

A Forrester Total Economic Impact™
Study Commissioned By Intel
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The Total Economic Impact™ Of The Intel® vPro™ Platform

Cost Savings And Business Benefits
Enabled By The Intel vPro Platform

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Executive Summary

Intel has developed the Intel® vPro™ platform as a comprehensive business platform delivering data-driven performance, hardened security features, flexible management, and a consistent computing infrastructure to help businesses stay ahead of what's next. Intel commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying computers with Intel® Core™ vPro™ processors, technologies, and services within the Intel vPro platform such as Intel® Active Management Technology (Intel® AMT) on computers running Windows 10 Professional. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of new hardware powered by the Intel vPro platform on their organizations.

To better understand the potential benefits, costs, and risks associated with this investment, Forrester surveyed more than 250 people at medium-sized organizations worldwide (in the range of about 100 to 1,000 employees) and interviewed individuals at three organizations to validate survey results and provide more narrative details. To represent the results for this TEI study, Forrester created a composite organization, based on interview and survey details, modeled as a mid-size company with 750 laptops and desktops with Intel Core vPro processors running Windows 10 Professional.

Prior to deploying computers powered by Intel Core vPro processors, organizations had a varied mix of computer processors and operating systems. They saw rising IT management costs, too many help desk calls, and IT issues that hindered end user productivity. After investing in Intel Core vPro processors with Microsoft's Windows 10 operating system, organizations (interviewed and surveyed) saw benefits in greater security, more effective management, and greater employee efficiency. These benefits were driven in particular by features and technologies built in to the Intel vPro platform such as hardware-based security features, fast processors, and flexible management.

Key Findings

Quantified benefits. The following risk-adjusted present value (PV) quantified benefits are representative of those experienced by the companies interviewed and surveyed:

- ▶ **Reduced security issues save an estimated 7,680 security support hours annually with reduced support and management work.** Organizations deployed the Intel vPro platform with built-in features like hardware-enhanced security and stable image management, plus Intel Active Management Technology (Intel AMT) to deliver robust security with remote management. As a result, both minor and major security and management issues were reduced due to improvements enabled by the Intel vPro platform and Windows 10 Professional. In addition, the organizations resolved remaining issues much more quickly. "We don't have to send our engineers or support people into the field," said the IT manager at a financial services firm in the UK. Everyday issues such as resolving a password request and business-critical issues such as a major security attack were all reduced, saving significant IT support and management time. Over three years, reduced security support and management costs are worth nearly \$1.2 million to the composite organization.

Benefit Highlights



IT security remediation cost savings:

\$1.2 million



Improved end user productivity:

\$1.3 million



Reduced data security risk:

\$211,000



Composite organization:

- 600 employees
- 750 computers with the Intel® vPro™ platform and Windows 10
- Two desktop admins



- › **Improved employee efficiency saves an estimated 28,160 hours with better device security and management.** The Intel vPro platform better maintains computer stability, supports intensive computing processes, and help ensure that peripherals work. With the Intel vPro platform and Windows 10 Professional, employees spend less time waiting for updates to install, dealing with issues that require security and management support, and waiting for their desktops or laptops to wake up from sleep mode, when powering up, and after restarting. “Windows 10 with vPro is a more stable environment” compared to our computing infrastructure before, said the IT manager at a US construction services firm. Employee efficiency adds up to nearly \$1.3 million over three years for the organization.
- › **Improved computer and data security.** In addition to security remediation time savings, the Intel vPro platform helps keep company data safe and reduces the risk of a data breach with hardware-enhanced security and manageability features. A single data breach could cost millions in lost revenue, damaged reputation, customer remediation, regulatory fees or fines, and other direct and indirect costs to the business. Interviewed and surveyed organizations also mentioned data security. “We’ve had laptops left on planes and such,” said the IT manager at a US construction services firm. Not only do IT managers not need to send an IT admin out in the field to work on the problem, or at least set up a replacement, but they can rest easy knowing the lost computer is secured. The IT manager at a UK financial services firm said, “We have full coverage over all our computers with Intel Core vPro processors.” The composite organization’s avoided costs as a result of improved desktop data security are estimated to be more than \$211,000 over three years.
- › **Faster and more timely IT patch installations.** In addition to reduced support and management time responding to issues and questions, the Intel vPro platform, including automated remote management with Intel Active Management Technology (Intel AMT), delivers more convenient and effective ongoing patch management. “AMT is just fantastic. It provides great flexibility and power management. We’ve found it to be a bit of a game changer, really,” said the IT manager of a European bioinformatics firm. IT managers and desktop operations specialists at the composite organization save a total of 832 hours deploying patches and handling in-person exceptions, adding up to more than \$81,000 over three years.

Unquantified benefits. The interviewed and surveyed organizations experienced the following benefits, which are not quantified for this study:

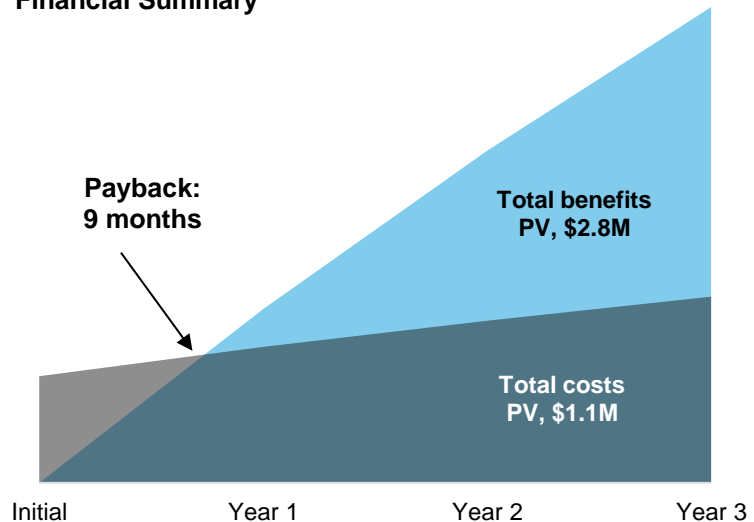
- › **Reduction or avoidance of other technologies or solutions.** Some interviewed and surveyed organizations highlighted reduced purchase and license costs, such as retiring a more expensive hardware encryption solution, consolidating imaging solutions, and eliminating extra management tools, by standardizing on the Intel vPro platform.
- › **Benefits enabled by other Intel hardware.** Interviewed and surveyed organizations mentioned other hardware, software, and services that maximize the value of the Intel vPro platform and Windows 10. “We always make sure to get the Intel SSDs,” said the IT manager at a UK financial services firm, highlighting the speed and reliability of these drives.

