July 2021

Web AR Best Practices & Case Studies

An ARtillery Intelligence Briefing

ARtillery intelligence

Executive Summary

There's growing sentiment in the mobile AR world that apps aren't the optimal vessel. Yet the technology lives on a device where apps rule. **90 percent** of mobile users' time is spent in apps versus the browser. Can AR break that cycle? And if so, could web AR be the answer?

What is web AR? In short, it delivers AR experiences through the mobile browser. Advantages include dynamism for AR's serendipity and short sessions, versus the friction of app stores and downloads. There, "activation energy" dampens AR adoption which is already challenged to begin with.

For example, will consumers spend **90 seconds** downloading an app for an experience that lasts **30 seconds**? Consider this in light of dynamic AR activations within a store aisle or real-world social interaction. These scenarios happen fast and need an AR delivery system that can be the same.

In these moments of dynamic activation, AR formats that can be launched quickly – and with broad compatibility – will find the most commercial success. These factors will also grow in importance as brands and retailers increasingly plant AR activation markers everywhere from websites to product packaging to public-space signage.

Web AR also inherits the qualities of the web, meaning interoperability with common web standards and functions. For example, web AR campaigns can utilize tools like **Google Analytics** for nuanced campaign metrics. The same level of performance tracking isn't possible on other popular AR channels and walled gardens such as social apps.

Beyond functional advantages, one of web AR's benefits is its potential reach. Because of mobile platform fragmentation, developers and marketers building app-based ads and experiences must choose a lane... or jump through hoops to develop creations that can be distributed across platforms.

The web is conversely operable across all smartphones. This allows for the widest range of devices that a given AR ad campaign can reach. This is an important consideration, given the relatively small size of the consumer AR base. Fragmenting that already finite universe diminishes addressable market.

Synthesizing all these factors, **ARtillery Intelligence** estimates that web AR's addressable market is **3.06 billion** global smartphones today – the greatest reach of any AR platform. Yet it's among the least-used consumer AR formats, due mostly to its nascent status. Altogether, this means that web AR has more headroom and growth potential than any other AR delivery channel.

But how will web AR reach that potential? What are best practices for web AR experiences and marketing campaigns? And who's doing it right so far? We'll tackle these questions and others throughout this report, including numbers, narratives, and case studies. The goal, as always, is to empower you with a knowledge edge.

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Key Takeaways

- **Though native apps dominate mobile usage in general, they may not be the best vessel for AR.**
- Apps' inherent "activation energy" may not be conducive to AR's adoption-challenged early stages.
- Furthermore, the app download process may be misaligned with AR's serendipitous use cases.
- These include social multiplayer interactions or dynamic commerce activations (e.g., in-aisle retail).
- Consumers aren't likely to spend 90 seconds downloading apps for experiences that last 30 seconds.

- **Despite these factors, AR has inherited the broader mobile environment's app dominance.**
- The most popular AR experiences to date are app-based including social AR lenses (e.g., Snap).
- The ease and familiarity of app stores – versus the open waters of the mobile web – contribute to this.
- App dominance in AR also results from greater capabilities such as sensor fusion with mobile hardware.
- This enables greater AR functionality such as graphical intensity, frame rates and positional tracking.

- **Web AR could begin to gain ground on native apps in both capability and usage.**
- In terms of device compatibility, web AR has the greatest addressable market of any mobile AR platform.
- This amounts to **3.06 billion** global smartphones today. Apple's ARkit reaches **1.25 billion** by comparison.
- Considering this reach in light of web AR's relatively low usage, its headroom and potential are sizable.

- **When examining platforms from a marketing perspective, web AR holds key advantages.**
- *Dynamic activation*: experiences can be launched from a variety of media including product packaging.
- *Dynamic updates*: experiences can be altered easily via web updates (versus clustered app versioning).
- *Dynamic analytics:* campaigns can utilize Google Analytics versus basic metrics provided by native apps.

- **Beyond advantages and growth signals for web AR, there are *UX tactics* to achieve success.**
- Because of web AR's functional deficiencies noted above, effective campaigns work around shortcomings.
- This includes minimizing file sizes due to web delivery. Prioritize overall experience over graphical intensity.
- Use clean design and large AR activation buttons if calls-to-action reside on web pages (e.g., eCommerce).
- Hold users' hands with clear instructions for AR activation (e.g., plane detection).
- Remember the credo, *utility is king*: Eschew novelty and whimsy in favor of repeatable user value.

- **Beyond UX tactics, there are *marketing tactics* that engender effective web AR campaigns.**
- Goal setting is paramount: Establish concrete brand objectives, and how AR can uniquely achieve them.
- In some cases, this stage can reveal that AR *isn't* the right medium, in which case it shouldn't be used.
- Don't do *AR for AR's sake*... this often leads to failure and misguided expectations in campaign ROI.
- Adequately gauge commitment levels for media spend, as paid distribution can unlock web AR.
- Similarly, calls to action are critical: make sure they're thoughtfully placed to entice target audiences.

- **When the above tactics are practiced, web AR has proven effectiveness and positive ROI.**
- Huggies achieved a **5.2 percent** scan rate and **1:03 minutes** average engagement time.
- Home Depot's web AR product visualization feature boosted conversions **2x-3x** over benchmarks.
- Adidas' web AR ad achieved a **4x** engagement delta, **11-second** average dwell time and a **2.8x** ROI.
- Nissan's web AR ad achieved an **8x** engagement delta over auto-vertical rich-media benchmarks.
- 7-Eleven achieved **10 million** in-store web AR lens engagements from **30 campaigns**.

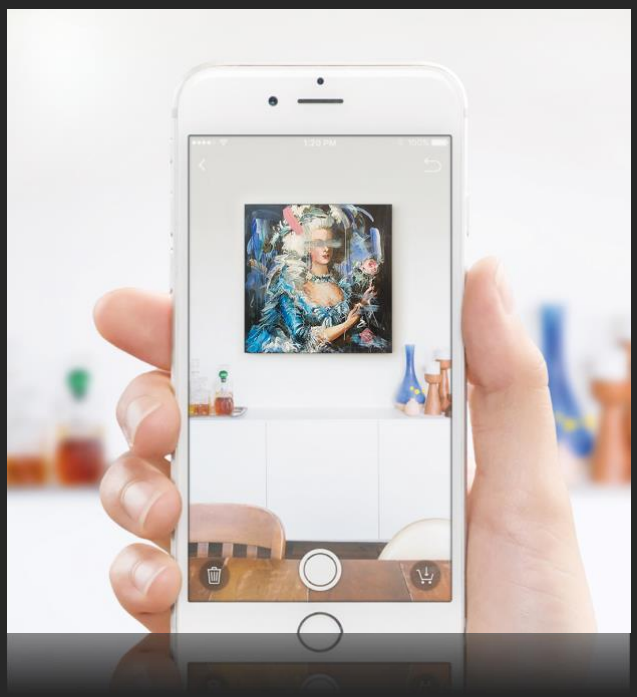
- **Web AR – like the broader AR world – is still finding its footing and isn't a silver bullet.**
- In a marketing sense, web AR is finding success in some product categories and use cases but not others.
- These areas of optimal applicability will continue to develop as AR user behavior itself does.
- Meanwhile, one key historical lesson for emerging tech is that utility and user value sustain over novelty.
- As these factors materialize, marketers should follow fundamentals and make data-backed decisions.

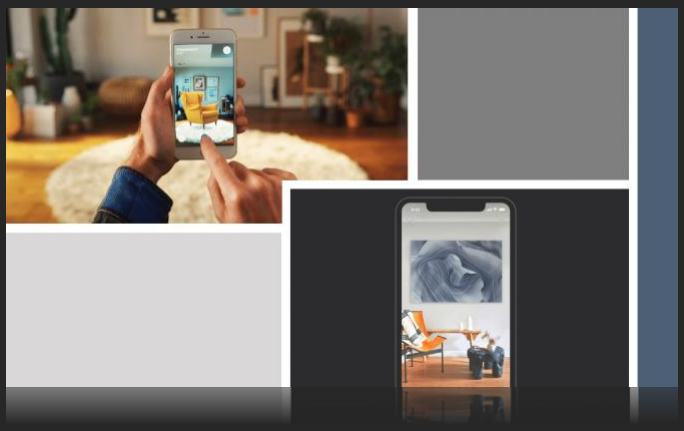
Introduction: Touchpoints

AR's most popular consumer touchpoints today include social apps like **Snapchat** and **Facebook**. They've leaned into AR's natural alignment with the virality of social content. For example, AR enhances the already-popular use case of sharing multimedia. Brand advertisers have also rushed to join the party.

Other AR distribution channels include native apps. These are subdivided by brands' own apps (e.g., **IKEA Place**) and third-party apps (e.g., **Houzz**). Finally, web AR is a less-developed but promising AR channel that delivers AR experiences through the ubiquitous mobile browser.

Among these formats, social lenses lead in terms of consumer AR usage and engagement levels. This is largely due to these channels' natural fit with AR, and their embrace of the technology by building developer platforms. **Snapchat** has been a poster child here.





That success will continue among social channels, including more recent AR entrants like **Instagram** and **TikTok**. But the channel that could see the most growth is web AR. This is due to its practical advantages such as compatibility among mobile devices[i], and its capacity for fast AR activation.

In other words, many app-based AR experiences (including social apps) require users to have a given app first. Requiring them to download said app while trying to activate an AR experience could stall an already-challenged mainstream adoption curve.

In these moments of dynamic activation, AR formats that can be launched quickly and with broad compatibility will be most successful. This will increasingly be the case as brands and retailers plant AR activation markers on their products and store aisles.

