

Forrester Total Economic Impact™ Study Prepared For Microsoft

The Total Economic Impact™ Of Windows Internet Explorer 9

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FORRESTER

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Executive Summary

In April 2011, Microsoft commissioned Forrester Consulting to examine the total economic impact and potential savings enterprises may realize by deploying Windows Internet Explorer 9. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of migrating from Internet Explorer 8 (primarily) to Internet Explorer 9 and supporting the upgraded browser within their organizations.

As information workers rely more heavily on the Internet and web-based applications to perform their functions, IT professionals must leverage today's browser innovations such as faster rendering, tabs, pinned sites, streamlined browser designs, and new search features to improve worker productivity. However, many larger enterprises today support legacy browsers. More browser options present security, compliance, and IT support and control issues when workers self-provision their own tools.

The Web of yesteryears was static and content focused. Users spent their time finding and consuming data, but it was difficult to share information in real time. Even as enterprises lag behind in browser upgrades, leading consumer-facing websites take advantage of modern browser capabilities that enhance rendering speed, provide enhanced support for rich Internet applications (RIAs), and offer new privacy and security capabilities. The Web today is increasingly interactive and personalized and has become an increasingly social place to share and watch videos. As we look to tomorrow, we see an interactive Web with rich graphics and fast performance. We see an increasing number of rich web applications connecting and engaging users. And as the promise of these rich web applications dominates the user experience and as users spend more time in the browser on their PCs — they will come to expect more — they will expect the same richness and interactive capabilities once exclusive to native PC applications.

From an information worker perspective, these benefits are only part of the picture. In Internet Explorer 9 (described in Appendix A), the simplified yet enhanced user interface and user experience puts the focus on the content of each website. By default, only the controls essential for browsing are in the browser frame. Features such as tabs and color-coded tab grouping, quick copying, accelerators, web slices, improved search and navigation, and better reliability provide tangible productivity benefits for browser-intensive information workers. Security capabilities, like the improved SmartScreen filter in Internet Explorer 9, are helpful in defending against malicious and social engineering threats. Some larger organizations have been relatively slow to support new browsers, but modern browsers offer productivity enhancements that can enable people to work faster as they navigate and engage in applications on the Web.

Forrester's Total Economic Impact™ (TEI) methodology (see Appendix C) captures and quantifies the voice of the customer relative to technology investments. In this study, we conducted in-depth interviews with six Microsoft Technology Adoption Program (TAP) customers to discuss each organization's experience upgrading from Windows Internet Explorer 8 to Internet Explorer 9. A consensus among the interviewees allows Forrester to report that these organizations experienced benefits from Internet Explorer 9 in excess of the costs of deployment and ownership.

Forrester's interviews with these six customers (see Interview Highlights section) and subsequent financial analysis determined that a 60,000-employee composite *Organization* (described in Appendix B) would be expected to experience the risk-adjusted costs, benefits, net savings, and payback period summarized in Table 1.

Table 1Composite *Organization's* Three-Year Risk-Adjusted Savings

Total benefits (PV)	Total costs (PV)	Net savings (NPV)	Payback period
\$5,029,959	(\$1,680,960)	\$3,349,000	15 months

Source: Forrester Research, Inc.

The three-year risk-adjusted total NPV of **\$3,349,000** represents the net costs and benefits attributed to using Internet Explorer 9 versus Internet Explorer 8 (see details below in the Costs, Benefits, Flexibility, and Risk sections). In addition, the *Organization's* risk-adjusted benefits (PV) were **\$5,029,959**, and the payback period was **15 months**.

From the customer interview process, Forrester also identified two significant *unquantified* business benefits attributed to migrating from Internet Explorer 8 to Internet Explorer 9, and these are listed below and further described in the Benefits and Flexibility sections of this study.

- Productivity for power users or browser-intensive users (quantified but not included in NPV totals).
- Internet Explorer 9 brings new HTML5 support, allowing developers to write the same markup that reduces the costs of creating new applications (future flexibility option — not quantified).

If risk-adjusted costs and benefits still demonstrate a compelling business case, it raises confidence that the investment is likely to succeed because the risks that threaten the project have been taken into consideration and quantified. The risk-adjusted numbers should be taken as “realistic” expectations, as they represent the expected value considering risk. Assuming normal success at mitigating risk, the risk-adjusted numbers should more closely reflect the expected outcome of the investment.

The objective of this study is to identify and quantify the overall costs and benefits experienced by the *Organization*. These results can be used as a guide to allow other organizations to determine the appropriate benefits for their particular environments.

Disclosures

The reader should be aware of the following:

- The study is commissioned by Microsoft and delivered by the Forrester Consulting group.
- Forrester makes no assumptions as to the potential savings that other organizations will receive. Forrester strongly advises that readers should use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Windows Internet Explorer 9.
- 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.

- The customers for the interviews were provided by Microsoft.

