May 2021

Camera Commerce: AR Monetization Materializes

An ARtillery Intelligence Briefing

ARtillery Intelligence

Executive Summary

In AR's early stages, a few areas stand out for their monetization potential and business case. We've examined such areas in past reports, including AR's role in enterprise productivity, and its use in helping consumer brands add dimension to their product marketing.

But another branch of AR has potentially greater experiential impact for consumers, and revenue impact for brands: *immersive shopping*. Related to – but separate from – AR advertising, this is when AR is used as a tool to visualize and contextualize products for more informed consumer purchases.

This is a subset of AR that we call *camera commerce*. It comes in a few flavors, including visualizing products on "spaces and faces," to see if they fit. It also includes visual search, which involves pointing one's smartphone camera at a given product to get informational, identifying or transactional overlays.

Among these formats, product visualization is out of the gate first and has the most traction. Visual search is meanwhile less mature due to more complex technological underpinnings like computer vision. But it has greater monetization potential, given the high-intent use case of actively scanning items.

In each case, AR brings additional context and confidence to product purchases. And this value has been elevated during a pandemic when eCommerce itself has inflected. AR has brought back some of the product dimension and tactile detail that's been taken away from consumers during retail lockdowns.

Beyond the pandemic, AR brings sustained value as a shopping tool as it's proven to boost conversions in several eCommerce scenarios. For example, **Shopify** reports that products that offer 3D and AR visualization achieved **94 percent** greater conversions on average than non-AR equivalents.

In addition to boosting conversion rates, the informed purchases that AR engenders can reduce return rates. For example, **SeekXR** reports that AR-guided purchases have **25 percent** fewer returns than non-AR benchmarks. This is a welcome benefit for online merchants who suffer from margin-depleting product returns.

Beyond online shopping, camera commerce could find a home in brick & mortar retail. Specifically, it could develop as a utility for in-aisle interactions such as evoking product details. This could also support "touchless" retail shopping if epidemiological health measures sustain into the post-Covid era.

Synthesizing these factors – along with AR's broader growth and cultural acclimation – ARtillery Intelligence estimates that AR will influence **$36 billion** in consumer spending by 2024. This means that AR will play a role in some part of the consideration funnel for these transactions.

But how will this all come together? What cultural and technological barriers loom? And who's doing what? We'll tackle these questions throughout this report, including numbers, narratives and case studies for camera commerce. The goal, as always, is to empower you with a knowledge edge.

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Key Takeaways

Among AR use cases gaining traction, immersive shopping has been an early standout.
- This is defined by AR that helps consumers visualize and contextualize products before purchasing.
- Otherwise known as *camera commerce*, it's projected to drive $36 billion in consumer purchases by 2024.
- Advantages include bringing visual context and confidence to consumer purchase decisions.
- This area has been amplified in the Covid-era as it brings more dimension to eCommerce.

Camera commerce is subdivided by remote product visualization and proximity-based visual search.
- Product visualization involves remotely simulating commercial items on "faces & spaces."
- Visual search involves pointing one's phone at nearby products to activate informational overlays.
- Product visualization has gained earlier traction, but visual search could eventually surpass it.
- This is due to the high-intent use case (much like web search) of actively seeking product info.

Starting with product visualization, it has become a popular camera-commerce modality.
- AR-informed purchases can boost engagement and performance in shopping contexts.
- This includes higher conversions for product purchases, compared to non-AR benchmarks.
- It can also reduce return rates, given that the initial purchase was more informed and aligned.
- AR visualization will gain value as it expands to the rear-facing camera and a broader set of products.

Visual search meanwhile continues to gain traction as a way to visually identify unknown items.
- Google is starting with general-interest subjects like pets and flowers to seed broader demand.
- But the real opportunity will be with commercial products such as fashion items with unclear branding.
- Beyond Google, Pinterest shows promise in visual search because of its visual shopping persona.
- Snap Scan is also developing visual-search use cases that utilize AI and data from vertical partners.