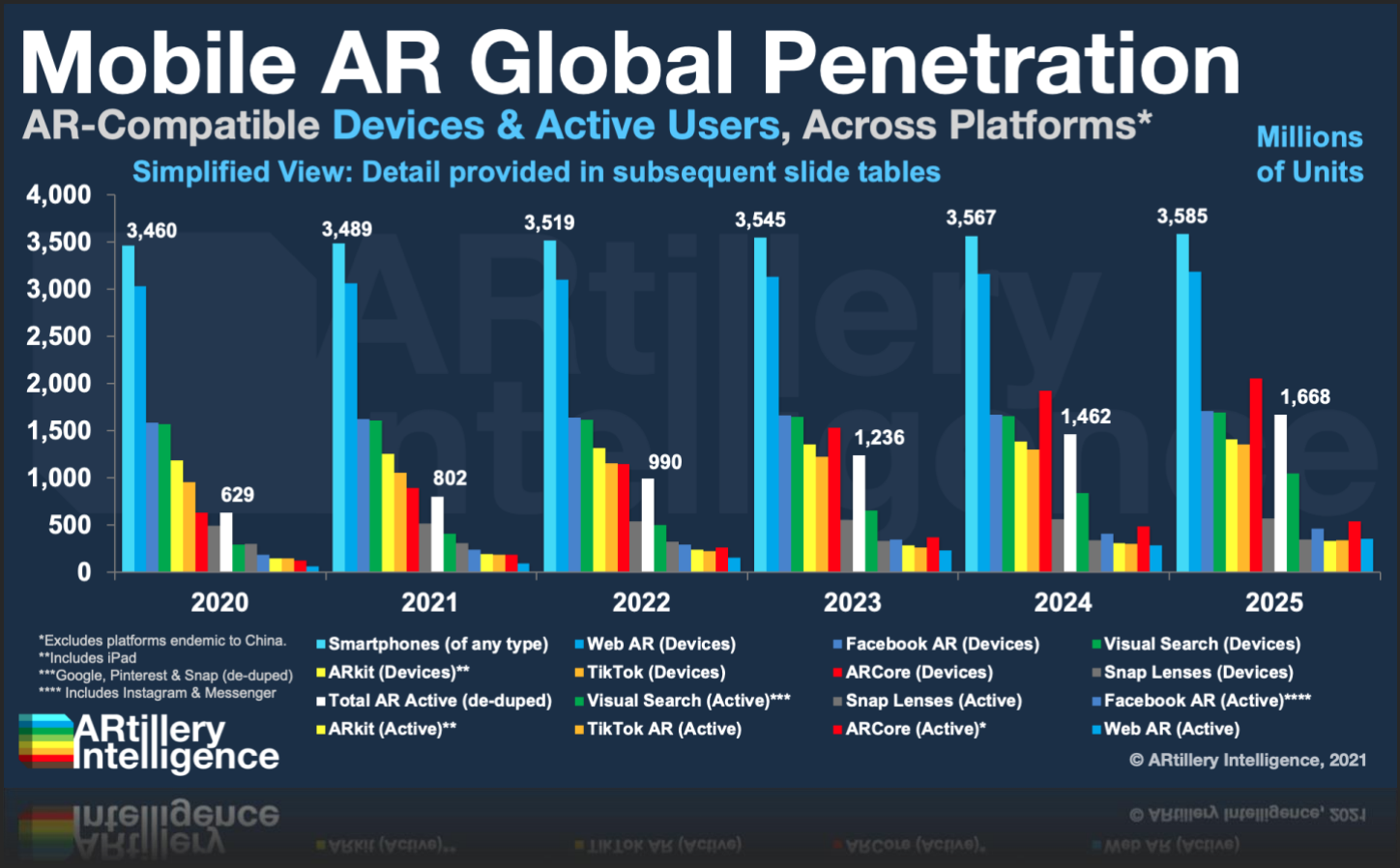
"Web AR has some nice advantages," **8th Wall** CEO Erik Murphy-Chutorian told ARtillery Intelligence. "You're not tied into a social network. You're not tied into a platform. You don't have to go to an app store and you aren't restricted on devices. You really can get on most peoples' phones."

By the Numbers

Speaking of phone compatibility, web AR is advantaged by its sheer reach. Specifically, it's compatible with more than **3.06 billion** global smartphones – the greatest of any platform. Because it's browser-based, it has broader compatibility with mobile hardware and operating systems.

This scale is also owed to the work of web AR innovators like **8th Wall** that have been able to get AR to work on commodity hardware and standard cameras. In fact, the above AR compatibility figure is based largely on the device types that **8th Wall** has tested. Other players that serve AR ads have validated these figures.

As for other platforms, **Facebook** is projected to have **1.63 billion** AR-compatible smartphones, followed by **ARkit** (**1.25 billion**), **TikTok** (**1.1 billion**), **ARCore** (**891 million**), and **Snapchat** (**515 million**). When adding up and de-duplicating these figures, AR active users total about **802 million**.



Closing the Gap

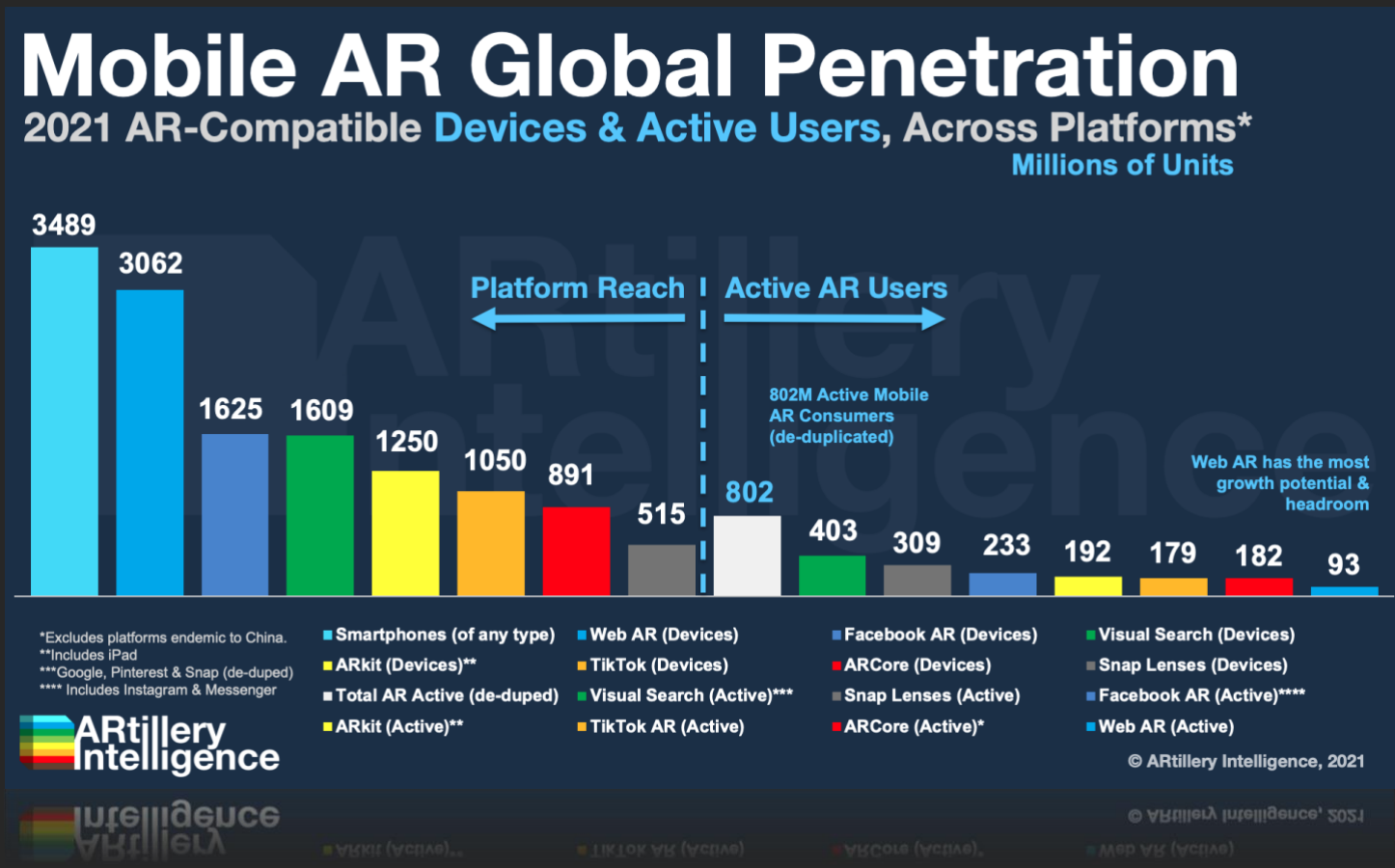
Despite its reach advantage, web AR has the least active users of all the aforementioned platforms. This isn't a mark against its quality, but a characteristic of its early stage. Social apps have a more established position through incubating AR and infusing it into already-popular activities like social sharing, as noted.

By contrast, the mobile web is more of an open "wild west" environment. This is one reason why apps – despite all their friction and activation energy – account for **90 percent**[ii] of time spent on mobile devices. AR inherits these established mobile usage patterns.

But for web AR, having the greatest reach and the least active use is positive in one sense: *headroom*. Web AR has the greatest growth potential of any mobile AR channel. As it continues to improve in functional capabilities and consumer acclimation, it could begin to close that gap.

This is already happening, the latest evidence being **8th Wall's** "Release 16." Among other things, it features up to **50 percent** improvements in positional tracking (SLAM) and up to **70 percent** frame rate increases.

Furthermore, this mobile AR market-sizing exercise reveals another key factor: *platform fragmentation*. Compared to the mature smartphone market that has two platforms, AR (and VR for that matter) have several, which could further compel web AR and its cross-platform advantages.