TEI Framework And Methodology

Introduction

From the information provided in the six interviews, Forrester has constructed a TEI framework for those organizations considering migrating to Windows Internet Explorer 9. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

Approach And Methodology

Forrester took a multistep approach to evaluate the impact that Internet Explorer 9 can have on an organization (see Figure 1). Specifically, we:

- Interviewed Microsoft marketing staff to gather data relative to Internet Explorer 9 and the browser market in general.
- Interviewed six organizations currently participating in Microsoft Technology Adoption Program (TAP) for Windows Internet Explorer 9 to obtain data with respect to costs, benefits, risk, and flexibility.
- Designed a composite *Organization* based on characteristics of the interviewed organizations (see Appendix B).
- Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interviews as applied to the composite *Organization*.

Figure 1

TEI Approach



Source: Forrester Research, Inc.

Forrester employed four fundamental elements of TEI in modeling the financial implications of deploying Windows Internet Explorer 9:

1. Costs.
2. Benefits to the entire organization.
3. Flexibility.
4. Risk.

Forrester's TEI methodology provides a complete picture of the total economic impact of technology investment decisions. Please see Appendix C for additional information on the TEI methodology.

Analysis

Interview Highlights

A total of six interviews were conducted for this study in April 2011, involving representatives from the following organizations who wished to remain anonymous.

1. A large US government organization, which has piloted IE9 to 150 users for a four-month period. It will eventually deploy IE9 to several hundred thousand users worldwide. Its primary Windows operating system is Vista, followed by an ever-increasing presence of Windows 7 users.
2. A global electronics and engineering company, which currently has around 200 IE9 users in pilot phase. It will introduce IE9 to several thousand more users in the following months and eventually deploy IE9 to several hundred thousand users over the next 18 months. Its primary Windows operating system is Windows XP, and they are migrating to Windows 7 for all new hardware.
3. A large global financial services company, which at the time of the interview had 12 IT staff members who were using IE9 in pilot mode. In the following two months, this number would grow to 50 users, and by June 2012, the company expects to have all 100,000 users on IE9. Its primary Windows operating system is Windows XP, and it is in the process of migrating to Windows 7.
4. One of the largest technology hardware companies in the world, which currently has 1,600 IE9 users in its pilot program who have been using it for three months. Eventually, it will deploy IE9 to more than 80,000 users. Its primary operating system is Windows 7, with a minority of Windows XP users.
5. A global accounting, tax, and consulting firm, which has 200 IE9 users in its pilot phase. It will introduce IE9 to more than 50,000 employees over the period of July 2011 to May 2012. Windows 7 is its primary operating system, with a minority of users on Vista.
6. A large global technology manufacturing and services company currently deploying IE9 formally to 80 users in the TAP and informally to 1,600 users who have downloaded it on their own. By October 2011, all applications will have to meet the IE9 standard, with full deployment to all 80,000 browser users occurring by October 2013.

These interviews uncovered a number of important insights about customer organizations' experience with Internet Explorer 9:

- These organizations were transitioning from a large installed base of Internet Explorer 8 users, although all organizations reported using a mix that included IE6 and IE7 as well as other (usually unsupported) browsers in use inside their companies.

- Most organizations are making the transition to Internet Explorer 9 as part of their migration to the Windows 7 operating system, although demand from users and the relative ease of deploying Internet Explorer 9 *ahead* of the new operating system means that the two product upgrades are viewed as only loosely coupled.
- The business rationale for moving from Internet Explorer 8 to Internet Explorer 9 was described collectively by the interviewed customers in the following terms:
 - The performance and ease of use of IE9 is reported by five of the six interviewed customers to be better than IE8, allowing for marginal improvement in productivity for browser-intensive and power users. A majority of the interviewed customers predicted with confidence that there would be a quantifiable increase in productivity for live call center, e.g., type users where their full-time job is browser-based.
 - Users can pin sites to the Windows 7 Taskbar in the standard IT Windows image.
 - Improved security and reliability — architectural shifts (protected mode, DEP/NX) provide advances and relevancy for modern threats.
 - Enables users to make better decisions when downloading applications with improvements to SmartScreen filter in IE9 (versus IE8) with application reputation.
 - IE9 will include tracking protection lists to allow consumers to opt out of third-party tracking.
 - IE9 includes the adoption of web standards such as HTML5 and CSS3 to future-proof its applications and by using same markup to reduce the cost of creating new applications.
 - Built-in anti-phishing and anti-malware features mitigate malicious and social engineering attacks coming from unknown external sites.
 - Crashes are isolated in tab to minimize disruptions.
 - An administrative customization tool kit (IEAK) makes it easier to configure a standard deployment package.
 - IE9 continues to support legacy compatibility modes; Compatibility View list ensures best default experience for end users.
 - With support of single network sign-on and more than 1,500 group policies, IT professionals can drive desktop standardization and savings without compromising control.
 - IE9's backward compatibility with IE8 and IE7 eases migration issues.
- Interviewed customers reported that one of the biggest hurdles they had to overcome prior to making a decision to upgrade the browser was gaining an inventory of applications in their environment and determining the scope of application remediation. Companies frequently saw this as a bigger problem than turned out to be the case.
- The time to fully deploy Internet Explorer 9 among the interviewed organizations was projected to be 12 to 18 months, including testing, application remediation, pilot, and distribution.