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

- › **Ongoing management and services costs.** The composite organization budgets some new ongoing management tasks each year directly associated with Intel Core vPro processor-based computers, at an estimated three-year total cost of more than \$470,000.
- › **Investment in some new laptops and desktops with the Intel vPro platform.** Organizations average about a 3.5-year refresh cycle, and many had already purchased computers on the Intel Core vPro processors and Windows 10 Professional standard. However, some organizations' computers had not been updated in time for the start of their companywide strategy to manage computers with Intel vPro platform tools. The composite organization needed to purchase an estimated 30% of computers to ensure full implementation across the organization; these incremental costs are included as part of the Intel vPro platform investment. This adds up to more than \$354,000 in incremental device costs during the implementation period.
- › **The Intel vPro platform and Windows 10 Professional migration and implementation costs.** Five employees at the composite organization focused most of their time over a four-month implementation period to manage the continued implementation and deployment of Intel Core vPro processor-based computers, including: configuring the operating system, updating processes to leverage new technologies such as remote management, set up user policies, test applications and processes, and undergo training. Also, some additional software, hardware, and third-party services were included. Implementation costs total \$265,000.

Forrester's financial analysis found that a composite organization, based on interviews and surveys with many existing customers, experienced benefits of \$2.8 million over three years versus costs of \$1.1 million, adding up to a net present value (NPV) of \$1.7 million, a payback of nine months, and an ROI of 155%.

Financial Summary



The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing the Intel vPro platform.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Intel core vPro processors can have on an organization:



DUE DILIGENCE

Interviewed Intel stakeholders and Forrester analysts to gather data relative to the Intel vPro platform.



CUSTOMER INTERVIEWS AND SURVEY

Interviewed three organizations and surveyed 256 organizations using the vPro platform to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewed and surveyed organizations.



FINANCIAL MODEL FRAMEWORK

Constructed a financial model representative of the interviews and survey using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewed organizations.



CASE STUDY

Employed four fundamental elements of TEI in modeling the Intel vPro platform's impact: benefits, costs, flexibility, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Intel 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 Intel vPro platform.

Intel 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.

Intel provided the customer names for the interviews but did not participate in the interviews.

The Intel vPro Platform Customer Journey

A BEFORE AND AFTER LOOK AT THE TRANSITION TO THE INTEL VPRO PLATFORM

Interviewed And Surveyed Organizations

For this study, Forrester conducted three interviews with Intel vPro platform customers and surveyed 256 others.

Interviews were with IT managers at three firms: a European bioinformatics organization, a financial services firm in the United Kingdom, and a construction services firm in the northeast United States.

Surveyed customers were from the following countries in the following quantities:

- › The United States (54).
- › Japan (54).
- › The United Kingdom (51).
- › Germany (50).
- › China (47).

All interview and survey respondents worked in organizations between 100 and 1,000 employees, with the following breakdown based on survey responses:

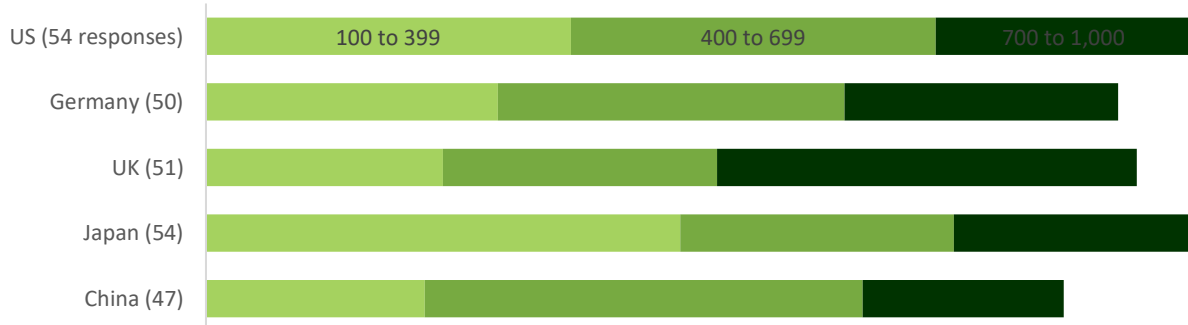
- › Between 100 and 399 employees (87).
- › Between 400 and 699 (93).
- › Between 700 and 1,000 (76).



Locations of surveyed and interviewed organizations:

China
Germany
Japan
United Kingdom
United States

Survey Participation By Country And Company Size

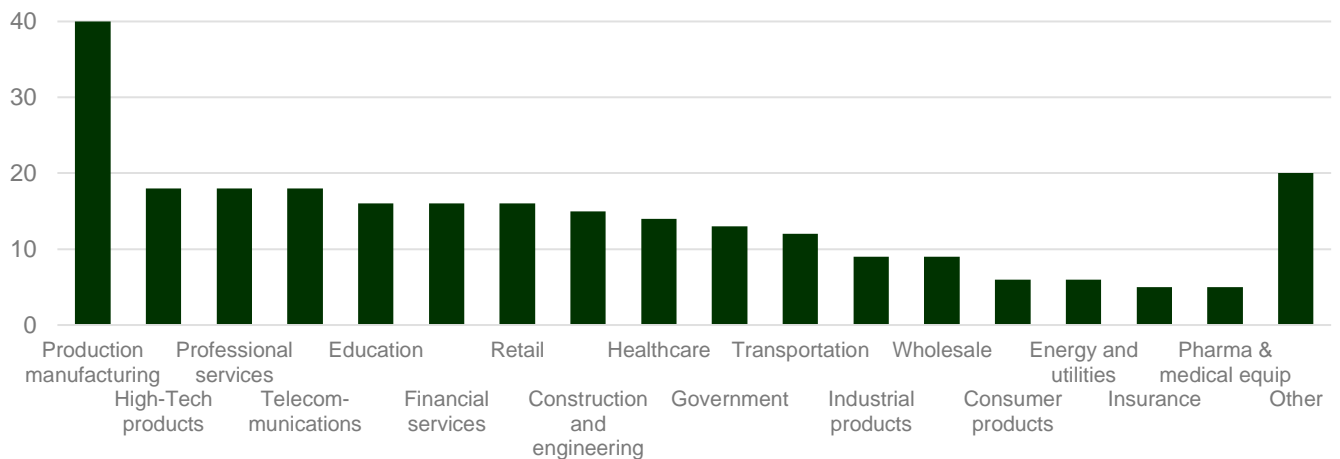


Base: 256 respondents at mid-size organizations that have implemented the Intel vPro platform

Source: A commissioned study conducted by Forrester Consulting on behalf of Intel, July 2018

The survey also represented a wide variety of industries, including manufacturing, professional services, high-tech products, telecommunications, education, financial services, retail, and several others, as show in the diagram below.

