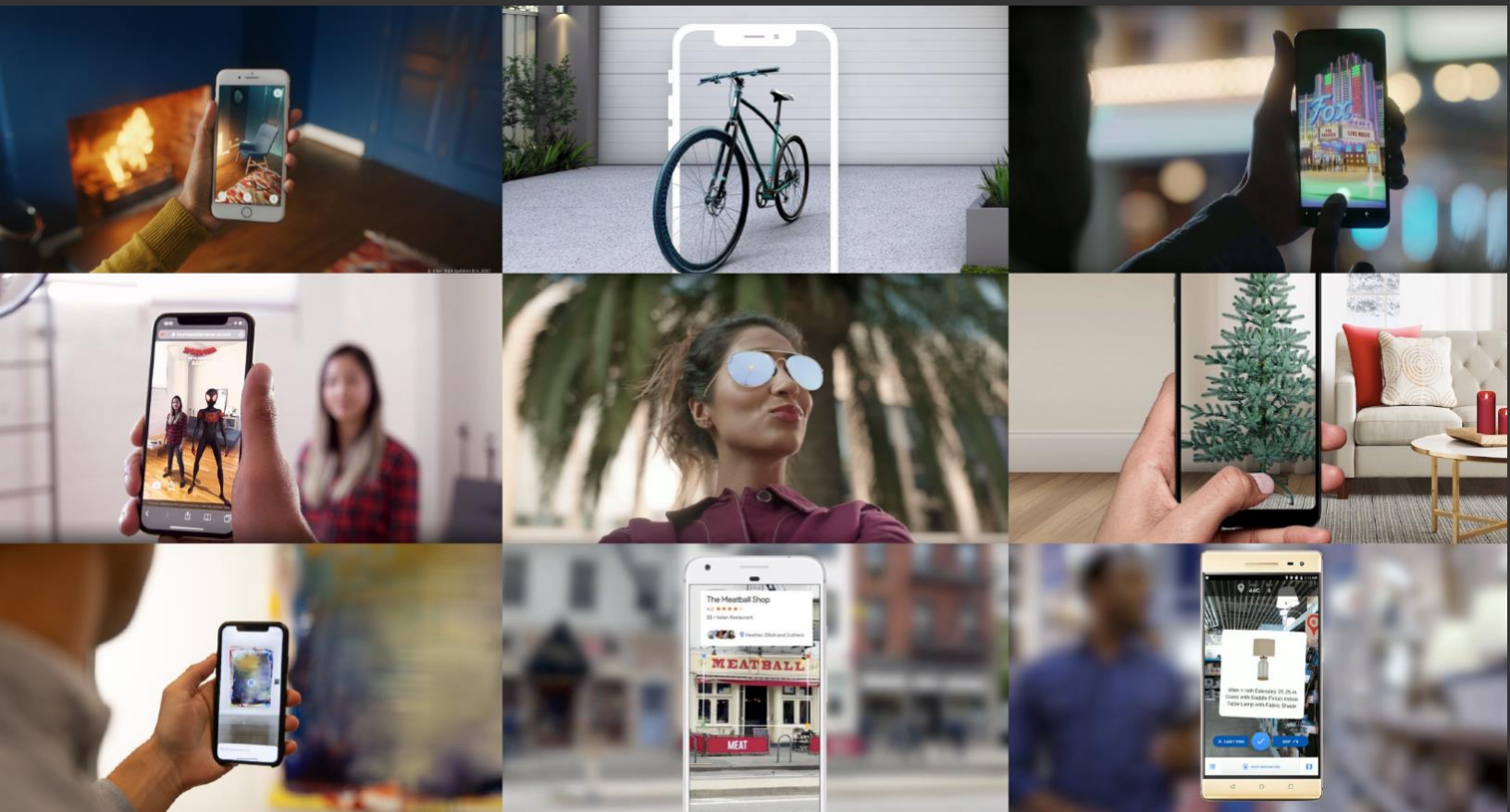


# ARtillery Intelligence



## ARtillery Intelligence Briefing

AR Advertising Deep Dive, Part II: Case Studies

August 2020

# Executive Summary

Augmented reality continues to evolve and take shape as an industry. Like other tech sectors, it has spawned several sub-sectors that comprise an ecosystem. These segments represent standalone topics in ARtillery Intelligence's ongoing analysis, including monthly Intelligence Briefings like this.

Prominent sectors include industrial AR, social, gaming, and AR shopping. But existing alongside all of them – and overlapping in a classic Venn diagram – is AR advertising. This includes immersive animations that let consumers visualize products in their space through the smartphone camera.

AR advertising is actually one of the most lucrative AR subsectors, on pace to reach **\$1.41 billion** this year according to ARtillery Intelligence estimates, and **\$8.02 billion** by 2024. These figures measure the money spent on sponsored AR experiences with paid distribution on networks like **Facebook** and **Snapchat**.

As we've examined in past reports, the factors propelling this revenue growth include brand advertisers' growing affinity for, and recognition of, AR's potential. Its ability to demonstrate products in immersive ways resonates with their creative sensibilities, transcending what's possible in two-dimensional formats.

Beyond that high-level appeal among creative constituents, there's a real business case. AR ad campaigns continue to show strong performance metrics. This was the case in "normal" times and has accelerated during the Covid era when retail lockdowns compel AR's ability to visualize products remotely.

Proof points can be seen in the numbers, such as campaign performance metrics analyzed in

Part I of this report series,<sup>i</sup> as well as ARtillery's recent Global Mobile AR Revenue Forecast.<sup>ii</sup> We're now doubling down on those narratives and data with a procession of case studies.

Put another way, Part I introduced the *what*, *why* and *how* of AR advertising. In this second installment, we go deeper on the *how*, using real campaign examples. What's working and not working in these early stages while the AR advertising playbook is still being written?

Another thing you may remember from Part I is how AR ad campaigns are taking shape in ways that map to advertisers' varied goals. Building on AR's unique ability to span the consumer purchase funnel. As noted, these include upper-funnel reach-driven campaigns and lower-funnel conversion-driven campaigns.

We'll organize the case studies in this report accordingly. This will include structured sections that each dive into campaigns that map to the stages of the purchase funnel and, correspondingly, advertisers' goals. We'll also examine the various and evolving analytics: what are the metrics being used to track AR advertising's effectiveness?

As a bonus, ARtillery Intelligence will create a dynamic tracking sheet for AR ad campaigns, available to PRO subscribers. This will be an at-a-glance chart that shows hundreds of AR ad campaigns, including results and other key attributes and source links. As always, the goal is to empower you with a knowledge position.



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# Key Takeaways

- IAR Among the many subsectors of augmented reality (AR), advertising is a leading revenue category.**

  - IAR ARtillery Intelligence estimates AR ad revenues will be **\$1.41 billion** this year, growing to **\$8.02 billion** by 2024.
  - IAR This measures the dollars spent on sponsored AR lens distribution in channels like Snapchat and Instagram.
  - IAR It does not include the money companies spend on AR experiences for self-distribution (e.g. apps).
- IAR Driving this revenue is a combination of consumer traction and advertiser interest.**

  - IAR AR-fueled lenses have gained popularity with users, building on already-popular behavior like sharing media.
  - IAR Advertisers have followed that usage and discovered that AR affords them greater creative capabilities.
- IAR Brand advertisers are also attracted to AR's business case that continues to be validated in ROI metrics.**

  - IAR AR ad campaigns outperform non-AR benchmarks on several measures, including depth of engagement.
  - IAR AR advertising is further driven by Covid-era retail lockdowns that compel remote product visualization.
  - IAR AR advertising also has a proven and rare ability to **span the purchase funnel**, from awareness to action.
- IAR Upper-funnel campaigns aid brand awareness through high-reach channels like Snapchat and Facebook.**

  - IAR Ally Bank achieved **100,000** high-engagement impressions through its web-AR based Monopoly game.
  - IAR GREATS Shoes achieved a **3.4x** brand lift and a **62 percent** reduction in cost-per-increment of brand lift.
  - IAR Purina achieved **172 million** impressions and **30-second** average playtime for its social lens campaign.
- IAR Mid-funnel campaigns lead consumers closer to purchases through AR games and social sharing.**

  - IAR Panera achieved **171,000** engagements and **47,000** social shares for its breakfast-wrap lens campaign.
  - IAR Adidas achieved a **4x** engagement delta over non-AR benchmarks and **11-second** average dwell times.
  - IAR Miller Lite achieved a **25 percent** lift in brand favorability and **3+ minute** session lengths for its AR campaign.
- IAR Lower-funnel campaigns achieve high conversion rates through product try-ons and informed purchases.**

  - IAR Miele Vacuum achieved a **300 percent** conversion boost over non-AR benchmarks in its AR-enabled banner ad.
  - IAR Papa Johns achieved a **25 percent** conversion rate for its AR-enabled campaign to sell pizzas on Valentines Day.
  - IAR CB2 achieved a **7 percent** conversion boost and **21 percent** greater revenue-per-visit for its AR campaign.
- IAR The above sampling of AR campaign results validates the range of product categories possible.**

