

A Forrester Total Economic Impact™
Study Commissioned By Microsoft
June 2020

The Total Economic Impact™ Of Microsoft Dynamics 365 Remote Assist

Cost Savings And Business Benefits
Enabled By Dynamics 365 Remote Assist

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ABOUT FORRESTER CONSULTING

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Executive Summary

In 2020, systemic risk makes every company a globally exposed enterprise — from the COVID-19 pandemic and climate change to highly complex economic interdependencies and geopolitical upheaval and tension.¹ Organizations must react today to ensure business continuity, meet changing customer and market demands, accelerate business velocity, support remote work and collaboration, ensure data privacy and security, keep employees safe and healthy, and minimize emissions.

Mixed reality is an important part of organizations' arsenal to survive, adapt, and succeed in this new business landscape.² The pandemic has now brought its value to life with starkness and urgency, as companies realize that it can help them ensure continuity, protect health and safety, and quickly adapt to vastly different business needs.

Methodology. Microsoft commissioned Forrester Consulting to conduct a Total Economic Impact™ study examining the potential ROI that manufacturing organizations may realize by deploying Dynamics 365 Remote Assist, via both HoloLens and mobile devices. The purpose of this study is to provide a framework for readers to evaluate the potential financial impact of Remote Assist for their own organizations.

Customer journey. Forrester interviewed 10 decision makers at organizations using Microsoft Dynamics 365 Remote Assist via HoloLens and/or mobile devices. Remote Assist enables users to stream video of what they are working on to remote colleagues, who provide guidance and annotate the scene in front of the user in three dimensions. Interviewees invested in Remote Assist to allow employees to support more sites and customers, reduce travel costs, minimize emissions, accelerate issue resolution, improve employee experience, and ensure business continuity — especially as companies adapted to the COVID-19 pandemic.

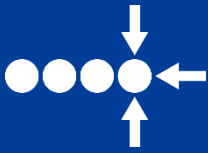
Composite organization. This TEI analysis illustrates the financial benefits, flexibility, costs, and risks realized for a composite organization that is representative of the 10 interviewed customers. The composite is a global enterprise that operates 15 manufacturing sites and supports 1,000 customer deployments. Remote Assist is deployed to 15 experts, 120 manufacturing site technicians, 50 field service agents, and 500 supported customers along with managers, IT, and innovation leads. [Learn more →](#)

Key Findings

Quantified benefits. Forrester modeled \$6.3 million in three-year risk-adjusted present value (PV) benefits for the composite organization:

- › **Labor and travel savings for 50 field technicians totaling \$684,000.** Field technicians shift 50% of inspections to virtual, improve first-time fix (FTF) by 10% for tier 1 issues and by 40% for tier 2 issues, and can now self-resolve 75% of tier 3 issues with remote expert support. Field technicians ultimately avoid 55 trips per year, saving 188 hours valued at \$4,230 plus \$2,498 in travel costs.
- › **Labor savings for 120 manufacturing site technicians totaling \$680,000.** Technicians boost inspection productivity by 25%, halve labor for tier 2 issues, and slash tier 3 issue resolution labor by 75%. Site technicians ultimately save 124 hours per year valued at \$2,790.
- › **Labor savings for 15 highly specialized experts totaling \$1.2 million.** Experts reduce trips for major manufacturing site inspections

Key Benefits



Reduced lost revenue, wasted labor, and direct costs by over **\$20,000** per throughput-impacting issue



Avoided over **\$93,000** in annual labor and travel costs per expert



For interviewees, **avoiding just one trip's travel costs could offset the entire cost** of a Remote Assist subscription and a HoloLens device.



ROI
138%



Benefits PV
\$6.3 million



NPV
\$3.6 million



Payback
12 months

and avoid last-minute travel for tier 3 issues at customer and manufacturing sites. Experts ultimately avoid 17 international trips per year, saving 384 wasted travel hours valued at \$39,744.

- › **Avoided travel costs for 15 experts totaling \$1.6 million.** Experts can now virtually see, annotate, and direct an onsite user, avoiding trips with an average travel cost of \$3,500 (ranging from \$1,000 to \$6,000 and occasionally up to \$15,000). The composite organization's experts avoid 17 trips per year, saving \$53,550 in travel costs. Combined with labor savings, this leads to a savings of \$93,000 per expert.
- › **Avoided lost revenue, wasted labor, and direct costs by accelerating resolution for 60 production-impacting issues totaling \$2.1 million.** The issues being solved by Remote Assist are business-critical; when failures happen, downtime is costly. The composite organization resolves issues at least five days faster with Remote Assist, reducing costs and losses from reduced throughput or stoppages. Each issue resolved faster with Remote Assist prevents 4 hours of lost production, and for each hour saved, the composite avoids \$950 in wasted labor, \$2,500 in lost operating income, and \$1,563 in direct costs such as rush shipping, waste, or fees — \$20,052 in savings per issue.

Unquantified benefits. Remote Assist also benefited interviewees with:

- › Improved employee experience, helping attract, hire, and retain people.
- › Enhanced customer experience (CX) from speed and quality.
- › Increased audit frequency and ability to prove compliance.
- › Reduced health and safety risks for traveling workers.
- › Enhanced knowledge acquisition, retention, and sharing.
- › Faster decision making, approvals, deployments, and service.
- › Improved quality and accuracy of work.
- › Better disaster preparedness and ability to ensure business continuity.
- › Reduced emissions from travel.

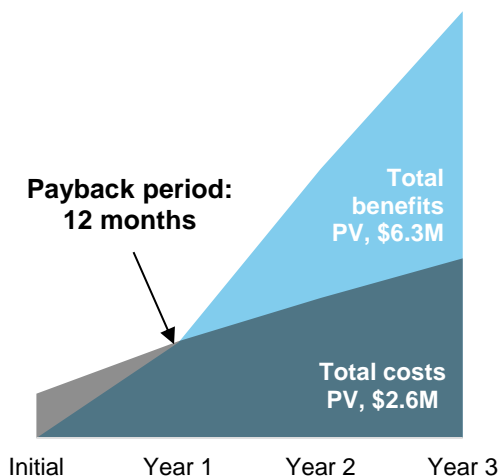
Flexibility. Remote Assist enabled opportunities to launch new revenue-generating, remote-only service offerings, to deploy and integrate with other Microsoft solutions, to stream and record content from other mixed reality applications, to support other business functions including IT and facilities, and to encourage broader process redesign and innovation.

Costs. Forrester modeled \$2.6 million in three-year risk-adjusted PV costs for the composite organization:

- › Remote Assist subscriptions for 210 internal employees and 500 supported customers **totaling \$1.6 million.**
- › One hundred HoloLens 2 device purchases plus device management and repair and replacement overhead **totaling \$478,000.**
- › Internal labor and systems integrator (SI) services for Remote Assist pilot, implementation, and management **totaling \$496,000.**
- › User training for 210 employees and 500 customers **totaling \$91,000.**

Synopsis. Forrester's risk-adjusted financial analysis for a composite organization shows \$6.3 million in benefits versus \$2.6 million in costs over three years from investing in Microsoft Dynamics 365 Remote Assist, adding up to a net present value (NPV) of \$3.6 million, a payback period of 12 months, and an ROI of 138%.

Financial Summary



Forrester's Total Economic Impact methodology helps organizations understand, evaluate, and communicate the business impact of any investment.

TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing Microsoft Dynamics 365 Remote Assist.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Microsoft Dynamics 365 Remote Assist can have on an organization:



DUE DILIGENCE

Interviewed Microsoft stakeholders, Microsoft partners, and Forrester analysts to gather data relative to Dynamics 365 Remote Assist.



CUSTOMER INTERVIEWS

Interviewed 10 organizations using Dynamics 365 Remote Assist to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

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



FINANCIAL MODEL FRAMEWORK

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



CASE STUDY

Employed four fundamental elements of TEI in modeling Microsoft Dynamics 365 Remote Assist's impact: benefits, costs, flexibility, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by 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 Dynamics 365 Remote Assist.

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.

Remote Assist Opportunities In 2020

Mixed Reality And The Future Of Work

In 2020, systemic risk makes every company a globally exposed enterprise — from the COVID-19 pandemic and climate change to highly complex economic interdependencies to geopolitical upheaval and tension.³ Organizations must react today to ensure business continuity, meet changing customer and market demands, accelerate business velocity, support remote work and collaboration, ensure data privacy and security, keep employees safe and healthy, and minimize the company's environmental impact.

Mixed reality is an important part of organizations' arsenal to survive, adapt, and succeed in this new business landscape.⁴ Until the COVID-19 pandemic, many business leaders saw mixed reality as a “nice-to-have” or an “experiment.” Now, the pandemic has brought its value to life with starkness and urgency: Organizations are realizing that mixed reality is an innovation whose time has come and that can ensure continuity, protect employees' health and safety, and quickly adapt to vastly different business needs.

Potential Opportunities For Remote Assist

Dynamics 365 Remote Assist is a mixed reality application that enables a user to stream video of what they are working on to remote colleagues, who can provide guidance and directly annotate in three dimensions the scene in front of the user. It can be run on HoloLens 1 and HoloLens 2 devices for hands-free usage and on Android and iOS mobile devices. Interviewed customers told Forrester that Remote Assist offers simple yet powerful capability for remote collaboration, and because it is available as an “off-the-shelf” application, it enabled them to deploy the solution with relative speed and ease.

There are many potential use cases for an application like Remote Assist. While not all have been proven out, the following list illustrates some of these potential opportunities in different industries:

- › **Manufacturing.** Manufacturing was one of the earliest adopters of mixed reality applications for logical reasons: Plants are distributed globally with expensive, complex machinery and demanding uptime needs. Manufacturers in any sector can use Remote Assist to conduct routine inspections and audits, set up and deploy new equipment, and address break/fix issues faster and with less labor. Further, as their products go out to the market, brands can use Remote Assist to help customers deploy a product properly, teach them to use it, conduct inspections, and address break/fix issues as part of support contracts. While using Remote Assist for B2B support is perhaps most common, companies can also extend product support using Remote Assist to resellers and partners (B2B2C models such as retailers or dealerships) or even directly to consumers.
- › **Energy producers.** Energy producers can use Remote Assist for equipment deployment, inspection, auditing, and break/fix scenarios at widely dispersed global sites from oil rigs to solar farms, which include massive and complex technology investments and must be run according to stringent safety, environmental, regulatory, dependability, and efficiency standards.

“If you don't invest in innovation today, once mixed reality is well-designed with everyone able to use it, you would be far behind. You'd need to start from the beginning, while others can easily adapt with the knowledge they'd already learned. This is crucial, because we never know when there might be a point of change like touchscreens. At first, no one could use them and didn't want them. But suddenly, everyone switched, and companies that didn't invest got left behind.”

*X-Reality innovation leader,
robotics*



“With [Remote Assist on] HoloLens, we can extend our eyes and environment to someone who isn't there. We can show the expert the exact area with a problem and the screens they need to see, instead of just describing it.”

*IT X-Reality leader,
automotive manufacturer*



- › **Utilities and telecommunications.** Organizations in these industries must deploy, inspect, and service widely distributed infrastructure such as power and cable lines, cellular towers, consumer connection points, and beyond. Field teams can use Remote Assist to ensure work is completed correctly, document what has been done, and get help from remote colleagues to accelerate work and avoid second visits.
- › **IT services and technical support.** Companies that offer managed services and support contracts to other businesses could use Remote Assist to deploy, inspect, and service equipment at customer locations with greater speed, efficiency, and lower cost.
- › **Healthcare providers.** Doctors, surgeons, and nurses could use Remote Assist to seek advice from experienced practitioners for a condition or task, to learn to deploy and use medical devices and equipment, and to train by demonstration or observation. Rural providers may value access to broader expertise from larger, urban, or research-focused providers. Many providers are today learning from other experienced providers worldwide about how to respond to pandemic-related healthcare situations and to learn from device manufacturers how to correctly install, use, and repair equipment when the manufacturer can't come onsite.
- › **Education.** Any educational or vocational program with tactile or physical learnings could use Remote Assist to conduct live demonstrations and to observe students who are learning to do a task.
- › **. . . and beyond.** Many more opportunities could exist in sectors such as transportation, construction, live events, retail, financial services, insurance, and defense that are not explicitly listed here.

