The Total Economic Impact™ Of Microsoft Surface Hub

Cost Savings And Business Benefits Enabled By Surface Hub

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Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. Ranging in scope from a short strategy session to custom projects, Forrester's Consulting services connect you directly with research analysts who apply expert insight to your specific business challenges. For more information, visit forrester.com/consulting.

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Executive Summary

Microsoft commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) businesses may realize by deploying Surface Hub in traditional and nontraditional spaces. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the communication and collaboration benefits that Surface Hub can enable for their organizations, compared with traditional meeting spaces with non-touch displays and whiteboards. They can leverage the touch-enabled, large-screen computing platform to improve the outcome of collaboration for in-person meetings, as well as leverage the one-touch communication options to include external participants. The study focuses on the positive impact of Surface Hub on meeting management time, remote meeting participation, ad hoc collaboration, meeting room equipment cost and complexity, and closing more sales with compelling and interactive presentations with clients.

> **"We had a client meeting to propose a project. Instead of using the whiteboard, we used the Surface Hub, and it was incredibly successful."**
>
> **~ Director of design and construction, architecture firm**

To better understand the benefits, costs, and risks associated with a Surface Hub implementation, Forrester interviewed several Surface Hub early adopters, to report on the costs and benefits they have experienced. Readers can apply these communication- and collaboration-focused benefits to their own business case analysis of Surface Hub. Each organization installed devices in a meeting room or collaboration space (or on a mobile cart, making it useful for either). They used Surface Hub devices to connect remote users via Skype for Business for more effective contributions, annotate and share information for in-person and remote meetings, display shared content, or deliver sales pitch meetings with customers. Results have been summarized as a representative organization that has deployed six devices by the end of the first year, with significant scale-out planned in years 2 and 3.

Prior to Surface Hub, these companies provisioned meeting rooms with some or all of the following: whiteboards, projection screens or flat panel monitors, in-room desktop PCs, large conference tables, speakers, a speakerphone, and other equipment. Collaboration spaces would be lucky to have a whiteboard and a few chairs. These organizations saw a benefit in being able to expand collaboration and simplify meeting room devices, while also delivering new features such as digital inking and improving remote user meeting participation.

SURFACE HUB DRIVES MEETING PRODUCTIVITY, REDUCES COSTS, AND HELPS INCREASE SALES

Forrester's interviews with five customers and subsequent financial analysis found that a composite organization based on these interviewed organizations experienced the risk-adjusted ROI and benefits shown in Figure 1.[1] See Appendix A for a description of the composite organization.

The composite organization analysis, which includes a slow Surface Hub ramp-up through Year 1 and aggressive deployment in years 2 and 3, points to benefits in years 1, 2, and 3 of about $110,000, $685,000, and $1 million, respectively. Costs were about $36,500 during implementation and about $71,000, $345,000, and $315,000 in years 1, 2, and 3, respectively. The estimated summary metrics are an ROI of 138% and a payback of about nine months.

FIGURE 1
Financial Summary Showing Three-Year Risk-Adjusted ROI And Key Benefits

| **ROI:** 138% | **Printing costs:** ▼ $25 per meeting | **Meeting time saved:** ▼ 15-23 min. per meeting | **Sales:** ▲ 20% |

Source: Forrester Research, Inc.

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› **Benefits.** While a conservative Surface Hub deployment is planned for the first year, deployment in years 2 and 3 is planned to be much larger, and the benefits summarized here are also expected to be considerably higher in those years. Review the Benefits chapter starting on page 9 for more details about the expected annual benefits. Here is a summary of the composite organization's risk-adjusted benefits:

- **Pre- and post-meeting productivity improvements of 75%, adding up to nearly $48,000 in the first year.** For a standard hour-long meeting, employees at the composite organization often wasted 10 minutes or more while setting up video or screen-sharing services for remote participants. Once the meeting was complete, employees spent another 20 minutes typing up notes, photographing whiteboards, and emailing those files to colleagues.

- **Room equipment cost avoidance of more than $8,000 or more per room, for any rooms planned for equipment install or refresh.** If not for Surface Hub, rooms and collaboration spaces generally would have been equipped with whiteboards. They were often analog whiteboards, though sometimes they were more expensive digital or "smart" whiteboards. Certain audio-visual equipment purchases, such as monitors, projectors, screens, speakerphones, and video cameras, can also be avoided by using built-in Surface Hub features.

- **Avoided printing costs of about $9,000 in the first year.** Collaboration with Surface Hub helps eliminate the need for printed materials for note-taking or annotation, as participants can make notes directly on the screen.

- **Improved sales of 20% for in-person sales meetings that were conducted in a Surface Hub meeting room, adding up to more than $44,000 in the first year.** Surface Hub offers a specific benefit to salespeople: It serves as a platform for presentations and collaboration, both in-person and remotely. Because of its superior user experience, it leads to a higher close rate on deals pitched using Surface Hub.

- **Improved collaboration, higher quality of developed goods and services, and overall better and faster business decisions.** For example, product designers working to build complex machinery can more easily visualize the details of their design and work together on the same product visualization from multiple locations.

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

- **Surface Hub device costs of about $33,000 during the initial period and $54,000 in the first year.** Device costs are estimated based on expected retail pricing and include a conservative set of typical accessories, such as a wall mount, a mobile cart, or an extra pen. As with benefits, considerably more device costs are expected in years 2 and 3, as detailed in the Costs section starting on page 16.

- **Implementation and ongoing management resource and other costs of about $3,500 during the initial period and about $17,000 in the first year.** These costs reflect standard implementation and support services provided by Microsoft and Microsoft Partners. They cover support and maintenance for the Surface Hub devices.

Disclosures

The reader should be aware of the following:

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

› Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Microsoft Surface Hub.

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

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

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TEI Framework And Methodology

INTRODUCTION

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

APPROACH AND METHODOLOGY

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

› Interviewed Microsoft marketing, sales, and/or consulting personnel, along with Forrester analysts, to gather data relative to Surface Hub and the marketplace for Surface Hub.

› Interviewed five organizations that were early adopters and are currently using Microsoft Surface Hub, to obtain data with respect to costs, benefits, and risks.

› Designed a composite organization based on characteristics of the interviewed organizations (see Appendix A).

› 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.

› Risk-adjusted the financial model based on issues and concerns the interviewed organizations highlighted in interviews. Risk adjustment is a key part of the TEI methodology. While interviewed organizations provided cost and benefit estimates, some categories included a broad range of responses or had a number of outside forces that might have affected the results. For that reason, some cost and benefit totals have been risk-adjusted and are detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling Microsoft/Surface Hub's service: benefits, costs, flexibility, and risks.