  - IAR Early-adopter verticals include cosmetics and fashion, but this will expand as advertisers acclimate.
  - IAR AR advertising will also migrate to the rear-facing camera to augment the broader canvas of the physical world.
  - IAR Adoption drivers will map to motivation, spending power and product-alignment with 3D visualization.
- IAR The most success and effectiveness will be realized by brands who commit to long-term AR initiatives.**

  - IAR This will be required to develop competency and effectiveness in what is a new and rapidly-developing playbook.
  - IAR Advertisers who commit to ongoing work can amortize costly upfront learning curves over several campaigns.
- IAR Technical complexity isn't always required for AR success. Instead, prioritize end-user experience.**

  - IAR Low-poly graphics are preferable in order to prioritize reliability and functionality over graphical complexity.
  - IAR Web AR shows success as a distribution channel given its lower friction in onboarding consumers.
  - IAR Web AR also has advantages in avoiding platform fragmentation, and its ability to push updates instantly.
- IAR Calls-to-action for AR campaigns should be thoughtfully devised and consider consumers' ambivalence.**

  - IAR Marker-based AR can drive engagement through explicit calls to action on owned-assets like product packaging.
  - IAR Other calls-to-action include video, which can demonstrate AR experiences before users engage.
  - IAR YouTube and Google search results are emerging as high-scale distribution channels for AR-enabled ads.
- IAR Market gaps (opportunities) include scalable 3D asset creation for vast product catalogs (think: Walmart).**

  - IAR Analytics also remain a question mark, as AR balances established benchmarks and "native" metrics.

# Defining AR Advertising

To level set on AR advertising definitions and core principles, we'll repeat some of the language used to introduce Part I of this report series. It's important to establish these definitions and parameters in order to contextualize the case studies in this report.

First, to define *AR advertising*, it involves paid media placements that allow consumers to activate their smartphone cameras and superimpose branded animations on the real world. This is usually to promote or visualize a given advertiser's products in the various ways we'll detail in this report.

To further clarify, ARtillery's market sizing around AR advertising (see below) includes paid placements to promote and distribute AR experiences, such as sponsored AR lenses in **Facebook** and **Snapchat**. It doesn't include

self-distributed AR within a company or brand's own apps, such as AR furniture visualization in the **IKEA Place** app.

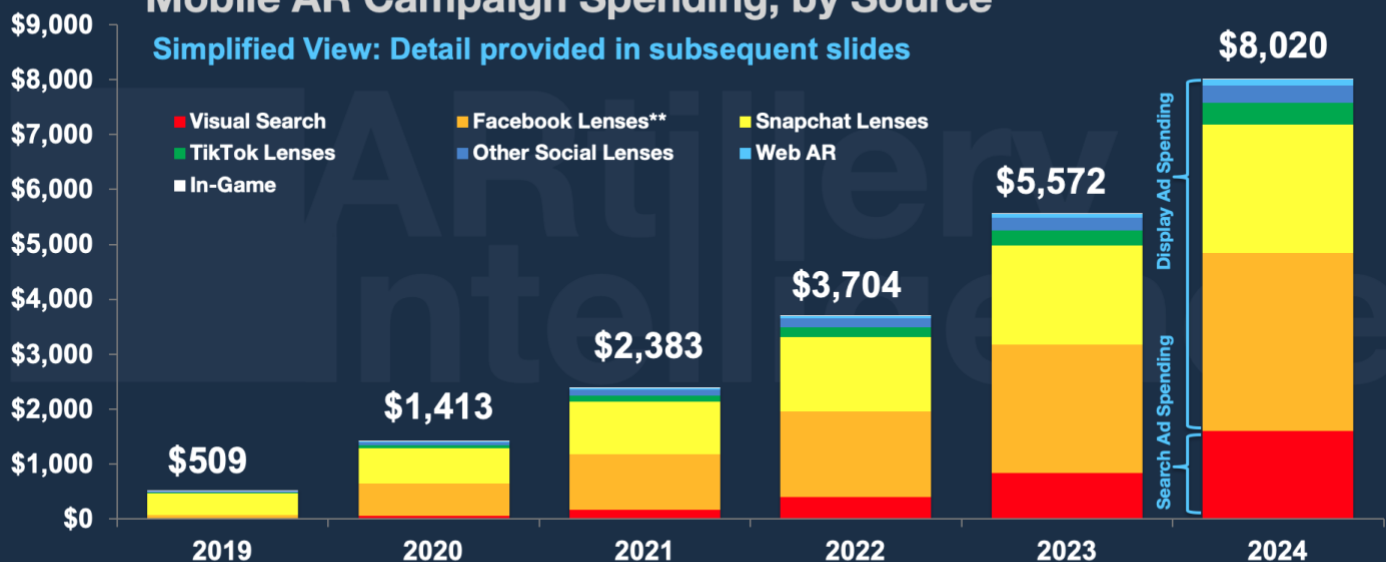
The latter falls under the category of *AR commerce* – an area quantified in ARtillery's recent Mobile AR revenue forecast<sup>iii</sup> and further detailed in upcoming reports like this. AR advertising of course *leads to* commerce, but it's a different area of spending (marketing versus advertising) in terms of how companies budget and execute promotional strategies.

To put it another way, AR advertising and commerce flow into each other, just as advertising's goal is to drive commerce in the ways we'll examine in this report. But commerce can also happen outside of paid ad campaigns, such as a company's own app, web properties, and self-distributed AR.

## Mobile AR Ad Revenue

U.S. \$Millions

Mobile AR Campaign Spending, by Source\*



# Creative Sensibilities

AR advertising’s revenue growth is being driven by a few key factors. One is that brands are attracted to the technology’s ability to demonstrate products in immersive ways. That appeals to their creative sensibilities – erstwhile stuck in 2D media and confining formats like mobile banner ads.

Adoption is also driven by the fact that it’s working. There’s a feedback loop of campaign performance, results and ROI. This causes AR ad creation and investment to grow in the form of recurring campaigns among brand advertisers, as well as new entrants that hear about its effectiveness through case studies.

“We’ve shown in our first test of AR ads that the AR version of the ad, when A/B tested against a non-AR ad, drives statistically-significant more conversion,” **Facebook’s** Elise Xu said on stage at AWE Europe. “The next step is making the creation of these assets far easier and cheaper.”

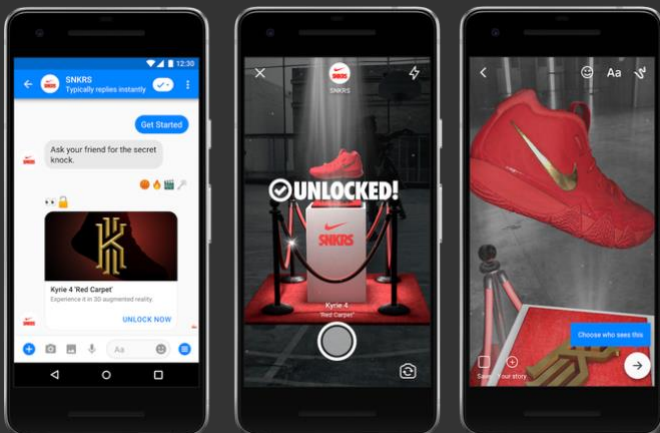


Image Source: Facebook, Inc.

# Spanning the Funnel

Another influential factor that’s driving AR advertising’s appeal is its ability to span the consumer purchase funnel, as noted in the executive summary. It’s conducive to upper-funnel *reach* and lower-funnel *response*. This is a relatively rare attribute in advertising media, as a sliding scale exists between endpoints of the funnel.

For example – for those unfamiliar with these terms – upper-funnel advertising includes things like TV, newspaper and billboard advertising: It’s all about reach and brand awareness. Lower funnel advertising includes things like search: It’s all about high-intent action, but it’s not optimal for brand awareness.

Back to AR, it can span this funnel by achieving high-reach distribution in places like **Facebook’s** News Feed and **Snapchat’s** Lens Explorer. From there, it can achieve high-performance (as we’ll cover in this report) when users activate immersive product try-ons, then convert to purchasing items on the spot.

That last step in the funnel — the actual transaction — is the most impactful. AR’s inherent visualization can boost these conversion rates, which are also accelerated by transactional functionality that’s increasingly incorporated into lens-forward social channels like **Snap**, **Facebook** and **Instagram**.

To demonstrate AR ad strategies that target these funnel stages (and some that combine them), the next several sections will dive into representative examples and case studies.

# AR's Meter Stick

Before we go into the case studies, another definitional factor to acknowledge is 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 isn't adequately measured in these ways.

Of course, the ultimate metric is revenue. It's a universally-understood metric that applies across ad formats. But revenue attribution isn't always available. When revenue lift can be tracked – usually in the case of lower-funnel formats – attributing campaign success is straightforward.

But because that's not always the case, the advertising world relies on metrics that are proxies for, or extrapolations of, revenue impact. This has led to traditional benchmarks including impressions, clicks and other metrics like “brand recall,” that usually map to campaign goals.

