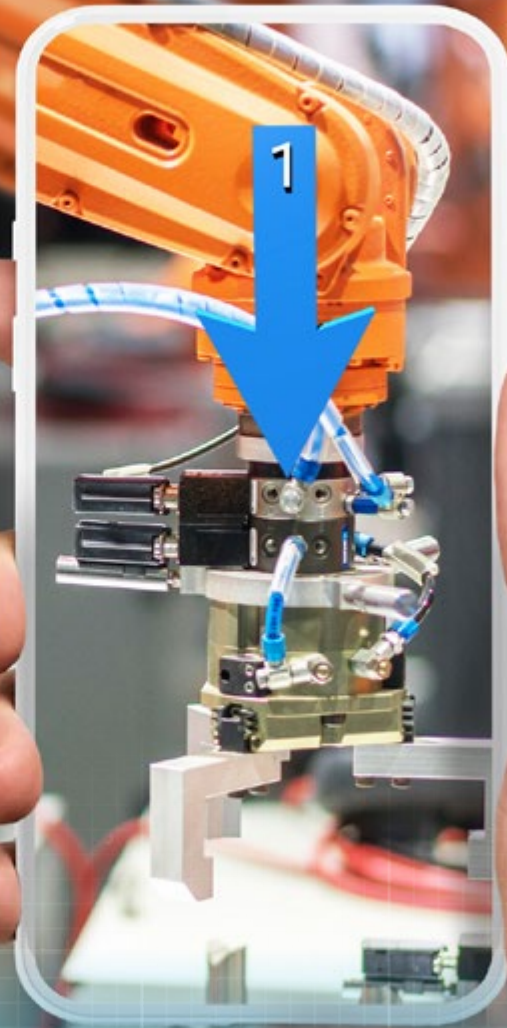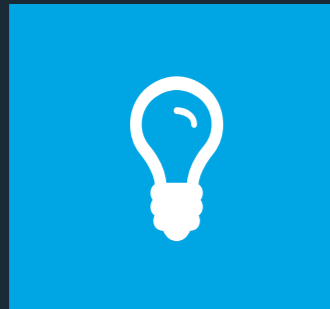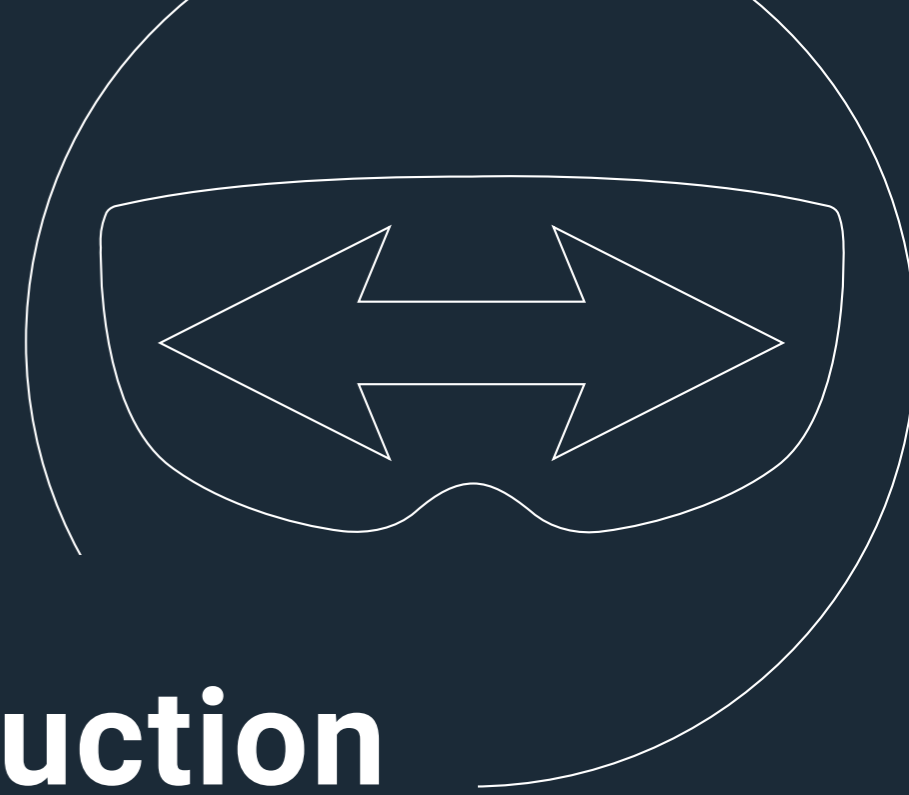TeamViewer
Pilot

