ARtillery Intelligence

ARtillery Intelligence Briefing

AR Usage & Consumer Attitudes, Wave III

May 2020

PRODUCED IN PARTNERSHIP WITH

Thrive Analytics

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**, **ARtillery Intelligence** wrote questions to be presented to more than **1,000** 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 several months of ARtillery Intelligence Briefings that examine social, gaming and commerce-driven AR. Now, a deeper view into real consumer usage and attitudes validates those narratives while providing new dimension on mobile AR strategies and opportunity spotting.

So what did we find out? At a high level, mobile AR usage is up to **26 percent** of U.S. adults. Many of these users experience mobile AR through apps, such as those built on **ARkit** and **ARCore**. But there's faster growth for lower-friction experiences such as "AR-as-a-feature" and web AR.

Mobile AR users also appear active and engaged across the board, with **just under half** of users reporting that they engage at least weekly. The top app category is gaming, which we attribute to **Pokémon Go's** popularity. But other categories such as social AR and visual search are growing faster. 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, and an explicit lack of interest.

This disparity between current-user satisfaction and non-user disinterest continues to underscore a key challenge for AR: you have to experience it to really *get it*. But there's little drive for users to get that first taste without first seeing the benefits. This boils down to a classic "chicken & egg" dilemma that represents a core marketing challenge for AR.

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 chicken & egg challenge was uncovered in our corresponding VR report last month[i]. This makes it a common challenge with immersive tech, though AR is relatively advantaged by mobile ubiquity. Still, it will take time and acclimation before AR reaches a more meaningful share of the population.

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

Table of Contents

Key Takeaways

- **26% of consumers have tried mobile AR.**
  - This represents healthy adoption, but also substantial headroom to grow.
  - We expect adoption to accelerate in future survey waves, similar to early smartphone adoption.

- **51% have used "AR-as-a-feature, 50% ARCore apps, 36% ARkit apps, and 18% web AR.**
  - AR-as-a-feature (AR within non-AR apps) took the lead for the first time this year.
  - Practiced by top AR apps like Snapchat (lenses), this represents the most successful AR distribution strategy.
  - Though apps have an early lead, web AR's advantages will vault it forward in the coming years.

- **71% of mobile AR users are active at least monthly. 46% are active weekly or greater.**
  - Active frequency is a key mobile app metric that impacts monetization potential, such as in-app purchases.
  - Mobile AR that fuses novelty with frequency (e.g. social messaging) can achieve high active use and retention.
  - Visual search is also an emerging mobile AR use case that breeds high-frequency use.

- **Games lead mobile AR usage (84%), followed by social (40%) and product visualization (35%).**
  - Social app success can result from sticky/frequent behavior, viral growth and network effect.
  - Product visualization succeeds on saving users time and money through more-informed purchases.
  - Though it didn't score among the top three, the greatest growth rate among AR categories is in visual search.

- **Mobile AR users want more AR games (63%), retail apps (43%), education (39%) and city guides (38%).**
  - Mobile AR gaming dropped from last year's aspirational rankings, while retail apps grew significantly.
  - AR city guides and retail apps are not only gaining popularity but are inherently monetizable.

- **68% of mobile AR users report high or very-high satisfaction.**
  - AR's visual and immersive formats can captivate consumers as a departure from routine mobile interfaces.
  - That said, satisfaction ratings are down from last year, representing a potential backlash to early AR hype.

- **54% of non-mobile AR users report definitive disinterest, and 28% report confusion.**
  - Stark variance between user and non-user attitudes underscores AR's "chicken & egg" dilemma.
  - Because it's so visual and visceral, you have to experience it to really *get it*.
  - Yet without that experience and perspective, there's little motivation to get a first taste.
  - Compounding these challenges, AR's immersive qualities can't be captured in ad copy or video.

- **55% of mobile AR users will pay $1.00 or more for apps. 15% will pay $5.00 or more.**
  - This compares with 19% of non-users who will pay $1.00 or more for apps. 42% won't pay any amount.
  - Price sensitivity underscores another stark variance in attitudes between users and non-users.

- **In-app purchases (IAP) showed strong acceptance among users (20%) and non-users (30%)**
  - IAP should always be considered as it addresses the largest range of interests.
  - Pokémon Go has made $3 billion+ to date through IAP, inheriting an established model from mobile gaming.
  - Revenue per user is often greater with IAP due to proven behavioral economics of micro transactions.

- **AR's true widescale adoption will hinge on the release of a killer app in the next few years.**
  - There's not enough of an adoption impetus yet for mainstream consumers to flock to AR en-masse.
  - Broad AR appeal and high-frequency use could result from valuable"all-day" utilities such as visual search.
  - Developers' acclimation and "native footing" is underway and will be a key factor in bringing a killer app to market.

Introduction: A Snapshot

ARtillery Intelligence monthly reports often cover topics like AR's social, advertising and commerce strategies. This compels additional dimension into AR usage. And the best way to get that is to ask consumers how they feel. The result is the latest AR consumer survey.

Working closely with our consumer research partner **Thrive Analytics**, ARtillery Intelligence wrote questions for a sample of more than **1,000** U.S. adults. This represents the third wave of Thrive Analytics' **Virtual Reality Monitor**.[ii] 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.

- **26%** of consumers have tried mobile AR, up from **22%** in Wave II
- **50%** of mobile AR users have used ARCore apps, **36%** ARkit apps and **18%** web AR.
- **68%** of mobile AR users are either satisfied (**27%**) or very satisfied (**41%**).
- **71%** of mobile AR users are active at least monthly, **46%** are active at least weekly.
- **84%** of mobile AR users have used games, **40%** have used social apps.
- **63%** of users want more games, **43%** want in-store retail apps and **40%** want education apps.
- **55%** of mobile AR users would pay **$1.00** or more for an app, **15%** would pay **$5.00** or more.
- **42%** of non-mobile AR users are unwilling to pay any amount for mobile AR.
- **59%** of non-mobile AR users are unlikely or extremely unlikely to adopt mobile AR.

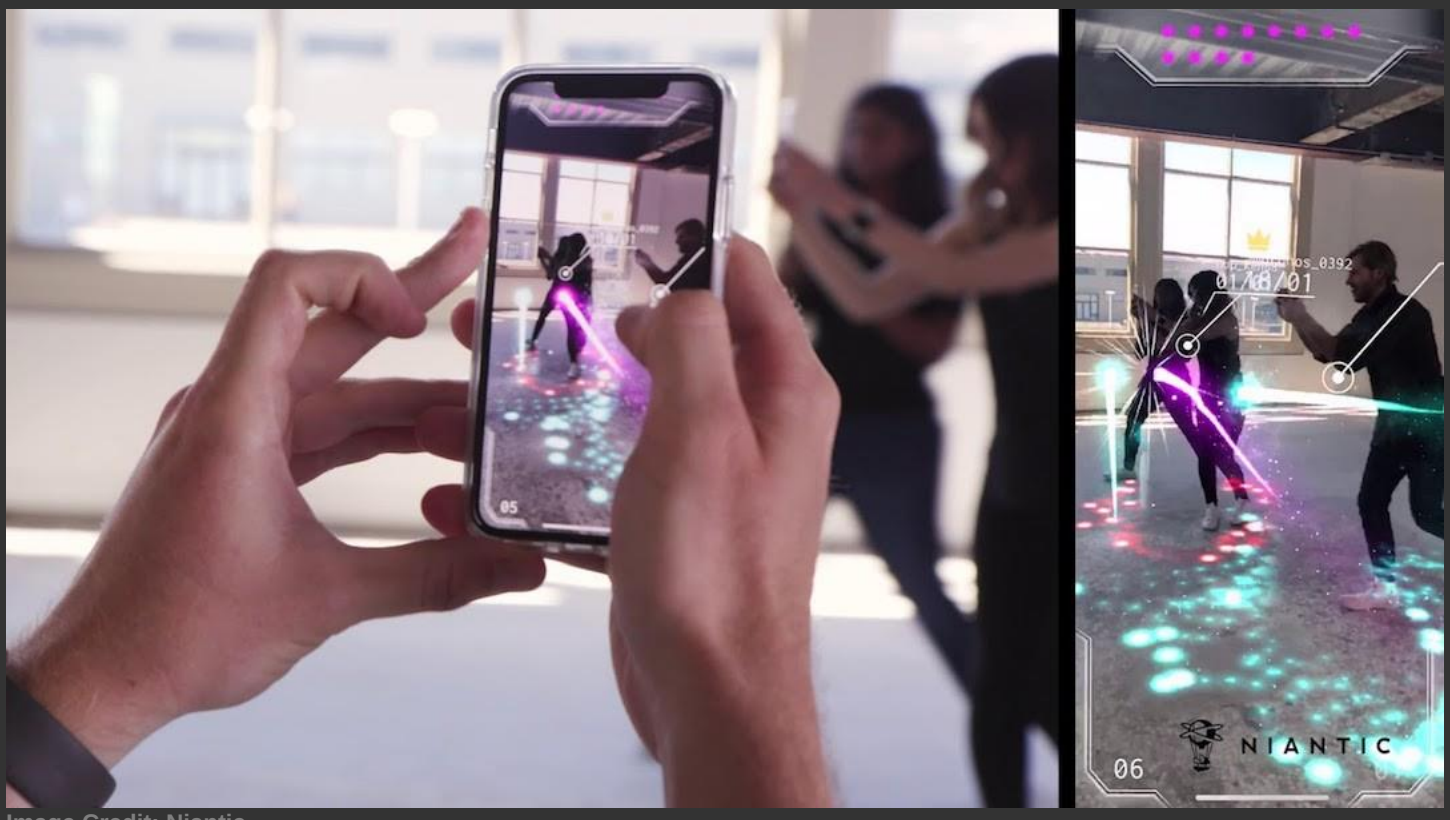


Image Credit: Niantic

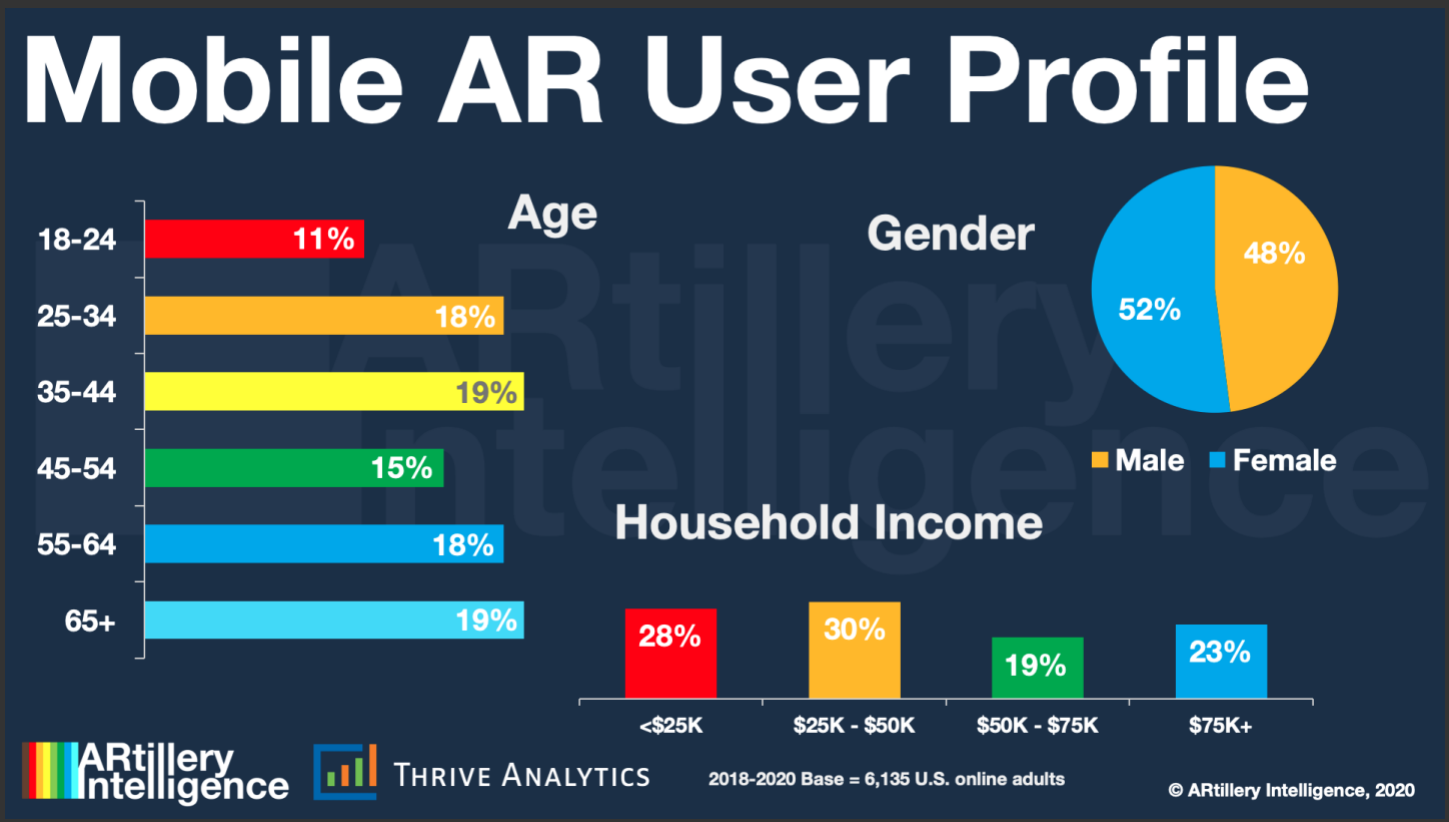
Survey Audience: The *Who?*

To first add context to survey findings throughout this report, who's answering the questions? It includes more than **1,000** U.S. adults. Going deeper into demographics and psychographics, the respondents break down as shown below. More detail and segmentation are available upon request.[iii]

As the data show, the survey sample spans a wide range of U.S. adult consumers. Gender breaks down fairly evenly, as do age and income levels. The latter include attractive demographic groups such as active and buying-empowered ages (**25-44**), and high-income homes (**$75K+**).