Survey Respondents By Industry



Base: 256 respondents at mid-size organizations that have implemented the Intel vPro platform
 Source: A commissioned study conducted by Forrester Consulting on behalf of Intel, July 2018

Key Challenges

Surveyed and interviewed organizations recognized that older computer hardware and software was a factor in some missed opportunities. They saw an opportunity to improve IT management, tighten security, and increase efficiency. Survey respondents identified several key issues:

- › **Security (81%).** Organizations struggled with computer configurations that may not have met standard installation specs, may not have had the latest updates and patches, and came with potential data security holes (such as no encryption options). The IT manager of a European bioinformatics firm said, “Data management and data security are important to us because we deal with various scientific and medical data sets that include confidential data and patient information.”
- › **Management and standardization (56%).** Patches were not installed in an efficient, standard manner, too many different computing devices were available, and too many weren’t on the same operating system.
- › **IT cost (60%).** Most organizations sought to reduce IT costs. Locking down device and data security, improving management standards, and standardizing IT processes were all organizational goals.
- › **Productivity (75%).** Subpar security and IT management meant end users were likely to deal with more — and more time-consuming — issues. Respondents recognized that computers with more issues did not run at the most efficient rate — and probably didn’t have a particularly efficient processor to start with.
- › **Mobility (50%).** Half of respondents overall saw this as an issue — though fewer did in the US and Japan, probably because they have had greater and longer access to more and cheaper mobile form factors such as tablets, phones, and hybrid devices. Conversely, 58% of respondents in China, Germany, and the UK identified the management and security of devices for highly mobile users as a key issue.

“Data management and data security are important to us.”

IT manager, European bioinformatics firm



Key issues:

Security

Productivity

IT costs

Computer management

Mobility

Solution Requirements

Organizations saw an opportunity to deliver better security, management, and productivity across a more standardized desktop and laptop environment. Additionally, interviewed and surveyed organizations were looking to deliver high-performance computers and wanted to be able to manage company assets closely.

While only 42% were concerned specifically with computer hardware costs, 60% saw overall IT costs as an issue and wanted to keep them in check. Organizations were ready (and perhaps already actively looking) for a quality hardware and software solution that could be an opportunity to improve IT management and security, reduce costs, and improve efficiency. We asked respondents, “What were the main priorities behind the decision to invest in and deploy laptops and desktops with Intel Core vPro Processors?” On a scale of 1 to 5, organizations said:

- › Improving security was the most critical priority, with an average of 4.5 and 63% rating it a high or top priority. This was even higher in the US, with a 4.6 rating and 89% rating it high or top. Of the several categories presented in this question, security was the only option that did not receive a single “not a priority” response.
- › Improving performance was a 4.3, and 63% rated it a high or top priority.
- › Improving employee productivity was a 4.2, with 59% rating it a high or top priority.

Organizations added computers powered by Intel Core vPro processors to their device catalog:

- › From manufacturers that met the Intel vPro platform specifications.
- › With features that included hardware-based security features, a powerful processor, and other hardware and software tools for midmarket and enterprise management.

As the organizations were between 100 and 1,000 employees (and computers), nearly all were able to complete deployment in less than six months and take advantage of the Intel vPro platform from Year 1. On average, 30% of computers did need to be purchased ahead of the standard, budgeted hardware refresh schedule, which is included as an investment cost in the financial analysis in this study.

Key Results

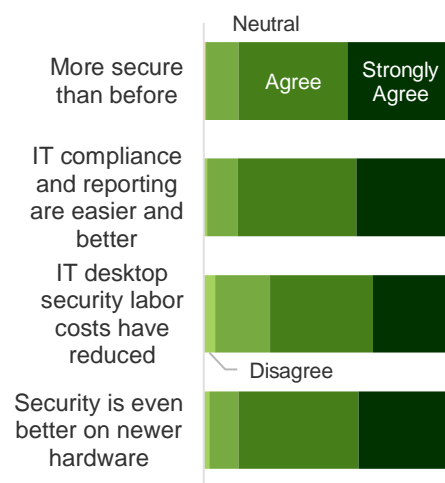
The interviews and survey responses revealed that an investment in Intel Core vPro processors in new computers running Windows 10 Professional can deliver significant value, including greater value compared to computers not running Intel Core vPro processors, computers not running Windows 10, and computers that are more than a year old. Questions were asked on a scale that included “strongly agree,” “agree,” “neutral,” “disagree,” and “strongly disagree” (though no respondents selected “strongly disagree” for these questions).

- › **Improved security.** Interviewed and surveyed organizations identified significant security improvements for computers with Intel Core vPro processors running Windows 10. Respondents agreed or strongly agreed that:



Improving security:
81% identified it as a key issue
63% as high or top priority
Overall rated a 4.5 (of 5)

Security



Base: 254 respondents at mid-size organizations that have implemented the Intel vPro platform
Source: A commissioned study conducted by Forrester Consulting on behalf of Intel, July 2018

- Computers with Intel Core vPro processors and Windows 10 are more secure than before (75%).
- IT compliance and reporting are easier and better (76%).
- Computer security labor costs have reduced (64%).
- Security is even better on newer hardware compared to older laptops and desktops (75%).

› **Improved productivity.** Interviewed and surveyed organizations saw productivity improvements for end users who were provisioned computers with Intel Core vPro processors running Windows 10. Respondents agreed or strongly agreed that:

- Computers run faster and better than before (85%).
- Users with newer hardware see even greater productivity improvement (81%).
- The options available for new computers powered by Intel Core vPro processors in more varied form factors (such as convertible 2-in-1s) have led to greater adoption by users — for example, sales road warriors looking for light but powerful laptops (81%).
- Battery life is improved (77%).
- Power users such as financial employees, data scientists, and others working with large data sets can get more work done more quickly due to improved performance and reduced application crashes (79%).

