contact information for the right engineer as well as the escalation policy for that team. Each team stored contact and on-call information in differing ways, adding to the confusion. This meant that notification was often a game of trial-and-error. The wrong engineers would be alerted, disrupting their productivity or off-work time. Systems would stay down for longer periods as operators tried to locate and contact the correct person, decreasing end user productivity reliant on certain applications. With an average of 30 incidents per day, this process could result in a lot of lost productive time.

With PagerDuty, the organization is able to assign the right notifications to engineers responsible for those systems, set escalation policies in the event that the primary contact is unreachable, and automate on-call schedules. The engineers are

able to configure notifications so that only the most critical issues are sent during on-call hours, and the reliability and redundancy built into PagerDuty's service ensures that notifications reach the right person in the way they want to be reached. This complete automation of the notification process eliminates the errors and challenges inherent in the NOC model, resulting in more accurate and rapid notifications, automated escalations, and ultimately reduced system downtime. Business end users are therefore more satisfied and confident in the systems they rely on, and their productivity is not impacted by prolonged outages. Engineers are only disrupted if there is a critical event with their systems and can more quickly assess and resolve the issue so that more time can be spent on innovative projects.

While the interviewed organization has not been able to isolate metrics to quantify this benefit, it feels that the impact is significant. Forrester encourages readers who have metrics tied to productivity to include these calculations in their business case.

+ Improved On-Call Experience And Quality Of Life For Engineers (Nonquantified)

In addition to better customer retention and improved productivity, PagerDuty also allows the organization to continue toward its goal of providing its engineers with the tools they need to work quickly, without delays or reliance on manual processes.

As part of this shift, engineers are tied to their systems in PagerDuty and must bear the responsibility of keeping these systems working. What may have been an otherwise burdensome task is simplified with PagerDuty's service. Users can configure PagerDuty to notify them only when critical issues arise and in the way they want to be notified. They can also better manage on-call scheduling and escalation policies. Additionally, the mobile app allows users to assess and respond to notifications remotely. According to the engineering manager, "This service system making it so that engineers can define how to be reached when they need to be reached is something that our engineers really, really love."

An important criterion for the decision to invest in PagerDuty was that everything is API-driven. This means everything can be automated, including sending events to PagerDuty directly from the monitoring system as well as automatically adding and removing users and managing the configuration of PagerDuty without human intervention. Additionally, users can continue to add services on top of PagerDuty using their APIs, such as value-add dashboards and interfaces.

"In the old days, chances are high that at some point you'd call the wrong person. And if you're the wrong person, even if it's a relatively short call, that kind of ruins your evening. That, by definition, can't happen anymore."

~Engineering manager

While the interviewed organization has not been able to isolate metrics to quantify this benefit, it feels that the impact is significant. Forrester encourages readers who have metrics tied to on-call experience and quality of life to include these calculations in their business case.

+ Cost Avoidance From Not Automating Notifications Internally

The organization realized that in order to achieve the benefits above, it would either have to build a system internally or seek the services of an external vendor. The organization estimates that if it were to build and manage similar functionality internally, it would require one engineer's full-time effort along with approximately \$100,000 per year in infrastructure to support the system. Alternately, the organization felt PagerDuty could provide the functionality it needed. After bringing in PagerDuty for a proof of concept (POC), the organization felt that PagerDuty could deliver these business benefits in a more cost-effective way than an internal solution could. There is also the additional benefit that internal efforts could be focused on building and strengthening more organization-specific and business critical systems.

In assessing the ability for the interviewed organization and others to achieve this benefit, we consider the best case, most likely case, and worst case outcomes and apply a risk adjustment. For this benefit, possible factors that could affect outcomes include the difference in resource costs among organizations, the sophistication of the system built and resulting infrastructure and management needs, and the possibility that internal costs may exceed those stated below. To compensate, this benefit was risk-adjusted and reduced by 40%. The risk-adjusted total benefit resulting from this cost avoidance over the three years was about \$655,000. See the section on Risk for more detail.

