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# ARTILLRY INTELLIGENCE BRIEFING

## ENTERPRISE XR: IMPACTING THE BOTTOM LINE

**JANUARY 2018**

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# Executive Summary

The past year has been volatile for AR and VR (a.k.a. XR). After an exuberant 2016, the sector's temperature cooled when consumer hardware penetration – a key leading indicator of industry health – fell short of expectations. So attention shifted to areas of nearer-term scale: mobile and enterprise.

For enterprise (mobile is covered in a separate report)[i], its nearer-term opportunity is due to a greater addressable market. There are more receptive buyers in enterprise environments, due to measurable time and efficiency gains in AR-assisted job roles. This creates a clear ROI narrative.

To quantify, companies like Intel and Coca-Cola demonstrate 15-45 percent efficiency gains today. This includes time saved in assembly, sorting and maintenance functions. Given that enterprise process management generally strives for single-digit efficiency gains, this XR impact is notable.

And unlike consumer markets, where mobile devices are the near-term play, head-worn XR devices are already penetrating the enterprise. This is due to one big variable: style. Current AR glasses don't pass consumer markets' stylistic requirements, but that's not an issue in the enterprise.

For all of these reasons and more, *ARtillry Intelligence* projects enterprise XR to grow from $554 million in 2016 to $39 billion by 2021, with an inflection point in 2019. Revenue in early years will be hardware- dominant as an installed base paves the way for recurring software revenue in later years.

Most of that revenue will be from AR versus VR. Though VR's place in the enterprise will be valuable and transformative, AR's market opportunity is larger. This is due to its breadth of applicability across enterprise functions, and pass-through vision that enables more usage time per working day.

But despite all of these positive dynamics and fertile ground for enterprise XR's growth, there will be challenges. As with any organizational technology adoption, there is red tape, inertia, sales cycles and the complications of system integration. As the saying goes, anything worthwhile isn't easy.

So how will this all play out? What are enterprise XR's benefits and proof points? What are enterprises saying and doing to indicate areas of opportunity? Who's exhibiting best practices? And what are the biggest lessons and takeaways? This report sets out to answer these burning questions.

Image Source: Vuzix

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# Key Takeaways

- XR has been heralded as the next major technological transformation. This will materialize, but later than expected.
  - Similar to the early-2000's e-commerce bubble, XR excitement and market sizing isn't overblown… it's just early.

- Soft consumer hardware sales have shifted attention to near-term scale and opportunity, including mobile and enterprise.

- *ARtillry Intelligence* projects enterprise XR to grow from $554 million in 2016 to $39 billion by 2021.
  - Enterprise AR will grow from $314 million in 2016 to $35.2 billion in 2021, including a 2019 inflection point.
  - Enterprise VR will grow from $240 million in 2016 to $3.8 billion in 2021.

- AR's share results from breadth of applicability for enterprise functions, and pass-through vision that enables versatility.
  - AR will also be widely applicable across verticals including CPG, automotive and aerospace.
  - Enterprises have less stylistic and budgetary restraints than consumers, given today's bulky and costly smart glasses.

- Enterprise XR includes live AR remote assistance (assembly, maintenance), pre-authored AR guidance (sorting, maintenance), and immersive VR collaboration (training, design), among other formats.

- Adoption drivers include strong ROI and operational efficiencies (time and error reduction) in functions like manufacturing.
  - Intel, Coca-Cola and others detailed in this report demonstrate 15-45 percent efficiency gains today.
  - Additional cost savings result from remote support and collaboration, which lessen travel and machine downtime.

- Beyond micro-economics, enterprise AR has potential to transform workforce management
  - AR's guided instructions or live remote assistance makes more people qualified for more jobs.
  - This unlocks enterprise efficiencies and employees' in-house mobility, task variety and morale.
  - AR can enable experienced and valued veterans to work remotely, rather than retire or burn out from field work.

- Enterprise XR benefits are counterbalanced by several challenges, most of them due to organizational inertia.
  - Like many technologies, XR will face resistance at organizational and departmental levels.
  - The first and only point of entry is often "innovation centers," where XR is often well received but then languishes.

