



CONSUMER AR: WHEN, HOW AND HOW BIG?

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ARTILLRY INTELLIGENCE

AWE NITE: MAY 17, 2018



GLOBAL XR REVENUE BREAKDOWN

AR = Smart glasses and software revenues (games, apps, etc.)
VR = Headset and software revenues (games, apps, etc.)

U.S. \$Millions

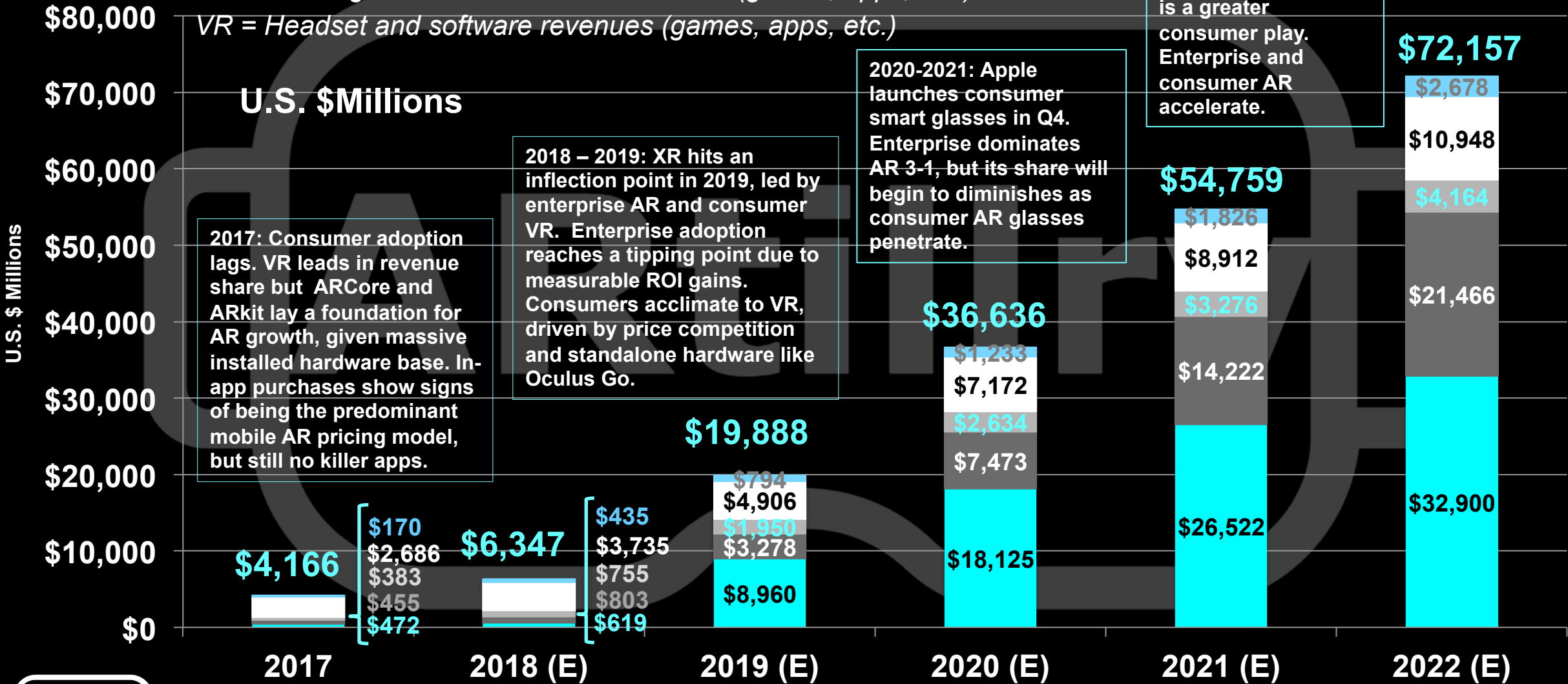
U.S. \$ Millions

2017: Consumer adoption lags. VR leads in revenue share but ARCore and ARkit lay a foundation for AR growth, given massive installed hardware base. In-app purchases show signs of being the predominant mobile AR pricing model, but still no killer apps.

2018 – 2019: XR hits an inflection point in 2019, led by enterprise AR and consumer VR. Enterprise adoption reaches a tipping point due to measurable ROI gains. Consumers acclimate to VR, driven by price competition and standalone hardware like Oculus Go.

2020-2021: Apple launches consumer smart glasses in Q4. Enterprise dominates AR 3-1, but its share will begin to diminishes as consumer AR glasses penetrate.

2022: VR has a place in the enterprise but is a greater consumer play. Enterprise and consumer AR accelerate.