Composite Organization

Based on the interviews with Internet Explorer 9 customers (names provided by Microsoft), Forrester constructed a TEI framework, a composite *Organization*, and an associated savings analysis that illustrates the areas financially affected. The composite *Organization* that Forrester synthesized from these results is a 60,000-person global organization, of which there are 50,000 browser users and as many PCs that will be migrating to Internet Explorer 9 across 40 locations in several countries. The other 10,000 employees are not daily browser users and are in manufacturing and distribution roles.

For the most part, the browser users will have migrated from Internet Explorer 8, with a minority migrating from Internet Explorer 6 and 7. The *Organization* permits unsupported browsers, although recent initiatives aim to minimize the use of nonsupported software, including browsers. The *Organization* plans to migrate a vast majority of its browser users to Internet Explorer 9 over the next 12 months after performing application testing and any necessary remediation on its mission-critical web-based applications.

The *Organization's* operating systems in use are principally Windows XP and some Vista, with a growing contingent of Windows 7 machines. Vista users are rapidly being migrated to Windows 7 along with XP users as part of the PC refresh cycle.

The *Organization* supports approximately 1,000 web-based applications across its globally distributed workforce. Of these applications, approximately 300 are mission-critical. These, along with another 30 high usage/visibility applications, will have to be tested for IE9 compatibility, for a total of 330 to be tested.

Please see Appendix B for a more detailed description of the composite *Organization*.

Framework Assumptions

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

Costs

Our *Organization's* main costs associated with upgrading from Internet Explorer 8 to Internet Explorer 9 are:

1. Implementation labor costs, including application inventory, assessment, testing, and remediation.
2. Internal training (a labor cost).
3. An increase in initial help desk calls due to users' inexperience with Internet Explorer 9 (Year 1 only).
4. Software upgrade — possible scenario (not quantified).

The following are the cost inputs to the financial analysis.

Implementation Labor Costs

The interviewed organizations in this study predicted the effort required by their IT staff to evaluate, test, pilot, and deploy Internet Explorer 9. With these projections as a basis, Forrester assumed that the composite *Organization* with

50,000 browser users and 330 mission-critical applications would require a commensurate level of IT effort, shown in Table 2 below.

For the composite *Organization*, the amount of labor calculated here is equal to 2,020 hours (approximately one FTE). Further, the work is projected to be facilitated and quickened with the use of several deployment and migration tools. Study participants used different sets of tools depending on their incumbent desktop/client management solutions but often included Internet Explorer Compatibility Test Tool, Internet Explorer Administration Kit (IEAK), Configuration Manager, System Center Essentials 2010 (Essentials), Center Configuration Manager (SCCM), Microsoft Deployment Toolkit 2010, Application Compatibility Toolkit, and Windows Server Update Services (WSUS).

The amount of labor required for implementation is highly dependent on the number and type (Web versus on-premises) of applications used in the enterprise, the frequency with which applications are updated, the level of remediation for other software modernization projects such as Windows 7, and the architecture (i.e., 32-bit versus 64-bit) of the modern desktop. A historical rule of thumb for initially estimating the extent of this effort is that 80% of applications require little or no remediation (less than 1 hour) to be compatible with Internet Explorer 9 within a 32-bit environment. Another 15% of applications can be identified for remediation and functionality resolved for compatibility with some effort (less than one day). The final 5% of applications may require significant effort or replacement/version upgrades and thus the greater amount of labor and/or software replacement cost. (The interviewed customers have confirmed that migrating from Internet Explorer 8 to Internet Explorer 9 will actually take less effort than the above historical rule of thumb). Web applications typically can be resolved the fastest, and staging the remediated application into the production environment is done centrally, resolving conflicts for users quickly and en masse versus on a per-machine basis.

Table 2 outlines the costs to inventory applications, assessment and testing of applications, and remediation if necessary. These activities and costs occur in the initial phase of the project and total \$131,300.

Table 2
Implementation Labor Costs

Ref.	Metric	Calculation	Initial phase
A1	Inventory of applications	Estimated hours	320
A2	Application assessment and testing		500
A3	Remediation		1,200
A4	Hours	$A1+A2+A3$	2,020
A5	Hourly compensation (fully loaded)		\$65
At	Implementation labor costs	$A4 \times A5$	\$131,300

Source: Forrester Research, Inc.

A side effect of application identification, testing, and remediation reported to Forrester was a boost toward greater software standardization across the enterprise as the companies reviewed and inventoried applications and questioned the rationale and the continued use of some applications. Identifying application owners and finding process improvements and new efficiencies came about through the effort described above.

Internal Training Labor Costs

While the interviewed organizations in this study reported that Internet Explorer 9 training for IT staff, developers, power users, or help desk staff was not a significant cost factor, Forrester presents this cost category to indicate that some staff members will require assistance or guidance concerning the new capabilities of the browser. Readers of this study should keep in mind that many users will already be accustomed to using a modern browser at home, and they often expect a comparative — if not superior — computing experience while at work. Over time, this cost category will largely disappear. Forrester assumes that 75 IT staff members will spend half a day each informally learning the new capabilities of Internet Explorer 9, largely using online and self-instruction media. For the composite *Organization*, the calculation for this training cost, which is \$19,500, is shown below.

