



# ARTILLRY INTELLIGENCE BRIEFING

## MOBILE AR USAGE & CONSUMER ATTITUDES

MARCH 2018

PRODUCED IN PARTNERSHIP WITH





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# Executive Summary

How do consumers feel about mobile AR? Who's using it? How often? And what do they want to see next? Perhaps more importantly, what are non-users' reasons for disinterest? And how can app developers and anyone else building mobile AR apps optimize product strategies accordingly?

These are the questions we set out to answer. Working closely with Thrive Analytics, ARtillry Intelligence wrote questions to be presented to more than 2000 U.S. adults in Thrive's established consumer survey engine. The results are in and we've analyzed the takeaways in a narrative report.

This follows last month's ARtillry Intelligence Briefing<sup>i</sup>, which examined mobile AR app strategies and business models. Now, a deeper view into real consumer usage and attitudes validates those findings, while providing new dimension on mobile AR strategy development and opportunity spotting.

As for the findings, one third of consumers surveyed have used a mobile AR app. And those consumers appear active and engaged, with more than half reporting that they use mobile AR apps at least weekly. The top app category by far is gaming, which we attribute to Pokémon Go's popularity.

Mobile AR users also indicated high levels of satisfaction with the experience. But beyond these and a few other positive signals, there are some negative signs and areas for improvement. For example, non-mobile AR users report low likelihood of adopting soon, and an explicit lack of interest.

This disparity between current-user satisfaction and non-user disinterest underscores a key challenge for immersive technologies: you have to "see it to believe it." In order to reach high satisfaction levels, apps have to first be tried. This presents marketing and logistical challenges to push that first taste.

Put another way, AR's highly visual and immersive format is a double-edged sword. It can create strong affinities and high engagement levels. But the visceral nature of its experience can't be communicated to prospective users with traditional marketing such as ad copy or even video.

The same challenge was uncovered in our corresponding VR report last August<sup>ii</sup> (we'll publish the second wave in Q3). This makes it a common challenge with immersive media like AR and VR. It will take time and cost reductions before they reach a more meaningful share of the consumer public.

Meanwhile, there are strategies to accelerate that process, and to build AR apps that are compelling to consumers' current standards. In the coming pages, we'll examine those strategies and unpack the rest of the survey findings. This is meant to empower readers with a greater knowledge position.





# Key Takeaways

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

## **32% of consumers have tried mobile AR.**

- This represents healthy adoption, but also substantial headroom to grow.
- We expect adoption to accelerate in future VRM survey waves, similar to early smartphone adoption.

## **66% of mobile AR users are active at least monthly. 54% are active weekly or greater.**

- This addresses a key mobile app metric, tied to monetization potential: active users.
- These are relatively high figures, indicating that typical app retention issues are lessened in AR.
- Mobile AR that fuses novelty with frequency (e.g. social messaging) can achieve high active use and retention.

## **Games lead mobile AR usage (83%), followed by social (36%) and product visualization (31%).**

- Game success can result from challenging play, attainable leveling-up, easy onboarding and AR novelty.
- Social app success can result from sticky/frequent behavior (e.g. messaging) and network effect.
- Product visualization succeeds on saving users time and money through more-informed purchases.

## **Consumers want more AR games (72%), city guides (39%), sports (35%) and retail apps (33%).**

- AR city guides and retail are inherently monetizable, and address brick & mortar hunger for innovation.
- AR in sports can likewise provide team owners and broadcasters greater "second screen" engagement.

## **73% of mobile AR users report high or very high satisfaction.**

- There are few consumer products (including VR) that show such high satisfaction levels.
- AR's visual and immersive format captivates consumers as a departure from routine mobile interfaces.

## **53% of non-mobile AR users report definitive disinterest, and 28% reported confusion.**

- These findings signal a need for better consumer education.
- Mobile AR will slowly assimilate, but can be accelerated with the above tactics (e.g. social, gaming).

## **Stark variance between user and non-user attitude underscores AR's double-edged sword.**

- Users are immediately "sold" but it requires pushing that first taste on a wide scale.
- AR's visual and visceral state can't be captured in ad copy or video, creating a marketing challenge.
- Stickiness and social features can carry AR experiences to more users via network effect.

## **64% of mobile AR users will pay \$1.00 or more for apps. 14% will pay \$5.00 or more.**

- This is a strong demand signal, considering greater price sensitivity in the broader app universe.

## **29% of non-users will pay \$1.00 or more for apps. 38% won't pay any amount.**

- This again underscores the stark variance in attitudes between users and non-users.

## **In-app purchases (IAP) showed strong acceptance among users (21%) and non-users (32%)**

- IAP should always be considered as it addresses the largest range of interests.
- Revenue per user is often greater with IAP due to the behavioral economics of micro transactions.

## **Overall, AR attitudes are similar to VR, including non-user apathy and marketing challenges.**

- AR will penetrate faster than VR due to "zero-cost hardware," and less technological invasiveness.
- AR is more scalable due to versatility for all-day use, compared to VR's isolation.

## **Low adoption barriers will accelerate mobile AR's installed base, thus attracting developers and content.**

- More content in turn attracts more users, which further incentivizes developers – a virtuous cycle.
- Technological accelerants will lower barriers further, such as ARkit and ARCore updates.
- Multiplayer support in these toolsets will unlock network effect and further accelerate growth.

# Introduction: A Snapshot

In last month's ARtillery Intelligence Briefing,<sup>iii</sup> we examined mobile AR app strategies and business models. This compelled us to follow up with additional dimension into AR strategies. And the best way to do that is to ask consumers how they feel. So we fielded the latest AR consumer survey.

Working closely with our data partner [Thrive Analytics](#), ARtillery Intelligence wrote questions to present to a sample of more than 2000 U.S. adults. This represents the second wave of Thrive's [Virtual Reality Monitor](#).<sup>iv</sup> And now that the results are in, there are several implications and takeaways.

The survey results are a telling snapshot of mobile AR adoption, which we'll detail in the coming pages. That will include charts and a narrative story arc that unpacks strategic takeaways, and our outlook for mobile AR. But before we take a deeper dive, here's the highlight reel of survey findings.