Some additional opportunities exist that could span most industries:

- › **Training.** Firms could deploy Remote Assist for nonregimented training in situations where a remote user wants to demonstrate an activity in real time, record their work for later viewing, or observe a new employee trying a task for the first time to offer guidance. Training could even be offered to customers via Remote Assist. Note that more advanced or formalized training would generally use a training-focused application, such as Dynamics 365 Guides.
- › **Auditing.** A worker could use Remote Assist to record the exact actions taken for auditing; a remote auditor could use it to watch and note steps taken for verification in real time.
- › **Collaboration.** Any team could use Remote Assist to work on a physical model, whiteboard, or other visually aided collaboration workflow where annotations and real-time viewing of objects and demonstrations, not just participants faces, offer additional value for speed and effectiveness of collaboration.
- › **Internal IT support.** Internal IT teams could use Remote Assist when working on user devices like laptops and phones, on internal data centers and equipment, and beyond.
- › **Facilities.** Firms could use Remote Assist to demonstrate where there may be an issue in a workspace, to evaluate and decide on appropriate repairs, or to decide on proper placement of equipment such as technology, desks, marketing displays, or even decorations.
- › **Inventory.** An onsite user and remote viewer could use Remote Assist to collaborate on evaluating and tracking product levels, placing orders for resupply, and guiding restocking of inventory.

“Usually, we need to prove the value of something to implement it. With Remote Assist, we don't even need that conversation. It's proved itself over and over again.”

*Chief information officer,
automotive*



“We are really comfortable with the ROI for Remote Assist because we are talking about travel avoidance and getting production lines operational faster. It can generate huge savings. With just-in-time manufacturing, if we're down for 3 hours, it can shut our customer down — generating penalties very fast that ramp quickly. Every minute we can save getting a line up is avoiding a huge cost.”

*IT X-Reality leader,
automotive*



Customer Journey

Forrester interviewed 10 organizations using Dynamics 365 Remote Assist.				
SECTOR	REGION	ANNUAL REVENUE	USER ESTIMATE	INTERVIEWEES
Energy	Global	Over \$25 billion	1,400 users	Technology innovation leader
Automotive	Global, based in North America	Over \$25 billion	Recent growth to 500 users	<ul style="list-style-type: none"> Innovation portfolio manager Senior research engineer
Chemicals	Global, based in North America	\$10 to \$25 billion	400 users ramping to 3,000 users	Director of research, development, and engineering (RD&E)
Electrical	Europe	Less than \$1B	300 users	Digital transformation leader
IT services	Europe	Less than \$1B	260 users	Product manager
Automotive	Global, based in Europe	\$10 to \$25 billion	110 users	<ul style="list-style-type: none"> Chief information officer VP of innovation
Power	Global, based in Europe	\$10 to \$25 billion	100 users	Innovation product director
Automotive	Global, based in Europe	Over \$25 billion	30 users	IT X-Reality leader
Consumer products	Global, based in Europe	Over \$25 billion	25 users ramping to 500 users	Mechanical engineering lead
Robotics	Global, based in North America	Over \$25 billion	15 users	X-Reality innovation leader

Investment Objectives

The interviewed organizations searched for a solution that could:

- › Allow experts and technicians to support more sites/customers.
- › Reduce travel costs and emissions.
- › Accelerate issue resolution and reduce downtime.
- › Improve employee experience, especially for travel-heavy positions.
- › Ensure business continuity, especially with pandemic restrictions.

Vendor Selection

The interviewed organizations chose Remote Assist because of:

- › The simplicity to set up, deploy, integrate, and manage in the Microsoft technology stack, including mobile device management, Office, Teams, and Azure — without significant customization or coding.
- › Their confidence in security, stability, manageability, and support of Microsoft technology stack.
- › The perceived quality and capability of HoloLens devices.
- › The simplicity to train users and drive adoption.

“The mixed reality solutions from Microsoft are really great. . . . I’m very happy with it. It was so convincing to get it running with a very lean production and really have a chance to improve processes. And there’s no drawback I see with HoloLens. I’m very convinced of this technology, just like our company is.”

Digital transformation leader, electrical



How key roles at interviewed organizations utilized Remote Assist

USER	TYPE OF WORK	DEPLOYMENTS	INSPECTION	BREAK/FIX
Specialized remote expert	<ul style="list-style-type: none"> Specialized, highly experienced skill set Global support of complex, expensive, dangerous, or highly regulated equipment Responsible for rare but highly impactful tasks like major inspections or tier 3 issues Time-consuming, expensive, and often unpredictable worldwide travel (50%+) Highly paid salary 	<ul style="list-style-type: none"> Remotely instructs the installment of equipment — usually at internal sites like manufacturing plants May dial out to other experts while onsite for additional support 	<ul style="list-style-type: none"> Instead of multiple traveling experts, one goes onsite while others join remotely May remotely oversee or support inspections led by onsite technicians 	<ul style="list-style-type: none"> Remote support to accelerate resolution of tier 1 and 2 issues by onsite technicians Avoid travel and delays for disruptive, urgent, or highly technical tier 3 issues by remotely coaching technicians
Onsite technician	<ul style="list-style-type: none"> Varying seniorities such as line workers, engineers, and managers responsible for various day-to-day operations and most issues Located at a manufacturing site (or similar) May work in clean rooms or dangerous environments where exit/reentry is time-consuming and should be minimized No travel generally required Low to moderate salary 	<ul style="list-style-type: none"> Installs equipment under oversight or with support of other onsite technicians, office workers, or remote experts 	<ul style="list-style-type: none"> Enable remote observation and recording of inspections Get support from other onsite techs that are not in the space room Get support from remote experts as needed 	<ul style="list-style-type: none"> Get support from onsite employees not in room Get support from remote experts as needed to accelerate resolution Resolve tier 3 issues with support of remote expert, rather than needing them to travel
Field service technician	<ul style="list-style-type: none"> Varying experience levels Supports product users, company sites, or dispersed infrastructure in a region Responsible for occasional tasks at supported sites, typically one to 12 times per year Constant (80%), usually drivable, travel with consistent but not massive travel costs Low to moderate salary 	<ul style="list-style-type: none"> Installs equipment under oversight or with support of other field technicians or remote experts May remotely instruct a customer for self-deployment 	<ul style="list-style-type: none"> Replace onsite with remote inspections Dial out to other technicians or experts for observation or support 	<ul style="list-style-type: none"> Remote preview of the issue before coming onsite to improve FTF Call out to other field technicians for support on tier 1 and 2 issues Resolve tier 3 issues with support of remote expert to avoid travel
Supported customer or business end user	<ul style="list-style-type: none"> User/buyer of the product Little to no technical expertise Relies on external support Salaries vary, may or may not be employed by the product or support provider Relies on the product for business use, so delays or issues have significant negative cost, labor, and revenue consequences 	<ul style="list-style-type: none"> May do a self-deployment with remote support from field technicians for simpler tasks or when faced with travel or access restrictions 	<ul style="list-style-type: none"> Some inspections can become remote with field technician observers May allow for increased inspection frequency 	<ul style="list-style-type: none"> Self-resolution of very basic issues with remote field technician support Demonstrate the issue before field technician travels, helping ensure they bring the right tools and achieve first-time fix

VOICE OF THE CUSTOMER

“Remote Assist is basically a no-brainer. It pays for itself quickly. It’s built on Microsoft infrastructure. We have no security concerns.”

Anonymous interviewee

“We have 300 to 400 Remote Assist users, ramping to a couple thousand. They are mostly using mobile, but we also have 14 HoloLens devices that are shared with a team that does extensive travel and sometimes shipped to locations. Mobile users use it for routine work about once per day for short confirmation. HoloLens devices are used less often, about once per week for an hour or two for more in-depth work.”

Director of RD&E, chemicals

“Remote Assist on HoloLens 2 is fantastic with automatic spacial recognition, fine-grained alignment, and working with both hands. But there are situations where a phone [with Remote Assist mobile] may be adequate, and you have a much lower barrier to entry.”

Senior research engineer, automotive

“Remote Assist was almost turnkey. We tested it with 30 real calls and used recordings and surveys to make sure it was working. It’s an out-of-the box software — it just works. However, you do have to work on network, bandwidth, [and learning] who can connect and when, how it works with Teams, whether groups can connect and collaborate, and how to analyze and report on usage.”

Innovation product director, power

Composite Organization

Forrester aggregated findings from the 10 interviewed customers to design a composite organization and an associated ROI analysis that is representative of their experiences. The composite is a global enterprise that generates \$11 billion in annual revenue by manufacturing, selling, and supporting products used by 1,000 customers worldwide:

- › **Manufactures products at 15 sites globally.** The average site has four production lines operating 16 hours per day, 365 days per year. Each line shift is staffed by 50 line workers earning \$17 per hour and four technicians earning \$25 per hour in fully burdened salary pay — \$950 in labor per hour. Each line produces product worth \$500,000 in revenue per day at 8% operating profit margin — \$2,500 in profit generated per line, per hour. Downtime incurs costs for rush shipping, wastage, and refunds and credits, costing 5% of the equivalent lost production revenue — \$1,563 in costs per hour of downtime.
- › **Supports 1,000 customer deployments of its products with a 50-person field service team spread regionally across the globe.** Customers typically require support for quarterly inspections, simple

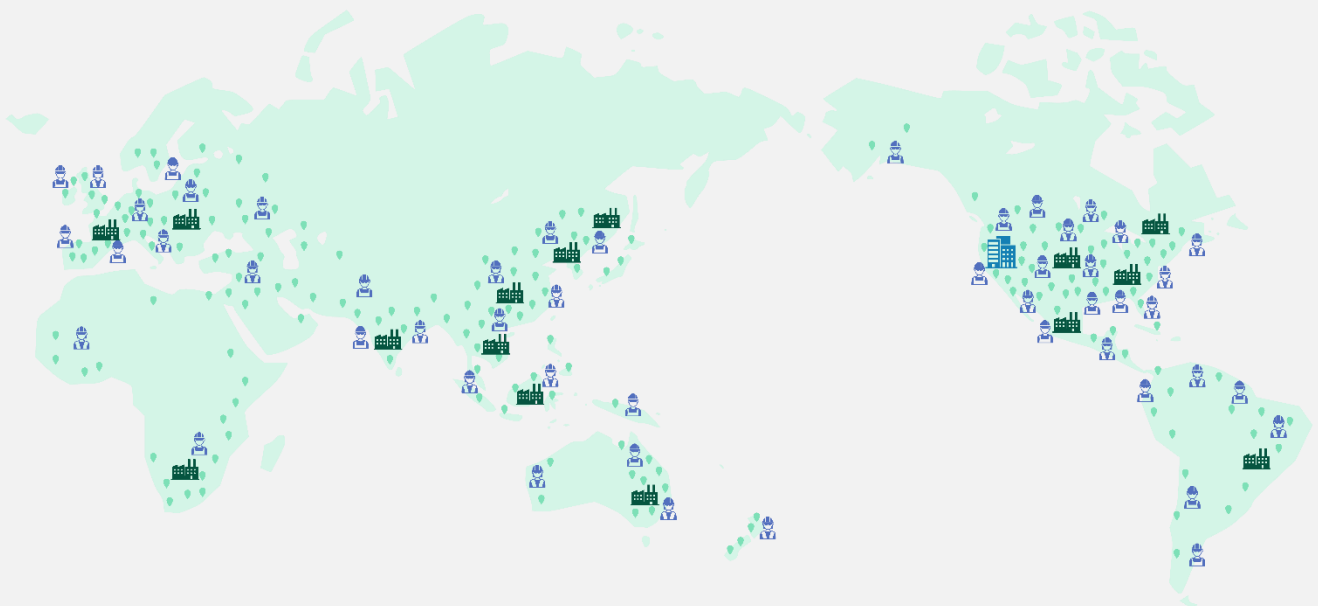
tier 1 issues every other month, one more complex tier 2 issue once per year, and a 10% chance of a critical tier 3 issue. Field service technicians earn \$25 per hour in fully burdened pay and travel at least 50% of the time for inspections and break/fix scenarios.