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

FIGURE 2

TEI Approach

Perform due diligence › Conduct customer interviews › Design composite organization › Construct financial model using TEI framework › Write case study

Source: Forrester Research, Inc.

Analysis

COMPOSITE ORGANIZATION

For this study, Forrester conducted a total of five interviews with representatives from the following companies, which are Microsoft customers:

› A commercial architecture firm based in the United States.

› A large law firm based in the Midwest region of the United States.

› A European automaker.

› A large medical center based in the United States.

› A private research university in the United States.

These organizations worked with Microsoft to participate in a Surface Hub early adoption program, which they started in the middle of 2015 with the delivery and installation of one 84-inch and one 55-inch device for most; some received a few more.

All have placed these devices in frequently used conference rooms or collaboration spaces to replace other whiteboard and presentation tools or as an additional tool to enhance collaboration, giving employees the opportunity to use the devices in team meetings, client meetings, and collaboration sessions. Several interviewed organizations also had experience with Perceptive Pixel devices, which were developed by a company acquired by Microsoft, and used touch and ink screen technology implemented in Surface Hub.

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization that Forrester synthesized from these results represents an organization with the following characteristics:

› It is a US-based design/manufacturing firm with a large business sales team (such as an architecture or manufacturing firm, though organizations in other industries are also relevant to this study).

› It has 2,000 employees.

› It had (and still has) a variety of conference room types and automation options. Rooms with traditional meeting technologies have whiteboards, most have screens, and larger rooms have computing and automation solutions.

› Two larger conference rooms were already planned for a refit/upgrade, with more planned in later years.

The organization saw value in participating in the program and was very interested in starting to use the devices. Going forward, the organization sees great value in Surface Hub devices. It has plans to purchase more devices in the first year, and then broadly deploy in years 2 and 3:

› Two Surface Hub devices were installed during the early adoption period, with four more to be installed in the first year.

› Years 2 and 3 are planned for a much wider scale-out, with more devices installed in conference rooms and more new collaboration spaces built out.

INTERVIEW HIGHLIGHTS

The interviewed organizations, as Surface Hub early adopters, were able to quantify benefits primarily related to collaboration and communication. The device form factor, technology, and integrated software can help improve meeting productivity, reduce costs, and improve business development results with customers. Organizations were also able to

identify several benefit areas where they had already observed improvement or expected to see improvement in the future once Surface Hub devices were deployed throughout the organization and integrated into more business-specific processes; however, this was not quantified.

The organizations summarized their situation before Surface Hub and after deployment, summarizing key benefit areas they have achieved or expect to achieve.

Situation

The interviewed organizations, from a mix of industries and using Surface Hub across a variety of roles, highlighted a number of key issues and opportunities they hoped to address or will address with Surface Hub:

> All organizations highlighted a goal of reducing or eliminating wasted time setting up the room. The contributing factors were attributed to connecting content to screens, dealing with multiple conferencing solutions when including remote users, and then distributing notes after a meeting. "Most conference rooms have a dedicated PC, so the person that's organized the meeting or the meeting secretary will go in early, log on to that computer, and set up whatever they need," said the US medical center messaging and collaboration manager.

> Several organizations highlighted a goal to encourage and facilitate more collaboration between employees and teams. The proposed solutions included introducing more ad hoc collaboration spaces and nontraditional meeting rooms. "The potential that we see for the Surface Hub is not to replace all of the conference room video technology, but to be placed in collaborative conference rooms. So huddle rooms, that sort of thing where you want people at the board or connecting to the board or drawing on the board," said the director of design and construction at the architecture firm.

> Some organizations shared how rooms with Surface Hub devices have impressed clients and led to higher-quality sales meetings, enabling some new and larger sales.

> Some organizations highlighted the high cost of outfitting meeting rooms. Typical spaces require a screen, whiteboards, speakerphones, cameras, a large conferencing table, a conference room PC, and other equipment. "We've talked with IT just to give them basic numbers. Our current setup before the [Surface] Hub is a flat screen, a web camera, and computer, and it's not particularly integrated," said the director of design and construction at the architecture firm.

> The legal firm outlined a goal to help teams work together better across offices and deliver more interactive, compelling courtroom presentations with a large, touch-enabled device. "We have a second office, and people from both often work together on projects. We've struggled with how to make those teams as efficient as the teams that can go grab a conference room here together and whiteboard stuff," said the COO at the US law firm.

> The medical center shared goals for more touch-enabled computing devices for kiosks and medical information displays.

"Most conference rooms have a dedicated PC, so the person that's organized the meeting or the meeting secretary will go in early, log on to that computer, and set up whatever they need."

~ Messaging and collaboration manager, US medical center

"We have a second office, and people from both often work together on projects. We've struggled with how to make those teams as efficient as the teams that can go grab a conference room here together and whiteboard stuff."

~ COO, US law firm

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› The two design firms (the architecture firm and the car manufacturer) both highlighted a goal of providing better tools to improve design ability, speed, and collaboration.

› The university shared a goal of improving education through the use of technology, including devices that instructors could use to explain concepts more thoroughly and that students could use (and are already using) to collaborate better on group projects. "Students, as you might expect, are very quick to pick up on the new technology," said the instructional designer at the private research university.

Solution

The 55- and 84-inch Surface Hub devices helped the interviewed organizations solve many of the issues listed above and take advantage of many of the opportunities. Deployment has started slow but is expected to grow significantly in later years.

For issues and opportunities not already addressed, the potential for third-party-developed applications (such as a touch-enabled CAD application) excited the organizations about the future for Surface Hub.

Results

The interviews revealed a number of benefits enabled by Surface Hub:

› **Meetings are set up and completed more quickly, particularly for post-meeting notes and information sharing and when participants join remotely.** Remote meeting participants were able to join easily using Skype for Business with just one click. This was an improvement on past experiences, when participants often used a mix of phone and videoconferencing solutions. Meeting notes were also quickly distributed as a OneNote or .png file. "Emailing the OneNote files after a meeting saved time on every meeting that uses the Surface Hub," said the COO of the law firm.

› **Meeting room equipment costs can be avoided.** New and planned room upgrade costs can be avoided in favor of the single Surface Hub device, which can serve as a computer, screen, whiteboard, phone, and videoconference device. "We've talked with IT just to give them basic numbers," said the director of design and construction at the architecture firm.