This is all a function of **Thrive Analytics'** longstanding position and strategy development in consumer surveys. Its time-tested methodology and survey network comply with industry standards and best practices. ARtillery will continue working with Thrive for annual AR and VR consumer surveys.

"AR and VR are still in early-adoption phases," said **Thrive Analytics** managing partner **Jason Peaslee**. "There are still technology challenges, but we think AR & VR have the ability to transform the way people work, connect, and learn. We're excited about the prospects, and committed to measuring them."



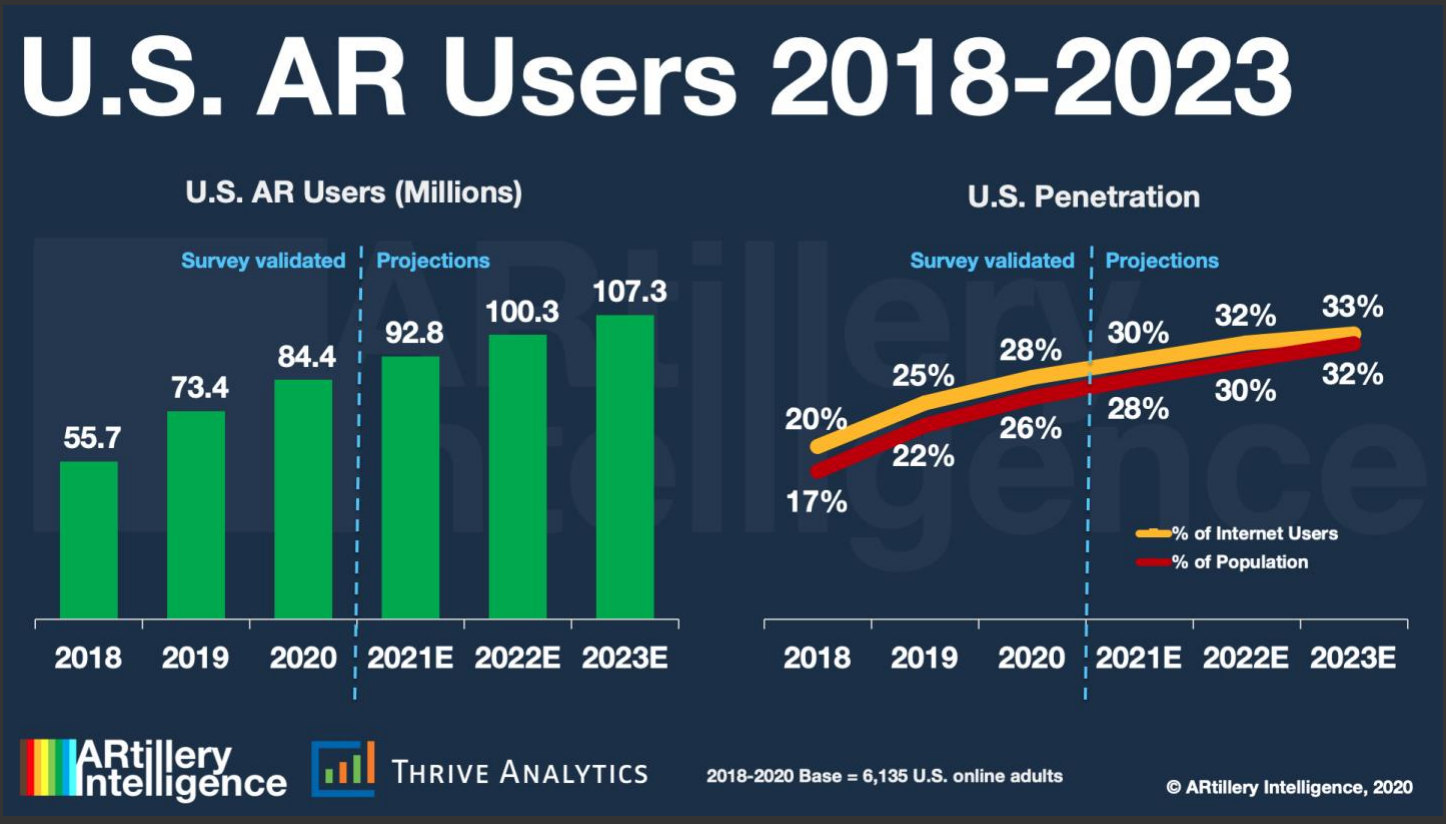
Part I: AR *User* Attitudes

To organize strategic takeaways in this report, we've delineated the sentiments of AR ***users*** and ***non-users***. Both can provide telling signals for AR product development and strategy refinement. Starting with current users, what are they saying and thinking? The following sections dive in.

Usage: The *How Many?*

Starting at the very top, what's mobile AR's overall penetration and adoption among consumers? Survey results peg it at **26 percent** of U.S. adults. This is up from **22 percent** in Wave II of the study, indicating a healthy growth rate. This counters claims in the media that AR adoption has flatlined.

In fact, adoption in mid-twenty percent ranges – including measured year-over-year growth – signal a combination of healthy traction and lots of room to grow. AR is still in early stages of its industry lifecycle, and we expect usage to accelerate in future survey waves as consumer comfort levels advance.



Formats: The *How?*

Drilling down one level, how and in what formats are AR users consuming the experience? Given that **Apple** and **Google's** AR developer kits (**ARkit** and **ARCore**) have democratized mobile AR, they're collectively the leading delivery channels.

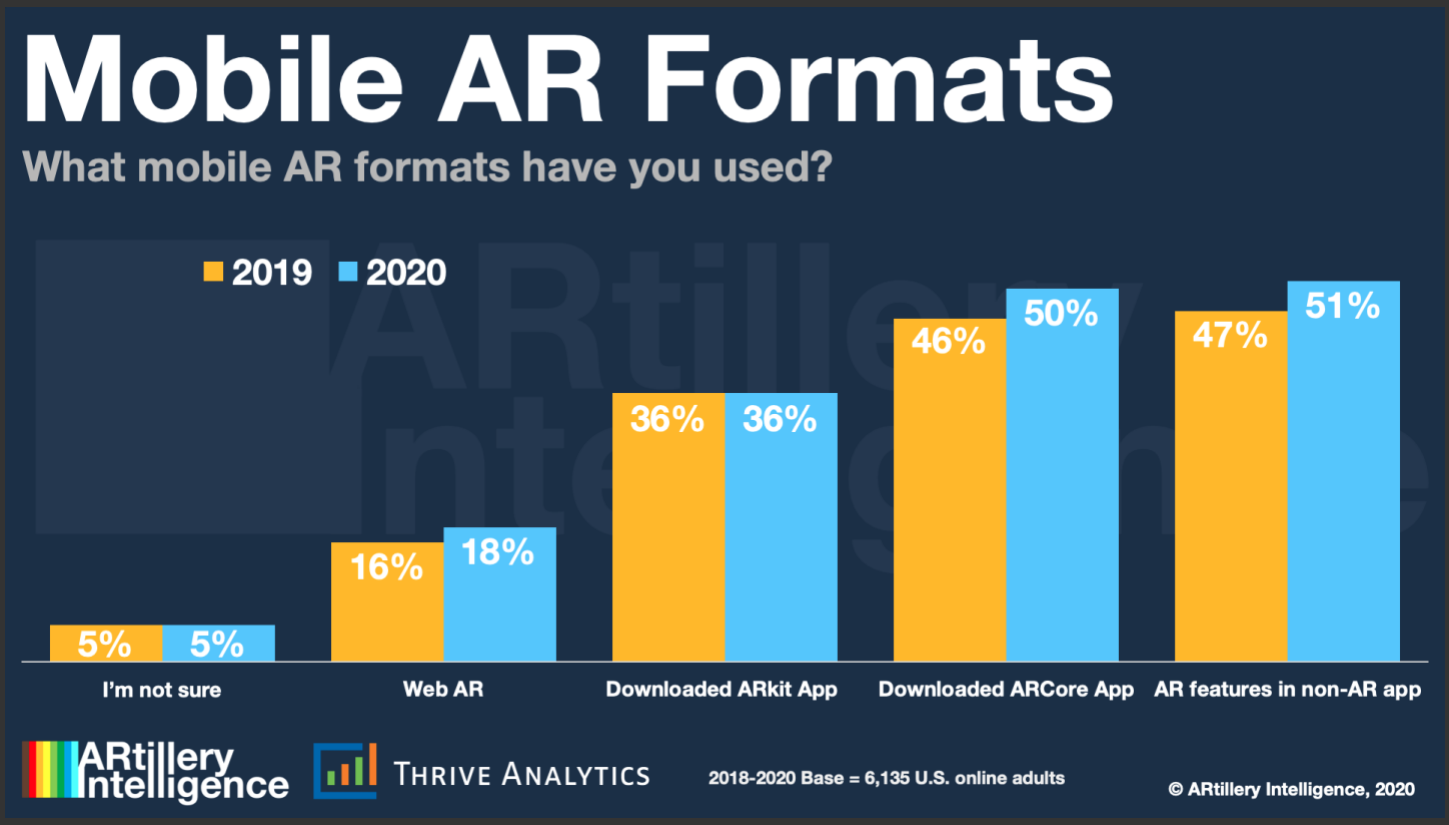
Specifically, **50 percent** of AR users report using **ARCore** apps while **36 percent** report using **ARkit** apps. This is surprising due to these platforms' respective market shares. Though **ARCore** will eventually reach a larger **Google Android** base, **ARkit** technically has an early lead of compatible **iPhones**.[iv]

But more interesting is what lies beyond these platforms. As we've examined[v], apps aren't the best vessel for AR, given download friction and other dynamics. That leaves two formats seen in these results – one that's already outperforming and one that's emerging.

The outperforming format is what we call "AR-as-a-feature." This lowers adoption barriers by planting AR functionality within already-well traveled apps. In fact, the most popular flavors of AR to date – **Pokémon Go** and **Snapchat Lenses** – constitute AR-as-a-feature.

The second area is Web AR. These are AR experiences delivered in the mobile browser. Because AR is still early and unproven, there's little motivation for consumers to go through the typical friction of downloading apps. Web AR is conversely activated with just a web link and avoids platform-compatibility issues.

Web AR still has some quality and capability deficiencies compared to native apps, but that's quickly changing due to the work of innovative startups like **8th Wall** and others.[vi]



Content: The *What?*

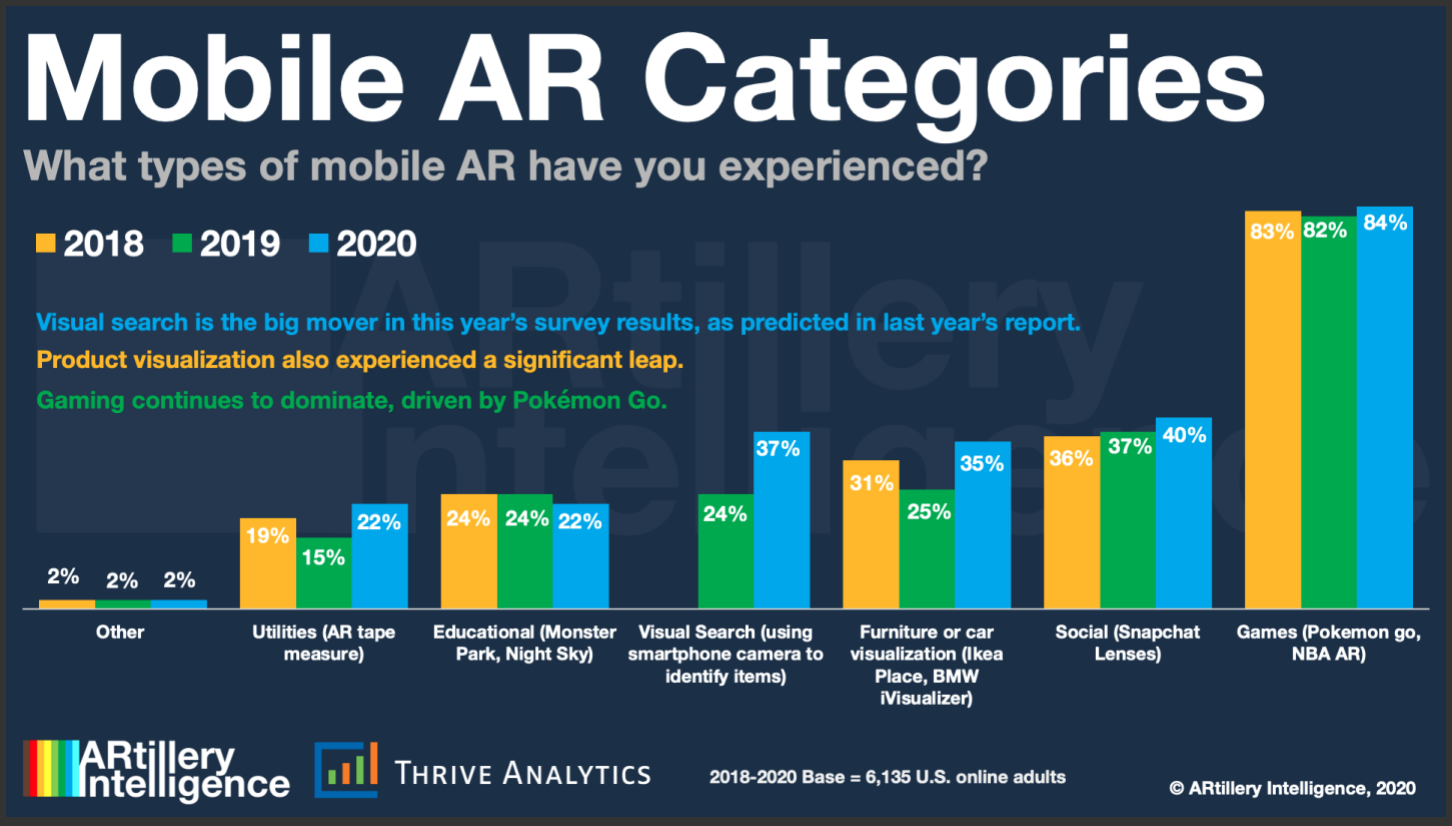
Drilling down yet another level, what content categories are mobile AR users consuming most? As mentioned, the most popular flavors of AR so far are **Pokémon Go** and **Snapchat Lenses**. So naturally, our survey results peg gaming (**84 percent**) and social (**40 percent**) as top categories.