- Tactics for overcoming hurdles include building on already-adopted systems (e.g. Android), and grassroots support.
  - Greater chance of deployment can result from advocacy within the business units proposed to use XR. Bottom-to-top organizational buy-in can create powerful demand signals that lead to real XR deployments.
  - Value propositions should go beyond bottom-line impact and be spun to address individual (and sometimes selfish) pain points of decision makers and influencers throughout the organization.

- Despite challenges, there's good news.
  - After initial adoption, subsequent XR implementations are easier to achieve, as comfort levels are gained.
  - There is evidence that sales cycles are reducing in length.
  - Cultural familiarity with XR will inch forward and lessen enterprise resistance – a common process in tech revolutions.
  - We'll see step functions as companies make investments that fuel advancement, which in turn drives more investment.

- Challenges will persist into 2018 but momentum and acclimation are leading towards a 2019 tipping point.
  - Enterprise XR will follow a similar adoption pattern seen in smartphone enterprise integration over the last decade.

*Key takeaways are also highlighted throughout the main body of this report.*

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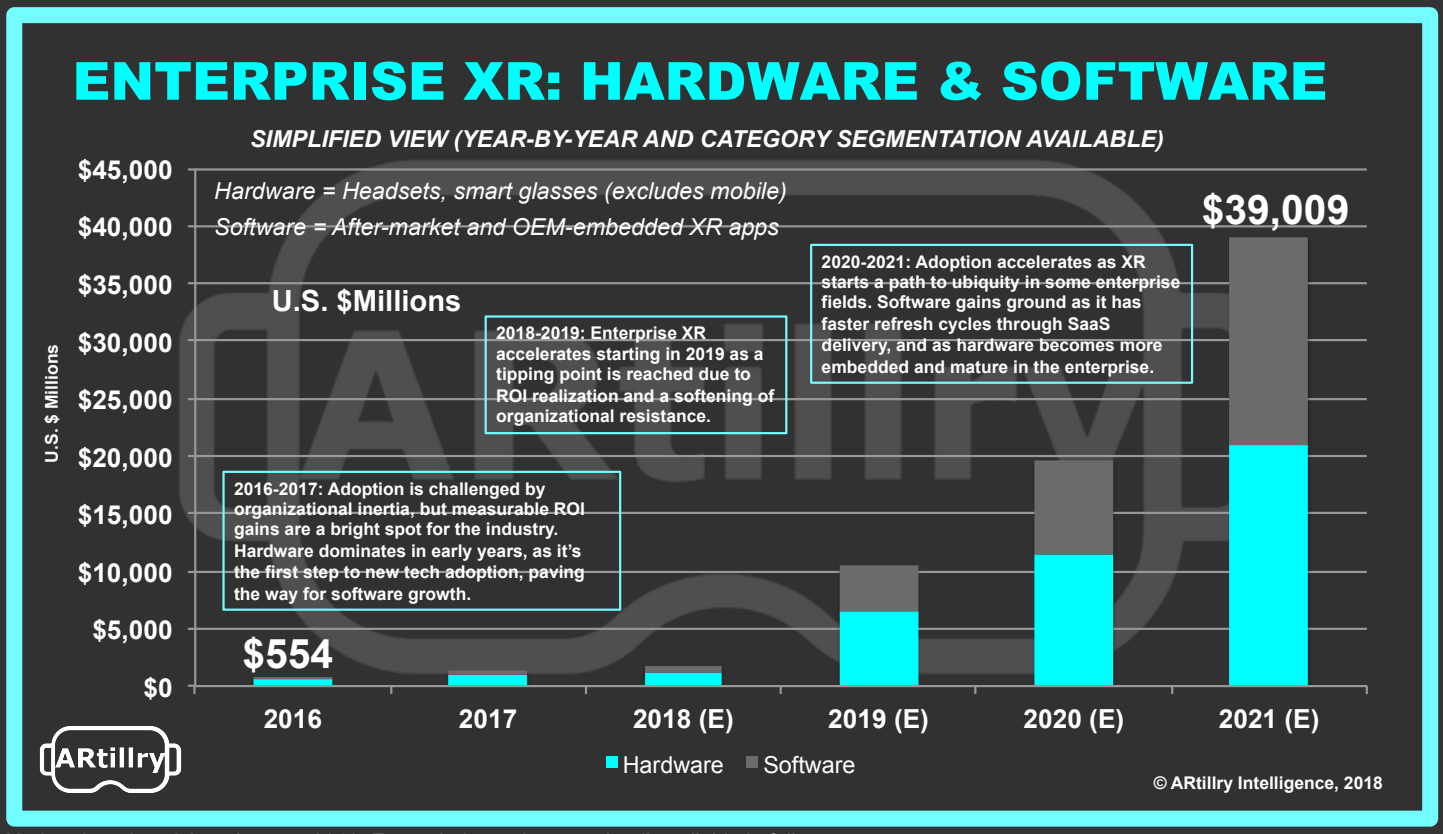
# Introduction: The Road to $39 Billion