> *"We had a client meeting to propose a project. Instead of using the whiteboard, we used the Surface Hub, and it was incredibly successful."*
>
> ~ Director of design and construction, architecture firm

› **Sales meetings with current and potential clients close with a sale more often.** Clients were impressed with the well-designed display and presentation devices, and the organizations were able to deliver higher-quality presentations. They had the opportunity to bring the client to the screen and together draw up a diagram or brainstorm a list, providing an even greater level of meeting richness and interactivity. "We had a client meeting to propose a project. Instead of using the whiteboard, we used the Surface Hub, and it was incredibly successful," said the director of design and construction at the architecture firm.

› **Process- or business-specific tasks are completed more collaboratively and at a higher level of quality.** As detailed in the Situation section above, organizations identified a number of issues and opportunities related to industry- or role-specific processes where Surface Hub has enabled improvement or future improvement is expected. Specific collaboration scenarios have already been enabled, such as some design, education, and (as described above) sales. More detailed processes come with the expectation of a broader catalog of applications related to medicine, law, design, manufacturing, education, and other industries.

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BENEFITS

The composite organization has experienced a number of benefits since starting to use Surface Hub devices. Since the organizations are using the devices early in the product life cycle, the information provided by each interviewed organization focused primarily on how Surface Hub helped enable collaboration and communication benefits. Key benefits identified by interviewed organizations include:

› Improved meeting productivity, specifically for initiating meetings with remote participants and handling post-meeting tasks.

› Reduced meeting room equipment costs and avoided printing costs.

› Improved results from client meetings held in Surface Hub-enabled rooms, leading to more and larger sales.

› Improved collaboration and business impact. While organizations discussed these benefits, particularly in vertical-specific scenarios, they were not quantified. They are shared in the last benefit section.

Meeting Productivity Improvement

With Surface Hub, meetings are able to start and finish more quickly. Also, in-between meeting tasks are greatly reduced, such as connecting laptops to share individual content or making sure everyone has opened the right PowerPoint slide deck and is on the right slide. The Skype for Business app provides one-touch meeting access, avoiding any issues that might come up when connecting a device, such as updating resolution or dealing with primary versus secondary monitors. Any notes captured during the meeting across the multiple productivity applications and web browsing tools are already digitized and can be saved via OneNote or other applications, avoiding whiteboard photography or transcribing — and notes are automatically erased from the Surface Hub device in case you forget. Post-meeting tasks now involve just a few clicks to send the OneNote notes to all participants or save them to SharePoint. "I personally have probably 50 pictures of whiteboards from the last five years on my phone that I constantly refer to; if I don't retype them up, I will go searching through my pictures to find them when I need them. Emailing the OneNote files after a meeting saved time on every meeting that uses the Surface Hub," said the COO of the US law firm. The director of computing for the firm continued by highlighting how the device helps with information security: "Your stuff isn't lying around out there on the walls all over the place for outside people to walk through and see."

Table 1 shows the estimated time meeting attendees would take capturing meeting information, notes, and brainstorming results using OneNote, a touchscreen, and pen inking. This takes into account the number of meeting rooms with Surface Hub devices, the estimated number of scheduled meetings per week that could be affected by Surface Hub, the average number of attendees in each meeting, and the average time per meeting. For an average 1-hour meeting, an additional 20 minutes (on average) is spent on post-meeting tasks such as staying after to type up whiteboard notes, taking pictures of whiteboards, recreating paper annotations in a digital format, or writing up text-only explanations to go alongside a diagram or image.

With Surface Hub, the organization can use inking and OneNote to annotate documents, take notes, and capture all information that would have previously been written on a whiteboard. When a map, image, or diagram is reviewed, meeting participants can draw directly on the digital image, saving significant time trying to redraw arrows or notes, change diagrams, or type up text notes, as well as avoid any confusion related to trying to relate text notes correctly to an

> *"Emailing the OneNote files after a meeting saved time on every meeting that uses the Surface Hub."*
>
> ~ COO, US law firm

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image or diagram. Altogether, this saves significant post-meeting time for both the note-takers and the other attendees reviewing notes — an average of 75% of time saved, as estimated by the organization.

Furthermore, as estimated by the representative organization, 33% of all meetings will include remote participants. These meetings are also quicker and easier to manage with a single touch to initiate the online meeting. "We hold interoffice meetings with the Surface Hub. They connect from their meeting room to our Surface Hub. Sometimes multiple people connect to our Surface Hub meeting room from their Surface tablets via Skype for Business in their own offices," said the director of computing of the US law firm.

TABLE 1

Meeting Productivity Improvement Related To Remote Attendee Management And Post-Meeting Tasks

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
A1	Number of meeting rooms and spaces outfitted with Surface Hub devices			6	26	41
A2	Number of scheduled meetings per week that could be affected by Surface Hub			30	260	410
A3	Average number of attendees per meeting			4	4	4
A4	Percent of meetings with remote attendees			33%	33%	33%
A5	Typical duration of each meeting (min.)			60	60	60
A6	For meetings with remote participants, average time spent dealing with remote attendee connections (min.)			10	10	10
A7	Average post-meeting time spent transcribing and distributing notes and other information (min.)			20	20	20
A8	Percent of pre- and post-meeting time saved with Surface Hub			75%	75%	75%
A9	Meeting attendee average hourly rate			$70	$70	$70
A10	Percent of time recovered for work tasks			50%	50%	50%
At	Meeting productivity improvement	A2 * A3 * (A6/60 * A4 + A7/60) * 52 * A8 * A9 * A10		$63,609	$551,278	$869,323
	Risk adjustment	↓25%				
Atr	**Meeting productivity improvement — easier remote meeting setup and faster post-meeting logistics (risk-adjusted)**		**$0**	**$47,707**	**$413,459**	**$651,992**

Source: Forrester Research, Inc.

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Especially for organizations that currently have different video, phone, and/or screen-sharing solutions, initiating and confirming everyone is online can take time, and even a small error can lead to significant delays — the representative organization estimates 10 minutes — waiting for the meeting to start. With Surface Hub, even organizations with one solution can avoid the setup, installation, and integration required; they can now initiate a Skype for Business meeting with video, audio and screen-sharing with a touch of a button. The organization estimates it can save 75% of this time.

This 75% in time savings for these tasks adds up to 15 to 23 minutes saved each meeting. A large portion of this time saved is applied to additional tasks, such as handling personal issues, doing other work tasks, or socializing with co-workers. The organization estimates this adds up to $63,609 in the first year, and with the significant deployment growth expected in years 2 and 3, a related increase in benefits of $551,278 in Year 2 and $869,323 in Year 3.

Given this benefit is built on a number of averages and estimates, there is a risk of overestimation where just one or two changes can lead to different benefit results. For that reason, a 25% risk adjustment has been applied, and the risk-adjusted totals are $47,707 in Year 1; $413,459 in Year 2; and $651,992 in Year 3, as shown in Table 1. See the section on Risks for more information.