As a matter of process and methodology, we should mention here that we explicitly name these experiences as examples when asking survey respondents about the corresponding categories. In order to avoid false positives, it's always good to be very specific in survey questionnaires.

While we're at it, we'll address another looming question: Is **Pokémon Go** AR? Many purists argue that it is not. Our take, examined in our February 2020 Intelligence briefing[vii], is that any graphical, audible or geographically-contextual augmentation (including **Pokémon Go**) aligns with a meaningful definition of AR.

As for specific success factors, **Pokémon Go** has an optimal mix of game mechanics, leveling up, challenging play and contextual augmentation. In fact, after receding from its 2016 peak, the game has quietly returned to prominence and consumer traction with 2019 as its most successful year to date.[viii]

As for social AR lenses, success factors include simple activation and virality. There's also a fun element, amplified by a social-graph driven network effect, and viral growth. This has caused **Snapchat** in particular to reach **163 million** daily AR users and strong revenue growth from paid AR lenses.[ix]



Highly Motivated

Expanding on the above, the motivating factor for **Snap** and other AR lens players like **Facebook** is engagement and repeat use, validated by their own numbers and these survey figures. That not only keeps users in their walled gardens but drove an estimated **$1.58 billion** last year, growing to **$8.8 billion** in 2023 (see below).[x]

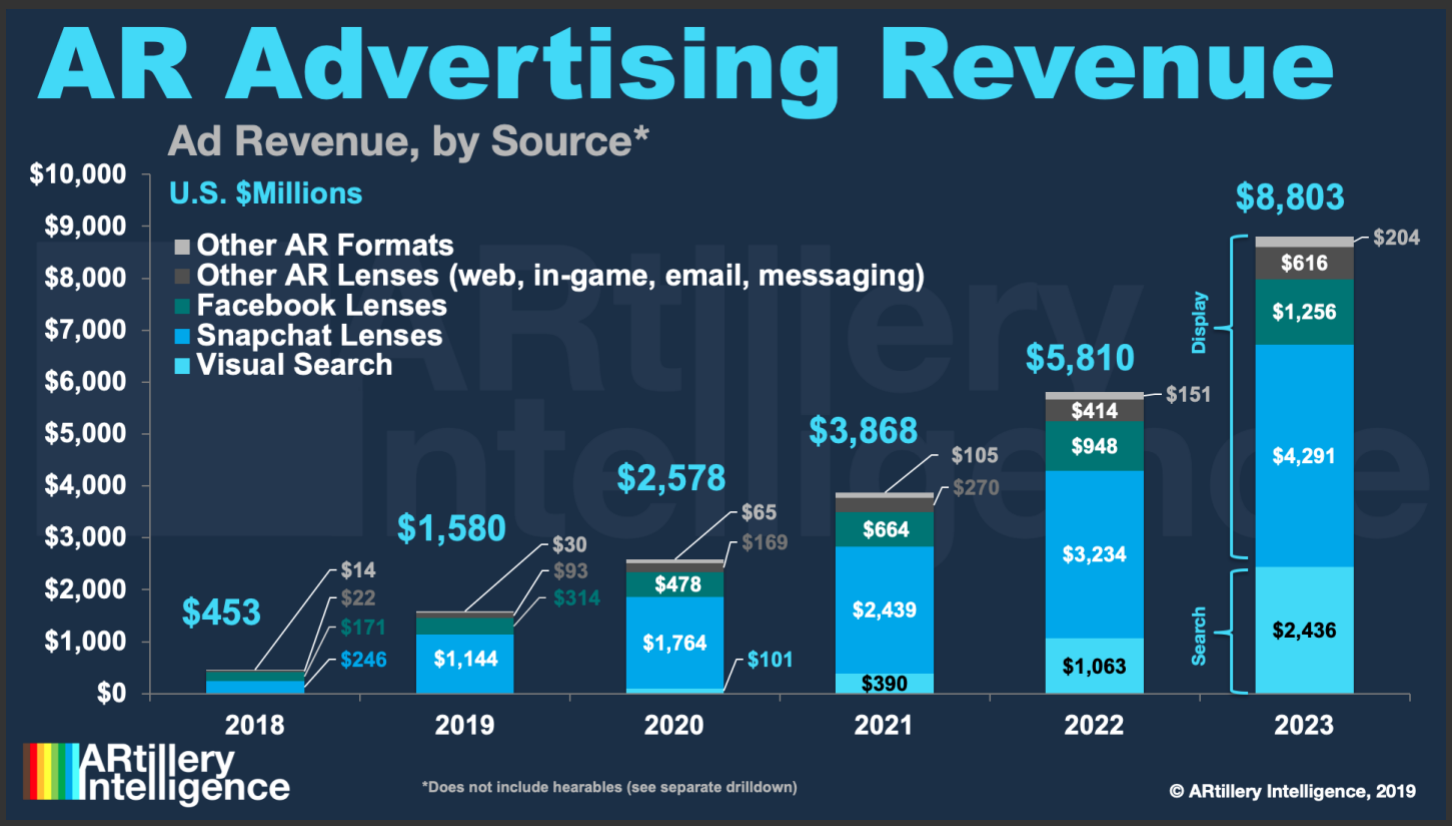
Speaking of motivation, **Google** wants visual search to support and future proof its core search business.[xi] As shown by **Google Lens**, users can point their phones at real-world items to contextualize them. Notably, visual search grew from **24 percent** of users in Wave II to **36 percent** in Wave III.

As we wrote in last year's report:

What everyone's really waiting for is AR's killer app, which we could see emerge sometime next year when AR developers truly gain their native footing. We believe the first killer apps will involve social AR, gaming or "all-day" utilities such as visual search.

To expand on that, visual search's "all-day" potential flows from its versatility and broad application... just like search itself but with the physical world as its canvas. The ability to pull out your phone and identify items – commercial or not – can happen in lots of daily contexts and will continue to grow.

To acknowledge other fast-moving AR categories, product visualization grew from **25 percent** in Wave II to **35 percent** in Wave III. Though less frequent, product visualization apps like **IKEA Place** and **BMW iVisualizer** can save consumers time and headaches through more informed product purchases.



Satisfaction: The *How Good?*

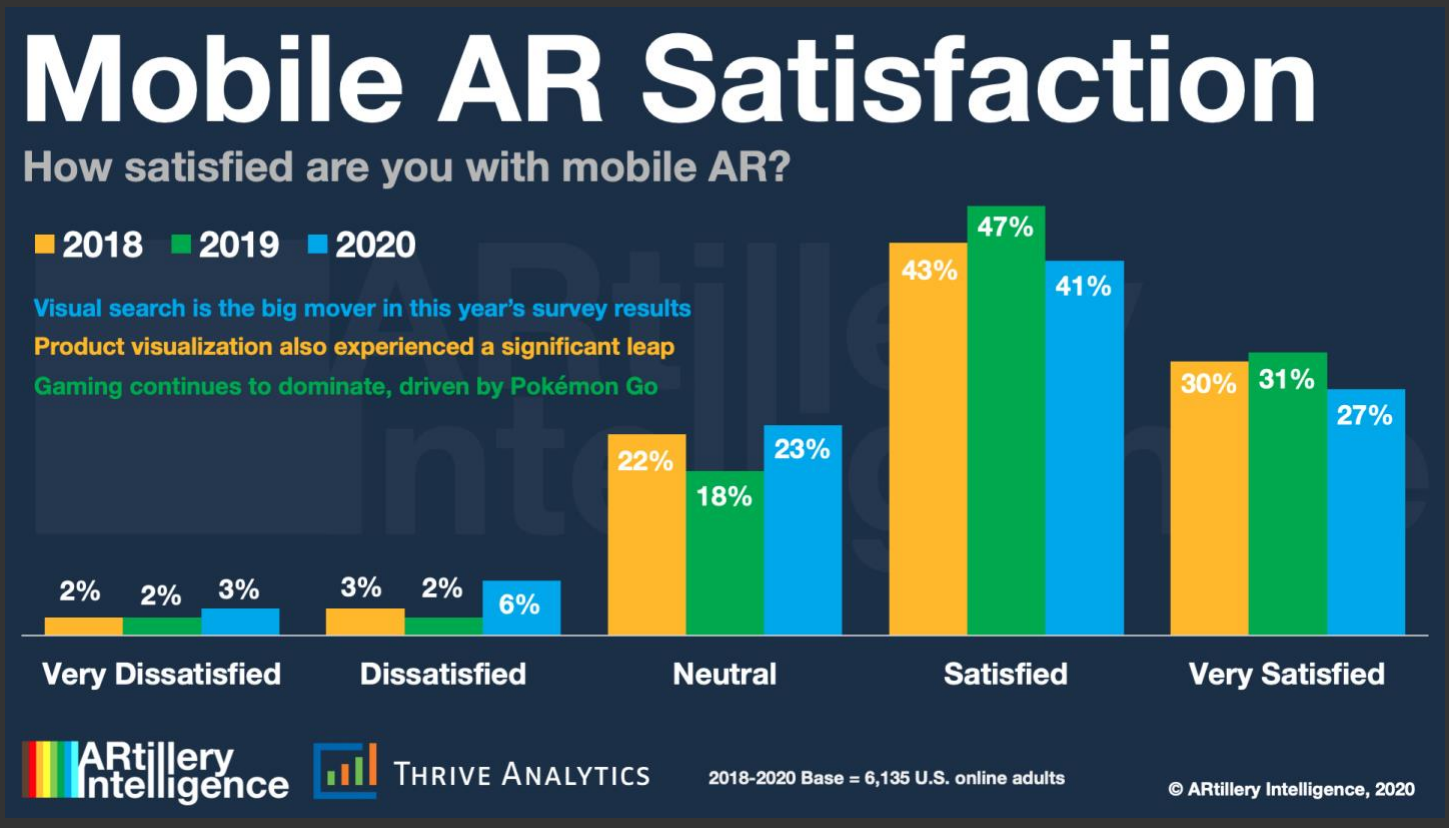
Another key signal for mobile AR is survey respondents' satisfaction levels. **68 percent** report either high (**27 percent**) or very-high (**41 percent**) satisfaction levels. **23 percent** remain neutral and **nine percent** report low or very-low satisfaction. This represents a slight dip in satisfaction from Wave II.

Still, there are few consumer products that show such high satisfaction. As a point of comparison, the corresponding VR findings we examined last month[xii] were likewise high. But they were lower than these reported AR sentiments with **55 percent** reporting high or very-high satisfaction.

Overall, 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 anecdotal observations we and others have made about the subpar and underwhelming state of mobile AR experiences so far. We stand by the assertion that apps will evolve a great deal – just as early **iOS** apps did – but it's notable that high satisfaction is already present today.

With three waves of survey research, consistent findings are another point of validation. Indeed, with a larger collective sample and three waves of research, higher than expected satisfaction levels can't be chalked up to anomaly. Future waves will provide additional validation, insight and longitudinal analysis.