- › **Employs 15 highly specialized experts who support major inspections and critical issues.** These experts earn \$92 per hour, traveling at least 50% of the time for inspections and break/fix scenarios at manufacturing plants and customer sites. The average inspection requires three days of travel and planning labor, while the average break/fix scenario requires four days due to the unpredictable, last-minute nature of the travel and more challenging or complex situations needing to be resolved. Travel costs for transportation, lodging, and incidentals are estimated at \$3,500 per expert, per trip.



Modeled deployment. The composite organization's investment in Microsoft Dynamics 365 Remote Assist:

- › Is led by an innovation leader earning \$250,000 with an IT admin earning \$120,000 in fully burdened annual salary.
- › Is supported by five field service managers and one manufacturing lead per 15 sites, earning an average of \$90,000 per year.
- › Runs a two-month pilot to test the application, demonstrate the use cases, secure funding, and get buy-in from team leads.
- › Deploys Remote Assist to eight technicians per 15 manufacturing sites, 50 field service techs, 15 experts, and 500 (50%) of its supported customers. The organization uses Remote Assist on mobile devices and 100 HoloLens 2 devices. A systems integrator (SI) partner supports the deployment.

Forrester modeled the Total Economic Impact of Dynamics 365 Remote Assist for a composite organization based on 10 interviewed customers:



-  Based in North America with 15 highly specialized experts
-  Runs 15 global manufacturing with 120 Remote Assist users

-  Products are installed at 1,000 customer sites globally
-  50 regional field technicians support customer sites

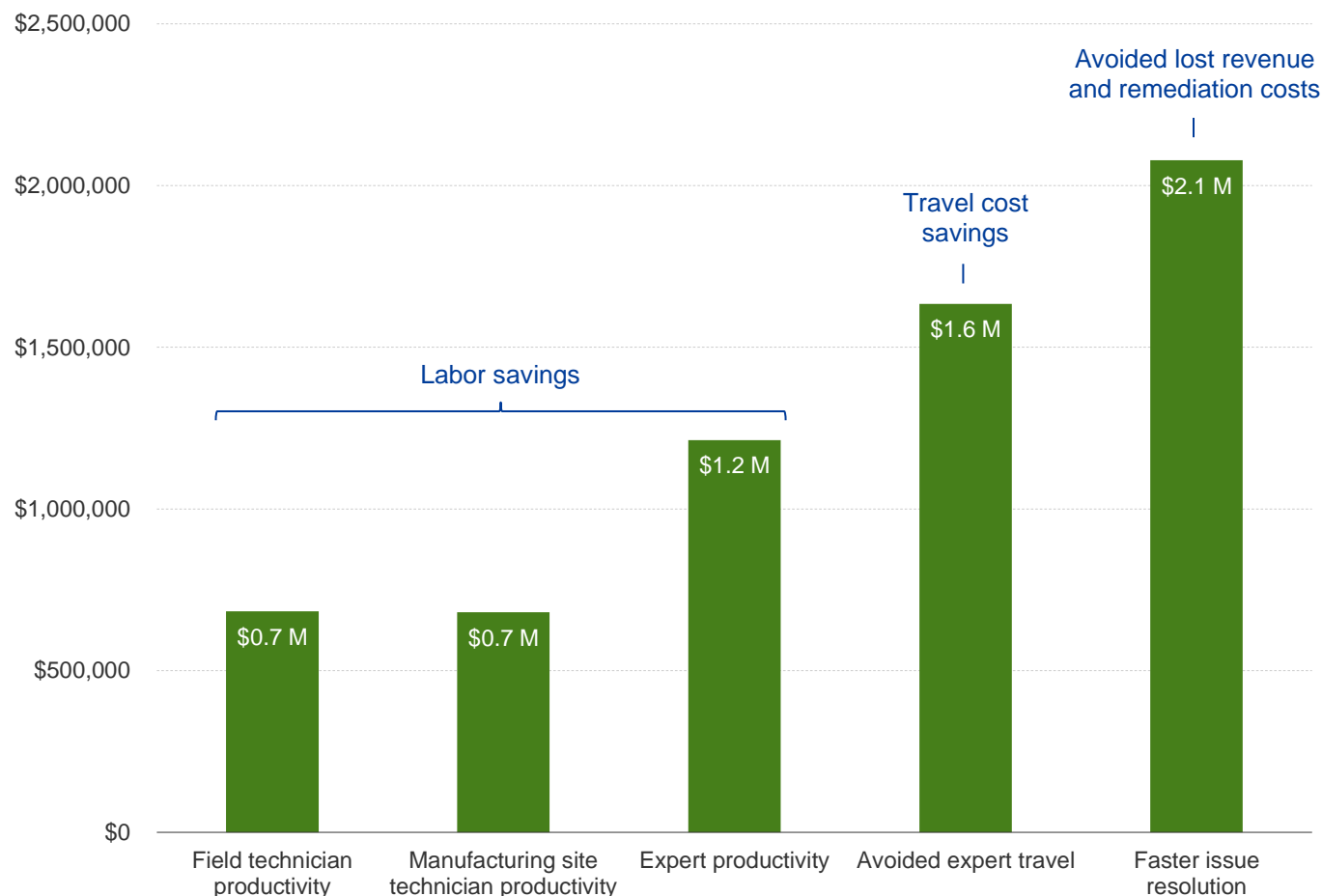
Analysis Of Benefits

QUANTIFIED BENEFIT DATA FOR THE COMPOSITE ORGANIZATION

Total Benefits

REF.	BENEFIT	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Atr	Field technician productivity	\$168,300	\$336,375	\$336,375	\$841,050	\$683,719
Btr	Manufacturing site technician productivity	\$167,400	\$334,800	\$334,800	\$837,000	\$680,416
Ctr	Expert productivity	\$299,405	\$596,160	\$596,160	\$1,491,725	\$1,212,784
Dtr	Avoided expert travel	\$403,200	\$803,250	\$803,250	\$2,009,700	\$1,633,882
Etr	Faster issue resolution	\$511,326	\$1,022,652	\$1,022,652	\$2,556,630	\$2,078,342
	Total benefits (risk-adjusted)	\$1,549,631	\$3,093,237	\$3,093,237	\$7,736,105	\$6,289,143

The table above shows the total of all benefits across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of almost \$6.3 million.



Field Technician Productivity

Evidence and Data. Interviewed organizations outfitted field service support teams with Remote Assist, using HoloLens devices and/or mobile devices. This enables “you-see-what-I-see” scenarios in real time and allows remote participants to “draw on reality,” aiding collaboration. In some cases, organizations provided Remote Assist subscriptions directly to supported sites themselves either for use via mobile devices or for shipping a HoloLens device. Advanced information and remote collaboration via Remote Assist ultimately deflected site trips, boosted FTF rates, and accelerated task completion for field technicians by:

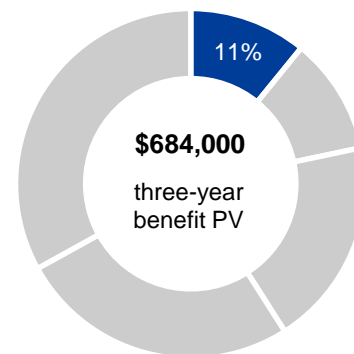
- › Allowing supported customers or sites to demonstrate issues or needed work in advance of the field tech coming onsite.
- › Enabling field techs to coach supported customers or users to complete inspections or resolve simple issues themselves.
- › Enabling field techs to get virtual assistance from other field technicians or specialized experts as needed.
- › Recording of issue resolution to save for future training and reference.
- › Improving hands-free productivity while the field tech is using Remote Assist via HoloLens rather than a handheld communication device.

The mechanical engineering lead for a consumer products brand explained the value of enhancing field support for resellers in a B2B2C business model: “We give our [resellers] the ability to communicate with peer support people and expert certified technicians. If they have something come in that is problematic, they can get support instantly at their fingertips. Secondly, it reduces cost and travel for our personnel in the field. We are working on becoming carbon neutral, and so reducing the amount of emissions we create is important. We’re working toward a 30% to 40% reduction in travel. [Remote Assist] is going to be critical in reducing costs, reducing emissions, and giving our resellers and their customers an instant sense of support. We can give better quality and care, and customers see we can quickly solve their problems.”

An IT services product manager described the FTF improvement: “One-third of field tech visits require a return visit. With Remote Assist, they can achieve first-time fix, which reduces ticket volume. Technicians work on three tickets per day, and instead of returning to a site from the previous day, they can work three new tickets the next day.”

Modeling and Assumptions. Forrester modeled the financial benefit of field technician productivity for the composite using the following:

- › All 50 field techs use Remote Assist via both HoloLens and mobile as desired to get virtual support from other field techs or experts.
- › Field tech labor costs \$25 per hour in fully burdened pay plus \$50 in travel and incidentals per avoided site visit.
- › Fifty percent of the 1,000 supported customers are assigned Remote Assist subscriptions (using mobile) to interface with field technicians.
- › The composite recognizes only half of savings in Year 1 because driving Remote Assist adoption takes time and continued effort.
- › Customers with their own Remote Assist subscriptions now conduct inspections remotely, reducing 4 hours of field tech labor to 1. Inspections occur quarterly at all sites.



Field tech productivity:
11% of total benefits

Field technicians
avoid 55 trips per
year, saving 188
hours valued at
\$4,230 plus \$2,498
in travel costs.



“[Remote Assist] helps us avoid miscommunications between the expert and field person. Which wire do we cut? What is the specific model of this machine? What texture and color should this chemical mixture provide? Sometimes the work is even dangerous, and the field person needs to be hands-free. None of this can be done with a voice call. We need video, file sharing, and real-time annotation.”

Director of RD&E, chemicals



- › Customers preview issues to field techs before they travel to the site, boosting FTF from 80% to 90% for tier 1 issues — saving 4 hours for every avoided repeat trip. Sites have an average of six tier 1 issues per year, per site (6,000 per year).
- › Tier 2 issues occur once per year, per supported site (1,000 per year). With advance preview of the issue, remote support, and access to past recordings, field techs increase FTF for tier 2 issues from 50% to 90% — saving 4 hours for every avoided repeat trip.
- › Tier 3 issues occur at 10% of supported sites annually (100 per year). Instead of an expert traveling for all tier 3 issues, field techs can now fix 75% with remote help — saving 8 hours in wasted field tech labor plus savings for experts (see Expert Productivity: Calculation Table).

“We can reduce the amount of spare parts we need and improve first-time fix with [Remote Assist on] HoloLens.”

Product manager, IT services



Risks. Forrester uncovered moderate risks that may impact field technician productivity labor savings, including:

- › Adoption of Remote Assist by customers and field techs.
- › Specific type, complexity, and safety of inspections and issues, and whether they can be handled without the tech present.
- › Number of field techs, supported sites, frequency of visits, average pay, and average travel costs.

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

Synopsis. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted PV of \$683,719.