- 32% of consumers have tried mobile AR.
- 73% of mobile AR users are either satisfied or very satisfied.
- 66% of mobile AR users are active monthly, 54% are active weekly.
- 83% of mobile AR users have used games, 53% have used social apps.
- 72% of mobile AR users want more games, 40% want education apps and 39% want city guides.
- 64% of mobile AR users would pay \$1.00 or more for an app, 14% would pay \$5.00 or more.
- 38% of non-mobile AR users are unwilling to pay any amount for mobile AR.
- 55% of non-mobile AR users are unlikely or extremely unlikely to try mobile AR.
- 28% of non-mobile AR users don't know where to look for apps, or if their phone is compatible.



Image Source: Google Poly

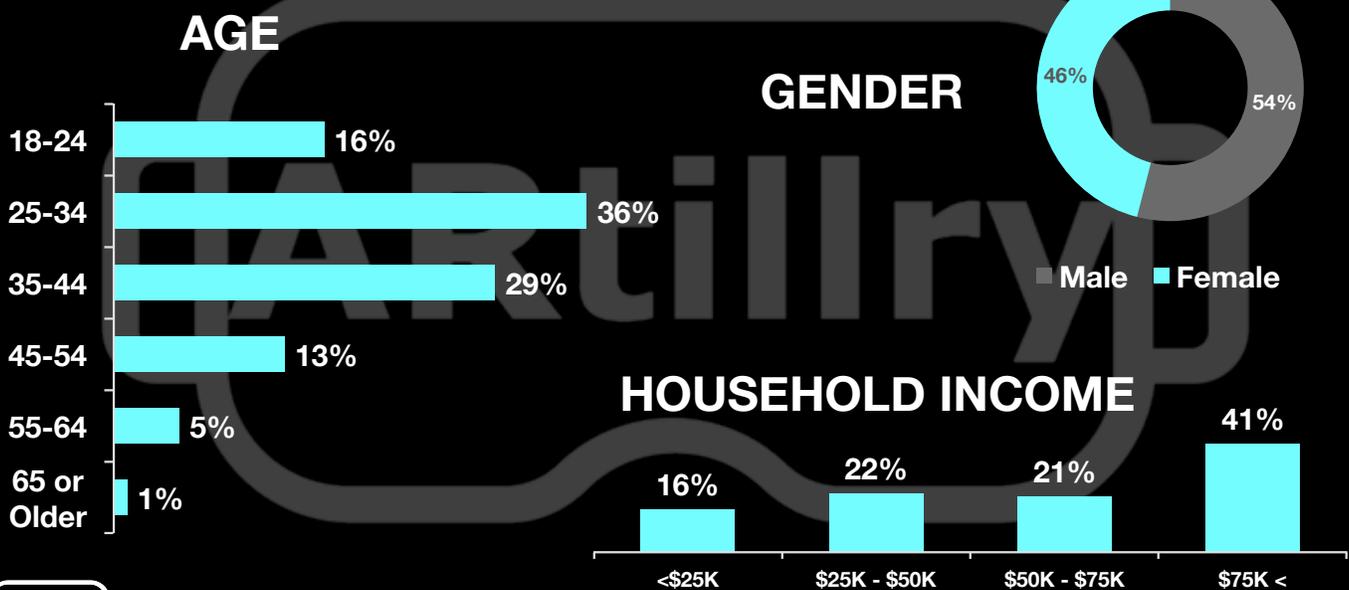


# Survey Audience: The “Who?”

To first add context to the survey findings throughout this report, who’s answering the questions? It includes more than 2000 U.S. adults. Going deeper into demographics and psychographics, the respondents break down as shown below. More detail and segmentation are available on request.<sup>v</sup>

As the data show, the survey sample spans a wide range of U.S. adult consumers. Gender breaks down fairly evenly, while age and income levels skew towards more attractive demographic groups. That includes active and buying-empowered age groups (25-34), and high-income homes (\$75K+).

## MOBILE AR USER PROFILE



Thrive Analytics  
smart decisions that drive success

N= 703

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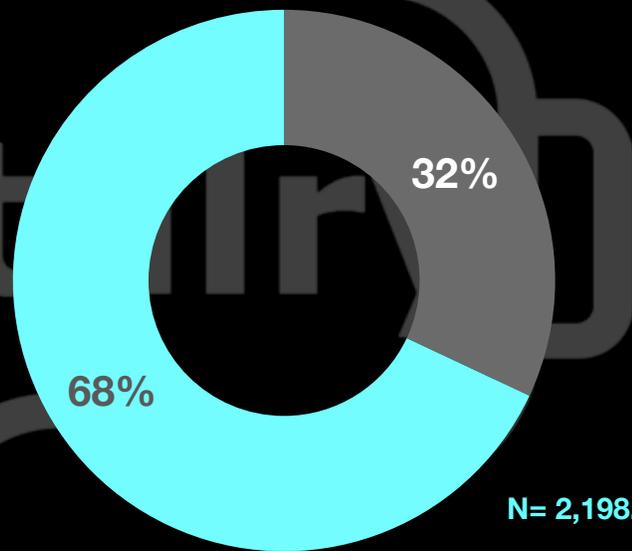
# Usage: The “How Many?”

Starting our analysis at the very top, what’s the overall penetration and adoption of mobile AR among consumers? [Survey results indicate that it currently stands at about a third \(32 percent\)](#). This isn’t surprising, however it’s slightly greater than expected when measured against anecdotal evidence.

This is a positive sign for the health of consumer-based mobile AR: [These figures represent a combination of healthy adoption \(considering the early stage\) and lots of room to grow](#). We expect usage levels to accelerate quickly in future survey waves, similar to early smartphone adoption.

## MOBILE AR APP USAGE

Have you  
used  
mobile  
AR ?



N= 2,198.



■ Yes ■ No

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# Frequency: The “When?”

The quantity of users alone is a binary figure. Either someone has used AR (at least once) or they haven’t. To provide more granularity, how often are they using AR? [This gets to a key metric in mobile apps, which is to set aside download metrics and instead focus on active users](#).



The standard metric that has developed among analyst examinations and first-party reporting is monthly active users (MAU). On that measure, VRM survey data indicate that 66 percent of mobile AR users are active at least monthly. This is a relatively high figure by mobile app standards.<sup>vi</sup>

Going one level deeper, 54 percent of respondents use mobile AR at least once per week and 36 percent do so several times per week. Only 8 percent used AR just once, after initially downloading an app. This indicates that the active-use challenges endemic to mobile apps aren't as great in AR.