From the Source

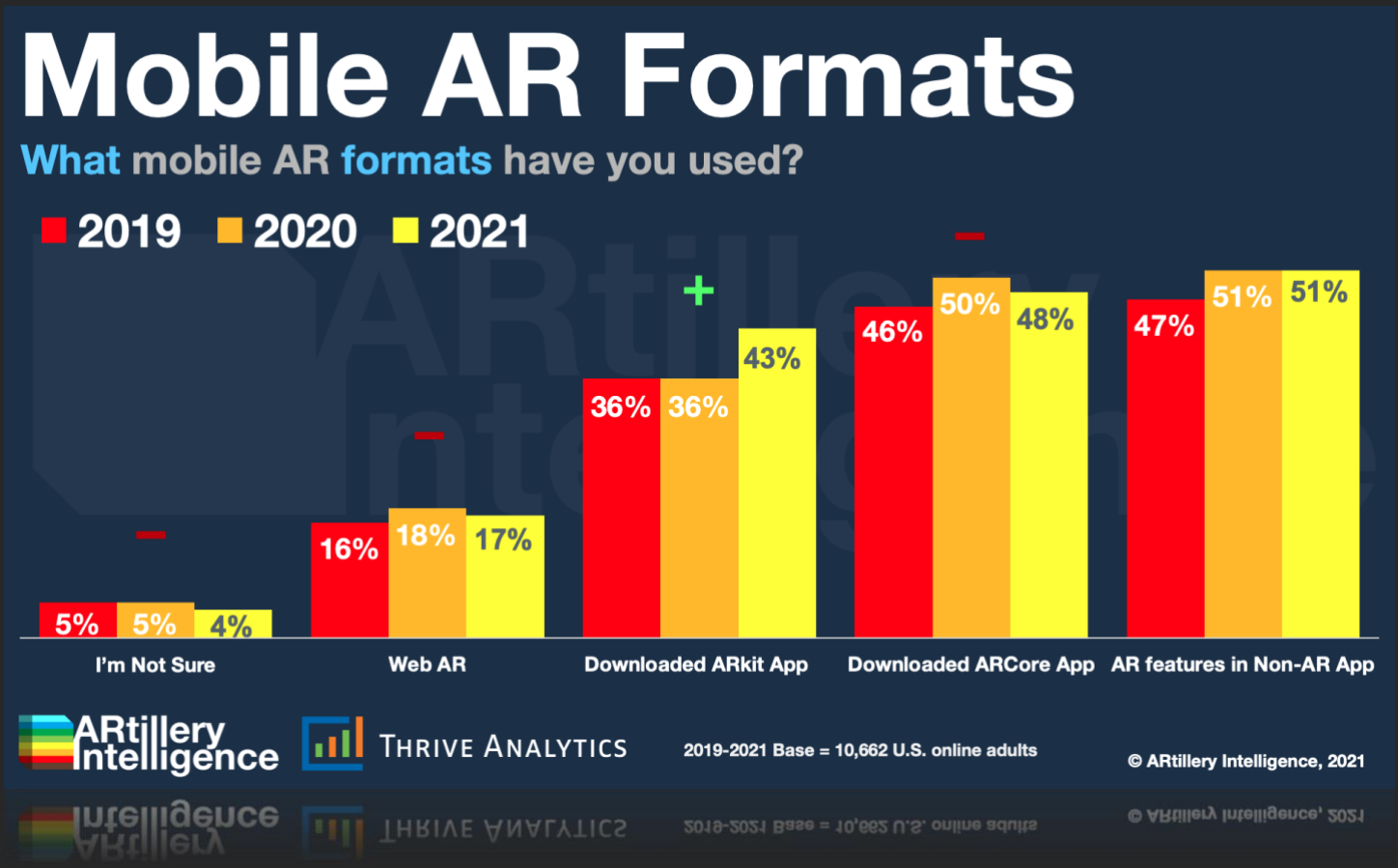
To further compare mobile AR platforms in a data-backed way, how do they stack up in terms of consumers' reported usage? **ARtillery's** recent survey findings[iii] – produced in tandem with consumer survey specialist **Thrive Analytics** – provides more color.

When asked what types of AR formats users have tried, the leading category was "AR as a feature" (ARaaF). To define what that means, it's AR experiences that have been integrated into existing (non-AR) apps. That includes many of the social AR platforms examined earlier including **Facebook** and **Snapchat**.

These ARaaF experiences benefit from piggybacking on established apps and experiences, such as social lenses. This will continue to be a strong delivery channel for AR, and is advisable for players who already have reached scale with their mobile apps.

Web AR meanwhile lingers at **17 percent** of survey responses. That's not surprising given the data and explanations on the previous page. Indeed, web AR's best days are ahead. Though its current active use is lowest among platforms, its installed base is greatest... meaning it has the biggest shell to grow into.

As for standalone AR native apps, they perform well in the survey – also due to the factors examined in the previous section. However, we're most bullish on the future prospects of ARaaF and web AR.



Web AR: Side-by-Side

Moving on to a more qualitative analysis, how does web AR stack up to other platforms in terms of capability? AR ad agency **Poplar** put together a useful chart to answer this question.

When choosing an AR ad platform, factors include capacity for organic discovery, paid promotion, developer skills required, and lens capabilities. At a high level, these factors stack up evenly among social AR platforms, while native apps hold the advantages cited earlier.

But social platforms fall short in advanced campaign analytics when compared to web AR. Social channels also fall short in being able to advertise products like alcohol. Indeed, web AR has become a go-to channel for AR campaigns around spirits brands such as Jack Daniels and Discovery Wines.

Beyond these high-level platform comparisons, what are web AR's more granular and tactical advantages? The next few sections dive in.

Poplar.Studio
www.poplar.studio

WHAT AR PLATFORM SHOULD YOU USE?

	LENS STUDIO & SPARK AR STUDIO			8TH WALL WEB XR API ETC	AR CORE & AR KIT
				Web AR	Native app
Frame rate	High	High	High	Average	High
Paid promotion	✓	✓	✓	✓	✗
Quick to build	✓	✓	✓	✓	✗
Low barrier of entry	✓	✓	✓	✓	✗
Photo capture	✓	✓	✓	✓	✓
Video capture	✓	✓	✓	✓	✓
# impressions, captures & shares	✓	✓	✓	✓	✓
Other analytics	✗	✗	✗	✓	✓
No content restrictions (alcohol, tobacco, pharmaceuticals, etc)	✗	✗	✗	✓	✓

Web AR Barriers

Despite all the web AR advantages outlined so far in this report, there are also drawbacks. Though its capabilities continue to improve and catch up to native apps, web AR's current detriments should be acknowledged when choosing an AR distribution channel.

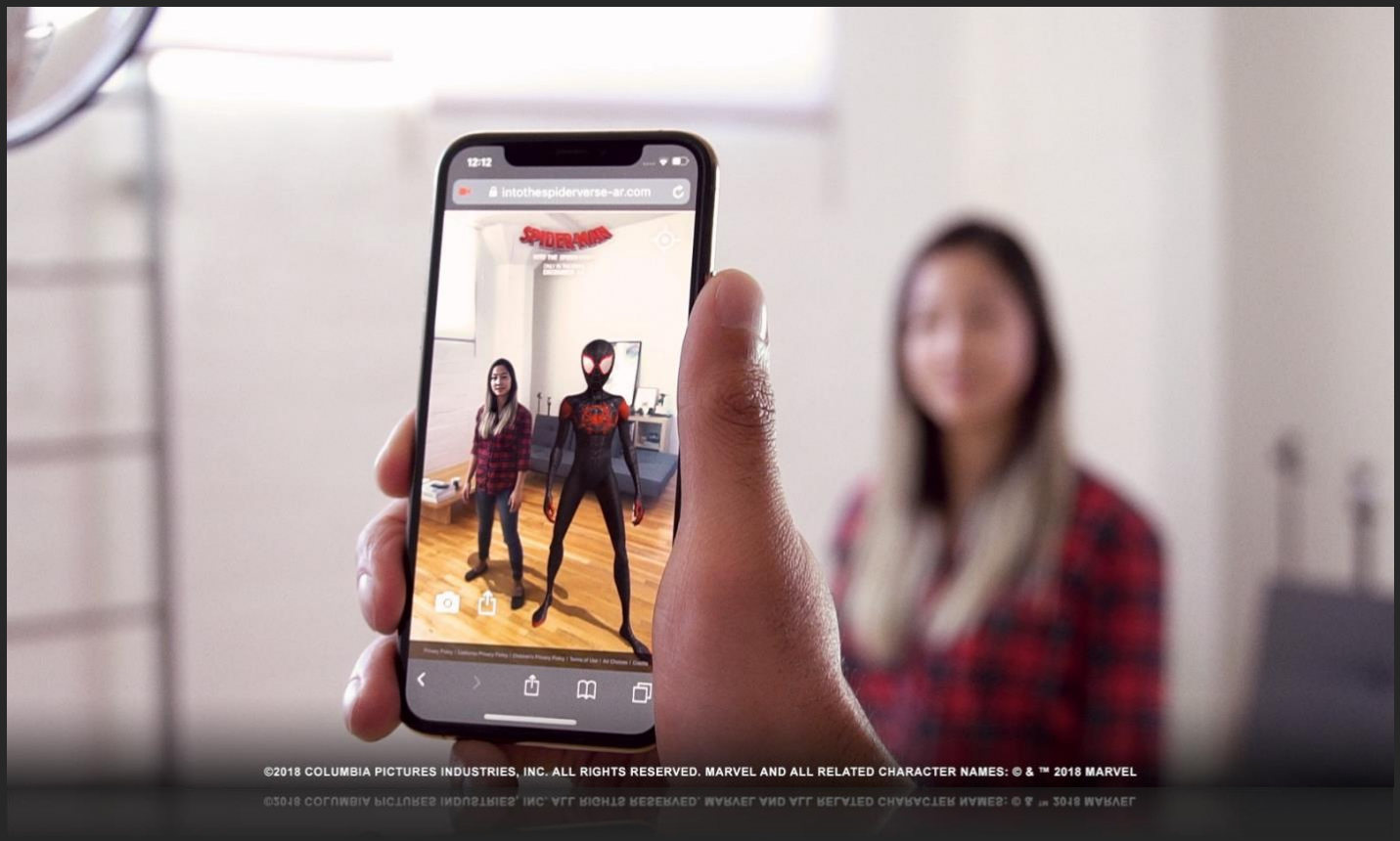
For example, native apps can better utilize native libraries for tighter integration with device hardware. They do so using a platform such as ARkit that has direct access to the hardware (given **Apple's** vertical integration), and grants this benefit to its native apps.