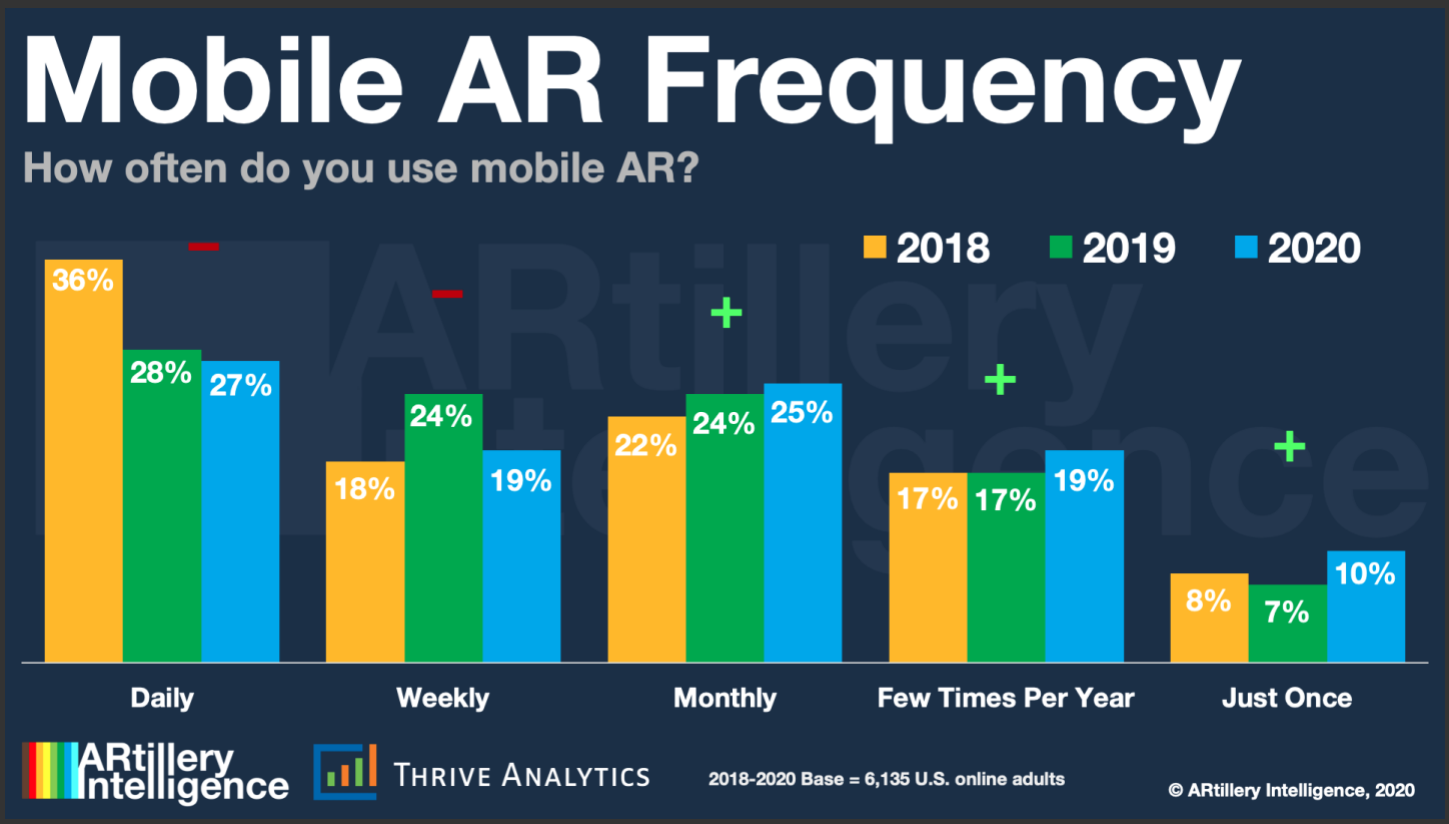
Frequency: The *When?*

Picking up where the last section left off, a key variable in tracking mobile AR success is how often it's being used. As we've written, AR is a snack (VR is a meal). So shorter sessions should be counterbalanced by high-frequency. The name of the game is to instill active use or "replayability."

Mobile AR experiences that fuse the novelty of augmentation with frequent or repeatable activities show the most monetization potential (e.g. in-app purchases). These "sticky" behaviors include social messaging, gaming, and utilities like visual search. These are things that happen daily or more.

Drilling into the data, **71 percent** of mobile AR users are active at least monthly, **46 percent** do so at least weekly, and **27 percent** engage daily. These are high figures by mobile app standards,[xiii] and indicate that the active-use challenges endemic to mobile apps aren't as great in AR.

That's the good news. The bad news is that daily and weekly use are down from 2018 and 2019. This could be due to disappointment that's set in after the initial wave of AR hype circa-2017. Though AR interest in the wake of that period has declined, we believe that it will bounce back as AR experiences evolve.



Deeper Dive: Frequency + Format

Staying with the topic of frequency, we can gain added dimension by combining the variables that have been examined so far. In other words, what *types* of AR experiences are driving the most repeat usage? And how does reported AR frequency map to the types of AR that are being used?

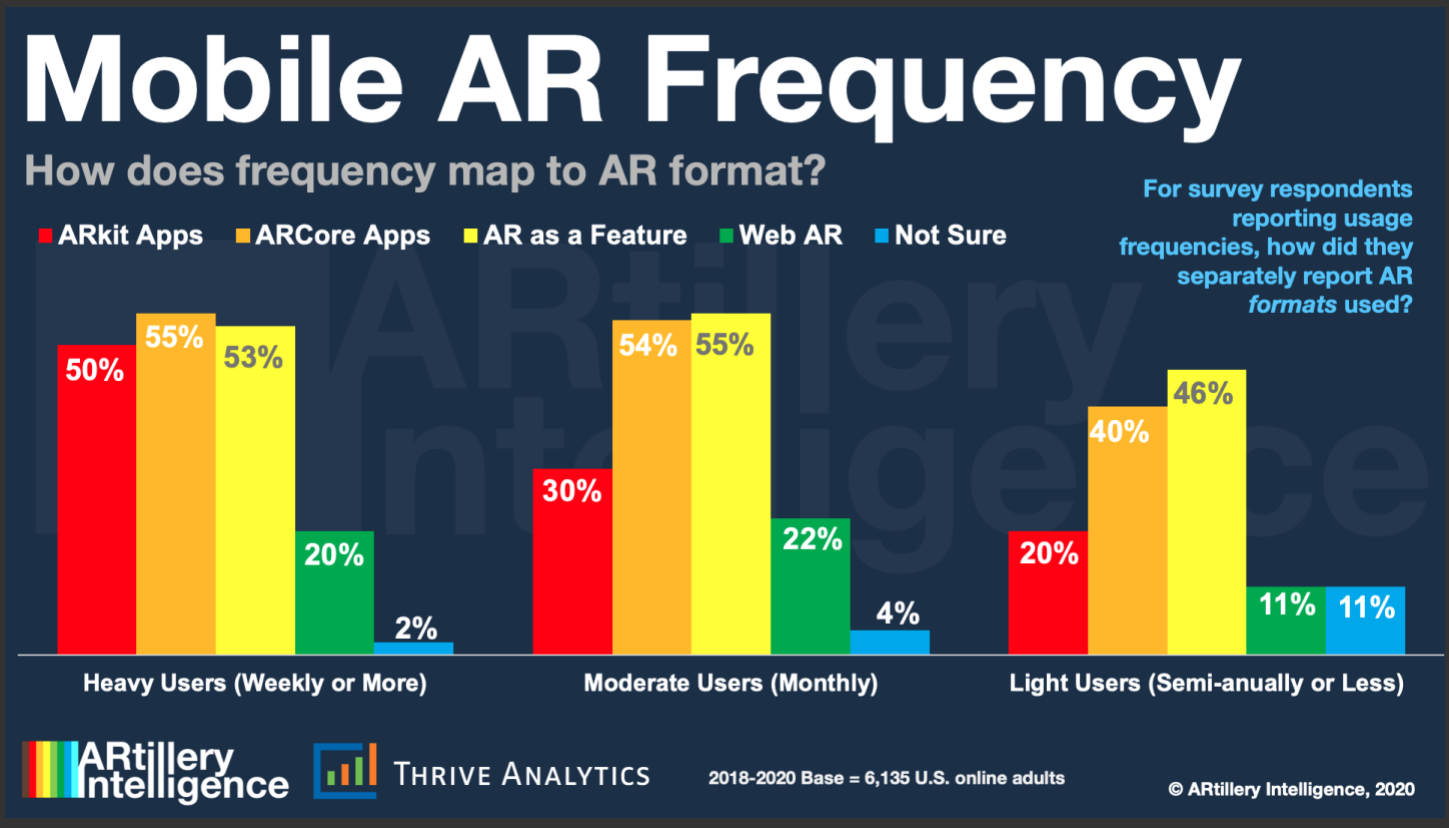
To do this, we cross-referenced some of the survey results. For survey respondents reporting usage frequencies, how did they separately report the AR content formats they've used? Just like in the overall format breakdown examined earlier, **ARCore** apps and "AR-as-a-feature" lead usage.

But going deeper into AR formats at different frequency levels reveals new insights. For example, AR-as-a-feature exceeds **ARCore** for the most frequent users. This stands to reason as AR-as-a-feature is the format applied by AR experiences that our separate research show to be most active.

As indicated earlier, these most notably include **Pokémon Go** and **Snapchat Lenses**. These are both AR features in non-AR apps. Their ease of use and accessibility – nestled within already-popular apps – can be attributed for this high frequency. Put another way, they make the AR experience easy to get to.

This is a key takeaway for AR developers or strategists. To drive frequent use, it continues to be validated that planting AR in users' existing paths is more effective than making them download separate AR apps. This "training wheels" approach continues to pop up in our research.[xiv]

Meanwhile, Web AR is worth watching for all the same reasons of frictionless activation.



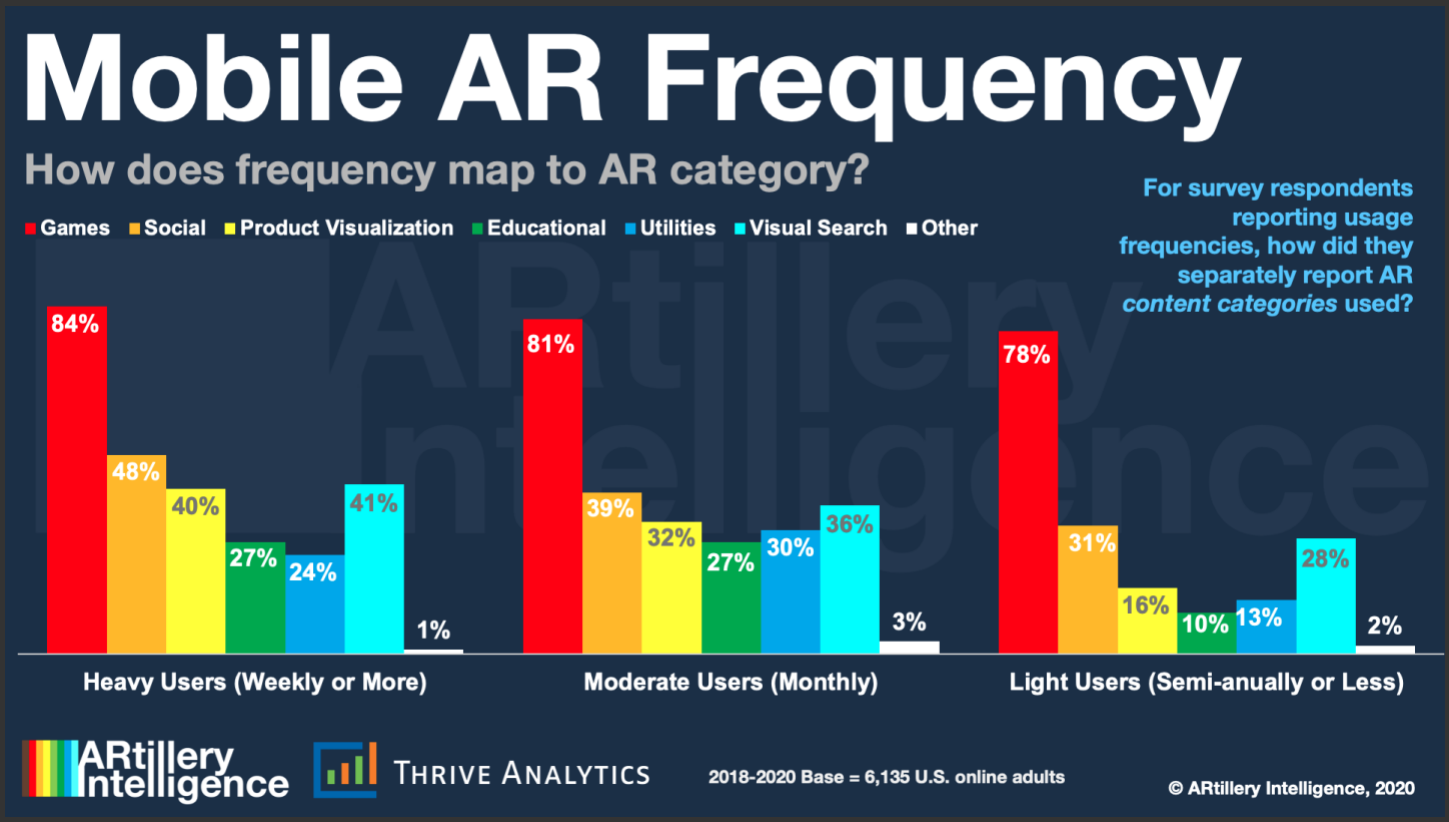
Deeper Dive: Frequency + Category

Sticking with the same exercise of cross-referencing mobile AR frequency with other attributes, how does it map to AR category? As examined earlier, AR app *categories* go one level deeper than *format* (the previous slide) to more granular types of content and experiences (e.g. social, gaming, etc.).

For survey respondents reporting usage frequencies, how did they separately report the AR content categories they've used? Just like in the overall content breakdown examined earlier, AR gaming leads in various frequency subdivisions. Social AR likewise follows in each frequency grouping.

