

Augmented reality in reality: A field study

4 findings that prove AR-enabled remote guidance outperforms a standard video call.

XMReality White Paper
October 2018



XMReality AR-enabled remote guidance vs. a standard video call:

-  Which do users prefer?
-  Which solves problems fastest?
-  Which is more accurate and causes fewer errors?

Augmented reality vs. a standard video call: Let's face facts

In summer 2018 XMReality carried out an extensive field study to find out which technology was more effective at giving remote support: XMReality's AR-enabled remote guidance solution, or a standard video call. We used Skype for the video calls, set up in the same way as the XMReality solution, and with all tests fully supervised.

Over 200 members of the public helped us. None were experts, yet the increases in speed and accuracy they achieved using AR remote guidance was major. How much would one of your own more experienced field technician boost their performance using the same tool? Read the results—and decide for yourself.



The test
Assembling a 3D wooden puzzle.

Four key findings

#1

84 % prefer XMReality remote guidance to a standard video call.

Positive features highlighted by our test subjects: "intuitive", "gives direct visual feedback", "more possibilities for the expert to guide you", "pedagogical", "easy to adjust", "good when there is a language barrier".

#2

Problem solving is 32 % faster with XMReality remote guidance than a standard video call.

How much could 32 % faster problem resolution save you? A recent report found that 82 % of the global industrial companies surveyed had experienced unplanned downtime in the past three years. The average outage was four hours. The average cost was 2 MUSD. 32 % of that? 640,000 USD.

#3

50 % fewer errors occurred when using XMReality remote guidance compared to a standard video call.

Yes. You read that right. Video calls involved far more trial and error when solving the test problem. With XMReality remote guidance, test subjects saw the expert's hands showing them exactly how to place the right parts, in the right place, in real time. No complex verbal instructions needed.

#4

Users perceived XMReality remote guidance as more efficient than a standard video call.

Perception is everything. When users *feel* they can solve things more efficiently—they do. Net perceived efficiency, measured as a net promoting score (NPS), was far higher for XMReality remote guidance (52) than a standard video call (-13). Users *felt* it was helping them more efficiently. And so it became: speed and accuracy were measurably improved.

Service speed and efficiency

Less downtime, faster resolution—today, and tomorrow

How competitive is your service division currently? And how much faster and more efficient will it need to be to stay competitive in a global industry driven by digital transformation?

For manufacturing and field service firms in the real world, it's how much digital transformation *can prove* they can cut downtime and improve speed and efficiency that counts. A recent Accenture report⁽¹⁾ predicted that digital transformation will produce growth in productivity, hand-in-hand with savings for the global manufacturing industry.

Augmented reality: A crucial competitive edge

One of the key technologies at the forefront of this, is augmented reality (AR). Its capabilities as a service tool enable both savings and growth. AR remote guidance enables service organizations and manufactures to speed up resolution time, response time and increase service accuracy.

And they can do all this at lower cost, with smaller more agile teams fixing more but travelling less. The result is more companies than ever are now deploying or evaluating AR remote guidance as a service solution that can help keep them competitive.

Easily implemented, and driving measurable improvements in service speed, efficiency and precision we believe AR-enabled field service and aftermarket service is today's competitive edge—and tomorrow's new normal.

And that these field study results, *prove it*.



72%

of service organizations are already using or evaluating AR right now.

The Feasibility of augmented reality, The Service Council⁽²⁾

30%

INCREASED PRODUCTIVITY



30%

REDUCED MAINTENANCE COSTS

⁽¹⁾ Accenture, The rise of Smart Production

⁽²⁾ The Service Council, The Feasibility of augmented reality

Real results—revealed

Augmented reality in reality: we wanted to prove, exactly, how much speed, efficiency and precision our solution added to remote problem solving. So we put it head-to-head with today's most commonly used tool: the standard video call.

Empowering everybody to solve problems better

The Field study focused on helping *everybody*, regardless of age or digital competence, solve problems better, remotely. And if 'tech novices' can perform better using the tool, for businesses with more skilled field technicians, we'd expect performance to be boosted even more.