TABLE 1
Cost Avoidance From Not Automating Notifications Internally

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
A1	FTEs to manage notification system		1	1	1
A2	Average engineer fully loaded salary		\$264,000	\$264,000	\$264,000
A3	Estimated infrastructure cost for internal system		\$100,000	\$100,000	\$100,000
At	Cost avoidance of not automating notifications internally	$(A1 \times A2) + A3$	\$364,000	\$364,000	\$364,000
	Risk adjustment		↓ 40%		
Atr	Cost avoidance of not automating notifications internally (risk-adjusted)		\$218,400	\$218,400	\$218,400

Source: Forrester Research, Inc.

★ Cost Savings From Automating Manual Processes In The NOC

Prior to PagerDuty, the organization had eight FTEs working in the NOC to connect alerts to the right people and notify them accordingly. Now these processes are completely automated and are therefore significantly quicker and reliable. During Year 1, the NOC was phased out as engineers began using PagerDuty. The Year 1 calculation assumes a more conservative pace of change and also takes into account severance expenses. By Year 2, the processes in the NOC have been completely automated by PagerDuty.

In assessing the ability for the interviewed organization and others to achieve this benefit, we consider the best case, most likely case, and worst case outcomes and apply a risk adjustment. For this benefit, possible factors that could affect outcomes include the difference in resource costs among organizations, the feasibility for most organizations to completely automate processes in their NOCs, and the level of automation achieved. To compensate, this benefit was risk-adjusted and reduced by 50%. The risk-adjusted total benefit resulting from these cost savings over the three years was \$1.8 million. See the section on Risk for more detail.

TABLE 2
Cost Savings From Automating Manual Processes In The NOC

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
B1	FTEs no longer needed in the NOC		4	8	8
B2	Average operator fully loaded salary		\$180,000	\$180,000	\$180,000
Bt	Cost savings from automating manual processes in the NOC	B1*B2	\$720,000	\$1,440,000	\$1,440,000
	Risk adjustment		↓ 50%		
Btr	Cost savings from automating manual processes in the NOC (risk-adjusted)		\$360,000	\$720,000	\$720,000

Source: Forrester Research, Inc.

Total Benefits

Table 3 shows the total of the two quantified benefits listed above, as well as present values (PVs) discounted at 10%. Over three years, the organization expects risk-adjusted total benefits to be a PV of slightly over \$2 million.

TABLE 3
Total Benefits (Risk-Adjusted)

Ref.	Benefit	Year 1	Year 2	Year 3	Total	Present value
Atr	Cost avoidance of not automating notifications internally	\$218,400	\$218,400	\$218,400	\$655,200	\$543,128
Btr	Cost savings from automating manual processes in the NOC	\$360,000	\$720,000	\$720,000	\$1,800,000	\$1,463,261
	Total benefits	\$578,400	\$938,400	\$938,400	\$2,455,200	\$2,006,389

Source: Forrester Research, Inc.

COSTS

The interviewed organization experienced two main costs associated with the solution:

- › Cost No. 1. Software licensing fees.
- › Cost No. 2. Internal time spent on integration and management.

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

💰 Software Licensing Fees

Software licensing fees are assessed on a per user basis and are contracted either monthly or annually. The organization started with approximately 150 users. By the end of Year 1, just over 415 users were on PagerDuty. By the end of Year 3, this number was up to approximately 700 users. The per user per month cost of \$19 included in Table 4 represents the typical pricing for an organization of this size for the standard plan. The organization recently upgraded to the enterprise plan for the final two months of Year 3, at a price of \$39 per month per user. The annual costs noted in Table 4 account for the growth in users from month to month, and Year 1 also includes the 30-day free trial period. This results in annual licensing fees of approximately \$76,000 in Year 1 up to \$169,000 in Year 3.