Camera commerce takes place in a variety of channels, which will continue to evolve.
- Social apps like Snapchat lead the way currently, due to their popularity as AR channels.
- Over time, search will gain ground as a camera commerce channel for the reasons stated above.
- Web AR will also grow as an AR shopping channel, due to its frictionless activation and compatibility.
- Apps will continue to be a strong channel (e.g., IKEA Place), but will recede in market share over time.

One gating factor for camera commerce is the supply chain of 3D virtual assets.
- In order for products to be visualized through AR, the experience requires detailed 3D models.
- This is challenging because creation workflows are rigorous, making it difficult to scale asset production.
- File size is also an issue on mobile devices, so compression and optimization will be valuable enablers.
- These advancements will let large e-tailers scale up production, while smaller players can participate.

Camera commerce has been amplified in the Covid era, so the question is if these levels sustain.
- AR shopping piggybacks on Covid-driven eCommerce inflections as it enhances remote shopping.
- Through this, AR has been exposed as a valuable tool, which could support its longer-term adoption.
- Beyond eCommerce, AR can support "touchless" in-aisle interactions as physical stores reopen.
- Altogether, AR can reduce consumers' time in stores and reduce physical interactions while there.

Beyond shopping, AR could grow as a tool for consumers to find and discover local businesses.
- Even in a pandemic, physical-world retail accounts for 80 percent of consumer spending.
- AR could continue to evolve and replace tools like Yelp and Google Maps to guide local search & discovery.
- This will be tied to geo-spatial AR efforts (a.k.a. AR Cloud) from tech giants like Google, Facebook & Snap.
- We'll follow up later this year with a report that explores AR's role in transforming local offline commerce.