■ Enterprise AR ■ Consumer AR ■ Enterprise VR ■ Consumer VR ■ XR Advertising

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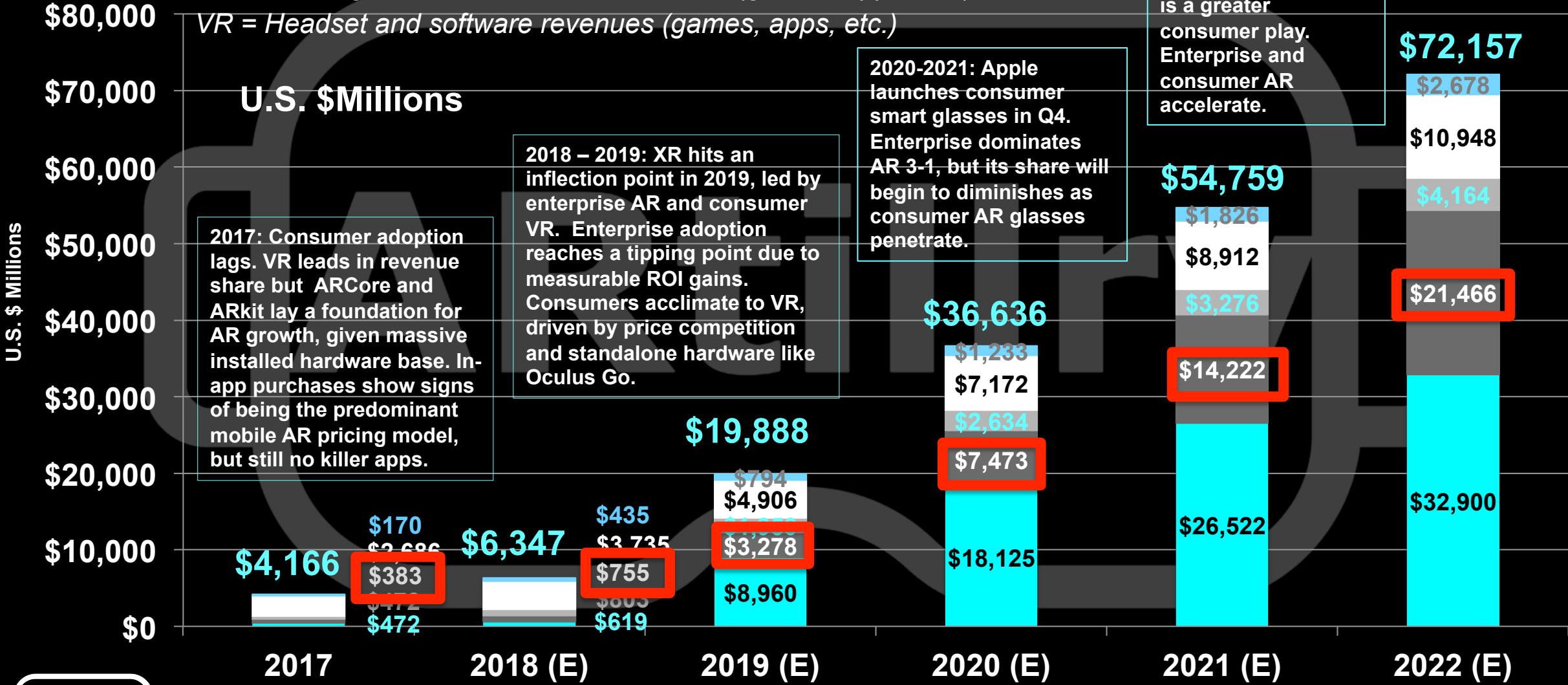
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CONSUMER AR DRILLDOWN

(DETAILED VIEW)

Hardware = Smart glasses (excludes mobile hardware)

Software = AR apps, games and in-app purchases

2020: Revenues continue to be dominated by IAP, but premium software revenue starts to grow in share as smart glasses penetrate further, and are less conducive to in-app pricing models.