The architecture firm recalled another benefit, based on several meetings where it had to keep the client waiting a few extra minutes in the lobby. While this was not included in the financial modeling, employees had to quickly clean up the conference room from the previous meeting, including erasing whiteboards, removing examples taped to walls, and running down a colleague who wrote "saved" next to their whiteboard notes. Taking notes on whiteboards does run a higher risk of confidential information getting out — even the remnants of erased notes might still be readable, perhaps by other employees walking past the open door or clients who are in the room for another meeting. "Before Surface Hub, we had mad dashes to unpin old diagrams or pin up new ones right before they arrive or while they're waiting," said the director of design and construction at the architecture firm.

> *"Before Surface Hub, we had mad dashes to unpin old diagrams or pin up new ones right before [new clients] arrive or while they're waiting."*
>
> ~ Director of design and construction, architecture firm

Cost Savings From Avoided Room Equipment Purchases And Avoided Printing Costs

For the organization, the Surface Hub replaced a number of other devices. The conference room with the 84-inch Surface Hub installed had no need for whiteboards, a screen and projector, a dedicated conference room PC, a video camera, a conferencing phone, or monitor connection cabling. The composite organization was also able to avoid purchasing a specialty conference table that included locked PC storage. While the alternative projector and screen or monitor would have cost less on its own than the Surface Hub, the cost of all equipment added together is much closer to the cost of the Surface Hub — and, for some organizations, the total cost may be higher, especially for the 55-inch Surface Hub device. Whiteboards are a few hundred dollars each. A 70-inch monitor might cost $10,000 or more (though a more economical firm might settle for a 40-inch screen for just a few thousand). A conference call device and a video camera could cost at least $1,000. The organization estimates the average cost for room equipment to be at least $8,300.

Note that this does not include added options such as higher-quality monitors or projectors, an electronic whiteboard, or the integration or replacement of any conference room management systems; however, many organizations plan to implement these options or might consider them in the future. The automotive manufacturer highlighted an additional option: "We are experimenting with meeting room setup. We don't always need a table

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and chairs." With Surface Hub, the manufacturer can consider new meeting room configurations to help provide more flexible private meeting spaces that encourage interaction and collaboration with the Surface Hub. These configurations can also motivate people to hold quicker meetings — since everyone might be standing the whole time, they'll want to stay on topic and be done more quickly.

TABLE 2
Cost Savings From Avoided Room Equipment Purchases And Avoided Printing Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
B1	Number of Surface Hub devices installed		2	4	20	15
B2	Percent of Surface Hubs installed in conference rooms		50%	50%	50%	50%
B3	Percent of conference rooms with Surface Hub devices that were planned for upgrade		75%	75%	50%	50%
B4	Meeting Rooms and Ad-hoc spaces buildout/upgrade already planned	B1 * B2 * B3	1	1	5	3
B5	Avoided hardware and software costs with Surface Hub (whiteboards, screen, etc.), average per room		$8,300	$8,300	$8,300	$8,300
B6	Percent of meetings with printed handouts			25%	25%	25%
B7	Meetings with printed handouts per week held in Surface Hub meeting spaces	A2*B6		8	65	103
B8	Total number of pages printed per meeting that can be avoided with Surface Hub			75	75	75
B9	Percent of printouts that are color copies			33%	33%	33%
B10	Cost for black & white copy (per page)			$0.01	$0.01	$0.01
B11	Cost for color copy (per page)			$1.00	$1.00	$1.00
B12	Printing cost savings per meeting	B8 * ((1-B9) * B10 + B9 * B11)		$25.25	$25.25	$25.25
Bt	Cost savings from equipment purchases and printing costs	B4 * B5+B7 * B8 * ((1-B9) * B10 + B9 * B10) * 52	$8,300	$18,805	$126,853	$160,152
	Risk adjustment	↓10%				
Btr	**Cost savings from equipment purchases and printing costs (risk-adjusted)**		**$7,470**	**$16,925**	**$114,168**	**$144,137**

Source: Forrester Research, Inc.

For the organization, meeting room cost savings are applied only to meeting rooms, and only those meeting rooms that are planned for an equipment upgrade. Table 2 shows the total number of devices to be purchased. We then factored in the estimated number of devices that will be installed in the conference room and replace a planned upgrade (rounded up). Note that in later years, fewer devices will be installed in conference rooms in favor of group collaboration areas. The organization estimates one to five planned room upgrades to be avoided each year, and it expects to avoid the $8,300 per room average equipment cost.

The architecture firm highlighted an additional cost avoidance that has been applied to the composite organization: avoided printing costs. This organization got ready for client design review meetings by preparing a portfolio of color-printed design ideas and drafts. These were taped to walls or spread out on the conference table to review, mark up, and discuss. With Surface Hub, the organization expects it will all but eliminate color copy costs, by displaying these images on the screen and using the pen and touch interface to mark up the images (also saving considerable time on post-meeting transcribing, as mentioned in the first benefit section). The organization estimates it spent $1.00 per color copy (though much less for black and white); with many images printed for each meeting, many copies of each image printed, and multiple client meetings per week, this adds up to a considerable savings opportunity. For the organization, this adds up to about $25 in printing costs saved each meeting or about $9,000 in the first year.

Table 2 shows estimated printing cost savings for the composite organization. The organization estimates one-quarter of meetings have handouts, and of those, one-third have color copies provided. Color copies are very expensive (especially for large formats, which are more likely given the investment for color), though black and white is relatively cheap for a large organization with a copier contract.

Avoided room equipment and printing costs are summed in Table 2, and they are estimated at $8,300 during the initial period, because one device was installed in a main conference room that was planned for an upgrade. The cost savings were then $18,805 in Year 1; $126,853 in Year 2; and $160,152 in Year 3. A 10% risk adjustment has been applied to compensate for any overestimates in printing or equipment costs, and the risk-adjusted totals are $7,470 during the initial period; $16,925 in Year 1; $114,168 in Year 2; and $144,137 in Year 3. See the section on risk for more information.

Sales Improvements Enabled By Client Meetings That Leverage Surface Hub

More productive meetings and reduced costs are important, but even more important is how Surface Hub can help improve meeting and collaboration *results*. Specifically, clients are not only impressed with the technology, but they find the meetings more interactive and participatory, helping them feel more engaged and part of the process and helping lead to more successful sales meetings. "We can use it as a natural extension of our presentations. It will allow us to deliver high-quality presentations and show our expertise in terms of design and our synthesis with technology," said the director of design and construction at the commercial architecture firm.