So AR's challenge will be to develop native metrics: We still don't know what they'll be. What will be the CTR of AR? We're starting to see some early indicators emerge, many of which you'll see cited in case studies throughout this report. But these metrics are still underdeveloped and will evolve.

## Stick Around

To provide one representative example of native AR metrics, *dwelling time* is emerging as a performance indicator. This is because AR's ability to captivate consumers with immersive content has proved to boost their time spent with it, which can in turn boost things like brand affinity and ad recall.

For example, **8th Wall** reports that **80 percent** of users of its AR activations had session

lengths greater than one minute; and **50 percent** were greater than two minutes. **Poplar's** David Ripert likewise reports **75 - second** average dwell times for AR lenses, which is **4x longer** than mobile video.

Beyond session lengths, there's also frequency of use, which is showing strong early signals. For example, **Snapchat** has reported that its lens users engage **30 times per day**. This includes organic (non-advertising) lenses but it still indicates the engagement levels that sponsored lenses are capable of.

All of the above will be important in order to establish benchmarks for AR advertising. Standard units like session lengths can assign value to the engagement levels that advertisers can expect. Because advertisers' biggest aversion to AR is unclarity of ROI, standard metrics can help “normalize” its performance.

“With media agencies 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.”



Image Source: Facebook, Inc.

# Upper-Funnel AR Campaigns

With those definitions established, we'll start our analysis at the top of the consumer-purchase funnel. What are best practices in using AR to amplify brand messaging or

product awareness; and to do so with large audiences? Who are the exemplars? And how are they achieving results? The following case studies dive in...





# Ally Bank

When done right, AR has a natural ability to engage users with interactivity and novelty. That's one reason why it's an effective ad medium, outperforming other media on several key metrics. The latest evidence comes from **Gramercy Tech's** Jeremy Patuto at ARiA.

AR-based marketing campaigns that Gramercy has executed for its clients have seen up to **2.25x** boosts in dwell time — a telling engagement metric as noted in the previous section. For example, its AR experience for the Museum of Dogs increased onsite dwell time from **20 to 45 minutes**.

But greater performance came from its work with **Ally Bank** on a multi-city **Monopoly**-theme AR game. The AR campaign was gamified as a scavenger hunt. In six U.S. cities, it placed tiles on the ground that represented the 36 squares of a **Monopoly** board.

To collect a square required scanning it with one's smartphone, which activated an AR animation. The animation featured Mr. Monopoly driving up in a fancy car and awarding points and cash prizes. These were sent within a few hours to the user's email address (entered after winning something).

And the results? Ally achieved **100,000 plays**, each of which represented a highly engaged brand impression and an email address for follow-up marketing. **86 percent** of players went on to complete the game which entailed finding an additional five **Monopoly** pieces after the first one.

One thing that jumps out from these results is scale. AR is often mislabeled among brand advertisers as lacking scale. But **100,000** high-engagement impressions is notable. We've seen greater reach in a few outlying cases, but those didn't have the same depth of brand engagement seen here.



Image Source: Ally Bank

## Success Factors

What can be attributed to these results in the spirit of identifying best practices? AR's natural engagement played a part, as well as UX design and intuitive interactions. These are amplified by recognizable and lovable IP. This mix contains elements of **Pokémon Go's** success formula.v

“It was only after a week that there were a hundred thousand plays in these six cities,” said Patuto on stage at ARIA. “And it wasn't like there were brand ambassadors [saying] ‘hey come here, play this game.’ It was just naturally out there on the street and people were finding it.”

Another success factor Patuto specifies is the fact that web AR was the distribution channel for the experience. The serendipity of finding game tiles on sidewalks required an AR format that activated the experience quickly. Waiting to download an app would have spoiled the moment.

And practically speaking, web AR made it accessible across mobile platforms so that the scalability goals above could truly be reached while sidestepping compatibility issues. Lastly, web AR has benefits in being able to push updates live rather than dealing with app version updates.

## Challenges

As for the challenges (equally important for strategic takeaways), there were a few technical hurdles. To meet user-friendliness goals, the experience had to work over a 3G connection and limit battery drain. This required stripping down animations to a maximum polygon count.

“Poly count couldn't exceed **35,000 triangles** which sounds like a lot but it's really not,” said Patuto. “And then we had to make sure that the file size was under **10 megabytes**. So we couldn't do too much with shadows and we had to be very smart with how we rendered all this stuff.”

Fraud was also a challenge, as is always the case for anything location-based (just ask **Niantic**). There were also hiccups with the physical markers to get them to register the user's scan and game accomplishment. But the Gramercy team was able to tackle these issues as they arose.

The lesson: have an agile team that's ready to roll with issues on the fly. Because AR is a new marketing vehicle, the playbook is still being written. But it's clear already that there are lots of potential advantages for brands that want to reach deeper levels of customer engagement.

## Video Companion



*Click image to play*

# GREATS Shoes

More evidence from the upper-funnel side of the AR ad spectrum comes from Brooklyn-based sneaker retailer **GREATS**. Through an AR lens campaign on **Facebook**, the company achieved a meaningful **3.4x** brand lift compared to its campaign benchmark of standard video ads.

In absolute terms, that brand lift equates to **38,300** additional people who remembered the brand after experiencing the lens. This is known in the advertising analytics world as *brand recall* — a key metric for awareness-based advertising. AR continues to show efficacy on this front.

This has a lot to do with AR's inherent levels of immersive engagement that can create a lasting impact on memory. In a recent study published by **Zappar** and **Neuro-Insight**,<sup>vi</sup> it was demonstrated that AR can achieve **70 percent** greater memory encoding than non-AR media.



Image Source: GREATS

## Lessons & Learnings

So what were the qualities of the campaign itself? GREATS was interested in cultivating more brand awareness and more fans of its handmade full-grain leather shoes. The experimental company chose **Facebook** AR lenses along with video ads that carried the same creative concept.

The multi-platform approach not only allowed it to reach more users, but to compare results and see AR's impact. It also gave AR a delivery vehicle and launch point, as activations happened as an optional engagement on the brand's videos, distributed on **Facebook's** News Feed.

Once the front-facing camera was activated in this way, selfie overlays carried the campaign's creative concept of a cheeky and self-referential "This is an AR ad" message. Users could play with animations that reacted to facial expressions. Social attributes also propelled distribution through virality.

News Feed placement was based on demographic targeting for **GREATS'** highest lifetime-value customers. This is known as *lookalike targeting* — zeroing in on demographics in one channel that represent groups with proven brand loyalty from other channels.

Along with the above metrics, **GREATS'** shoe campaign was able to achieve a **62 percent** reduction in cost per increment of brand lift. So not only did it help the brand achieve greater brand recall, but it did so in a way that was more cost-efficient than other digital media like video.

# Purina

More evidence from the upper-funnel side of the AR ad spectrum comes from AR ad-focused startup **Poplar**. It worked with pet food brand **Purina** on a **Facebook** and **Snapchat** world lens (rear-facing camera) that let users play with the brand's Felix the Cat virtually in their space.

With **Facebook** and **Snapchat** as primary distribution channels, the campaign utilized sponsored lens options that amplify distribution to targeted users. The result was **5.8 million** paid impressions at the time of CEO David Ripert's AWE presentation last May — a total that's since grown.

"We got an update on the impressions," Ripert told us recently. "They've actually received a whopping **172 million** paid impressions, on **Facebook** and **Snap**."

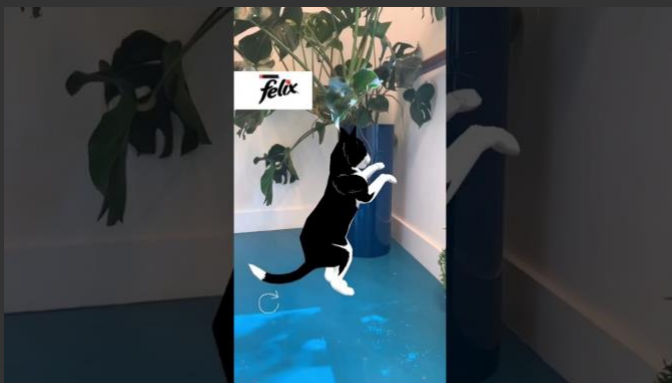


Image Source: Poplar

## It's About Quantity

To put the **127 million** into perspective, the Superbowl — often heralded as a high-water mark for campaign scale — usually reaches just under **100 million** TV viewers. This is a useful benchmark for perspective, but is of course apples to oranges with AR in terms of engagement levels.

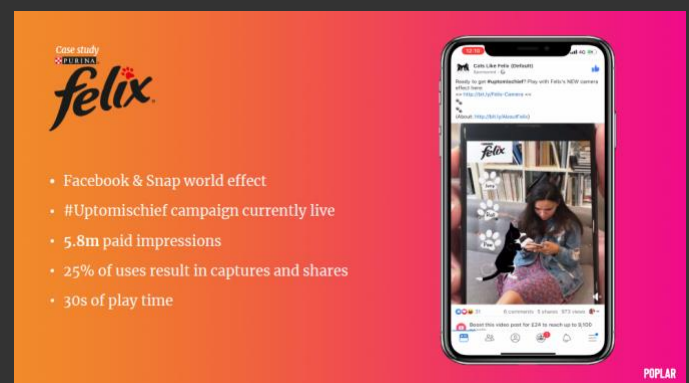
Sticking with the sheer numbers, nine-figure audiences are one signal that AR advertising can achieve real scale. That's not going to be the case for the majority of campaigns, but these high-performing outliers are a leading indicator for the medium's strength.