Field Technician Productivity: Calculation Table

REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
A1	Field service technician fully burdened hourly pay	Composite	\$25	\$25	\$25
A2	In-person inspections replaced with remote	25% to 50% now virtual	1,000	2,000	2,000
A3	Avoided labor hours per inspection	Interview data	3	3	3
A4	Inspection labor savings	$A1 * A2 * A3$	\$75,000	\$150,000	\$150,000
A5	Avoided excess visits, tier 1 issues	10% increase in FTF, 25% to 50% adoption	150	300	300
A6	Avoided excess visits, tier 2 issues	40% increase in FTF, 50% to 100% adoption	200	400	400
A7	Avoided labor hours per issue	Interview data	4	4	4
A8	Tier 1 and 2 issue labor savings	$A1 * (A5 + A6) * A7$	\$35,000	\$70,000	\$70,000
A9	Avoided excess visits, tier 3 issues	75% now resolved with Remote Assist	38	75	75
A10	Avoided labor hours per tier 3 issue	Interview data	8	8	8
A11	Tier 3 issue labor savings	$A1 * A9 * A10$	\$7,600	\$15,000	\$15,000
A12	Travel and incidental cost per trip	Interview data	\$50	\$50	\$50
A13	Travel and incidental costs avoided	$(A2 + A5 + A6 + A9) * A12$	\$69,400	\$138,750	\$138,750
At	Field technician productivity	$A4 + A8 + A11 + A13$	\$187,000	\$373,750	\$373,750
	Risk adjustment	↓10%			
Atr	Field technician productivity (risk-adjusted)		\$168,300	\$336,375	\$336,375

Manufacturing Site Technician Productivity

Evidence and Data. Interviewed organizations outfitted manufacturing sites with Remote Assist and HoloLens devices. Devices were shared among users of different levels, including line workers, manufacturing technicians, and production managers. These employees used Remote Assist to collaborate internally and externally to handle inspections and break/fix scenarios faster and with less reliance on external help:

- › Employees could conduct inspections or demonstrate issues inside clean rooms with collaborative support, without needing to suit up multiple times to exit and reenter the space.
- › Employees could get real-time guidance from other technicians or experts throughout the site, including access to other data and information those workers might be tracking at their stations.
- › Employees could reach out to technicians from other sites and to experts when needing assistance that exceeded local knowledge.
- › Employees could record issue resolution to save for future training and reference.
- › Employees could improve hands-free productivity while the field tech used Remote Assist via HoloLens rather than a handheld communication device.

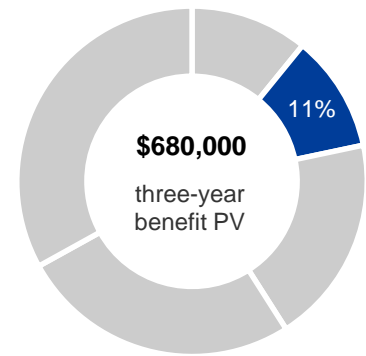
Interviewed customers described significant acceleration of deployment, inspection, and break/fix work with real-time, hands-free, annotated collaboration via Remote Assist and could deflect experts from site visits, handling key tasks with onsite employees. The COVID-19 pandemic further emphasized this value for companies, as fewer workers and roles were allowed site at a given time (if at all), and the remaining onsite workers needed to access virtual support.

An automotive company's innovation portfolio manager explained how site technicians use Remote Assist: "Liaison engineers go down to the plant floor [and use Remote Assist] to converse with the plant operator and stream issues to other engineers who are upstairs at their desks. We have a one-to-many conversation from plant floor to office." The manager continued: "An operator who is not a subject matter expert on the plant floor can get experts for collaboration and diagnosis at their desks. . . . We are seeing cost savings. Engineers don't need to carry around a laptop on the floor, take pictures, and email back and forth. They can return to other work more quickly. They can solve issues quicker with one person as eyes and ears and everyone else doing the diagnosis with their desktop data."

Focus played a role as well, as an automotive company's senior research engineer described: "Focus is better when people collaborate with Remote Assist. People aren't always paying attention at their laptops on virtual meetings. But when someone turns on [a live feed] and says, 'Look at what I see and what I can do,' everyone is invested in doing the thing right now. We solve problems in an hour or two that would take days or weeks not only because we don't have to travel but also because people weren't paying attention before."

Modeling and Assumptions. Forrester modeled the financial benefit of manufacturing tech productivity for the composite using the following:

- › The composite operates 15 global manufacturing sites, each with four lines with eight trained Remote Assist users per site.



Manufacturing site tech productivity: 11% of total benefits

Manufacturing site technicians save **124 hours per year** valued at \$2,790.



"A complex issue can take an hour with Remote Assist or 8 hours without expert support — and you still might not solve it."

VP of innovation, automotive



- › Each line is inspected once per month (720 total annual inspections). Inspections previously required 8 hours each for two FTEs. Remote Assist, which is used for half of inspections, improves productivity and speed by 25%, saving 2 hours each.
- › Each line experiences tier 2 issues once per week (3,120 annually). Tier 2 issues previously required 8 hours of labor. The organization uses Remote Assist for half of these issues, reducing labor by 50% each time.
- › Each line experiences two tier 3 issues per year (120 annual tier 3 issues). Tier 3 issues previously required four technicians for 40 hours each, with the expert ultimately coming onsite for final resolution. The composite uses Remote Assist for half of these issues, reducing labor by 75% to 40 hours total when used.
- › Site technician labor costs \$25 per hour in fully burdened pay.
- › The composite recognizes only half of savings in Year 1 because driving Remote Assist adoption takes time and continued effort.

“HoloLens with Remote Assist is a no-brainer. We want to buy two for every plant. They pay for themselves in no time at all, and then it’s all benefits from there. It pays for itself in just travel costs alone.”

*Innovation product director,
power*



Risks. Forrester uncovered moderate risks that may impact manufacturing technician productivity labor savings, including:

- › Adoption of Remote Assist by line workers, technicians, and managers.
- › Specific type, complexity, and safety of inspections and issues, and whether they can be handled by onsite technicians.
- › Number of users, sites, frequency of inspections and issues, average number of people working on tasks, and average pay.

Synopsis. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted PV of \$680,416.

Manufacturing Site Technician Productivity: Calculation Table

REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
B1	Manufacturing technician fully burdened hourly pay	Composite	\$25	\$25	\$25
B2	Inspections using Remote Assist	25% to 50% now virtual	180	360	360
B3	Hours saved per inspection	Interview data	4	4	4
B4	Inspection labor savings	B1*B2*B3	\$18,000	\$36,000	\$36,000
B5	Tier 2 issues using Remote Assist	25% to 50% now virtual	780	1,560	1,560
B6	Hours saved per tier 2 issue	Interview data	4	4	4
B7	Tier 2 issue labor savings	B1*B5*B6	\$78,000	\$156,000	\$156,000
B8	Tier 3 issues using Remote Assist	25% to 50% now virtual	30	60	60
B9	Hours saved per tier 3 issue	Interview data	120	120	120
B10	Tier 3 issue labor savings	B1*B8*B9	\$90,000	\$180,000	\$180,000
Bt	Manufacturing site technician productivity	B4+B7+B10	\$186,000	\$372,000	\$372,000
	Risk adjustment	↓10%			
Btr	Manufacturing site technician productivity (risk-adjusted)		\$167,400	\$334,800	\$334,800

Expert Productivity

Evidence and Data. All companies have their share of occasional issues requiring diagnostics and remediation beyond the knowledge of local technicians. Even routine tasks such as operational checks may require advanced expertise when critical, delicate, complex, or dangerous equipment and environments are involved. By outfitting worldwide sites Remote Assist, interviewed organizations empowered local technicians to handle these tasks themselves with an expert remotely viewing, annotating, and instructing the technician through the task.

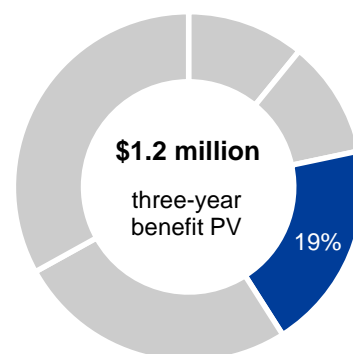
Expert travel incurs significant wasted labor costs at high wages (sometimes even at overtime rates), along with significant costs for travel, lodging, and food and beverage. For interviewees, avoiding just one trip's travel costs could offset the entire cost of a HoloLens and the Remote Assist license.

Experts wasted at least three to four days of work per trip, sometimes more. Travel alone generally required at least two days due to the length of international flights combined with the journeys to the sites themselves. Further, experts wasted time planning for their trips — disrupting work in the process — and spent significantly longer onsite than they generally would spend connected to a remote expert session. Interviewed companies shared multiple examples of time savings:

- › A power company reduced trips by 10% in its first eight months, expecting substantially more savings. Further, it now sends one expert instead of four for some cases. At days of travel time saved per expert per issue, the Remote Assist investment paid for itself in less than five months in labor and travel savings alone.
- › An energy company saves 50 hours per trip due to its global, remote sites across a large labor force.
- › An electrical manufacturer has heavily ramped usage and is avoiding between two and 15 visits per site per week with Remote Assist. Each session now requires only 30 to 60 minutes, instead of three days of labor.
- › The chemicals company's experts went from serving five customers per month to between 20 and 40 per month with Remote Assist.
- › An automotive firm is saving at least three days of labor per expert several times per month.
- › A consumer products brand expects to reduce travel by 20% to 40%.
- › A robotics manufacturer aims to save at least one week per issue.

Interviewees also achieved savings when deploying new equipment or helping customers with their deployments of a company's products. The director of RD&E for a chemicals company explained: "Customers usually need to schedule a visit from an expert to install equipment. But experts are busy and schedule at least a month out. To get through schedule restrictions and now pandemic restrictions, we have sent a HoloLens, done a pre-session, then walked the user through installation with the expert. Instead of waiting a month, it can be done in a week."

The COVID-19 pandemic has heightened the importance of remote expert support across interviewed companies. The chemicals director of RD&E explained: "Our experts are not allowed to travel right now [due to the pandemic] but are required for plant audits. Doing it via Remote Assist on HoloLens and mobile lets them provide sufficient support."



Expert productivity:
19% of total benefits

"We used to fly someone halfway across the world; they'd solve the issue in under an hour, then come home. Now, we can bill 1 hour of work instead of 50 hours."

Anonymous interviewee



"With [Remote Assist on] HoloLens, we can extend our eyes and environment to someone who isn't there. We can show the expert the exact area with a problem and the screens they need to see, instead of just describing it."

IT X-Reality leader, automotive



"Our experts can now sit in the offices and service many more customers, much faster. They could only serve one customer per visit, with about five visits per month. Now they do one or two customers per day."

Director of RD&E, chemicals



Modeling and Assumptions. Forrester modeled the financial benefit of expert productivity for the composite using the following:

- › Previously, three experts traveled for major inspections twice per year, per line. With Remote Assist, one expert travels with others joining remotely for half of inspections. Each avoided trip saves 24 hours of excess labor.
- › Remote expert support, instead of travel, now resolves 75% of tier 3 issues at customer sites (75 per year), avoiding at least four days of excess labor for planning and travel each time.
- › Remote expert support, instead of travel, now resolves 50% of tier 3 issues at manufacturing sites (60 per year), avoiding at least four days of excess labor for planning and travel each time.
- › Measured time savings are for planning travel, disruption to other work, and actual time on the road *excluding* any time spent on tasks.
- › Expert labor costs \$92 per hour in fully burdened pay.
- › The composite recognizes only half of savings in Year 1 because driving Remote Assist adoption takes time and continued effort.