The organization can hold client meetings in Surface Hub-enabled rooms to deliver higher-quality sales presentations on the touch-enabled device. Clients are impressed not just with the device, but with how the organization can deliver information-rich, quality presentations with interactive presentation techniques. Surface Hub also offers opportunities for meeting attendees to step up to the screen together to make notes on slides and pull up a OneNote screen to brainstorm. Client sales meetings held in a Surface Hub-enabled meeting room can lead to an increase in closed sales. The organization estimates that it has four to 24 client meetings in a Surface Hub-enabled room each week, with the growth related to the increased deployment in years 2 and 3. Each closed deal has an average value of $150,000, and the organization has an estimated sales meeting close rate of 8%. It estimates a 20% improvement in closed sales for in-person client sales meetings held in Surface Hub-enabled rooms. With the organization's profit margin, these add up to annual benefits of $49,920 in Year 1; $174,720 in Year 2; and $299,520 in Year 3.

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Given the variability of sales deals, a 10% risk adjustment has been applied. The risk-adjusted annual benefits are $44,928 in Year 1; $157,248 in Year 2; and $269,568 in Year 3. See the section on risk for more information.

TABLE 3

Sales Improvements Enabled By Client Meetings That Leverage Surface Hub

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Number of meetings with prospective clients, per week, in or using a Surface Hub room (two per room per week)			4	14	24
C2	Average sales deal size (per customer per year)			$150,000	$150,000	$150,000
C3	Average sales close rate for direct client engagement			10%	10%	10%
C4	Sales close rate improvement due to meetings with Surface Hub			20%	20%	20%
C5	Profit margin			8%	8%	8%
Ct	Sales improvements due to Surface Hub	C1*C2*C3 *C4*C5*52	$0	$49,920	$174,720	$299,520
	Risk adjustment	↓10%				
Ctr	**Sales improvements enabled by client meetings that leverage Surface Hub (risk-adjusted)**		**$0**	**$44,928**	**$157,248**	**$269,568**

Source: Forrester Research, Inc.

Other Expected Benefits From Improved Collaboration And Business Effectiveness

Beyond improving sales, Surface Hub can help improve the outcomes of meetings and collaboration sessions. Internal teams can visualize and customize information, images, and notes more effectively and gain new and faster insights. Presentations to executives can be more effective, with more dynamic display of information and more clear transitions from broad concepts to drill-down details. And clients are not only impressed with the technology, but they find the meetings more interactive and participatory. Clients feel more engaged and part of the process, which helps lead to faster projects and less opportunity for any confusion. "We were working with a tech company. They appreciated how we scanned model shots of their proposed space and brainstormed what we wanted to do with the space. They joined at the screen to co-author notes and ideas in real time. It was incredibly successful," said the director of design and construction at the architecture firm.

While this is not financially measurable at this time, the organization has seen and expects to see a number of

"We were working with a tech company. . . . They joined at the screen to co-author notes and ideas in real time. It was incredibly successful."

~ Director of design and construction, architecture firm

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financial and nonfinancial benefits that have been enabled and can be enabled by Surface Hub:

> The legal firm has started to help teams work together better across offices with Surface Hub, to deliver more interactive, compelling courtroom presentations. "Our lawyers are rarely all in the office at one time. We're constantly traveling for depositions, trials, et cetera, and it's hard to feel that really — the collaborative spirit that you feel when you're like in the war room together," said the COO of the US law firm. The COO continued: "We have a vision of taking these devices to trial to help tell our story to the judge and jury. We see this as an opportunity, not only to wow the jurors, but help tell our story more cohesively and easily by simply touching the screen to enlarge a part of a deposition transcript or to play a video."

> The medical center is planning to deploy Surface Hub devices for increased medical information collaboration. "We built a satellite campus, and so we have physicians up there, and, of course, anytime you've got some sort of a satellite area, you want them to be able to connect to the mothership," said the US medical center messaging and collaboration manager. Surface Hub devices can help doctors communicate with each other, hold videoconferences, and use the touch- and pen-enabled displays to annotate information on the screen.

> The two design firms, the architecture firm and the car manufacturer, both expect significant improvements in design ability, speed, and collaboration, as third-party vendors develop new applications for Surface Hub devices.

> The university shared a goal of improving education through the use of technology, including devices that instructors can use to explain concepts more thoroughly and that students can use (and are already using) to collaborate better on group projects. "Students work on diagnostic cases and are able to use the Surface Hub to load up images and documents, make annotations, and then email to themselves. They hardly ever use whiteboards," said the instructional designer at the private research university.

Total Benefits

Table 4 shows the total of all benefits, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of more than $1.4 million.

TABLE 4
Total Benefits (Risk-Adjusted)

Ref.	Benefit Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Atr	Meeting productivity improvement — easier remote meeting setup and faster post-meeting logistics	$0	$47,707	$413,459	$651,992	$1,113,158	$874,922
Btr	Cost savings from avoided room equipment purchases and avoided printing costs	$7,470	$16,925	$114,168	$144,137	$282,700	$225,502
Ctr	Sales improvements enabled by client meetings that leverage Surface Hub	$0	$44,928	$157,248	$269,568	$471,744	$373,331
	Total benefits (risk-adjusted)	**$7,470**	**$109,559**	**$684,875**	**$1,065,697**	**$1,867,601**	**$1,473,756**

Source: Forrester Research, Inc.

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COSTS

The composite organization experienced a number of costs associated with the Surface Hub solution:

> Surface Hub device purchase costs.

> Initial and ongoing costs, including software and hardware administration and support, installation, training, and integration.

Surface Hub Device Costs

Risk-adjusted Surface Hub device costs are shown in Table 5. Microsoft sells Surface Hub as a package; the price includes the hardware and operating system, as well as important group collaboration applications such as OneNote and newer versions of Word, PowerPoint, and Excel. Also included are common accessories – a spare pen, a wall bracket or a portable cart.

TABLE 5

Surface Hub Device Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Number of new 55-inch Surface Hub devices purchased		1	3	15	10
D2	Number of new 84-inch Surface Hub devices purchased		1	1	5	5
D3	Cost of 55-inch Surface Hub (incl. accessories)		$10,400	$10,400	$10,400	$10,400
D4	Cost of 84-inch Surface Hub (incl. accessories)		$22,700	$22,700	$22,700	$22,700
Dt	Surface Hub device costs	D1 * D3 + D2 * D4	$33,100	$53,900	$269,500	$217,500
	Risk adjustment	0%				
Dtr	**Surface Hub device costs (risk-adjusted)**		**$33,100**	**$53,900**	**$269,500**	**$217,500**

Source: Forrester Research, Inc.

Implementation, Management And Support Costs

Physical device installation by a third-party installation expert is recommended. The organization opted for this, and has started implementing the following deployment plan:

> Rolling stands (available from Microsoft), for about half of the 55-inch Surface Hub devices.