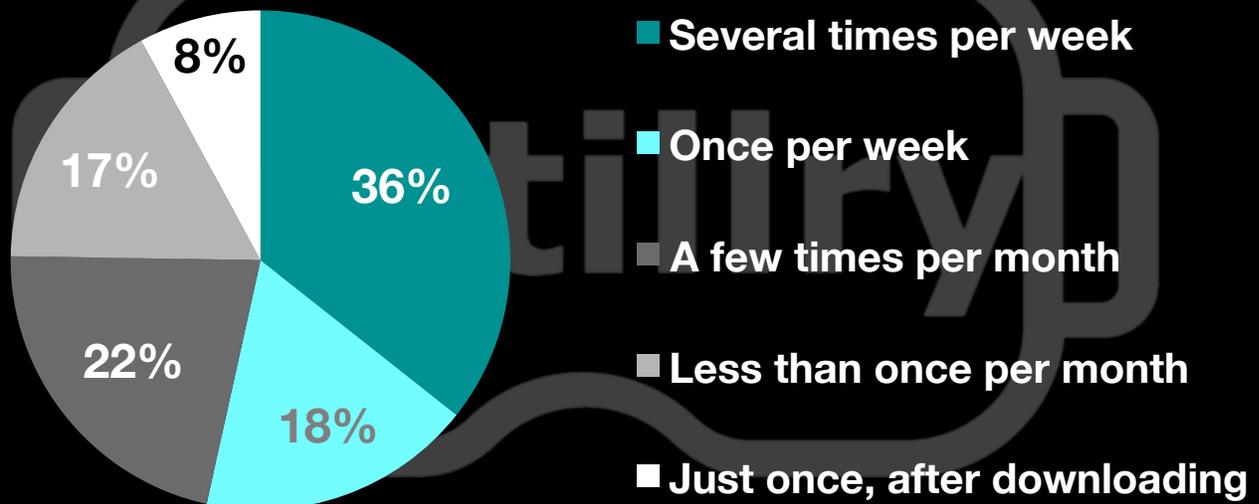
This is surprising because many mobile AR apps we've examined have appeal that lies mostly in novelty. AR is attractive for that reason, but the issue is that novelty wears off quickly. As discussed in last month's Intelligence Briefing, it's advisable to combine that novelty with sticky behavior.

For example, apps or features that fuse AR's visual appeal with frequent or repeatable activities show the most monetization potential (e.g. in-app purchases). These "sticky" behaviors include social messaging, gaming, and commerce-related functions. These are things that happen daily or more.

Back to the active-use figures above, we can surmise that a lot of mobile AR adoption is with apps that inherently offer such frequent and habitual use. This stands to reason, given that the most popular mobile AR apps so far are in gaming and social messaging, which we'll explore next.

## MOBILE AR APP FREQUENCY

How often do you use mobile AR?



N= 703



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# Content: The “What?”

As mentioned, mobile AR’s high reported frequency could be due to the types of apps being used. **And there we see inherently sticky and repeat-use apps score high in the survey responses.** Specifically, games received the highest score by far (83 percent) followed by social (36 percent).

“Games” can mostly be taken to mean Pokémon Go – implicit in its high market share, and explicit in the survey question that was asked. Its addictive play and viral nature has created a clear lead in usage among AR apps. This holds telling signals for success factors for app developers.

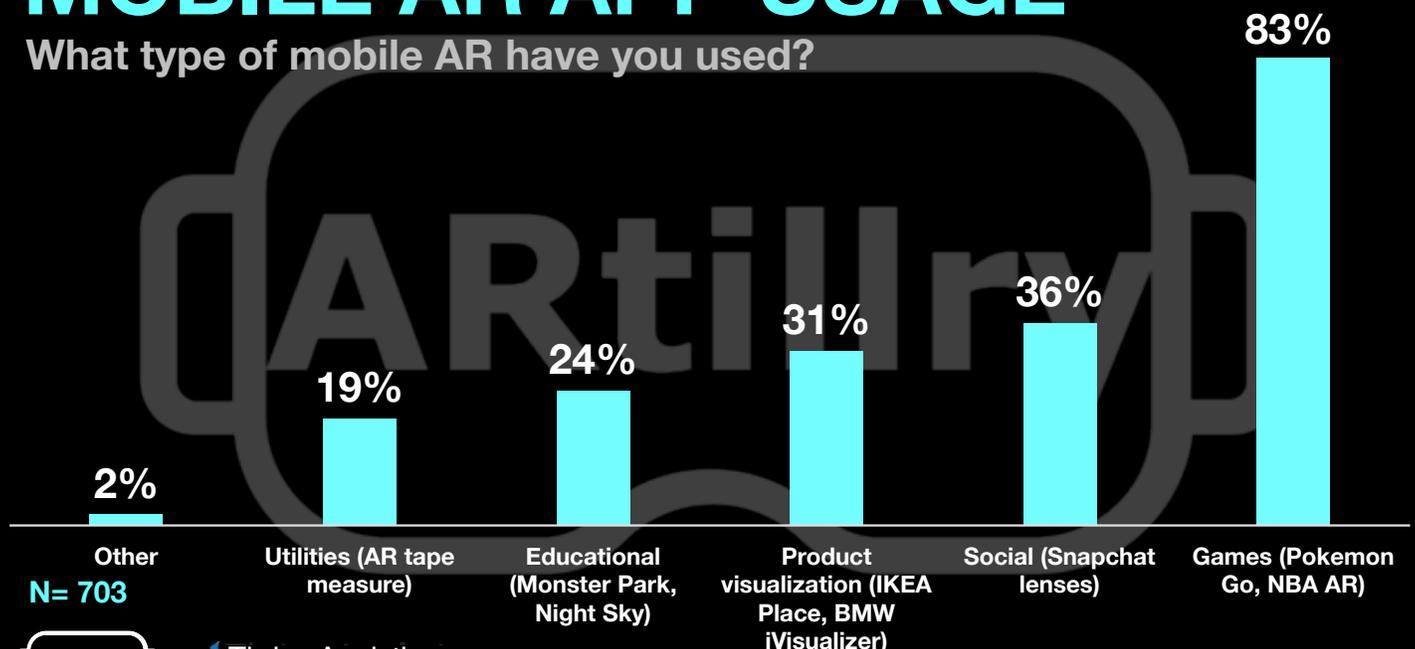
As for what those factors are, it requires an entirely separate report (part of which was covered in last month’s Intelligence Briefing). But in short, **it’s all about game mechanics that strike an optimal balance of challenging play, attainable leveling-up, easy onboarding and novel AR features.**

We’ve already seen apps attempting to clone these game mechanics or “reskin” them to different brands, such as Ghostbusters. Most successful among these will likely be Niantic’s follow up to Pokémon Go, which will apply its proven architecture and game mechanics to a Harry Potter theme.