Our target objectives:

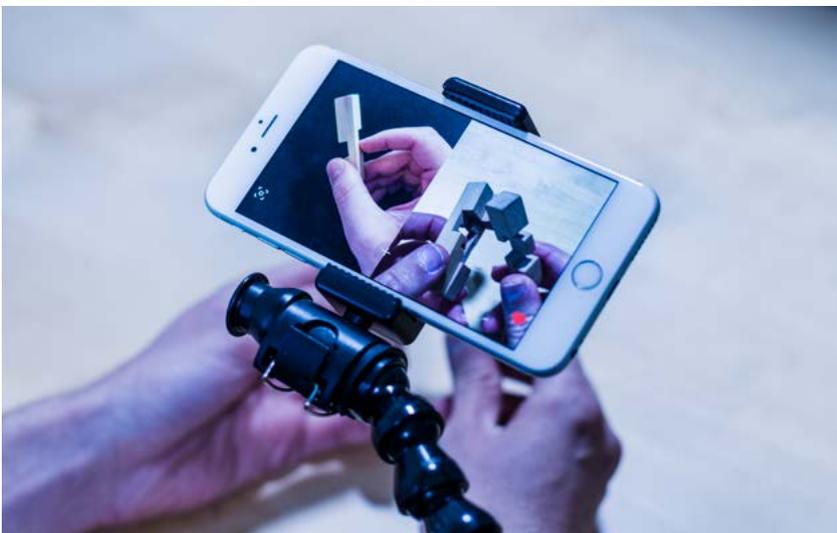
1. To find out if and how XMReality's AR-enabled remote guidance solution gives better guidance than a standard video call
2. To find out how XMReality's AR-enabled remote guidance solution is experienced and perceived by users of all ages

Let battle commence...

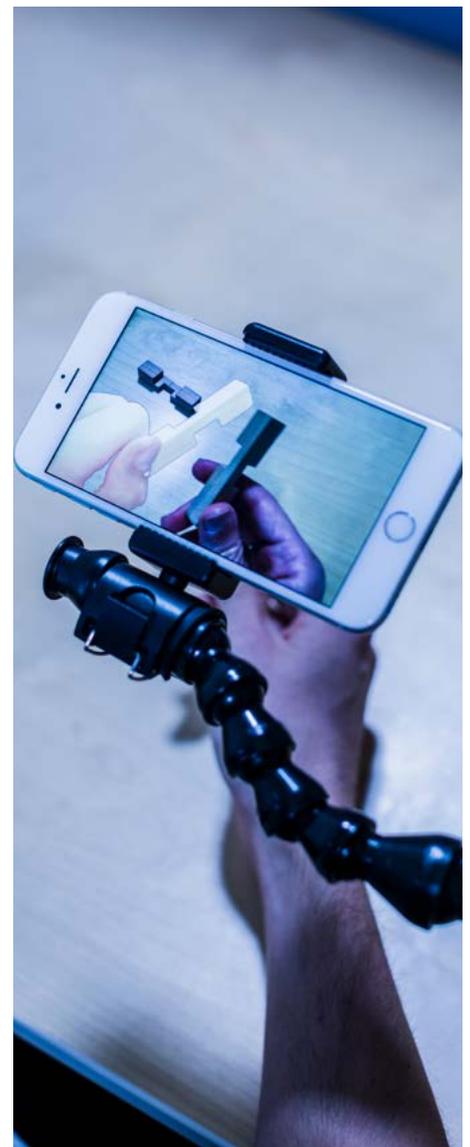
With today's complex engineering components there is often no clear 'up' or 'down' for field service engineers to refer to. How quickly could participants be guided to put the puzzle together, with the right rotation and the right parts in the right places?

To capture this we selected the problem to solve to be a spatial task; to assemble a 3D wooden puzzle.

Standard video call with split screen.



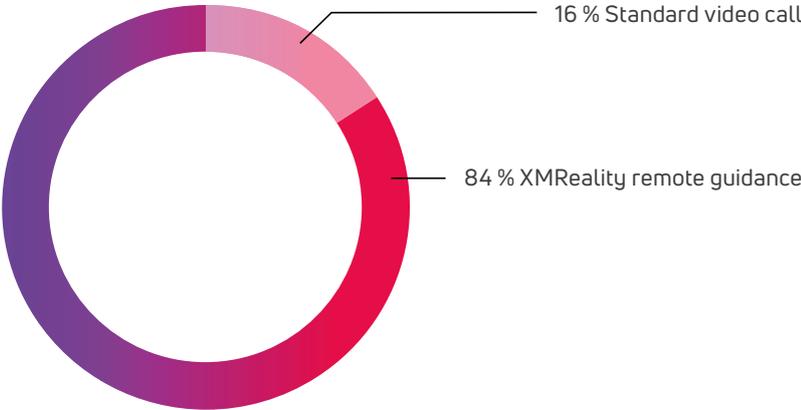
XMReality remote guidance with AR hands-overlay.