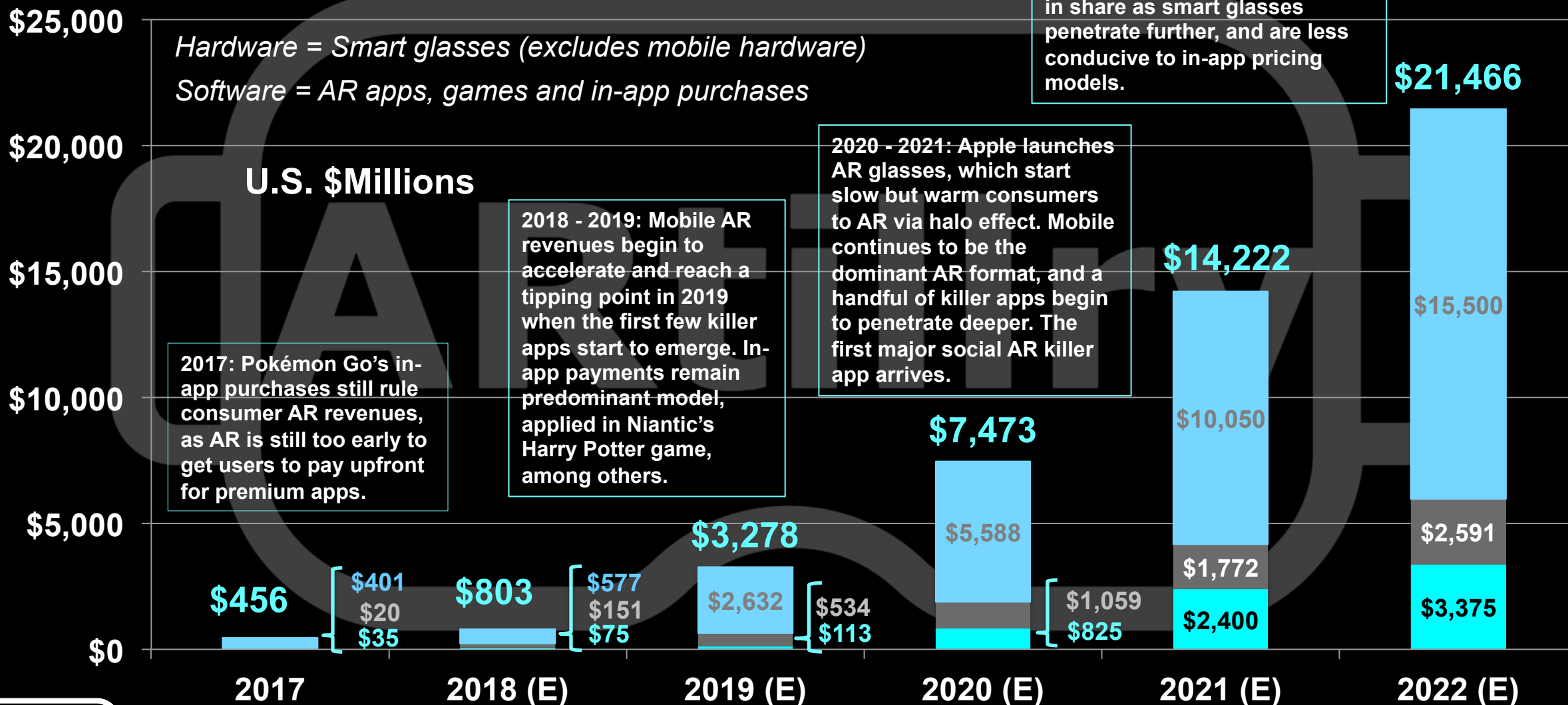
U.S. \$Millions

2017: Pokémon Go's in-app purchases still rule consumer AR revenues, as AR is still too early to get users to pay upfront for premium apps.

2018 - 2019: Mobile AR revenues begin to accelerate and reach a tipping point in 2019 when the first few killer apps start to emerge. In-app payments remain predominant model, applied in Niantic's Harry Potter game, among others.

2020 - 2021: Apple launches AR glasses, which start slow but warm consumers to AR via halo effect. Mobile continues to be the dominant AR format, and a handful of killer apps begin to penetrate deeper. The first major social AR killer app arrives.

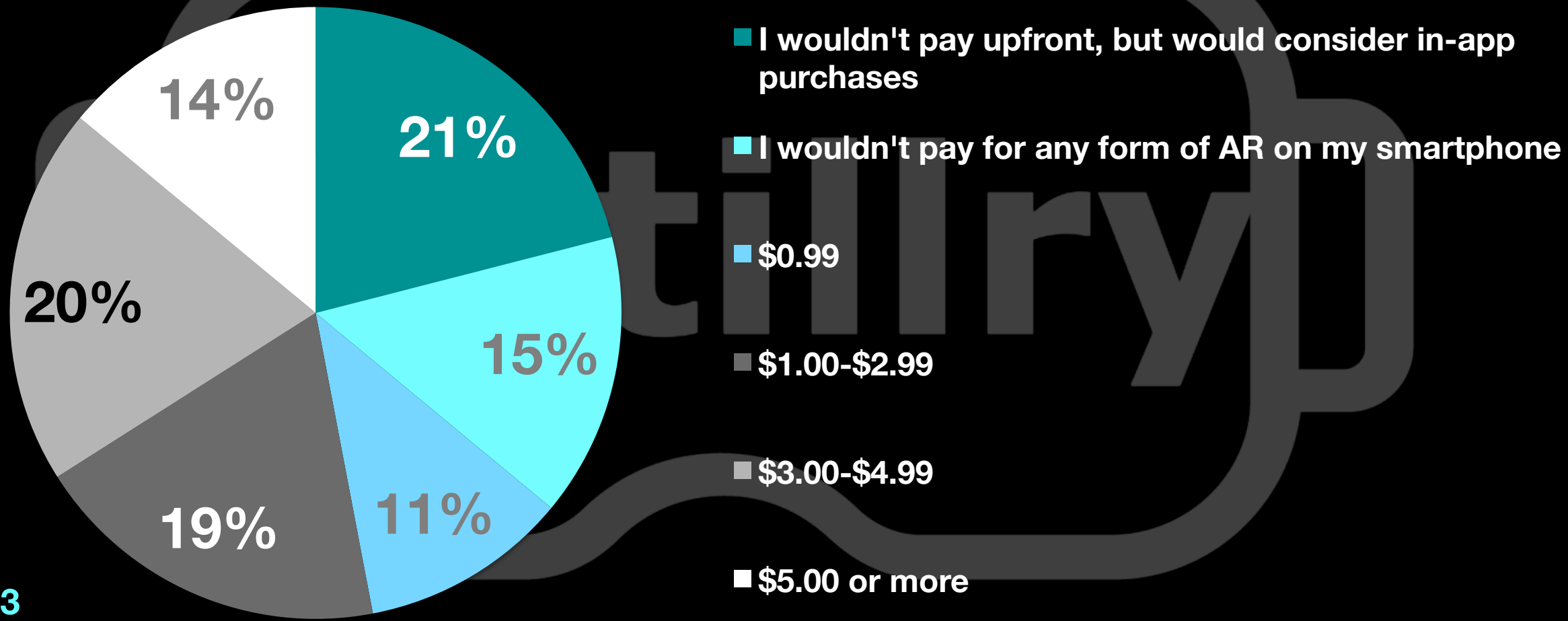
U.S. \$ Millions



■ Hardware ■ Premium Apps ■ In-App Purchases

MOBILE AR APP PRICING (CURRENT USERS)

WHAT IS THE MOST YOU WOULD PAY FOR A MOBILE AR APP?