Reduce Unplanned Machine Downtime and Maximize your Return on Investment with Augmented Reality

teamviewer.com/pilot

37,400
new aircrafts will be
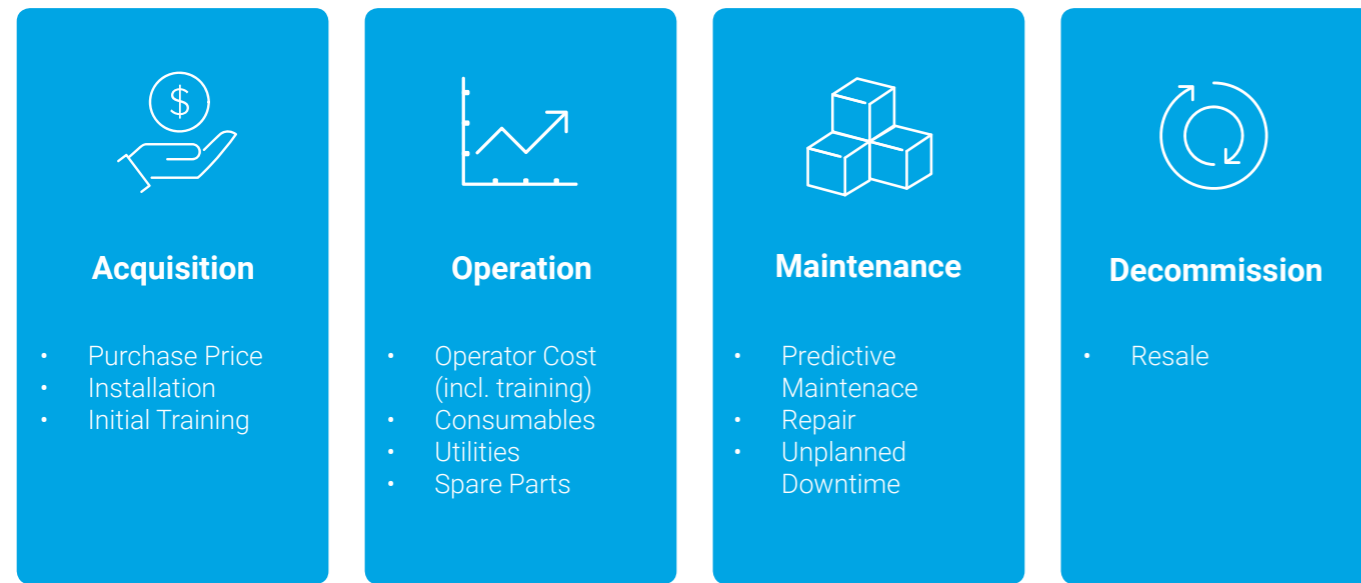required over the next
20 years[1]

Introduction

The pace of competition in the manufacturing industry continues to increase — pushing for lower price per part, shorter lead times, and more stringent quality control.

For example, in the aviation industry alone, 37,400 new aircrafts are expected over the next 20 years – 30 percent for aircraft replacement and the rest for growth – including passenger aircrafts and freighters.[1]

Manufacturers today are focusing on achieving higher levels of productivity, optimizing processes, and reducing costs in order to meet these rising demands and maximize their return on investment (ROI).

Life Cycle Cost of a Machine

Acquisition
- Purchase Price
- Installation
- Initial Training

Operation
- Operator Cost (incl. training)
- Consumables
- Utilities
- Spare Parts

Maintenance
- Predictive Maintenace
- Repair
- Unplanned Downtime

Decommission
- Resale

Maintenance Costs and Unplanned Downtime Impact Return on Investment

On average, operation and maintenance costs have major impacts on the return on investment (ROI) — combined, they often exceed even the acquisition cost.