Practically speaking, this means native apps have inherently more powerful capabilities. For example, the hardware integration noted above can involve things like the iPhone's IMU sensor bundle that tracks signals like device direction and movement. That can translate to better positional tracking.

"**Apple** specifically has done a really good job of getting accurate scale in AR," **8th Wall's** Murphy-Chutorian told ARtillery Intelligence. "There are things like measuring if my suitcase fits inside a box, or virtual tape measures. They've done an excellent job getting the accuracy right for those things."

Apps also work well when engaged frequently, such as the small set of daily-use apps like email, messaging or Instagram. For these few use cases, home-screen positioning and quick access are well served by native apps.

"Apps are really good for these things that you come back for all the time, like if you're going to sit there checking your **Facebook** feed multiple times per day," said Murphy-Chutorian. "It's almost like apps are a commitment: once you have that level of commitment, they're appropriate."



Web AR Benefits

Picking up on the last native app benefit examined above, having direct access to a given app on one's home screen is indeed beneficial. But practically speaking, this only applies to a few daily-use apps. The majority of mobile app usage is held by just a handful of popular apps.

In other words, native apps' home-screen benefit is almost a moot point for everyone else. Unless you plan on competing with **Facebook**, **Gmail**, and **Twitter** for home-screen position – which you likely won't accomplish – the interface-permanence outlined above doesn't really apply.

"Say you're a new company and you want to do something in AR," posed Murphy-Chutorian. "You build a native app and put it in the store. How many downloads do you get? People really struggle to get their apps downloaded, and their reach and visibility are much smaller."

So for the vast majority of developers building mobile experiences today — especially in the still unproven AR category — the native app calculus is different. Apps can actually be a disadvantage in that their access is weighed down by the friction of app store downloads.

This is where web AR has an edge, as brands can plant universally-operable web links as scannable markers wherever they have presence. That includes brand marketing like product packaging or any owned media. In fairness, **Snapchat** has shown similar potential through Snapcodes that activate AR.

"Any source of traffic you have becomes an opportunity to show AR," said Murphy-Chutorian. "Another great area for reach is people who own restaurants, stores or sell goods that are printed on anything. It's AR on the back of the toy you just bought, or the cereal box, or **Starbucks** lid."

Similarly, web AR can inherit all the things that the web does. For example, you can connect AR experiences to your payments processor as well as web-based tools like **Google** Maps' API or **Google** Analytics.

"Those kinds of web combinations let you build much more powerful things than what you can do on AR apps and social networks," said Murphy-Chutorian

We group these and other web AR advantages into three main categories: *activation*, *updates,* and *analytics.* Let's take those one at a time…

Dynamic Activation

Starting with activation, one of AR's inherent opportunities is serendipitous encounters. These include launching a branded AR animation in a store aisle, or a shared AR lens with a friend in a public space. Prompts for such opportunities could start to permeate store aisles and public spaces.

These prompts could be physical markers or other spatially-anchored AR experiences. And the magic of discovering and activating these creations is only present when they can be launched *quickly*. Web AR offers just that, as the base ingredient is ubiquitous cameras and browsers.

Now consider an app workflow instead: If a user doesn't have the necessary app, the experience can't be launched until she is first bounced to the app store, waits for the download, then is questionably landed back in the right place once the download is complete. After all those steps play out, the moment is sometimes gone.

All this friction goes against one of our fundamental success factors for AR (and all emerging tech): It's too early and unproven to make users *work for it* or *wait for it*. AR should be laid directly in users' paths or infused with the things they already do. An example of the latter is, again, Snapchat lenses.

Furthermore, if we go back to the point about physical markers, web AR is compatible with universal QR codes. These are easy to create and integrate with existing media such as product packaging or signage. These are things that brands already own: They're sunk costs and are great vehicles for AR.

Dynamic Updates

The next AR advantage is dynamic updates. Because experiences are delivered through the good-old web, you can rapidly prototype, deploy and change the software. Apps conversely involve an onerous process of approvals and clustering static software versions in separate intervals.

This is what we like to call the “headache factor,” and web AR scores favorably on that metric. Web AR’s update dynamism can also be valuable in early versions of any AR experience when rapid iteration is the name of the game. Updates become less frequent in later stages.

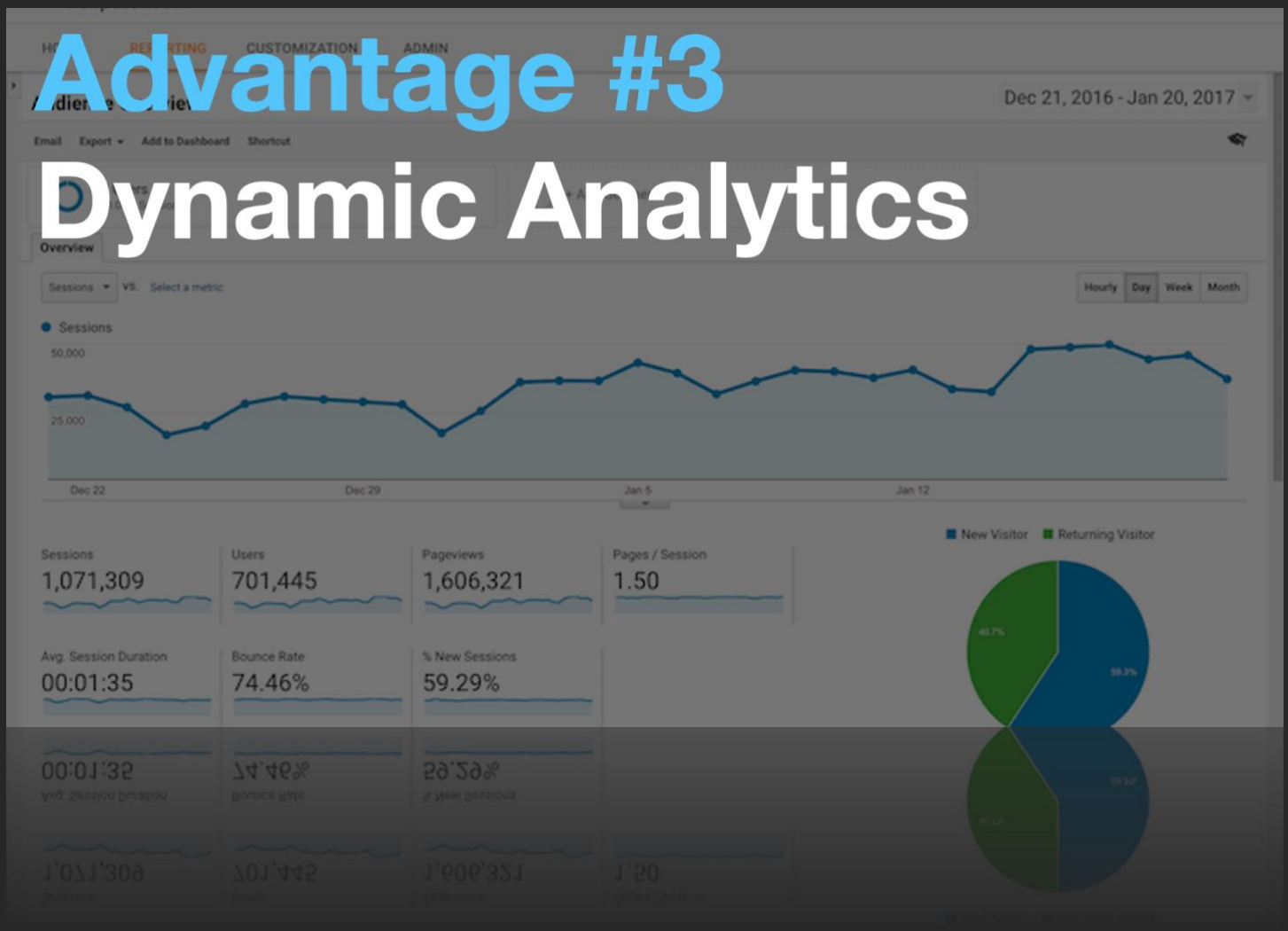
One example of this principle is Ally Bank’s Monopoly-themed web AR campaign that we examined in a recent report.[iv] As the location-based AR game experience played out, its creators were able to send rapid updates as they discovered things that needed to be fixed, such as vulnerabilities for location fraud.

Dynamic Analytics

Moving on to the third web AR advantage, it's all about dynamic analytics. This is a web AR advantage that's less discussed but it's potentially the most valuable of the lot. Because, again, web AR is delivered through the good-old web, you can utilize web-based analytics tools.

For example, you can run your campaign through **Google** Analytics with tracking links, and get other behavioral metrics such as session lengths. This can not only help attribute effectiveness and ROI, but also provide insights to course correct and optimize AR-based experiences and campaigns.