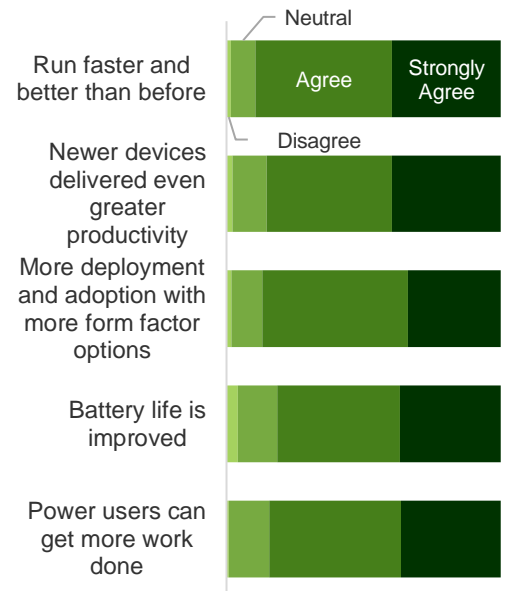
› **Improved IT management tasks.** Interviewed and surveyed organizations reported laptop and desktop management improvements with computers with Intel Core vPro processors running Windows 10, leading to IT improvements and efficiencies. Respondents agreed or strongly agreed that:

- Computers with the Intel vPro platform running Windows 10 are easier to manage (77%).
- Management is even easier with newer laptops and desktops (73%).
- Computers have fewer issues (73%).
- There are fewer tier 2 (or higher) help desk calls related to desktop management (70%).
- Desktop management IT costs have reduced (67%).
- Intel support and added solutions have been a significant part of the overall value (71%).

Composite Organization

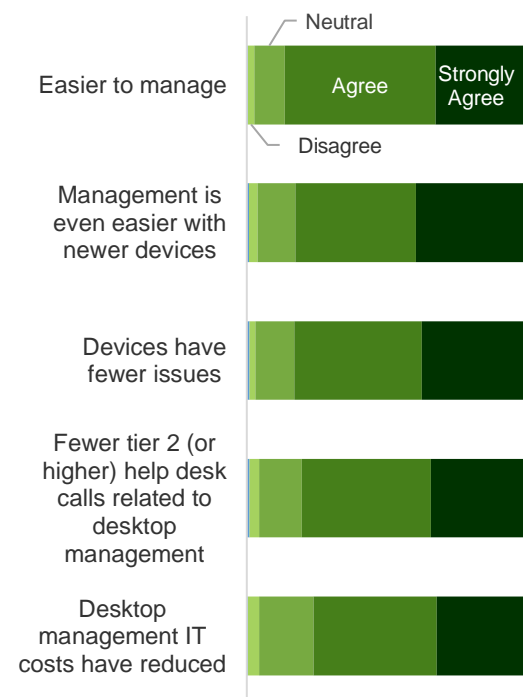
Based on the interviews and survey responses, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization is representative of the nearly 260 companies that Forrester interviewed or surveyed and is used to present the aggregate financial analysis in the next section. The composite organization that Forrester synthesized from the customer interviews has the following characteristics:

Productivity



Base: 254 respondents at mid-size organizations that have implemented the Intel vPro platform
Source: A commissioned study conducted by Forrester Consulting on behalf of Intel, July 2018

IT Management



Base: 255 respondents at mid-size organizations that have implemented the Intel vPro platform
Source: A commissioned study conducted by Forrester Consulting on behalf of Intel, July 2018

Description of composite. The composite is a US-based company with 600 employees and 750 total laptop and desktop computers with the latest Intel Core vPro processors, 575 of which run Windows 10. (Because most organizations purchase devices through a volume licensing plan, Windows 10 Professional is used as the standard in this study.) Two full-time desktop administrators are responsible for day-to-day management, and three support engineers spend a significant amount of time on desktop support questions and issues.

Before the organization deployed desktop computers with Windows 10 Professional and the latest Intel® Core™ vPro™ processors, it supported a broad array of Intel-based devices and Windows operating system versions. Some devices included the Intel vPro platform, but given the small number of users, the IT department was not yet able to implement management tools to leverage it fully. Also, while some users in the organization could take advantage of some improvements in security, performance, and stability, adoption was too small for any significant benefits that were measured at the organization.

The organization has used the Intel vPro platform to enable current security, management, and productivity benefits for about a year, but has purchased laptops and desktops (aka “computers”) with Intel core vPro processors for several years.

Deployment characteristics. For a company with 600 employees, implementing computers with Intel core vPro processors and Windows 10 Professional was not as comprehensive and long as a larger, enterprise organization might expect. The organization was flexible enough to be able to deploy everything within six months, without greatly impacting any departments or individuals.



Key assumptions

600 employees

750 computers

Two desktop managers

Three support techs

Analysis Of Benefits

QUANTIFIED BENEFIT DATA AS APPLIED TO THE COMPOSITE

Total Benefits						
REF.	BENEFIT	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Atr	Reduced security support resolution time and costs	\$473,575	\$473,575	\$473,575	\$1,420,725	\$1,177,711
Btr	Improved employee productivity with increased performance	\$541,538	\$541,538	\$541,538	\$1,624,615	\$1,346,726
Ctr	Reduced security risk-related costs due to desktop and laptop protection	\$85,000	\$85,000	\$85,000	\$255,000	\$211,382
Dtr	Improved IT management efficiency with better management tools	\$32,680	\$32,680	\$32,680	\$98,040	\$81,270
Total benefits (risk-adjusted)		\$1,132,793	\$1,132,793	\$1,132,793	\$3,398,380	\$2,817,089

Reduced Security Support Resolution Time And Costs

With the Intel vPro platform powering laptops and desktops running Windows 10 Professional related security issues are reduced, compared to the previous environment that included varied processor technologies and operating systems. Minor issues such as small security problems — for example, a user who downloads a virus or a single computer infected by spyware — are fewer, completely avoided, or resolved more quickly. Also, the impact from major issues, such as a zero-day security event, can be greatly reduced. Interviewed and surveyed organizations identified security as a key issue — 81% identified it as such, and 63% identified it as a high or top priority. Seventy-five percent agreed or strongly agreed that security is better than before, and 64% agreed or strongly agreed that computer security labor costs have reduced.

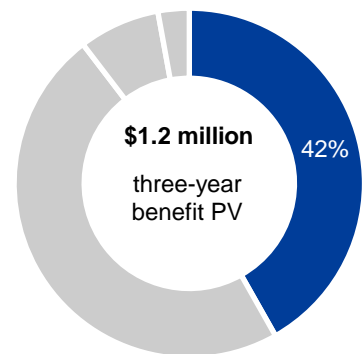
The Intel vPro platform features and technologies that drive improved security benefits include:

- › Intel Active Management Technology. (Intel AMT)
- › Hardware-enhanced security features.
- › Specific hardware requirements for a consistent infrastructure.