Risks. Forrester uncovered moderate risks that may impact expert productivity labor savings, including:

- › Adoption of Remote Assist by supported customers, field technicians, line workers, site technicians, plant managers, and experts.
- › Specific type, complexity, regulatory requirements, and safety of inspections and issues, how frequently they require expert support, and whether they can be conducted virtually.
- › Number of users, sites, frequency of inspections and issues, average number of people working on tasks, and average pay.

Synopsis. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted PV of \$1,212,784.

Experts avoid 17 trips per year, saving 384 hours valued at \$39,744.

“Our experts are not allowed to travel [due to the pandemic] but are required for audits. Remote Assist on HoloLens and mobile lets them provide sufficient support.”

Director of RD&E, chemicals



“Instead of sending an entire team of experts for a major inspection, we can send just one expert with the rest connected virtually. It saves a lot of time for the other experts who don’t travel.”

Anonymous interviewee



Expert Productivity: Calculation Table

REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
C1	Expert fully burdened hourly pay	Composite	\$92	\$92	\$92
C2	Number of major inspections using Remote Assist	25% to 50% now use Remote Assist	30	60	60
C3	Avoided visits for manufacturing site inspections	C2*2	60	120	120
C4	Hours avoided per inspection visit	Interview data	24	24	24
C5	Site major inspection labor savings	C1*C3*C4	\$132,480	\$264,960	\$264,960
C6	Avoided visits for tier 3 issues to customers	A9	38	75	75
C7	Hours saved per tier 3 issue	Interview data	32	32	32
C8	Field tier 3 issue labor savings	C1*C6*C7	\$111,872	\$220,800	\$220,800
C9	Avoided visits for tier 3 issues at manufacturing sites	B8	30	60	60
C10	Site tier 3 issue labor savings	C1*C7*C9	\$88,320	\$176,640	\$176,640
Ct	Expert productivity	C5+C8+C10	\$332,672	\$662,400	\$662,400
	Risk adjustment	↓10%			
Ctr	Expert productivity (risk-adjusted)		\$299,405	\$596,160	\$596,160

Avoided Expert Travel

Evidence and Data. Typical expert travel costs ranged from \$1,000 to \$6,000 per expert, per trip. These visits often arose from unexpected issues, causing manufacturers to book last-minute flights and hotels at much higher rates than average. Experts typically needed to travel to sites across the globe and, due to travel length and seniority, often traveled with business class amenities. In some cases, these travel costs could reach \$10,000 to \$20,000 due to these factors — especially when accessing remote sites requiring helicopters or boats. An automotive innovation portfolio manager explained: “Cost avoidance for projects is big. Multiple engineers do not need to be onsite. We have less boots on the ground but the same impactfulness. We also avoid a lot of the reactive travel that happens in capital projects for issues and validation, which can take a line offline for a week and waste a week of time and resources for an engineer to travel.”

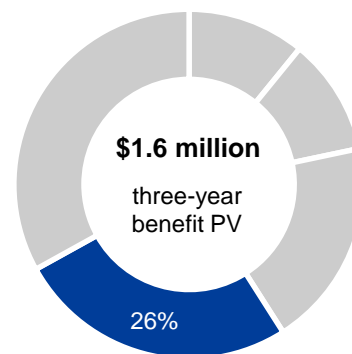
Modeling and Assumptions. Forrester modeled the financial benefit of avoided expert travel for the composite using the following:

- › The composite saves an average of \$3,500 in flight, ground transfer, hotel, and food/beverage costs for each avoided expert trip.
- › Experts replace travel with remote resolution for 120 inspections, 75 customer issues, and 60 manufacturing site issues.
- › The composite recognizes only half of savings in Year 1 because driving Remote Assist adoption takes time and continued effort.

Risks. Forrester uncovered moderate risks that may impact expert travel cost savings, including:

- › Adoption of Remote Assist by supported customers, field technicians, line workers, site technicians, plant managers, and experts.
- › Specific type, complexity, regulatory requirements, and safety of inspections and issues, how frequently they require expert support, and whether they can be conducted virtually.
- › Travel distance and difficulty between expert locations and sites.
- › Regional, seasonal, and market-influenced travel and hotel rates.

Synopsis. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted PV of \$1,633,882.



Avoided expert travel: 26% of total benefits

Experts avoid 17 trips per year, saving \$53,550 in travel costs.

“We have less boots on the ground but the same impactfulness.”

Innovation portfolio manager, automotive



Avoided Expert Travel: Calculation Table

REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
D1	Avoided visits for manufacturing site inspections	C3	60	120	120
D2	Avoided visits for tier 3 issues to customers in the field	C6	38	75	75
D3	Avoided visits for tier 3 issues at manufacturing sites	C9	30	60	60
D4	Total avoided expert trips	D1+D2+D3	128	255	255
D5	Average travel cost per visit	Interview data	\$3,500	\$3,500	\$3,500
Dt	Avoided expert travel	D4*D5	\$448,000	\$892,500	\$892,500
	Risk adjustment	↓10%			
Dtr	Avoided expert travel (risk-adjusted)		\$403,200	\$803,250	\$803,250

Faster Issue Resolution

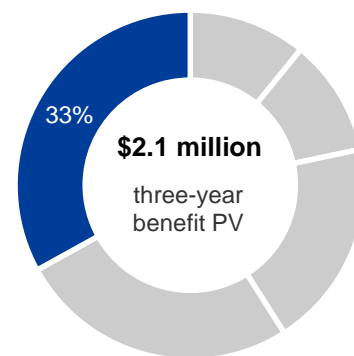
Evidence and Data. By using Remote Assist, interviewed customers not only reduced wasted labor and travel costs but were also able to resolve issues more quickly. Rather than find the soonest possible availability for an expert, coordinate travel, fly them out, and then have them address the issue (sometimes even needing another expert to join later if the first-time fix was unsuccessful), the experts could dial in remotely using Remote Assist in their first available hour-long block. Interviewees shared that experts generally remediated issues one to two weeks faster as a result, with massive business impacts.

For issues that impacted production, accelerating resolution meant avoiding lost sales, wasted labor, and direct costs such as rush shipping, compliance and service-level agreement (SLA) fines, and overtime. Even with built-in redundancy, a slight drop in throughput could mean major business losses — or rarely a significant or complete stoppage of production. One anonymous interviewee explained: “We have fixed operating costs. Any slowdown can have a significant cost. Problems are very expensive, so reducing time-to-resolution is really important.” Using Remote Assist therefore protected significant business revenues at the top line while simultaneously preventing losses that hurt the bottom line.

- › An electrical manufacturer uses Remote Assist two to 15 times per week per site and has reduced its mean-time-to-resolve by over one week, avoiding losses as high as €20,000 to €50,000 per day.
- › An automotive company’s redundancy ensures that issues never stop throughput, only degrade it. Even so, in just one case, the company resolved a single issue more than one week faster with cost savings greater than the entire company’s investment in Remote Assist.
- › A robotics company that operates a selection of highly secure, dangerous sites worldwide where a failed communication could even total *billions* of dollars in cost reduces such catastrophic risks by using Remote Assist for communication between workers and observing site managers.
- › One hour of downtime could cost \$300,000 for another interviewed automotive company. The company is making several new technology investments, including Remote Assist, with the aim of improving overall manufacturing availability by up to 4%.

Real costs of downtime vary dramatically per situation, per company. Issues may cause no drop due to their role in the line or due to redundancy (many protections exist to avoid downtime). However, some issues led to dramatic stoppages of lines costing millions of dollars per day for interviewed organizations. Solving them even an hour or two earlier could have a monumental impact.

Interviewed customers reported that the costs of issues could be catastrophic. For many, just a day of downtime at a site could cost millions. With these costs, the overall calculated ROI could double or triple just by preventing a few major issues. But the magnitude and likelihood of issues could be extremely difficult to predict, with many other measures (such as redundancy) in place to prevent or quickly resolve them. Forrester therefore constructed a highly conservative financial analysis to avoid “blowing out” the results given the extreme unpredictability of this benefit’s actual financial impact.



**Faster issue resolution:
33% of total benefits**

Remote Assist solves throughput-impacting issues **five days earlier**, saving **\$20,052 per issue** in lost operating income, wasted labor, and direct costs.

“We are really comfortable with the ROI for Remote Assist because we are talking about travel avoidance and getting production lines operational faster. It can generate huge savings. With just-in-time manufacturing, if we’re down for 3 hours, it can shut our customer down — generating penalties very fast that ramp quickly. Every minute we can save getting a line up is avoiding a huge cost.”

*IT X-Reality leader,
automotive*



Modeling and Assumptions. Forrester modeled the financial benefit of faster issue resolution for the composite using the following:

- › The organization addresses 60 tier 3, throughput-impacting issues with Remote Assist per year rather than with expert travel.
- › Issues affect one line, reducing throughput by 5%.
- › Lines produce \$500,000 in daily revenue at an 8% operating margin.
- › Each line is staffed by 50 workers and four technicians, with two 8-hour shifts per day at 365 days per year.
- › Avoiding one hour of lost output avoids \$2,500 in lost profits, \$950 in wasted labor, and \$1,563 in excess direct costs (5% of revenue) such as rush shipping and inventory waste.
- › The composite solves issues five days (80 production hours) earlier with Remote Assist — avoiding loss of 4 hours of total throughput per issue.

Risks. Forrester uncovered significant risks that may impact faster issue resolution benefit recognition, including:

- › Number of users, sites, and their adoption of Remote Assist.
- › Complexity, risk, and cost of manufacturing site equipment, its importance and role in the production lines, the relative levels of expertise required for that equipment, and the scarcity of experts.
- › Frequency and severity of issues impacting throughput, their likelihood to impact production, and the level of redundancy in equipment.
- › Typical site operating capacity, revenue generated, operating profit margin, number of line workers and average salaries, SLAs, client agreements, compliance costs, and costs of overtime or rush shipping.
- › Typical time required from issue identification to the expert onsite for remediation, based on location and expert availability.

Synopsis. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted PV of \$2,078,342.

“Junior facilities, machine engineers, or mechanics may run into a malfunction and need to take the machine offline. Now they can quickly call the person and fix it; it prevents downtime and delays for the factory line.”

*Senior research engineer,
automotive*



“Every minute a production line is shut down it costs us \$5,000. We have the cost of idle team members. We have the machine cost. We may have to do overtime on the weekend and rush deliveries.”

