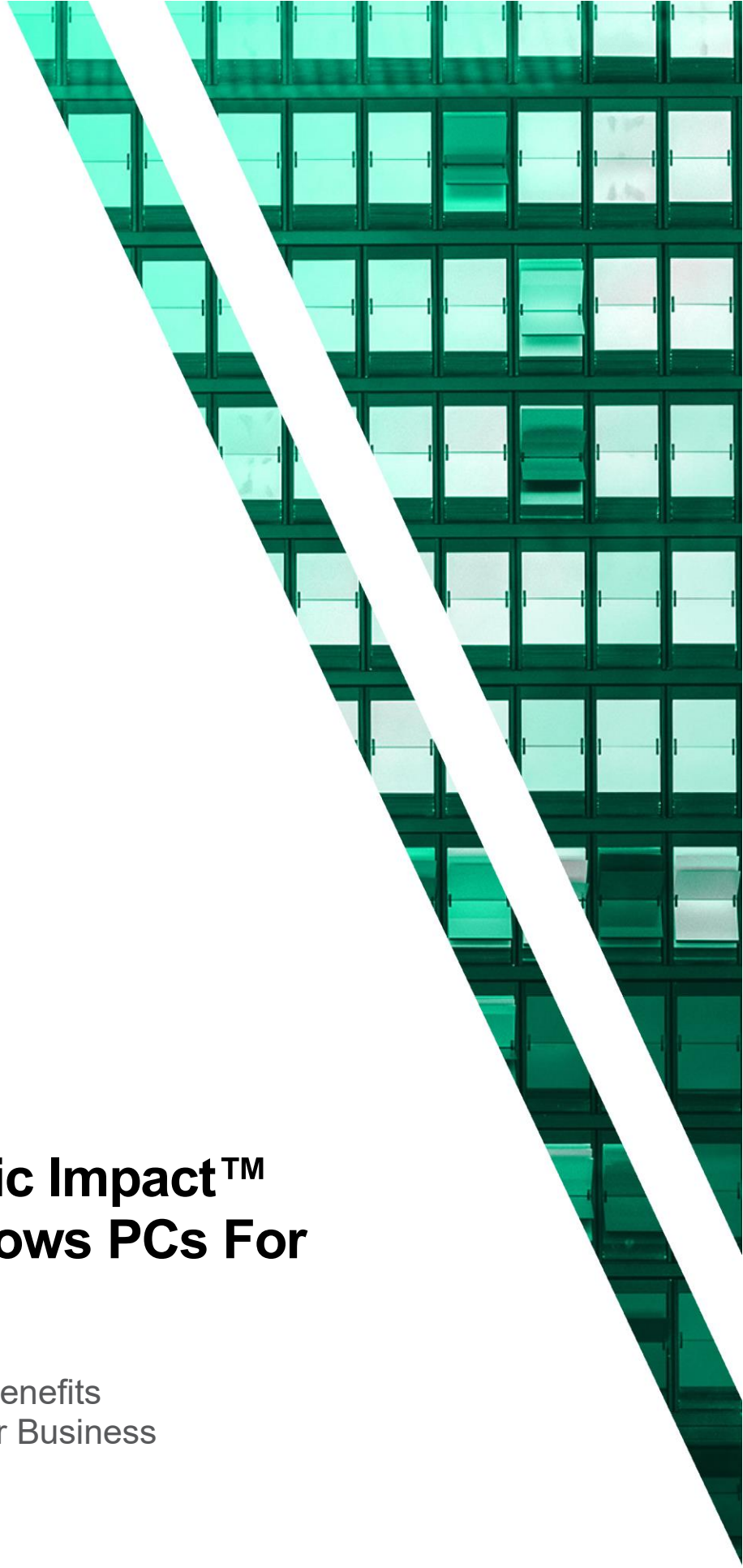
FORRESTER®



The Total Economic Impact™ Of Microsoft Windows PCs For Business

Cost Savings And Business Benefits Enabled By Windows PCs For Business

SEPTEMBER 2021

A FORRESTER TOTAL ECONOMIC IMPACT™ STUDY COMMISSIONED BY MICROSOFT

Executive Summary

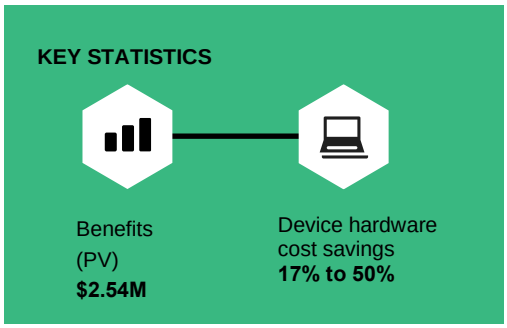
Windows PCs for business with Microsoft Office (including Microsoft 365) remain the dominant operating system and productivity suite combination across the globe.[1] With recent trends of choose-your-own-device policies, as well as cloud and remote work, some organizations are considering alternative end-point PCs and devices for their employees.

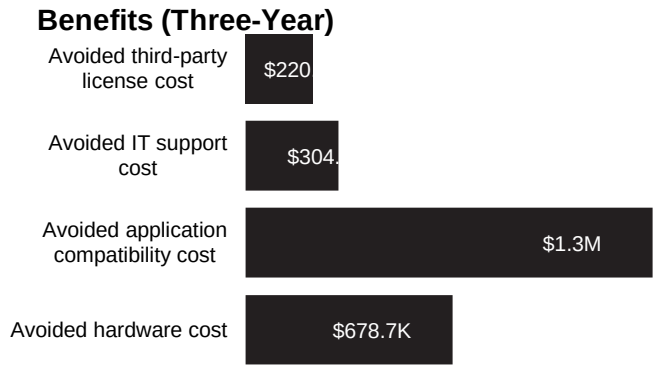
Microsoft commissioned Forrester Consulting to conduct the following Total Economic Impact™ (TEI) studies and examine the potential benefits enterprises may realize by deploying Windows PCs as opposed to alternative endpoint devices.[2] The purpose of these studies is to provide readers with a framework to evaluate the potential financial impact of Windows PCs on their organization as compared to refreshing with alternative end-point PCs and devices.

The first scenario considers a composite organization with 2,500 employees using Windows PCs for business. The composite organization is considering moving to non-Windows devices for business, and the study evaluates the value it would realize by maintaining Windows PCs for business. In the second scenario, the composite organization is considering deploying browser-based PCs for business with an alternative browser-based business suite. The study evaluates the benefits and the opportunity costs of maintaining Windows PCs for business with Microsoft Office. A summary of the findings is listed below.

Scenario 1 (Page 3):

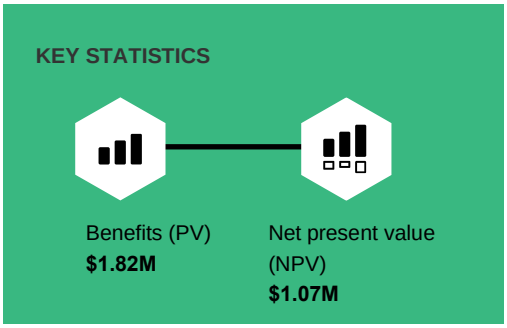
Windows PCs compared to Non-Windows PCs and Devices

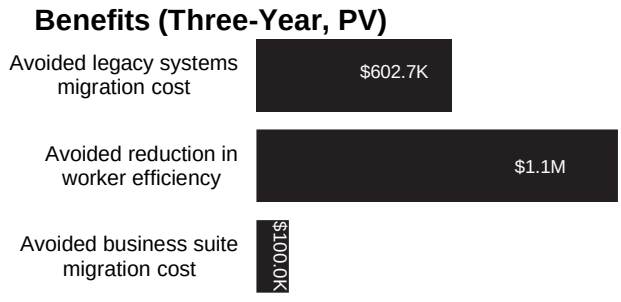




Scenario 2 (Page 28):

Windows PCs With Microsoft Office compared to Browser-Based PCs With an Alternative Browser-Based Business Suite





[1] Source: “The State Of Employee Computing, 2021,” Forrester Research, Inc., August 2, 2021.

[2] 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.

FORRESTER®

The Total Economic Impact™ Of Microsoft Windows PCs For Business

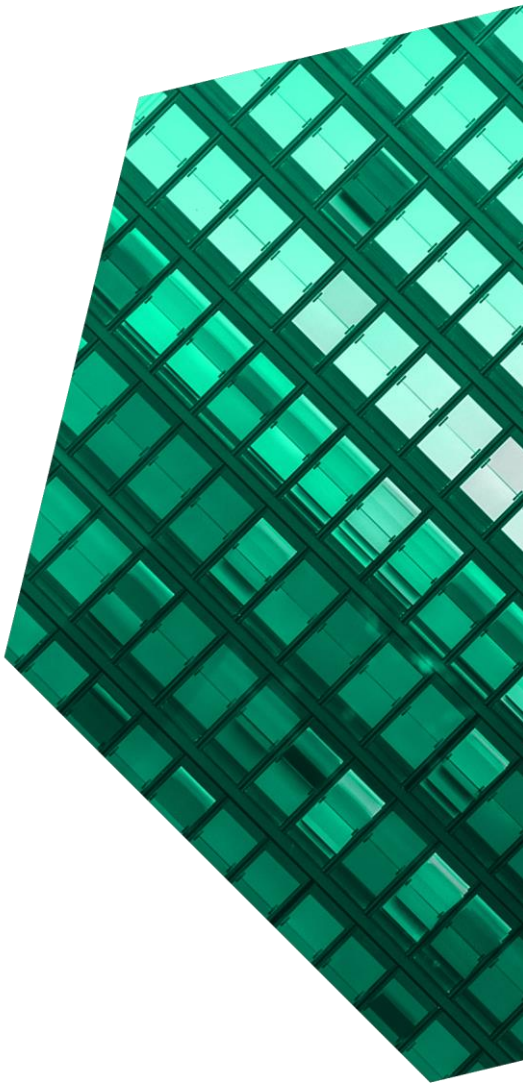
Cost Savings And Business Benefits Enabled By Windows PCs For Business As Compared To Non-Windows PCs And Devices

SEPTEMBER 2021

A FORRESTER TOTAL ECONOMIC IMPACT™ STUDY COMMISSIONED BY MICROSOFT

Table Of Contents:

Consulting Team: Chris Layton
Brendan Ng



Executive Summary

Surveyed and interviewed decision-makers that use Windows and non-Windows devices for business consistently reported cost savings associated with their Windows PCs. These decision-makers indicated that non-Windows devices for business caused additional complexities and limitations. An organization with Windows applications, IT staff trained to support Windows PCs, and 2,500 devices expects to save $2.54 million in risk-adjusted and present value costs over three years with Windows PCs for business.

Windows PCs for business are used across industries and around the world.[3] Recent trends of choose-your-own-device policies have moved some organizations towards supporting both Windows and non-Windows devices for business. While these policies provide employees more choice, they also cause additional complexities and costs for the organization.

Microsoft commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential benefits enterprises may realize by focusing their environment on Windows PCs for business.[4] The purpose of this study is to provide readers with a framework to evaluate the potential financial impact on their organizations as compared to non-Windows devices for business.

To better understand the benefits and risks associated with this investment, Forrester interviewed ten decision-makers and surveyed 1,782 decision-makers with experience using both Windows and non-Windows devices for business. For the purposes of this study, Forrester aggregated the experiences of the interviewed and surveyed decision-makers and combined the results into a single composite organization. All values are reported in risk-adjusted, three-year present value (PV) unless otherwise indicated.