Newer Intel vPro platform tools such as Intel® Authenticate solution, Intel® Runtime BIOS Resilience, and Intel® Transparent Supply Chain are expected to improve security and management efficiency even more.

Windows 10 Professional also includes features and technologies like Credential Guard and Windows Defender, which, when deployed on new devices powered by the Intel vPro platform, can deliver even greater protection.

The table above shows the total of all benefits across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of more than \$2.8 million.



Reduced security costs: 42% of total benefits

For the composite organization, the previous security management environment included:

- › Eighty minor issues per month related to desktop management that took a total of 5 hours to resolve per issue.
- › Ten major issues per month related to desktop management that took 30 hours to resolve per issue. Note: This is a broad category; for many organizations, this average consisted of one or two issues that took a lot of time to resolve, plus 10 or more others that took 5 or 10 hours.

With new computers powered by the Intel vPro platform and Windows 10, issues and resolution time both are reduced:

- › Twenty minor issues per month take about 1 hour each to resolve.
- › Five major issues per month each take 8 hours (on average) to resolve.

For the composite, results are based on:

- › A desktop security manager fully burdened salary estimated at \$135,000.

Reduced Security Support Resolution Time And Costs: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	Minor issues related to user computers before the Intel vPro platform and W10 (per month)		80	80	80
A2	IT time to resolve minor issue before (hrs./issue)		5	5	5
A3	Minor issues related to user computers since the Intel vPro platform and W10 (per month)		20	20	20
A4	IT time to resolve minor issue today (hrs./issue)		1	1	1
A5	Total hours saved from fewer and easier-to-resolve minor security issues due to the Intel vPro platform and Windows 10	$(A1*A2-A3*A4)*12$	4,560	4,560	4,560
A6	Major issues related to user computers before the Intel vPro platform and W10 per month		10	10	10
A7	IT time to resolve major issue before (hrs.)		30	30	30
A8	Major issues related to user computers since the Intel vPro platform and W10 per month		5	5	5
A9	IT time to resolve major issue today (hrs.)		8	8	8
A10	Total hours saved from fewer and easier-to-resolve major security issues due to the Intel vPro platform and Windows 10	$(A6*A7-A8*A9)*12$	3,120	3,120	3,120
A11	Avg. desktop security manager salary (rounded value shown)	$\$135,000/2,080$	\$64.90	\$64.90	\$64.90
At	Reduced security support resolution time and costs (rounded)	$(A5+A10)*A11$	\$498,500	\$498,500	\$498,500
	Risk adjustment	↓5%			
Atr	Reduced security support resolution time and costs (risk-adjusted)		\$473,575	\$473,575	\$473,575

This financial analysis includes benefits enabled by Intel Active Management Technology (Intel AMT) and device encryption, even

though these technologies have been available (as part of the Intel vPro platform and Windows 10 Professional, respectively) for several years. Some organizations did not enable and adopt these significantly until they were ready with their Intel vPro platform implementation including management and security tool and process improvements.

Time savings add up to nearly \$499,000 saved per year, though due to the possibly overestimated reduced number of events, event resolution savings, and/or salary, Forrester adjusted this benefit downward by 5%, for an annual benefit of nearly \$474,000 yielding a three-year risk-adjusted total PV of almost \$1.2 million.

Improved Employee Productivity With Increased Performance

With Intel vPro platform-powered computers running Windows 10 Professional, end users can expect improved efficiency compared to the previous environment with multiple processors, operating systems, and management tools. Computers leveraging the Intel vPro Platform and Windows 10 are:

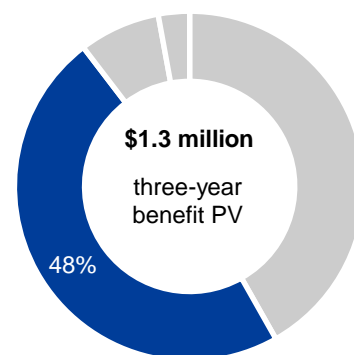
- › **Faster.** Premium processors are faster to wake from sleep, to restart, and in power-up and -down cycles. Eighty-one percent of survey and interview respondents agreed that users with newer hardware see greater productivity improvement.
- › **More mobile.** Better battery life means employees can be more mobile and get more work done without worrying about computer power. “We have people that work remotely, people that work abroad,” said the IT manager of a UK financial services firm. Seventy-seven percent of survey and interview respondents agreed that battery life is improved.
- › **More powerful.** A premium processor can also perform calculations and manage large sets of data more efficiently, meaning users such as financial analysts working with large data sets or mobile sales reps remotely accessing back-end systems can get more done more quickly. Eighty-five percent agreed or strongly agreed that computers run faster and better than before.

IT security and management improvements also impact all other employees: Reduced IT support calls and remediation also mean that end users aren’t making calls and spending time waiting for resolutions. The IT manager for a European bioinformatics firm said, “We have many people who work remotely; before, if they had an issue either they had to wait to come back to try to fix them with the IT team, or a person had to go to them.” The IT manager for a US construction services firm said, “We have a user that had to basically shut everything down to run his design application.”

For the composite organization, Forrester assumes that:

- › All 600 employees with computers powered by Intel Core vPro processors with Windows 10 gain at least some benefit (and some employees have more than one computer).
- › Employees achieve a productivity improvement of 30 minutes each week on general work tasks (which may be significantly higher for power users such as finance and sales).
- › Employees also gain productivity from reduced security issues and better IT management processes. “We get very few complaints,” said

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



Improved employee productivity: **48%** of total benefits

the IT manager at a US construction services firm. While the previous and next benefit sections focus on IT task and work time savings, end users also benefit, estimated to be an average of about 25 minutes per employee per week (though again, more likely to be more variable from week to week).

- › The average fully burdened salary across the organization for all employees provisioned with Intel Core vPro processor-powered computers with Windows 10 is \$100,000.
- › For broad productivity benefits, not all recovered time is directly applied to additional work; there are meetings, breaks, social conversations, etc. While these are important to a healthy, productive workplace, they are not considered a benefit of this investment.