> Wall mounts for the other half of the 55-inch Surface Hub devices, in smaller conference rooms or in central, open collaboration spaces.

> Wall mounts for all 84-inch Surface Hub devices, in larger conference rooms.

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Some time and effort is required setting up the Surface Hub devices. The cost included an IT resource to add them as network devices and conferencing resources, set up key preferences and install applications, along with a facilities or operations resource to manage the room logistics, room modifications, and the optional integration with room lighting systems. Also part of the resource costs was the training provided to all potential meeting leaders and attendees, to teach them about connecting to meetings with Skype for Business, using the pen-enabled screen to take notes, and saving meeting information for later distribution and use.

Microsoft's standard Surface Hub support and management service is also included.

These implementation and ongoing resource-related costs add up to the risk-adjusted totals shown in Table 6.

TABLE 6
Implementation, Management, And Annual Maintenance Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
E1	Surface Hub installation service		$3,150	$5,050	$25,250	$20,500
E2	Ongoing Surface Hub management resources			$4,350	$17,825	$28,700
E3	Ongoing support and maintenance licenses			$5,800	$23,300	$37,800
Et	Installation and ongoing Surface Hub costs	E1 + E2 + E3	$3,150	$15,200	$66,375	$87,000
	Risk adjustment	↑10%				
Etr	**Installation and ongoing Surface Hub costs (risk-adjusted)**		**$3,465**	**$16,720**	**$73,013**	**$95,700**

Source: Forrester Research, Inc.

Total Costs

Table 7 shows the total of all costs as well as associated present values, discounted at 10%. Over three years, the composite organization expects total costs to total a present value of nearly $620,000.

TABLE 7
Total Costs (Risk-Adjusted)

Ref.	Cost Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Dtr	Surface Hub device costs	$33,100	$53,900	$269,500	$217,500	$574,000	$468,238
Etr	Installation and ongoing costs	$3,465	$16,720	$73,013	$95,700	$188,898	$150,907
	Total costs (risk-adjusted)	**$36,565**	**$70,620**	**$342,513**	**$313,200**	**$762,898**	**$619,145**

Source: Forrester Research, Inc.

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FLEXIBILITY

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

Since Surface Hub is a relatively new solution, interviewed organizations reported benefits or expect future benefits in areas of the business beyond sales enablement, as described in the Benefits section. However, they were not yet in a positon to measure the impact, though some impacts are expected to be very significant. These include role- and industry-specific benefits, such as:

> *"Drawing on the screen while you are talking to the witness — or have the witness do it — is a much more natural way than manipulating a mouse."*
>
> ~ Senior lawyer at a US law firm

› The law firm plans to use Surface Hub as a key tool in its court presentations. This requires some planning and training within the organization, as well as some support from the facilities department of the court system. But once Surface Hub is operational, the firm expects that the device will help it deliver more compelling, persuasive presentations. "Drawing on the screen while you are talking to the witness — or have the witness do it — is a much more natural way than manipulating a mouse, and more engaging for the judge and the jury. Using a pen to circle a key point, using my hands to zoom in on a picture — it is just more persuasive," said a senior lawyer at the US law firm. The law firm estimates that more compelling and persuasive presentations will lead to more and larger positive case results, leading to greater revenue.

› The medical center hopes to bring Surface Hub out of the meeting rooms to be more available and helpful for patients and medical professionals. While there are a number of HIPAA and other certification hurdles to be cleared, the center hopes to use the Surface Hub touch-enabled devices in more creative ways, such as displaying a body diagram that can be touched and zoomed in on for more detailed information, using the devices to review X-ray or MRI images, or providing enhanced medical station status reporting. Any of these or other enhancements the medical center can enable in the future can help improve patient care and shorten the time a patient needs to spend at the medical center, which can help the center serve new patients and bring in new ones.

› The architecture and car manufacturing firms both expect to use Surface Hub as a key part of their design processes. While primary design will likely still be done at a personal workstation, Surface Hub can be used to share ideas with colleagues while touching, zooming, manipulating, and even applying minor changes during the meeting. It can also be used as a large-screen device to help a designer or engineer get a closer look at their work, again being able to touch, zoom, manipulate, and make changes right on the screen. These organizations expect Surface Hub to improve design, which can lead to a number of benefits, such as faster development, fewer issues during production, improved product features, and more sales.

› The university hopes to bring Surface Hub devices into the classroom, where they become an integral part of teaching and learning. Instructors can use the screen to display presentations; use the pen to make notes, which can be quickly emailed to everyone in the class; or record the whole lecture hour, including presentations and notes, for students to review after class. "We have been looking for solutions that would make it easier than trying to shoot video of the chalkboard, specifically ways to digitally capture it. And there are some things out there, but nothing that really transposes into a traditional classroom, like a chalkboard does. Right now we have camera people in there that have to zoom in on the chalkboard," said the instructional designer at the private research university.

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RISKS

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

TABLE 8

Benefit And Cost Risk Adjustments

Benefits	Adjustment
Improved meeting productivity	↓ 25%
Meeting room equipment cost savings	↓ 10%
Improved client sales	↓ 10%

Costs	Adjustment
Installation and ongoing costs	↑ 10%

Source: Forrester Research, Inc.

Quantitatively capturing implementation risk and impact risk by directly adjusting the financial estimates results provides more meaningful and accurate estimates and a more accurate projection of the ROI. In general, risks affect costs by raising the original estimates, and they affect benefits by reducing the original estimates. The risk-adjusted numbers should be taken as "realistic" expectations since they represent the expected values considering risk.

The following impact risks that affect benefits are identified as part of the analysis:

› Productivity benefits have been adjusted at a higher rate to compensate for any overestimated improvements.

› Meeting room cost savings are adjusted to allow for lower-than-expected avoided costs.

› Sales benefits are also adjusted to allow for lower-than-expected improvements or average deal size.

The following implementation risk that affects costs is identified as part of this analysis:

› Implementation and ongoing costs have been adjusted, given the costs of resources may be higher than expected, or more Surface Hub device add-on options might be included.

Table 8 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the composite organization. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

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Financial Summary

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment in Surface Hub.

Table 9 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 8 in the Risks section to the unadjusted results in each relevant cost and benefit section.