But going deeper into AR categories at different frequency levels reveals new insights. For example, social AR and product visualization scored relatively high among respondents who reported daily use. This indicates these two AR use cases are naturally recurring and can be used to boost engagement.

Visual search had a similar divergence across frequency levels. Its engagement levels are greatest among heavy users (41 percent) compared to moderate (36 percent) and light (28 percent) users. This validates the earlier assertion that visual search is a naturally high-frequency behavior.



Deeper Dive: Frequency + Satisfaction

Continuing the cross-referencing exercise, how does mobile AR usage frequency map to user satisfaction? The question – as in the previous two pages – boils down to how survey respondents at various usage frequencies separately answered the question of how satisfied they are with AR?

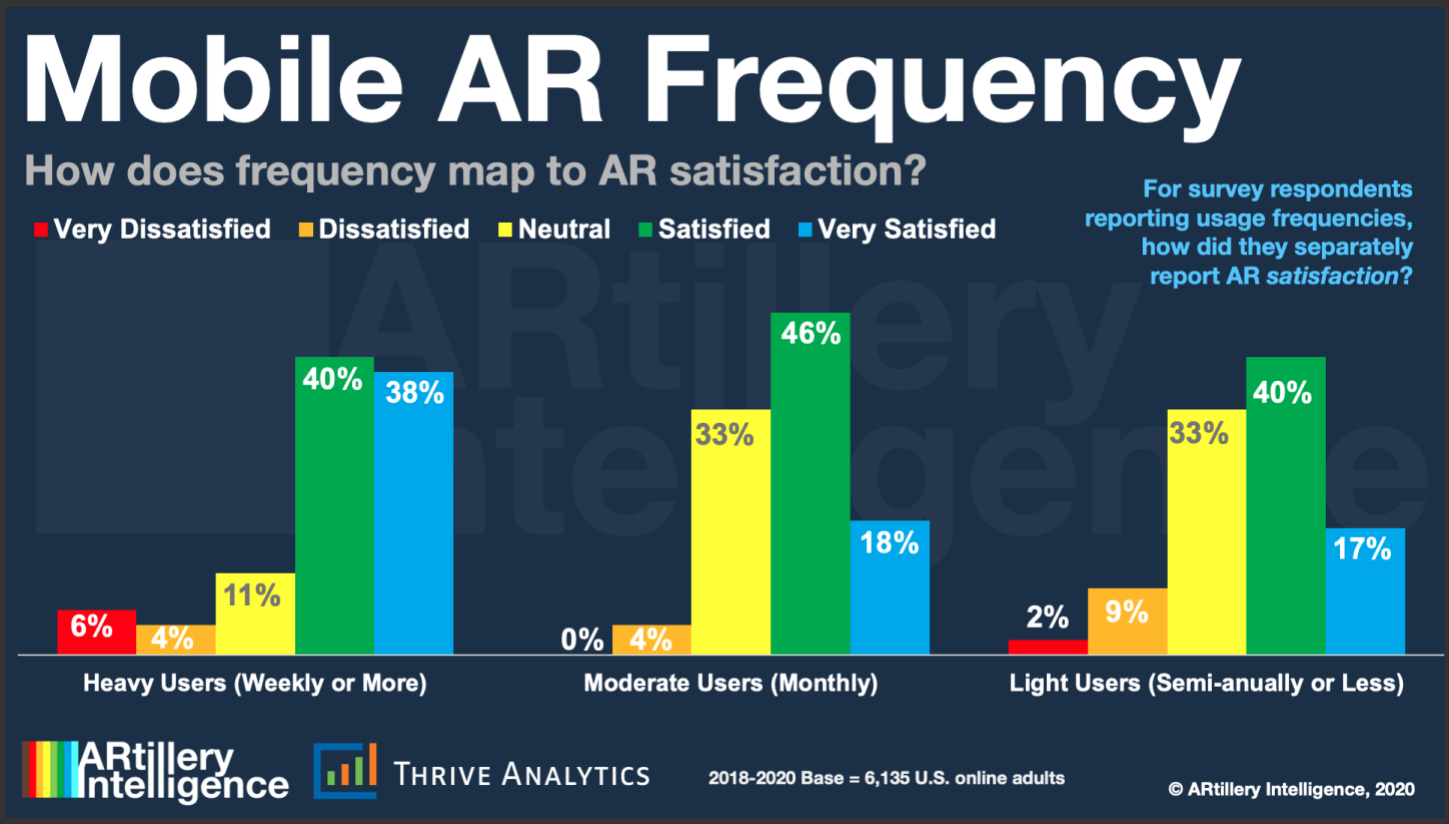
The high-level takeaway is that the greatest satisfaction was reported for daily users, while moderate satisfaction was highest for monthly users. This isn't surprising, as frequency should map to satisfaction. But a few nuances emerge once we start to dig deeper.

For example, among "satisfied" users (follow the green bars in the chart below), monthly use (**46%**) exceeds daily and weekly use (**40%**).

However, "very satisfied" users have the inverse relationship, with much stronger daily and weekly use (**38%**) than monthly use (**18%**).

One clear translation to these data is that boosting satisfaction can have a correlative impact on usage frequency. That should be an obvious goal of any product, but the strategic takeaway is that there can be an outsized payoff in usage frequency which directly impacts monetization potential.

The key question is 'how?' Boosting satisfaction levels will involve product and UX tactics that continue to develop. So far, they include some of the lessons examined later, such as social components (e.g. messaging), utility and gamification in AR experiences.



Price: The *How Much?*

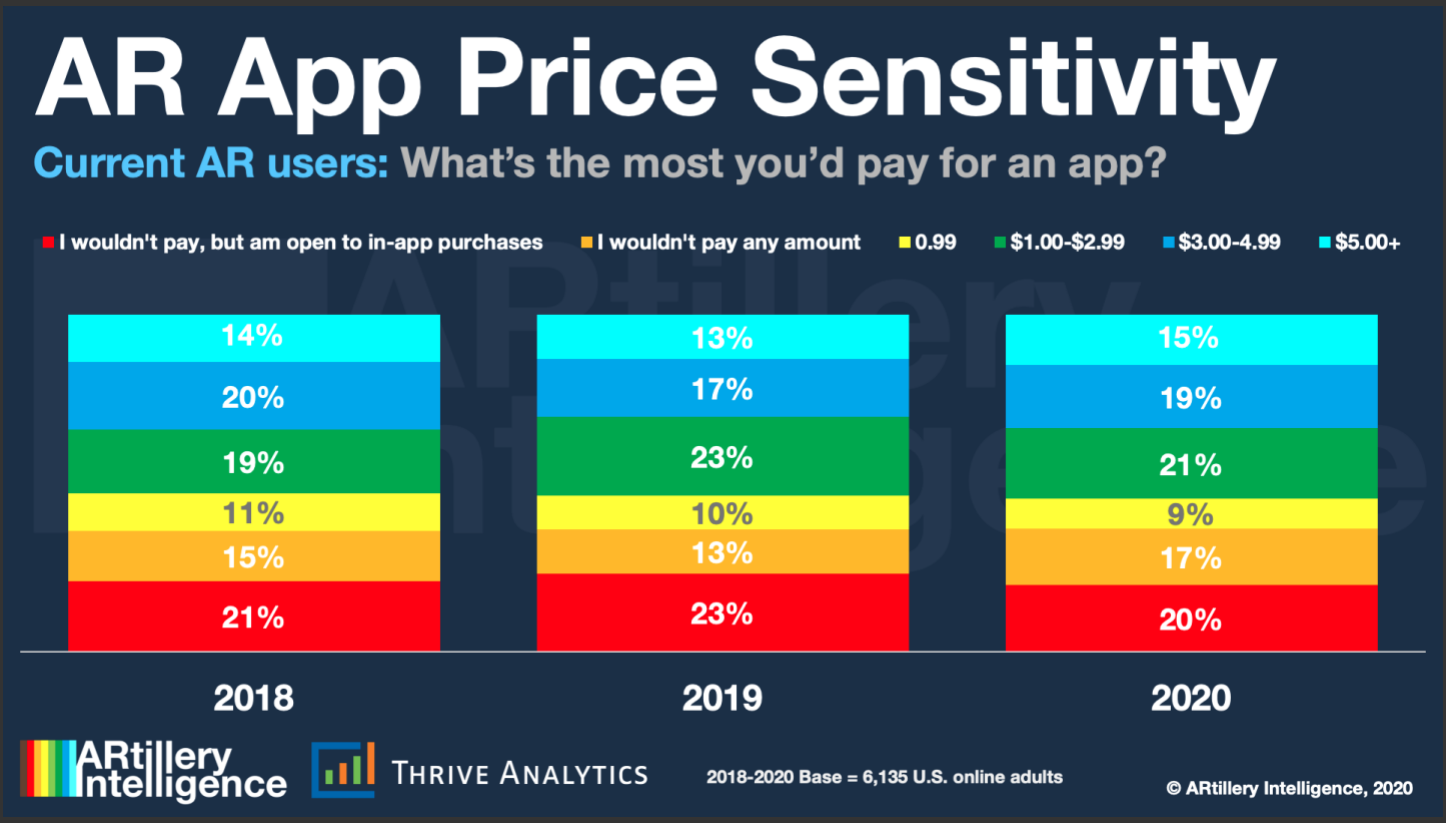
Next on the list of survey questions is the all-important matter of price. This is delineated between mobile AR users and non-users (non-users covered later) with varying responses for each. Starting with users, **55 percent** will pay **$1.00** or more for AR apps. And **15 percent** will pay **$5.00** or more.

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.

Further delineating AR users' cost sentiments, the most popular price point (**21%**) is between **$1.00** and **$3.00**. Though this is down a few percentage points from 2019's Wave II, it notably exceeds in-app purchases which have proven successful in popular apps like **Pokémon Go**.

Specifically, the game has derived **$3 billion+** from in-app purchases.[xv] The virtues of this payment structure trace back to its low barriers to entry. Given AR's early and unproven state, free apps (with optional in-app purchases), are an easier sell. This is why they appeal most to non-AR users, as we'll explore later.

Back to AR users, their sentiments can be valuable inputs to any app pricing strategy that looks to target existing or already-engaged AR enthusiasts. Their demand levels and corresponding price elasticity should be primary inputs to inform any such strategies.



Aspiration: The *What's Next?*

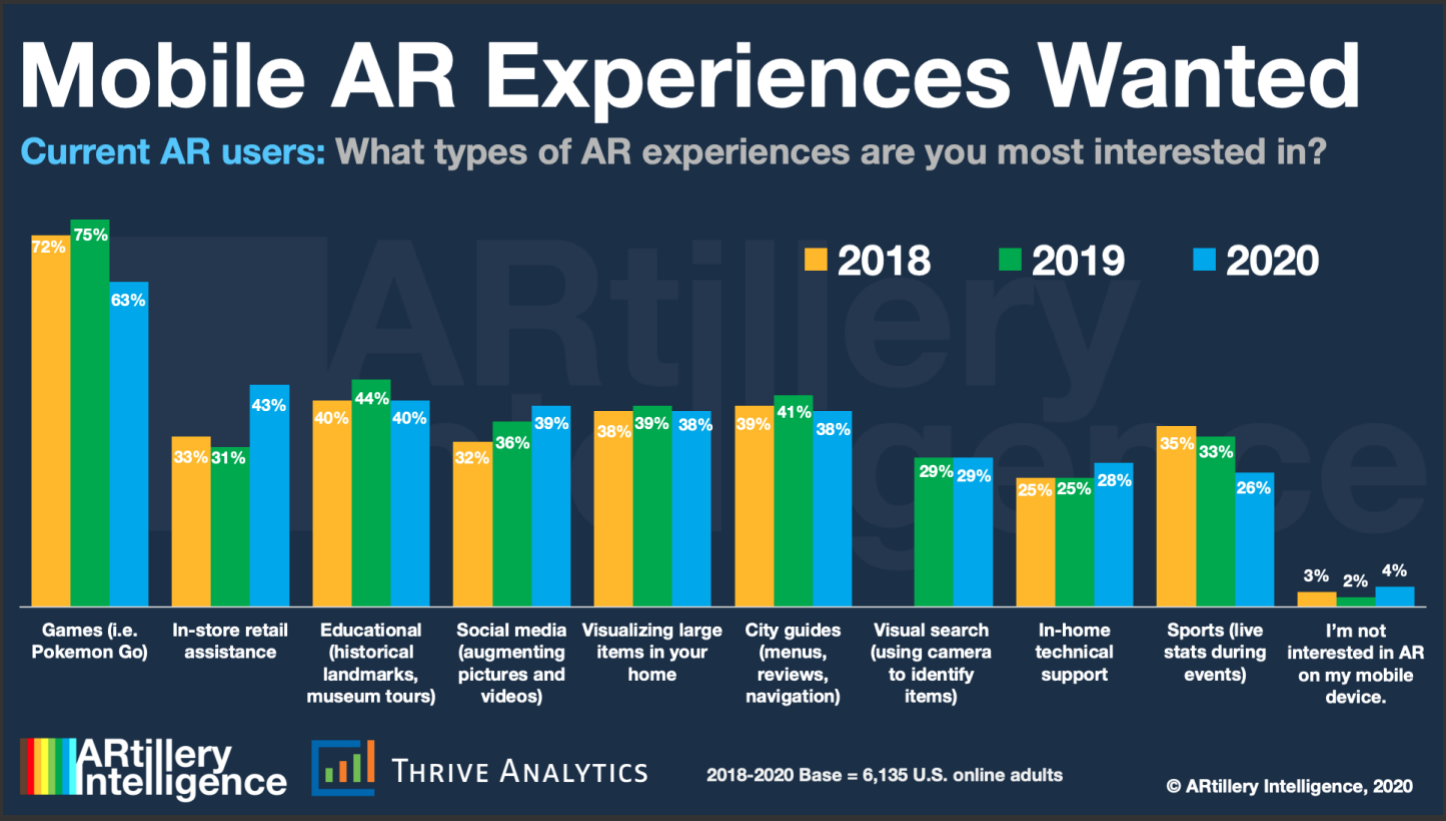
Going back to types of AR experiences, perhaps more important than consumers' current usage is their future behavior. What do they want to see next? Like the above pricing analysis, these answers vary based on the main survey subsegments of current users and non-users

Starting with users (non-users examined later), gaming leads for aspirational use (**63%**). That's followed by in-store retail assistance (**43%**), education (**40%**), social (**39%**), product visualization (**38%**), and local discovery & city guides (**38%**).