Key findings #1

People prefer XMReality remote guidance to standard video calls

Your service technicians are on the front line. And in a global market field service teams and service call centers can be in different countries, speaking different languages. So a tool that is 'pedagogic', 'intuitive', 'gives direct visual feedback' and is 'easy to adjust' according to the users themselves, can build confidence, capabilities—and significant savings.



WHAT USERS SAID:

"Direct visual feedback"

"Intuitive"

"Pedagogical"

"Gives more possibilities for the expert to guide"

"Easy to adjust during task without having to ask for repetition"

"Good when there is a language barrier or audio feedback is bad"

84%

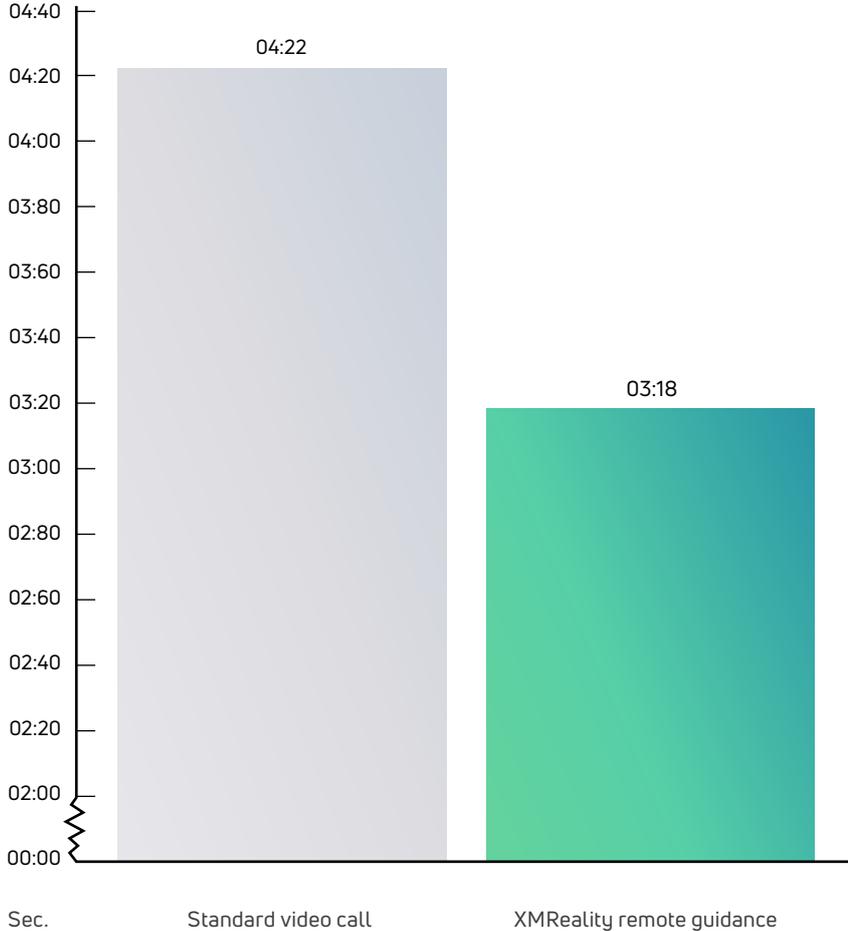
Preferred using XMReality remote guidance on a smartphone to the standard video call.

Key findings #2

XMReality remote guidance is more time-efficient at solving the test problem than a standard video call

Unplanned downtime produces huge costs. And can mean losing your customer's trust, as well as your productivity. A recent report found that during downtime 46 % of companies surveyed couldn't deliver services, and 37 % lost production time on a critical asset. A tool that enables your service technicians to resolve outages faster, can save your bottom line—and your customer's trust.