AR and VR (collectively known as XR) have been heralded as the next major technological transformation – on the order of the PC, consumer Internet and mobile revolutions. *ARtillry Intelligence* believes these claims are mostly true, but have been mistimed.

Similar in some ways – though not as drastic – to the early-2000's e-commerce bubble, excitement and market sizing for XR isn't overblown… it just may be a bit early. Evidence can be seen in slower than expected consumer VR hardware sales, a key leading indicator for the sector's near-term health.

As these signals started to materialize in 2017[ii], attention shifted to areas of nearer-term scale and opportunity. That includes places that have a larger addressable market or more receptive buyers. The former is true for mobile AR, while the latter is evident in enterprise XR integrations.

Sticking with enterprise (mobile AR was covered in a separate report)[iii], there's sizable revenue potential. *ARtillry Intelligence* projects enterprise XR to grow from $554 million in 2016 to $39 billion by 2021.[iv] Revenue will inflect in 2019 as enterprise resistance begins to recede (examined later).




Updated market sizing, January 2018. Expanded year-by-year detail available in full report.

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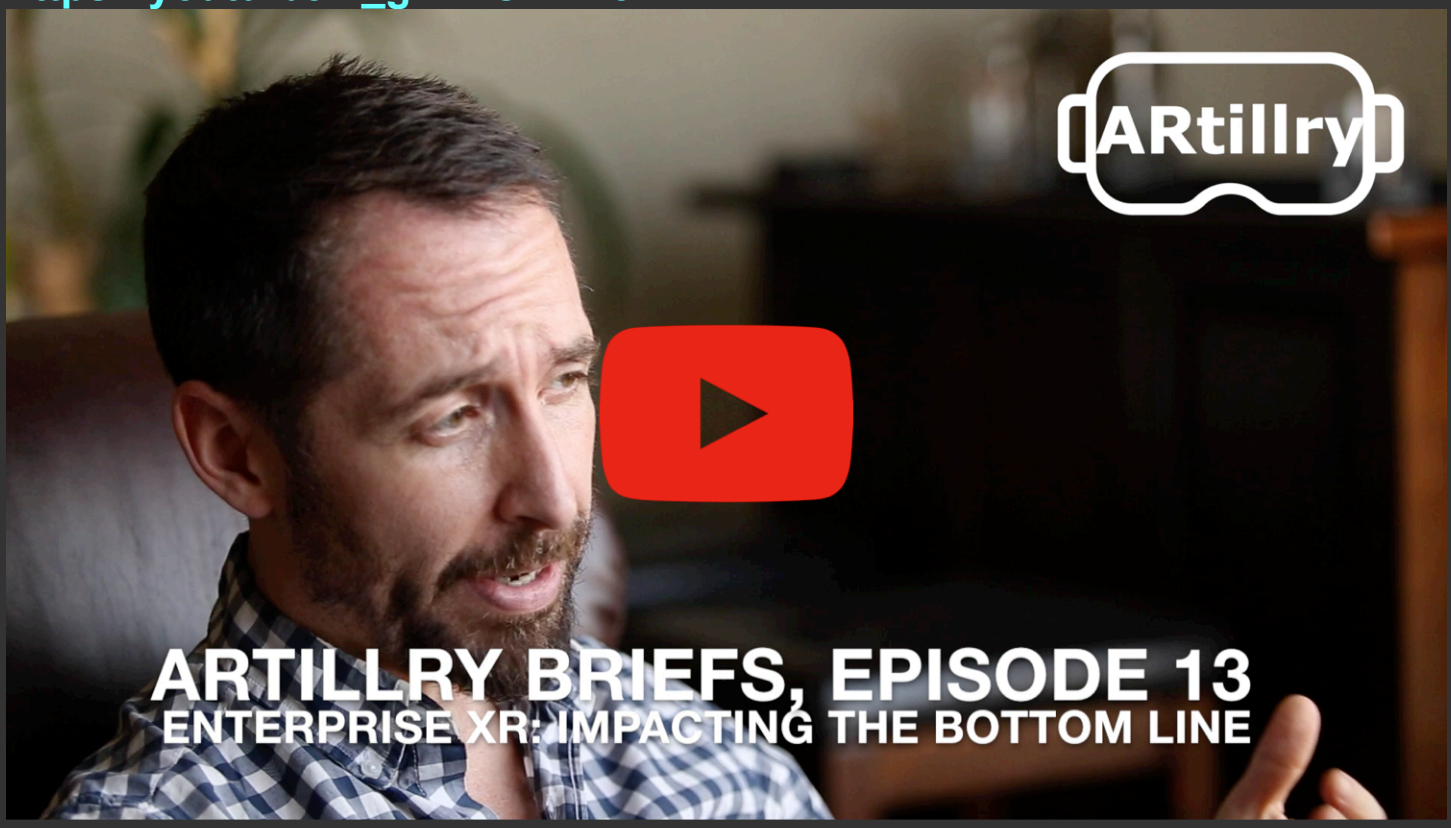
By comparison, consumer AR glasses have a longer adoption horizon. Though likely boosted by Apple's rumored smart glasses in 2020, they aren't yet streamlined enough for consumers. But enterprises have less stylistic needs, as adoption criteria are more about bottom-line impact and ROI.

On that measure, enterprise XR boasts strong operational efficiencies like time and error reduction in manufacturing, sorting and maintenance. XR will also be widely applicable across enterprise verticals including everything from consumer-packaged goods (CPG) to automotive and aerospace.