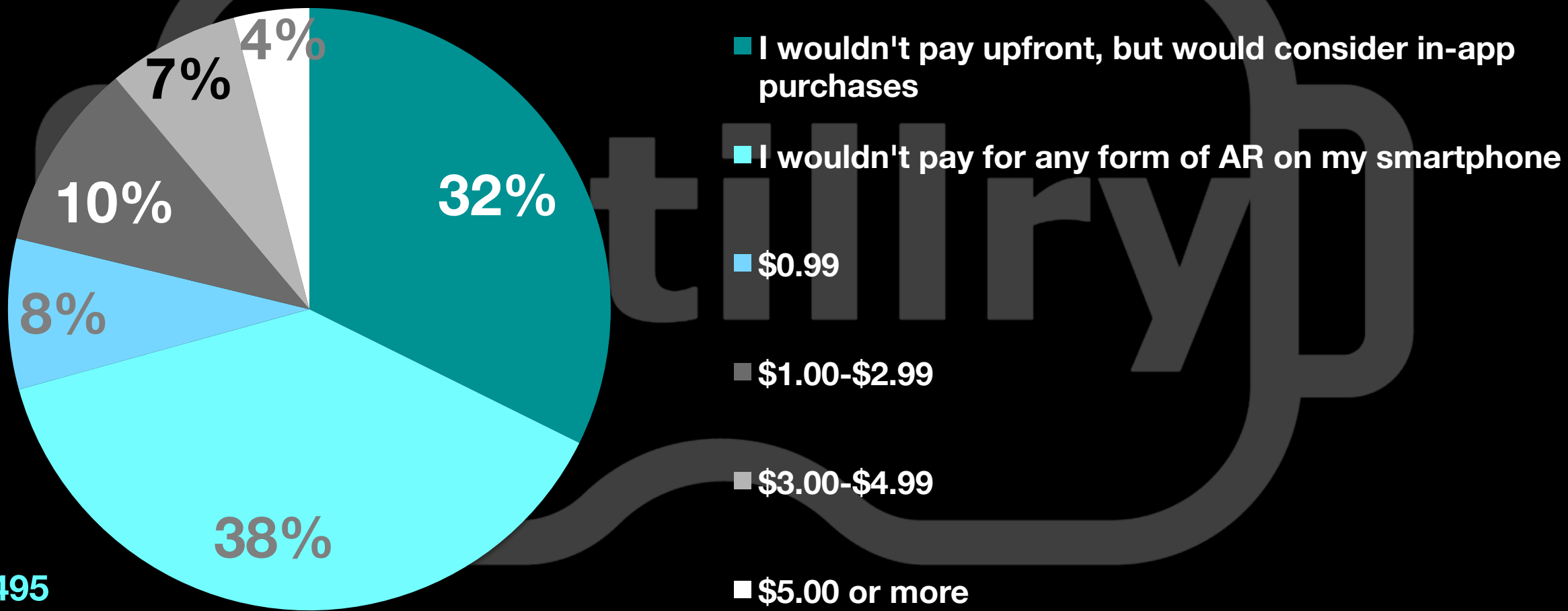


N= 703



MOBILE AR APP PRICING (NON- USERS)

WHAT IS THE MOST YOU WOULD PAY FOR A MOBILE AR APP?