Extracting insights from these figures and their year-over-year trending, two things jump out at us: **1.** The drop in interest for gaming and sports; and **2.** The jump in interest for in-store retail AR. Together, these points validate the assertion that technologies tend to evolve into mundane utilities as they mature.

In other words, gaming has dominated AR as seen in our ongoing market analysis and in the survey results throughout this report. But as was seen in technologies like the desktop web, killer apps ended up being things that were more mundane and useful like email, communications and news.

The way this could play out for AR – as we've predicted in the past – is that gaming could give way (at least to some degree) to emerging use cases that are everyday utilities. That will include visual search as mentioned earlier, as well as use cases shown below like shopping and local navigation.



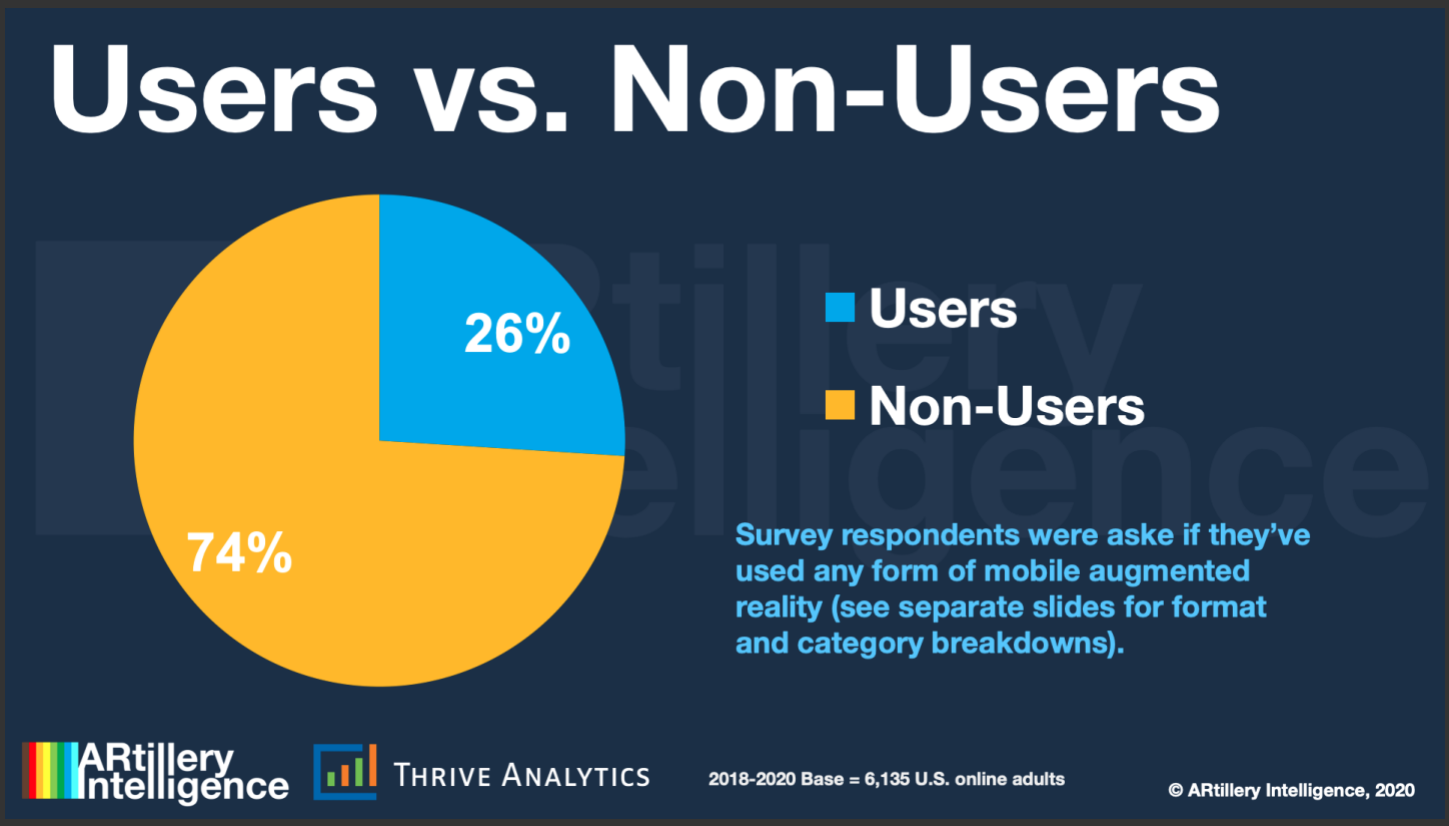
Part II: *Non-User* Attitudes

Perhaps more important than current VR users, what are *non-users* saying? Because they're much larger in number at this early stage, appealing to them is a strategic imperative. And that requires knowing what they like and don't like. The following sections examine these non-user attitudes.

Usage: The *How Many?*

Starting at the top, how do AR non-users stack up to AR users. To back up the claim made above that non-users represent a large majority, that number currently stands at **74 percent**. That makes AR users correspondingly represent **26 percent** of survey respondents (U.S. adults).

Like we did in the previous several sections for mobile AR users, we'll drill down into more precise sentiments from this non-user segment, starting with the all-important question of *why*? More accurately, the key question is why they *don't* use the technology.



Reasons: The *Why Not?*

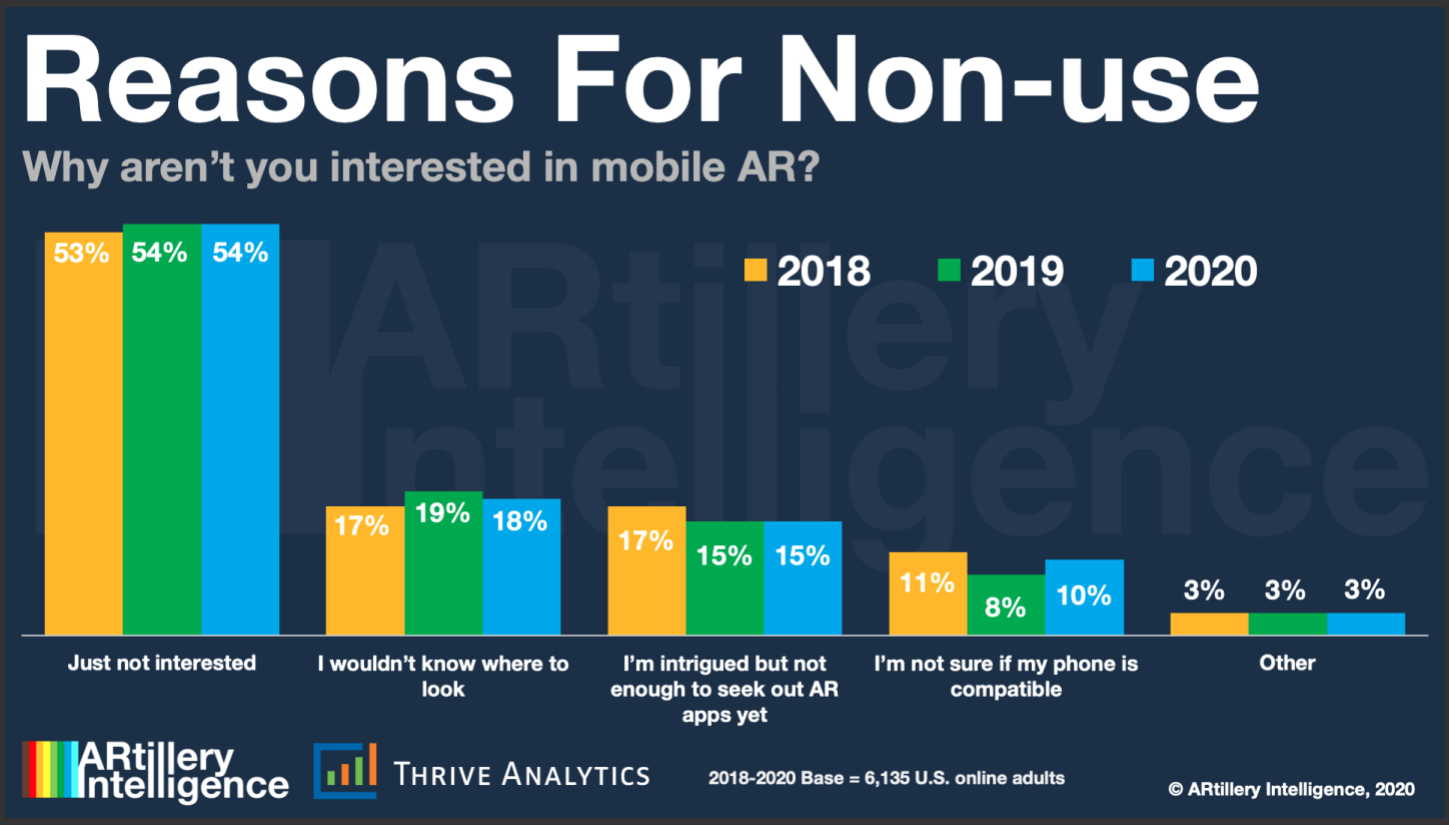
Contrasting AR-user satisfaction levels examined earlier, those mostly-positive results are offset by negative signals from non-users. Specifically, **54 percent** report that their reason for non-use is *just not interested*. This rather definitive and discouraging sentiment represents a key challenge for AR.

Adding to that, **28 percent** report confusion with mobile AR. That includes *I wouldn't know where to look* (**18 percent**) and *I'm not sure if my phone is compatible* (**10 percent**). Meanwhile, **15 percent** reported interest but not enough to go through the trouble of looking for, and downloading, AR apps.

As for the *just not interested* crowd, they represent the most damning of these non-user responses. This highlights a key "chicken & egg" dilemma for immersive tech. Because it's so visual and visceral, you have to experience it to really *get it*. Without that perspective, there's little motivation to get a first taste.

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 gamification and social features that carry the experience to more users via network effect.



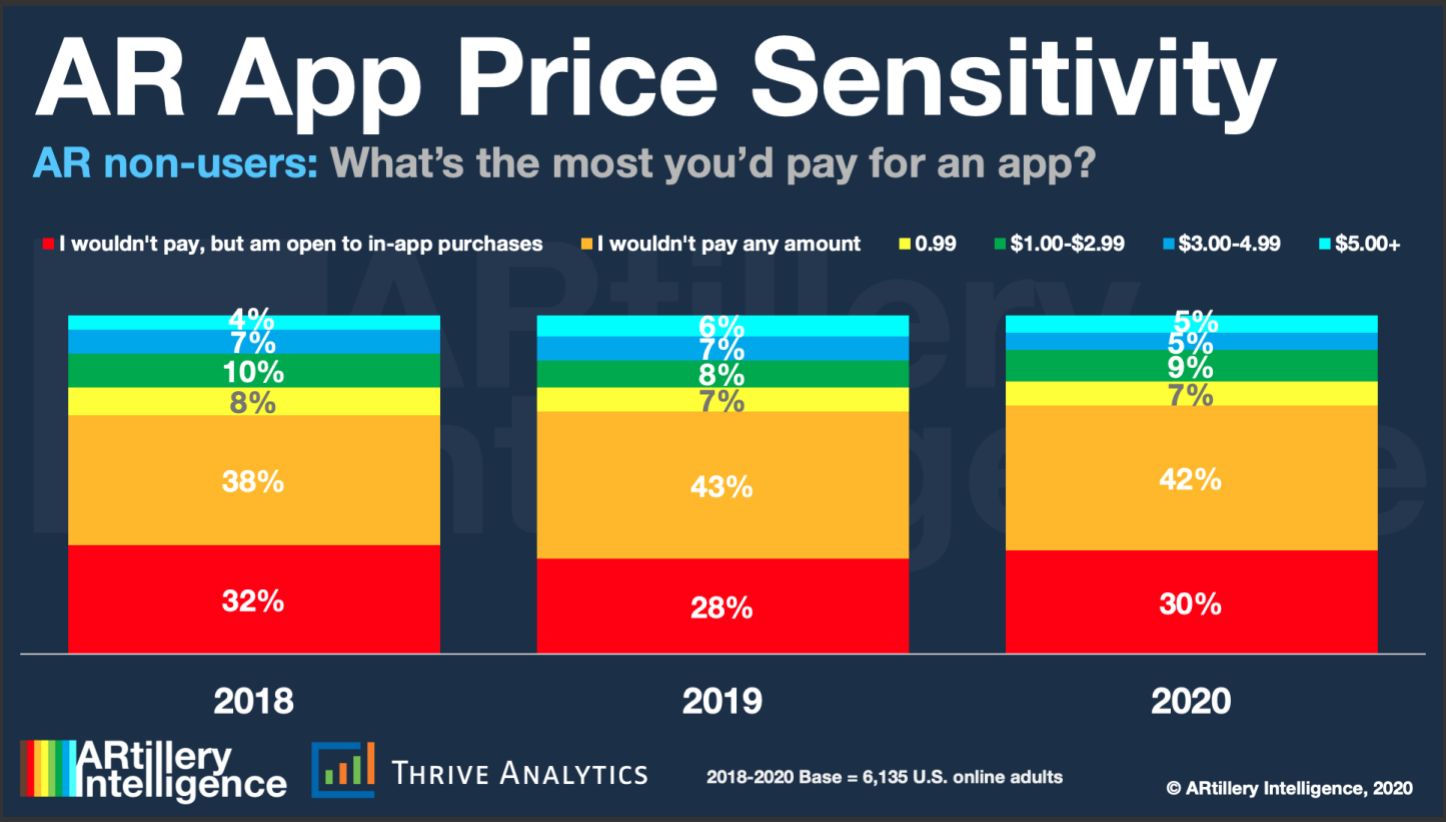
Price: The *How Much?*

Earlier we examined AR users' price sensitivities. Now it's time to perform that same exercise for non-users, which vary widely from current-user sentiments. As a reminder, **55 percent** of users will pay **$1.00** or more for AR apps, and **15 percent** will pay **$5.00** or more. These figures plummet for non-users.