Compare this advantage to native apps, where analytics are lacking because developers are at the mercy of what the platform wants to give them. The granularity in performance tracking and analytics varies across AR platforms, and more can be seen in the comparative feature chart shown earlier.



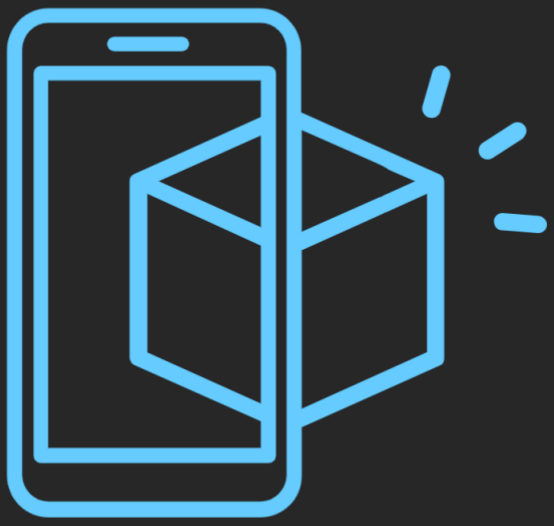
Video Companion

Click to Play

The *How*: Web AR Tactics

The question that flows from the web AR analysis so far in this report is *how* to get the most out of this channel? What's the best way to build AR experiences and campaigns that lean into web AR's advantages… or build around its disadvantages?

Indeed, web AR's broad compatibility, device interoperability and reach compel specific campaign tactics. And the technical drawbacks examined earlier likewise require specific tactics to avoid suboptimal end-user experiences. Here are a few of those tactics…



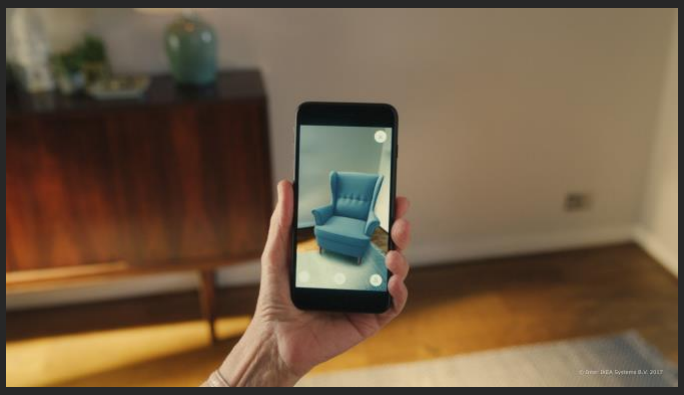
UX Tactics

Be Omni-channel: Because of the *dynamic activation* explored in the previous section, marketers can execute the much-vaunted "omnichannel" approach. When a campaign lives on the web, it can be opened with a link, and therefore distributed to other channels, versus confined to one app.

That includes everything from product packaging to SMS. Beyond reach, this cross-channel ability taps into an AR advertising success factor that we've examined in the past: *amortization*. In other words, the cost and time to produce AR experiences can be spread across additional channels and campaigns.

Work Around Shortcomings: Back to AR's functional drawbacks, it's true that browser-based AR experiences are inferior in some ways to apps. The latter can better utilize native libraries for tighter integration with device hardware and processing, as noted.

Web AR experiences therefore should build around the medium's attributes and shortcomings. Due to web-based delivery, **Rock Paper Reality's** (RPR) Patrick Johnson advises minimizing file sizes and aiming for an overall compelling user experience, rather than prioritizing graphical intensity.



NexTech AR Solution's[v] Paul Duffy likewise asserts that simplicity is key. Use clean design and large AR activation buttons that are above the fold on a given eCommerce page. Once users click, it has to be a seamless launch. Again, prioritize performance over graphical intensity.

Hold Users' Hands: It's also important in early days of AR's cultural acclimation to guide users in explicit ways and hold their hands, even if it weighs down the experience from a design perspective. This includes graphical instructions about how to localize a device with plane detection markers (see case study later in this report on **Google's** AR approach).

When this is done right, experiences can sidestep some of web AR's functional constraints. When weighing form and function, the ultimate goal shouldn't be design awards and impressing other AR people, but rather *user engagement* and *advertiser ROI*.

Utility is King: AR will evolve and expand into new categories, but utility will be a common denominator. Just like early smartphone apps, there will be limited shelf life for novelty experiences. True utility, such as virtually trying on fashion items, will be the AR design target that wins in the long term.

Marketing Tactics

Goal Setting: In the case of web AR marketing campaigns, the discovery phase is critical, says **RPR's** Johnson. It's all about clear goal-setting for brand objectives. This involves mapping out campaign endpoints, such as brand awareness (upper-funnel) or revenue lift (lower-funnel).

It's also about defining targeted personas that the campaign — and thus the brand — is meant to engage. These steps directly steer campaign strategy.

For example, when working with brand clients, Johnson sometimes advises them *not* to do AR. This happens whenever it's discovered in early phases that their goals don't align with AR and they're instead driven by "tech for tech's sake."

Commitment Level: Related to goal-setting, it's important to gauge advertisers' financial commitment. What's their paid ad budget? This will impact what and how many channels an AR experience can be distributed to. As mentioned earlier, omnichannel approaches can boost campaign performance.

Not a Silver Bullet: Though AR continues to broaden into new product categories, Johnson says that it shines today in a few specific areas. One example is commodities that differentiate mostly on marketing (think: **Budweiser** versus **Coors**).

Calls-To-Action are Critical: Another important campaign tactic comes down to activation points. In other words, where and when is the AR experience activated? Calls-to-action should be strategically placed in the paths of targeted users, whether that's websites, social posts or print QR codes.

Effectiveness traces back to the all-important discovery stage referenced above. Know the campaign's target personas and the media touchpoints to which they're endemic. Beyond the initial call-to-action, it's advisable to map out the entire experience and clickstream.

In other words, optimize the flow from call-to-action to activation to post-AR action. The latter goes back to campaign goals and can include things like social shares, or buying a given product. Build the experience around that flow and steer users toward intended actions.

Listen to the Data: Building on the previous point, how do you know where to place calls to action and optimize an AR experience? The answer is to work with an agency like **RPR** that's refined its AR playbook, and/or develop your own competency through testing.

Saatchi Art has done both. Its VP of Product Wayne Chang stresses the importance of analytics, as his team is currently evaluating where they should put AR calls-to-action. Buttons are currently on individual product pages, but should they also exist further up the funnel as more of a discovery tool?

Video Companion

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Case Studies

To build on all of the above by “showing rather than telling,” the next section dives into several representative case studies. These look at best practices and implementations of web-AR-centric marketing campaigns.

For optimal relevance and applicability, we’ve chosen campaigns that span a range of verticals and product categories. See them all below.

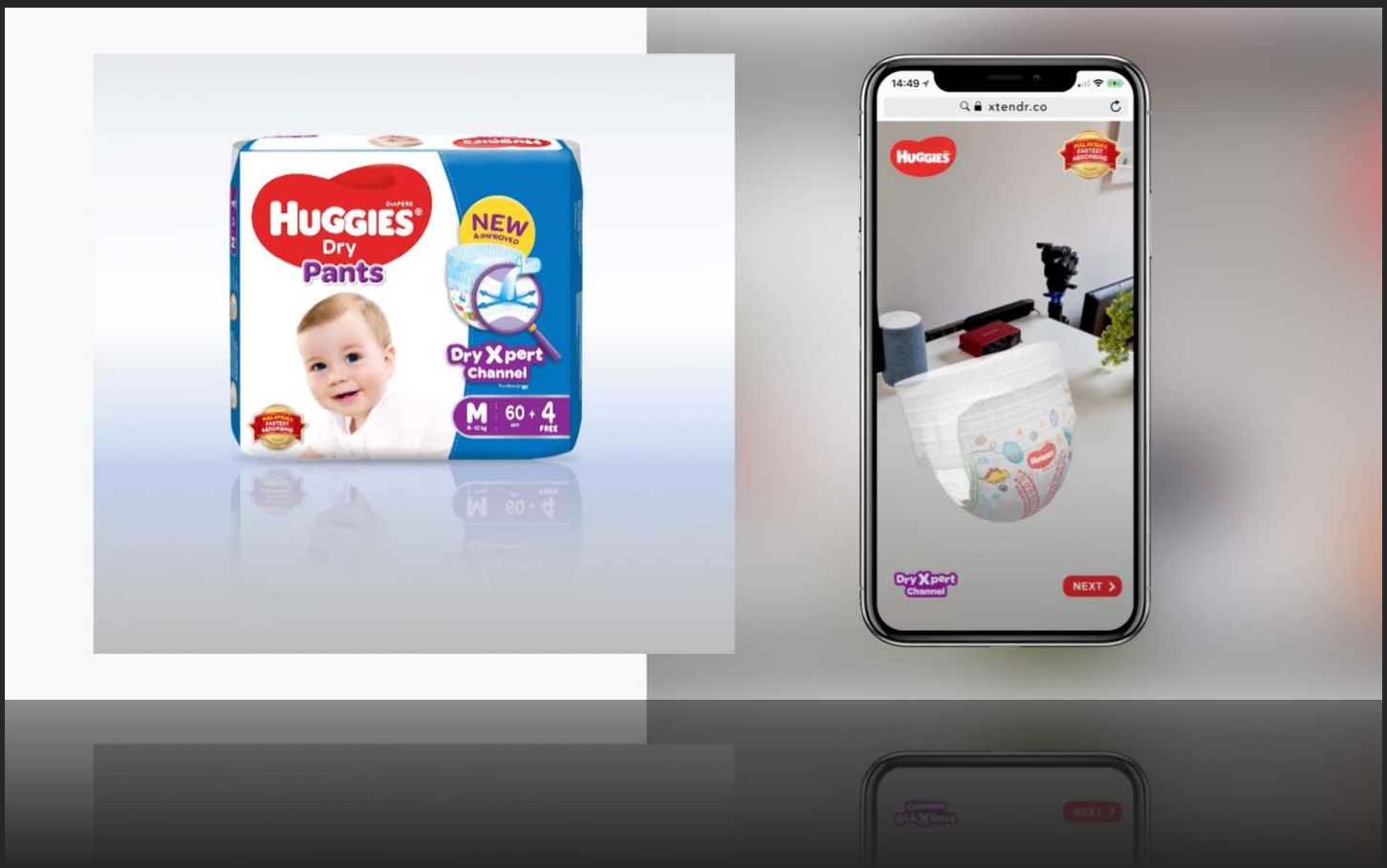
Huggies

To enliven the launch of its new Dry Xpert product line, **Huggies Malaysia** developed a web AR campaign in partnership with **8th Wall**. Triggered by a QR code on select **Huggies** packaging, the AR experience featured an interactive demonstration of the product's main features.