KEY STATISTICS

Benefits (PV)
$2.54M

Device hardware cost savings
17% to 50%

KEY FINDINGS

Quantified benefits. Risk-adjusted present value (PV) quantified benefits include:

- **Avoided third-party license costs totaling over $220,000.** Third-party licenses for device and systems management, identity and access management, and security solutions cost less for Windows PCs for business than comparable non-Windows devices.
- **Avoided IT support costs totaling nearly $305,000.** Most non-Windows devices for business take longer to deploy than comparable Windows PCs for business. Additionally, support tickets for non-Windows machines take longer to resolve, requiring additional IT support.

- **Avoided application compatibility costs totaling over $1.3 million.** The introduction of non-Windows devices for business to an organization often creates compatibility issues with critical business applications, requiring additional systems, equipment, and virtualization software.
- **Avoided hardware costs totaling nearly $679,000.** Interviewees and surveyed respondents reported that Windows PCs for business cost less to purchase than non-Windows devices for business, and peripherals for Windows PCs for business also cost less to purchase than peripherals for non-Windows devices for business. In addition, Windows PCs for business below $500 and above $800 are refreshed less frequently than comparable non-Windows devices for business.

Unquantified benefits. Benefits that are not quantified for this study include:

- **Greater end-point visibility and governance.** Interviewees reported that Windows PCs for business allowed for greater visibility and governance over what data is stored and where it is located, helping companies to stay in compliance with security policies.
- **Increased worker productivity.** Windows PCs for business users avoided many of the application compatibility issues that non-Windows device for business users experienced. This saved those employees time and allowed for fewer interruptions.

The financial analysis based on the decision-maker interviews and survey found that a composite organization experiences benefits of $2.54 million over three years.

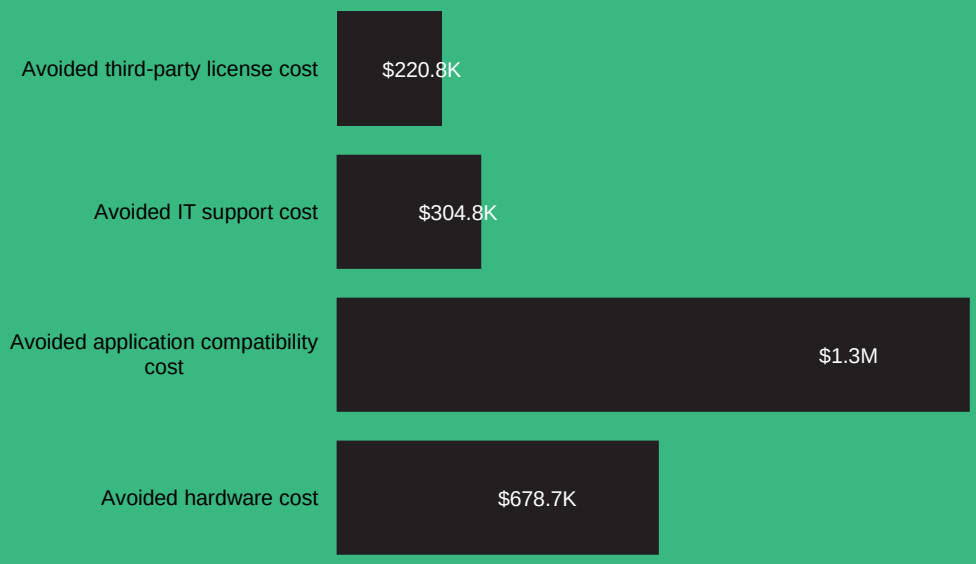
BENEFITS PV
$2.54M

WINDOWS PC SUPPORT TICKET RESOLUTION TIME
10% to 20% faster

AVERAGE ANNUAL APPLICATION SUPPORT COST SAVINGS PER WINDOWS PC
$332

REDUCTION IN HARDWARE COST VS. NON-WINDOWS DEVICE FOR BUSINESS
17% to 50%

Benefits (Three-Year)



TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews and survey, Forrester constructed a Total Economic Impact™ framework for those organizations considering whether to support a Windows or a non-Windows environment.

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 supporting Windows PCs for business can have on an organization.

Windows PCs for business and non-Windows tablets and PCs for business were compared within three price tiers: less than $500, between $500 and $800, and more than $800. This approach allows readers to evaluate the impact of supporting Windows PCs for business based on the specific needs and device landscape of their organization.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Microsoft and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the study to determine the appropriateness of an investment in Windows PCs for business.

Microsoft reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

Forrester sourced the customer interviews, and Microsoft did not participate in the interviews.

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

DUE DILIGENCE

Interviewed Microsoft stakeholders and Forrester analysts to gather data relative to Windows PCs for business.

DECISION-MAKER INTERVIEWS AND SURVEY

Interviewed ten IT executives and surveyed 1,782 device decision-makers at organizations using both Windows and non-Windows devices for business to obtain data with respect to benefits and risks.

COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewed and surveyed decision-makers.

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 decision-makers.

CASE STUDY

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

The Microsoft Windows PCs For Business Customer Journey

Drivers leading to the Windows PCs For Business investment

KEY CHALLENGES

Forrester interviewed ten decision-makers and surveyed 1,782 decision-makers with experience using both Windows and non-Windows devices for business. For more details on the organizations that participated in this study, see Appendix B.

Based on these results, Forrester found that organizations experienced supporting non-Windows devices for business, including:

- **Application compatibility.** Application compatibility was a common and acute issue for device decision-makers in organizations that supported non-Windows devices for business. Critical programs for business operations, such as electronic medical records systems, expense software, and enterprise resource planning (ERP) systems, needed to be accessed through Windows virtual machines or additional Windows workstations. In some cases, organizations avoided upgrades to their non-Windows machines to avoid further application compatibility issues.

> **"Everything that doesn't run on a web-based interface is a problem for our [non-Windows] users."**
> *— Chief technology officer, healthcare*

- **Increased management overhead.** Interviewees revealed it was difficult to find staff that have the expertise to support both Windows and non-Windows devices for business. In addition, staff who support non-Windows devices for business often are paid 10% to 15% more given their relative scarcity.
- **More expensive hardware.** Non-Windows devices for business can cost significantly more than comparable Windows PCs. Peripherals for non-Windows devices can also cost two to three times as much as comparable peripherals for Windows PCs for business.
- **The need for separate device management systems.** Adopting non-Windows devices for business required organizations to use separate device management systems and associated maintenance solutions. Low-maturity organizations often needed to manage non-Windows devices for business individually with limited governance and oversight. Higher-maturity organizations used device management solutions, which cost from $80 to more than $100 annually per user.
- **Limited end-point visibility and governance.** One of the strongest concerns for non-Windows device managers was a lack of visibility into what data was on devices and where that data was stored, which created risk and compliance concerns. Policies to limit local data storage could not fully protect against certain privacy regulations. Several interviewees' organizations restricted the type of work that could be done on non-Windows tablets for business below $800 to manage these risk and compliance concerns.
- **More challenging support tickets.** While both interviewees and survey respondents reported fewer support tickets from non-Windows devices for business, the tickets that did occur were much more time-consuming to resolve. In many cases, tickets from non-Windows machines were referred to third parties, costing more and impacting employee productivity.

COMPOSITE ORGANIZATION

Based on the interviews and survey, Forrester constructed a TEI framework and a composite company that illustrates the areas financially affected. The composite organization is representative of the ten decision-makers that Forrester interviewed and the 1,782 respondents that Forrester surveyed and is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

Description of composite. The composite organization operates globally and is headquartered in North America. It has a total of 2,500 employees, each of whom have a Windows PC for business. Of the 2,500 employees, 1,233 (49%) are knowledge workers who use a PC priced over $800; 561 (22%) are task workers who use a PC priced between $500 and $800; and the remaining 706 (28%) are frontline workers who use a PC priced below $500.

For this composite organization, knowledge workers primarily work in an office setting throughout the day and almost all their work is done through a computer. Task workers typically work more in an operational setting and may move between a variety of environments throughout the day and may or may not share a PC. Frontline workers are generally customer-facing and use shared PCs for one main program at a time, such as a point-of-sale system or a customer relationship management program.

The composite organization does not have IT staff that are trained to support non-Windows devices for business. In addition, the composite organization has business applications that require virtualization or Windows support for non-Windows devices for business to access.

Key assumptions

- **2,500 Windows PCs for business**
- **49% of PCs >$800**
- **22% of PCs $500 to $800**
- **28% of PCs <$500**

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	Avoided third-party license cost	$47,285	$91,614	$135,943	$274,842	$220,836
Btr	Avoided IT support cost	$121,000	$122,670	$124,393	$368,062	$304,838
Ctr	Avoided application compatibility cost	$277,111	$553,823	$830,536	$1,661,470	$1,333,618
Dtr	Avoided hardware cost	$206,950	$236,665	$392,592	$836,207	$678,688
	Total benefits (risk-adjusted)	$652,345	$1,004,772	$1,483,464	$3,140,581	$2,537,980

AVOIDED THIRD-PARTY LICENSE COST

Interviewed and surveyed device decision-makers reported cost savings in third-party licenses for their Windows PCs for business as compared to non-Windows devices for business.

- Non-Windows devices for business often required additional device management systems, which cost from $80 to more than $100 annually per user.
- Windows PCs for business priced below $800 were less likely to need additional identity and access management services as compared to non-Windows devices for business.
- Windows PCs for business priced above $500 were less likely to require additional security software, and licenses for Windows PCs for business also cost less than comparable non-Windows devices for business.

Modeling and assumptions. To reflect the interviewees' experiences, Forrester assumes the following:

- Third-party licenses costs for Windows and non-Windows devices for business are informed by surveyed device decision-makers.

Surveyed device decision-makers spent:

- 19% more on third-party device and system management solutions for non-Windows devices for business.
- 6% more on third-party identity and access management solutions for non-Windows devices for business.
- 10% more on third-party security solutions for non-Windows devices for business.
- 14% more for third-party compliance and governance solutions for non-Windows devices for business.

- Third-party license cost savings at each price tier are calculated using the difference in average license costs between Windows and non-Windows devices and the percentage of users requiring licenses. For devices less than $500, third-party license costs are reported as slightly lower for non-Windows tablets for business, so this is reflected as a negative cost savings in the financial model.
- Costs for the following types of third-party licenses are accounted for: business suite, business productivity solutions, meeting and voice solutions, collaboration, data and analytics, device and systems management, identity and

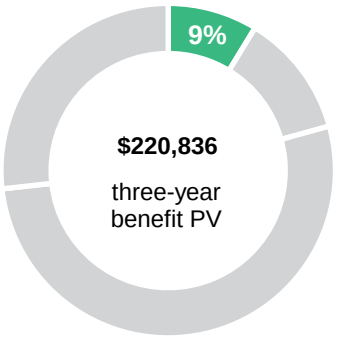
access management, and security solutions. Virtualization and Windows support costs are accounted for separately under the “Avoided application compatibility cost” benefit section.

- License costs of business productivity solutions, meeting and voice solutions, collaboration, and data and analytics are assumed to be the same for Windows and non-Windows devices for business, so these license costs do not contribute to the cost avoidance of a Windows PC for business. However, license cost differences for business suite, device and systems management, identity and access management, and security solutions are assumed to differ between Windows and non-Windows devices for business based on survey responses.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary based on:

- The needs of the organization and individual users, which will influence the types and costs of licenses required. While it is assumed the survey respondents represent these needs, readers should consider their organization’s own needs for third-party licenses, which may impact cost savings from Windows PCs for business.
- The addition of more third-party services to provide cloud-based solutions, which may decrease the cost savings advantage for a Windows PC for business as the impact of operating system (OS) compatibility could be reduced.