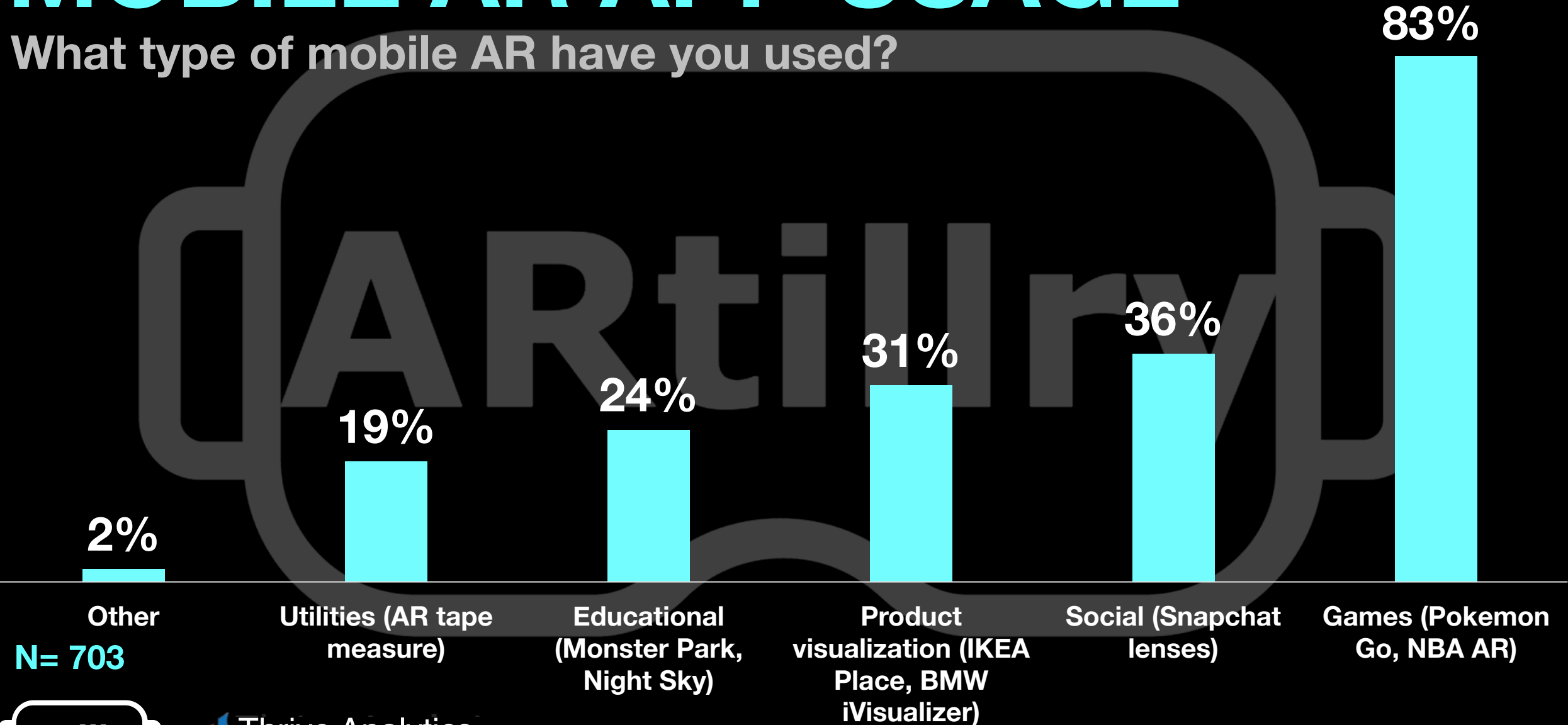


N= 1,495



MOBILE AR APP USAGE

What type of mobile AR have you used?



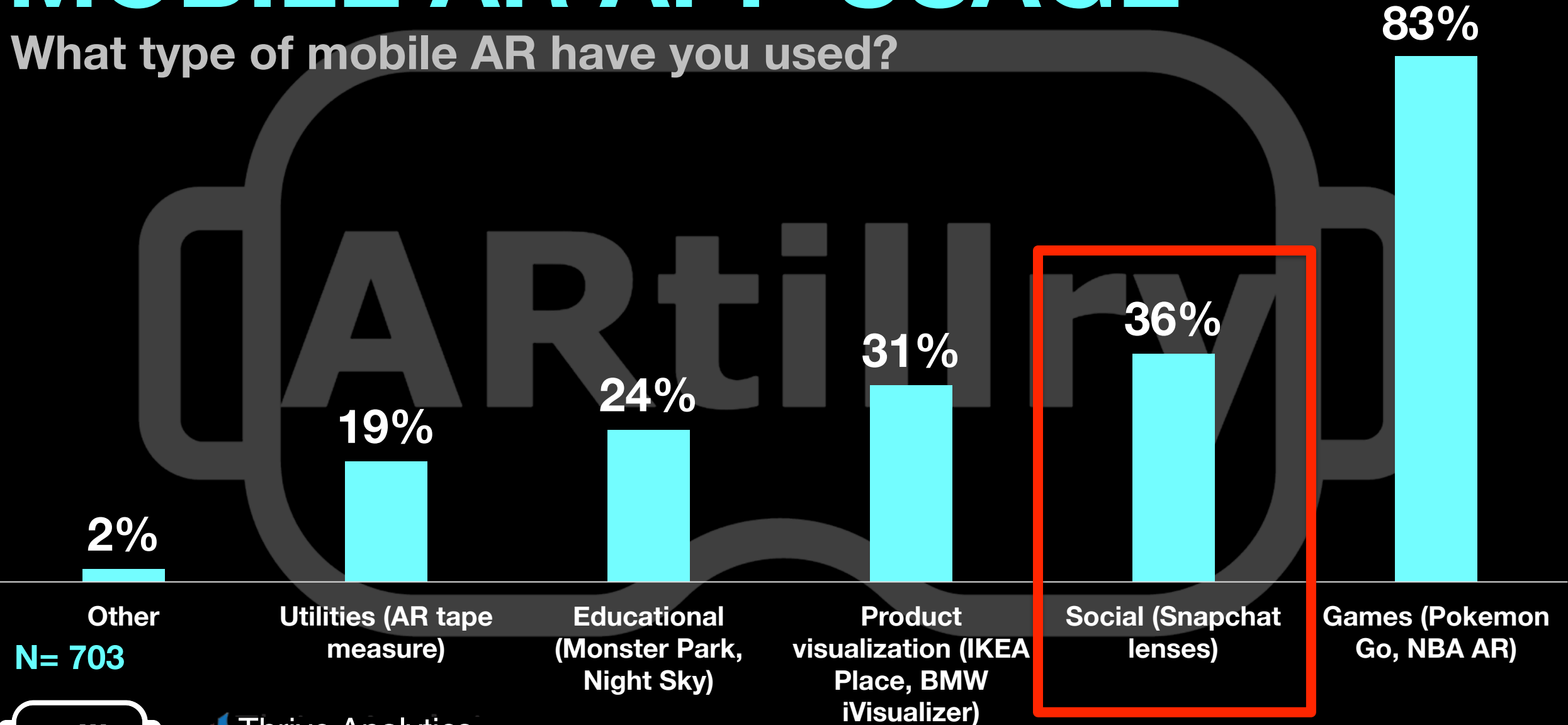
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Thrive Analytics
smart decisions that drive success

MOBILE AR APP USAGE

What type of mobile AR have you used?