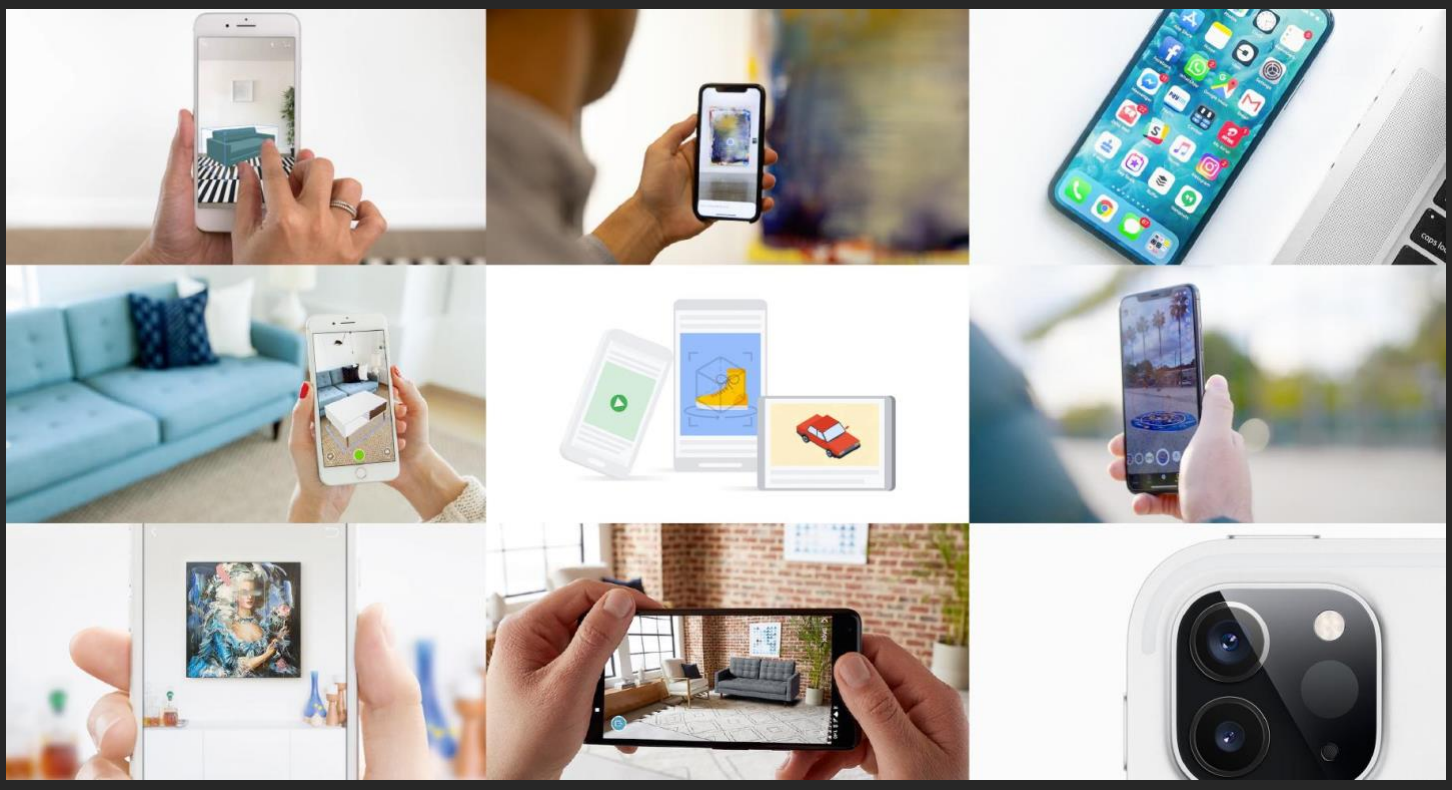
Camera Commerce

Following AR's circa-2017 hype cycle, it's become evident that the technology isn't a "silver bullet" as once heralded. It won't transform *all* aspects of our lives and work, having varied applicability to some areas more than others. But this doesn't mean it won't create considerable value.

Indeed, as AR continues to grow into its own skin, it's showing strong potential to revolutionize a handful of areas. Those include sectors that we've examined in past reports, such as enterprise productivity, mobile gaming, social engagement and brand marketing.

Next on this list of AR-conducive activities is *consumer shopping*. This area that we've begun to call *camera commerce* involves using graphical overlays to enhance or inform shopping experiences. It engenders more informed purchases and can even boost conversion rates as we'll explore later.

One aspect that makes camera commerce so opportune is the fact that it's naturally monetizable. After AR has gotten flack for not having a meaningful business case, incorporating it into the shopping flow unlocks a clearer set of business models, which we'll explore later in this report.



Advertising vs. Commerce

While we're level setting on definitions and classifications, an important distinction is *advertising* versus *commerce*. These areas flow into each other in an important value chain that drives consumer purchases, but they're separate areas of enterprise spending and strategic development.

At a high level, *AR advertising* is defined as spending on campaigns that are created and distributed through specific paid channels. For example, as we examined in our recent two-part report series on AR advertising[i], sponsored lens campaigns on **Snapchat** and **Facebook** exemplify AR advertising.

AR commerce meanwhile can happen *within* AR ad campaigns, but it's generally broader. It's defined as AR that's incorporated into any shopping flow. That can mean venues that are outside of a brand's paid advertising channels, such as its own app or mobile website.

Another example in retail contexts is AR commerce that's activated through brand packaging. This includes animations that come to life when prompted by a physical marker. This flavor of camera commerce has considerable benefits, including utilizing existing and owned brand assets.

For the purposes of this report, we'll be zeroing in on *AR commerce* – a.k.a. *camera commerce* – rather than *AR advertising.* See our separate report series[ii] that's mentioned above for the latter.