Results. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of nearly $221,000.



Avoided third-party license cost

Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Cumulative new Windows PCs for business <$500 added	Composite	235	470	705
A2	Cumulative new Windows PCs for business $500 to $800 added	Composite	187	374	561
A3	Cumulative new Windows PCs for business >$800 added	Composite	412	823	1,234
A4	Monthly cost avoidance savings for licenses for Windows PCs for business <$500	Survey and interviews	($6)	($6)	($6)
A5	Monthly cost avoidance savings for licenses for Windows PCs for business $500 to $800	Survey and interviews	$11	$11	$11
A6	Monthly cost avoidance savings for licenses for Windows PCs for business >$800	Survey and interviews	$9	$9	$9
A7	Subtotal: Third-party license cost avoidance savings for Windows PCs for business <$500	A1*A4*12	($16,920)	($33,840)	($50,760)
A8	Subtotal: Third-party license cost avoidance savings for Windows PCs for business $500 to $800	A2*A5*12	$24,684	$49,368	$74,052
A9	Subtotal: Third-party license cost avoidance savings for Windows PCs for business >$800	A3*A6*12	$44,496	$88,884	$133,272
A10	Additional savings from third-party compliance and governance solution	Survey and interviews	$3,369	$3,369	$3,369
At	Avoided third-party license cost	A7+A8+A9+A10	$55,629	$107,781	$159,933
	Risk adjustment	↓15%			
Atr	Avoided third-party license cost (risk-adjusted)		$47,285	$91,614	$135,943
	Three-year total: $274,842			**Three-year present value: $220,836**	

AVOIDED IT SUPPORT COST

Evidence and data. Interviewees and survey respondents reported IT support cost savings through support tickets. Tickets for Windows PCs were easier to resolve and deployment was generally faster.

- Survey respondents reported that Windows PCs for business above $500 can be deployed 20% to 30% faster than comparable non-Windows devices for business, providing IT support cost savings.

Windows PCs for business above $500 can be deployed 20% to 30% faster than comparable non-Windows devices for business.

- While surveyed device decision-makers indicated that Windows PCs for business generated 5% to 10% more tickets than non-Windows devices for business, those tickets were easier to resolve and took 10% to 20% less time than tickets for non-Windows devices for business, resulting in net cost savings for supporting Windows PCs for business.

Help tickets for Windows PCs for business are 10% to 20% faster to resolve.

- Some interviewees reported an even greater cost of resolving tickets for non-Windows devices for business since they took between two to ten times longer to resolve, indicating that support cost savings for Windows PCs for business may be even larger.

> **"When you get a [non-Windows device] problem, it's harder to resolve. Our ticket costs can be higher by a factor of 10."**
> *— Chief information officer, global healthcare*

> **"[Non-Windows devices for business] might get fewer level one or two calls, but calls are more expensive, and our desktop technicians can't resolve these problems, so we need to send them to an engineer.[Non-Windows devices for business] trouble tickets' resolution times are three times higher than Windows."**
> *— Chief technology officer, retail*

Modeling and assumptions. To reflect the interviewees' experiences, Forrester assumes the following:

- A non-Windows IT professional has a fully burdened salary of $29 per hour.
- Existing Windows IT support staff are retrained to support non-Windows devices for business and that additional staff is not needed. While survey respondents indicated that most Windows and non-Windows devices for business could be managed with a similar number of IT support staff, many interviewees indicated that significantly more FTEs were required to support their non-Windows devices for business.
- Organizations reported that Windows PCs for business that are less than $500 took marginally longer to deploy than comparable non-Windows tablets for business, so this additional time is modeled as negative time savings.

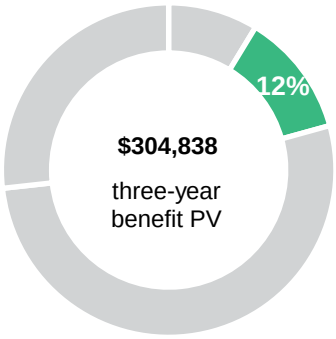
Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary based on:

- The differences in number of security breaches. Device decision-makers indicated that Windows PCs for business above $500 tend to experience

more security breaches than comparable non-Windows devices for business. Similarly, resolution time took longer on Windows PCs for business above $800. However, these organizations had significantly more full-time employees dedicated to securing and auditing non-Windows devices for business than comparable Windows PCs for business, suggesting that some of the differences in number of security breaches could be a result of organizational support.

- The variance in deployment time for Windows and non-Windows devices for business. While this analysis uses the average values survey respondents reported, this variance indicates that the cost savings benefit of deploying Windows PCs for business can vary.
- The variance in how much longer non-Windows support tickets took to resolve. This analysis uses the average support resolution time as survey respondents reported but, depending on the needs and expertise of users, the cost savings of supporting a Windows PC for business could also vary.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of nearly $305,000.



Avoided IT support cost

Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Hourly wage of non-Windows IT staff support	Standard	$29	$29	$29
B2	New Windows PCs for business <$500 added	Composite	235	235	235
B3	New Windows PCs for business $500 to $800 added	Composite	187	187	187
B4	New Windows PCs for business >$800 added	Composite	412	411	411
B5	Hours saved deploying one Windows PC for business <$500	Survey and interviews	-0.1	-0.1	-0.1
B6	Hours saved deploying one Windows PC for business $500 to $800	Survey and interviews	1.0	1.0	1.0
B7	Hours saved deploying one Windows PC for business >$800	Survey and interviews	0.6	0.6	0.6
B8	Total hours saved deploying Windows PCs for business	(B2*B5)+(B3*B6)+(B4*B7)	411	410	410
B9	Subtotal: Savings from deployment	B1*B8	$11,919	$11,890	$11,890
B10	Cumulative new Windows PCs for business <$500 added	Composite	235	470	705
B11	Cumulative new Windows PCs for business $500 to $800 added	Composite	187	374	561
B12	Cumulative new Windows PCs for business >$800 added	Composite	412	823	1,234
B13	Annual hours saved supporting a Windows PC for business <$500	Survey and interviews	-0.2	-0.2	-0.2
B14	Annual hours saved supporting a Windows PC for business $500 to $800	Survey and interviews	0.6	0.6	0.6
B15	Annual hours saved supporting a Windows PC for business >$800	Survey and interviews	0.0	0.0	0.0
B16	Total hours saved supporting Windows PCs for business	(B10*B13)+(B11*B14)+(B12*B15)	65	130	196
B17	Subtotal: Savings from ongoing support	B1*B16	$1,885	$3,770	$5,684
B18	Non-Windows tablets for business <$500 supported per IT FTE	Survey and interviews	214	214	214
B19	Non-Windows tablets for business $500 to $800 supported per IT FTE	Survey and interviews	243	243	243
B20	Non-Windows PCs for business >$800 supported per IT FTE	Survey and interviews	216	216	216
B21	Number of new IT FTEs not needed to recruit and train	(B2/B18)+(B3/B19)+(B4/B20)	4	4	4
B22	Avoided cost to hire/retrain one non-Windows IT FTE	Standard	$30,160	$30,160	$30,160
B23	Subtotal: Avoided cost to hire and train new IT FTE for non-Windows devices	B21*B22	$120,640	$120,640	$120,640
Bt	**Avoided IT support cost**	**B9+B17+B23**	**$134,444**	**$136,300**	**$138,214**
	Risk adjustment	↓10%			
Btr	Avoided IT support cost (risk-adjusted)		$121,000	$122,670	$124,393
	Three-year total: $368,062		**Three-year present value: $304,838**		

AVOIDED APPLICATION COMPATIBILITY COST

Evidence and data. Interviewees and survey respondents reported that application compatibility was a significant added cost of supporting non-Windows devices for business and posed continual challenges and lost productivity.

- The chief technology officer at a retailer noted that introducing non-Windows devices for business required an accelerated $250,000 upgrade to certain software systems.

The chief technology officer at a healthcare firm reported that the organization's non-Windows devices require significantly more virtualization licensing than its Windows PCs, increasing costs.

- Both the chief technology officer at a quick service restaurant organization and a European healthcare enterprise had to purchase extra Windows machines to serve as a connection to critical applications that some employees' non-Windows devices for business could not access.

The vice president of IT at a retailer has experienced widespread issues integrating non-Windows devices for business into the organization. Each issue cost thousands of dollars to resolve along with additional lost productivity.

- Survey respondents indicated that non-Windows devices for business above $500 required virtual desktop infrastructure (VDI) support, which cost 10% to 20% more per user as compared to Windows PCs for business.
- In addition, survey respondents who used Windows support indicated that 43% of their non-Windows devices for business above $500 required additional Windows support to access critical business applications, which cost their organizations between $500 and $700 per user annually.

Between 35% to 41% of non-Windows devices for business require VDI support.

Modeling and assumptions. To reflect the interviewees' experiences, Forrester assumes the following:

- This analysis accounts for the cost of additional application support as well as the likelihood that a Windows or a non-Windows device for business requires that support as surveyed device decision-makers indicated.
- The cost savings indicated in the analysis show the normalized difference in license costs between Windows and non-Windows devices for business in each device price tier.

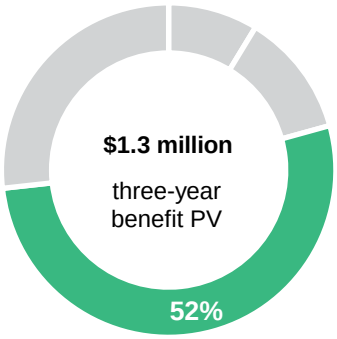
Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary based on:

- The expected cost savings indicated. These cost savings are based on average responses from survey respondents. If an organization plans its applications around a multi-OS environment, application support costs savings of a Windows PC for business might be reduced. However, interviewed device decision-makers indicated that this was largely not an option for their organizations.
- If an organization selected applications that are already compatible with both Windows and non-Windows devices for business. The application

compatibility cost savings associated with a Windows PC for business could be

reduced. Survey respondents indicated that this was not an option for their organizations.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of more than $1.3 million.



Avoided application compatibility cost

Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Cumulative new Windows PCs for business <$500 added	Composite	235	470	705
C2	Cumulative new Windows PCs for business $500 to $800 added	Composite	187	374	561
C3	Cumulative new Windows PCs for business >$800 added	Composite	412	823	1,234
C4	Monthly avoided application compatibility costs for a Windows PC for business <$500	Survey and interviews	$19	$19	$19
C5	Monthly avoided application compatibility costs for a Windows PC for business $500 to $800	Survey and interviews	$29	$29	$29
C6	Monthly avoided application compatibility costs for a Windows PC for business >$800	Survey and interviews	$35	$35	$35
C7	Subtotal: Avoided application compatibility costs for Windows PCs for business <$500	C1*C4*12	$53,580	$107,160	$160,740
C8	Subtotal: Avoided application compatibility costs for Windows PCs for business $500 to $800	C2*C5*12	$65,076	$130,152	$195,228
C9	Subtotal: Avoided application compatibility costs for Windows PCs for business >$800	C3*C6*12	$173,040	$345,660	$518,280
Ct	Avoided application compatibility cost	C7+C8+C9	$291,696	$582,972	$874,248
	Risk adjustment	↓5%			
Ctr	Avoided application compatibility cost (risk-adjusted)		$277,111	$553,823	$830,536
	Three-year total: $1,661,470			**Three-year present value: $1,333,618**	

AVOIDED HARDWARE COST

Evidence and data. Initial hardware costs, peripherals, and differences in refresh cycles lead to hardware cost savings for Windows PCs for business across survey respondents and interviewees.