## ... And Quality

AR's potential strength as a high-scale reach medium is coupled with potentially deep engagement and high frequency. In this case, the **Purina** campaign showed strong user engagement in the form of shares and captures. Specifically, **25 percent** of users shared or captured the experience.

Moreover, dwell time is a metric we continue to examine as a more telling and native metric for AR performance, as noted earlier in the report. On that measure, the Purina campaign achieved an average **30-second** playtime.

For reference, the average playtime for video ads is about **20 seconds** according to **Poplar**. And video is a passive medium, compared to AR's active engagement to play with a given experience. As noted earlier, that orientation drives **70 percent** greater memory response than non-AR formats.



**Case study**  
**PURINA**  
**felix**

- Facebook & Snap world effect
- #Uptomischief campaign currently live
- 5.8m paid impressions
- 25% of uses result in captures and shares
- 30s of play time

POPLAR

Image Source: Poplar

# The NFL

The previous case study mentioned “Superbowl-sized” audiences. Sticking with that football theme, our next case study that demonstrates AR’s upper-funnel capabilities comes from the **NFL**. Its **Snapchat** lens campaign for Superbowl LIII offered “sticker packs” for each team.

Fans of the **New England Patriots** and **LA Rams** could apply these stickers in various ways as selfie filters to show their team support. The result was a high degree of user engagement through captured selfies that were augmented and shared... as AR lenses usually go.

But more interesting about this lens campaign was its reach. It was viewed more than **303 million times**. As noted in the previous case study, the Superbowl itself — often heralded as a benchmark for media reach and brand advertising — reaches just under **100 million** TV viewers.

## Depth of Engagement

Like the Purina campaign, there are quality and quantity benefits. Though it’s not specific to this campaign, **Snapchat** has reported that its AR active users engage **30 times per day** on average. This far exceeds engagement levels in most other forms of ad media, except search.

Snapchat also reports that sponsored lenses average **10 to 15 seconds** of playtime, **19 percentage-point** lifts in ad awareness, **6-point** lifts in brand awareness and **3.4-point lifts** in action intent on average. They also achieve an average **9-point lift** in post-engagement product sales.

“There is a depth of engagement [on Snapchat],” **NFL** Digital Media VP Blake

Stuchin told Engaget. In fact, the **NFL** put its money where its mouth is, and has doubled down on **Snapchat** paid lens campaigns. It ran a similar campaign in advance of the following **NFL** season.

## Advertiser Disconnect

The **NFL’s** campaign comes as AR faces doubt from brand advertisers about ROI and reach.vii AR can be a low reach play at times, but it’s telling that the Superbowl LIII campaign achieved **300 million+** engagements. Though an outlier, it could be a leading indicator of AR’s potential.

Meanwhile, the advertiser disconnect signals the need for education, as well as continued validation and experimentation from early-adopter brands like the **NFL**. Among the metrics outlined above, the key lesson for reach-driven brands is the *scale* that AR can achieve.

That realization and adoption by a larger share of brand advertisers will cycle in slowly, just as it did for mobile advertising. As noted earlier, this is happening to the tune of a projected **\$1.4 billion** in AR ad revenue this year, on pace for **\$8.02 billion** by 2024.

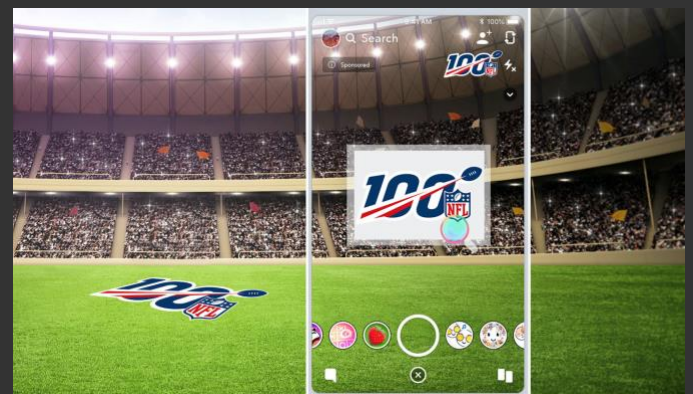


Image Source: Snap, Inc.

# Mid-Funnel AR Campaigns

Moving our way down the consumer-purchase funnel, what are best practices in using AR to get consumers closer to a conversion? Mid-funnel activities include AR-based games; experiences that link to a product page;

experiences that drive high “dwell-times”; or other indicators of consumer engagement.

Who are the exemplars? And how are they achieving results? The following case studies dive in...



## Panera

Advertising continues to be a bright spot in AR's otherwise-challenged early days. As noted earlier, brand spending on AR ads is on track reach **\$1.41 billion** this year, making this one of the most high-performing subsectors of the AR universe.

This isn't a new message, as AR traction among advertisers continues to be a rallying cry from industry proponents. But beyond the "sell-side," it's rare to get a first-hand account from brands or agencies that have run AR campaigns. What are they doing and learning from the process?

These questions were addressed during a recent interview ARtillery Intelligence conducted with **M7 Innovations** founder Matt Maher (audio embedded below). The creative agency executed a recent AR campaign for quick-serve restaurant **Panera**, along with 3D-model photogrammetry work with **Qreal**.

### Increasing Craveability

The campaign ran on **Facebook** and **Snapchat**, letting users interact with Panera's breakfast wraps through AR lenses. Activated through face movement (e.g. yawning), 3D models of the wraps appeared for hungry consumers to visualize and rotate in AR.

After spending **\$50,000** on **Facebook** and **Snapchat**, the campaign had **9.3 million** users, **171,000** clicks/swipes, and **47,000** shares. According to Maher, it also achieved a **25 percent** store visit rate on **Facebook**, and a **2.8 percent** conversion rate for digital purchases on **Snapchat**.

"AR is very engaging," said Maher. "It gets people to click through; it gets people to actually play around with these models. But the second piece is what AR actually does to the

brain. [...] Qreal just did a study with Oxford and New South Wales University, and we now have scientific data that proves that when a human sees a dish in 3D in photogrammetry, it increases craveability. It increases them wanting to actually consume that dish rather than just seeing a 2D image."

### Amortizing AR

This campaign success partly stems from AR's inherent advantages that Maher cites. But it's also about execution, such as realistic 3D models and competency with this developing medium. For the latter, Maher sees the most success from brands that are committed to AR.

In other words, ongoing work with AR not only improves knowledge and execution but also amortizes early-stage costs over many campaigns. For example, this was **Panera's** third AR campaign, separating it from brands that are doing AR to "check a box."

"It shows that **Panera** is investing in AR as a medium, not as the shiny object that so many other brands do [...] With this third campaign, we've honed in on how we want to show the food. We want people to crave it. And then we put this one out on **Facebook** and **Snap**. Because we went through that progression, we had this success — we have learnings, and they really take this seriously as a medium."



## Single View of the Customer

Part of that learning curve can also be accelerated in AR with real-time results for consumer engagement. And given the lower-funnel results demonstrated above, actual conversion data and revenue lifts — versus upper funnel impressions — can embolden that feedback loop.

This is further advantaged when operating within walled gardens like **Snapchat** and **Facebook**. Usually “walled garden” is a bad word, but in this case it enables a “single view of the customer,” versus common attribution challenges of tracking consumers across several channels.

Another advantage according to Maher is AR’s ability to integrate with physical media. Brands can utilize already-invested signage or packaging for AR calls-to-action. This can bring static and owned media to life with AR triggers that create moments of customer engagement.

It also represents a key trend we’ve been tracking: After the AR-cloud fueled excitement over the concept of “AR everywhere,” the AR industry has come back to realizing and embracing the virtues of more simplistic — but effective — *marker-based* AR activations, such as QR codes.

These markers are not only more practical to roll out in retail settings or product packaging, but they serve as prompts for consumer activation, which is needed at this stage of the AR adoption curve. And if we need any more convincing, there are signs that Apple is moving in this direction.<sup>viii</sup>

## Lessons & Learnings

As for advice on campaign execution, Maher believes that there are a few success factors to add to those outlined above. For one, be

thoughtful around AR calls-to-action. Give consumers an idea of what they have in store, using video previews of the AR experience.

Realistic 3D asset creation is also a big success factor. As noted, **M7** works with **QReal** with the knowledge that investment in photogrammetry is important to achieve realistic models that evoke the “craveability” mentioned above. This is especially true in food-based AR.

Other areas of development include analytics. As noted earlier, common click-based impressions don’t capture the depth of AR engagement. But they’re important in early days to compare to established benchmarks.

“With media agencies and creative agencies, it’s hard to reframe your mind in this new medium. 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.”