Table 3

Training Costs

Ref.	Metric	Calculation	Initial
B1	Number of employees		75
B2	Hourly compensation (fully loaded)		\$65
B3	Hours		4
Bt	Training — internal labor	B1*B2*B3	\$19,500

Source: Forrester Research, Inc.

Increase In Initial Help Desk Calls

Several of the interviewed organizations predicted an initial uptick in Internet Explorer 9 help desk-related calls due to users' inexperience. This uptick would soon be followed by an unrelated decrease in malware-related help desk calls due to the enhanced security features in Internet Explorer 9. We will quantify the uptick help desk costs in this section and quantify the malware cost avoidance in Table 6 in the Benefits section.

Table 4

Initial Increase In Help Desk Calls Associated With Users' Inexperience With Internet Explorer 9

Ref.	Metric	Calculation	Year 1	Year 2	Year 3	Total
D1	Number of help desk calls	50,000 browser users times one interaction per user	50,000			
D2	Hours per incident	Help desk	0.5			
D3	Average hourly compensation (fully loaded)		\$55			
D4	Average yearly initial deployment percentage		100%	0%	0%	
Dt	Help desk costs associated with users' inexperience	$D1 \times D2 \times D3 \times D4$	\$1,375,000	\$0	\$0	\$1,375,000

Source: Forrester Research, Inc.

Software Upgrade — Possible Scenario

Some applications will not easily be made compatible with Internet Explorer 9 without remediation via replacement or upgrade to a newer version. Although none of the interviewed organizations reported such a situation, there remains the chance that this might occur for the readers of this study, and for one or two key enterprise applications, an upgrade to a newer version might be the most cost-effective means to achieve compatibility. Forrester only illustrates this cost category in this study and does not apply a cost factor as evaluating the value of new ERP, CRM, or other upgraded applications is beyond the scope of this study.

Forrester suggests there may be software license costs attributed to a decision to upgrade an application, perhaps making the expenditure sooner than planned, in order to achieve compatibility with the new browser. One way to estimate this amount is to calculate the interest on the total amount of the software expenditure over the time that the spending was advanced on the calendar or road map (the change in the project's NPV). Note that if an organization is already planning a replacement or upgrade for other functionality or application life-cycle reasons and the timing of the purchase has not been changed for browser compatibility reasons, then it is likely that no such cost accrues to the Internet Explorer 9 investment.

Alternatively, this cost category might be omitted for organizations that determine that this type of compatibility challenge can be met by running the application in a backward-compatibility mode or by investing in virtualization. Operating system or session virtualization eliminates the challenges associated with application conflicts by isolating each application into its own virtual environment while enabling these applications to communicate with the local operating system and other applications. Virtualization reduces the costs of packaging, deploying, testing, updating, and servicing installed software. With virtualization, software and user access are managed centrally, yet user settings and profiles are saved in the local cache, providing instant access for subsequent use — even offline.

Total Costs

Total costs for the composite *Organization's* deployment of Internet Explorer 9 are reflected in Table 5 below.

Table 5

Total Three-Year Costs Associated With Migrating To Internet Explorer 9 (Non-Risk-Adjusted)

Costs	Initial	Year 1	Year 2	Year 3	Total
Implementation labor costs	131,300	0	0	0	131,300
Training — internal labor	19,500	0	0	0	19,500
Help desk costs associated with users' inexperience	0	1,375,000	0	0	1,375,000
Software upgrades	0	0	0	0	0
Total	\$150,800	\$1,375,000	\$0	\$0	\$1,525,800

Source: Forrester Research, Inc.

Benefits

The total value of the benefits of Internet Explorer 9 is greater than the costs, as interviewees in this study projected to Forrester. Customers identified the following key potential benefits resulting from transitioning from Internet Explorer 8 to Internet Explorer 9:

- Malware protection and improved security.
- Some improvement in productivity for power browser users.

Malware Protection And Improved Security

Several of the participants in this study reported that malware attacks have been increasing in the past couple of years. Most of the participants believe that Internet Explorer 9 will reduce the number of malware assaults that their organizations must actively address. Malicious elements remain a problem when they come in via other vectors such as email, instant messaging, and from user self-installed applications. The interviewed organizations believed that the IT staff, help desk staff, and users will be impacted by fewer cases of malware with Internet Explorer 9 deployed versus Internet Explorer 8 (or previous versions).

Looking at the time required for users to contact the help desk or IT staff and time spent attempting to fix corrupted machines, e.g., issuing loaner PCs when needed, reimaging machines, etc., Forrester assumes a rather conservative 1 hour per incident at a cost of \$55 (average fully loaded hourly compensation). This includes time spent by users, IT, and help desk staff. Interviewed organizations agreed that using Internet Explorer 9 might save an average of one incident per browser user per year, or for the *Organization*, 50,000 incidents per year. Given the *Organization's* 12-month rollout schedule, the amount of labor savings indicates a value of \$6,875,000 over the three-year period as shown in Table 6.