Mean duration to solve the test problem



32%

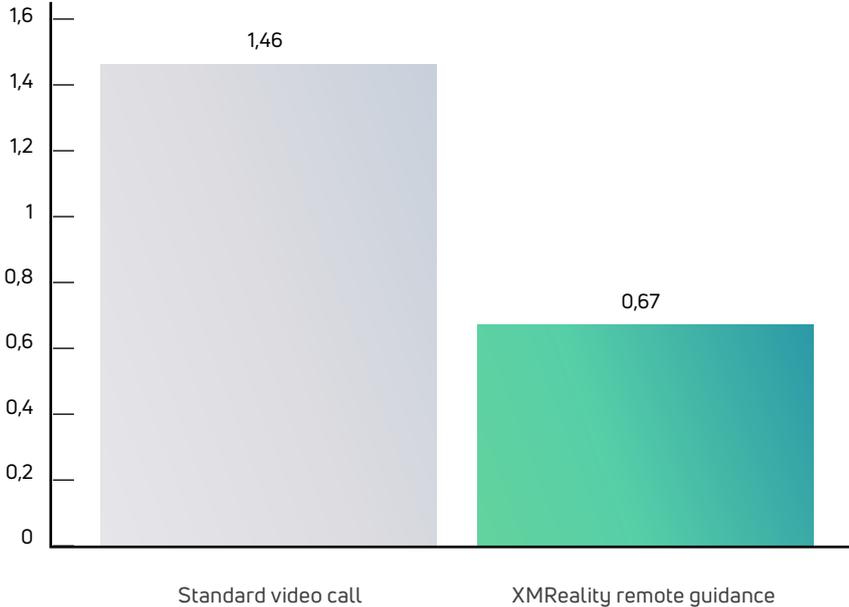
Faster resolution time using XMReality remote guidance compared to a video call.

Key findings #3

XMReality remote guidance is more accurate at problem-solving

Quality always counts. Improving the precision and accuracy of your service team is crucial to maintaining your competitive edge. In an age of increasing technological complexity production and manufacturing equipment is getting more complex and more challenging, with more elements manufactured and assembled across larger chains. Empowering your technicians to make fewer errors builds their speed and confidence, driving savings and skills.

Mean number of faults when solving the test problem



50%

Fewer errors occurred when using XMReality remote guidance.

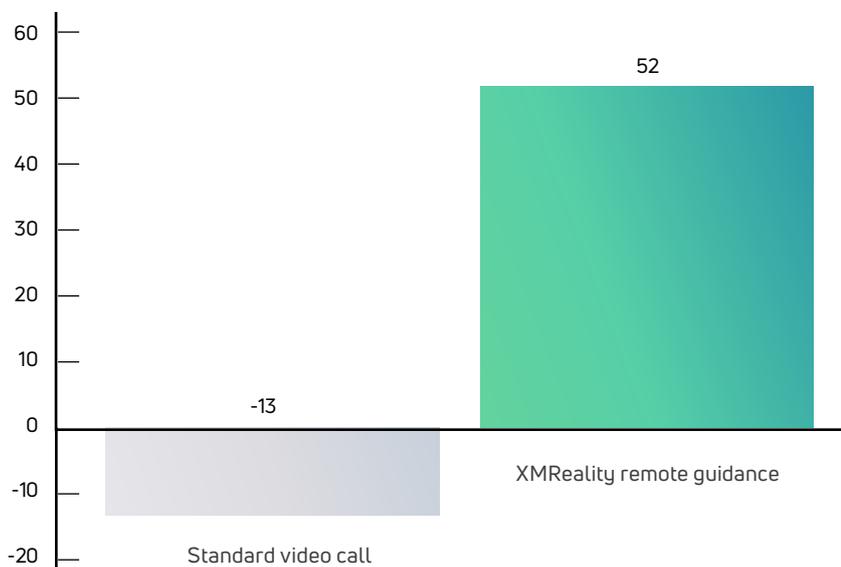
Key findings #4

Users perceive XMReality remote guidance as more efficient

The more positively we perceive a tool, the better we perform using it. So imagine if you could give your service technicians a tool that made them *feel* more efficient, secure and confident. Well, you can. When test subjects were asked how they perceived the two different technologies, they reported that XMReality remote guidance enabled them to solve the task in a more efficient way.

Our perceptions create reality. The more efficient your service technician perceives their tools to be, the more confidently and efficiently they'll perform.