Specifically, **19 percent** of non-users would pay **$1.00** or more, while **5 percent** would pay **$5.00** or more. The disparity between user and non-user sentiments isn't surprising, given that non-users have a self-selected disinterest in AR to begin with (not to mention the data on the previous page).

More worrisome is that the greatest share of respondents (**42 percent**) are unwilling to pay *any amount* for mobile AR. These users align with the *just not interested* crowd. AR marketing efforts can avoid such users, including specific demographic attributes that **Thrive Analytics** can generate on request.

However, one positive signal from non-users is that **30 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.



Breaking Down IAP

Expanding a bit on in-app purchases (IAP), these data clearly support it. **20 percent** of AR users and **30 percent** of non-users report that they won't pay upfront for mobile AR apps but will use IAP. This is a key finding that validates several other market signals we've separately examined around the IAP opportunity.[xvi]

In short, several signs point to IAP as a prevailing revenue model for mobile AR. Besides the evidence seen in this survey, IAP is a purchase method in which consumers are already comfortable, given its prevalence in mobile gaming. There, it drives **$156 billion** in annual revenues[xvii]

In AR specifically, IAP likewise indicates traction. The AR revenue leader so far is **Pokémon Go** and the majority of its revenue – to the tune of **$3 billion+** [xviii] to date – is through IAP. Given price sensitivity to early/unproven technology, IAP lets users ease into the experience before paying.

In fact, IAP can be advantageous for several reasons. Average revenue per user (ARPU) is often greater than upfront app purchases, due to the behavioral economics of micro-transactions, and the unit economics of recurring revenue. It depends on the app being developed, but IAP should always be considered as a payment model.

This is especially so in gaming and social AR. Conversely, signals indicate that IAP isn't as effective in media and information experiences. That's where consumers have been conditioned to expect subscription or free ad-supported experiences. For example, the latter is likely how visual search will monetize.

Image Credit: Niantic

Aspiration: The *What if?*

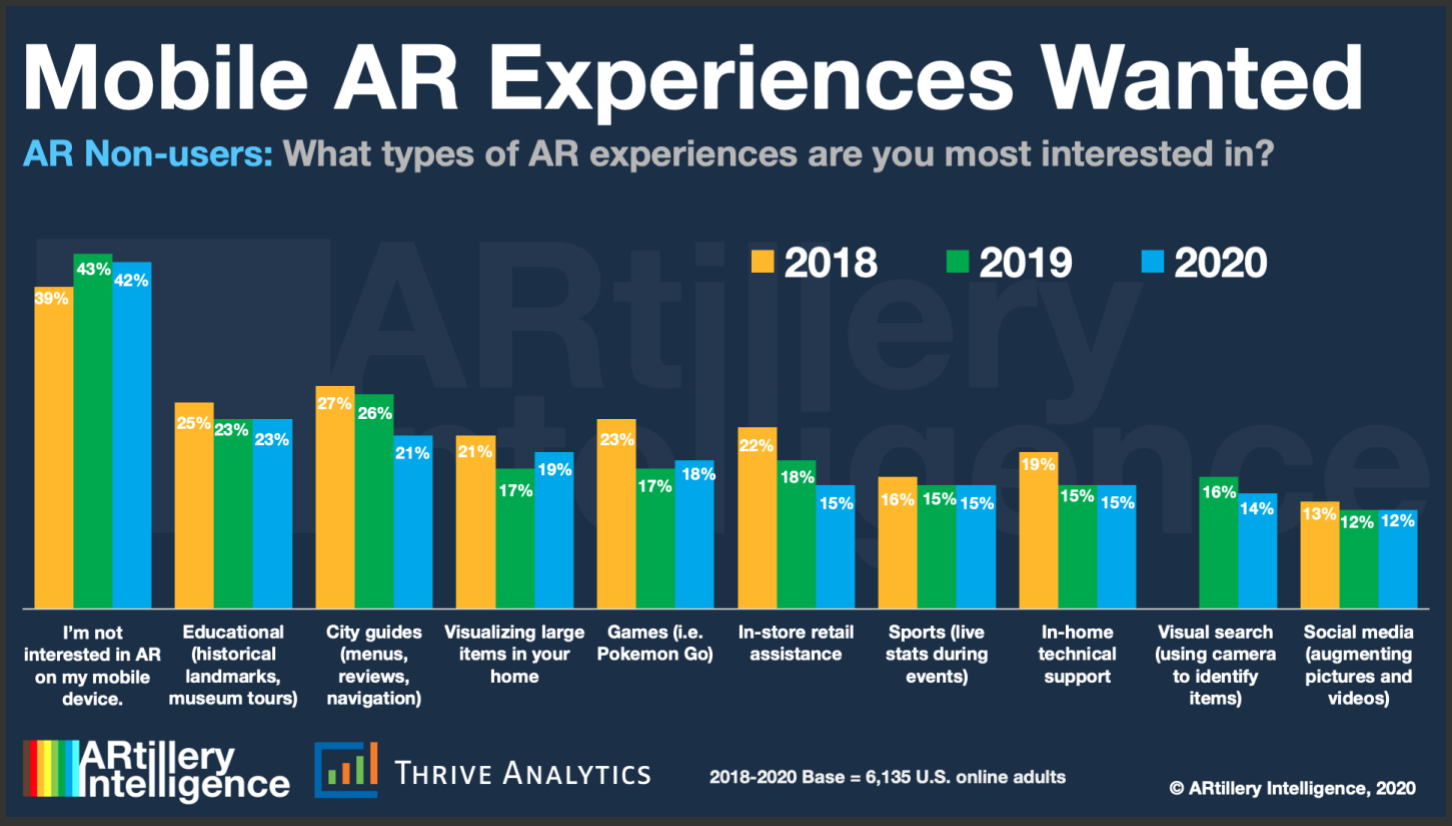
The analysis of non-user sentiments continues... next covering the types of AR experiences they want to see. This is admittedly a hypothetical exercise, because these non-users are essentially reporting the types of experiences they *would be* interested in if they ever converted to AR users.

First, the bad news: **42 percent** aren't interested in any form of AR – again, not surprising. As for those who played along with the exercise to report aspirational desires, educational AR leads (**23 percent**) followed by city guides (**21 percent**) and product visualization (**19 percent**).

One reaction may be to discount these results because these are users who don't engage in mobile AR and are unlikely to (further explored on the next slide). However, we believe these results are important for developing AR product strategies for *tomorrow*.

In other words, because non-users eclipse users (again **74 percent** versus **26 percent**), they represent a majority of the U.S. adult population. And as AR naturally grows, these are the users that could become AR converts over the coming years. So their sentiments matter.

Furthermore, non-users represent different psychographics than users. The latter are typical early adopters, gamers, social mavens and overall tech-savvy individuals. Non-users conversely represent the mainstream, so long term AR product strategies should take their sentiments to heart.



Looking Ahead: The *What's Next?*

Beyond reasons for disinterest and price sensitivity, we asked non-users about the likelihood of being swayed by mobile AR in the next 12 months. There, the answers were similarly discouraging, with the majority of respondents (**59 percent**) reporting that they're unlikely or extremely unlikely to adopt.

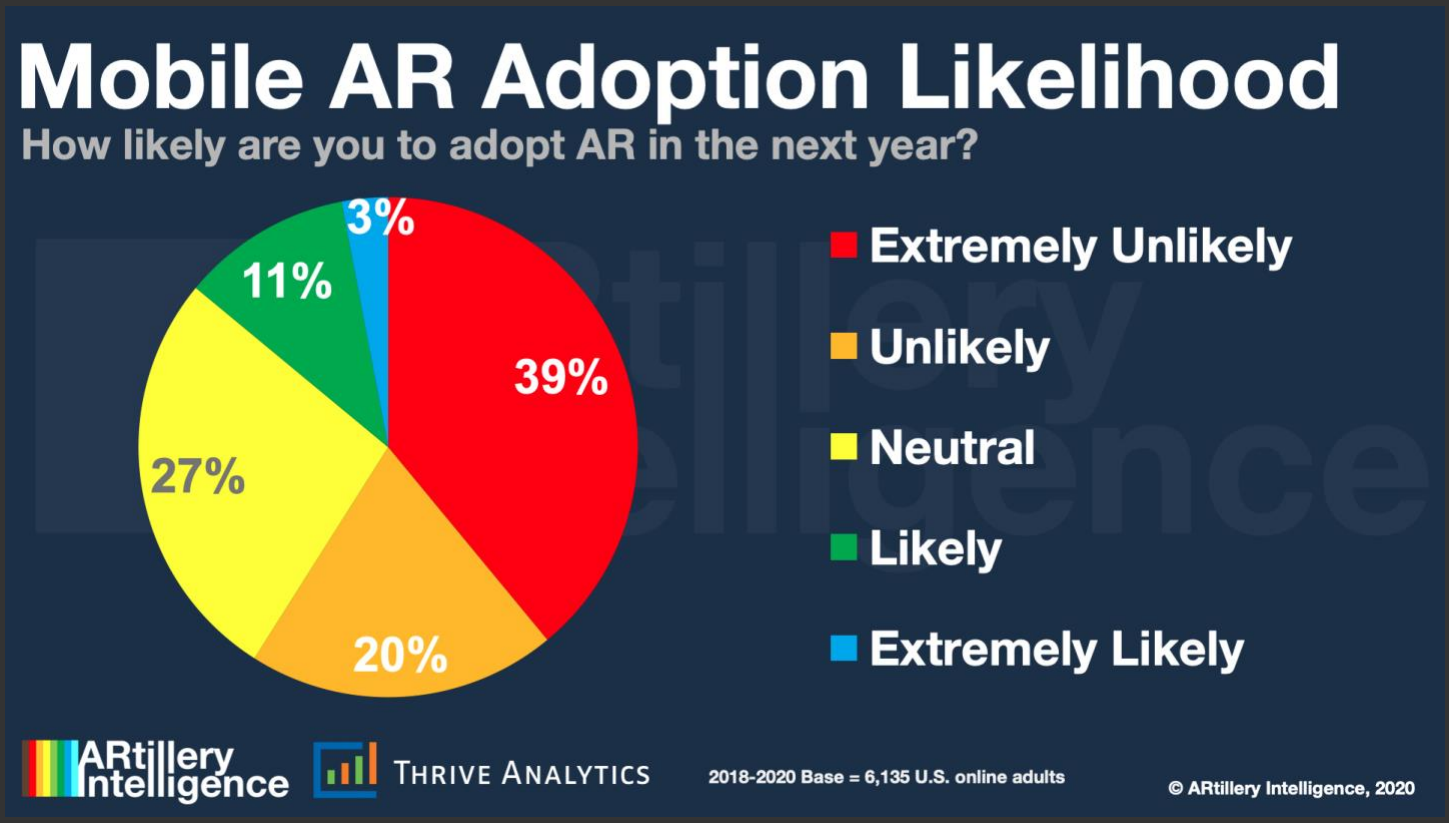
These findings, along with those in the previous few pages, signal a need for better consumer education. Though these aspirational and forward-looking sentiments aren't surprising for self-selected non-users, there are still potential actions and strategies to win them over.

First and foremost is education. If we go back to the *Reasons for Non-Use* slide, some of the sentiments represent user groups that could be attainable. Setting aside the *just not interested* crowd as a possible lost cause, the "*wouldn't know where to look*" respondents can actually be addressed.

In other words, their responses signal the need for better consumer education. The AR industry, though innovative, has been accused of being stuck in its own "bubble," while lacking competency in consumer marketing. This is an area of improvement for the AR industry to collectively work on plain-spoken messaging.