Table 6

Malware Cost Avoidance — Reduced IT, Help Desk, And User Costs

Ref.	Metric	Calculation	Year 1	Year 2	Year 3	Total
D1	Number of incidents avoided	50,000 browser users times one incident per year	50,000			
D2	Hours per incident	IT, help desk, users	1			
D3	Average hourly compensation (fully loaded)		\$55			
D4	Average yearly deployment percentage		50%	100%	100%	
Dt	Malware cost avoidance — reduced help desk costs	$D1 \times D2 \times D3 \times D4$	\$1,375,000	\$2,750,000	\$2,750,000	\$6,875,000

Source: Forrester Research, Inc.

Productivity

In addition to time saved on help desk calls by malware recipients, many browser-intensive users inside the *Organization* may expect to see benefits from Internet Explorer 9's faster page rendering, response time, and screen refresh. The ability of users to pin sites to the taskbar also makes it easier and quicker to access important line of business applications, and there will be some productivity improvements as a result of the seamless interface with Windows 7 and a smarter address bar.

User productivity is difficult to assess, and organizations have varying appetites for including such soft benefits in the business case for investment in new software. Study interviewees nevertheless reported marginal productivity benefits using Internet Explorer 9's faster performance (versus Internet Explorer 8), especially for tech-savvy users and those in browser-heavy jobs such as call centers and service desks. Customers interviewed estimated an average savings of 5 – 10 minutes per day for browser-intensive users of Internet Explorer 9. Forrester has conservatively calculated productivity benefits based on five minutes per day in Table 7.

The value of incremental user output is unique to each organization and to different jobs within organizations, and the willingness and ability to measure or estimate its value will vary. For the summary and total savings calculations presented in various tables in this study, Forrester has not included any values for user productivity. Nevertheless, given customer validation of the benefit to users — albeit with caveats around the challenge of quantification — a sample calculation is shown in Table 7. In this example, we include only those roles that require intensive browser use, and we discount the value of their time saved by 50% to adjust for productivity “leakage.” Forrester assumes that for information workers, only a portion of the time gained from improved productivity — ranging from 50% to 75% — will actually be realized by the *Organization*. Not all of the time saved will be converted into productive output.

Note that if the benefits described above are included in the financial results, the savings for this analysis would be increased by \$8.25 million over three years — a compelling indicator for the success of a move to Internet Explorer 9. However these cost savings were not included in the study's financial results because it's difficult to quantify the impact of this productivity gain on the bottom line. Table 7 summarizes the potential productivity benefits that the composite *Organization* can gain as a result of the migration from Internet Explorer 8 to Internet Explorer 9. The data is based on users experiencing faster page rendering, response time, and screen refresh, as well as the ability of users to pin sites to the taskbar, making it easier and quicker to access important business applications — and add to those the seamless interface with Windows 7 and a smarter address bar.

Table 7

Increased User Productivity (Savings Not Included In Study Totals)

Ref.	Metric	Calculation	Year 1	Year 2	Year 3	Total
E1	Number of workers	Only browser-intensive users	6,000			
E2	Hourly rate per worker	Average hourly rate including benefits	\$55			
E3	Number of hours saved	5 minutes per day * 240 workdays / 60 minutes	20			
E4	Percent captured		50%			
E5	Deployment percentage	Year 1 ramp-up	50%	100%	100%	
Et	Increased user productivity	$E1 * E2 * E3 * E4 * E5$	\$1,650,000	\$3,300,000	\$3,300,000	\$8,250,000

Source: Forrester Research, Inc.

Developers

As with user productivity, quantifying developer productivity gains is challenging, especially in the TAP stages of Internet Explorer 9 rollout and usage. None of the organizations interviewed by Forrester had active developer usage of Internet Explorer 9 or HTML5, so we will not be quantifying the benefits in this study. However, in the Flexibility section of this study, we highlight the future interoperability benefits of Internet Explorer 9's support for HTML5.

Total Quantified Benefits

Table 8 summarizes the quantified benefits accruing from an investment in Internet Explorer 9 for the composite *Organization*.

Table 8

Total Three-Year Quantified Benefits (Non-Risk-Adjusted)

Benefits	Initial	Year 1	Year 2	Year 3	Total
Malware cost avoidance — reduced IT, help desk, and user costs		\$1,375,000	\$2,750,000	\$2,750,000	\$6,875,000
Total quantified benefits		\$1,375,000	\$2,750,000	\$2,750,000	\$6,875,000

Source: Forrester Research, Inc.

Flexibility

Flexibility, as defined by TEI, represents investing in additional capacity or agility that can be turned into business benefit for some future additional investment. Forrester and the *Organization* believe that investing in Internet Explorer 9 lays the groundwork to take advantage of the following flexibility option.

Customers cited Internet Explorer 9's role in paving the way for their organizations to continue to modernize web-based applications using HTML5. Although data for calculating the value of this flexibility option was insufficient when this study was conducted, we'll describe our interviewees' predictions along with Microsoft's description of the same markup benefits of HTML5.