## Audio Companion



*Click image to play*



# Google Swirl

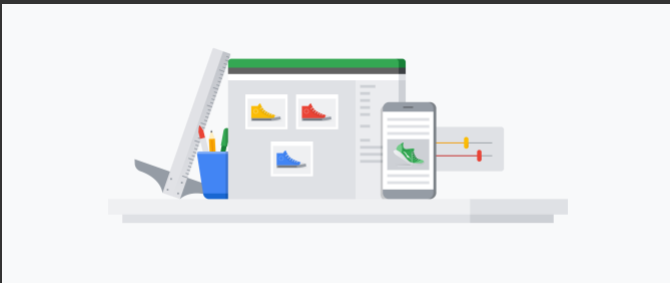


Image Source: Google

As AR continues to face market challenges, one bright spot is advertising, as explored in part I of this report series<sup>ix</sup> and as demonstrated by the case studies in this report.

This is driven by brands' realization that AR lets them demonstrate products in immersive ways. That appeals to creative sensibilities, erstwhile confined to tiny 2D boxes. More importantly, the feedback loop generated by high-performing AR ad campaigns emboldens a business case.

But another factor could be a key accelerant: Self-motivated investment from tech giants to build the tools that enable and stimulate AR ad creation. We're seeing that as **Snap** continues to double down on AR;<sup>x</sup> and as **Facebook** does similar... now including AR sleeping giant, **Instagram**.<sup>xi</sup>

## Future-Proofing Search

But could greater impact come from the biggest ad giant of all: **Google**? It's been pushing various flavors of AR to future proof its core search business. That includes visual search to contextualize items you point your phone at, and AR-infused search results for 3D visualization.

We've spent ample time talking about the former, and less with the latter. But the concept of 3D/AR models populating search results took a step forward with Google's recent **Swirl** rollout. Available previously on a limited basis, it's now available globally to Google advertisers.

For those unfamiliar, **Swirl** is an interactive 3D ad format that lets consumers see, zoom and spin 3D models in search results or web pages. That happens on your screen or overlaid in your space with camera activation. Offering both options means AR can "ease in" as a shopping modality.

Speaking of lowering friction, **Swirl's** virtues manifest on the brand side too. By standardizing a 3D format and giving it distribution scale through search, **Swirl** could stimulate adoption from brands — otherwise faced with a fragmented set of tools to offer (and get analytics from) 3D shopping.

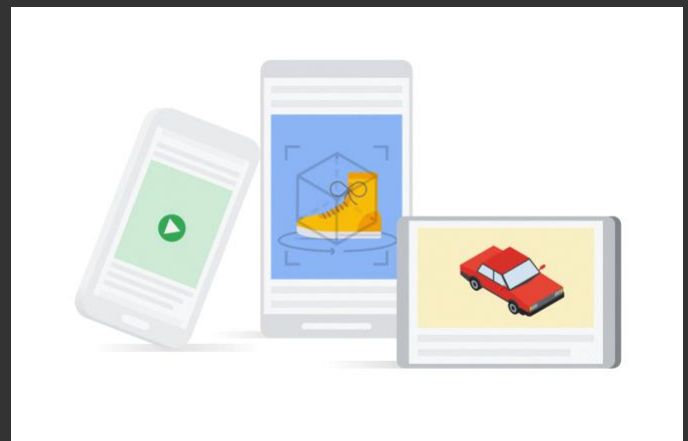


Image Source: Google

## Proof Points

As part of **Swirl's** global launch, **Google** has revealed a few proof points on its performance from early partners and beta participants. One thing to note from the below list is the versatility in product categories that **Swirl** can accommodate. This speaks to the magnitude of its potential impact.

— **Purina ONE's** Swirl ad let users virtually play fetch with a 3D dog, meant to evoke the vibrance of a healthy pet. It achieved a **6x** engagement delta over 2D benchmarks.

— **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 rich media benchmarks, **11-second** dwell times and a **2.8x** ROI

— **Belvedere Vodka's** Swirl ad let users simulate the experience of adding products to a gift bag. It achieved **6.5x** brand-favorability and **4.9x** purchase-intent over benchmarks.

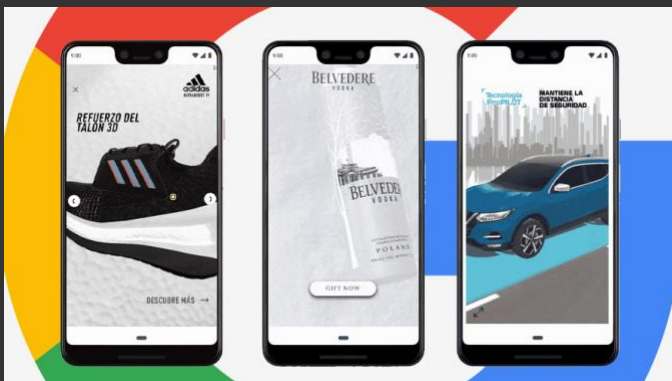


Image Source: AdWeek

## Time to Shine

All of the above represents an ongoing evolution of the search engine results page (SERP), from “10 blue links.” That includes the early-2010s’ “universal search” trend (video, images, etc.), followed by the knowledge graph (panels at the top of search results that answer questions directly).

3D models are the next logical step in that evolution. They’re also a way for **Google** to continue growing search revenue — which gets harder to do over time, as percentage growth is calculated from a larger base. That’s one of the motivations for **Swirl**, along with Google’s long-term future-proofing.

The AR advertising sector will benefit as a byproduct. Given **Google's** scale, 3D models in search could acclimate and get consumers hooked on immersive online shopping. That will motivate brands to invest, which in turn stimulates AR advertising startups to feed that demand.

That all starts with **Google** building the tools, which is where we are now. Speaking of timing, the current state of the world has boosted all-things eCommerce, especially those that compensate for the lack of touching/feeling products in physical stores. The next few quarters will be **Swirl's** time to shine.

## Miller Lite

Another representative example of AR's upper-funnel potential comes from **Miller Lite's** St. Patrick's Day campaign. The multi-dimensional campaign included a **Unity**-built AR portal that let users enter an immersive Irish-themed (and beer-themed) world, and an AR coin-toss drinking game.

Separately, the web AR portion of the campaign, powered by **8th Wall**, launched animations when users pointed their phones at designated markers on **Miller Lite** cans and packaging. The animations featured the campaign's protagonist, the Bearded Man, in various hijinx.

And the results? The AR portal had a **28 percent** engagement rate, compared with a **20 percent** benchmark for non-branded AR experiences. **93 percent** of users completed the portal tour, which exceeded historic benchmarks that are about **40 percent**.

The coin toss game had a **75 percent** re-engagement rate, indicating AR's potential for replayability. There was also a **25 percent** lift in **Miller Lite** "favorability" versus typical St. Patrick's Day fare (think: Guinness); and session lengths with the Bearded Man averaged **3 minutes**.

The results speak for themselves in outperforming non-AR benchmarks. One highlight is the **25 percent** favorability lift, given that the campaign's main objective was to elevate **Miller Lite's** seasonal affinity. The challenge was doing so for a beer that's not endemic to St. Patrick's Day.

Another thing we'll underscore from the results is the **3+ minute** session lengths. As examined earlier, long session lengths for AR campaigns counter the notion that AR effectiveness is diminished by relatively short sessions (upheld device, arm fatigue, etc.).



## Lessons & Learnings

As for campaign strategy, **Miller Coors** launched the AR portal two weeks before the holiday to boost awareness. It then followed that with the bearded man AR can activation during St. Patrick's Day weekend. And all of the above was amplified through **Miller Lite's** social channels.

The takeaway for consumer-facing brands, or anyone considering AR advertising, is that it's really working. Scale and reach are still relatively low, but even that's showing signs of reaching Superbowl-sized audiences, as noted, when propelled by the virality of social channels like **Snapchat**.

But regardless of AR's capability and reach today, it shows enough positive signals for brands to start experimenting and developing competency for tomorrow. One lesson from the smartphone era is that those who failed to do

so fell behind and lost competitive edge to those who did.

"As consumers demand more engaging and immersive experiences, brands should absolutely be thinking about incorporating AR into their marketing campaigns," **Unity's** Tony Parisi told us. "Two areas I'd recommend starting with are digitizing and storytelling. If a brand has physical products, they should start looking into creating real-time 3D assets to represent those products virtually. They don't have to complete the full catalog, but it's important to start so they understand the tools and processes. I also encourage brands to think about how to tell their story with AR. Whether the product is a manufactured good, a financial service, or food or beverage, there's a story to tell – one that will be more relevant and engaging to consumers through the lens of AR."



Image Source: Miller Coors

## MAC

As AR continues to find its footing and potential killer apps, there are early signs of monetization in advertising and commerce. That stems from the fact that AR product visualization and “try before you buy” have user appeal/utility and growing interest from brand advertisers.

The consumer appeal is driven by the fact that AR visualization is more effective than traditional 2D images in eCommerce. As mentioned earlier in the report, that appeal is amplified during Covid-era lockdowns when we can’t see & touch products in store aisles.