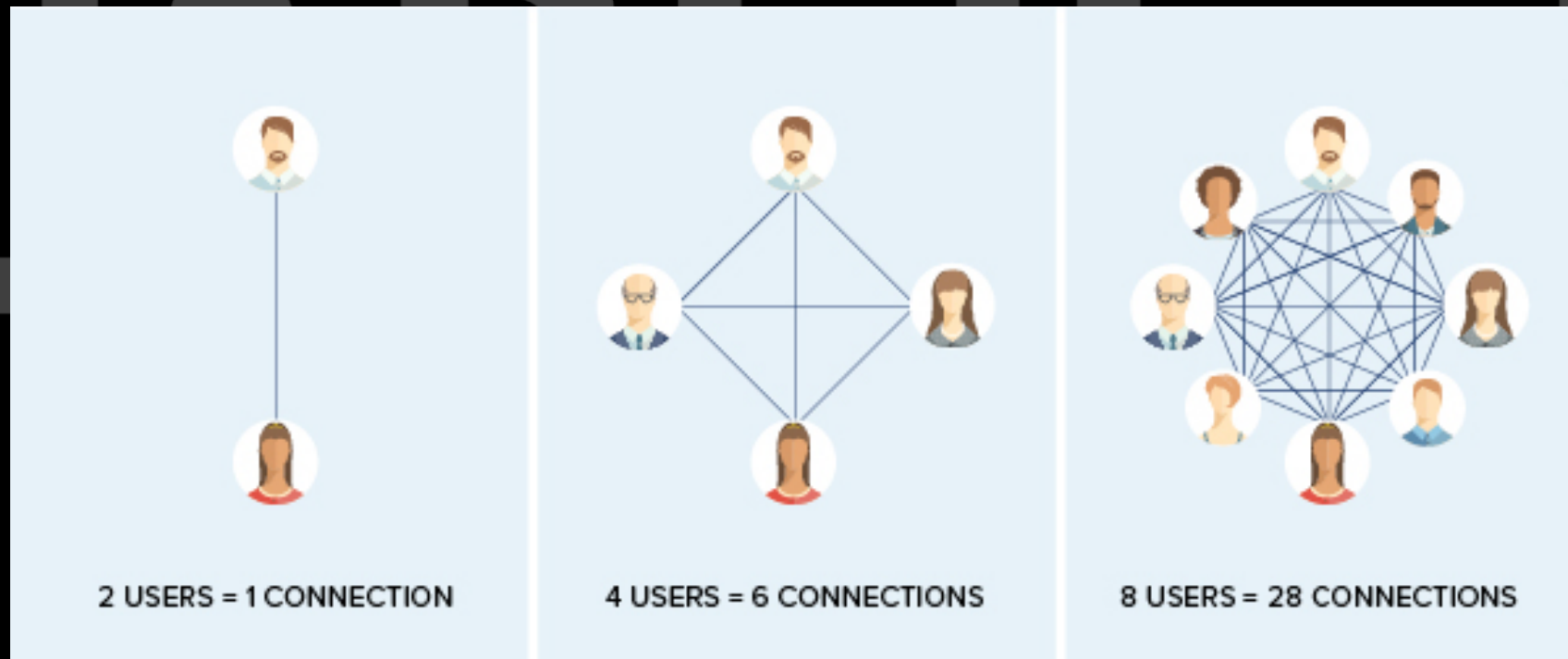


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“There’s been an evolution of killer apps on the internet and I suspect that the same thing is going to happen in AR... I keep hearing that AR and VR are useful for gaming, and training. Somewhere in there is going to be the killer app and I’m confident it will be networked.”
-- Bob Metcalfe



SOCIAL AR LEADING INDICATOR:

Snapchat Lenses are used by **70 million** people per day, at an average of **3 minutes each**, which translates to **500 years** of play time per day.

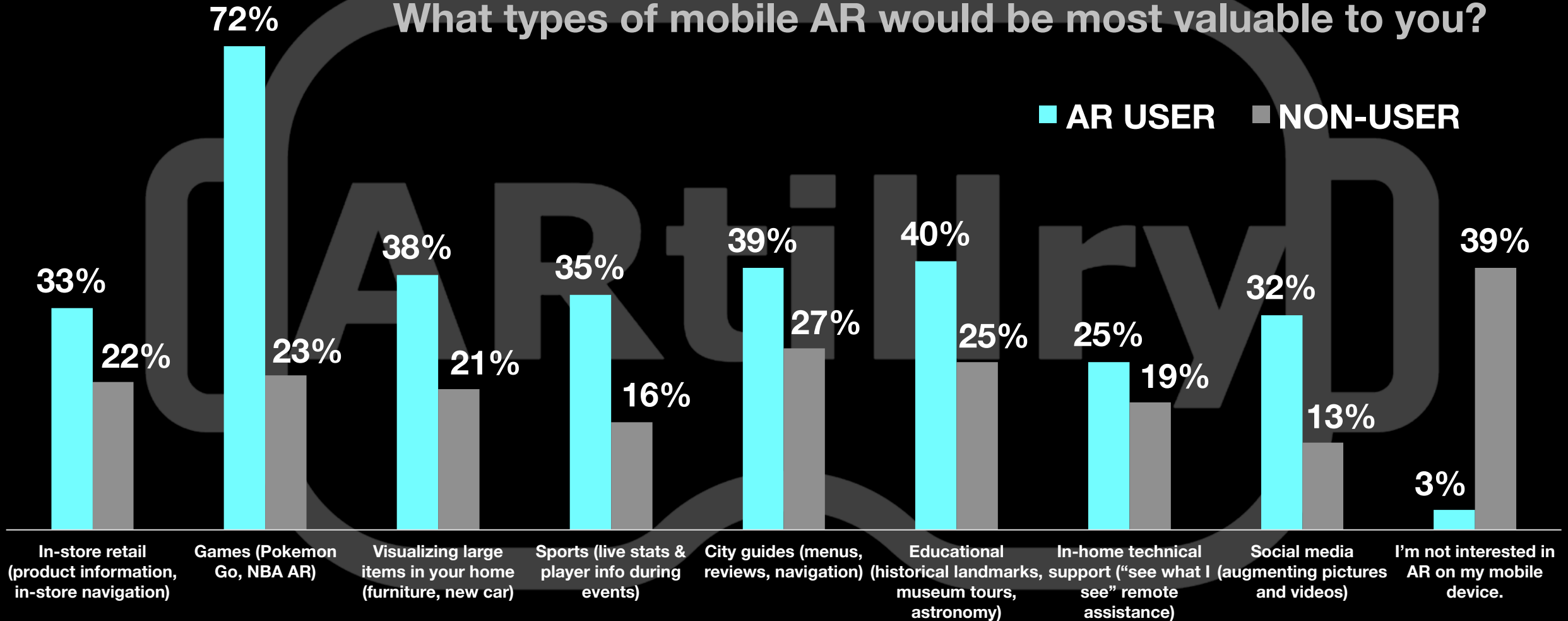
But... that only scratches the surface.
The real action is in *synchronous* AR.