Improved Employee Productivity With Increased Performance: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Total number of employees who have computers powered by Intel Core vPro processors with Windows 10		600	600	600
B2	Hours saved from faster task completion per week per employee with improved performance from the Intel vPro platform		0.5	0.5	0.5
B3	Total end user time saved from faster task completion, per year (hrs.)	$B1*B2*52$	15,600	15,600	15,600
B4	Hours saved from avoiding IT management/support issues per week	Related to table C	1,040	1,040	1,040
B5	End user time impacted during minor issue resolution (hrs.)	Related to table A	6,840	6,840	6,840
B6	End user time impact during major issue resolution (hrs.)	Related to table A	4,680	4,680	4,680
B7	Average information worker hourly salary (rounded)	$\$100,000/2,080$	\$48.08	\$48.08	\$48.08
B8	End user productivity factor (50%)		50%	50%	50%
Bt	Improved employee productivity with increased performance	$(B3+B4+B5+B6)*B7*B8$	\$676,923	\$676,923	\$676,923
	Risk adjustment	↓20%			
Btr	Improved employee productivity with increased performance (risk-adjusted)		\$541,538	\$541,538	\$541,538

For the composite organization, end user productivity benefits add up to nearly \$677,000 per year. However, productivity benefits are difficult to measure and attribute directly to a single influence and may be overestimated. For that reason, Forrester adjusted this benefit downward by 20%, for an annual benefit of nearly \$542,000, yielding a three-year risk-adjusted total PV of more than \$1.3 million.

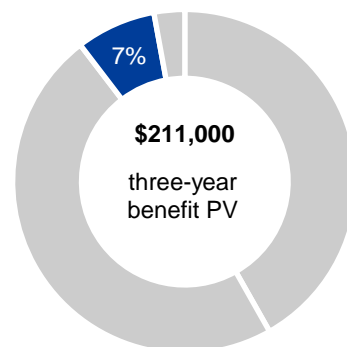
Reduced Security Risk-Related Costs Due To Desktop And Laptop Protection

The Intel vPro platform protects against data loss or leakage with features including hardware-based encryption and secure remote management with Intel Active Management Technology (Intel AMT).

This means organizations that have deployed computers running Intel Core vPro processors with Windows 10 Professional installed can expect that a data breach event is less likely to happen, with more secure hardware and tools that can improve compliance and track issues, compared to the previous environment with varied processor technologies and operating system versions. As mentioned above, 75% of survey and interview respondents agreed or strongly agreed that computers are more secure. Seventy-six percent also agreed or strongly agreed that IT compliance and reporting is easier and better.

A data breach can cost millions of dollars per event, as reported in research from the Ponemon Institute, which publishes an annual report on the impact of security based on the estimated number of records, industry, and geography. For the composite organization, the cost of a major security event is estimated to be \$8 million.¹

However, these events don't happen every year, so the average expected cost of a data breach is less. For the composite organization, the expected risk, or chance, a significant data breach event could happen due to computer security lapses is estimated to be 5%, for an average annual expected cost of \$400,000. The Intel vPro platform with Windows 10 is estimated to reduce this risk by 25%, adding up to a \$100,000 annual cost avoidance benefit.



Reduced data security risk:
7% of total benefits

Reduced Security Risk-Related Costs Due To Desktop And Laptop Protection: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
C1	Estimated cost of a security data breach		8,000,000	8,000,000	8,000,000
C2	Estimated risk of a data breach occurrence due to desktop security issues		5%	5%	5%
C3	Potential reduction in data breach risk related to computers due to the Intel vPro platform and Windows 10		25%	25%	25%
Ct	Potential reduced security risk-related costs due to desktop and laptop protection	$C1 \cdot C2 \cdot C3$	\$100,000	\$100,000	\$100,000
	Risk adjustment	↓15%			
Ctr	Reduced security risk-related costs due to desktop and laptop protection (risk-adjusted)		\$85,000	\$85,000	\$85,000

As these metrics are primarily based on outside research, and a composite organization data breach could involve less or more data records, this benefit has been risk-adjusted by a higher rate, 15%, for a risk-adjusted annual benefit of \$85,000 and a three-year PV of over \$211,000.

Improved IT Management Efficiency With Better Management Tools

With Intel vPro platform-powered computers running Windows 10 Professional, the composite organization's IT desktop management team can expect efficiencies in general day-to-day management, fewer in-person support calls, and fewer IT requests, compared to the previous environment that included varied computing technologies, operating systems, and management tools. More than 70% of survey and interview respondents agreed or strongly agreed that Intel vPro platform computers are easier to manage, have fewer issues, and require less tier

"Of all the benefits we have seen enabled by vPro, we would estimate that 70% to 80% of that benefit is attributable to Intel AMT."

IT manager, UK financial services firm



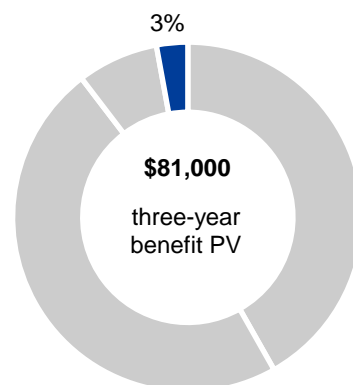
2 (or higher) support escalation

“Remote management is a great advantage,” said the IT manager for a European bioinformatics firm, highlighting a key enabler of this benefit: remote management with Intel Active Management Technology (Intel AMT). One organization attributed a very significant impact from Intel’s remote management technology, including patch and update delivery as well as other benefits impacted by the technology already mentioned above. The IT manager for a UK financial services firm said: “Of all the benefits we have seen enabled by vPro, we would estimate that 70% to 80% of that benefit is attributable to Intel AMT. The ability to be able to free up resources is really good for the company.”

For the composite organization, Forrester estimates:

- › **A reduction of 4 hours per week saved for each of the two desktop management specialists** on patching and general management tasks, such as managing the delivery of patches in a more secure and timely manner, even for remote or mobile workers who don’t access the network as often as others.
- › **A reduction of 4 hours per week for each of the two desktop support technicians** through reduced password resets and access to more secure data sources. Before security features such as device encryption, many organizations would block access like this but can now allow access (with setup, management, and approval), reducing these requests.

“In our organization, one-third of our desktops and laptops have vPro so far, but we spend less than 20% of desktop management time working with these devices,” said the IT manager at a UK financial services firm.