- **Interoperability with HTML5** — Internet Explorer 9 brings new HTML5 support, allowing developers to write the same markup that reduces the costs of creating new applications. HTML5 is the next version of the language that underlies the web (HTML), and it supports several features that will make websites behave more like applications. Developers are showing increased interest in technologies that promote open web architectures, and HTML5 is certainly one of these. According to Forrester, 60% of developers are either already using HTML5 or planning to within the next two years. With support for SVG, CSS3, and DOM, developers have a new set of capabilities that will help usher in the next wave of innovation across the Web. According to Microsoft, Windows Internet Explorer 9 is committed to enabling the use of the same markup with extensive support for modern standards, active participation with the standards bodies, and comprehensive test cases.

The value of flexibility is unique to each organization, and the willingness to measure its value varies from organization to organization (see Appendix C for additional information regarding the flexibility calculation).

Risk

Both risk-adjusted and non-risk-adjusted costs and benefits are discussed in this study. *The Organization's* costs and benefits in Tables 5 and 8 are quoted in non-risk-adjusted (best-case) terms and before risk adjustments are made. The assessment of risk provides a range of possible outcomes based on the risks associated with web-related projects in general and specific risks relative to migrating from Internet Explorer 8 to Internet Explorer 9. In our research, we saw that this migration was a relatively low-risk endeavor.

Measurement of risk is a way of incorporating the levels of confidence and uncertainty regarding the cost and benefit estimates of a given investment. Higher confidence that the cost and benefit estimates will be met implies that the level of risk is lower and that the variation between the risk-adjusted and non-risk-adjusted outcomes is minimized.

The following general risks were considered in this study:

- Lack of organizational discipline in creating processes and procedures to best take advantage of the benefits.
- The potential that the benefits will not be measured and quantified, and as a result, no TEI benefit would be captured and acknowledged.

The following risks associated with migrating from Internet Explorer 8 to Internet Explorer 9 were considered in making risk adjustments to the costs:

- There is risk associated with the process of dealing with application compatibility and remediation issues when migrating from Internet Explorer 8 to Internet Explorer 9, especially applications that won't work with Internet Explorer 9.

The following risks associated with migrating from Internet Explorer 8 to Internet Explorer 9 were considered in making risk adjustments to the benefits:

- Internet Explorer 9 does not reduce IT, help desk, and user's time and effort associated with malware issues as much or as soon as forecasted.

For this study, Forrester applied a 20% risk adjustment (increase of 20%) to the total costs associated with migrating to Internet Explorer 9 in Table 5 to reflect the risks listed above. See Table 9 for risk-adjusted total costs.

Table 9

Total Three-Year Costs Associated With Migrating To Internet Explorer 9 (Risk-Adjusted Upward By 20%)

Costs	Initial	Year 1	Year 2	Year 3	Total
Implementation labor costs	157,560	0	0	0	157,560
Training — internal labor	23,400	0	0	0	23,400
Help desk costs associated with users' inexperience	0	1,650,000	0	0	1,650,000
Software upgrades	0	0	0	0	0
Total	\$180,960	\$1,650,000	\$0	\$0	\$1,830,960

Source: Forrester Research, Inc.

For this study, Forrester applied a 10% risk adjustment (reduction of 10%) to the total quantified benefits in Table 8 to reflect the risks listed above. See Table 10 for risk-adjusted total quantified benefits.

Table 10

Total Three-Year Quantified Benefits (Risk-Adjusted Downward By 10%)

Benefits	Initial	Year 1	Year 2	Year 3	Total
Malware cost avoidance — reduced IT, help desk, and user costs		\$1,237,500	\$2,475,000	\$2,475,000	\$6,187,500
Total quantified benefits		\$1,237,500	\$2,475,000	\$2,475,000	\$6,187,500

Source: Forrester Research, Inc.

If risk-adjusted benefits still demonstrate a compelling business case, it raises confidence that the investment is likely to succeed, as the risks that threaten the project have been taken into consideration and quantified. The risk-adjusted numbers should be taken as “realistic” expectations, as they represent the expected value considering risk. Assuming normal success at mitigating risk, the risk-adjusted numbers should more closely reflect the expected outcome of the investment.

Financial Summary

The risk adjusted financial results calculated from the Costs and Benefits sections can be used to determine the savings, NPV, and payback period for the *Organization's* investment in Internet Explorer 9. These are shown in Table 11 below.

Table 11

Cash Flow — Risk-Adjusted

Cash flow — Risk-adjusted estimates						
	Initial	Year 1	Year 2	Year 3	Total	PV
Costs	(180,960)	(1,650,000)	0	0	(1,830,960)	(1,680,960)
Benefits		1,237,500	2,475,000	2,475,000	6,187,500	5,029,959
Net benefits	(\$180,960)	(\$412,500)	\$2,475,000	\$2,475,000	\$4,356,540	\$3,349,000
Payback period	15 months					

Source: Forrester Research, Inc.

The data collected in this study indicates that migrating from Internet Explorer 8 to Internet Explorer 9 has the potential to provide significant quantifiable benefits and positive net benefits after Year 2. The three-year, risk-adjusted PV savings of **\$3,349,000, along with a 15-month payback period** (breakeven point), raises confidence that the

investment is likely to succeed, especially after the risks and uncertainty that may affect the project have been considered, quantified, and incorporated into the business case.