Moving on to social apps, their high-usage ranking is likely due to Snapchat’s AR lenses. This once again carries the merits of a frequent and sticky behavior: social messaging. It’s also something that is inherently viral because of the social two-way or one-to-many framework of Snapchat.

## MOBILE AR APP USAGE

What type of mobile AR have you used?



N= 703



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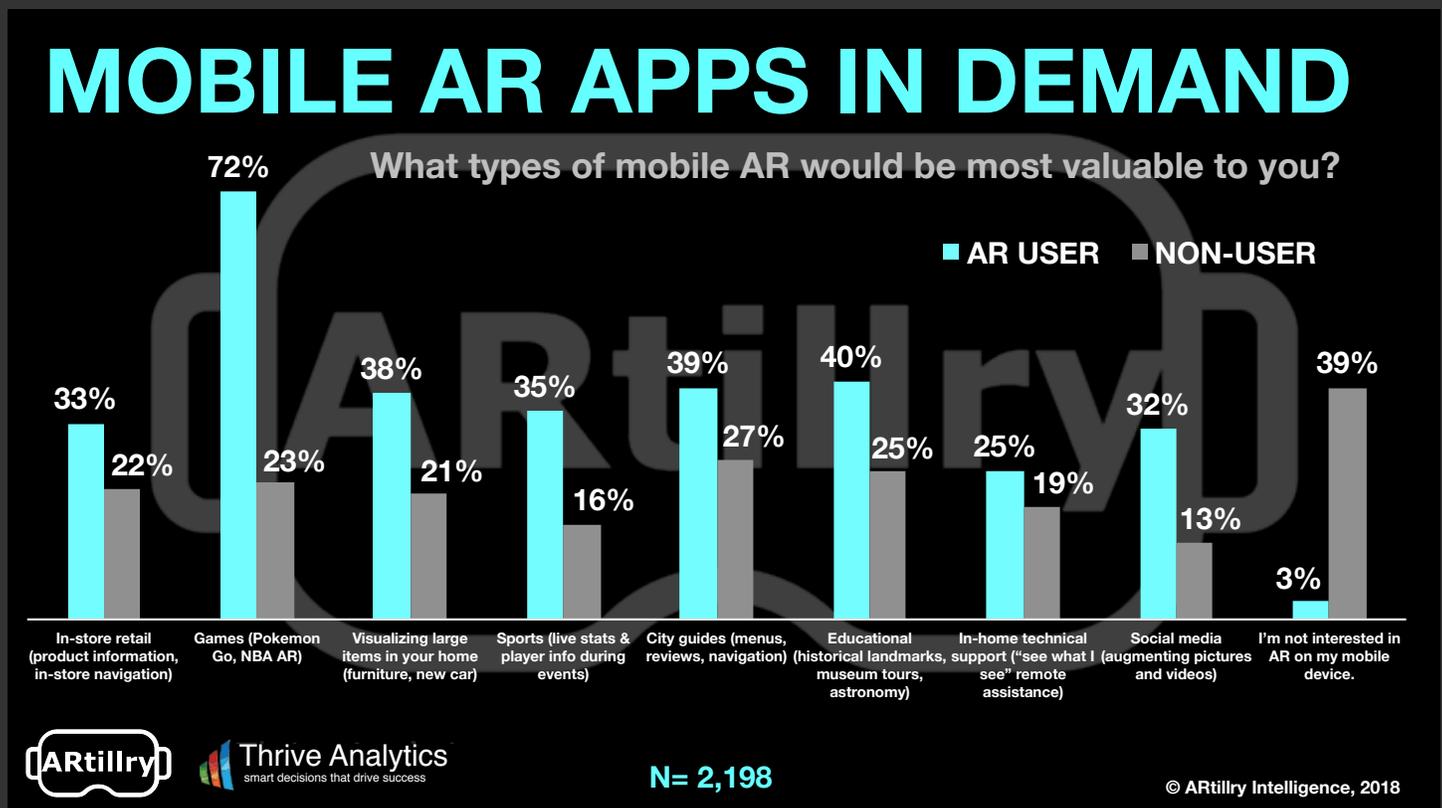
The thing to watch next is Snapchat's forthcoming AR features. These include AR Geofilters, which adds an AR twist to the already-proven geofilters ad format. **Geofilters also happen to be monetized, which could signal new areas of mobile AR revenue. Valuable lessons will emerge from this.**

To acknowledge other categories, product visualization (31 percent) and utilities (19 percent) offer user value. Though less frequent, product visualization apps like IKEA Place and BMW's iVisualizer can save consumers time and headaches, as examined last month, by enabling informed purchases.

Regarding education (24 percent), mobile AR offers visual learning that's effective and appealing to children. It can also apply to higher education, particularly the sciences, given 3D visualization of complex objects. And the price is right, given the "zero-cost hardware" of an existing smartphone.

## Demand Signals

Perhaps more important than consumers' current usage is their sentiment about what's coming next. Gaming again was the clear winner (72 percent), and there's likewise demand for education (40 percent) and product visualization (38 percent). But here, we also see new categories emerge.





These include city guides (39 percent), sports (35 percent) and retail (33 percent). City guides and retail align well with AR, given the potential to overlay product info like reviews and promotions. Moreover, they're monetizable and come at a time when brick & mortar retail is hungry for innovation.

Speaking of hungry for innovation, AR in sports can provide team owners the ability to create more compelling arena experiences, such as player stats and additional layers of entertainment.<sup>vii</sup> Meanwhile broadcasters can battle cord-cutting with compelling "second-screen" mobile AR features.

Here we also see an important trend – users are more vocal about desired apps than non-users. This is shown across all app categories above, and validates a key disparity: Users are "sold" and highly engaged. Non-users conversely show explicit disinterest... but mostly because they haven't tried it.