To maximize the ROI, manufacturers often focus on one key aspect: i**ncreased machine utilization time.**

In the past couple of decades, automation systems have become more complex — ranging from adaptive automation to collaborative ones. They have drastically reduced the overall lead time by reducing cycle times, eliminating repetitive actions, and increasing the possibility to produce more parts per shift.

But, that's only one part of the equation.

There's another major factor: **unplanned downtime.**

"**98%** expect to increase efficiency with digital technologies like integrated Manufacturing Execution System (MES), predictive maintenance, or augmented reality solutions." [2]

Unplanned downtime can be caused by several factors such as hardware failure, lack of operator, or even waiting time for right fault diagnostics and support.

During this unplanned downtime, the **overhead costs add up, on top of the loss of production**.

$50 billion

In a study conducted by Deloitte, unplanned downtime costs industrial manufacturers in excess of $50 billion every year. [3]
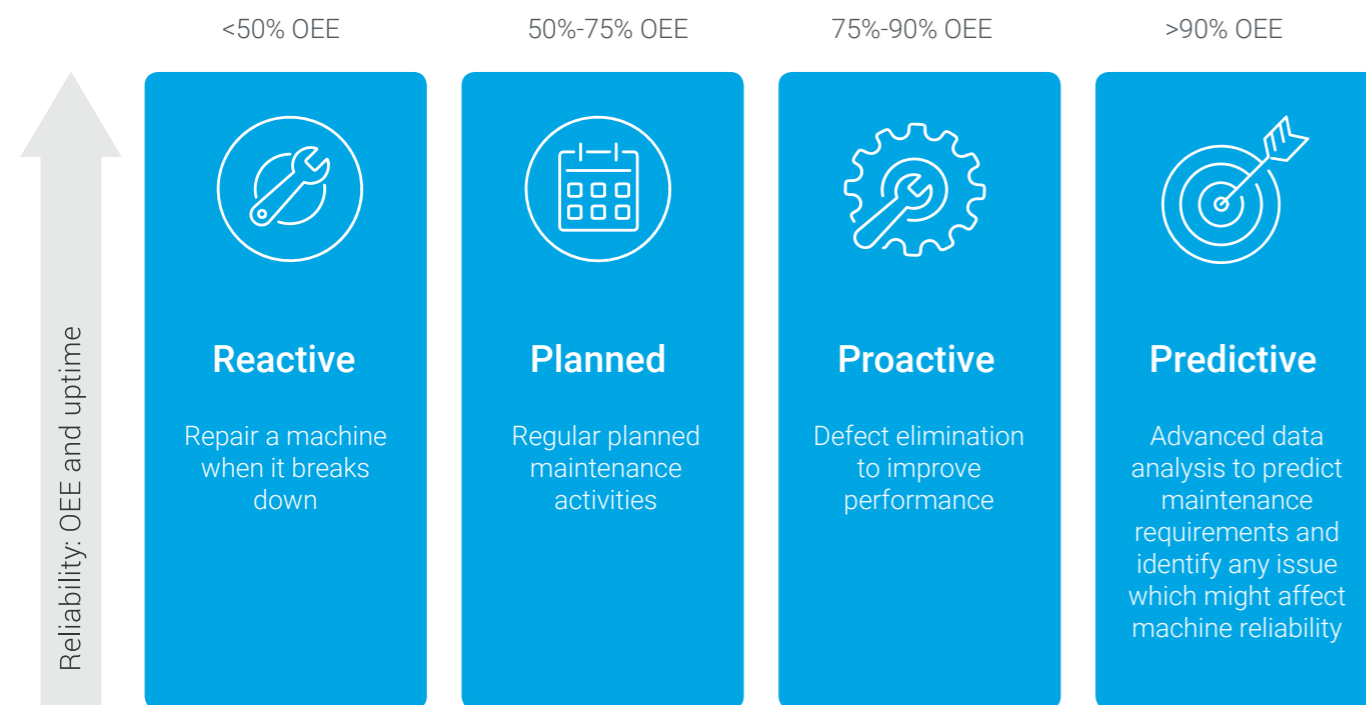
$22,000 per minute

A survey showed that one minute of downtime costs automotive manufacturers $22,000. [4]

Reducing Unplanned Machine Downtime

In a standard maintenance strategy model, there is a major dependency on reactive and planned maintenance, which accounts for only up to 75 percent original equipment effectiveness (OEE).