- Interviewees' organizations spent between 17% and 50% less to purchase a Windows PC for business as compared to a non-Windows device for business.

Windows PCs for business cost 17% to 50% less per machine.

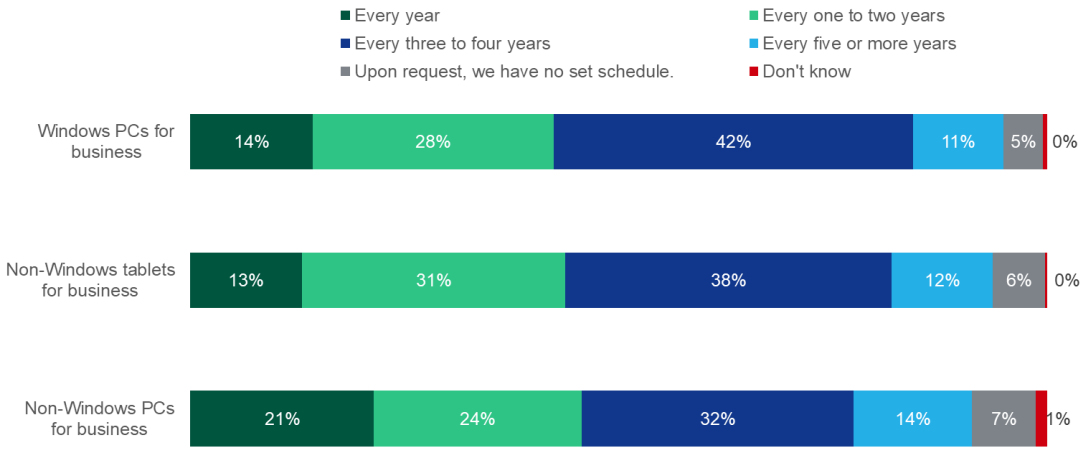
- Peripherals were also more expensive for organizations supporting non-Windows devices for business. Respondents reported spending twice to four times more for non-Windows peripherals compared to the cost of Windows PC for business peripherals in the same organization.
- Survey respondents had to refresh non-Windows devices 5% to 10% more frequently for tablets below $500 and PCs above $800.

Non-Windows device for business peripherals cost two to four times more.

Modeling and assumptions. To reflect the interviewees' experiences, Forrester assumes the following:

- Non-Windows PCs above $800 are assumed to cost 30% more than comparable Windows PCs. Non-Windows tablets below $800 are assumed to cost the same as Windows PCs for business as interviewees' companies indicated that they found less-expensive, lower-powered non-Windows tablets for business below the $800 price range to perform the limited tasks appropriate for some job functions.
- The cost of device refreshes considers if a device is expected to require a refresh within the three years evaluated in this analysis. If a device needs to be refreshed, we calculated the depreciation of a replacement device (assuming no salvage value) for the additional months it will be required through the end of the three years.

"On average, how often does your organization refresh the following device types?"



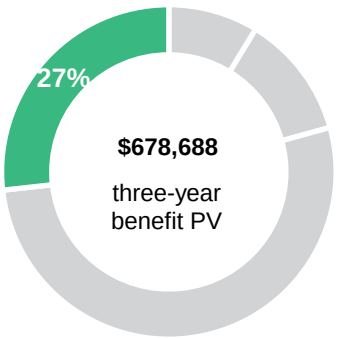
Base: 1,782 business and technology end-user compute influencers and decision-makers responsible for device purchasing decisions
Note: Percentages may not total 100 because of rounding.
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, February 2021

- While some organizations resell old devices, the resale value is often very low due to equipment being outdated as well as wear and tear. As such, resell value has not been accounted for in this analysis.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary based on:

- The resale value of devices. If an organization is expecting to resell Windows and non-Windows devices for business for a significant portion of the original device cost, this could impact hardware cost savings associated with Windows PCs for business.
- The needs of specific organizations and the specific costs associated with purchasing a Windows or a non-Windows device for business. While assumptions in this analysis represent a more typical case of hardware cost savings of a Windows PC for business, some organizations reported that non-Windows machines cost up to 100% more than a Windows machine.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of nearly $679,000.



Avoided hardware cost					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
D1	New Windows PCs for business <$500 added	Composite	235	235	235
D2	New Windows PCs for business $500 to $800 added	Composite	187	187	187
D3	New Windows PCs for business >$800 added	Composite	412	411	411
D4	Cost avoidance for one Windows PC for business <$500	Interviews	$0	$0	$0
D5	Cost avoidance for one Windows PC for business $500 to $800	Interviews	$0	$0	$0
D6	Cost avoidance for one Windows PC for business >$800	Interviews	$300	$300	$300
D7	Subtotal: Avoided costs from non-Windows devices	(D1*D4)+(D2*D5)+(D3*D6)	$123,600	$123,300	$123,300
D8	Cost avoidance from longer refresh rate for Windows PCs for business <$500	Survey	$0	$0	$160
D9	Cost avoidance from longer refresh rate for Windows PCs for business $500 to $800	Survey	$0	$0	($130)
D10	Cost avoidance from longer refresh rate for Windows PCs for business >$800	Survey	$0	$0	$290
D11	Subtotal: Cost savings from refresh rates	(D1*D8)+(D2*D9)+(D3*D10)	$0	$0	$132,480
D12	Total Windows PCs for business in their first year	D1+D2+D3	834	833	833
D13	Total Windows PCs for business in their second and third years	Initial: Assumption Year 2 and Year 3: $D13_{py}$ + 834	0	834	1,667
D14	Windows PC for business peripheral cost avoidance during first year	Interviews	$113	$113	$113
D15	Windows PC for business peripheral cost avoidance during second and third years	Interviews	$38	$38	$38
D16	Subtotal: Avoided peripheral costs	(D12*D14)+(D13*D15)	$94,242	$125,821	$157,475
Dt	Avoided hardware cost	D7+D11+D16	$217,842	$249,121	$413,255
	Risk adjustment	↓5%			
Dtr	Avoided hardware cost (risk-adjusted)		$206,950	$236,665	$392,592
	Three-year total: $836,207		**Three-year present value: $678,688**		

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not able to quantify include:

- **Greater end-point visibility and governance.** Interviewed decision-makers found that Windows PCs for business allowed for greater visibility and governance over end-point devices, meeting compliance requirements.
    - One of the strongest concerns interviewed decision-makers had around non-Windows devices for business was a lack of visibility into the data on the devices and where the

data was stored, which created risk and compliance concerns.

- Many interviewees needed to limit the types of data stored on non-Windows devices for business and provide non-Windows device users with additional training, where these extra measures were not required with Windows PCs. Even with these extra measures, non-Windows devices created risk in staying compliant with privacy regulations.

> **"We have blocked our [non-Windows] computers from storing any sensitive financial information as we can't have the same level of oversight of those devices."**
> *— Chief information officer, banking*

- **Worker productivity**. Many of the application compatibility issues avoided with Windows PCs for business benefited IT support and the end users themselves. In many cases, non-Windows device for business users could not natively access critical business applications, and workarounds took end users additional time to access each day. In addition, issues and outages with these workaround solutions inhibited non-Windows device for business users in ways Windows PC users did not experience.

Appendix A: Total Economic Impact

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

TOTAL ECONOMIC IMPACT APPROACH

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

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

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

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

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

PRESENT VALUE (PV)

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

NET PRESENT VALUE (NPV)

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

RETURN ON INVESTMENT (ROI)

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

DISCOUNT RATE

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

PAYBACK PERIOD

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

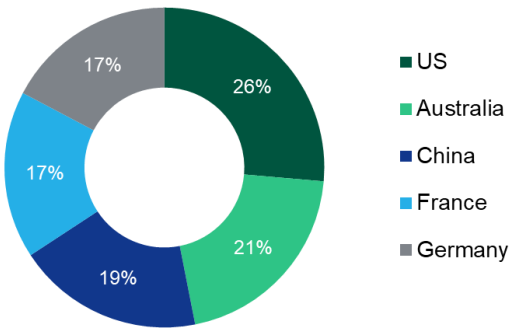
Appendix B: Interview and Survey Demographics

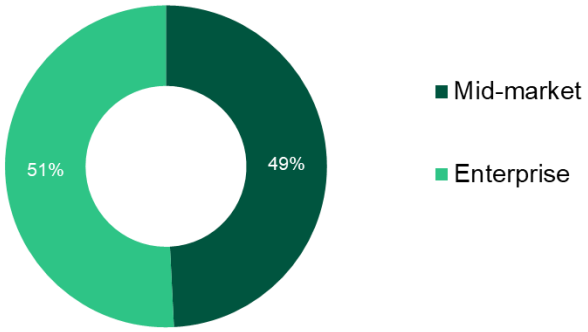
Interviewed Decision-Makers			
Interviewee	**Industry**	**Region**	**Size**
Chief technology officer	Retail	Global	10,000 employees
Chief technology officer	Healthcare	North America	20,000 employees
Vice president of IT	Financial services	Global	10,000 employees
Chief technology officer	Restaurant franchisor	North America	5,000 employees
Vice president of IT	Retail	North America	50,000 employees
Chief information officer	Healthcare	Europe	100,000 employees
Chief information officer	High technology	Global	5,000 employees
Chief information officer	Banking	North America	100 employees
Vice president, information technology	Engineering	North America	1,000 employees
Chief information security officer	Healthcare	North America	7,000 employees

Survey Demographics

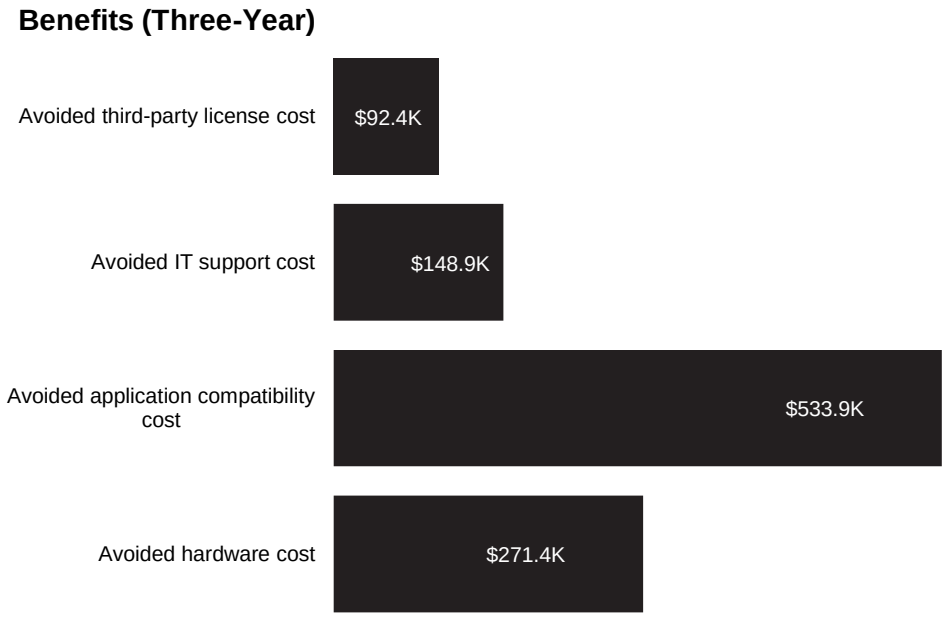
The survey was launched in January 2021 and concluded fielding in February 2021. Forrester surveyed a total of 1,782 business and technology end-user compute influencers and decision-makers.