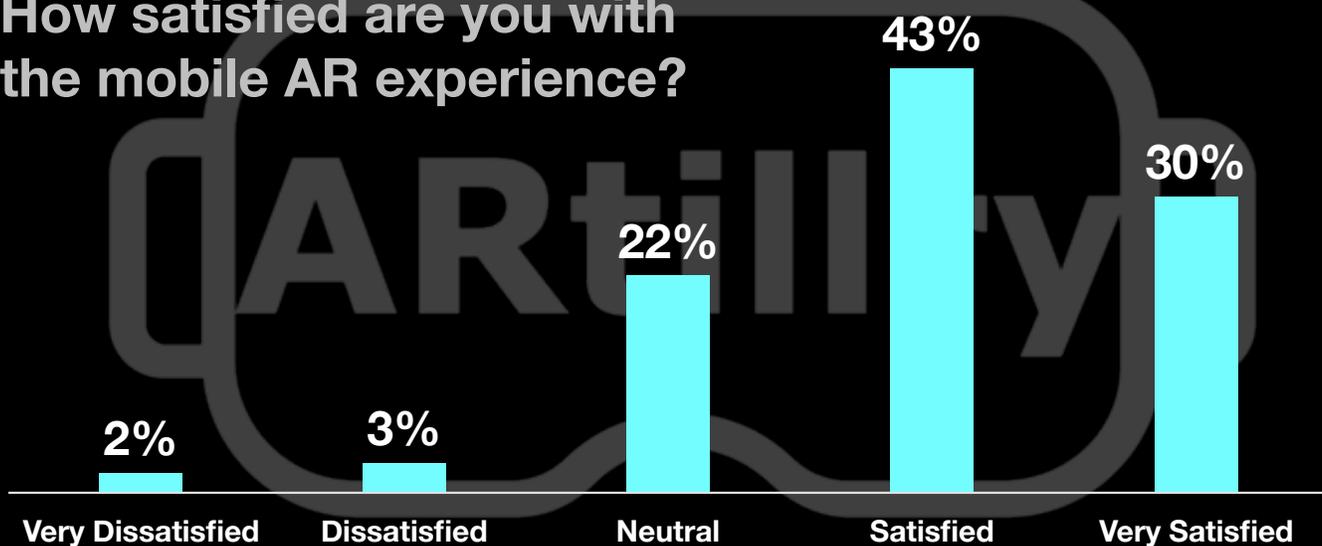
This is an important finding, which we'll explore next.

## Satisfaction: The "How Good?"

Another positive sign for mobile AR is the satisfaction levels that current users report. 73 percent report either high (43 percent) or very high (30 percent) satisfaction levels. 22 percent remain neutral and only five percent report low or very-low satisfaction. These are strong quality signals.

### MOBILE AR APP SATISFACTION

How satisfied are you with the mobile AR experience?



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smart decisions that drive success

N= 703

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In fact there are few consumer product that show such high satisfaction levels. As a point of comparison, the VR findings from Virtual Reality Monitor that we examined in August's Intelligence Briefing<sup>viii</sup> were likewise high. But they were still slightly lower than these reported AR sentiments.

This tells us a few things. For one, AR's highly visual and immersive format is already proving to captivate consumers. This is largely due to its revolutionary – rather than evolutionary – interface when compared with non-immersive mobile app experiences that have become routine.

It also counters some of the observations we made in last month's Intelligence Briefing that early mobile AR development will comprise mostly sub-par experiences. We stand by the assertion that apps will evolve a great deal, just as early iOS apps did, but high satisfaction is happening already.

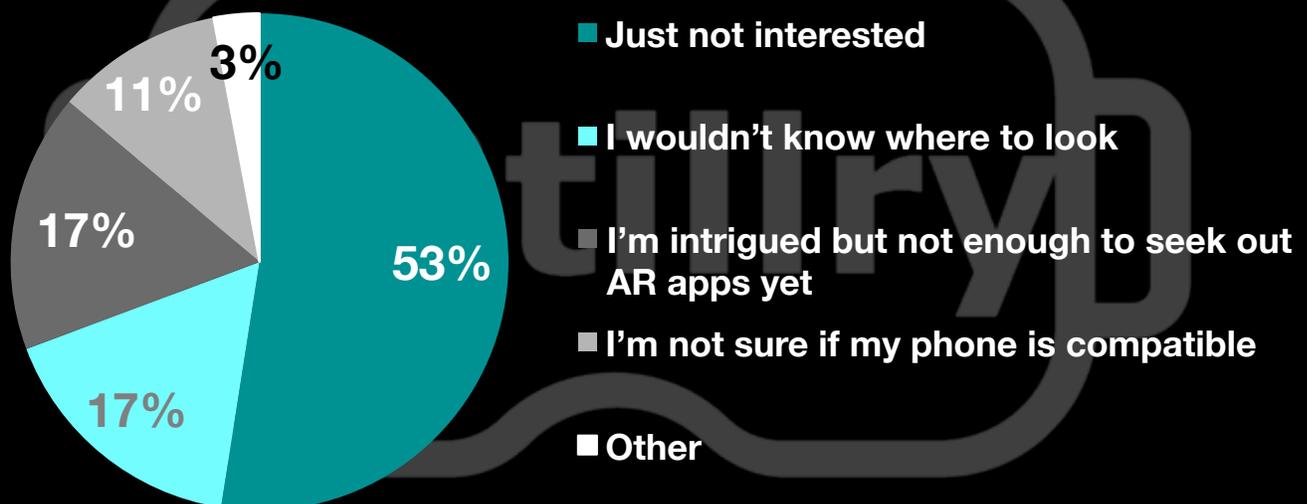
## Not So Fast...

But mobile AR sentiments aren't all good news. When looking at non-users, we see the opposite. 53 percent of non-mobile AR users report that their reason for disinterest is the rather definitive "just not interested." This represents a daunting barrier for mobile AR proponents to overcome.

Meanwhile 28 percent reported confusion with mobile AR. That includes "I wouldn't know where to look," (17 percent) and "I'm not sure if my phone is compatible" (11 percent). Meanwhile, 17 percent reported interest but not enough to go through the trouble of looking for and downloading AR apps.

## MOBILE AR NON-USER SENTIMENT

WHY HAVEN'T YOU USED MOBILE AR?