In conclusion, Forrester's interviews with Windows Internet Explorer 9 TAP customers yielded valuable observations. Forrester found that organizations can realize benefits in the form of:

- Malware cost avoidance — reduced IT, help desk, and user costs (quantified).
- Productivity for power users or browser-intensive users (quantified but not included in summary totals).
- Internet Explorer 9 brings new HTML5 support, allowing developers to write the same markup that reduces the costs of creating new applications (flexibility option — not quantified).

Based on these findings, organizations looking to upgrade to Internet Explorer 9 from Internet Explorer 8 can anticipate malware cost avoidance savings, marginal productivity gains for browser-intensive users, and future application development cost reduction with HTML5.

Using the TEI framework, many organizations may find a potentially compelling business case to make such an investment.

Forrester makes no assumptions regarding the effects of migrating from Internet Explorer 8 to Internet Explorer 9 at other organizations. This study examines the potential impact attributable to the Microsoft customers that participated in our examination. The underlying objective of this document is to provide guidance to technology and business decision-makers seeking to identify areas where value can potentially be created by migrating to Internet Explorer 9.

Appendix A: About Windows Internet Explorer 9

According to Microsoft, migrating from Internet Explorer 8 to Internet Explorer 9 can increase the manageability, security, and productivity for an organization's web-based work and investments. Internet Explorer is designed to be fast, clean, and trusted.

Fast

Part of re-imagining the role of the browser is rethinking the concept of fast. Today, fast is too narrowly defined as page load time. Designed to take full advantage of the power of your computer's hardware through Windows, Internet Explorer 9 delivers rich and immersive experiences that are as fast and responsive as native applications installed on your computer.

1. Internet Explorer 9 leverages the full power of your PC by utilizing the GPU through the DirectX, Direct2D, and DirectWrite APIs to ensure that text is crisp and graphics and animations are smooth. New GPU-powered HTML5 enables stunning HD video and audio content without the need for a plug-in.
2. With the performance enhancements in Internet Explorer 9, companies can invest in web applications that are more rich and immersive and offer experiences that are similar to those of Windows native applications.

Clean

With Internet Explorer 9 and Windows, Microsoft re-imagined the role of the browser and how people interact with websites and web applications. Internet Explorer 9 is site-centric as opposed to browser-centric. Websites have a cleaner look that makes them shine.

1. By default, only the controls essential for browsing are in the browser frame, letting people browse and experience all that the sites have to offer.
2. The browser integrates seamlessly with Windows 7 and includes a smarter address bar.
3. You can use the GPO settings to customize and manage the browser by doing things such as:
 - 1) Set your users' home page and new tab page to an intranet portal.
 - 2) Specify a policy list of sites you want to be displayed in Compatibility View mode.

Trusted

The more that the web becomes part of our everyday lives, the more complex that the issues of online trust and browser trust become. Internet Explorer 9 has a robust set of built-in security, privacy, and reliability technologies that keep you safer and your browsing experience uninterrupted.

1. Features to harden the browser against drive-by attacks such as protected mode, DEP/NX.
2. Crashes are isolated in tab to minimize disruptions.
3. The SmartScreen URL filter continues to be a key user safety investment in Internet Explorer 9. Since the launch of Internet Explorer 8, SmartScreen has blocked more than 1.5 billion socially engineered malware

and phishing attacks and continues to block between 3 million and 5 million attacks each day. Microsoft is committed to providing industry-leading protection from phishing and malware.

4. Application Reputation lets users make better decisions when downloading applications from the Web.
5. IE9 helps enhance user privacy through features such as Tracking Protection.

Interoperable

Internet Explorer 9 has HTML5 at the center, allowing developers to write the same markup. With extensive support for SVG, CSS3, and DOM, developers have a new set of capabilities that will help usher in the next wave of innovation across the Web. Internet Explorer 9 is committed to enabling the use of the same markup with extensive support for modern standards, active participation with the standards bodies, and comprehensive test cases.

1. Standards support in IE9 simplifies web development and enables developers to deliver one page that works across browsers.
2. An administrative customization tool kit (IEAK) makes it easy to configure a standard deployment package.
3. With support of single network sign-on and nearly 1,500 group policies, IT professionals can drive desktop standardization and savings without compromising control.
4. IE9's backward compatibility with IE7 and IE8 eases migration hassles. Backward compatibility modes enable enterprise developers to choose the right standards at the right time.
 - 1) IE9's compatibility mode is the same as in IE8 — both default to IE7 document mode, version vector, and user-agent string.
 - 2) Intranet sites: render and work the same on IE8/IE9.
 - 3) Extranet/internet sites render and work the same as IE8 using the EmulateIE8 X-UA-Compatible meta tag/HTTP header.
5. Adopting the web standards in IE9 will future-proof your applications.

Appendix B: Composite Organization Description

Composite Organization

Based on the interviews with existing Internet Explorer 9 TAP customers, Forrester constructed a TEI framework, a composite *Organization*, and an associated benefits analysis that illustrates the areas affected financially. The composite *Organization* that Forrester synthesized from these results is described by the following characteristics:

Organization Size And Dimensions

- A 60,000-person global organization, of which there are 50,000 browser users and as many PCs that will be migrating to Internet Explorer 9 across 40 locations in several countries. The other 10,000 employees are not

daily browser users and are in manufacturing and distribution roles. For the most part, the browser users will have migrated from Internet Explorer 8, with a minority migrating from Internet Explorer 6 and 7.