*Chief information officer,
automotive*



Faster Issue Resolution: Calculation Table

REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
E1	Avoided visits for tier 3 issues at manufacturing sites	C9	30	60	60
E2	Shortened days to issue resolution	Interview data	5	5	5
E3	Operational hours per day	Composite	16	16	16
E4	Average throughput reduction	Interview data	5%	5%	5%
E5	Hours of lost throughput avoided	$E1 * E2 * E3 * E4$	120	240	240
E6	Lost profit per hour	Composite	\$2,500	\$2,500	\$2,500
E7	Wasted labor per hour	Composite	\$950	\$950	\$950
E8	Direct costs per hour	Composite	\$1,563	\$1,563	\$1,563
Et	Faster issue resolution	$E5 * (E6 + E7 + E8)$	\$601,560	\$1,203,120	\$1,203,120
	Risk adjustment	↓15%			
Etr	Faster issue resolution (risk-adjusted)		\$511,326	\$1,022,652	\$1,022,652

Unquantified Benefits

Interviewed organizations discussed other benefits they had experienced but could not yet quantify:

- › **Employee experience.** Remote Assist helps field technicians and experts reduce the frequency of work-related travel, which is time-consuming and often last-minute. This strains workers personal lives, leading to short tenures at many organizations. One anonymous interviewee explained: “Field service jobs can be a ‘widow maker’ because people are spending all their time on the road. It may work for some people or for a period of time, but lives can change, and some employees won’t want to keep traveling like they were. With Remote Assist, we have a better chance of keeping these employees and their knowledge for the long term.” A consumer products mechanical engineering lead echoed: “Our field employees were spending a ton of time behind the windshield and in airports, and not much time with their family. We really are striving to make it a better work-life balance.”
- › **Ability to attract, hire, and retain employees.** Employees value reduced travel strain and are excited by new technology, which makes them feel more valued and improves the work experience. This helps attract new employees and retain current ones. An electrical manufacturer’s digital transformation leader explained: “Production workers usually just get basics like work clothing and safety gear — nothing nice like smartphones for office workers. But now they’re allowed to work with such an expansive new technology. It’s very convincing. They really love it. They are happy that the company allows them to really use the newest technology.” A power company’s innovation product director echoed: “We are seeing universal acceptance [of mixed reality]. Our NPS from users was stunningly good. Over the last eight months, only one user was a detractor with all others as a high neutral or a promoter. We did not expect NPS to be that high or [see] that level of universal acceptance.”⁵
- › **Knowledge acquisition, retention, and sharing.** Remote Assist empowers a worker to perform a task hands-on with virtual guidance and observation. Instead of the task being performed for them by a traveling worker, they actually do the work themselves — helping them learn how to do the task for the future, with improves comprehension and memory from the tactile work. Organizations can also leverage Remote Assist for real-time training and demonstration outside of normal work tasks, and new trainees can use it to observe real-time work for learning. Further, companies can record and store Remote Assist session recordings using Microsoft Streams and Teams, so employees can later find what has been done for that specific equipment in the past, find similar jobs to help self-resolution when remote support isn’t available, and go through as training for future work. The chemicals company’s director of RD&E shared: “We have better knowledge retention and transfer [with Remote Assist]. The field person is learning how to do it with instruction instead of the expert coming in and doing it themselves. And sometimes, we even stream it to others or record it for the future in Microsoft Streams for broader training.” An automotive innovation portfolio manager echoed: “[Remote Assist] helps remove tribal knowledge that only a few SMEs [subject matter experts] know. We can record sessions and build knowledge based on the actions that were taken, then share them in Microsoft Teams and Microsoft Streams.”

“Field service jobs can be a ‘widow maker’ because people are spending all their time on the road. It may work for some people or for a period of time, but lives can change, and some employees won’t want to keep traveling like they were. With Remote Assist, we have a better chance of keeping these employees and their knowledge for the long term.”

Anonymous interviewee



“[Using mixed reality] makes our company attractive when we’re hiring new employees. It’s very convincing to go to a company that is really using [it], where it’s not just a single device on someone’s desk but something that has been regularly used for some time. It shows that our company is investing in the newest technology.”

*Digital transformation leader,
electrical manufacturer*



“We have better knowledge retention and transfer [with Remote Assist]. The field person is learning how to do it with instruction instead of the expert coming in and doing it themselves. And sometimes, we even stream it to others or record it for the future in Microsoft Streams for broader training.”

Director of RD&E, chemicals



- › **Faster decision making and approvals.** Remote Assist enables a field or plant worker to demonstrate proposed work in real time, helping remote stakeholders quickly understand, align on, and approve the work — resulting in faster work completion. This benefited internal sites by reducing downtime or accelerating deployment and benefited supported customers who needed work but had to approve budget first. A director of RD&E for a chemicals company explained: “Sometimes we diagnose what needs to be done but need approval for budget first. We can use Remote Assist to show the problem, make the recommendation, and get approval. It lets us get approval and fix issues faster and builds goodwill. It can even drive revenue because we perform more services.”
- › **Faster customer deployments and service.** Experts and field technicians can support more sites and tasks with the productivity improvements driven by Remote Assist, freeing time earlier on their calendars. Further, with remotely guided issue resolution or deployment of new equipment, scheduling can happen much faster — only requiring a small block of expert or technician time without the need for travel. One company’s customers used to wait a minimum of one month for equipment deployment, but with Remote Assist, the company can ship a HoloLens and remotely guide deployment in just one week.
- › **Improved quality and accuracy.** Remote support and observation ensure tasks are done correctly — helping prevent repeat work, repair costs, wasted inventory, warranty claims, and downtime. The chemicals company’s director of RD&E explained Remote Assist’s impact: “Installations of new equipment by field techs were often done poorly. It was difficult to debug. By guiding remotely, we have not had any installation mistakes. It’s done faster, it’s done right, and the field person also learns how to do it better for the next time.”
- › **Improved CX from speed and quality.** Improved speed of deployments and service combined with better quality of work boosts customer experience for supported customers. Customers can use and gain value from purchased products faster while minimizing the impact of any potential issues during their use. Interviewees also noted improved brand image because of their use of new, advanced technology that instilled confidence for customers. A consumer products mechanical engineering lead shared: “We had a situation with major damage for a customer’s product, and the expert got on a Remote Assist call with [the local technician] and was able to identify the problem and offer approaches the resolution in 20 minutes. The customer was waiting and was blown away that we could diagnosis the issue so quickly and give them next steps.”
- › **Audit frequency.** Travel and schedules restricted audit speed and frequency. This meant issues or errors could go undetected for weeks or months — especially during major deployments or capital projects. One anonymous interviewee shared, “Remote inspections and observations let us catch an issue the day the work was done, instead of three weeks later when our expert would have shown up.”
- › **Compliance.** Improved quality of work and more frequent audits ensure equipment and sites are within compliance. Further, recording of Remote Assist sessions for tasks and inspections themselves provides complete documentation of what is done or observed — more than captured in a written work or inspection summary. Should questions or issues arise in the future, these recordings can prove

“Installations of new equipment by field techs were often done poorly. It was difficult to debug. By guiding remotely, we have not had any installation mistakes. It’s done faster, it’s done right, and the field person also learns how to do it better for the next time.”

Director of RD&E, chemicals



“We had a situation with major damage for a customer’s product, and the expert got on a Remote Assist call with [the local technician] and was able to identify the problem and offer approaches the resolution in 20 minutes. The customer was waiting and was blown away that we could diagnosis the issue so quickly and give them next steps.”

Mechanical engineering lead, consumer products



“Remote inspections and observations let us catch an issue the day the work was done, instead of three weeks later when our expert would have shown up.”

Anonymous interviewee



what happened or if the issue had been missed previously. An anonymous interviewee explained: “We can record the Remote Assist call for compliance. We get an actual digital copy of the inspection or work. If an inspector doesn’t write something on a report, it doesn’t mean they didn’t see it. But if it wasn’t on the Remote Assist video, then they really didn’t see. Now we can have 100% proof.”

- › **Health and safety.** Expert and field technician visits can be dangerous — due to the dangers of traveling and working in a potentially unfamiliar environment. Allowing an onsite person to complete work with remote guidance could prevent travel risks and minimize onsite risks, as long as there is appropriate supervision and safety steps are taken to protect the mobile or HoloLens device user while they work. An anonymous interviewee shared: “We can avoid putting employees at risk with their work from traveling. The vast majority of dangers are travel related — driving; onsite; going to remote locations; working in new, dangerous environments they haven’t been to before.” Further, during the COVID-19 pandemic, companies are seeking to reduce the number of individuals working onsite and together in the same spaces and enforce social distancing; virtual collaboration with Remote Assist can reduce interactions that could lead to potential viral exposure.
- › **Disaster preparedness and business continuity.** Interviewees stressed the importance of maintaining production at manufacturing sites and of supporting customer deployments, inspections, and issues at all times to prevent lost revenue from disruption. The COVID-19 pandemic has forced increased recognition of this need, driving explosions in adoption, but the need already existed: Ensuring continuity is essential in the face of volatile geopolitical restrictions and natural disasters (especially as climate change increases environmental risks). With Remote Assist, companies can remotely deploy, inspect, and fix issues across manufacturing and customer sites. This has helped both interviewed companies *and their customers* avoid lost revenue, protect jobs for traveling and onsite workers, and ensure that they generate continued business value. In some cases, this is even more important when products and services may be critical to society at large (such as healthcare, infrastructure, and food). The chemicals company’s director of RED&E explained: “Sometimes our experts or field techs can’t go to a customer’s site because of restrictions. Now, we can guide them through the work even though we can’t visit and ensure operations as expected. It lets us retain business we might have lost otherwise.”
- › **Reduced emissions.** Minimizing expert and field technician travel helps companies reduce emissions. With climate change posing huge risks to people and businesses, companies recognize that they must play an important role in reducing impact — and increasingly, their customers will demand it. Government regulation may even increase tax costs or fine polluters. A consumer products mechanical engineering lead shared: “[Remote Assist] is going to be critical in reducing costs, reducing emissions, and giving our resellers and their customers an instant sense of support. We can give better quality and care, and customers see we can quickly solve their problems.”

“With the pandemic, our experts can’t go to factories. We’re seeing an uptick in interest and use of Remote Assist as a result.”

Director of RD&E, chemicals



“COVID-19 will drastically change our return to work. Even for something as pedestrian as training, people used to sit and work together. Now we need to do that collaboration remotely. We expect to see an explosion of use cases we aren’t thinking about right now.”

Innovation portfolio manager, automotive



“[Remote Assist] is going to be critical in reducing costs, reducing emissions, and giving our resellers and their customers an instant sense of support. We can give better quality and care, and customers see we can quickly solve their problems.”

Mechanical engineering lead, consumer products



Flexibility

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

There are multiple scenarios in which a customer might implement Microsoft Dynamics 365 Remote Assist and later realize additional uses and business opportunities, including:

- › Launching new lower-tier customer support offerings focused mainly on virtual-only support, potentially generating new revenue and enabling scale that would otherwise be impossible with the existing workforce.
- › Quickly deploying Remote Assist via mobile or shipping HoloLens devices to respond, ensure continuity, and help innovate during natural disasters and other market shocks, such as the COVID-19 pandemic.
- › Deploying and integrating with Microsoft Dynamics 365 Field Service or other Microsoft solutions.
- › Using Remote Assist to stream content from other first-party, third-party, and custom-built Mixed Reality applications.
- › Using Remote Assist for additional departments and roles, such as internal IT and facilities teams.
- › Innovating on the leading edge, as putting new technology in the hands of employees can drive brilliant and unexpected innovations.
- › Redesigning business processes and enhancing decision making by analyzing mixed reality device and application data.

Flexibility would also be quantified when evaluated as part of a specific project.

“We are considering a cheaper level of customer support contract with Remote Assist where we could scale to more customers, without scaling up headcount. It would be new opportunities with smaller revenue fees that could let us scale our business.”