Software costs are variable from organization to organization, considering different licensing agreements, organization size, and other factors. To compensate, this cost was risk-adjusted up by 10%. The risk-adjusted cost of software over the three years was just under \$388,000. See the section on Risk for more detail.

TABLE 4
Software Licensing Fees

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Number of users (end of year)		150	415	530	700
C2	Average cost per user per month			\$19	\$19	\$39
Ct	Software licensing fees			\$76,684	\$106,324	\$169,256
	Risk adjustment		↑ 10%			
Ctr	Software licensing fees (risk-adjusted)		\$0	\$84,352	\$116,956	\$186,182

Source: Forrester Research, Inc.

💰 Internal Time Spent On Integration And Management

To achieve basic integration with their systems, the organization spent approximately 5 hours on the POC and another 30 hours to get the system to support the entire environment, or about 35 hours total upfront. This time was spread out over several engineers working part time on implementing PagerDuty. In addition, the organization has spent significant nonrequired time building more integration between PagerDuty and its systems as well as adding additional value-added services on top of PagerDuty such as dashboards and interfaces. This time is estimated at approximately 100 hours per year. Ongoing management is fairly limited, as PagerDuty is easy to use and configure. The organization estimates that across all 700 users, it spends about 30 minutes per week total making adjustments in notification settings and schedules. Training was minimal. The organization spent about an hour documenting how to use PagerDuty for those engineers who needed it. For those engineers who needed training, on average, they spent about 10 to 15 minutes. Forrester typically does

not quantify time commitments of less than 30 minutes, but readers should determine if their training needs will exceed that threshold and add in costs accordingly.

Resource costs are more fluid than other costs, and time spent on integration and ongoing management will vary from organization to organization. To compensate, this cost was risk-adjusted up by 20%. The risk-adjusted cost of internal time spent over the three years was about \$63,000. See the section on Risk for more detail.

TABLE 5
Internal Time Spent On Integration And Management

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Hours spent on integration		35			
D2	Ongoing management (hours per year)	30 minutes per week		26	26	26
D3	Ongoing integration/development efforts (hours per year)			100	100	100
D4	Average engineer fully loaded salary		\$264,000	\$264,000	\$264,000	\$264,000
Dt	Internal time spent on integration and management	$(D1+D2+D3)*(D4/2,080)$	\$4,442	\$15,992	\$15,992	\$15,992
	Risk adjustment		↑ 20%			
Dtr	Internal time spent on integration and management (risk-adjusted)		\$5,331	\$19,191	\$19,191	\$19,191

Source: Forrester Research, Inc.

Total Costs

Table 6 shows the total of all costs as well as associated present values, discounted at 10%. Over three years, the organization expects total costs to total a net present value of a little more than \$366,000.

TABLE 6
Total Costs (Risk-Adjusted)

Ref.	Cost	Initial	Year 1	Year 2	Year 3	Total	Present value
Ctr	Software licensing fees	\$0	\$84,352	\$116,956	\$186,182	\$387,490	\$313,223
Dtr	Internal time spent on integration and management	\$5,331	\$19,191	\$19,191	\$19,191	\$62,903	\$53,055
	Total costs (risk-adjusted)	\$5,331	\$103,543	\$136,147	\$205,372	\$450,393	\$366,279

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 PagerDuty 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 B).

The organization notes two areas of flexibility tied to its investment in PagerDuty. The first is that by relying on PagerDuty to automate the notification process, the organization is able to use its internal resources to focus on building and strengthening more business-differentiating systems and processes. This resource strategy can yield tangible benefits in improving process outcomes and customer satisfaction. The second area is that the organization has taken advantage of opportunities presented by PagerDuty’s APIs to build new systems on top of PagerDuty and make integrations more powerful and value-add. The organization considers this to be “time and money really well spent.”