**Improved IT management:
3% of total benefits**

Improved IT Management Efficiency With Better Management Tools: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
D1	IT desktop engineers		2	2	2
D2	IT management and patch hours saved per week with the Intel vPro platform with W10		4	4	4
D3	Total IT management time saved per year (hours)	$D1 * D2 * 52$	416	416	416
D4	IT engineer average salary (rounded)	$\$110,000 / 2,080$	\$52.88	\$52.88	\$52.88
D5	IT desktop support specialists		2	2	2
D6	Total desktop support hours saved per week with the Intel vPro platform with W10		4	4	4
D7	Total desktop support time saved per year (hours)	$D5 * D6 * 52$	416	416	416
D8	IT support specialist salary (rounded)	$\$62,000 / 2,080$	\$29.81	\$29.81	\$29.81
Dt	Improved IT management efficiency with better management tools	$D3 * D4 + D7 * D8$	\$34,400	\$34,400	\$34,400
	Risk adjustment	↓5%			
Dtr	Improved IT management efficiency with better management tools (risk-adjusted)		\$32,680	\$32,680	\$32,680

Adding up the relevant hours and applying the proper fully burdened estimated salary (separated to show the higher salary for desktop

managers compared to desktop support specialists), this adds up to \$34,400 per year. Time savings may be overestimated; to account for this risk, Forrester adjusted this benefit downward by 5% for an annual benefit of \$32,680 and a three-year risk-adjusted total PV of more than \$81,000.

Unquantified Benefits

In addition to the benefits detailed above with business and financial metrics, organizations identified other benefits that are more difficult to measure or have not yet been measured, including:

- › **Other solution or technology cost savings or avoidance.** Some interviewed and surveyed organizations said they reduced or eliminated some third-party solutions made redundant with the latest Intel Core vPro processors and Windows 10. For example, some organizations no longer needed another hardware encryption solution or extra management tools, meaning they could eliminate ongoing license payments. In addition, simplifying computer management influenced reduced security and management costs detailed above.
- › **Benefits enabled by other Intel hardware.** Interviewed organizations mentioned other hardware, software, and services that maximize value of the Intel vPro platform and Windows 10. “We use Intel® Pro SSDs,” said the IT manager at a UK financial services firm, highlighting the speed and reliability of these drives.

Flexibility

The value of flexibility is clearly unique to each customer, and the measure of its value varies from organization to organization. There are multiple scenarios in which a customer might choose to implement Intel Core vPro processors and later realize additional uses and business opportunities, including the following scenarios:

- › **Some organizations came to the Intel vPro platform for high-performance computers.** “We have a minimum quality bar and specification for new hardware,” said the IT manager of a US construction services firm. That minimum bar happened to be vPro computers, and this firm has started to take advantage of some management and security features. However, the IT manager continued, “More features of vPro may be valuable to the company in the future,” which can mean unlocking new benefits for organizations.
- › **New Intel vPro platform features and technologies are available.** While Intel Active Management Technology (Intel AMT) may be synonymous with the Intel vPro platform for some, Intel has expanded the Intel vPro platform with new features and technologies, such as Intel Authenticate solution, Intel Runtime BIOS Resilience, and Intel Transparent Supply Chain. Taking advantage of these and other Intel technologies and services can further add to computer management efficiency, improved security, and greater productivity.

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

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for a future additional investment. This provides an organization with the “right” or the ability to engage in future initiatives but not the obligation to do so.

Analysis Of Costs

QUANTIFIED COST DATA AS APPLIED TO THE COMPOSITE

Total Costs

REF.	COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Etr	Ongoing costs	\$0	\$189,000	\$189,000	\$189,000	\$567,000	\$470,015
Ftr	Purchase costs for Intel Core vPro processor-powered computers with Windows 10 Professional	\$354,375	\$0	\$0	\$0	\$354,375	\$354,375
Gtr	Implementation costs	\$278,250	\$0	\$0	\$0	\$278,250	\$278,250
	Total costs (risk-adjusted)	\$632,625	\$189,000	\$189,000	\$189,000	\$1,199,625	\$1,102,640

Ongoing Costs

Tasks related to computer management with the Intel vPro platform are minimal, but it does require some extra time to complete and includes:

- › New maintenance tasks related to the Intel vPro platform and Windows 10 Professional.
- › Management of added services based on Intel technologies, such as Intel Active Management Technology (Intel AMT).
- › Other new maintenance and support costs.
- › Training on the use and management of these new tools and features.

The table above shows the total of all costs across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total costs to be a PV of about \$1.1 million.

Ongoing Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
E1	Intel vPro platform maintenance costs			\$70,000	\$70,000	\$70,000
E2	Cost of services based on Intel technologies			\$45,000	\$45,000	\$45,000
E3	Other new maintenance and support costs			\$25,000	\$25,000	\$25,000
E4	Training and other costs			\$40,000	\$40,000	\$40,000
Et	Ongoing costs	E1+E2+E3+E4	\$0	\$180,000	\$180,000	\$180,000
	Risk adjustment	↑5%				
Etr	Ongoing costs (risk-adjusted)		\$0	\$189,000	\$189,000	\$189,000

Primarily based on survey responses, the following costs (adjusted for USD) are summarized in the table above.

To allow for underestimation, Forrester has applied a 5% risk adjustment. Ongoing costs add up to an annual risk-adjusted total of \$189,000, for a three-year risk-adjusted PV of just over \$470,000.

Purchase Costs For Intel Core vPro Processor-Powered Computers With Windows 10 Professional

While most laptops and desktops have been provisioned to employees as part of the normal, already budgeted refresh cycle, some purchases were required to meet Year 1 implementation plans. For the composite organization, Forrester estimates:

- › Thirty percent of laptops and desktops needed to be purchased out of the standard refresh cycle. These are allocated as a cost in this investment analysis.
- › A new computer based on the Intel vPro platform and running Windows 10 averages a cost of \$1,500.

Implementation risk is the risk that a proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

Purchase Costs For Intel Core vPro Processor-Powered Computers With Windows 10 Professional: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
F1	Number of devices planned for vPro and Windows 10 deployment		750			
F2	Intel Core vPro processor-powered computers running Windows 10 Professional purchased outside standard refresh schedule		30%			
F3	Cost per computer		\$1,500			
Ft	Purchase costs for Intel Core vPro processor-powered computers with Windows 10 Professional	$F1 * F2 * F3$	\$337,500	\$0	\$0	\$0
	Risk adjustment	↑5%				
Ftr	Purchase costs for Intel Core vPro processor-powered computers with Windows 10 Professional (risk-adjusted)		\$354,375	\$0	\$0	\$0

With a 5% risk adjustment to allow for underestimated computer purchase costs, the total cost associated with desktop and laptop purchases needed to implement a full IT management strategy focused on the Intel vPro platform is less than \$355,000.