FIGURE 3

Cash Flow Chart (Risk-Adjusted)
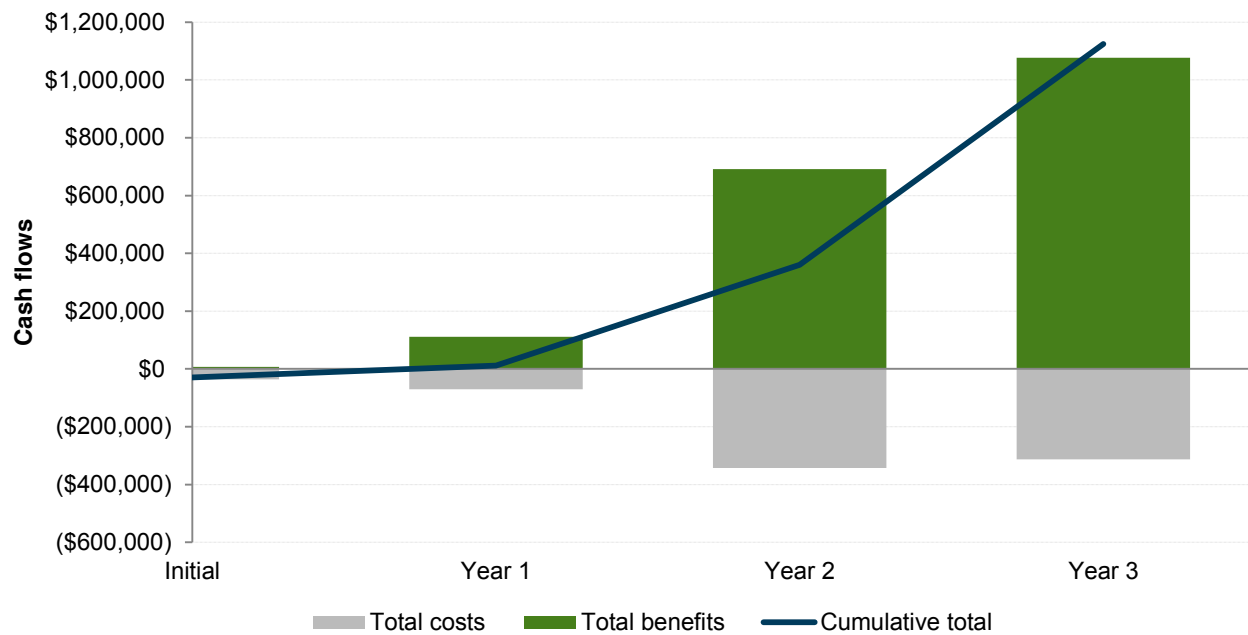
Source: Forrester Research, Inc.

TABLE 9

Cash Flow (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Costs	($36,565)	($70,620)	($342,513)	($313,200)	($762,898)	($619,145)
Benefits	$7,470	$109,559	$684,875	$1,065,697	$1,867,601	$1,473,756
Net benefits	**($29,095)**	**$38,939**	**$342,362**	**$752,497**	**$1,104,704**	**$854,611**
ROI						**138%**
Payback period (months)						**9.0**

Source: Forrester Research, Inc.

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Microsoft Surface Hub: Overview

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

ENGAGING AND PRODUCTIVE MEETINGS

Microsoft Surface Hub reimagines the meeting experience so that you can unlock the power of the group. You can walk up and join a Skype for Business meeting with a single tap and share content effortlessly, so that you spend your time connecting to people rather than technology. And since you can easily send meeting notes and content, you can communicate outcomes and action points.

Scheduled Or Spontaneous. Schedule meetings in advance with Skype for Business, or invite remote attendees ad hoc when you want to bring them into the discussion.

One-Touch Meeting Start. Start meetings on time with a tap of the screen. End your session with an option to save and send meeting content to the group for later use.

Easy-To-Share Content. You can easily share content from laptops, tablets, or phones. With inkback and touchback, your changes will appear on compatible personal devices.

Engaging For Everyone. Everyone can see content and contribute equally no matter where they are. Clear sound and high-quality video make meetings great.
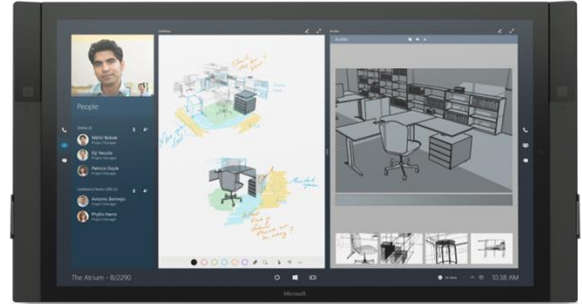
BEST WAY TO CREATE AND BRAINSTORM WITH OTHERS

Make working together the most productive part of your day. Share your ideas with others on a canvas that is as big as your imagination. Bring teams together in a way that feels completely natural, with technology that doesn't intrude but helps ideas flow. Expand what can be accomplished in the moment, and then don't lose the momentum — capture your work so you can act on it later.

OneNote Whiteboard. Use the OneNote whiteboard to share ideas on an infinite canvas, paste and annotate content from other apps, and bring remote participants into the brainstorm.

Fluid, Natural Ink. The ink on Microsoft Surface Hub is so fluid and responsive that it feels just like a pen on paper — and it lets two people ink at the same time.

Built For Teamwork. Whether you're in the room or on the other side of the world, Microsoft Surface Hub brings everyone into the collaboration.

Take Your Ideas With You. Save your whiteboard as a rich OneNote file and email it to others so your ideas don't evaporate when the meeting ends.

PLATFORM FOR AMAZING LARGE SCREEN APPS

In addition to the built-in team experiences Microsoft Surface Hub offers with Skype for Business, Microsoft Office, and OneNote, the device is customizable with a wide array of applications. Universal apps built for Windows 10 shine on Microsoft Surface Hub and scale to the large screen. You can also connect apps from your personal device and drive them from Microsoft Surface Hub.

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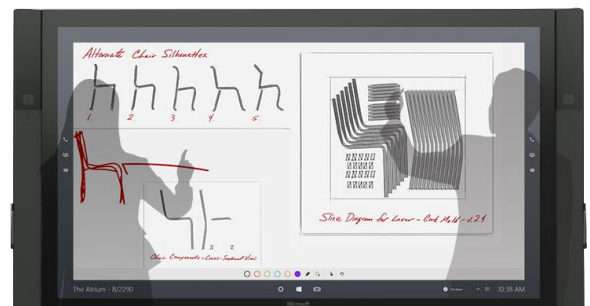
Windows Apps. You can run universal Windows apps natively from Microsoft Surface Hub or connect applications from your personal device.

Familiar Apps. Microsoft Surface Hub includes familiar Microsoft software and services that your business relies on, like Skype for Business, Office, and OneNote.

Create your own Apps. Build amazing experiences, designed specifically for your business, on the Microsoft Surface Hub platform.