## Detailed Visualization

One product category not yet examined in this report is cosmetics. But it has become one of the most popular AR “try-before-you-by” products. This popularity is driven by the fact that cosmetics require a great deal of detailed visualization that AR can provide, including color shades.

**YouTube** has leaned into this, offering AR try-ons that are launched from how-to videos about applying lipstick. Sponsored by cosmetics giant **MAC**, a call to action was offered during these videos to activate the front-facing camera and virtually try on various shades.

And the result? YouTube reported a **30 percent** AR activation rate. This means that **30 percent** of users that viewed these videos took the next step of trying on lipstick shades using AR. This far exceeds benchmarks for video advertising click-through-rates, which are about **1.84 percent**.<sup>xii</sup>

## Broadening AR Channels

Besides AR’s continually-validated efficacy, the other lesson here is broadening AR channels. It started with branded apps like **IKEA Place**, then higher-distribution branded lenses from social giants. Now we’re seeing alternate routes like in-game AR ads, messaging apps and even email.

**YouTube** could be a powerful addition to that list given its massive reach. It also offers a good fit for AR, given that it’s already conditioned the user behavior around product demos and how-to videos. AR is a logical extension and will especially shine in areas like cosmetics and apparel.

AR product visualization in these channels will continue to be driven by user appeal – especially during Covid-era retail lockdowns. But another driver will be self-motivated investment from influential tech giants like **Google**, as they take steps to future-proof their advertising businesses.

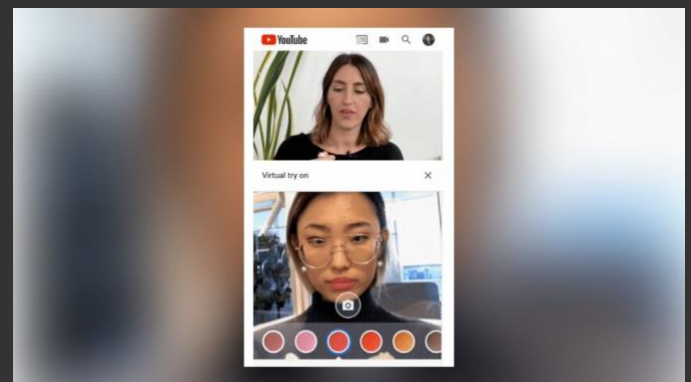


Image Source: Google

# Lower-Funnel AR Campaigns

Moving on to the lower portions of the consumer-purchase funnel, what are best practices in driving actual and quantifiable consumer purchases through AR product

visualization? Who are the exemplars? And how are they achieving results?

The following case studies dive in...



# NexTech AR Solutions

Evidence from the lower-funnel side of the AR commerce spectrum comes from a new case study from **NexTech AR Solutions**. The AR eCommerce firm reports that a recent 3D ad campaign it ran for **Miele Vaccum** saw a conversion boost of **300 percent** over non-AR equivalents.

The campaign also resulted in **32 percent** greater click-through-rates (CTR), **23 percent** lower cost-per-click (CPC) and an overall cost per acquisition (CPA) that was **74 percent** less than non-AR benchmarks. These results indicate not only performance but cost-efficiency and ROI.

## Isolate the Variable

As for the campaign itself and the measurement methodology, it involved a **\$999** premium **Miele Vaccum**. The banner-ad campaign A/B tested AR ads (test group) versus non-AR ad (control group). This involved **200,000** impressions, split evenly between AR and non-AR.

To isolate key variables and truly see AR's impact, both sets of ads looked identical in design and ad copy. They were both HTML5 banners in four standard IAB sizes. The only difference was the ability to interact with the AR version of the ad.

For the AR ad, a slowly rotating product indicated the ability to interact using a cursor (desktop) or touch (mobile). The additional option was available on smartphones to visualize the product in one's space by activating the camera. This all happened in web AR with no app required.

Interestingly, **NextTech** acquired the eCommerce site VCM.com where the vacuums are sold. Along with a few other acquisitions, this investment essentially provides an AR proving ground where it can control the full stack and optimize the workings of its 3D/AR ad Network.



Image Source: NexTech AR Solutions

# Papa John's

Proof points continue to roll out for AR's effectiveness as an advertising medium. Early-adopter brands are learning that AR lets them demonstrate products in immersive ways. That can include brand engagement (upper-funnel) or "try before you buy" (lower-funnel) visualization.

More evidence from the lower-funnel side of the AR commerce spectrum comes from **Papa John's** Valentine's Day **Snapchat** lens campaign. Meant to promote its festive heart-shaped pizza in U.S. markets, the front-facing camera activation let users play with heart-themed AR animations.

After doing so, users could then order a pizza directly from the **Snapchat** app. This resulted in a conversion rate of **25 percent** of lens viewers who ordered a pizza. Meanwhile, **60 percent** of lens views were from unique users and the campaign led to a **6 percent** lift in brand awareness.

Among these figures, the conversion rate is most relevant. There are lots of usage metrics for AR such as depth of user engagement. But the clearest ROI for brand advertisers is direct revenue impact. And a **25 percent** conversion rate far exceeds benchmarks in other digital media.

## On Your Mark

Another noteworthy component of this campaign is that it could be launched from a Snapcode in addition to the lens carousel. This can be a good way to onboard users to AR, especially for brands that have physical media

or store locations with signage that can prompt AR activity.

Snapcodes are technically "marker-based AR" in that a piece of physical media launches the experience. This branch of AR has gotten panned in the current wave of AR excitement for being a primitive form of the technology, compared with spatial mapping and the advent of the AR cloud.

But the pendulum could swing in the other direction as traction for AR continues to linger below desirable levels of mainstream scale. During early stages when most consumers aren't seeking out AR, prompts like markers and Snapcodes could provide a much-needed nudge.

Another success factor is Snapchat itself. Though it's a walled garden, it's a large and fitting one for AR. Lens sharing is a native and prevalent activity among the camera-forward user base. So it's become a top AR destination for brand advertisers, as examined in part I of this report series.<sup>xiii</sup>



Image Source: Papa Johns



## CB2

More evidence from the lower-funnel side of the AR commerce spectrum comes from **CB2**. The millennial-focused furniture retailer worked with **Vertebrae** to help customers visualize furniture through AR on their smartphones. The functionality was added to its mobile website.

This kicked off with **CB2's** menswear-inspired **GQ** furniture line but will expand to 650 other pieces in its inventory by year-end. This involves a heavy process of digitizing large items, which it will continue to do as fast as it can — an ongoing challenge in digitizing extensive product catalogs.

But **CB2** is motivated to get there, based on the validation it already sees. **Vertebrae's** preliminary data shows that products visualized through the AR feature saw **7 percent** average conversion boosts, **21 percent** greater revenue per visit, and **13 percent** greater average order value.



Image Source: CB2

## Lessons & Learnings

In examining how **CB2** achieved the above performance metrics, it's partly due to AR's inherent ability to engender more informed consumer purchases. But there are a few other tactics it applied that are worth extracting in terms of best practices and transferrable lessons.

For one, it's notable that just like **Ally Bank's** campaign examined earlier, **CB2** chose web AR as a vessel. The thought is that AR is too early and unproven to justify typical app friction. AR's need for a quick & dynamic experience is better aligned with the mobile web's easier access.

Moreover, **CB2** did its homework to determine that web AR is more aligned with how its customers specifically engage — both at home and in-store. Specifically, **CB2's** VP of marketing Samie Barr told *Furniture Today* that half the site's traffic comes from mobile web users.

Launching and testing AR with the **GQ** product line was also deliberate. **CB2's** research showed that the furniture line's male target audience generally has less familiarity with interior design or space planning. In other words, it's a good product/market fit for AR visualization.

It's also worth noting that **CB2's** campaign involves rear-facing camera AR. Most AR traction we've seen is for front-facing AR (sunglasses, cosmetics), but the broader canvas of the physical world is a larger opportunity. That includes cars and couches today but could expand significantly.



Image Source: CB2

# 

As mentioned earlier when looking at **MAC's** mid-funnel AR campaign, cosmetics is a fitting category for AR advertising. The same applies to **Olay's** AR campaign on **Facebook**, though it differs in its AR interactions and the fact that it demonstrated lower-funnel results.

The **Blippar**-powered campaign let users take a selfie which then applied computer vision and AI to analyze "skin age" and recommend products to reduce it. This is a more rudimentary form of AR as it doesn't involve live face tracking, but it nonetheless has the key ingredient of computer vision

The result was an immediate **2x** boost in conversions. This happened at meaningful volume, given **7,000** daily app users and **1.2 million** cumulative engagements. It also led to **five-minute** session lengths and boosted engagement among younger demographics that **Olay** wanted to target.

Session length is a particularly notable metric that continues to come up in this report. In a sea of vanity metrics like app downloads, it's important for AR to stick to more granular and representative indicators of actual engagement. Measurements like dwell time will continue to capture that.

But the holy grail is revenue lift, which was also present in the **Olay** campaign. Though it will take a while for AR to standardize native metrics that capture its unique engagement, revenue lift is a universally understood and valued metric as examined earlier.