The survey included participant quotas to ensure balanced representation with Windows and non-Windows device buyers across three device price points: less than $500, $500 to $800, and more than $800.





Appendix C: Summary Of Three-Year Benefits For Organizations With 1,000 Devices



Benefits PV

$1.05 million

Based on the interviews and survey, Forrester constructed a TEI framework and a composite company that illustrates the areas financially affected. The composite organization is representative of the ten decision-makers that Forrester interviewed and the 1,782 respondents that Forrester surveyed. The composite organization has the following characteristics:

The composite organization operates globally and is headquartered in North America with 1,000 Windows PCs for business: 493 are Windows PCs over $800, 224 are Windows PCs between $500 and $800, and the remaining 283 are Windows PCs below $500.

The composite organization is considering cost savings with maintaining a Windows ecosystem as opposed to moving towards non-Windows devices for business.

Appendix D: Endnotes

[3] Source: “The State Of Employee Computing, 2021,” Forrester Research, Inc., August 2, 2021.

[4] 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.


FORRESTER®

FORRESTER®

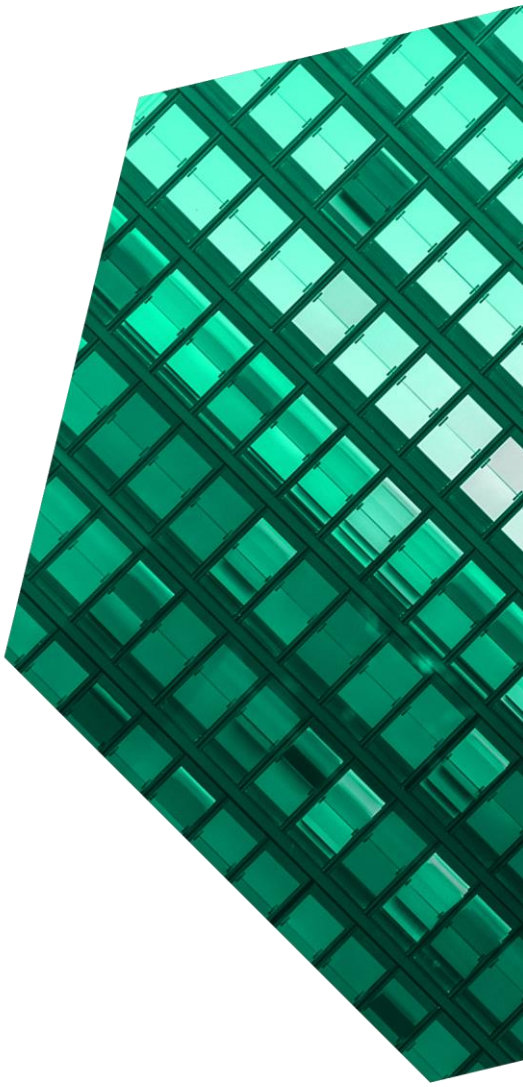
The Total Economic Impact™ Of Microsoft Windows PCs For Business

Cost Savings And Business Benefits Enabled By Windows PCs For Business With Microsoft Office As Compared to Browser-Based PCs With An Alternative Browser-Based Business Suite

SEPTEMBER 2021

Table Of Contents

Consulting Team: Chris Layton
Brendan Ng



ABOUT FORRESTER CONSULTING

Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. For more information, visit forrester.com/consulting.

Executive Summary

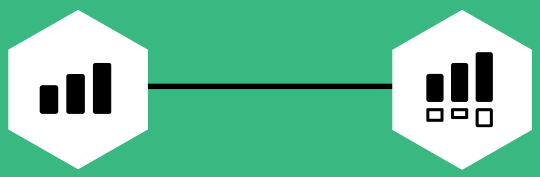
Interviewed and surveyed IT decision-makers shared that Windows PCs for business with Microsoft Office helped their organizations avoid the need for costly application migrations and increased worker efficiency. Deploying Windows PCs for business with Microsoft Office can help an organization with 2,500 Windows PCs for business and 12 legacy applications save $1.1M in risk-adjusted and present value costs over three years.

Windows PCs for business with Microsoft Office remain the dominant operating system and productivity suite combination across the globe.[5] With recent trends towards cloud and remote work, some organizations are moving towards lightweight browser-based laptops where all compute and productivity software resides in the cloud. While interviewees reported savings in hardware and IT support for browser-based configurations in limited use cases, organizations also reported additional costs associated with application cloud migration, increased complexity in managing multiple management systems, reduced worker efficiency, and additional need for third-party licenses.

Microsoft commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential benefits enterprises may realize by deploying Windows PCs for business with Microsoft Office.[6] The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Windows PCs on their organization when compared with browser-based PCs for business and an alternative browser-based business suite.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed ten decision-makers and surveyed 1,810 decision-makers with experience using both Windows PCs for business with Microsoft Office and browser-based PCs for business with an alternative browser-based business suite. For the purposes of this study,

KEY STATISTICS



Benefits (PV)
$1.82M

Net present value (NPV)
$1.07M

Forrester aggregated the experiences of the interviewed and surveyed decision-makers and combined the results into a single composite organization. All values are reported in risk-adjusted, three-year present value (PV) unless otherwise indicated.

KEY FINDINGS

Quantified benefits. Risk-adjusted present value (PV) quantified benefits include:s

- **Avoided legacy application migration costs totaling over $602,000.** Refreshing with Windows PCs for business avoids costs of migrating and rearchitecting business applications as most applications can run natively on Windows PCs for business, unlike browser-based PCs for business.
- **Avoided reduction in worker efficiency totaling over $1.1 million.** Workers moving to browser-based PCs for business initially lose some productivity due to training and a short

learning curve. In addition, some permanent efficiency loss would be expected for knowledge workers who need to run multiple browser-based applications simultaneously, which can impact performance of the device. Refreshing with Windows PCs for business avoids these issues.

> **"I wouldn't say move completely [to browser-based PCs for business]. For more powerful users who are using Microsoft Office or document tools on a regular basis, I would not recommend moving [to browser-based PCs for business] because it's going to be a much worse experience."**
> *Chief information officer, caregiving services*

- **Avoided business suite migration costs totaling over $100,000.** Moving to an alternative browser-based business suite requires an initial investment in a planning task force that includes management and engineering FTEs to oversee the migration. Additional third-party licenses may be required on an ongoing basis to meet some of the gaps in functionality provided by Microsoft Office but not an alternative browser-based business suite, and some other gaps in functionality may not be able to be met.

Unquantified benefits. Benefits that are not quantified for this study include:

- **Centralized device and security management.** Interviewees reported that browser-based PCs for business had difficulty working with their existing device and security management solutions. In some cases, this required IT to support additional third-party device management and security platforms. In another case, browser-based PCs needed to be isolated on the internal company network to prevent security vulnerabilities. Refreshing with Windows PCs for business avoided these issues.
- **Improved employee satisfaction with Windows PC for business.** Some decision-makers who had moved their departments from Windows PCs for business to browser-based PCs for business reported that their employees expressed dissatisfaction afterwards and that the employees did not feel as valued as they did with Windows PCs for business.

> **"If you have a group that's assigned to use [browser-based PCs for business] … they feel like they're now inferior because they don't get full Windows devices."**
> *Chief information officer, research foundation*

- **Retained user efficiency with Microsoft Office.** Some interviewees estimated that employees were more productive with Microsoft Office than they would be with an alternative browser-based business suite. This led to some organizations being unwilling to move away from Microsoft Office.

> **"Agent handling time and training are all very cost-conscious metrics for us and really any sort of call center environment, so making that switch away from Microsoft Office to [an alternative browser-based business suite] was considered likely to have too much of a negative impact on employee efficiency."**
> *Chief technology officer, customer service provider*

Opportunity Costs. Interviewed and surveyed decision-makers also reported opportunity costs of refreshing with Windows PCs for business as opposed to browser-based PCs for business. Risk-adjusted PV opportunity costs include:

- **Net hardware costs totaling less than $664,000.** While Windows PCs for business can

be used for more roles with greater flexibility, there is some additional cost of hardware as interviewees were typically looking at higher performance and specifications for Windows PCs for business than the performance and specifications for browser-based PCs for business. Even so, a portion (approximately 15%) of the higher hardware cost is offset by Windows PCs for business not needing to be refreshed as often as browser-based PCs for business.

- **Additional IT support totaling nearly $86,000.** While Windows PCs for business can support business applications running either locally or through a web browser, there is some additional IT support required as the devices have more complexity. This comparison in IT support is true only when considering certain types of users who have a more limited use case and may not need the additional capabilities of a Windows PC for business.

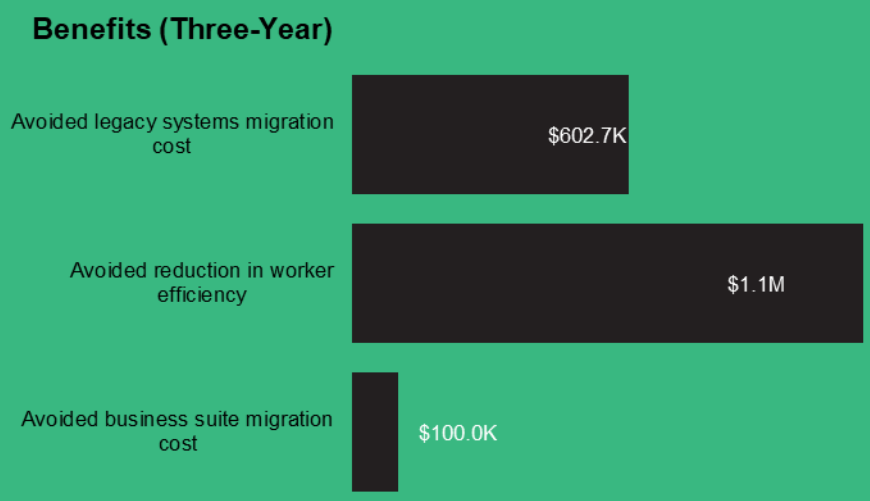
The decision-maker interviews and financial analysis found that a composite organization experiences benefits of $1.82M over three years versus opportunity costs of $750K, adding up to a net present value (NPV) of $1.07M when refreshing with Microsoft Windows PCs with Office versus browser-based PCs with an alternative browser-based business suite.

BENEFITS PV
$1.82M

NPV
$1.07M

EMPLOYEE EFFICIENCY
$1.11M

REDUCTION IN THIRD-PARTY LICENSES
$3.33 per user per month



TEI FRAMEWORK AND METHODOLOGY

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

The objective of the framework is to identify the opportunity cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Windows PC for business can have on an organization.

DUE DILIGENCE

Interviewed Microsoft stakeholders and Forrester analysts to gather data relative to Windows PC for business and Microsoft Office.

DECISION-MAKER INTERVIEWS AND SURVEY

Interviewed ten decision-makers and surveyed 1,810 decision-makers at organizations using both Windows PC for business and browser-based PCs for business to obtain data with respect to costs, benefits, and risks.

COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewed and surveyed decision-makers.

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 decision-makers.