In order to ensure improved OEE, the processes in the reactive, planned, and proactive phases need to be optimized. Additionally, preventive maintenance strategies need to be implemented.

<50% OEE	50%-75% OEE	75%-90% OEE	>90% OEE

Reliability: OEE and uptime

Reactive
Repair a machine when it breaks down

Planned
Regular planned maintenance activities

Proactive
Defect elimination to improve performance

Predictive
Advanced data analysis to predict maintenance requirements and identify any issue which might affect machine reliability
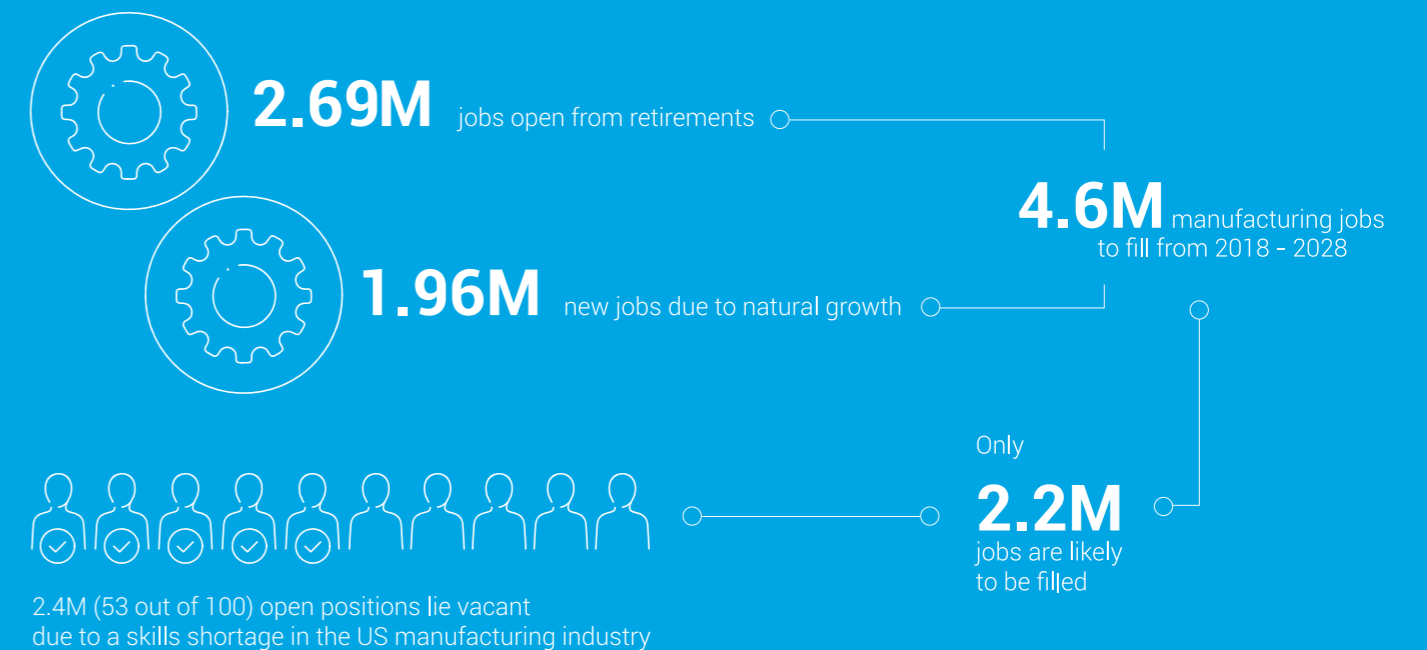
Source: Deloitte[5]

What impacts these phases?

1. Technical complexity and geolocation restriction

This prolongs the maintenance process, often incurring added cost for multiple technicians and experts travelling — in some cases, across the globe — to troubleshoot and repair issues.

2. Shortage of skilled experts increases wait time

Limited availability of skilled experts or subject matter experts (SME), prolong wait times and often increases machine downtime.