A few other campaign attributes are worth noting. As mentioned, this is a rudimentary

form of AR, which demonstrates that successful implementations don't have to be technologically complex. Ingredients for success are more about engaging consumers through memorable experiences.

Capabilities will only grow as both the technology improves (facial tracking, realistic product renderings) and as consumer comfort levels likewise advance. These two factors together could propel a virtuous cycle of supply and demand for AR visualization.

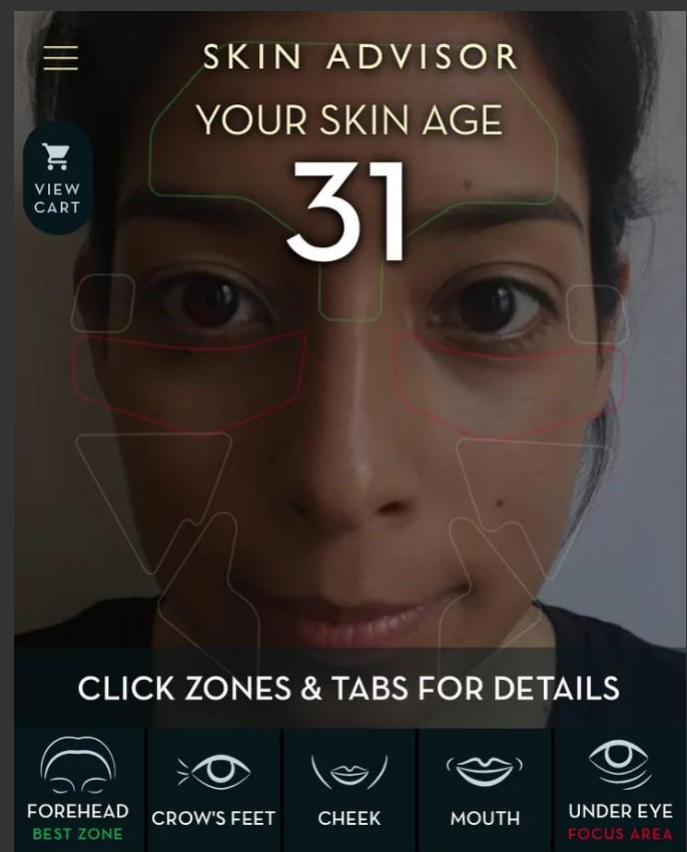


Image Source: Procter & Gamble

# Final Thoughts

After going through several AR advertising case studies what are the biggest lessons?

One common theme among successful AR advertising players is reducing friction. That goes for both users and advertisers. Users are drawn to AR experiences that don't require "activation energy," such as **Snapchat's** integration of AR into the existing behavior of social media sharing. It's also evident in the web AR based campaigns in this report.

Similarly, with transactional functionalities that flow from AR ads such as **Instagram** shopping, the entire purchase funnel happens all in one flow. In successful cases, users aren't bounced to another app, nor to a website to further browse products and transact. It all happens in one place.

# Opportunity Gap

Another key lesson is less about what's present in today's market and more about what's *missing*. A big gap in AR advertising is the tools to create 3D graphical assets for AR product visualization. Large players like **IKEA** have done this in house, but a more open and scalable tool is needed.

That could unlock AR advertising by democratizing it for more businesses, especially smaller ones. It could also enable companies with massive catalogs (think: **Walmart**) to scale up the digitization of their inventory cost-effectively. That will better enable product visualization in AR ads.

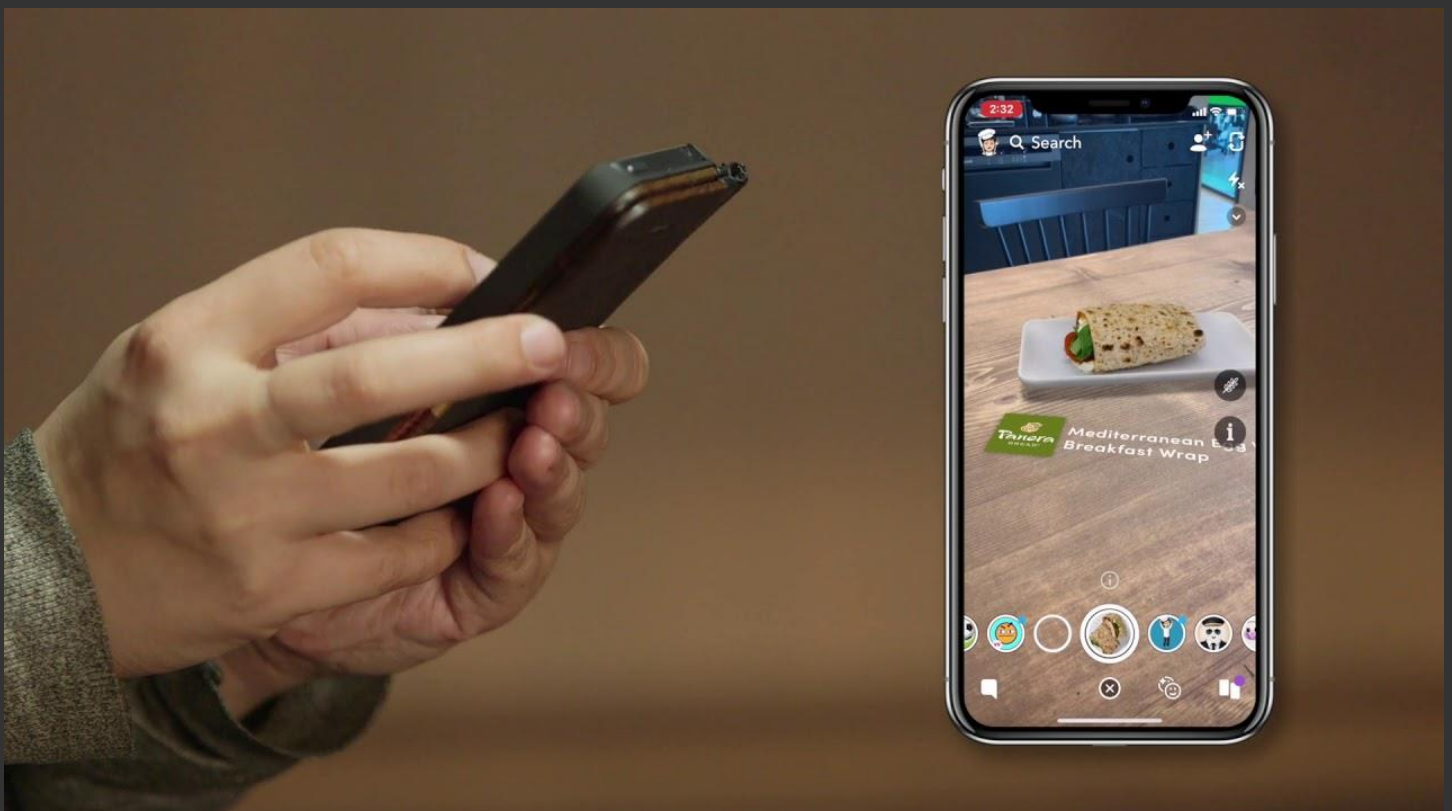


Image Source: M7 Innovations

## New Categories

Early adopter product categories in AR advertising include cosmetics and fashion. But adoption will continue to broaden as advertisers get acclimated; as the technology improves; and as AR migrates more to the rear-facing camera to augment the broader canvas of the physical world.

Adoption drivers will map to advertisers' motivation and spending power; as well as their products' conduciveness to 3D visualization (see chart below).

## New Metrics

Coming full circle to where we started, one question mark will continue to be analytics. Advertisers tend to stick to what they know. So AR will need to walk a fine line between

metrics that capture its deep engagement and those that advertisers are comfortable with.

This is all to say that AR advertising eventually needs more native metrics. In addition to session lengths, these could include biometric sentiment analysis using computer vision. Like all industry standards, this is something that requires widescale agreement, and will take several more years to develop.

## New Normal

Finally, in the Covid era, AR visualization can bring back some of the 3D product interaction that's lost in in-store experiences. And when retail does return, touching products will be minimized – presenting an opportunity for AR to support “touchless” interaction.

AR advertising will be a key part of that value chain in amplifying branded AR experiences in both retail store aisles; as well as safer and more socially-distanced locales.

# Brand & Retailer Adoption Drivers

## Factors Influencing Vertical-Specific AR Advertising & Commerce



# Stay Tuned...

After examining the AR advertising landscape, market sizes and driving factors (part I); and demonstrable case studies (part II), ARtillery Intelligence's next conquest is a dynamic tracking sheet.

This will be an at-a-glance chart containing hundreds of AR advertising campaigns. Attributes will include brand name, distribution channel, campaign description and ROI results

(when available). We'll track historical campaigns, as well as ongoing AR activations as they launch.