CASE STUDY

Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester's TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix E for additional information on the TEI methodology.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Microsoft and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the study to determine the appropriateness of an investment in the Windows PCs for business.

Microsoft reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

Forrester sourced the customer interviews, and Microsoft did not participate in the interviews.

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

The Microsoft Windows PCs For Business Customer Journey

Drivers leading to the Windows PCs For Business investment

KEY CHALLENGES

Forrester interviewed ten decision-makers and surveyed 1,810 decision-makers with experience using both Windows and browser-based PCs for business. For more details on the organizations that participated in the study, see Appendix F.

Based on these results, Forrester found that organizations experienced difficulties supporting browser-based PCs for business, including:

- **Legacy applications that are incompatible or do not work properly.** Interviewees discussed that, for their employees to use browser-based PCs for business, legacy applications needed to either move to a cloud environment or rearchitected to run on the different operating system. In cases where the applications were complex, this migration was expensive and took several months. In some cases, off-the-shelf services from third-party vendors were used as a workaround solution, but support was limited and led to a decrease in employee efficiency until problems could be resolved.
- **Reduced hardware performance when running multiple programs or browser tabs.** One major limitation that interviewees found with browser-based PCs for business was in their limited computing power. Users reported that their devices slowed noticeably when using multiple programs at once, even if those programs were accessed through a web browser. This meant that the use case for the browser-based PCs for business had to be limited to workers who only needed to access one or two programs at a time.
- **Difficulty integrating into an existing ecosystem.** When introducing browser-based PCs for business, IT staff had difficulty connecting the devices to company printers. The chief technology officer of a restaurant franchisor reported that their organization's browser-based PCs for business could not run legacy security programs, so these specific PCs were siloed on the company network and did not have full internet access, which limited the type of work that could be completed.

> **"We never saw [browser-based PCs] as a fit for our corporate environment or heavy users."**
> *Chief information officer, caregiving services*

In addition, organizations experienced difficulties integrating an alternative browser-based business suite as opposed to Microsoft Office. Some common challenges included:

- **A significant burden on IT groups to migrate.** Interviewees mentioned that moving from Microsoft Office to an alternative browser-based business suite placed a significant burden on IT to support migration. In many cases, the cost of this move alone was high enough that decision-makers decided it was note feasible to move to an alternative browser-based business suite. In addition, supporting browser-based PCs for business added additional platform costs and management complexities on an ongoing basis.

> **"Could I have saved a couple of bucks if I had to not do the Microsoft Office licensing? Yeah, probably. But then I would probably have all the problems with support, learning, drill out, and deployment."**
> *Senior vice president of technology, construction supplier*

- **An additional need for third-party licenses.** While interviewees mentioned that an alternative browser-based business suite could provide cost savings on monthly licenses, they also had to purchase additional third-party licenses as the alternative browser-based business suite did not offer the full functionality as compared to Microsoft Office including device management and full Excel capabilities. Surveyed decision-makers whose organizations used an alternative browser-based business suite reported spending an average of $3.33 more per user per month in third-party licenses than organizations using Microsoft Office reported. Some decision-makers also reported security concerns with the need to involve additional third-party providers.

> **"Microsoft Office gave us all of the collaboration tools and a common email platform. We weren't looking to mix and match [an alternative browser-based business suite] tools. I need those tools from Microsoft Office."** *Senior vice president of technology, construction supplier*

COMPOSITE ORGANIZATION

Based on the interviews and survey, Forrester constructed a TEI framework, a composite company, and a ROI analysis that illustrates the areas financially affected. The composite organization is representative of the ten decision-makers that Forrester interviewed and the 1,810 decision-makers that Forrester surveyed and is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

Description of composite. The composite organization operates globally and is headquartered in North America. It has a total of 2,500 employees, each of whom have a Windows PC for business. Of the 2,500 employees, 1,233 (49%) are knowledge workers who use a PC priced over $800; 561 (22%) are task workers who use a PC priced between $500 and $800; and the remaining 706 (28%) are frontline workers who use a PC priced below $500.

For this composite organization, knowledge workers primarily work in an office setting throughout the day and almost all their work is done through a computer. Task workers typically work more in an operational setting and may move between a variety of environments throughout the day and may or may not share a PC. Frontline workers are generally customer-facing and use shared PCs for one main program at a time, such as a point-of-sale system or a customer relationship management program.

The composite organization has 12 legacy applications that would need to be rearchitected to run on a browser-based PCs for business (see Avoided Legacy Systems Migration Costs for more details). In addition, the composite organization currently uses Microsoft Office and is considering moving employees to an alternative browser-based business suite.

Key assumptions

- **2,500 employees with Windows PCs for business**
- **49% knowledge workers ($800 per PC)**
- **22% task workers ($500 to $800 per PC)**
- **28% frontline workers ($500 per PC)**
- **12 legacy applications that need to be rearchitected**

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	Avoided legacy systems migration cost	$663,000	$0	$0	$663,000	$602,727
Btr	Avoided reduction in worker efficiency	$333,941	$426,977	$609,411	$1,370,328	$1,114,315
Ctr	Avoided business suite migration cost	$72,572	$21,570	$21,570	$115,712	$100,007
	Total benefits (risk-adjusted)	$1,069,513	$448,547	$630,980	$2,149,040	$1,817,049

AVOIDED LEGACY SYSTEMS MIGRATION COST

Evidence and data. Interviewees reported their organizations' employees could not use legacy Windows applications on browser-based PCs for business, which meant they either needed to rearchitect those applications to run on the browser-based PCs' operating systems, migrate those applications to the cloud, or find another workaround solution.

- While interviewees were selected who had already been able to successfully implement browser-based PCs for business for some of their employees, many reported that they had still encountered additional costs associated with required workaround solutions. In some cases, the workaround solutions were so cost prohibitive that interviewees no longer saw browser-based PCs for business as a viable option for use cases that needed access to legacy applications.
- Even when workaround solutions fit the basic requirements, some had caused significant productivity loss for employees and so browser-based PCs for business were removed.

> **"We have a Windows-based tool we tried to substitute with a browser-based solution, but it wasn't a good experience for employees. Because of this, we don't issue those employees [browser-based PCs for business]."**
> *Chief information officer, caregiving services*

- Interviewees who successfully migrated legacy applications for use with browser-based PCs for business had simpler applications. It was estimated that migrating one of these applications would still take around 1,000 developer hours, including all development, testing, deployment, and full integration.

> **"There's a certain point where, depending on the amount of legacy software, migrating for use on [browser-based PCs for business] doesn't make sense. If it was 10, 12, 15 applications, if we had maybe a large suite of in-house-developed software that had to be touched, then it probably would have made it cost prohibitive to go with [browser-based PCs for business]."**
> *Chief technology officer, restaurant franchisor*

- Interviewees reported that their organizations had previously migrated anywhere from three to a few hundred business applications that were used on browser-based PCs for business. For interviewees with a larger number of — or more complex — business applications, the applications were generally migrated for reasons unrelated to adopting browser-based PCs for business.

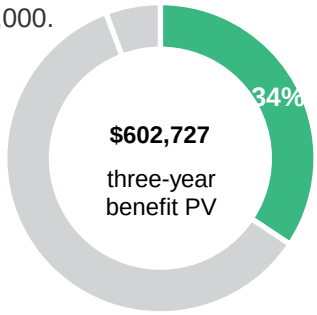
Modeling and assumptions. To reflect the interviewees' experiences, Forrester assumes the following:

- The composite organization has 12 business applications to migrate for use with browser-based PCs for business. All other required applications are already browser-based or otherwise accessible from a browser-based PC.
- The 12 business applications that must be migrated can be done so successfully without threatening the composite organization's operations.
- Each business application takes a total of 1,000 developer hours to fully migrate.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary based on:

- The number of business applications required for roles being considered for browser-based PCs, resulting in a different cost to migrate legacy applications.
- The complexity of the migrated applications and systems.
- Organizations may decide to migrate business applications for other reasons than using browser-based PCs for business, which means there would not be the same cost savings associated with maintaining use of Windows PCs for business.

Results. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of over $602,000.



Avoided Legacy Systems Migration Cost

Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Number of internal legacy applications needed to migrate	Composite	12	0	0
A2	Average developer hours needed to migrate one application	Composite	1,000	1,000	1,000
A3	Hourly wage per developer	$135,000/2,080 hours	$65	$65	$65
At	Avoided legacy systems migration cost	A1*A2*A3	$780,000	$0	$0
	Risk adjustment	↓15%			
Atr	Avoided legacy systems migration cost (risk-adjusted)		$663,000	$0	$0
	Three-year total: $663,000			**Three-year present value: $602,727**	

AVOIDED REDUCTION IN WORKER EFFICIENCY

Evidence and data. Interviewees indicated that some employees would not be as efficient when using browser-based PCs for business for reasons including hardware limitations and application compatibility.

- The chief information officer at a caregiving services company in North America reported their organization had to rely on a third-party vendor to replace a legacy Windows application for employees to use with browser-based PCs. However, for several months after the transition, the third-party application caused usability issues for employees, which resulted in an estimated 5 minutes of wasted time per day until the issue was resolved.
- While browser-based PCs for business were considered for some simpler roles, interviewees universally reported that browser-based PCs for business were not considered for many types of knowledge workers due to the device's hardware limitations and potential impact to user productivity.

> **"[Browser-based PCs for business] didn't work for our developers. They need robust machines to go do code, push it for production, new testing, technical things like that. [Browser-based PCs for business] didn't suit the need for that."**
> *Chief information officer, government health services*

- The chief information officer consultant from a global financial company noted that, after their employees were required to use multiple browser tabs on their browser-based PCs for business, device performance slowed noticeably.
- Employees who were moved to browser-based PCs for business for simpler roles generally took a couple of months until they were as comfortable using browser-based PCs for business as opposed to Windows PCs for business.

> **"When people are not used to [browser-based PCs for business], they have a real aversion to switching to it … If you're used to a Windows PC, which a lot of our users are, then there may be trouble switching."**
> *Senior VP of technology, real estate services*

Modeling and assumptions. To reflect the interviewees' experiences, Forrester assumes the composite organization can avoid costs of deploying browser-based PCs for business based on the following:

- The composite organization considers moving all frontline and task workers to browser-based PCs for business.
- The composite organization has identified half of its knowledge worker roles as potential browser-based PCs for business users. The other half are unable to effectively use browser-based PCs for business due to hardware limitations and continue to use Windows PCs for business.
- All employees lose some efficiency for the first three months of using browser-based PCs for business. This time includes training, setup, and a learning curve. Lost efficiency is lowest for frontline workers, higher for task workers, and highest for knowledge workers due to difference in training requirements and complexity of use.
- Knowledge workers see a permanent reduction in efficiency due to their programs running slower on a browser-based PC for business with more limited hardware. This reduction in efficiency equates to approximately five minutes per day.
- During the first year of browser-based PCs for business rollout, some additional efficiency loss

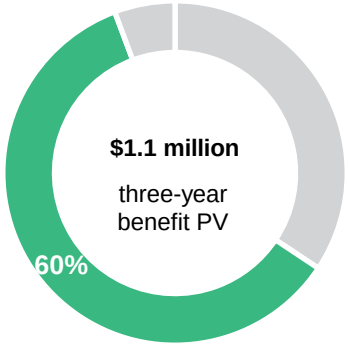
are incurred for three months while legacy applications migrate and usability issues are resolved. This efficiency loss is assumed to equal an average of five minutes per day. All issues are resolved during this first three-month period, and no future application compatibility issues are assumed in the second and third year of device refresh.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary based on:

- The types of employees and complexity of work considered for browser-based PCs for business, meaning the overall impact of efficiency could change.
- The age of employees learning to use browser-based PCs for business. Younger employees were generally observed as having a shorter learning curve, meaning efficiency loss may also vary.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $1.1M.