## Video Companion: Enterprise XR's Bottom-Line Impact

(click URL to open)

**https://youtu.be/4_gY7CsRRYo**

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## About ARtillry Insights

ARtillry Intelligence partners with the VR/AR Association to deliver a research package. Known as *ARtillry Insights*, it will equip subscribers in AR and VR sectors to make informed business decisions.

**FEATURES**
**Original Research:** Monthly reports and weekly briefs on XR data, opportunities and dynamics.
**Curated Research:** ARtillry analysts collect, analyze and filter recommended reading and data.
**Conference Talks:** We watch, select and summarize video from XR events.
**Slide Bank:** We assemble charts for your presentations and knowledge building.
**Slack Channel**: We're here to answer your XR questions.

**2018 EDITORIAL CALENDAR**
**January:** Enterprise XR: Impacting the Bottom Line (this report)
**February:** Mobile AR: App Strategies and Business Models
**March:** Local Commerce and the AR Cloud
**April:** XR Usage & Consumer Attitudes
**May:** XR Global Revenue Forecast
**June:** The State of XR: Mid-Year Review
**July & Beyond:** To Be Announced…

**COST**
VR/AR Association Members: **$39/month**
Non-VR/AR Association Members: **$89/month**

**https://youtu.be/WTruV4arTI0**

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# About ARtillry Intelligence

ARtillry is a publication and intelligence firm that examines augmented reality and virtual reality, collectively known as XR. Through writings, data and multimedia, it provides deep and analytical views into the industry's biggest players and opportunities. It's about insights, not cheerleading.