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 PagerDuty 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 PagerDuty, or that the results achieved by the interviewed organization may not be realized by other organizations, 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 following impact risks that affect benefits are identified as part of the analysis:

- › Resource costs, the size of the NOC, and the ability to fully automate notifications may vary from organization to organization.
- › The interviewed organization and other organizations may find that building internal systems for notification automation may differ in cost from the quantification included.

The following implementation risks that affect costs are identified as part of this analysis:

- › Software licensing fees may vary from organization to organization due to several factors, including size of the organization and differing discounts.
- › Resource costs, the difficulty of integrations, and the need for training and ongoing management will vary from organization to organization.

Table 7 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the interviewed organization. These are derived from the average of the estimated best case, worst case, and most likely case outcome for each cost and benefit category. Readers are urged to apply their own risk ranges based on their own degree of confidence in achieving the cost and benefit estimates.

TABLE 7
Benefit And Cost Risk Adjustments

Benefits	Adjustment
Cost avoidance from not automating notifications internally	↓ 40%
Cost savings from automating manual processes in the NOC	↓ 50%
Costs	Adjustment
Software licensing fees	↑ 10%
Internal time spent on integration and management	↑ 20%

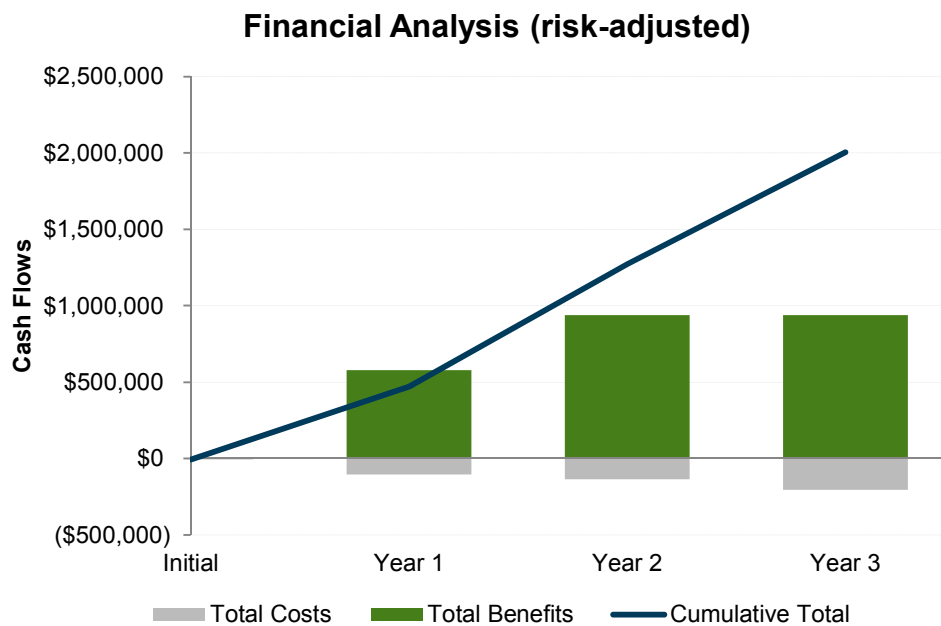
Source: Forrester Research, Inc.

Financial Summary

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI and NPV for the interviewed organization's investment in PagerDuty.

Table 8 below shows the risk adjusted ROI and NPV values. These values are determined by applying the risk-adjustment values from Table 7 in the Risk section to the unadjusted results in each relevant cost and benefit section.