> **"I am not convinced that we should take [browser-based PCs for business] to like 45% of our workforce or something like that. I am not trying to pull every laptop out of somebody's hand and give them a [browser-based PC for business] tomorrow."**
> *Chief information officer, construction supplier*



Avoided Reduction In Worker Efficiency

Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Months of avoided efficiency loss	Composite	3	3	3
B2	Frontline workers refreshing Windows PCs for business	Composite	235	235	235
B3	Initial retained productivity per frontline worker (hours per month)	Composite	0.5	0.5	0.5
B4	Avoided efficiency loss from migrating legacy applications (hours per month)	Composite	2	0	0
B5	Hourly rate per frontline worker (fully burdened)	$35,000/2,080 hours	$17	$17	$17
B6	Subtotal: Avoided initial reduction in frontline worker efficiency	B1*B2*(B3+B4)*B5	$29,963	$5,993	$5,993
B7	Task workers refreshing Windows PCs for business	Composite	187	187	187
B8	Initial retained productivity per task worker using Windows PC for business (hours per month)	Composite	1	1	1
B9	Avoided efficiency loss from migrating legacy applications (hours per month)	Composite	2	0	0
B10	Hourly rate per task worker (fully burdened)	$45,000/2,080 hours	$22	$22	$22
B11	Subtotal: Avoided initial reduction in task worker efficiency	B1*B7*(B8+B9)*B10	$37,026	$12,342	$12,342
B12	Information workers refreshing Windows PCs for business	Composite	206	206	206
B13	Initial retained productivity per information worker using Windows PC for business (hours per month)	Composite	2	2	2
B14	Avoided efficiency loss from migrating legacy applications (hours per month)	Composite	2	0	0
B15	Hourly wage per information worker (fully burdened)	$85,000/2,080 hours	$41	$41	$41
B16	Subtotal: Avoided initial reduction in information worker efficiency	B1*B12*(B13+B14)*B15	$101,352	$50,676	$50,676
B17	Number of information workers with refreshed Windows devices	Composite	206	412	618
B18	Ongoing retained productivity per information worker using Windows PC for business (hours per month)	Composite	2	2	2
B19	Subtotal: Ongoing retained information worker efficiency	B15*B17*B18*12	$202,704	$405,408	$608,112
Bt	Avoided reduction in worker efficiency	B6+B11+B16+B19	$371,045	$474,419	$677,123
	Risk adjustment	↓10%			
Btr	Avoided reduction in worker efficiency (risk-adjusted)		$333,941	$426,977	$609,411
	Three-year total: $1,370,328			**Three-year present value: $1,114,315**	

AVOIDED BUSINESS SUITE MIGRATION COST

Evidence and data. In addition to the cost avoidance of using Windows PCs for business, interviewees and surveyed decision-makers also reported some cost savings when using Microsoft Office as opposed to an alternative browser-based business suite.

- Many interviewees relied heavily on Microsoft Office for critical business operations. The risk and complexity of migrating to an alternative browser-based business suite was considered too great to even consider.

> **"We wouldn't have gotten through the pandemic if we didn't have Microsoft Teams and couldn't communicate and collaborate."**
> *Chief information officer, construction supplier*

- Of those organizations who did investigate migrating to an alternative browser-based business suite, some found that a dedicated task force was required, the migration would take several months, and the cost to the organization would be substantial.

> **"You could have some very detrimental results trying to move from Microsoft Office, which your company is depending on. You have to go through this whole process to switch to a [browser-based suite]. I mean, a company could go out of business."** *Chief information security officer, government health services*

- Interviewees noted that the alternative browser-based business suite they considered did not have the full functionality of Microsoft Office, and so additional third-party licenses were needed for employees. Surveyed decision-makers who used an alternative browser-based business suite reported spending an average of $3.33 more on third-party licenses per user per month than organizations using Microsoft Office.

> **"I have talked to other CIOs who switched from Microsoft Office to [an alternative browser-based office suite], and they say it is just night and day, especially around Outlook with email and calendaring experience and things like that. [An alternative browser-based office suite] is not worth the savings because it has such worse functionality than Microsoft Office."** *Chief information officer, caregiving services*

Modeling and assumptions. To reflect the interviewees' experiences, Forrester assumes the composite organization can avoid costs of moving to an alternative browser-based business suite with the following:

- Six FTEs are required to spend half of their time over three months to migrate the composite organization to an alternative browser-based business suite.
- The alternative browser-based business suite costs an average of $2.50 less per user per month than Microsoft Office.
- The composite organization needs to spend an additional $3.33 per employee per month in third-party licenses to meet employee needs an alternative browser-based business suite is not covering, such as device management, security, and Excel functionality.

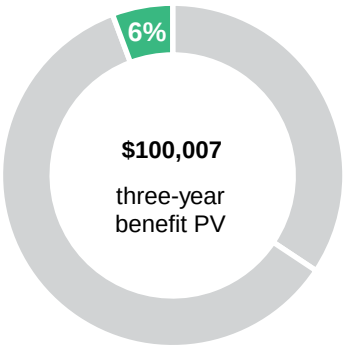
Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary based on:

- Whether or not an organization receives a discount that provides additional cost savings for

a limited time to move to an alternative browser-based business suite.

- The need for additional third-party licenses after moving to an alternative browser-based business suite.

Results. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV of $100,000.



Avoided Business Suite Migration Cost

Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Avoided number of IT engineers needed to migrate business suite	Composite	6	0	0
C2	Percentage of IT time saved not migrating	Composite	50%	0%	0%
C3	Months saved not needing to migrate business suite	Composite	3	0	0
C4	Monthly IT engineer salary	$80,000/12 months	$6,667	$6,667	$6,667
C5	Subtotal: Avoided change management cost	C1*C2*C3*C4	$60,003	$0	$0
C6	Employees using Microsoft Office	Composite	2,500	2,500	2,500
C7	Monthly cost difference for Microsoft Office	List price	($2.50)	($2.50)	($2.50)
C8	Avoided monthly third-party license cost with Microsoft Office per device	Survey and interviews	$3.33	$3.33	$3.33
C9	Avoided annual workflow management license cost	Survey	$476.12	$476.12	$476.12
C10	Subtotal: Net avoided licensing cost	(C6*(C7+C8)*12)+C9	$25,376.12	$25,376.12	$25,376.12
Ct	Avoided business suite migration cost	C5+C10	$85,379.12	$25,376.12	$25,376.12
	Risk adjustment	↓15%			
Ctr	Avoided business suite migration cost (risk-adjusted)		$72,572	$21,570	$21,570
	Three-year total: $115,712			**Three-year present value: $100,007**	

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not able to quantify include:

- **Centralized device and security management.** Interviewees also noted that browser-based PCs for business were not always able to support the device management and security solutions that were standard in their organization. The need to adopt additional third-party solutions specifically for the browser-based PCs for business placed a burden on IT departments to manage multiple platforms and tools.

  In one case, IT decided to isolate browser-based PCs from the rest of the company's network and limit their usability rather than adding an additional costly third-party security solution. In another case, IT budget had to be increased to account for additional management and security solutions. Refreshing with Windows PCs for business allows for IT to manage fewer services and platforms and avoid limiting employee access to the company network.
- **Retained user efficiency with Microsoft Office.** Some interviewees indicated that their organizations' employees were more efficient with Microsoft Office than an alternative browser-based business suite. Many employees were not even willing to consider switching because their experience with Microsoft Office had been so positive in the past that they were unwilling to jeopardize the benefits they had seen.

> **"We weren't prepared to go down the rabbit hole of user education and change with [an alternative browser-based business suite] when so many employees are familiar and experienced and with the Microsoft Office environment."**
> *Chief technology officer, customer support*

  Interviewees specifically mentioned Excel offered specific functionality and value for knowledge workers, Outlook provided organizational efficiency with email and coordination, and Teams enabled better collaboration across workers, especially when working remotely.
- **Higher employee satisfaction with Windows PCs for business.** Some interviewees also mentioned that their organizations saw resistance from employees in using browser-based PCs for business. In one case where a department was assigned to use browser-based PCs for business, employees in that department felt like they were not as valued as employees in other departments who used Windows PCs for business.

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might refresh devices with Windows PCs for business and later realize additional uses and business opportunities, including:

- **Retained developer time.** Some organizations deploying browser-based PCs for business had to dedicate significant developer resources to migrate legacy applications and systems. Refreshing with Windows PCs for business allows businesses to retain developer time for more high-valued projects and allow the business to focus on other priorities.

- **Ongoing software support.** Multiple interviewees mentioned that, after integrating browser-based PCs for business in their organization, supporting software for printing was discontinued by the supplier. The supplier instructed these organizations to use a third-party solution instead, which made interviewees uneasy about fully integrating that solution into their workspace. The interviewees indicated that they did not have this issue when refreshing with Windows PCs, meaning there is flexibility in deploying more broadly with reassurance of ongoing, comprehensive support for application and peripheral compatibility.

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

> **"It feels a little weird when [the browser-based PC supplier] is telling you to go to this third-party, open-source tool to handle printing. It makes you feel a little bit like, 'Really? And what happens a year from now if they aren't supporting that anymore?'"**
> *Chief information officer, caregiving services*

Analysis Of Opportunity Costs

Quantified cost data as applied to the composite

Total Opportunity Costs

Ref.	Opportunity Cost	Initial	Year 1	Year 2	Year 3	Total	Present Value
Dtr	Opportunity cost: net hardware cost	$0	$278,223	$278,223	$240,920	$797,366	$663,873
Etr	Opportunity cost: IT support cost	$0	$11,813	$42,277	$54,089	$108,180	$86,317
	Total opportunity costs (risk-adjusted)	$0	$290,036	$320,500	$295,009	$905,545	$750,190

OPPORTUNITY COST: HARDWARE COST

Evidence and data. Interviewees indicated that they generally spent more on hardware for Windows PCs for business as these PCs had higher capabilities. Browser-based PCs for business were being used in a more limited capacity with lower hardware requirements.

> **"[Browser-based PCs for business] are not very highly powered like a Windows device. They have minimal CPU and RAM [random access memory], so keep them to the basic use case and don't expect any higher than that."** *Chief information officer, research foundation*

However, browser-based PCs needed refreshing more often than Windows PCs for business. In fact, the surveyed decision-makers noted refreshing browser-based PCs for business every 2.5 years on average, compared to 3.0 years on average of Windows PCs for business.

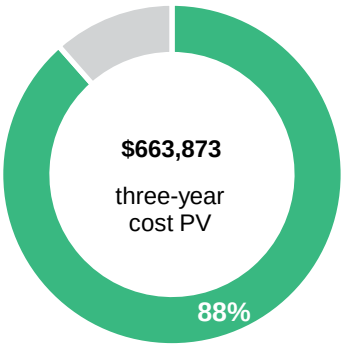
Modeling and assumptions. To reflect the interviewees' experiences, Forrester assumes the composite organization has some opportunity costs of not moving to browser-based PCs with the following:

- The composite organization would have saved 60% on initial hardware cost per PC if refreshing with browser-based PCs for business for more limited use cases.
- The browser-based PCs for business lasts an average of 2.5 years before they need refreshing as compared to the Windows PCs for business which last an average of 3.0 years.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary based on:

- The use cases of the devices. It is possible that browser-based PCs for business would last longer for some employees than others.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $664,000.