Run by career analyst and journalist Mike Boland, coverage is grounded in a disciplined and journalistic approach. It also maintains a business angle: Though fun and games permeate VR and AR (especially the former) long-term cultural, technological and financial implications are primary.

Learn more at **https://artillry.co/about**

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# About Intelligence Briefings

ARtillry Intelligence Briefings are monthly installments of VR/AR data and analysis. They synthesize original and third-party data to reveal opportunities and dynamics of VR and AR sectors. In addition to data, a layer of insights is applied to translate market events and raw figures into prescriptive advice.

More information, past reports and editorial calendar can be seen at:

**https://artillry.co/artillry-intelligence/**

# About the Author

Mike Boland was one of Silicon Valley's first tech reporters of the Internet age, as a staff reporter for *Forbes* (print) starting in 2000. He has been an industry analyst covering mobile and social media since 2005, and is now Chief Analyst of *ARtillry Intelligence*, covering emerging tech.

Mike is a frequent speaker at industry conferences such as VRLA, ad:tech and LeadsCon. He has authored in-depth reports and market-sizing forecasts on the changing tech & media landscape. He contributes regularly to highly read online news sources such as *TechCrunch*, *Business Insider* and the *Huffington Post*.

A trusted source for tech journalists, his comments have appeared in A-list publications, including *The New Yorker*, *The Wall Street Journal* and *The New York Times*.

Further background, history and credentials can be found at:

**http://www.mikebo.land/**

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# Methodology

This report highlights *ARtillry Intelligence* viewpoints, gathered from its daily in-depth coverage of the XR sector. To support the narrative, data are cited throughout the report. These include *ARtillry Intelligence* original data, as well as that of third parties. Data sources are attributed in each case.

For market sizing and forecasting, *ARtillry Intelligence* follows disciplined best practices, developed and reinforced through its principles' 15 years in research and intelligence in the tech sector. This includes the past two years covering AR & VR as a main focus. Inclusions are listed below.

More about ARtillry's market-sizing credentials can be found here:
**https://artillry.co/artillry-intelligence/forecasts/methodology/**

## WHAT'S COVERED IN FORECAST DATA

**The market sizing figures in this report include enterprise AR and VR products. These are each subdivided by hardware and software.**

**VR hardware includes headsets and bundled input or tracking devices, but does *not* include gaming consoles, smartphones and PCs required to run some headsets. Similarly with AR, smart glasses are included in revenue projections, but mobile devices (such iPhone sales) are not.**

### INCLUDED

- **AR & VR Hardware (Headsets, smart glasses)**
- **AR & VR Software (Enterprise productivity software, games, apps, in-app purchases)**
- **Bundled Hardware (Input or tracking devices)**

### NOT INCLUDED*

- **PC or Gaming Consoles (e.g. Playstation4)**
- **Smartphones (e.g. iPhone to run ARkit apps)**
- **AR & VR Services: (e.g. Enterprise consulting)**
- **VR Cameras (e.g. 360 degree camera hardware)**
- **AR & VR Advertising (e.g. Immersive in-game ads)**

***We will expand category inclusions in future forecasts**

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# Disclosure and Ethics Policy

ARtillry has no financial stake in the companies mentioned in this report, nor was it commissioned to produce it. With respect to market sizing, ARtillry remains independent of players and practitioners in the sectors it covers. It doesn't perform paid services or consulting for such companies, thus mitigating bias — real or perceived — in market sizing and industry revenue projections.

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# Contact

Questions and requests for deeper analysis can be submitted at:
**https://artillry.co/contact/**

# References

[i] See ARtillry Intelligence Briefing: *ARCore & ARkit: The Acceleration of Mobile AR*
[ii] See ARtillry Intelligence Briefing: *2017 Lessons, 2018 Outlook*
[iii] See ARtillry Intelligence Briefing: *Mobile AR: App Lessons and Business Strategy*
[iv] See ARtillry Intelligence Briefing: XR Global Revenue Forecast, 2016-2021

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