*Director of RD&E,
chemicals*



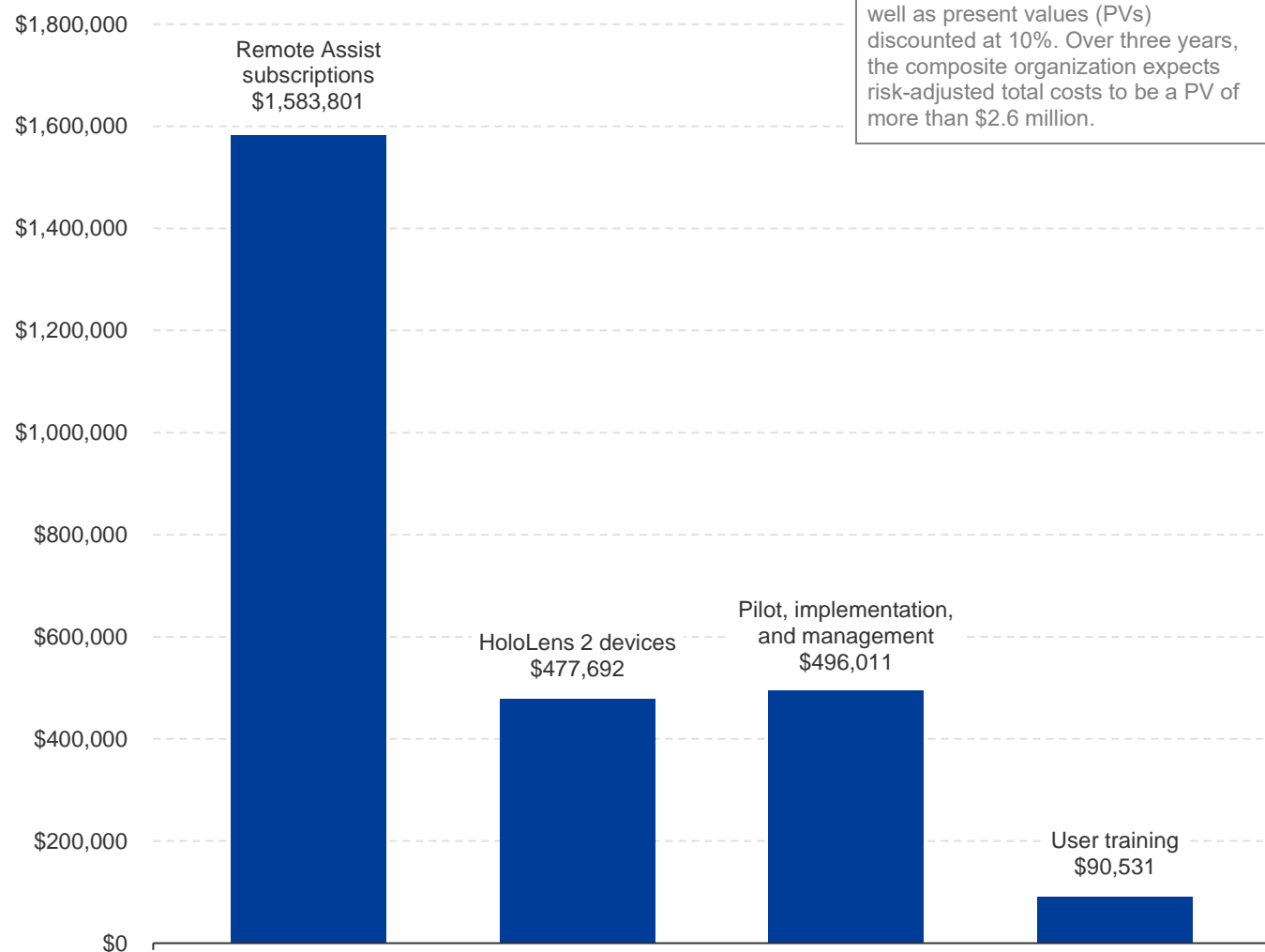
Analysis Of Costs

QUANTIFIED COST DATA AS APPLIED TO THE COMPOSITE

Total Costs

REF.	COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Ftr	Remote Assist subscriptions	\$0	\$636,870	\$636,870	\$636,870	\$1,910,610	\$1,583,801
Gtr	HoloLens 2 devices	\$367,500	\$44,310	\$44,310	\$44,310	\$500,430	\$477,692
Htr	Pilot, implementation, and management	\$221,904	\$167,587	\$77,170	\$77,170	\$543,830	\$496,011
Itr	User training	\$64,658	\$0	\$16,399	\$16,399	\$97,456	\$90,531
	Total costs (risk-adjusted)	\$654,062	\$848,767	\$774,748	\$774,748	\$3,052,326	\$2,648,035

The table above shows the total of all costs across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total costs to be a PV of more than \$2.6 million.



Remote Assist Subscriptions

Evidence and Data. Usage of Microsoft Dynamics 365 Remote Assist is typically licensed with a per-user, per-month subscription. Costs were sometimes bundled with other Microsoft solutions depending on environment and scale. In many cases, organizations incurred subscription costs across separate budgets for each site or team using the application. Firms could potentially recoup subscription costs incurred for customer support by passing the cost through to customers as part of support contracts, avoiding the investment cost for the organization providing the service.

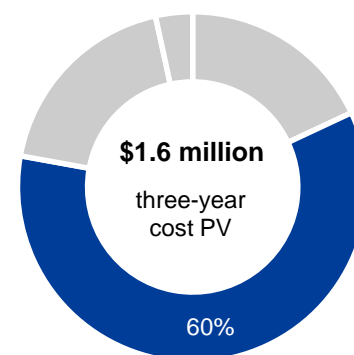
Modeling and Assumptions. Microsoft Dynamics 365 Remote Assist subscription costs for the composite organization assume the following:

- › The composite assigns 210 internal users Remote Assist subscriptions, including five innovation and IT employees, 15 manufacturing site leads, 120 manufacturing site technicians, five field service team leads, 50 field service technicians, and 15 experts.
- › The composite assigns 500 customers Remote Assist subscriptions, using the software to enable remote inspections and remote break/fix and to arm field technicians with more initial information before arriving onsite.
- › Remote Assist subscriptions list pricing is \$65 per user, per month. Costs for all users are included with no pass-through to other internal or external budgets to ensure financial model conservatism.

Risks. Forrester uncovered significant risks that may impact Remote Assist subscription costs, including:

- › Number of sites, users, and varying use cases.
- › Potential need to deploy Azure Active Directory or Microsoft 365 subscriptions for frontline users who may not already have corporate IT accounts. This was needed for a partial segment of the workforce at several of the 10 interviewed customers.

Synopsis. To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year risk-adjusted PV of \$1,583,801.



Remote Assist subscriptions: 60% of total costs

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

Remote Assist Subscriptions: Calculation Table

REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
F1	Dynamics 365 Remote Assist subscription per user, per month	Microsoft	\$65	\$65	\$65
F2	Number of internal users	Composite	210	210	210
F3	Number of customer users	Composite	500	500	500
Ft	Remote Assist subscriptions	$F1*(F2+F3)*12$	\$553,800	\$553,800	\$553,800
	Risk adjustment	↑15%			
Ftr	Remote Assist subscriptions (risk-adjusted)		\$636,870	\$636,870	\$636,870

HoloLens 2 Devices

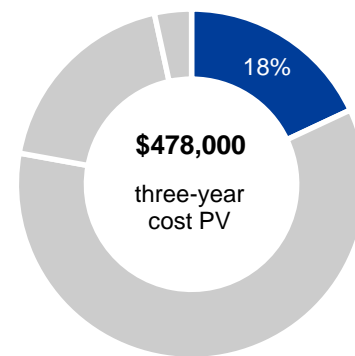
Evidence and Data. Interviewed organizations used Remote Assist on HoloLens 1, HoloLens 2, Android mobile devices, and iOS mobile devices. Higher-complexity uses of the application often leveraged the HoloLens devices to enable hands-free work and more effective collaboration on difficult tasks. Employees often turned to mobile devices for shorter, simpler needs (potentially more frequently) when a HoloLens device might be unavailable, take too long to access, or be “overkill” for the task at hand. HoloLens offered greater value to tackle difficult tasks and potentially offered greater savings as a result — but scale and speed could be constricting. On the other hand, mobile deployments offered much faster time-to-value along with near-limitless scale to additional types of users, new use cases, and remote sites. Ultimately, customers recommended a blend of the deployments depending on each company’s specific needs.

Modeling and Assumptions. HoloLens 2 device costs for the composite organization assume the following:

- › Each of the 15 manufacturing sites purchases two HoloLens 2 devices, which are shared by at least eight technicians and one manager per site.
- › Each of the 50 field technicians and 15 experts is provided a dedicated HoloLens 2 device to use as they travel.
- › Five HoloLens devices are shared by the innovation and IT teams for testing, demonstration, training, and potential shipping to sites.
- › HoloLens 2 devices cost \$3,500 each. Overhead of 10% is allocated for any repairs and replacements due to risk from frequent travel.
- › Microsoft Intune is used for device management and costs \$6 per device, per month.

Risks. Forrester uncovered low risks that may impact HoloLens 2 device costs, including the selected use cases, number of sites and users, travel and site damage risk, network integration needs, and device availability.

Synopsis. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year risk-adjusted PV of \$477,692.



**HoloLens 2 devices:
18% of total costs**

HoloLens 2 Devices: Calculation Table

REF.	METRIC	CALCULATION	INITIAL	YEAR 1	YEAR 2	YEAR 3
G1	Total number of HoloLens 2 devices	Composite	100			
G2	Cost per HoloLens	Microsoft	\$3,500			
G3	Device purchase costs	G1*G2	\$350,000			
G4	Overhead for device repairs and replacements	Interview data		10%	10%	10%
G5	Device repair and replacement	G3*G4		\$35,000	\$35,000	\$35,000
G6	Intune subscription per HoloLens device, per month	Microsoft		\$6	\$6	\$6
G7	Intune subscription costs	G1*G6*12		\$7,200	\$7,200	\$7,200
Gt	HoloLens 2 devices	G3+G5+G7	\$350,000	\$42,200	\$42,200	\$42,200
	Risk adjustment	↑5%				
Gtr	HoloLens 2 devices (risk-adjusted)		\$367,500	\$44,310	\$44,310	\$44,310

Pilot, Implementation, And Management

Evidence and Data. Interviewees found Remote Assist to be the entry point to mixed reality, as the fastest, easiest, and most affordable solution in their arsenal — providing significant returns and time-to-value.

Pilots typically ran for at least two months to test and evangelize the application, ranging from one to 18 months. During the pilot, companies identified ideal use cases and opportunities, built a business case, secured funding, and garnered buy-in from team leaders who would need to support, drive, and manage use within their teams. Longer pilots were associated with device delays as HoloLens was replaced with HoloLens 2 or when evaluating multiple extended reality technologies.

At the time of interviews, the COVID-19 pandemic was dramatically accelerating pilots and deployments. With the business need laid bare to ensure continuity, enable support work, and protect the health and safety of employees, innovation teams found themselves no longer needing to carefully test, evangelize, and build a business case for the investment. Readers driven by pandemic response may find this process to proceed significantly faster than for the bulk of interviewed organizations.

Deployment was typically short, as network integration and device management could be done using the same Microsoft technology as for other mobile devices. No customization or coding was generally needed. Licensing user accounts and training required limited effort from team leads to get everyone set up and push adoption.

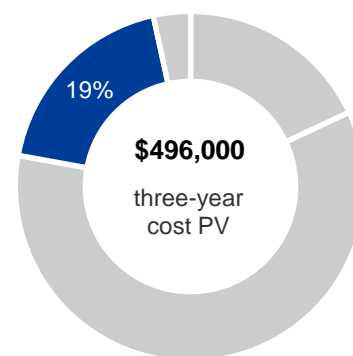
Management was also simple and focused mainly on occasional user licensing for new users, tracking of usage to report on success, and continued evangelism to increase adoption across teams.

Modeling and Assumptions. Pilot, implementation, and management costs for the composite organization assume the following:

- › A systems integrator drives initial deployment with assistance in setup, network integration, device acquisition, best practices, and a train-the-trainer model for team leads.
- › The XR leader dedicates three months to pilot and deployment. Moving forward, they dedicate one week per month in Year 1 and two days per month in subsequent years for change management and reporting.
- › An IT administrator dedicates three weeks to network integration, device management, and user access. Moving forward, the admin dedicates one day per month for Year 1 and 4 hours per month in subsequent years for device, user, and network management including updates.
- › Twenty team leads dedicate two weeks to testing, training, deployment, and change management within each of their field service and manufacturing site teams. Moving forward, they each dedicate one day per month for Year 1 and 4 hours per month in subsequent years for driving adoption, new hire training and setup, and reporting.
- › Eight test users support the pilot, each dedicating three days to testing.

Risks. Forrester uncovered significant risks that may impact internal labor costs, including:

- › Scale of deployment in sites, use cases, and users.
- › Internal IT restrictions and complexity for security and network access.