To activate the experience, users scanned the aforementioned QR code using an iOS or Android device. They would then see water rise on their screen as if their physical space was flooding. They could then press a red "absorb" button to stop the flooding with the **Huggies** Dry Xpert product.

After the game-like experience was complete, users were prompted to share it with friends through popular social channels. Altogether, the campaign's strengths include QR code activation on existing packaging, a fun/cheeky experience, and baked-in virality for additional distribution.

And the results? **Huggies** achieved a **5.2 percent** scan rate and an average engagement time of **1:03 minutes**. The latter is notable, given online video – the closest equivalent to mobile AR – has an average engagement time of about **20 seconds**, as examined in our recent AR advertising report.[vi]



Viacom CBS

Viacom CBS was interested in finding immersive ways to promote its SpongeBob Movie: “Sponge on the Run.” Working with AR studio Poplar, it launched a web AR experience that was prompted by calls to action in social media and other channels.

As for the experience itself, users were greeted by a trailer, then immediately taken to an AR face effect that emulated the film’s protagonist. The effect was activated when the user opened his or her mouth in response to a verbal cue from the movie characters (see video below).

For an additional viral kick, users were then prompted to capture an image of themselves and save to their device or share to social media. Finally, users were then redirected to a page that promoted the campaign’s associated sweepstakes that involved finding special codes on a series of retail products.

Altogether, the campaign’s strengths included social distribution, promotion through several channels, a fun/whimsical experience that’s on-brand with the movie’s persona, and a seamless clickstream to bring users to intended actions, such as the sweepstakes.

And the results? The campaign was part of a national program featured on over **22 million** products, which drove a **29 percent** lift in sales and helped drive **181,000 entries** to the weekly sweepstakes. The AR components specifically reached **15,797** monthly active users (MAUs)

It’s also worth noting that MAU’s grew **6,000 percent** in the campaign’s second month due to **Viacom CBS’** promotional efforts. This demonstrates that omnichannel approaches can amplify AR engagement and success, as the “whole is greater than the sum of its parts.”

The Home Depot

We continue to see metrics that validate AR's ability to boost product sales. This can be in both eCommerce and in-aisle contexts. The former is more pertinent in the recent environment of lockdowns, but the latter could shine in retail's "touchless" post-COVID era.

The latest evidence comes from **the Home Depot**, which reports that its AR product visualization feature boosts conversions **2x-3x** over eCommerce benchmarks. Its AR feature lets customers visualize a range of products in-home through the smartphone camera before purchasing.

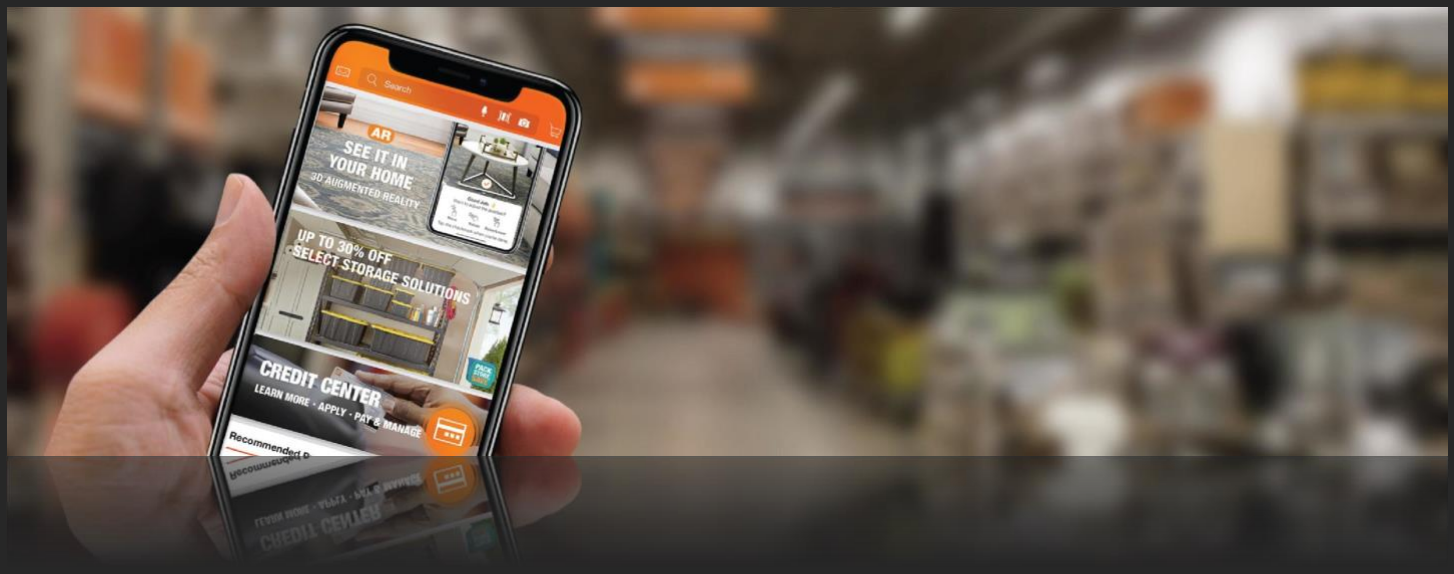
As further background, **the Home Depot** employed a web-AR approach, given the technology's relatively-low friction in launching in-home (or anywhere) AR experiences. It also has more online products supported by AR visualization than the total number of products that fit in one physical **Home Depot** store.

This has been a big area of investment for **Home Depot** as it has refocused digital efforts, given **100 percent** growth in Q2 2020 online sales. For such an extensive and high-variant (sizes, colors) product catalog as **Home Depot's**, AR visualization is particularly additive.

The theme in all of the above is meeting the moment. eCommerce inflected during the Covid-era. Retailers and brands that shifted with it outperformed competitors. This can be seen from others such as **Target** and **Walmart** who have leaned into touchless fulfillment models like curbside pickup.

But more than their temporal importance, these new shopping and commerce models may cause permanent habits and demand signals. Consumers have developed the taste for streamlined shopping, time savings, and tech-enabled procedural efficiencies.

This means that the post-Covid world could be a hybrid of old and new "normals," where new discoveries can be cherry-picked for permanent implementation. AR is on that list of tools that will help consumers shop smarter. Retailers and brands that meet this demand could develop a first-mover advantage in the post-Covid world.



Google

When it comes to emerging technologies, some companies are in a unique position to accelerate adoption. That can often happen by tapping into large established networks or user bases to expose and distribute the technology in question. It's a classic incubation play.

In AR, **Apple** is a good example of this, given its work to seed user demand and developer interest through ARkit and other mobile means. Snap has likewise popularized AR lenses by integrating them into the existing and popular activity of social multimedia sharing.

But greater impact could come from the web's most traveled destination: **Google**. Can it use this position to incubate AR and expose it at scale? It's already begun to do so by planting AR throughout its well-traveled touchpoints and search results pages (SERPs).

More specifically, **Google** continues to enable search results to come to life in 3D and AR. To define these two terms, 3D is when searchers can spin a 3D graphic (often on desktop SERPs), while AR offers the same effect but overlayed in one's space (on smartphones).

This has played out so far with topics that are conducive to visualization, and in educational contexts. These include subjects like a human skeleton or members of the animal kingdom. These use cases and categories will continue to broaden as **Google** tests the waters.

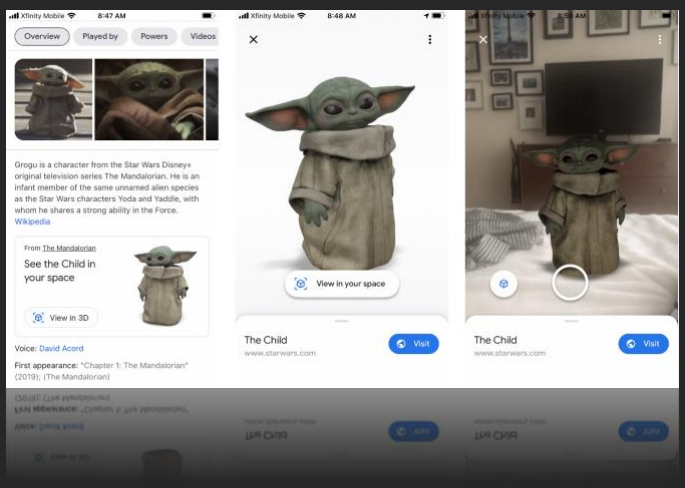
We'll also see this moving towards more monetizable searches. In **Google** fashion, it's gaining organic traction before it flips the monetization switch. The latter could involve things like characters to promote shows & films like it recently did with Baby Yoda (see across).