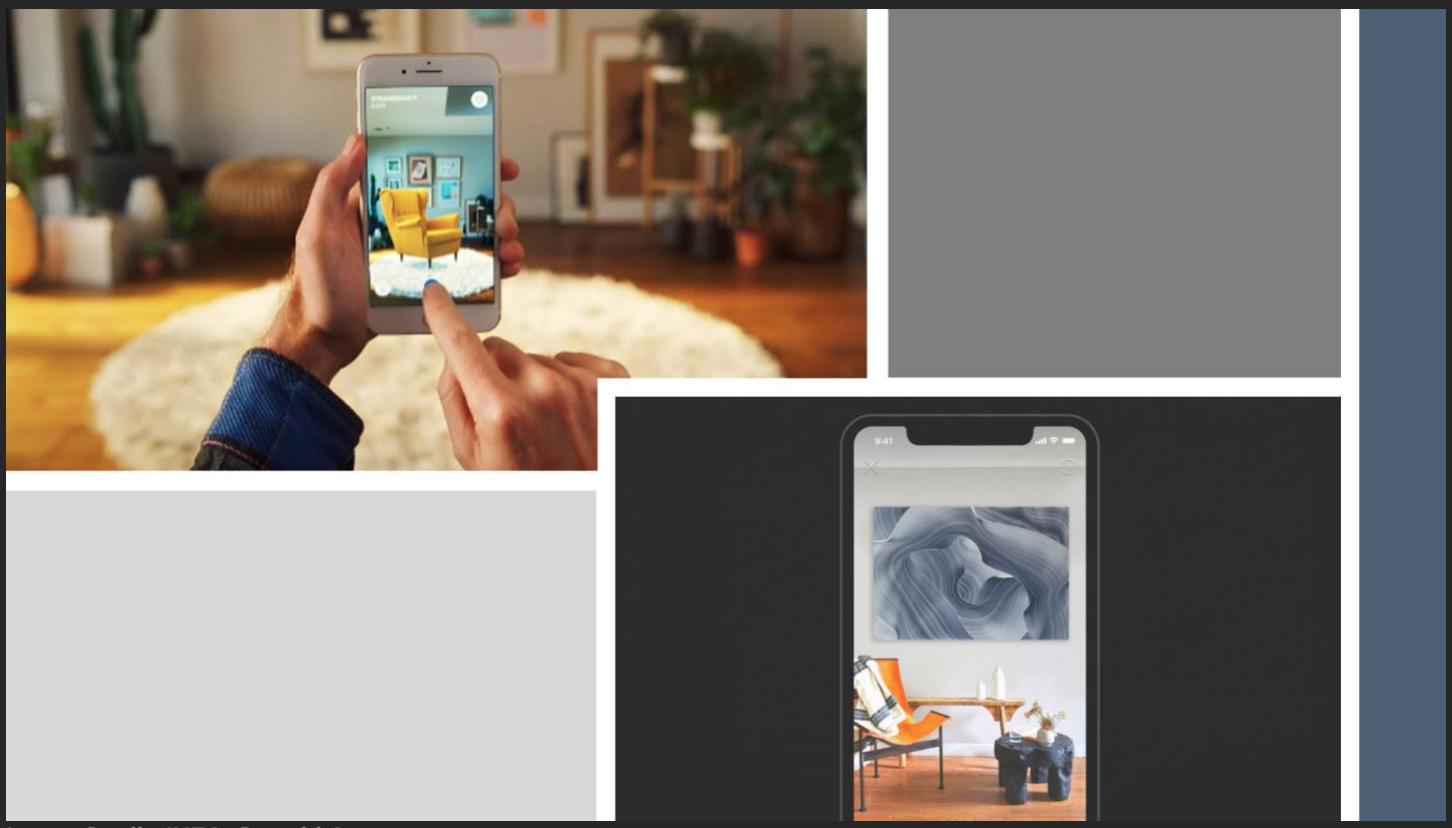


Image Credit: IKEA, Saatchi Art

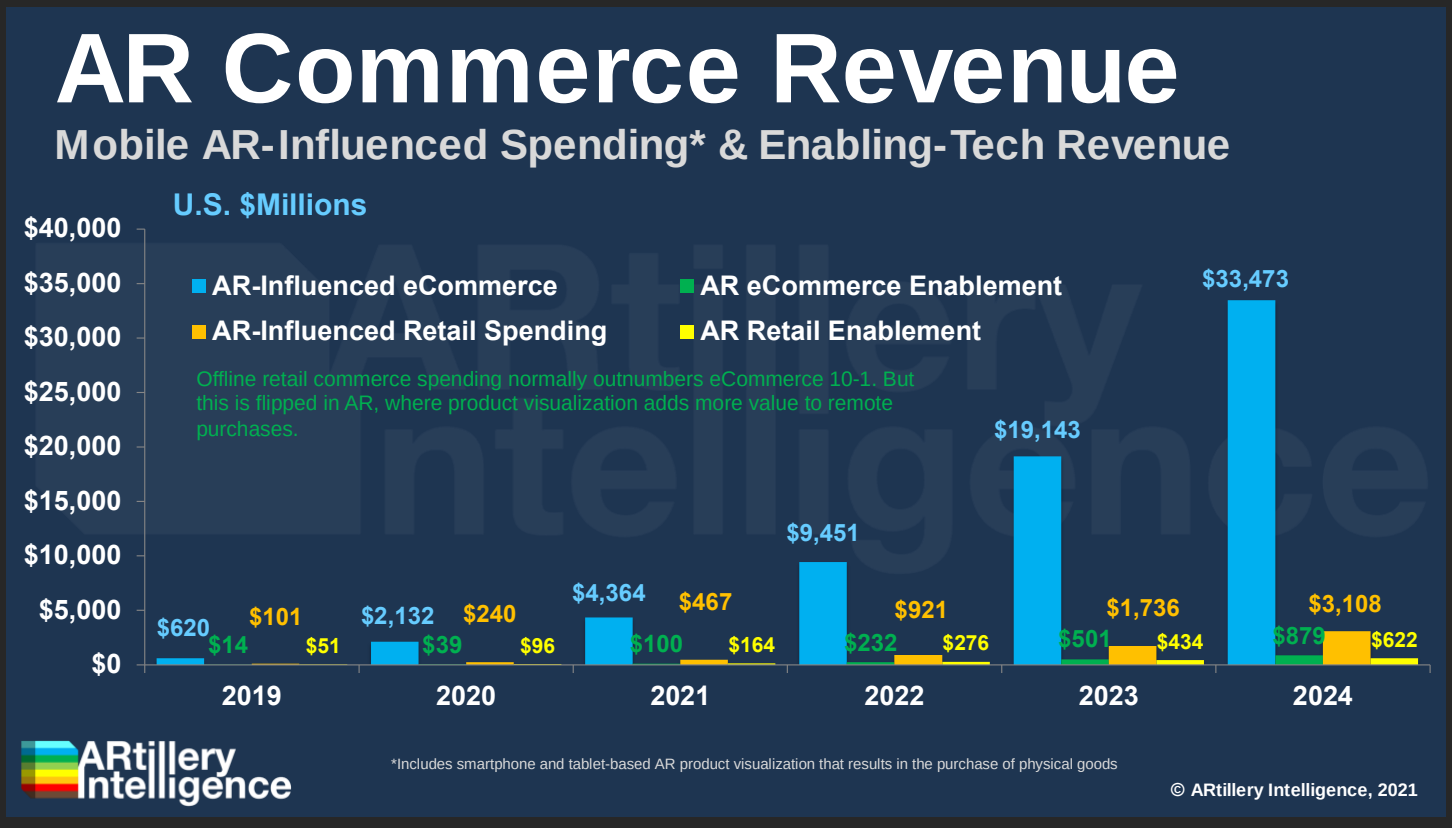
By the Numbers

Quantifying camera commerce and indicating its monetization potential, **ARtillery Intelligence** has projected AR-influenced consumer spending to exceed **$36 billion** by 2024. To define this figure, it's the aggregate value of consumer purchases that are influenced in some way by AR experiences.

Notably, this **$36 billion** in 2024 isn't *AR revenue* per se: It's rather the retail revenue that AR helps generate. As for where actual AR revenue comes in, it will be a fraction of consumer spending, to the tune of **$1.5 billion** (about **10 percent**) by 2024. This revenue is generated throughout the AR commerce value chain.