Net perceived efficiency



65

The difference in net perceived efficiency, measured as Net Promotor Score (NPS), is 65.

Results presented as a net perceived efficiency score from 1 (completely disagree) to 7 (completely agree):

Net perceived efficiency, measured as net promoting score (NPS), was higher for XMReality remote guidance (52) vs standard video call (-13).

(Net perceived efficiency scores calculated as 1-4 detractors, 5-6 passives, 7 promoters)

XMReality field study set-up

Why did we do this?

We wanted to compare an AR-enabled video call with a standard video call to see which one performed best.

Which problem did we test?

The problem to solve was a spatial task; to assemble a 3D wooden puzzle.

Who took part?

- 202 people from 9–80 years old
- None had previous experience of AR
- 75 % men, 25 % women
- 80 % Swedish speaking (native test site language)
- 20 % foreign language

Where was it held?

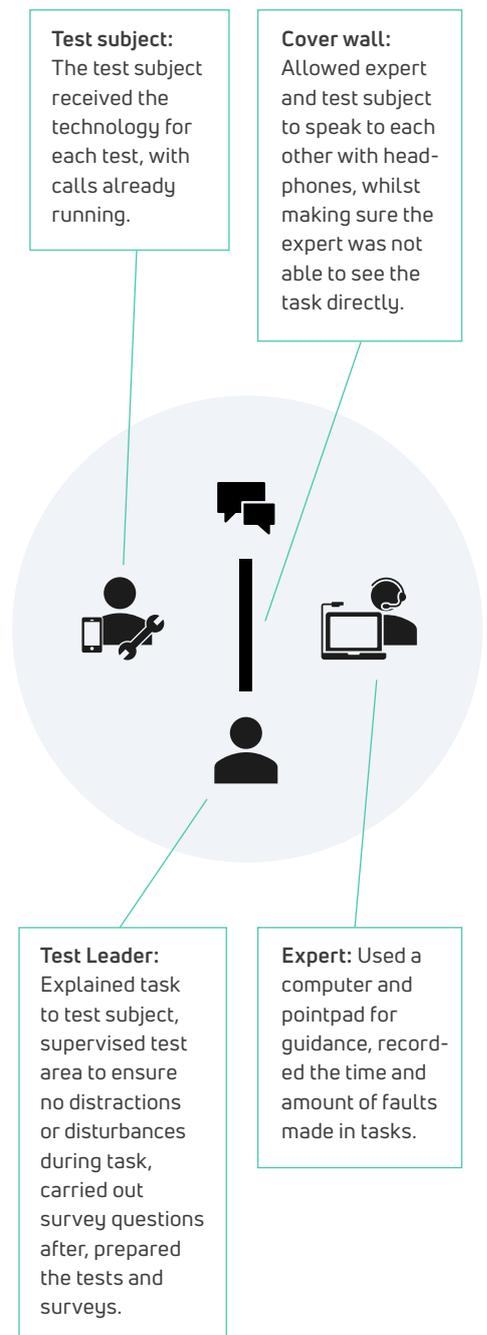
Three locations in the Swedish city Linköping: the City Library, the Swedish Air Force Museum and NärCon, a popular gaming and animation Event.

How was integrity guaranteed?

A screen stopped the expert from seeing the test subject carrying out the task.

Two experts conducted the tests: a guide, who guided the participant and recorded time and errors. And a supervisor, monitoring both sides of the screen, who ensured an undisturbed environment.

None of the participants had previous experience of AR-enabled remote guidance.



Fast forwarding industrial services

The implications for tomorrow

50 % reduction in errors when solving problems. 32 % faster resolution time: Such proven results are a line in the sand for the service and manufacturing industry.

Reduced downtime and 32 % faster service resolution could easily amount to thousands, if not millions of Euros saved for a large-scale global manufacturer. They indicate that AR-enabled service tools will very soon be essential to becoming, *and staying*, more competitive.

In a market where 72 % are already exploring AR-enabled service, driving speed and efficiency savings in services will be at the heart of future profitability.

Yet that is just the beginning.

AR is going places

The field study results on people's positive perception of, and preference for, AR remote guidance are crucial findings. People experienced XMReality remote guidance as a technology quite distinct from video calling—in how it felt, and what it enabled them to do.