Another way monetization will play out is **Google** Swirl, as examined in our recent camera commerce report[vii]. This 3D/AR format lets advertisers develop interactive search results. In early tests, these campaigns show strong engagement versus online benchmarks.

For example, **Nissan's** Swirl ad let users control a virtual car and see features like lane-assist. It achieved an **8x** engagement delta over rich media benchmarks in the auto vertical. **Adidas'** Swirl ad let users zoom and spin its Ultra Boost 2019 shoe. It achieved a **4x** engagement delta over 2D benchmarks, **11-second** dwell times and a **2.8x** ROI

All of the above represents an ongoing evolution of the SERP from its "10 blue links" origins. After years of expanding into the "knowledge graph," 3D models are the next logical step. They're also a way to future-proof search for a more camera-forward era.

Moreover, this ties back to our web AR theme. In addition to brand-driven campaigns through their owned channels (e.g., packaging, email, websites, SMS), a sizable portion of web AR activity could flow from search. After all, it's the web's most prevalent launch point.



7-Eleven

As the previous examples demonstrate, web AR can involve everything from remote product visualization to in-store shopping. And it spans utilitarian (contextualizing products) and whimsical (promoting film releases) use cases.

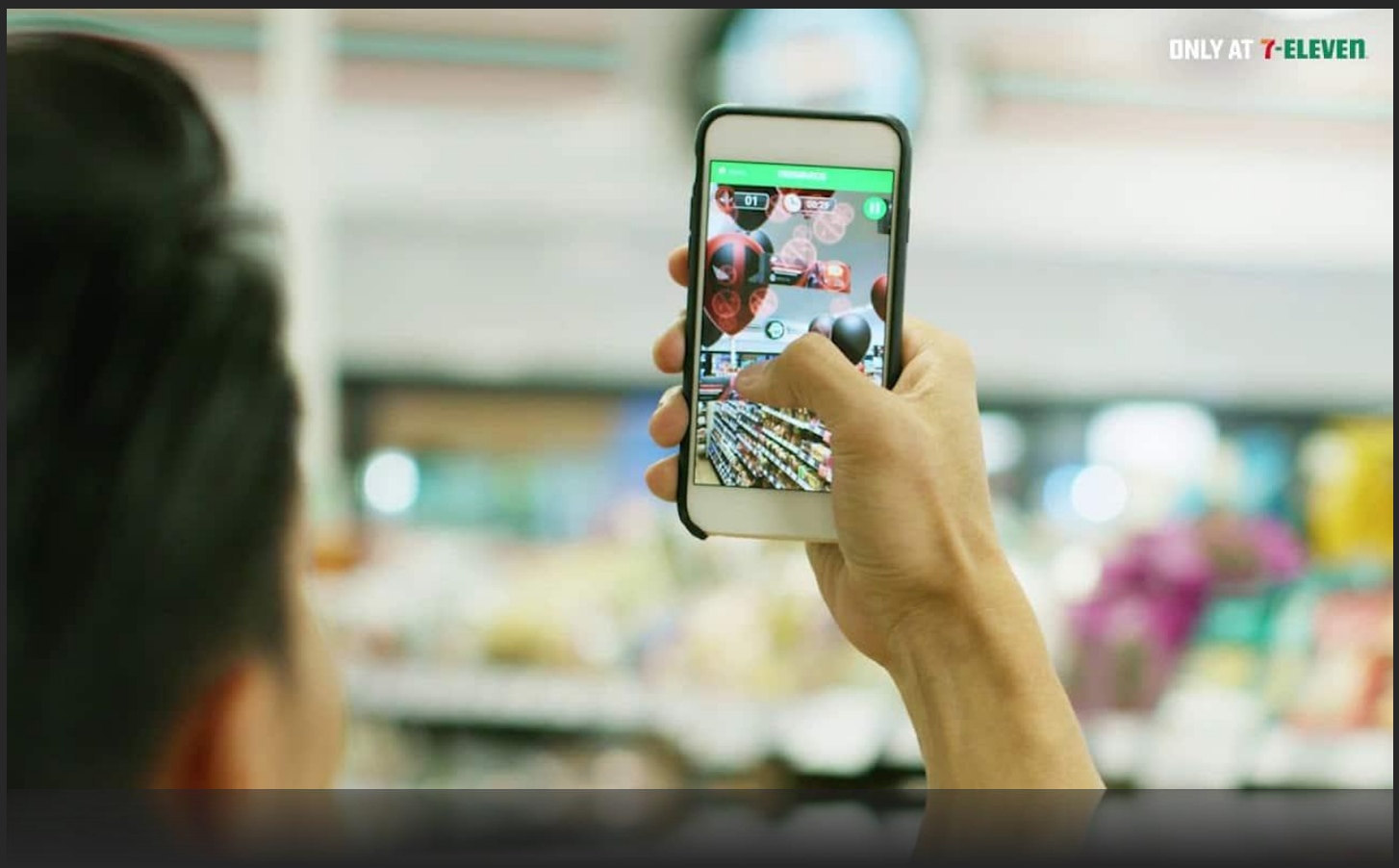
In the latter camp is **7-Eleven**. Its AR activations include in-aisle games, such as throwing virtual footballs at animated Reese's-branded blimps (rear-facing camera). There are also selfie lenses of giant Dorito hats (front-facing camera) that shoppers can play with.

In all cases, the goal is to boost brand engagement in a high buying-intent zone (store aisle). This is a form of AR we're very bullish on, given that buying intent and in-context use. These gamified and whimsical product tie-ins are also fitting to **7-Eleven's** brand persona.

And the results? **7-Eleven** was able to reach **10 million** in-store lens engagements from a total of more than **30 campaigns**.

This is just one form of in-aisle AR advertising that will grow as an advertising medium. Another will be visual search which involves pointing one's phone at a product to get more information. As examined earlier in light of **Home Depot's** efforts, this aligns with "touchless" retail in the post-covid era.

Meanwhile, **7-Eleven's** AR integrations are likewise on-brand, which is a lesson in choosing your flavor of AR wisely. This will continue to be a moving target, which is why close attention to best practices like this are a key exercise in AR's early days.



AR's Meter Stick

One key question that arises from all the above case studies involves analytics: What are the right metrics for AR engagement?

The advertising world tends to stick to what it knows, such as impressions and click-through rates (CTRs). But AR engagement may not be adequately measured in these ways. Because they were created for a different medium, things like impressions and CTRs don't capture AR's depth of experience.

Of course, the ultimate metric is *revenue*. It's a universally-understood metric that applies across ad formats. But its direct tie to ad performance isn't always available. When revenue lift can be tracked – usually with lower-funnel formats – attributing campaign success is straightforward.

But because that's not always the case, the advertising world generally relies on metrics that are *proxies for,* or *extrapolations of*, revenue impact. This has led to digital advertising benchmarks such as impressions, clicks and other metrics that are meant to map to a given campaign's goals.

What's the CTR of AR?

So AR's challenge will be to develop those native metrics. In other words, *what's the CTR of AR?* We're starting to see some early indicators emerge, many of which are demonstrated in the case studies above. But these metrics are still developing.

One common example from these case studies is *dwell time*. AR's ability to captivate consumers with immersive content has proved to boost this metric, which can in turn boost things like brand affinity and recall.

In all cases, it will be important to establish benchmarks for web AR. Standard units like session lengths can assign value to engagement levels that advertisers can expect. Because their biggest aversion to AR is unfamiliarly, standard metrics can help "normalize" its performance.

"With media and creative agencies, it's hard to reframe your mind in this new medium," M7 Innovations' Matt Maher told us. "So you benchmark it based on the past medium. […] But slowly, we're seeing the smart marketers say, 'Okay, we'll create new benchmarks. We'll start to adapt what we know.' You don't want this to be a bolted-on innovation. If it's measured wrong, [the client is] never going to do AR again. So you kind of need that balance of both to justify the spend."

Opportunity Gaps

One gating factor to the overall web AR and camera commerce opportunity is its supply chain. In other words, the graphical elements that comprise its experiences require a certain degree of production and distribution rigor. Here, we're talking about graphically-intensive (large-file) 3D models.

This presents a few opportunity gaps in. One is infrastructure and distribution for 3D product models. That includes things like compression technologies and rendering workflows to get images to the right places. This subsegment of AR is represented by innovators such as **VNTANA** and **Mawari**.

Another opportunity is for platforms that can streamline the *creation* of 3D assets. This already exists in one sense, considering 3D model creation engines. Here there's a rich pipeline of tools that address different types of graphics and skill sets – everything from **Unity** to **Sketchfab**.

There's also **Adobe Aero**, a tool that offers a drag & drop creation environment for 3D content. One of its biggest advantages is that it plugs right into **Adobe Creative Suite**, which is a ubiquitous platform for creative professionals, including tools like **Photoshop** and **Premiere**.

AR as A Service

A separate opportunity is 3D product scans, which relate mostly to the topic of this report. In order to provide AR product visualization experiences, these realistic scans are required. And there are companies that specialize in doing so, such as **CG Trader** in hard goods, and **QReal** in food.

There are also homegrown solutions. **IKEA**, **Wayfair** and others have developed in-house systems to 3D-scan their product libraries. But the real opportunity is for standardized methods that can help them scale up 3D image libraries; and bring it within reach of smaller down-market players. AR commerce players like **NextTech AR Solutions**[viii] provide tools for smaller players to generate this 3D content.

Shopify has also addressed this down-market need to a certain degree by bringing AR product visualization to **600,000** small businesses on its platform. To better "democratize" AR visualization, it offers ways for its merchants to deploy 3D graphics in **Apple's** Quick Look AR feature.