For example, the companies and technologies that occupy this value chain will help brands and retailers *AR-enable* their eCommerce experiences. It will also include technology to generate 3D models, optimize the transmission of large files, and generally integrate AR into the existing eCommerce tech stack.

Business models for these ecosystem players will include SaaS software licenses, as well as revenue share arrangements. These models exist today in the existing eCommerce ecosystem, and will be mirrored in the AR shopping microcosm that continues to develop.



Video Companion

Click to Play

Flavors of Camera Commerce

Earlier we made the distinction between *AR advertising* and *AR Commerce*, the latter being the focus of this report. To go one level deeper, AR commerce is subdivided by a few formats.

These include remote *AR visualization* and proximity-based *visual search*. They're equally opportune but fundamentally different. Let's take those one at a time.

Faces & Spaces

Remote *AR visualization* is the most well-known flavor of camera commerce today. This involves placing 3D objects on “faces & spaces” to visualize their qualities. These experiences have been distributed through social media apps that are native to AR lenses, as well as brand and retailer apps.

AR visualization has been most popular with items that go on one’s face. This piggybacks on consumers’ comfort levels with selfies and front-facing camera lenses. This can help depict dimensions and stylistic factors of face-worn items such as sunglasses or cosmetics.

However, a larger opportunity is beginning to unfold for AR visualization that moves from the front-facing camera to the rear-facing camera. This opens up AR visualization to the broader canvas of the physical world, thus bringing in several other types of products – everything from cars to couches.

The consumer AR lens leader, **Snapchat**, is keen on this evolution and has begun to provide tools in its Lens Studio creator software to develop outward-facing world lenses. Elsewhere, we see traction for tools like the **IKEA Place** app, which lets **IKEA** shoppers visualize furniture in their homes.

In fact, this raises another attribute for successful AR visualization: bulky products. AR can solve a common pain point of figuring out if an item will fit in one’s space. AR visualization also shines in areas where there’s a great deal of product detail that 3D imagery can exhibit, such as wood grain.

Image Credit: Houzz

Search What You See

The other main category of camera commerce is proximity-based visual search. Led today by **Google** (Google Lens) **Pinterest** (Pinterest Lens) and **Snapchat** (Snap Scan), this involves pointing one's phone at an object to identify it through informational overlays. It's also known in more plain-spoken terms as "search what you see."

Visual search use cases being developed today by **Google** include general-interest subjects like pets and flowers. But like web search, **Google's** evolutionary arc will involve cultivating usage and comfort levels before flipping the monetization switch. The latter will involve product-based visual searches.

In fact, commercial products are a natural fit for visual search, as there's a high degree of "commercial intent," inferred when consumers actively scan a given object. This high intent is the same factor that makes web search such a natural (and valuable) advertising medium, but in this case it's done visually.

That visual orientation may have an even greater correlation to commercial intent than web search does. **Pinterest** reports that **55 percent** of its users say that visual search is instrumental in developing their style. **49 percent** meanwhile use it to develop brand relationships, and **61 percent** report that it elevates in-store shopping.

Speaking of **Pinterest**, it's likewise positioning itself in visual search, as noted. In fact, the shopping use case that it has already conditioned makes its potential visual search monetization a natural extension. We'll explore its approach and positioning later in this report.