In interviews after the tests they were quick to see possible future scenarios where AR remote guidance could play a key role—from teaching, training, medicine and surgery, to marine operations, navigation and more. Such engagement underlines that augmented reality *in reality* is a fast-growing, dynamic and most of all *enabling* technology.

Revolutionizing knowledge sharing and giving a powerful competitive edge, XMReality Remote Guidance is an opportunity—here, now, and tomorrow—seriously not to be missed.

Want to know more?

To learn more about XMReality Remote Guidance:

<https://xmreality.com/product/>

To book a demo:

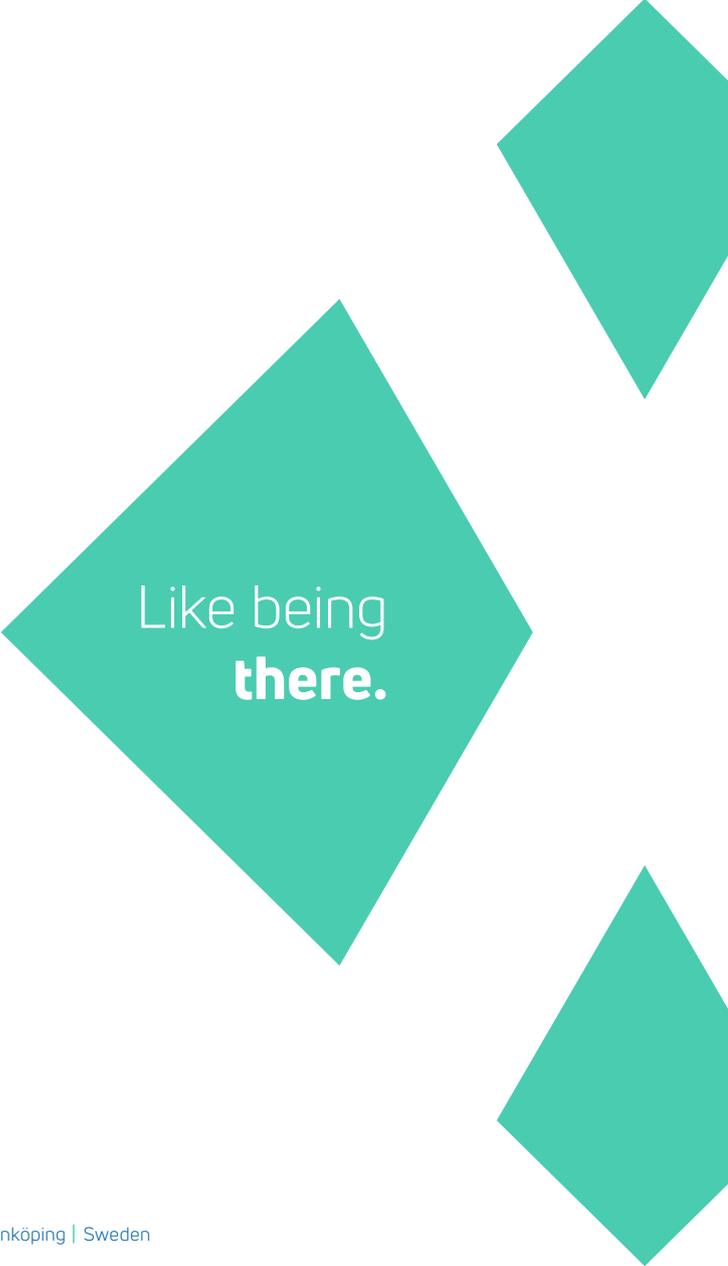
<https://xmreality.com/>

Contact us at XMReality to learn more about implementation best practice. We can also help you calculate ROI.

Mail: contact@xmreality.com

Phone: +46 (0)13 221 11 10

XMReality AB (publ) develops and sells solutions that revolutionize knowledge sharing through augmented reality (AR). The company is a market leader in remote guidance, which uses AR to guide onsite staff so that they can resolve or prevent problems. XMReality's customers are mainly global industrial companies, including Bosch Rexroth, ABB, Siemens Industrial Turbomachinery, Electrolux, and Bombardier. XMReality is headquartered in Linköping, Sweden, and is listed on Nasdaq First North (ticker: XMR).



Like being
there.

Teknikringen 10, 8 fl | SE-583 30 Linköping | Sweden