MOBILE AR APPS IN DEMAND

What types of mobile AR would be most valuable to you?



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smart decisions that drive success

N= 2,198

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MOBILE AR APPS IN DEMAND

What types of mobile AR would be most valuable to you?

■ AR USER ■ NON-USER

72%

33%

22%

In-store retail
(product information,
in-store navigation)

Games (Pokemon
Go, NBA AR)

38%

21%

Visualizing large
items in your home
(furniture, new car)

35%

16%

Sports (live stats &
player info during
events)

39%

27%

City guides (menus,
reviews, navigation)

40%

25%

Educational
historical landmarks, museum tours,
astronomy)

25%

19%

In-home technical
support ("see what I
see" remote
assistance)

32%

13%

Social media
(augmenting pictures
and videos)

3%

I'm not interested in
AR on my mobile
device.

39%



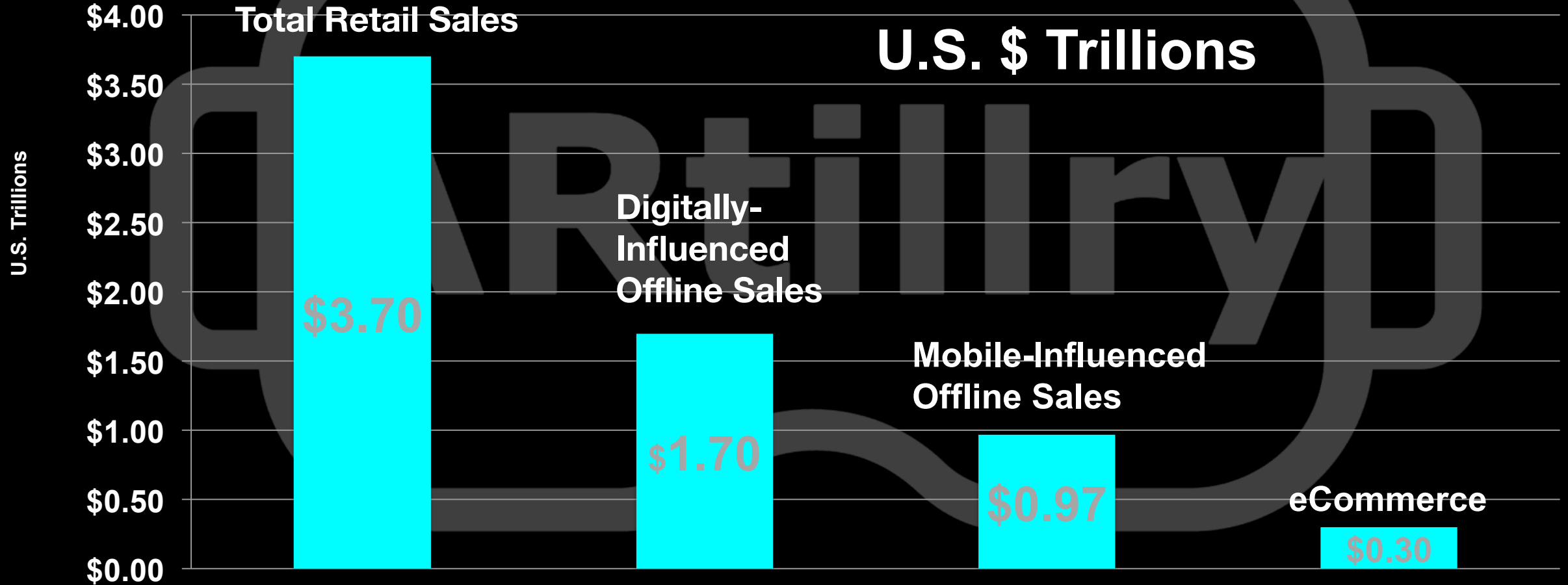
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smart decisions that drive success