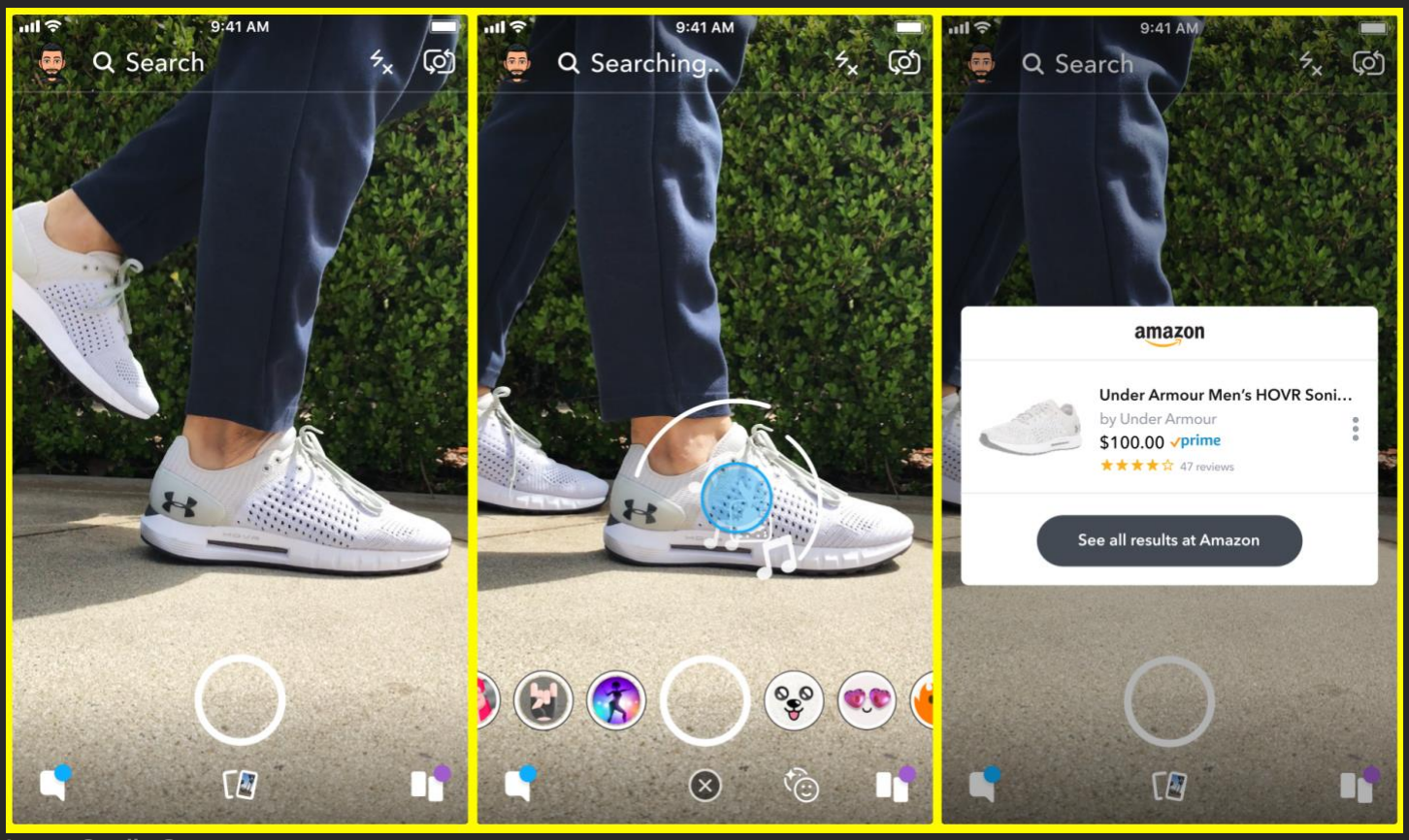


Image Credit: Snap

By the Numbers

After examining the two main forms of camera commerce, the next question is how big are they? As noted, product visualization is out of the gate first as a prevalent camera-commerce use case. But visual search could grow over time as its more-complex tech stack (e.g., computer vision) develops.