Integrated Solution. Microsoft Surface Hub apps take advantage of the large screen, touch and ink input, and onboard hardware like cameras and sensors.

ADVANCED TECHNOLOGY FOR THE MODERN WORKPLACE

Microsoft Surface Hub integrates beautifully into the modern workplace, enabling productivity in any space where people come together to get things done, from large conference rooms to informal huddle spaces to offices. The fully integrated design, choice of two screen sizes, and flexible mounting configurations mean there's a solution for your business needs. Microsoft Surface Hub is also designed to be easy to deploy and manage remotely.

Any Space. The fully integrated design, flexible mounting options and stands, plus a choice of two sizes mean there is a solution for any space.

Every User. Walk up to Microsoft Surface Hub and start working immediately. The simple, intuitive interface makes the experience natural and inviting.

Connected. Microsoft Surface Hub offers a variety of inputs, including wireless projection, HDMI, NFC, Bluetooth, and ports to connect to peripheral devices.

Scale With Your Enterprise. Microsoft Surface Hub was designed to be centrally managed and updated, enabling you to deploy at scale.

Visit https://www.microsoft.com/microsoft-surface-hub/ for more information.

Appendix A: Composite Organization Description

For this TEI study, Forrester has created a composite organization to illustrate the quantifiable benefits and costs of implementing Surface Hub. The composite company is based on characteristics of the interviewed customers:

› It is a 2,000-employee, US-based design/manufacturing firm with a large business sales team (such as an architecture or manufacturing firm, though others are also relevant to this study).

› It has a variety of conference room types and automation. All of the rooms have whiteboards, most have screens, and larger rooms have computing and automation solutions. Two larger conference rooms were already planned for a refit/upgrade, with more planned in later years.

› The organization is already a customer of many of Microsoft's other solutions.

The organization has plans to purchase a few devices in the first year, and broadly deploy in years 2 and 3:

› Two Surface Hub devices were installed during the early adoption period, with four more to be installed in the first year.

› Years 2 and 3 are planned for much wider scale-out, with more devices installed in conference rooms and more new collaboration spaces built out.

For the purpose of the analysis, Forrester assumes that the composite organization is an early adopter of Microsoft Surface Hub, but there were no perks of participating, particularly related to the purchase costs of Surface Hub devices.

The composite organization saw Surface Hub devices as a way to address the following business opportunities:

› Improve meeting productivity and reduce wasted time and frustration.

› Reduce meeting room equipment costs.

› Leverage technology as a tool to create business improvements and opportunities, such as improved sales and improved collaboration to make better business decisions.

FRAMEWORK ASSUMPTIONS

Table 10 provides the model assumptions that Forrester used in this analysis. 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 company's finance department to determine the most appropriate discount rate to use within their own organizations.

TABLE 10
Model Assumptions

Ref.	Metric	Calculation	Value
F1	Work hours per year (40 hours/week * 52 weeks)		2,080
F2	Information worker (meeting attendee) salary		$145,000
F3	Hourly	(C2/C1)	$70
F4	Discount rate		10%

Source: Forrester Research, Inc.

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Appendix B: Total Economic Impact™ Overview

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

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

BENEFITS

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

COSTS

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

FLEXIBILITY

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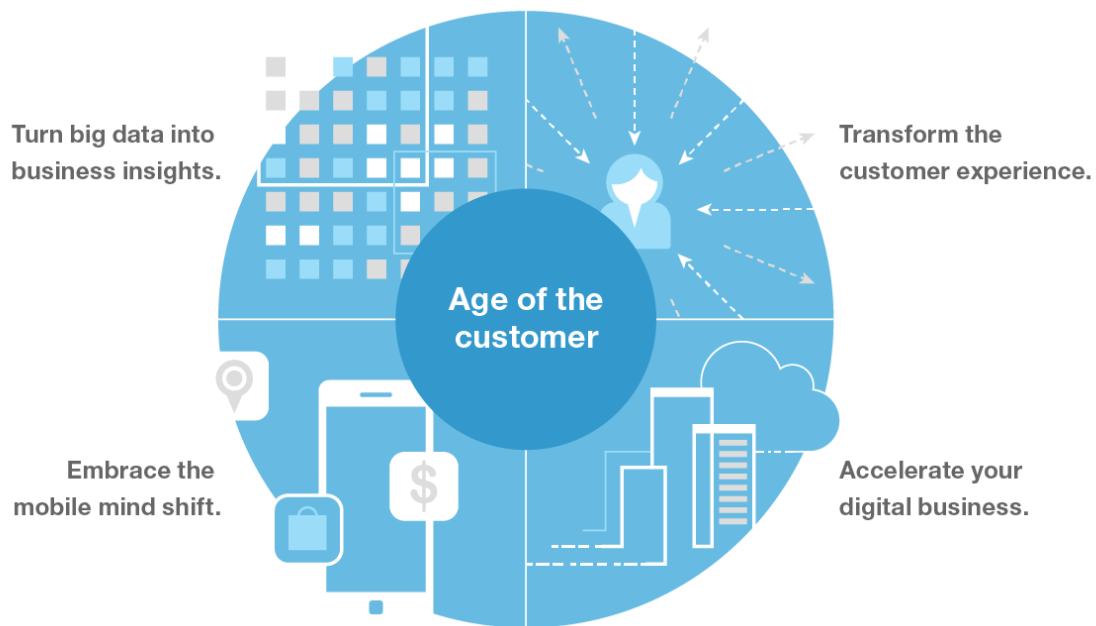
RISKS

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

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Appendix C: Forrester And The Age Of The Customer

Your technology-empowered customers now know more than you do about your products and services, pricing, and reputation. Your competitors can copy or undermine the moves you take to compete. The only way to win, serve, and retain customers is to become customer-obsessed.

A customer-obsessed enterprise focuses its strategy, energy, and budget on processes that enhance knowledge of and engagement with customers and prioritizes these over maintaining traditional competitive barriers.

CMOs and CIOs must work together to create this companywide transformation.

Turn big data into
business insights.

Transform the
customer experience.

**Age of the
customer**

Embrace the
mobile mind shift.

Accelerate your
digital business.

Forrester has a four-part blueprint for strategy in the age of the customer, including the following imperatives to help establish new competitive advantages:

Transform the customer experience to gain sustainable competitive advantage.

Accelerate your digital business with new technology strategies that fuel business growth.

Embrace the mobile mind shift by giving customers what they want, when they want it.

Turn (big) data into business insights through innovative analytics.

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Appendix D: Glossary

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

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

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

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

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

A NOTE ON CASH FLOW TABLES

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

Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.

TABLE [EXAMPLE]
Example Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.

Appendix E: Endnotes

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

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