Thrive Analytics  
smart decisions that drive success

N= 1,495

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Going beyond reasons for disinterest, we also asked about the likelihood of being swayed by mobile AR in the next 12 months. There, the answers were similarly daunting, with the majority of respondents (55 percent) reporting that they are unlikely or extremely unlikely to adopt.

Overall, these findings are telling. The answers each tell their own stories while they collectively demonstrate a common theme. **Starting with the commonalities, all responses signal a need for better consumer education.** This is especially true for the technologically-confused sentiments.

This challenge will recede as consumers develop more acclimation and comfort levels with AR over time. **But for now, this should tell the industry that AR remains in “techy” territory in terms of confusion and other factors that scare people away...** or at least exacerbate an ambivalent attitude.

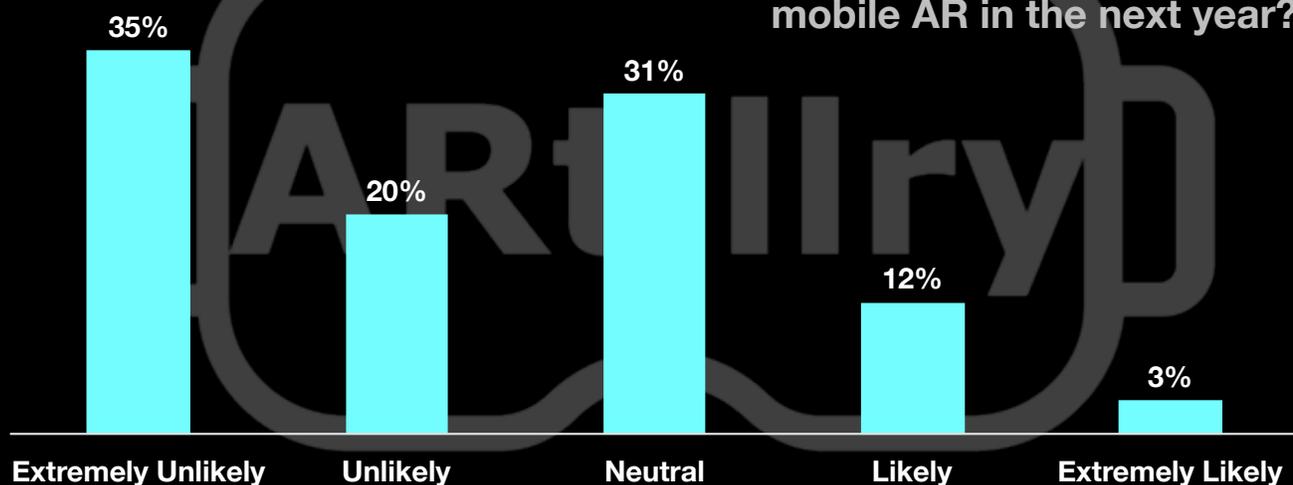
As for the “just not interested” crowd, that’s perhaps the most damning of these non-user responses. Not only is it supportive of more consumer education, like the above points, but it highlights a key challenge for immersive tech. Because it’s so visual and visceral, you have to see it to believe it.

In other words, the variance in satisfaction for users and non-users underscores AR’s marketing challenge. **People love it after they get a taste... but you have to get them to taste it before achieving that coveted point of satisfaction. And with AR, it’s difficult to do this through ad copy or video.**

This will slowly alleviate over time as mobile AR naturally assimilates into the consumer population through viral and other means. **Meanwhile, adoption for any given app can be accelerated through stickiness and social features that carry the experience to more users via network effect.**

## ADOPTION LIKELIHOOD (NON-USERS)

How likely are you to use mobile AR in the next year?



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smart decisions that drive success

N= 1,495

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# Price: The “How Much?”

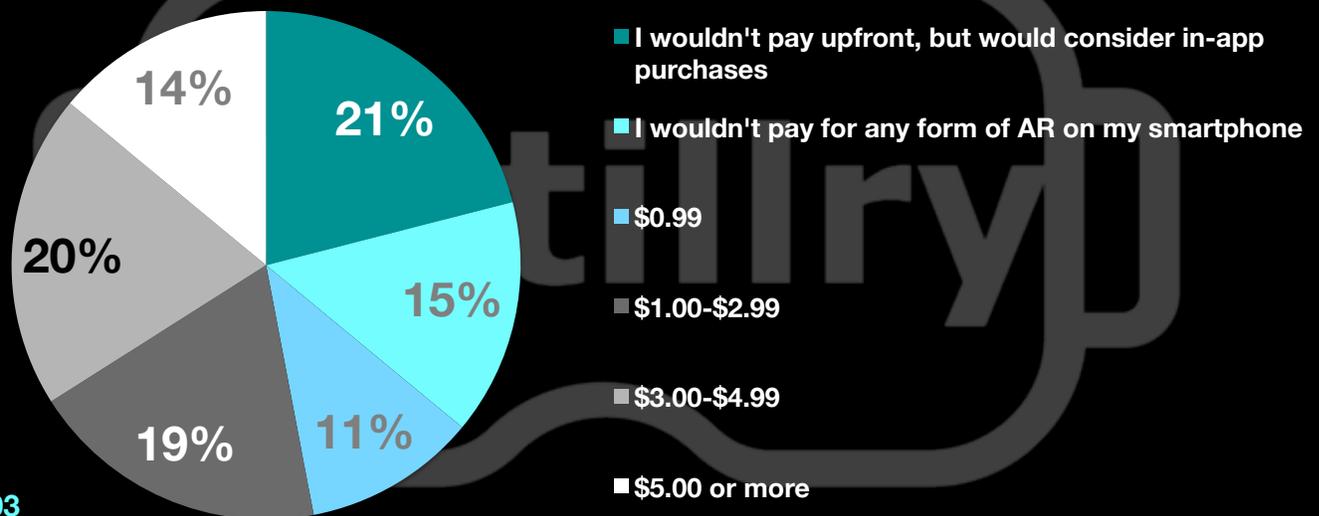
Last but not least in VRM survey responses is the all-important matter of price. Once again, this is delineated between mobile AR users and non-users – with varying responses for each. Starting with users, 64 percent will pay \$1.00 or more for AR apps. And 14 percent will pay more than \$5.00

This is a strong demand signal, considering greater price sensitivity in the broader universe of mobile apps. We attribute this higher willingness to pay for mobile AR to the same factors explored earlier regarding satisfaction. High satisfaction with AR logically correlates to more willingness to spend.