Altogether, this branch of the camera commerce value chain falls into a broader category we call *AR as a Service (ARaaS).* Like software as a service began to do a decade ago, ARaaS will democratize advanced AR functionality to lower barriers and accelerate time-to-market.

This will be a rapidly developing subsegment of AR that will have several opportunity gaps for innovative startups to fill. We'll continue to cover its progress in reports like this.

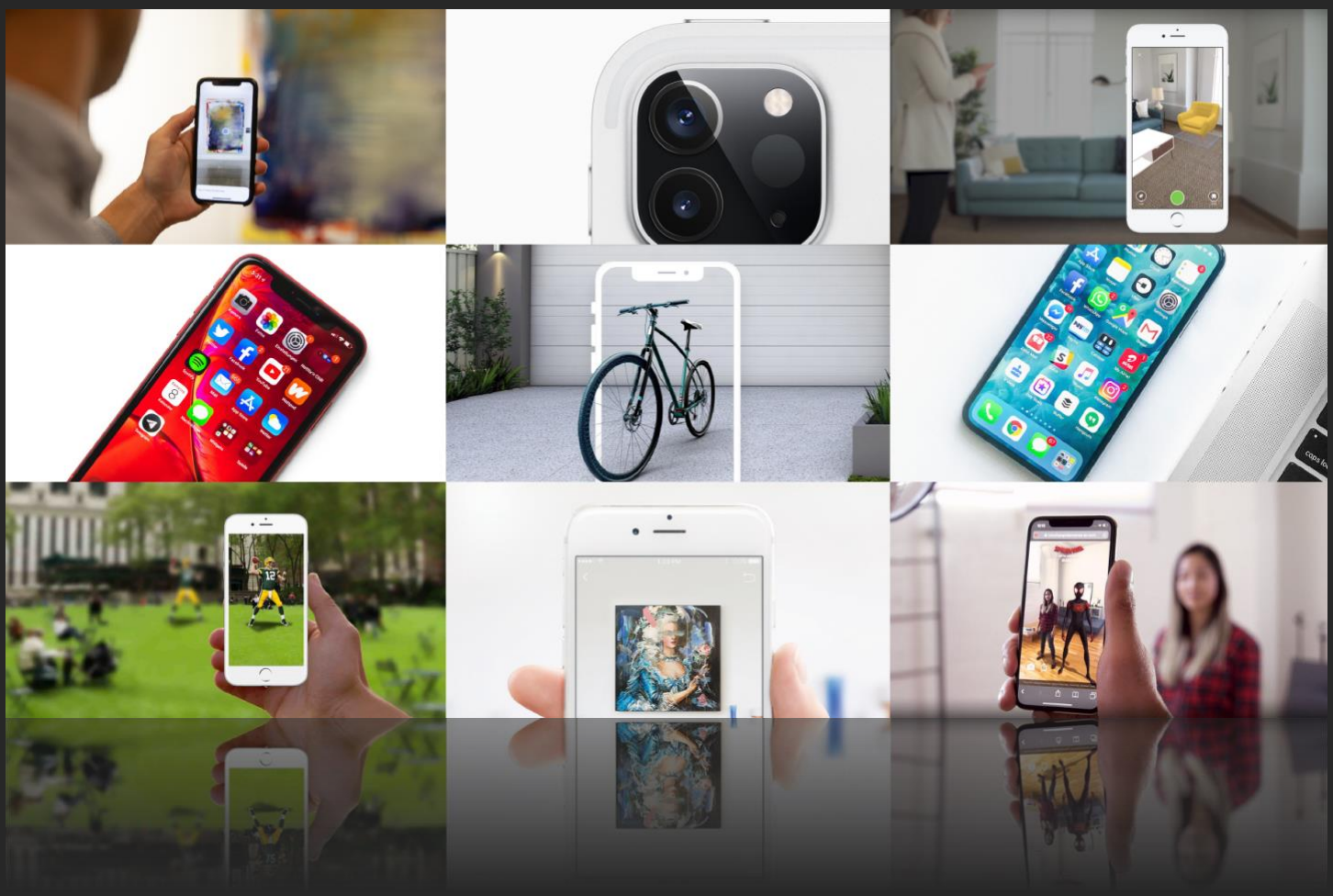
Final Thought: Art & Science

Based on all the evidence examined in this report, it's clear that web AR is primed for growth. Even its downsides reflect upsides in that they represent headroom for growth. AR's capabilities – currently inferior in some ways to native apps – are gradually improving while its active use grows accordingly.

The latter will happen on both supply and demand sides of the marketing equation. In other words, users will continue to engage web AR as they realize its capabilities and ease of activation. Marketers will be attracted to those users and likewise realize AR's benefits as an omnichannel format.

All of the above will impact web AR's biggest gating factor: *cultural assimilation*. This gradual process could be accelerated by underlying and adjacent technologies that make AR more attractive and user friendly. For example, LiDAR could do for AR what evolving smartphone cameras did for photography.

Meanwhile, for marketers it's all about fundamentals. As noted, that includes campaign goal setting, planning and execution. Then it's all about perpetual testing and course-correction based on results and data. In other words, just like the broader ad world, web AR will be part art and part science.



Video Companion

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Key Takeaways

- **Though native apps dominate mobile usage in general, they may not be the best vessel for AR.**
- Apps' inherent "activation energy" may not be conducive to AR's adoption-challenged early stages.
- Furthermore, the app download process may be misaligned with AR's serendipitous use cases.
- These include social multiplayer interactions or dynamic commerce activations (e.g., in-aisle retail).
- Consumers aren't likely to spend 90 seconds downloading apps for experiences that last 30 seconds.

- **Despite these factors, AR has inherited the broader mobile environment's app dominance.**
- The most popular AR experiences to date are app-based including social AR lenses (e.g., Snap).
- The ease and familiarity of app stores – versus the open waters of the mobile web – contribute to this.
- App dominance in AR also results from greater capabilities such as sensor fusion with mobile hardware.
- This enables greater AR functionality such as graphical intensity, frame rates and positional tracking.

- **Web AR could begin to gain ground on native apps in both capability and usage.**
- In terms of device compatibility, web AR has the greatest addressable market of any mobile AR platform.
- This amounts to **3.06 billion** global smartphones today. Apple's ARkit reaches **1.25 billion** by comparison.
- Considering this reach in light of web AR's relatively low usage, its headroom and potential are sizable.

- **When examining platforms from a marketing perspective, web AR holds key advantages.**
- *Dynamic activation*: experiences can be launched from a variety of media including product packaging.
- *Dynamic updates*: experiences can be altered easily via web updates (versus clustered app versioning).
- *Dynamic analytics:* campaigns can utilize Google Analytics versus basic metrics provided by native apps.

- **Beyond advantages and growth signals for web AR, there are *UX tactics* to achieve success.**
- Because of web AR's functional deficiencies noted above, effective campaigns work around shortcomings.
- This includes minimizing file sizes due to web delivery. Prioritize overall experience over graphical intensity.
- Use clean design and large AR activation buttons if calls-to-action reside on web pages (e.g., eCommerce).
- Hold users' hands with clear instructions for AR activation (e.g., plane detection).
- Remember the credo, *utility is king*: Eschew novelty and whimsy in favor of repeatable user value.

- **Beyond UX tactics, there are *marketing tactics* that engender effective web AR campaigns.**
- Goal setting is paramount: Establish concrete brand objectives, and how AR can uniquely achieve them.
- In some cases, this stage can reveal that AR *isn't* the right medium, in which case it shouldn't be used.
- Don't do *AR for AR's sake*... this often leads to failure and misguided expectations in campaign ROI.
- Adequately gauge commitment levels for media spend, as paid distribution can unlock web AR.
- Similarly, calls to action are critical: make sure they're thoughtfully placed to entice target audiences.

- **When the above tactics are practiced, web AR has proven effectiveness and positive ROI.**
- Huggies achieved a **5.2 percent** scan rate and **1:03 minutes** average engagement time.
- Home Depot's web AR product visualization feature boosted conversions **2x-3x** over benchmarks.
- Adidas' web AR ad achieved a **4x** engagement delta, **11-second** average dwell time and a **2.8x** ROI.
- Nissan's web AR ad achieved an **8x** engagement delta over auto-vertical rich-media benchmarks.
- 7-Eleven achieved **10 million** in-store web AR lens engagements from **30 campaigns**.

- **Web AR – like the broader AR world – is still finding its footing and isn't a silver bullet.**
- In a marketing sense, web AR is finding success in some product categories and use cases but not others.
- These areas of optimal applicability will continue to develop as AR user behavior itself does.
- Meanwhile, one key historical lesson for emerging tech is that utility and user value sustain over novelty.
- As these factors materialize, marketers should follow fundamentals and make data-backed decisions.

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 Intelligence Briefings

ARtillery Intelligence Briefings are monthly installments of spatial computing analysis. They synthesize original data to reveal opportunities and dynamics of spatial computing 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' 16 years in tech-sector research and intelligence. This includes the past 6 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.**

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Reference

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[i] ARtillery Intelligence Article, **How Big is the Mobile AR Market** (sign-in required)
[ii] **Mobile Users Time Spent with Apps Versus Web**
[iii] ARtillery Intelligence Report: **AR Usage & Consumer Attitudes, Wave IV** (sign-in required)
[iv] ARtillery Intelligence Report: **AR Advertising Deep Dive, Part II: Case Studies**
[v] Disclosure: This report's author owns stock in NexTech AR Solutions.
[vi] ARtillery Intelligence Report: **AR Advertising Deep Dive, Part I: The Landscape**
[vii] ARtillery Intelligence Report: **Camera Commerce: AR Monetization Materializes** (sign-in required)
[viii] Disclosure: This report's author owns stock in NexTech AR Solutions.