2.69M jobs open from retirements

1.96M new jobs due to natural growth

4.6M manufacturing jobs to fill from 2018 - 2028

Only
2.2M jobs are likely to be filled

2.4M (53 out of 100) open positions lie vacant due to a skills shortage in the US manufacturing industry

Source: Deloitte[6]

The Augmented Reality Support Solution that Transcends the **Digital World**

Implementing TeamViewer Pilot optimizes workflow processes significantly, reducing machine downtime in all three phases.

Reactive Phase

Experts located anywhere can support in-house and field technicians at the site in real time through video sessions for faster troubleshooting.

This approach is facilitated by features helping the expert to clearly identify the problem and describe the steps to be taken by the person on-site, even if hundreds of kilometers away.

3D object tracking, for instance, allows the expert technician to place arrows and other annotations on real-world objects that stick with them even as the person on the other end moves their smartphone camera.

Augmented reality technology accelerates user collaboration, and facilitates shorter communication chains, driving efficiency and innovation.

Planned Phase

A planned preventive maintenance strategy helps avoid unnecessary downtime caused by broken machinery or parts. But fault detection is often complex, especially in the industrial manufacturing sector where there are a lot of elements integrated into a system. Or the machine is manufactured in a different country and the developer settings are in the original language.

With TeamViewer Pilot, these challenges are easily solved by digitally enabling experts worldwide to virtually put themselves in the position of the person on site. The experts can also support through complex routine maintenance checks, especially with new technicians or ones that lack in-depth knowledge of the procedure.

This also helps optimize the logistics and warehouse processes where offsite experts assist in identifying the correct spare part, document the part number, and initiate the order process for replacements immediately.

Proactive Maintenance Phase

Proactive maintenance is a much more analytical phase where problems are identified in advance using data from different sources like performance reports and integrated sensors. It is crucial to correctly use the available data and identify any problem which might lead to a breakdown (e.g., table misalignment in machining centers or improper lubrication.)

Using Pilot, the remote expert can guide the service technician through procedures based on advanced analytics and identify small out-of-line errors which might accumulate and lead to a breakdown in the longrun.

This not only minimizes unwanted machine downtime, it also prolongs the lifespan of the machinery and decreases the spare-parts inventory.

" According to Airbus, implementation of SART (Smart Augmented Reality Tool) for inspection of bracket installation in fuselage assembly reduced inspection times in some cases from 3 weeks to 3 days."[7]

Maintenance Repair **and Overhaul Services Market**

Increased demand in cost savings compounded with shortage of skilled workers in several industrial sectors like automotive, aviation, or industrial manufacturing has driven immense growth in the maintenance repair and overhaul (MRO) sector.

In 2018, the European Maintence, Repair and Overhaul (MRO) service market was valued at USD $184.69 billion and is anticipated to expand at a CAGR of 2.5% until 2025.[8]

What can you do with **TeamViewer Pilot?**

Remote Support Using Augmented Reality

Real-time Collaboration with Experts

Highlight Real Objects with 3D Markers

Solve Problems Together

Fault Detection

Share your smartphone camera-view of on-site field issues with a remote expert for real-time virtual collaboration, troubleshooting, and faster fault detection.

Effective and Efficient Repairs

Offsite expert can guide the on-site technician using freehand drawings and 3D annotations to mark up the screen.

Mitigate Language Barriers

Offsite expert can provide support to overcome language barriers and guide the on-site personnel or technician.

Training: In-Depth Instructions for New or Unfamiliar Procedures

Offsite expert can guide the on-site technician step-by-step using freehand drawings and 3D annotations to mark up the screen.

Identification of Spare Part and Part Number

Offsite expert can support in identification of the correct spare part, document the part number, and initiate the order process for replacements.

Scheduled Preventive Inspections

Offsite experts can provide support for scheduled preventive inspections and detect anomalies faster to decrease unplanned downtime.

Why **TeamViewer?**
Industry-Leading Remote Connectivity Platform

TeamViewer is the world's most-loved remote desktop tool with over 30,000 new downloads every hour. Currently, there are over 2.0 billion live TeamViewer IDs that access the world's largest and fastest remote connection network. This is the only tool you will ever need to keep all your computers, servers, and devices at your fingertips.