Opportunity Cost: Net Hardware Cost

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
D1	Frontline workers refreshing $400 devices	Composite		235	235	235
D2	Task workers refreshing $650 devices	Composite		187	187	187
D3	Information workers refreshing $1,000 devices	Composite		206	206	206
D4	Total hardware cost to refresh Windows PC for business	(D1*400)+(D2*650)+(D3*1,000)		$421,550	$421,550	$421,550
D5	Average hardware savings per browser-based PC for business	Interviews		60%	60%	60%
D6	Subtotal: Initial hardware savings from device refresh	D4*D5		$252,930	$252,930	$252,930
D7	Weighted average cost per Windows PC for business	D4/(D1+D2+D3)		$671	$671	$671
D8	Weighted average cost per browser-based PC for business	D7*(1-D5)		$268	$268	$268
D9	Average refresh for Windows PCs for business (years)	Interviews		3.0	3.0	3.0
D10	Average refresh for browser-based PCs for business (years)	Interviews		2.5	2.5	2.5
D11	Additional hardware cost to refresh per Windows PC for business (prorated)	D7/D9*(3-D9)		$0	$0	$0
D12	Additional hardware cost to refresh per browser-based PC for business (prorated)	D8/D10*(3-D10)		$0	$0	$54
D13	Subtotal: Additional cost associated with higher refresh rate for browser-based PCs for business	(D11-D12)*(D1+D2+D3)		$0	$0	($33,912)
Dt	Opportunity cost: net hardware cost	D6+D13	$0	$252,930	$252,930	$219,018
	Risk adjustment	↑10%				
Dtr	Opportunity cost: net hardware cost (risk-adjusted)		$0	$278,223	$278,223	$240,920
	Three-year total: $797,366			**Three-year present value: $663,873**		

OPPORTUNITY COST: IT SUPPORT COST

Evidence and data. Interviewed and surveyed decision-makers reported that browser-based PCs for business generally required less IT support than Windows PCs for business, largely due to the limitation of the number and types of applications that browser-based PCs for business can run.

- A chief information officer at a research foundation in North America reported about 10% fewer support tickets for browser-based PCs for business than Windows PCs for business. In addition, a chief information officer consultant at a global financial software organization reported 35% fewer support tickets for browser-based PCs for business.
- While data on resolution time for support tickets for browser-based PCs was mixed, it was generally agreed they did not take longer to resolve than support tickets for Windows PCs for business.
- The amount of time required to deploy a browser-based PC for business depended largely on the experience of the IT staff but was generally reported to be about half of the time required to deploy a Windows PC for business. Part of this difference may have been due to using traditional, on-premises deployment as opposed to using cloud-based deployment methods available for Windows PCs for business.

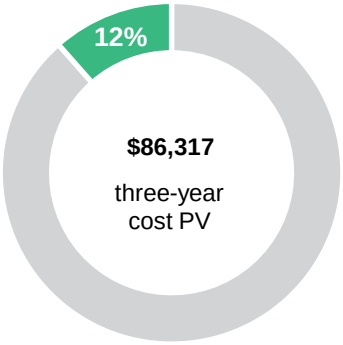
Modeling and assumptions. To reflect the interviewees' experiences, Forrester assumes the composite organization has some opportunity costs of not moving to browser-based PCs with the following:

- IT staff learns to support browser-based PCs for business with a negligible amount of time and no additional cost to the organization.
- In the first year, it takes the same amount of time to deploy a browser-based PC for business as a Windows PC for business. As the IT staff gains experience in the second and third years, it takes half as long to deploy a browser-based PC for business as a Windows PC for business.
- The surveyed decision-makers reported that the number of support tickets for Windows PCs for business is assumed to equal five per year, while browser-based PCs for business have four tickets per year.
- Support tickets for browser-based PCs for business take about two minutes less time to resolve than support tickets for Windows PCs for business. In addition, the browser-based PCs for business have an average of 20% fewer support tickets annually.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary based on:

- The time to resolve support tickets for browser-based PCs and Windows PCs may vary. Some decision-makers reported that support tickets for browser-based PCs for business were generally faster to resolve than support tickets for Windows PCs, meaning there could additional opportunity cost associated with supporting Windows PCs for business.
- IT staff may reinvest their time saved in supporting browser-based PCs for business and generate more value for the organization than their salaries would suggest, meaning the opportunity cost could be higher.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of $86,000.



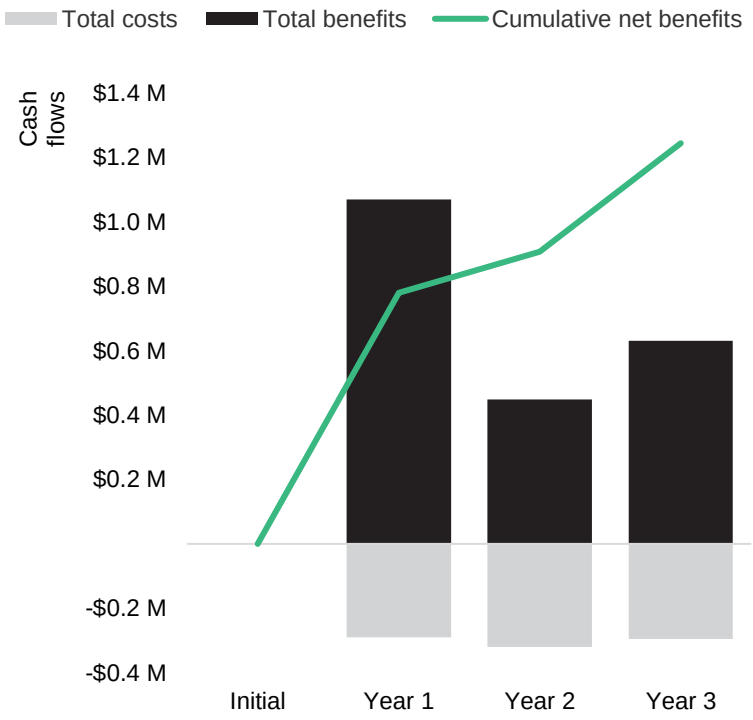
Opportunity Cost: IT Support Cost

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
E1	Number of Windows PCs for business being deployed instead of browser-based PCs for business	Composite		628	628	628
E2	Average time to deploy a Windows PC for business	Survey and interviews		2.0	2.0	2.0
E3	Average time to deploy a browser-based PC for business	Survey and interviews		2.0	1.0	1.0
E4	Hourly IT wage	$56,000/2080 hours		$27	$27	$27
E5	Subtotal: Additional cost of deploying Windows PCs for business	E1*(E2-E3)*E4		$0	$16,956	$16,956
E6	Cumulative Windows PCs for business refreshed	Cumulative devices from E1		628	1,256	1,884
E7	Average annual support tickets per Windows PC for business	Survey and interviews		5.0	5.0	5.0
E8	Average annual support tickets per browser-based PC for business	Survey and interviews		4.0	4.0	4.0
E9	Average time to resolve a Windows PC for business support ticket (minutes)	Survey and interviews		30.0	30.0	30.0
E10	Average time to resolve a browser-based PC for business support ticket (minutes)	Survey and interviews		28.0	28.0	28.0
E11	Subtotal: Additional cost of resolving Windows PCs for business support tickets	E6*((E7*E9)-(E8*E10))/60*E4		$10,739	$21,478	$32,216
Et	Opportunity cost: IT support cost	E5+E11	$0	$10,739	$38,434	$49,172
	Risk adjustment	↑10%				
Etr	Opportunity cost: IT support cost (risk-adjusted)		$0	$11,813	$42,277	$54,089
	Three-year total: $108,180			**Three-year present value: $86,317**		

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

These risk-adjusted values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Opportunity Cost section.

Cash Flow Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total opportunity costs	$0	($290,036)	($320,500)	($295,009)	($905,545)	($750,190)
Total benefits	$0	$1,069,513	$448,547	$630,980	$2,149,040	$1,817,049
Net benefits	$0	$779,477	$128,046	$335,971	$1,243,495	$1,066,859

Appendix E: 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.

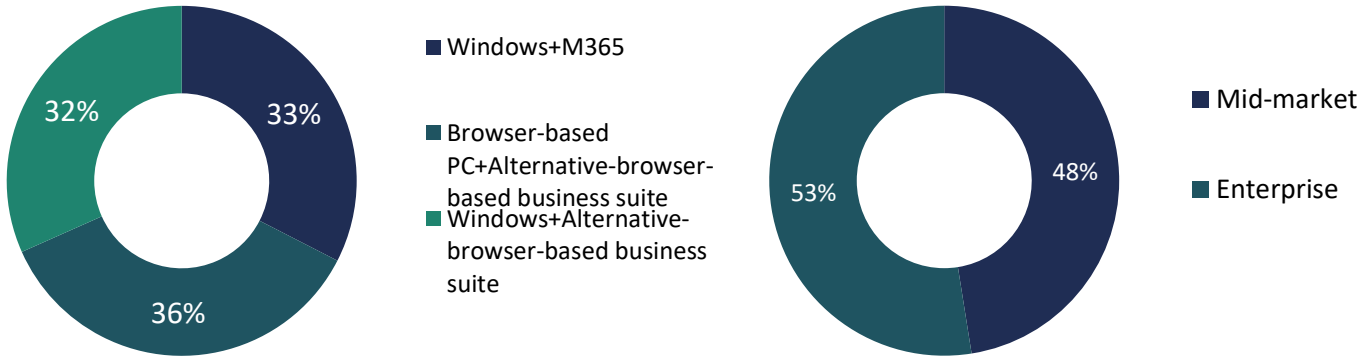
Appendix F: Interview and Survey Demographics

Interviewed Decision-Makers			
Interviewee	**Industry**	**Region**	**Size**
Chief information officer	Construction supplier	North America	~ 5,000 employees
Senior director of technology	Real estate management	Global	~ 20,000 employees
Chief technology officer	Customer support	Global	~ 1,000 employees
Senior VP of technology	Real estate services	Global	~ 5000 employees
Chief information officer	Caregiving services	North America	~ 5000 employees
Chief technology officer	Restaurant franchisor	North America	~ 5,000 employees
Chief information officer	Research foundation	Global	< 500 employees
Director of IT	Food supplier	North America	~ 10,000 employees
Chief information officer	Government health services	North America	~ 10,000 employees
Chief information officer consultant	Financial software	Global	~ 1,000 employees

Survey Demographics

The survey was launched on June 8, 2021 and concluded fielding on July 15, 2021. Forrester surveyed a total of 1,810 business and technology end-user compute influencers and decision-makers.

The survey included participant quotas to ensure balanced representation by company size, IT/business decision-makers, and Windows/browser-based PC buyers across three key scenarios: 1) Windows with M-365/O-365; 2) Windows with an alternative browser-based business suite; and 3) browser-based PCs with an alternative browser-based business suite.



Base: 1,810 business and technology end-user compute influencers and decision-makers
Note: Percentages may not total 100 because of rounding.
Source: A commissioned study conducted by Forrester Consulting on behalf of Microsoft, June 2021

Appendix G: Endnotes

[5] Source: “The State Of Employee Computing, 2021,” Forrester Research, Inc., August 2, 2021.

[6] 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


FORRESTER®