N= 2,198

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U.S. CONSUMER SPENDING

AR'S ADDRESSABLE MARKET WILL MAP TO WHERE THE MONEY IS BEING SPENT

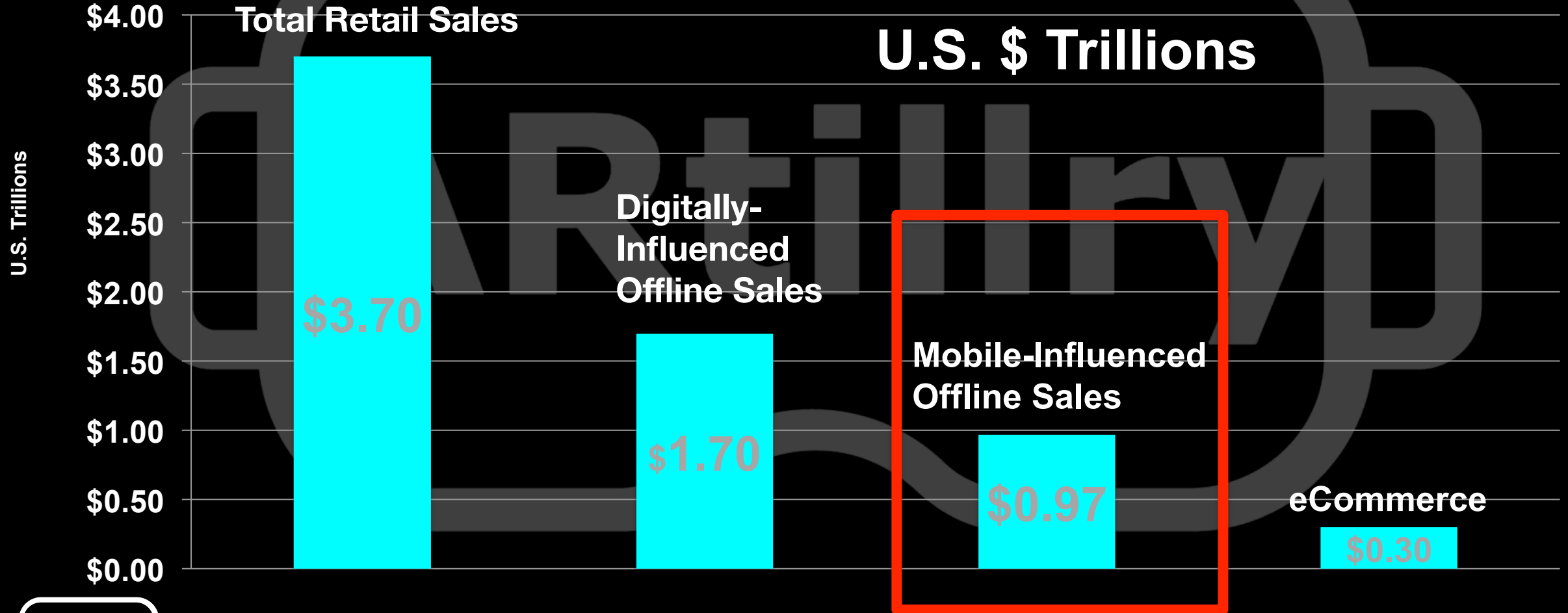


Source: Deloitte Digital

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U.S. CONSUMER SPENDING

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WILD CARDS




Persistence

-  Will Google's cloud anchors work as advertised?
-  Will Apple announce Multi-player at WWDC? What else?
-  Will better technology come from focused startups?

Occlusion

-  Items two blocks away can't appear in view
-  This has turned off many AR newbies expecting logical digital interactions




Fragmentation

-  Will platform interoperability slow AR's growth?
-  Will the AR cloud be fragmented by individual interests (and is that a bad thing)?
-  Digital asset ownership, protection, compensation and incentive

Formats

-  What will be the delivery vessel: Apps vs. Web XR?
-  Common inputs and gestural languages, evolving UX standards

Native Product Development

-  iPhone killer apps took 2-3 years to emerge (Uber, Waze, Foursquare, etc.)
-  Those apps were far from what anyone imagined in 2007
-  AR's killer apps will be far from what anyone imagined in 2017



VIDEO COMPANION

(CLICK LINK TO PLAY VIDEO)

https://youtu.be/_UTq8K_wbSM



ABOUT ARTILLRY INTELLIGENCE

ARtillery is a publication and intelligence firm that examines augmented reality (AR) and virtual reality (VR). 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://artillery.co/about/>



METHODOLOGY

ARtillery Intelligence follows disciplined best practices in market sizing and forecasting, developed and reinforced through its principles' 15 years in research and intelligence in the tech sector. This includes the past 2.5 years covering AR & VR as a main focus.

This report focuses on AR and VR revenue projections in various sub-sectors and product areas. *ARtillery Intelligence* has built financial models that are customized to the specific dynamics and unit economics of each. These include variables like unit sales, company revenues, pricing trends, market trajectory and several other micro and macro factors that *ARtillery Intelligence* tracks.

This approach combines *top-down* and *bottom-up* forecasting methodologies.. Together, confidence is achieved through triangulating revenues and projections in a disciplined way. For more information on what's included and not included in the forecast (a key consideration when evaluating the figures) see the corresponding slide in the introductory section of this report.

More about ARtillery Intelligence's market-sizing credentials can be found at <http://www.mikebo.land/forecasting>

DISCLOSURE AND ETHICS POLICY

ARtillery has no financial stake in the companies mentioned in this report, nor received payment for its production. With respect to market sizing, ARtillery 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.

ARtillery's disclosure and ethics policy can be seen in full at <https://artillery.co/about/disclosure-and-ethics-policy/>

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 as 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)
- XR Advertising (AR Lenses, display ads in VR)

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)



*We will expand category inclusions in future forecasts

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CONTACT & REFERENCE

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