TeamViewer Pilot is an interactive remote field support solution, powered by augmented reality, enabling you to collaborate with offsite experts and tag real-world objects in live video streams with 3D sequential arrows to provide guidance and clarify troubleshooting steps.

• Precise object tracking, fueled by the latest Apple and Google technology

• Fast connections, leveraging our global access network infrastructure

• Highest security and privacy standards

• Easy-to-use mobile and desktop applications

• Customer support in over 32 languages

Key Features

Remote camera sharing

Enable your on-site employees or clients to share their smartphone's camera view, so you can see the problem and help address it.

HD VoIP

Speak to the service technician or client on the other side of the screen, giving them detailed instructions on how to fix the issue.

Highlighting on 3D objects and adding text to markers

Help on-site employees or customers fix issues by drawing and highlighting on the screen, marking real-world objects as well as adding text descriptions.

Freeze Image

Pause the video stream to get a clear still image to work hands-free or highlight and discuss technical details.

Product Benefits

Solve problems faster

Enable your service technicians and customers to get direct support from experts via audio and interactive video.

Reduce costs

Reduce travel costs by replacing on-site visits with remote expert help for service technicians and customers.

Improve processes

Help close the skills gap and transfer knowledge for technical repairs and maintenance; or provide approval for inspections from a central location instead of an on-site visit.

Maintain security

Remote connections are powered by the TeamViewer global access network, secured by industry-grade end-to-end encryption.

Sources

1. Global Market Forecast 2018-2037 - Market – Airbus. https://www.airbus.com/content/dam/corporate-topics/publications/media-day/GMF-2018-2037.pdf accessed July 23, 2019

2. Digital Factories 2020 Shaping the future of manufacturing, PWC. https://www.pwc.de/de/digitale-transformation/digital-factories-2020-shaping-the-future-of-manufacturing.pdf, accessed July 21, 2019

3. Chris Coleman, Satish Damodaran, Mahesh Chandramouli, and Ed Deuel: "Making maintenance smarter," Deloitte. https://www2.deloitte.com/insights/us/en/focus/industry-4-0/using-predictive-technologies-for-asset-maintenance.html, accessed July 21, 2019

4. Downtime Costs Auto Industry $22k/Minute-Survey n.d. https://news.thomasnet.com/companystory/downtime-costs-auto-industry-22k-minute-survey-481017, accessed July 21, 2019

5. Chris Coleman, Satish Damodaran, Mahesh Chandramouli, and Ed Deuel: "Making Maintenance Smarter," Deloitte. https://www2.deloitte.com/insights/us/en/focus/industry-4-0/using-predictive-technologies-for-asset-maintenance.html, accessed July 21, 2019

6. 2018 Deloitte skills gap and future of work in manufacturing study, Deloitte. https://www2.deloitte.com/content/dam/insights/us/articles/4736_2018-Deloitte-skills-gap-FoW-manufacturing/DI_2018-Deloitte-skills-gap-FoW-manufacturing-study.pdf, accessed July 21, 2019

7. Augmented Reality for the Factory of the Future, Testia. https://www.testia.com/wp-content/uploads/2016/02/it3Dmag-2-Smart-AR-Tool-Testia-Airbus-Group-Company.pdf, accessed July 19, 2019