FIGURE 3
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

TABLE 8
Cash Flow (Risk-Adjusted)

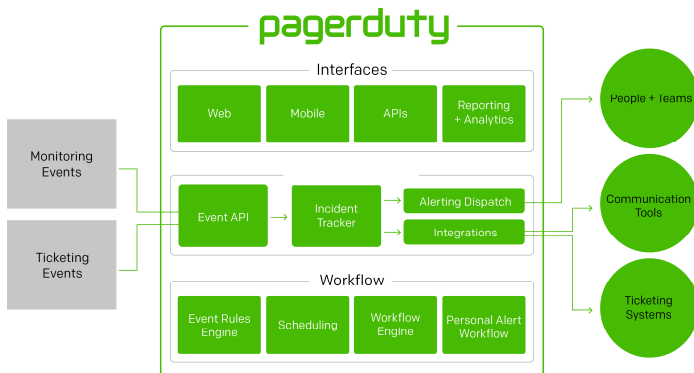
	Initial	Year 1	Year 2	Year 3	Total	Present value
Costs	(\$5,331)	(\$103,543)	(\$136,147)	(\$205,372)	(\$450,393)	(\$366,279)
Benefits	\$0	\$578,400	\$938,400	\$938,400	\$2,455,200	\$2,006,389
Net benefits	(\$5,331)	\$474,857	\$802,253	\$733,028	\$2,004,807	\$1,640,111
ROI						448%

Source: Forrester Research, Inc.

PagerDuty: Overview

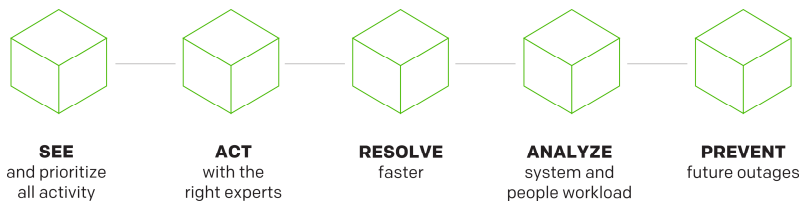
The following information is provided by PagerDuty. Forrester has not validated any claims and does not endorse PagerDuty or its offerings:

PagerDuty is a SaaS Operations Performance Management solution designed for operations and engineering teams to improve system reliability and deliver a better customer experience. By connecting people, systems, and data in a single view, PagerDuty delivers visibility across your entire operation and streamlines the incident resolution life cycle.



PagerDuty's operations performance platform integrates across all your systems and software to provide visibility across all incidents and the teams that manage system reliability. PagerDuty integrates with any system — through ready-to-use integrations or APIs.

PagerDuty addresses each stage of the incident resolution life cycle with capabilities designed to help teams resolve issues faster and reduce the customer and business impacts of downtime and outages.



Capabilities include:

- › Alert filtering and deduplication.
- › Customizable notification methods: voice, push notifications, SMS, email.
- › Alerting for individuals or teams, with automatic escalations.
- › Mobile app to acknowledge, resolve, and reassign from anywhere.
- › On-call scheduling, for both local and remote teams, with handoff notification rules.
- › Performance reporting across incidents and resolution handling.
- › Incident handling tracking to create a resolution knowledge base.
- › Integrations across infrastructure, application, web, ticketing, and collaboration tools.
- › APIs to build your own integrations.

Appendix A: Framework Assumptions

FRAMEWORK ASSUMPTIONS

Table 9 provides the model assumptions that Forrester used in this analysis.

The discount rate used in the PV and NPV calculations is 10% and time horizon used for the financial modeling is three years. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult with their respective company's finance department to determine the most appropriate discount rate to use within their own organizations.

TABLE 9
Model Assumptions

Ref.	Metric	Value
X1	Hours per week	40
X2	Weeks per year	52
X3	Hours per year (M-F, 9-5)	2,080
X4	Hours per year (24x7)	8,736
X5	Engineer fully loaded annual salary	\$264,000
X6	Operations fully loaded annual salary	\$180,000

Source: Forrester Research, Inc.

Appendix B: 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.

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 C: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Companies set their own a 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.

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 the discount rate (shown in Framework Assumptions section) 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 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 D: Supplemental Material

Related Forrester Research

“Predictions For 2014: Technology Monitoring,” Forrester Research, Inc., February 3, 2014

“Guarantee Business Value From Technology Monitoring,” Forrester Research, Inc., November 1, 2013

Appendix E: Endnotes

¹ 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 Risk.