For example, mainstream consumers get turned off by the alphabet soup that normally characterizes new technologies. Notice how the most successful forms of AR – **Pokémon Go** and **Snapchat lenses** – never use the term "AR". Google Lens likewise uses the term "search what you see."

The bottom line is that AR remains in "techy" territory in terms of confusion and other factors that compel better education and marketing.



Part III: Strategic Takeaways

To synthesize the biggest lessons in this report requires examining not just the top-scoring forms of mobile AR, but those that are growing the fastest. On that measure, it's notable that AR-as-a-service (AR features within non-AR apps) took the lead among AR *formats* for the first time this year.

Drilling down to *categories* of AR experiences, visual search and product visualization were the most notable movers. Though gaming and social continue to see the highest usage in sheer volume, visual search grew in users from 24 to 37 percent over the past year.

This supports our already-bullish stance on visual search such as Google Lens. Not only is its deep-pocketed benefactor motivated to push the technology to future-proof its core search business, it hits all the marks for potential killer apps. That includes high utility and frequency... just like search itself.

We're also bullish on social forms of AR. Given the technology's still-nascent stage, it needs an extra push to get over the classic "chicken & egg" dilemma that we examined throughout this report. And that extra push can come in the form of virality and networking that's infused with any AR experience.

Another category that shows promise is AR commerce enablement. This covers use cases examined in this report such as AR retail apps, product visualization, and local discovery (navigation & city guides). These categories not only performed well but represent inherently-monetizable use cases.

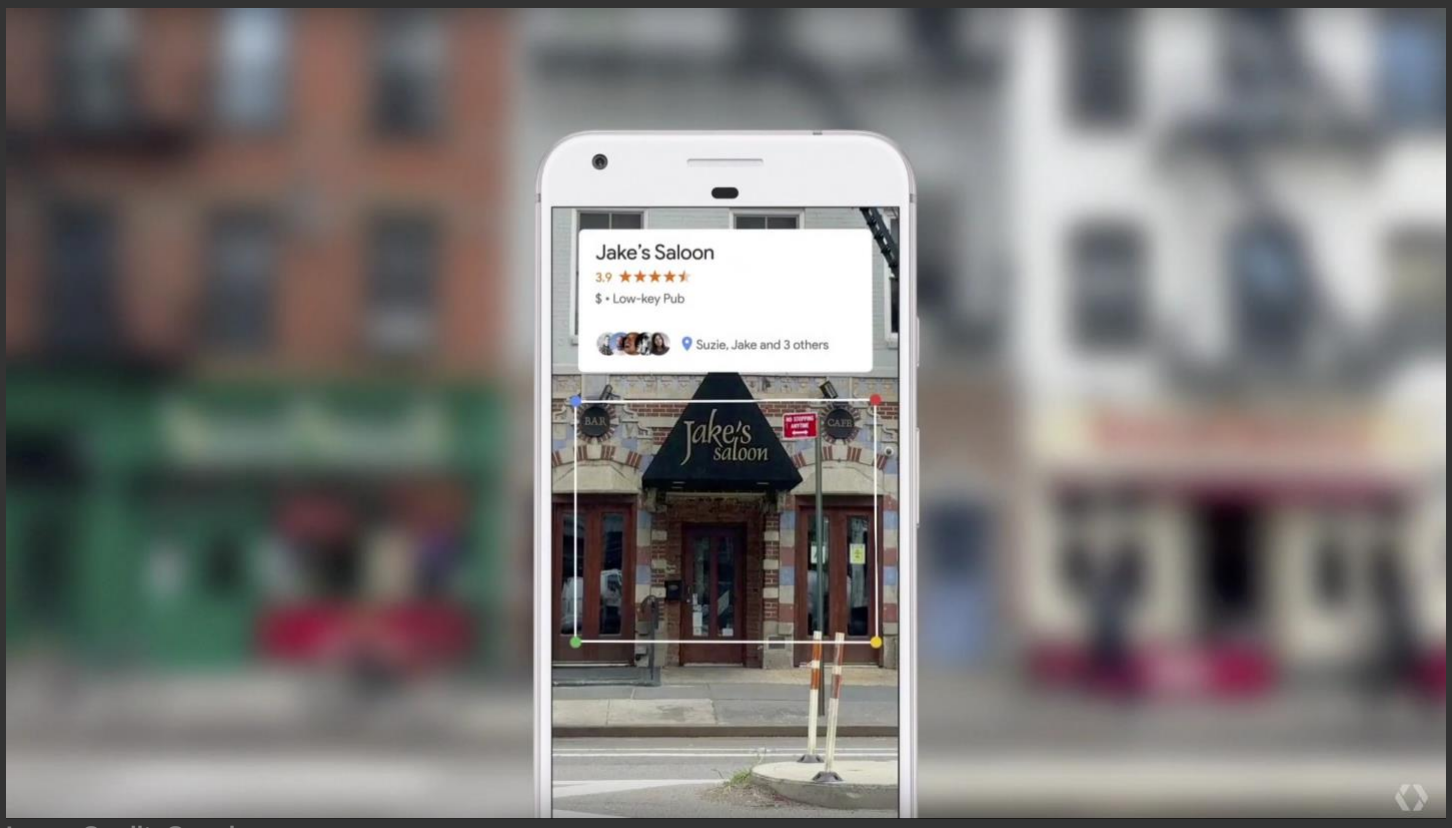


Image Credit: Google

ARchetypes

When examining the above “flavors” of mobile AR, a pattern emerges. These are many of the same types of killer apps and prevalent use cases that emerged in previous tech waves. With the desktop web and smartphones, it was search, commerce and social media that rose to prominence as frequent use cases.

AR will follow the same patterns – and some of its own – as these use cases tap into universal human needs that aren’t going away. They include the need to have information at our fingertips (visual search), connect with other people (social AR), and assist in finding and discovering products (AR commerce).

Not only do these use cases tap into universal needs, they’re also things consumers are *comfortable with*. Just as we asserted in our recent report series on lessons from AR leaders,[xix] AR will find its own unique areas to shine. But until then, success is most often found when it builds on the *familiar*.

We’ll be back next year in Wave V – and several monthly narrative and data reports until then – to continue tracking the evolution of consumer AR behavior and attitudes. Extending from that, our commitment is to trace that evolving behavior back to their strategic implications for business opportunity.

Image Credit: Apple

Video Companion: Lessons From AR Leaders

Click video to open

Key Takeaways

- **26% of consumers have tried mobile AR.**
  - This represents healthy adoption, but also substantial headroom to grow.
  - We expect adoption to accelerate in future survey waves, similar to early smartphone adoption.

- **51% have used "AR-as-a-feature, 50% ARCore apps, 36% ARkit apps, and 18% web AR.**
  - AR-as-a-feature (AR within non-AR apps) took the lead for the first time this year.
  - Practiced by top AR apps like Snapchat (lenses), this represents the most successful AR distribution strategy.
  - Though apps have an early lead, web AR's advantages will vault it forward in the coming years.

- **71% of mobile AR users are active at least monthly. 46% are active weekly or greater.**
  - Active frequency is a key mobile app metric that impacts monetization potential, such as in-app purchases.
  - Mobile AR that fuses novelty with frequency (e.g. social messaging) can achieve high active use and retention.
  - Visual search is also an emerging mobile AR use case that breeds high-frequency use.

- **Games lead mobile AR usage (84%), followed by social (40%) and product visualization (35%).**
  - Social app success can result from sticky/frequent behavior, viral growth and network effect.
  - Product visualization succeeds on saving users time and money through more-informed purchases.
  - Though it didn't score among the top three, the greatest growth rate among AR categories is in visual search.

- **Mobile AR users want more AR games (63%), retail apps (43%), education (39%) and city guides (38%).**
  - Mobile AR gaming dropped from last year's aspirational rankings, while retail apps grew significantly.
  - AR city guides and retail apps are not only gaining popularity but are inherently monetizable.

- **68% of mobile AR users report high or very-high satisfaction.**
  - AR's visual and immersive formats can captivate consumers as a departure from routine mobile interfaces.
  - That said, satisfaction ratings are down from last year, representing a potential backlash to early AR hype.

- **54% of non-mobile AR users report definitive disinterest, and 28% report confusion.**
  - Stark variance between user and non-user attitudes underscores AR's "chicken & egg" dilemma.
  - Because it's so visual and visceral, you have to experience it to really *get it*.
  - Yet without that experience and perspective, there's little motivation to get a first taste.
  - Compounding these challenges, AR's immersive qualities can't be captured in ad copy or video.

- **55% of mobile AR users will pay $1.00 or more for apps. 15% will pay $5.00 or more.**
  - This compares with 19% of non-users who will pay $1.00 or more for apps. 42% won't pay any amount.
  - Price sensitivity underscores another stark variance in attitudes between users and non-users.

- **In-app purchases (IAP) showed strong acceptance among users (20%) and non-users (30%)**
  - IAP should always be considered as it addresses the largest range of interests.
  - Pokémon Go has made $3 billion+ to date through IAP, inheriting an established model from mobile gaming.
  - Revenue per user is often greater with IAP due to proven behavioral economics of micro transactions.

- **AR's true widescale adoption will hinge on the release of a killer app in the next few years.**
  - There's not enough of an adoption impetus yet for mainstream consumers to flock to AR en-masse.
  - Broad AR appeal and high-frequency use could result from valuable"all-day" utilities such as visual search.
  - Developers' acclimation and "native footing" is underway and will be a key factor in bringing a killer app to market.

About ARtillery Intelligence

ARtillery Intelligence chronicles the evolution of spatial computing. Through writings and multimedia, it provides deep and analytical views into the industry's biggest players, opportunities and strategies.

Run by analysts and former journalists, coverage is grounded in a disciplined and journalistic approach. It also maintains a business angle: Though there are lots of fun and games in spatial computing, cultural, technological and financial implications are the primary focus.

Products include the AR Insider publication and the ARtillery PRO research subscription, which together engender a circular flow of knowledge. Research includes monthly narrative reports, market-sizing forecasts consumer survey data and multi-media, all housed in a robust intelligence vault.

Learn more **here**.

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. Its mission is to provide superior research and support services that inspire clients to make smarter decisions. For more information or to contact, visit here.

About Virtual Reality Monitor

Virtual Reality Monitor™ is Thrive Analytics' proprietary survey of virtual reality/augmented reality technology users. These surveys, conducted semiannually, 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 spatial computing analysis. They synthesize original and third-party data to reveal opportunities and dynamics of VR and AR sectors. 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 **here.**

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* and Editor-in-Chief of *AR Insider.*

Mike is a frequent speaker at industry conferences such as AWE, VRLA and XRDC. He has authored more than 120 reports and market-sizing forecasts on the tech & media landscape. He contributes regularly to 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 read **here**.

Methodology

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

For market sizing and forecasting, *ARtillery Intelligence* follows disciplined best practices, developed and reinforced through its principles' 15 years in tech-sector research and intelligence. This includes the past 4 years covering AR & VR exclusively, as seen in research reports and daily reporting.

Furthermore, devising these figures involves the "bottom-up" market-sizing methodology, which involves granular revenue dynamics such as unit penetration, pricing and growth patterns. More on ARtillery Intelligence market-sizing research and methodologies can be read **here.**

Disclosure and Ethics Policy

ARtillery Intelligence has no financial stake in the companies mentioned in this report, nor was it commissioned to produce it. With respect to market sizing, *ARtillery Intelligence* remains independent of players and practitioners in the sectors it covers, thus mitigating bias in industry revenue calculations and projections.

ARtillery Intelligence's disclosure and ethics policy can be seen in full **here.**

Contact

Questions and requests for deeper analysis can be submitted **here.**

References

Click to View

i See ARtillery Intelligence Report : **VR Usage & Consumer Attitudes, Wave IV** (sign-in required)
ii See ARtillery Intelligence Report : **VR Usage & Consumer Attitudes, Wave IV** (sign-in required)
iii Contact ARtillery Intelligence **here**
iv See ARtillery Intelligence Report : **Global AR Revenue Forecast 2018-2023** (sign-in required)
v See ARtillery Intelligence Report: **2018 Lessons, 2019 Outlook** (sign-in required)
vi See ARtillery Intelligence Report: **Lessons from AR Leaders, Part III** (sign-in required)
vii See ARtillery Intelligence Report: **Lessons from AR Leaders, Part II** (sign-in required)
viii See ARtillery Intelligence Article: **2019 was PGO's Best Revenue Year Yet** (sign-in required)
ix See ARtillery Intelligence Report: **Lessons from AR Leaders, Part II** (sign-in required)
x See ARtillery Intelligence Report : **Global AR Revenue Forecast 2018-2023** (sign-in required)
xi See ARtillery Intelligence Article **Follow the Money for AR Trajectory** (sign-in required)
xii See ARtillery Intelligence Report : **VR Usage & Consumer Attitudes, Wave IV** (sign-in required)
xiii Localytics: **Mobile App Retention Data**
xiv See ARtillery Intelligence Report: **Lessons from AR Leaders, Part III** (sign-in required)
xv See ARtillery Intelligence Article: **Pokémon Go Passes $3 Billion** (sign-in required)
xvi See ARtillery Intelligence Report: **Lessons from AR Leaders, Part II** (sign-in required)
xvii TechCrunch Article: **Consumer Spending in-App**
xviii See ARtillery Intelligence Article: **Pokémon Go Passes $3 Billion** (sign-in required)
xix See ARtillery Intelligence Report: **Lessons from AR Leaders, Part III** (sign-in required)