It’s also important to acknowledge in-app purchases. 21 percent of respondents reported that they won’t pay upfront for mobile AR apps but they will pay for items in apps or games. We can surmise that some portion of the groups willing to pay upfront are also open to in-app purchases.

## MOBILE AR APP PRICING (CURRENT USERS)

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



N= 703



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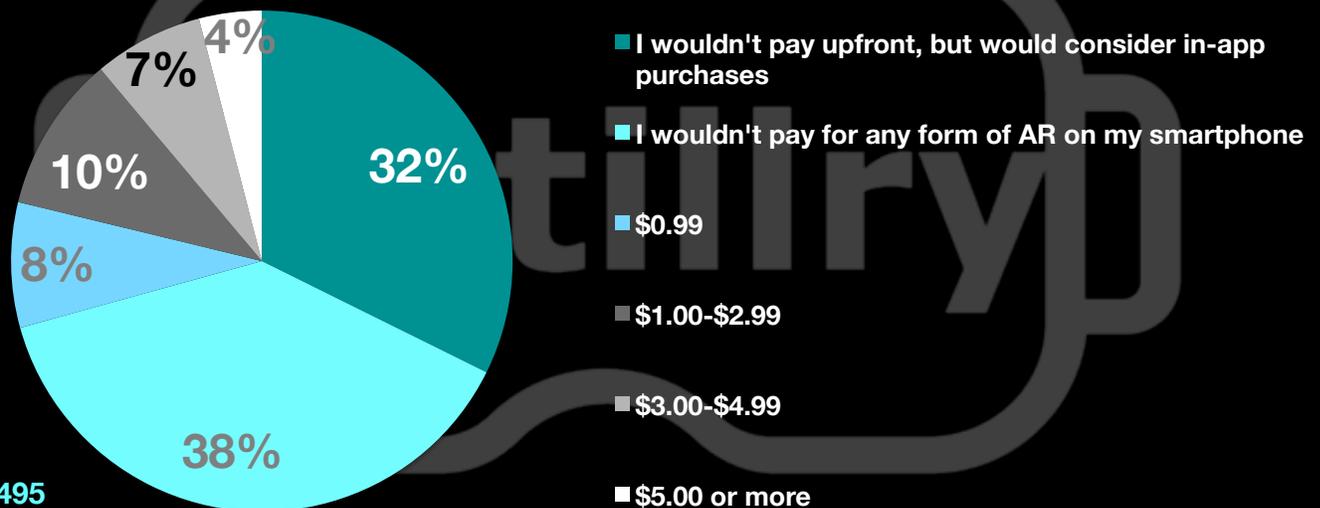
Meanwhile, non-users sing a different tune when it comes to price sensitivity. Only 29 percent of those respondents will pay \$1.00 or more for mobile AR apps. More worrisome is that the greatest share of responses (38 percent) is unwilling to pay *any amount* of money for mobile AR.

However, one positive signal from non-users is that 32 percent would consider in-app purchases after having downloaded a free mobile AR app. Along with the current-user responses, this indicates that in-app purchases should be considered to address the largest range of users and affinity groups.

In fact, in-app purchases can be advantageous for several reasons. Average revenue per user is often greater than upfront app purchases, due to the behavioral economics of micro transactions. It depends on the app (gaming often drives in-app purchases) but it should always be considered.

## MOBILE AR APP PRICING (NON- USERS)

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



N= 1,495



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# Final Thoughts: Strategic Implications

One of the key themes throughout this survey is the stark difference in sentiment between mobile AR's current users and non-users. The former show high satisfaction, demand for app functionality and willingness to pay. Non-users conversely show explicit disinterest and price sensitivity.

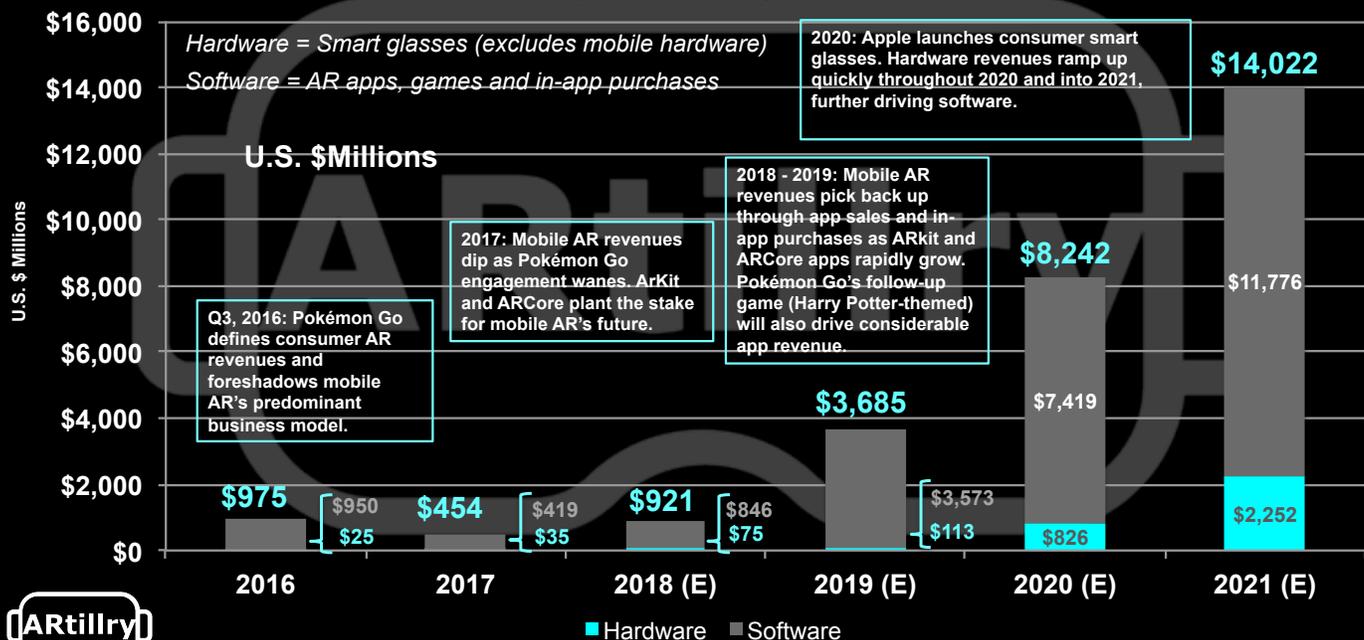
These findings hold important lessons for mobile AR proponents. Once again, it's a double-edged sword: AR's highly visceral interface captivates users. But that same orientation makes it so the advantages can't be communicated adequately by traditional methods of product marketing.