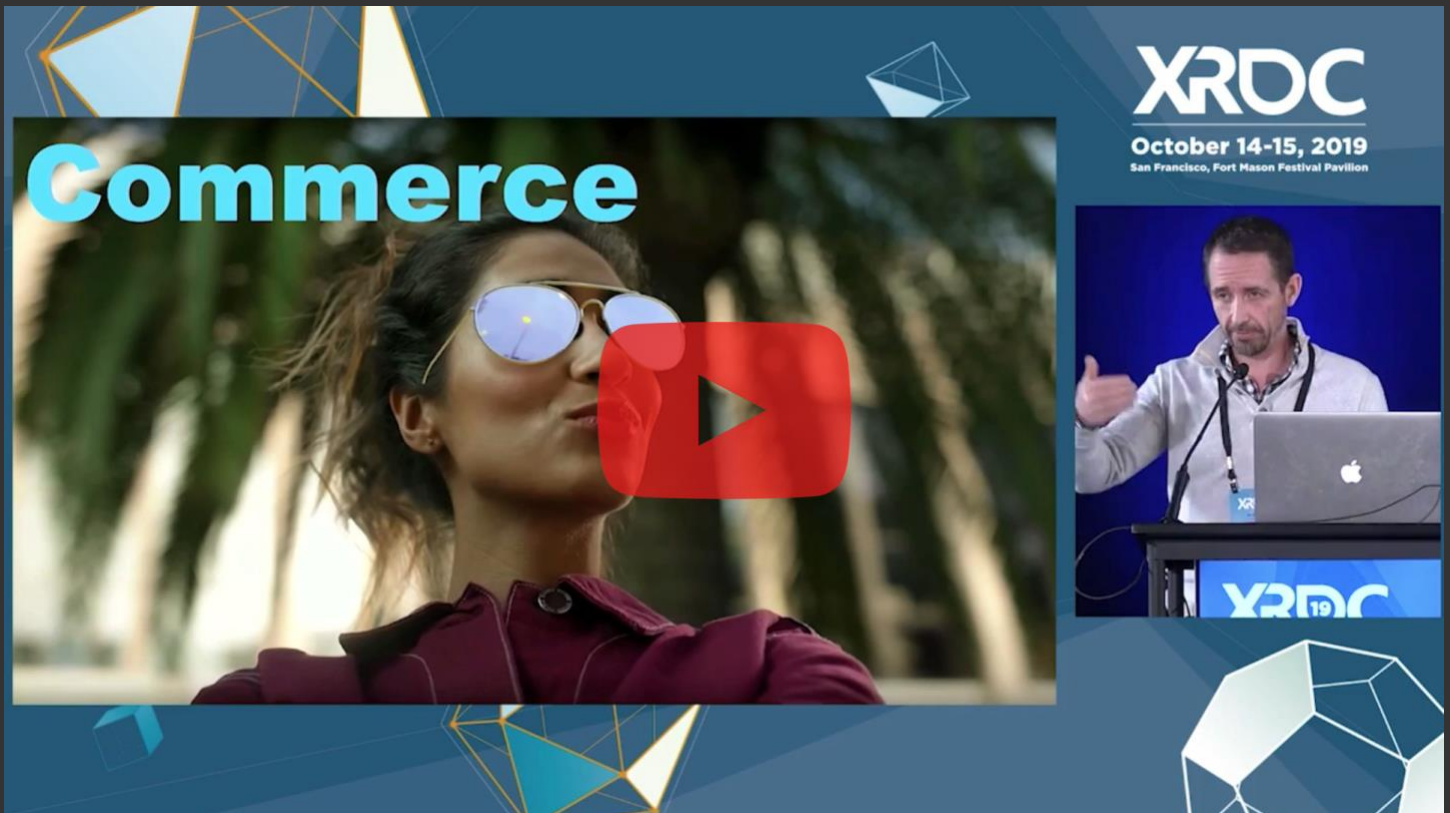
Stay tuned for that deep dive. Outside of this series, you can also look forward to ongoing analysis of AR advertising's opportunity through ARtillery Intelligence's writings & multimedia. It will be a swiftly-moving target.



Image Source: Snap, Inc.

# Video Companion: What's Working in AR Advertising?

Click video to open



ARtillery  
Intelligence

# Key Takeaways

- AR Among the many subsectors of augmented reality (AR), advertising is a leading revenue category.**

  - ARtillery Intelligence estimates AR ad revenues will be **\$1.41 billion** this year, growing to **\$8.02 billion** by 2024.
  - This measures the dollars spent on sponsored AR lens distribution in channels like Snapchat and Instagram.
  - It does not include the money companies spend on AR experiences for self-distribution (e.g. apps).
- AR Driving this revenue is a combination of consumer traction and advertiser interest.**

  - AR-fueled lenses have gained popularity with users, building on already-popular behavior like sharing media.
  - Advertisers have followed that usage and discovered that AR affords them greater creative capabilities.
- AR Brand advertisers are also attracted to AR's business case that continues to be validated in ROI metrics.**

  - AR ad campaigns outperform non-AR benchmarks on several measures, including depth of engagement.
  - AR advertising is further driven by Covid-era retail lockdowns that compel remote product visualization.
  - AR advertising also has a proven and rare ability to **span the purchase funnel**, from awareness to action.
- AR Upper-funnel campaigns aid brand awareness through high-reach channels like Snapchat and Facebook.**

  - Ally Bank achieved **100,000** high-engagement impressions through its web-AR based Monopoly game.
  - GREATS Shoes achieved a **3.4x** brand lift and a **62 percent** reduction in cost-per-increment of brand lift.
  - Purina achieved **172 million** impressions and **30-second** average playtime for its social lens campaign.
- AR Mid-funnel campaigns lead consumers closer to purchases through AR games and social sharing.**

  - Panera achieved **171,000** engagements and **47,000** social shares for its breakfast-wrap lens campaign.
  - Adidas achieved a **4x** engagement delta over non-AR benchmarks and **11-second** average dwell times.
  - Miller Lite achieved a **25 percent** lift in brand favorability and **3+ minute** session lengths for its AR campaign.
- AR Lower-funnel campaigns achieve high conversion rates through product try-ons and informed purchases.**

  - Miele Vacuum achieved a **300 percent** conversion boost over non-AR benchmarks in its AR-enabled banner ad.
  - Papa Johns achieved a **25 percent** conversion rate for its AR-enabled campaign to sell pizzas on Valentines Day.
  - CB2 achieved a **7 percent** conversion boost and **21 percent** greater revenue-per-visit for its AR campaign.
- AR The above sampling of AR campaign results validates the range of product categories possible.**

  - Early-adopter verticals include cosmetics and fashion, but this will expand as advertisers acclimate.
  - AR advertising will also migrate to the rear-facing camera to augment the broader canvas of the physical world.
  - Adoption drivers will map to motivation, spending power and product-alignment with 3D visualization.
- AR The most success and effectiveness will be realized by brands who commit to long-term AR initiatives.**

  - This will be required to develop competency and effectiveness in what is a new and rapidly-developing playbook.
  - Advertisers who commit to ongoing work can amortize costly upfront learning curves over several campaigns.
- AR Technical complexity isn't always required for AR success. Instead, prioritize end-user experience.**

  - Low-poly graphics are preferable in order to prioritize reliability and functionality over graphical complexity.
  - Web AR shows success as a distribution channel given its lower friction in onboarding consumers.
  - Web AR also has advantages in avoiding platform fragmentation, and its ability to push updates instantly.
- AR Calls-to-action for AR campaigns should be thoughtfully devised and consider consumers' ambivalence.**

  - Marker-based AR can drive engagement through explicit calls to action on owned-assets like product packaging.
  - Other calls-to-action include video, which can demonstrate AR experiences before users engage.
  - YouTube and Google search results are emerging as high-scale distribution channels for AR-enabled ads.
- AR Market gaps (opportunities) include scalable 3D asset creation for vast product catalogs (think: Walmart).**

  - Analytics also remain a question mark, as AR balances established benchmarks and "native" metrics.

# 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' 15 years in tech-sector research and intelligence. This includes the past 5 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

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- i ARtillery Intelligence Report, [AR Advertising Deep Dive, Part I](#) (sign-in required)
- ii ARtillery Intelligence Report, [Mobile AR Revenue Forecast, 2019-2024](#) (sign-in required)
- iii ARtillery Intelligence Report, [Mobile AR Revenue Forecast, 2019-2024](#) (sign-in required)
- iv ARtillery Intelligence article, [Advertisers Aren't Sold on AR...Yet](#)
- v ARtillery Intelligence Report, [Lessons from AR Leaders, Part II](#) (sign-in required)
- vi Neuro Insight Report, [How Augmented Reality Affects the Brain](#)
- vii ARtillery Intelligence article, [Advertisers Aren't Sold on AR...Yet](#)
- viii ARtillery Intelligence article, [Triangulating Clues in Apple's AR Roadmap](#) (sign-in required)
- ix ARtillery Intelligence Report, [AR Advertising Deep Dive, Part I](#) (sign-in required)
- x ARtillery Intelligence Report, [Lessons from AR Leaders, Part I](#) (sign-in required)
- xi ARtillery Intelligence Report, [Lessons from AR Leaders, Part III](#) (sign-in required)
- xii Video ad Click-through-rates: <https://www.invespcro.com/blog/online-video-advertising>
- xiii ARtillery Intelligence Report, [AR Advertising Deep Dive, Part I](#) (sign-in required)