Pilot, implementation, and management:
19% of total costs

“Launching Remote Assist was really simple. It was plug and play. Maintenance is low. The technology is quite friendly. We just needed to push through some resistance for adoption.”

*Chief information officer,
automotive*



“Remote Assist was almost turnkey. We tested it with 30 real calls and used recordings and surveys to make sure it was working. It’s an out-of-the box software — it just works. However, you do have to work on network, bandwidth, [and learning] who can connect and when, how it works with Teams, whether groups can connect and collaborate, and how to analyze and report on usage.”

*Innovation product director,
power*



- › Unique business processes and associated protocols that may need to be updated or may require custom curriculums or additional training to ensure appropriate and safe usage.
- › Potential for resistance to change management for processes and technologies within worldwide teams and their leaders.
- › Potential device acquisition delays.

Synopsis. To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year risk-adjusted PV of \$496,011.

Pilot, Implementation, And Management: Calculation Table

REF.	METRIC	CALCULATION	INITIAL	YEAR 1	YEAR 2	YEAR 3
H1	XR leader hours	Interview data	520	480	192	192
H2	XR leader fully burdened hourly pay	Composite	\$120	\$120	\$120	\$120
H3	XR leader costs	H1*H2	\$62,400	\$57,600	\$23,040	\$23,040
H4	IT admin hours	Interview data	120	96	48	48
H5	IT admin fully burdened hourly pay	Composite	\$58	\$58	\$58	\$58
H6	IT admin costs	H4*H5	\$6,960	\$5,568	\$2,784	\$2,784
H7	Team leads	Composite	20	20	20	20
H8	Team lead hours per employee	Interview data	80	96	48	48
H9	Team lead fully burdened hourly pay	Composite	\$43	\$43	\$43	\$43
H10	Team lead costs	H7*H8*H9	\$68,800	\$82,560	\$41,280	\$41,280
H11	Test users supporting pilot	Composite	8			
H12	Test user hours per employee	Interview data	24			
H13	Test user fully burdened hourly pay	Composite	\$25			
H14	Test user costs	H11*H12*H13	\$4,800			
H15	Professional services costs	Partner data	\$50,000			
Ht	Pilot, implementation, and management	H3+H6+H10+H14+H15	\$192,960	\$145,728	\$67,104	\$67,104
	Risk adjustment	↑15%				
Htr	Pilot, implementation, and management (risk-adjusted)		\$221,904	\$167,587	\$77,170	\$77,170

User Training

Evidence and Data. New users required anywhere from 2 to 8 hours of training to use Remote Assist, to use the HoloLens, to learn new process changes implemented with the Remote Assist rollout, and to undergo additional safety training to ensure employees adhere to protocols while using a HoloLens or mobile device (such as avoiding stepping backwards). Training varies by individual employee and their level of comfort with technology and willingness to try new things. Generally, employees felt excited and empowered by the opportunity.

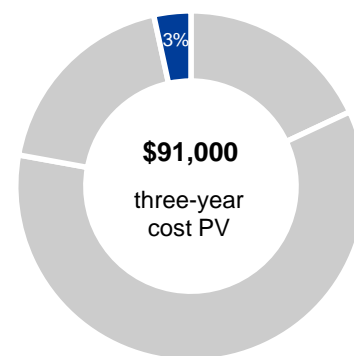
Modeling and Assumptions. User training costs for the composite organization assume the following:

- › Each site technician, field technician, and expert receive 6 hours of training for Remote Assist, HoloLens, process changes, and safety.
- › Supported customers who are given access to Remote Assist undergo a 2-hour training led by their local field technician.
- › Internal and customer employees turn over at a rate of 25% per year, requiring training for new users by Years 2 and 3.
- › Initial training occurs immediately before the beginning of Year 1; no training costs are incurred during Year 1.

Risks. Forrester uncovered moderate risks that may impact user training costs, including:

- › Number of users and their average salary.
- › Complexity and safety of processes and sites where users work.
- › Level of process redesign or change implemented with Remote Assist.

Synopsis. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year risk-adjusted PV of \$90,531.



User training:
3% of total costs

User Training: Calculation Table

REF.	METRIC	CALCULATION	INITIAL	YEAR 1	YEAR 2	YEAR 3
I1	Average employee turnover rate	Composite	100%	N/A	25%	25%
I2	Hours of training per internal user	Interview data	6		6	6
I3	Number of site and field technicians	Y2/Y3: I1*I3 ^{Initial} (rounded)	170		43	43
I4	Technician fully burdened hourly pay	Composite	\$25		\$25	\$25
I5	Number of experts	Y2/Y3: I1*I5 ^{Initial} (rounded)	15		4	4
I6	Expert fully burdened hourly pay	Composite	\$92		\$92	\$92
I7	Internal user training	I2*(I3*I4+I5*I6)	\$33,780		\$8,658	\$8,658
I8	Hours of technician time to train each customer	Interview data	2		2	2
I9	Number of customers trained by technicians	Y2/Y3: I1*I9 ^{Initial}	500		125	125
I10	Customer user training	I4*I8*I9	\$25,000		\$6,250	\$6,250
It	User training	I7+I10	\$58,780	N/A	\$14,908	\$14,908
	Risk adjustment	↑10%				
Itr	User training (risk-adjusted)		\$64,658	N/A	\$16,399	\$16,399

Additional Risks

Aside from the impact and implementation risks that affect each of the discussed benefits, interviewees discussed several inhibitors to use cases, speed of deployment, and overall returns. These risks should not be ignored, but as this Total Economic Impact analysis shows, the benefits outweighed the costs and risks for interviewed organizations.

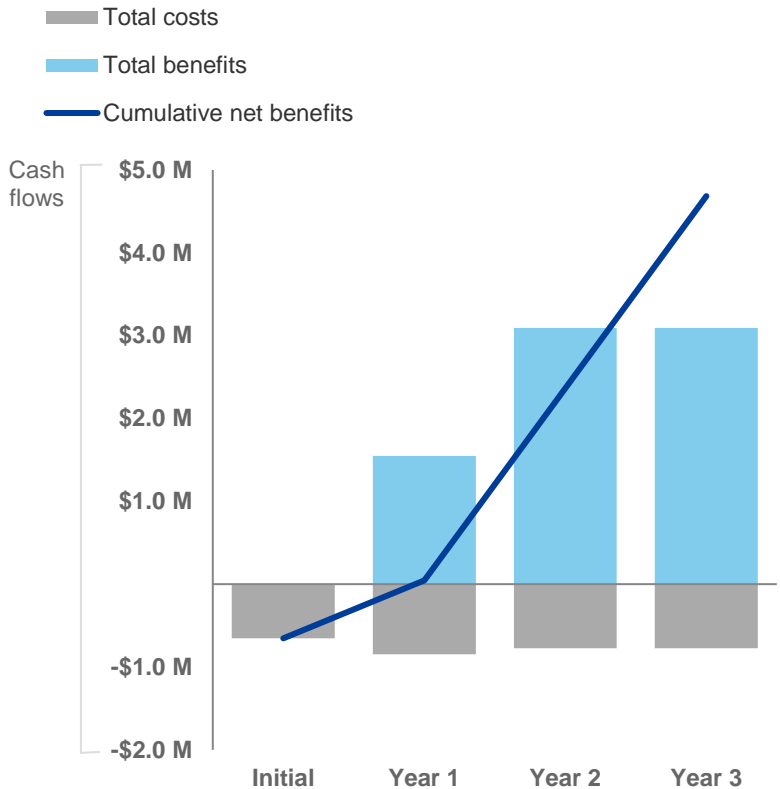
These inhibitors included:

- › **HoloLens 2 availability, though the ability to use mobile phones significantly minimizes this risk.** All interviewees indicated that their deployments were slowed by lacking HoloLens 2 availability in 2019, indicating pilots lasted many months longer, resulting in smaller than planned deployments into early 2020. This challenge has now passed, with no availability challenges cited by interviewees, but interviewees still held reservations that it could occur again.
- › **Device usage limitations.** Mobile devices or HoloLens had limitations such as battery life, weight, and comfort. Interviewees said typical HoloLens usage was 30 to 60 minutes, with total possible daily usage at 2 hours of battery life. Mobile usage was typically shorter, lasting several minutes to a half hour. Like other XR devices today, devices cannot be used ubiquitously in all environments due to heat, ruggedness, and safety rules. Other equipment such as safety glasses, hard hats, and hand-held tools could also interfere with either mobile or HoloLens usage.
- › **Executive and team lead buy-in.** Managers needed to push workers to try the technology and ensure they used it, and innovation leads pushing for the solution sometimes lacked the influence they needed. Once over the initial hump, adoption typically spread significantly — but it could take some work to get there. Readers should garner buy-in from key stakeholders for a collective go-live push.

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



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



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

Cash Flow Analysis (risk-adjusted estimates)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	(\$654,062)	(\$848,767)	(\$774,748)	(\$774,748)	(\$3,052,326)	(\$2,648,035)
Total benefits	\$0	\$1,549,631	\$3,093,237	\$3,093,237	\$7,736,105	\$6,289,143
Net benefits	(\$654,062)	\$700,864	\$2,318,489	\$2,318,489	\$4,683,779	\$3,641,108
ROI						138%
Payback period						12 months

Appendix A: Total Economic Impact

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

Total Economic Impact Approach



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



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



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



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

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



Present value (PV)

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



Net present value (NPV)

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



Return on investment (ROI)

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



Discount rate

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



Payback period

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

Appendix B: Supplemental Material

Related Forrester Research

“Adapt To Climate Change Or Face Extinction,” Forrester Research, Inc., October 5, 2018.

“Digital Innovators Treat Technology As A Business Asset,” Forrester (<https://www.forrester.com/fn/3Nm3clIEHBA8nlM97ZqGf>).

“Emerging Technology Spotlight: Augmented, Virtual, And Mixed Reality,” Forrester Research, Inc., October 22, 2018.

“Extended Reality Will Help Manufacturers With More Than Just Training And Remote Assistance,” Forrester Research, Inc., February 12, 2019.

“Forrester’s 30-60-90-Day COVID-19 Response Plan For Customer Service,” Forrester (<https://www.forrester.com/fn/LV1a13igk5X2lIny7VD7k>).

“The CIO’s Guide To Augmented, Mixed, And Virtual Reality,” Forrester Research, Inc., November 21, 2019.

“The Extended Reality Opportunity Today: Your Employees,” Forrester Research, Inc., April 4, 2019.

“The Future Of Work Starts Now,” Forrester Research, Inc., April 14, 2020.

“The Impact Of Extended Reality In 2030 On mCommerce Opportunities,” Forrester (<https://www.forrester.com/fn/5v3DTvIXyB4GjX2BohlpfT>).

“The Technology-Augmented Employee,” Forrester Research, Inc., February 13, 2018.

Appendix C: Endnotes

¹ Source: “The Future Of Work Starts Now,” Forrester Research, Inc., April 14, 2020.

² Source: “The CIO’s Guide To Augmented, Mixed, And Virtual Reality,” Forrester Research, Inc., November 21, 2019. Forrester defines mixed reality as “the virtual overlay of contextual digital information into the real world using holographic objects, anchoring points, and six degrees of physical freedom for movement.” It is a subcomponent of the broader category of extended reality (XR), which also includes augmented reality (AR) and virtual reality (VR).

³ Source: “The Future Of Work Starts Now,” Forrester Research, Inc., April 14, 2020.

⁴ Source: “The CIO’s Guide To Augmented, Mixed, And Virtual Reality,” Forrester Research, Inc., November 21, 2019.

⁵ Net Promoter and NPS are registered service marks, and Net Promoter Score is a service mark, of Bain & Company, Inc., Satmetrix Systems, Inc., and Fred Reichheld.