8. Grand View Research: Europe Maintenance, Repair, and Overhaul (MRO) Distribution Market Size, Share & Trends Analysis Report By Product, By Sourcing/Service, By Maintenance Type (Preventive/Scheduled & Corrective), By End Use, And Segment Forecasts, 2019 – 2025, Grand View Research, https://www.grandviewresearch.com/industry-analysis/europe-maintenance-repair-overhaul-mro-distribution-market, accessed July 19, 2019
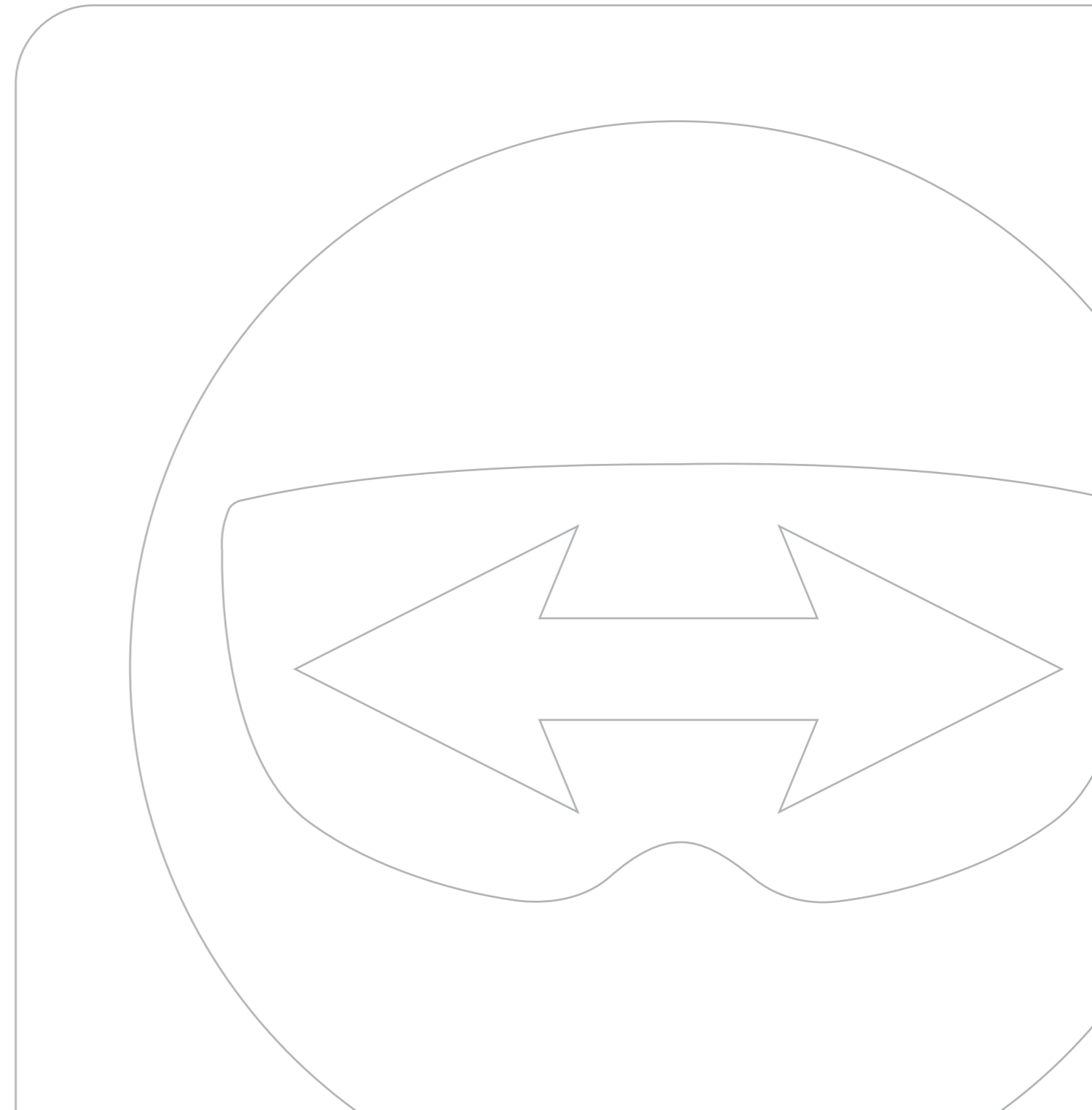
About **TeamViewer**

As a leading global remote connectivity platform, TeamViewer empowers users to connect anyone, anything, anywhere, anytime. The company offers secure remote access, support, control, and collaboration capabilities for online endpoints of any kind and supports businesses of all sizes to tap into their full digital potential. TeamViewer has been activated on approximately 2 billion devices; up to 45 million devices are online at the same time. Founded in 2005 in Goeppingen, Germany, the company employs about 800 people in offices across Europe, the US, and Asia Pacific.

Questions? Email us at pilot@teamviewer.com

Follow us on