- The *Organization* plans to migrate a vast majority of its browser users to Internet Explorer 9 over the next 12 months after performing application testing and any necessary remediation on its web-based applications.

Environment Prior To Internet Explorer 9 Investment

- Operating systems in use are principally Windows XP and some Vista, with a growing contingent of Windows 7 machines. Vista users are rapidly being migrated to Windows 7 along with XP users as part of the PC refresh cycle.
- The organization supports approximately 1,000 web-based applications across its globally distributed workforce. Of these applications, approximately 300 are mission-critical applications. These applications, along with another 30 high usage/visibility applications, will have to be tested for IE9 compatibility — a total of 330 to be tested.
- Browsers in use are mainly Internet Explorer 8, the *Organization's* supported standard, and some Internet Explorer 6 and 7. The *Organization* permits unsupported browsers, although recent initiatives aim to minimize the use of unsupported software, including browsers.

The Organization's Goals And Objectives Relative To An Investment In Internet Explorer 9

- Performance:
 - To take advantage of Internet Explorer 9's ability to leverage the power of the GPU through the DirectX, Direct2D, and DirectWrite APIs to ensure that text is crisp and graphics and animations are smooth.
 - To increase employees' overall productivity by making it faster and easier to get to the sites and applications browser users need.
- User experience:
 - The ability of users to pin sites to the taskbar, making it easier and quicker to access important line of business applications.
 - Seamless with Windows 7 and smarter address bar.
 - The *Organization* wants the ability to use the GPO settings to:
 - Set users' home page and new tab page to an intranet portal.
 - Direct browser users to an internal IT help site when they go to the Help Menu.
 - Specify a policy list of sites you want to be displayed in Compatibility View mode.
- Security:
 - To utilize the Internet Explorer 9 features that harden the browser against drive-by attacks such as protected mode, DEP/NX.

- To mitigate social engineering malware attacks coming from unknown external sites by using Internet Explorer's built-in anti-phishing and anti-malware features called SmartScreen.
- To isolate crashes within the tab to minimize disruptions.
- Enable users to make better decisions when downloading applications with improvements to SmartScreen filter in IE9 (versus IE8) with application reputation.
- Interoperability:
 - To take advantage of standards support in Internet Explorer 9, which simplifies web development and enables developers to deliver one page that works across browsers.
 - By adopting web standards such as HTML5 and CSS3 to future-proof its applications and by using same markup to reduce the cost of creating new applications.
- Management:
 - To utilize the administrative customization tool kit (IEAK), which makes it easier to configure a standard deployment package.
 - Support single network sign-on and nearly 1,500 group policies with Internet Explorer. The *Organization's* IT professionals will be able to drive desktop standardization and savings.
 - To minimize migration issues with Internet Explorer 9's backward compatibility with IE7 and IE8.

Appendix C: Total Economic Impact™ Overview

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

Benefits

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

Costs

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

Risk

Risk measures the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections, and 2) the likelihood that the estimates will be measured and tracked over time. TEI applies a probability density function known as “triangular distribution” to the values entered. At a minimum, three values are calculated to estimate the underlying range around each cost and benefit.

Flexibility

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

Appendix D: Glossary

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

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

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

Payback period: The breakeven point for an investment. The point in time at which net benefits (benefits minus costs) equal initial investment or cost.

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

A Note On Cash Flow Tables

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

Table [Example]

Example Table

Ref.	Category	Calculation	Initial cost	Year 1	Year 2	Year 3	Total

Source: Forrester Research, Inc.

Appendix E: About The Project Director



Bob Cormier **Vice President, Principal Consultant**

Bob is a vice president and principal consultant for Forrester's Total Economic Impact™ (TEI) service. He is a leading expert on deriving business value from technology investments, specializing in advising clients on the TEI framework — services that help organizations understand the overall financial value of IT strategies and investments. He serves the following client role:

- **Technology vendor sales enablement professionals.** Bob works with these professionals in their efforts to clearly articulate the unique value proposition of their solutions to prospects and customers using Forrester's TEI methodology.

Bob has authored numerous TEI case studies for Forrester's vendor clients. He has also delivered his acclaimed Justifying Technology Investments (JTI) workshop to more than 800 participants representing 400 organizations.

Bob has more than 25 years experience in the IT and consulting industries. Prior to joining Forrester, he held senior-level positions at two leading eBusiness consulting firms, ZEFER and Cambridge Technology Partners. Bob has successfully led company efforts to optimize financial, operational, and resource planning activities, incorporating leading-edge, professional service automation (PSA) applications and enterprise resource planning (ERP) systems. He has also held senior financial management positions at Digital Equipment and Anixter International.

During his career, Bob has consulted with global users and vendors of IT and has been a frequent speaker at conferences, events, and seminars.

Education

Bob earned an M.B.A. from Bentley University and a B.S. in business from the University of New Hampshire. As an adjunct professor, he has taught finance and economics courses for more than 10 years at Southern New Hampshire University and Daniel Webster College.