Implementation Costs

Implementation is focused on the planning, training, deployment, software, hardware, and similar costs related to ramping up and using Intel vPro platform-powered computers with Windows 10 Professional.

For the composite organization, Forrester estimates that implementation took four months and involved five IT desktop managers and support specialists.



Four months
Total implementation and deployment time involving five people

Implementation Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
G1	Planning costs		\$45,000			
G2	Training costs		\$45,000			
G3	Hardware costs		\$50,000			
G4	Software costs		\$35,000			
G5	Deployment services		\$40,000			
G6	Other internal or third-party costs related to implementation		\$50,000			
Gt	Implementation costs	$G1+G2+G3+G4+G5+G6$	\$265,000	\$0	\$0	\$0
	Risk adjustment	↑5%				
Gtr	Implementation costs (risk-adjusted)		\$278,250	\$0	\$0	\$0

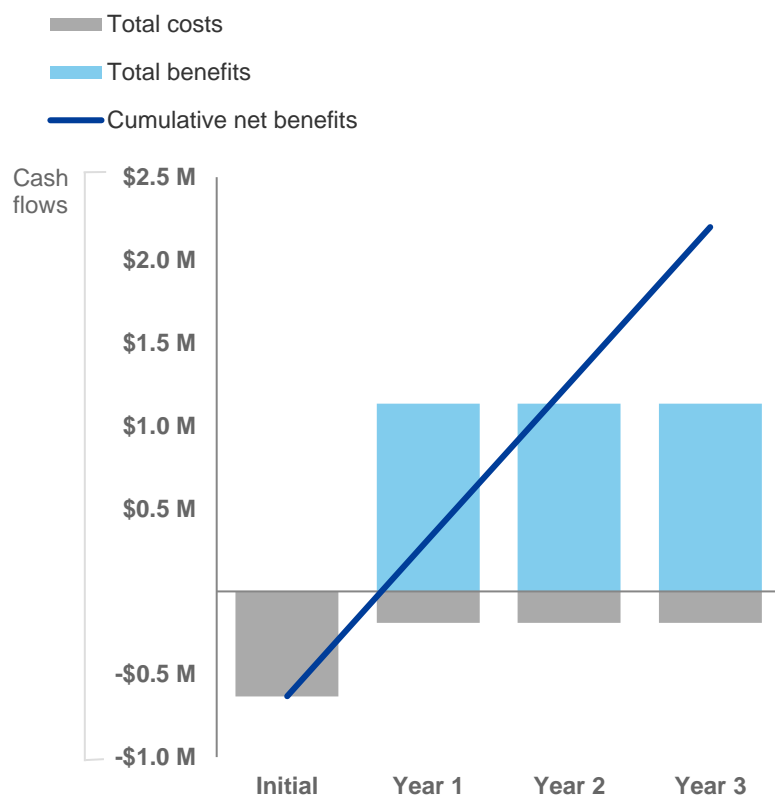
Survey respondents provided costs in each implementation category, which are summarized in the table above.

With a 5% risk adjustment to allow for survey response variability and underestimation, the implementation costs add up to just over \$278,000.

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



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



These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	(\$632,625)	(\$189,000)	(\$189,000)	(\$189,000)	(\$1,199,625)	(\$1,102,640)
Total benefits	\$0	\$1,132,793	\$1,132,793	\$1,132,793	\$3,398,380	\$2,817,089
Net benefits	(\$632,625)	\$943,793	\$943,793	\$943,793	\$2,198,755	\$1,714,449
ROI						155%
Payback period						9 months

Intel vPro Platform: Overview

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

Built for Business

The Intel vPro platform is comprised of Intel hardware, technologies, and solutions that form the building blocks for premium business computing. System manufacturers utilize these building blocks and contribute computing expertise to deliver notebooks, desktops, workstations, and other computing appliances that are verified “ready for business.”

THE HEART OF THE PLATFORM

The Intel vPro platform features the latest Intel processors, and the specification is updated on a yearly basis to provide continuous innovation. With eighth-generation Intel Core vPro processors, business users benefit from optimized architectures for desktop and mobile, with the headroom to support the workflows of today and tomorrow.

SPECIFICATION COMPONENTS

Complementing the processor, Intel vPro platforms incorporate specific chipsets, management-optimized networking, plus high-end memory and I/O components designed to improve business productivity. As shown in the table below, Intel vPro brand-compliant systems also enable a wide variety of Intel technologies and solutions that improve manageability, security, and stability for business devices.

To learn more, visit <http://intel.com/vPro>.

HARDWARE	TECHNOLOGIES	SOLUTIONS
INTEL® vPRO™ PLATFORM REQUIREMENTS		
Intel® Core™ i5 and i7 vPro™ Processors and Chipsets	Intel® Active Management Technology (Intel® AMT)	Intel® Authenticate Solution (validation)
Intel® Xeon® Processors and Chipsets	Intel® Trusted Execution Technology (Intel® TXT)	Intel® Remote Secure Erase (or equivalent)
Intel® Ethernet Controller	Intel® Software Guard Extensions (Intel® SGX)	
Intel® Wireless-AC	Intel® Virtualization Technology for IA-32, Intel® 64 and Intel® Architecture (Intel® VT-x)	
Discrete Trusted Platform Module (via 3 rd party)	Intel® Virtualization Technology for Directed I/O (Intel® VT-d)	
INTEL® vPRO™ PLATFORM RECOMMENDATIONS		
Intel® Solid State Drives Pro Series	Intel® Identity Protection Technology with Public Key Infrastructure (Intel® IPT-PKI)	Intel® Stable Image Platform Program (Intel® SIPP)
Intel® Optane™ Memory	Intel® Runtime BIOS Resilience *	Intel® Transparent Supply Chain *
Intel® Thunderbolt™ 3 Controller		Intel® Manageability Commander Intel® Setup and Configuration Software

* selected systems

Appendix A: Total Economic Impact

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

Total Economic Impact Approach



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



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



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



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

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.



Present value (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.



Net present value (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.



Return on investment (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.



Discount rate

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.



Payback period

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

Appendix B: Endnotes

¹ Source: “2017 Cost of Data Breach Study: United States,” Ponemon Institute, June 13, 2017 (<https://www.ponemon.org/library/2017-cost-of-data-breach-study-united-states>).