Consumers need to experience mobile AR before they become converts, which presents logistical challenges in pushing that "first taste" on a wide scale. So it will take time for assimilation to happen naturally, though we will see accelerants such as updates to Apple's ARKit and Google's ARCore.

Interestingly, the "double-edged sword" is similar in VR, as we examined in August for VRMs corresponding VR data. But the good news for AR is that pushing that first taste involves "zero-cost hardware" (existing smartphones), and less technological invasiveness (no headset to strap on).

## CONSUMER AR: HARDWARE VS. SOFTWARE

(DETAILED VIEW)





Based on those lower barriers, we believe that **AR – or at least mobile AR – will reach consumer acclimation and substantial penetration levels much faster than VR.** This joins AR's other scalability advantages over VR, such as versatility for all-day use, thus creating a larger market opportunity.

That faster penetration will in turn create more incentive and potential scale for app developers, when compared with VR. **This will result in more content and apps that are created for AR over the coming months, which in turn attracts more consumers. This continues in a sort of virtuous cycle.**

Other accelerants include viral impact from social AR experiences. We saw this with Snapchat's AR lenses, and the social aspects of Pokémon Go. This factor will grow as multiplayer support – where two users can interact with the same positional-tracked graphics – is added to AR tools like ARkit.

## Remember Fundamentals

Meanwhile, VRM survey data can inform mobile AR strategies. For example, optimal price points are key to business models. Aim too high, and it can have an elastic effect on demand. Aim too low, and it can leave money on the table. In-app purchases enable yield-optimization through variable pricing.

Similarly, it's advisable to build experiences that have stickiness or replayability. **This brings a new flavor to a longstanding mobile app strategy: optimize for high frequency and active use, as opposed to high download figures.** This also correlates to in-app purchases, which monetize active use.

This is one of many historical lessons that will apply to AR, and is evident in VRM results. But it's also early, so constant examination is required. User behavior and standards will evolve, just like they did with early smartphone apps. Those who develop mobile AR accordingly will see the most success.



# Video Companion: Mobile AR App Strategies

(click URL to open)

<https://youtu.be/vRQiKzrfDGs>





# Key Takeaways (redux)

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

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- We expect adoption to accelerate in future VRM survey waves, similar to early smartphone adoption.

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# About ARtillery Intelligence

ARtillery 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://artillery.co/about>





# About Thrive Analytics



Thrive Analytics is a leading digital marketing research and customer engagement consulting firm. With clients spanning leading national brands as well as publishers and agencies serving the small business community, it pairs proprietary market research services and data analytical tools with time-tested business insights and methodologies to help organizations measurably improve customer experience, loyalty and sales results. Its mission is to provide superior research and support services that inspire clients to make smarter decisions. For more information or to contact, visit:

<http://www.thriveanalytics.com>

# About Virtual Reality Monitor

Virtual Reality Monitor™ is Thrive Analytics' proprietary survey of virtual reality/augmented reality technology users. These surveys, conducted semi annually, track the adoption rates, usage, satisfaction levels, profiles and many other areas related to VR/AR users. Each wave has a customizable section for client specific inquiries. Results & key insights are communicated in advisory reports & presentations, charts & infographics, newsletters & articles and custom data views. Information from these studies are used by marketers, product managers, consultants and other people working in the technology space.

# About Intelligence Briefings

ARtillery 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://artillery.co/artillery-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 *ARtillery 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/>





# Methodology

ARtillery Intelligence has partnered with Thrive Analytics by writing the questions for the Virtual Reality Monitor consumer survey. These questions were fielded to 2,198 U.S. Adults. Additionally, ARtillery Intelligence wrote this report, which contains its own insights and viewpoints on the survey results.

For market sizing and analysis, *ARtillery 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 2.5 years covering AR & VR exclusively, as seen in research reports and daily reporting.

Thrive Analytics likewise follows best practices in consumer research, developed over its long tenure as a consumer research firm. More information and background on each firm can be seen in the preceding "about us," sections, or through the website links included with those descriptions.

More details about the survey sample (demographics, etc.) can be seen in this report's introduction.

# Disclosure and Ethics Policy

ARtillery has no financial stake in the companies mentioned in this report, nor was it commissioned to produce it. 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/>

# Contact

Questions and requests for deeper analysis can be submitted at:

<https://artillery.co/contact/>





# References

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<sup>i</sup> ARtillery Intelligence Briefing, *Mobile AR: App Strategies and Business Models*, February, 2018  
<http://artillery.co/artillery-intelligence/mobile-ar-app-strategies-and-business-models/>

<sup>ii</sup> ARtillery Intelligence Briefing: *VR Consumer Usage & Attitudes*, August 2017:  
<http://artillery.wpengine.com/wp-content/uploads/2017/08/intelligence-briefing-august-abridged2.pdf>

<sup>iii</sup> ARtillery Intelligence Briefing, *Mobile AR: App Strategies and Business Models*, February, 2018  
<http://artillery.co/artillery-intelligence/mobile-ar-app-strategies-and-business-models/>

<sup>iv</sup> Thrive Analytics *Virtual Reality Monitor*:  
<http://www.thriveanalytics.com/Virtual%20Reality%20Monitor.html>

<sup>v</sup> Contact us at: <https://artillery.co/contact/>

<sup>vi</sup> Localytics Mobile App Retention Data: <http://info.localytics.com/blog/mobile-apps-whats-a-good-retention-rate>

<sup>vii</sup> ARtillery interview with the Golden State Warriors: <https://artillery.co/2016/06/06/the-beginning-of-the-beginning-an-evening-with-the-vrara-gopro-and-gs-warriors/>

<sup>viii</sup> ARtillery Intelligence Briefing: *VR Consumer Usage & Attitudes*, August 2017:  
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