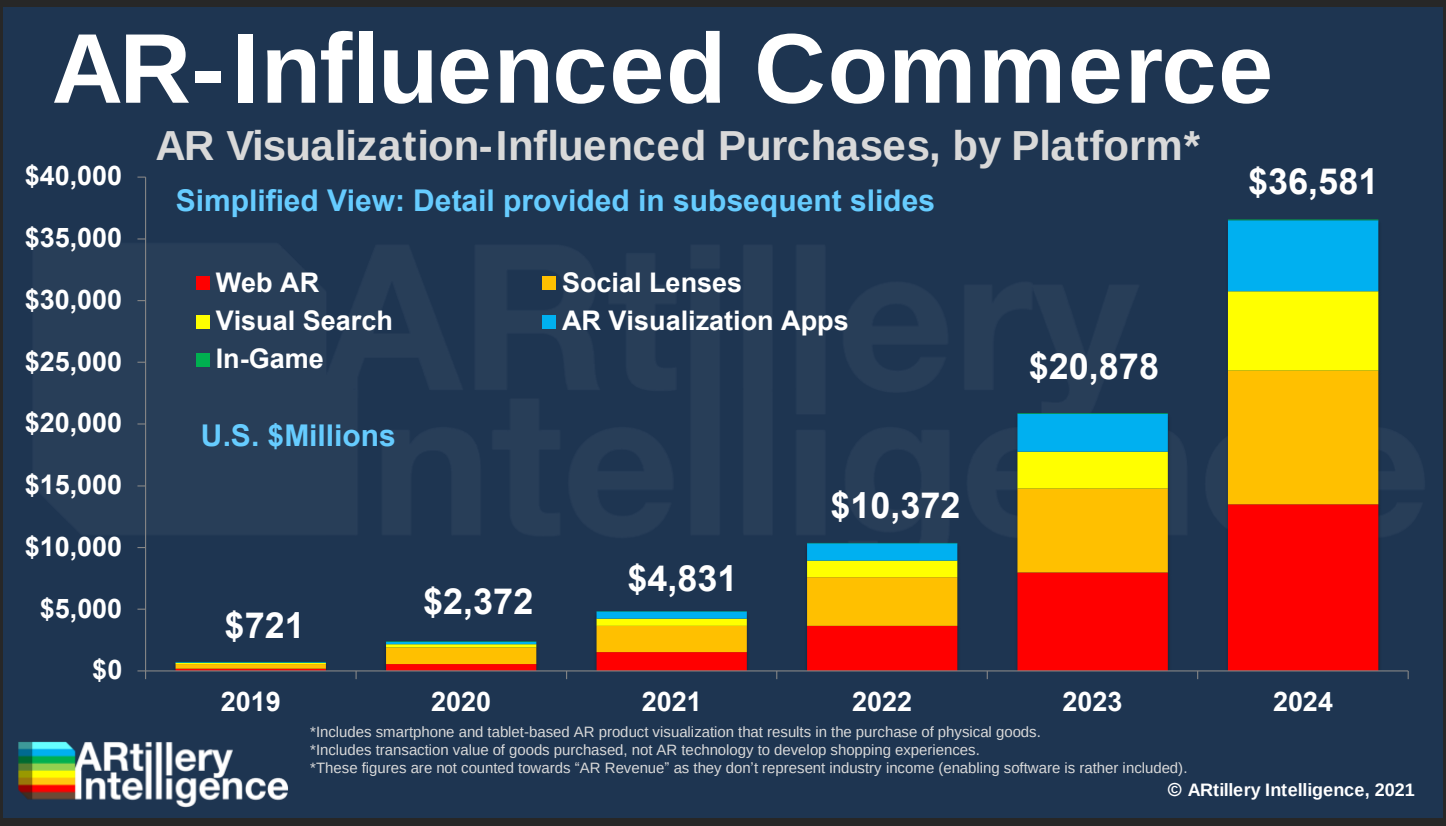
As a historical comparison, it's notable that a similar progression defined online advertising's early days. Display ads were prevalent long before search advertising was introduced by **Overture** (and eventually **Google**). This could be analogous to the relative evolutionary paths of AR visualization and visual search.

Similarly, we believe that visual search – driven by high commercial intent – could eventually be a larger revenue opportunity than AR product visualization. However, this will take several years to develop. Indeed, **Google** is barely monetizing visual search today.

Specifically, we've projected in our mobile AR revenue forecast[iii] that visual search will grow from influencing **$238 million** in consumer spending last year to **$6.4 billion** in 2024. This makes it smaller than AR visualization by about five to one in 2024... but growing faster.

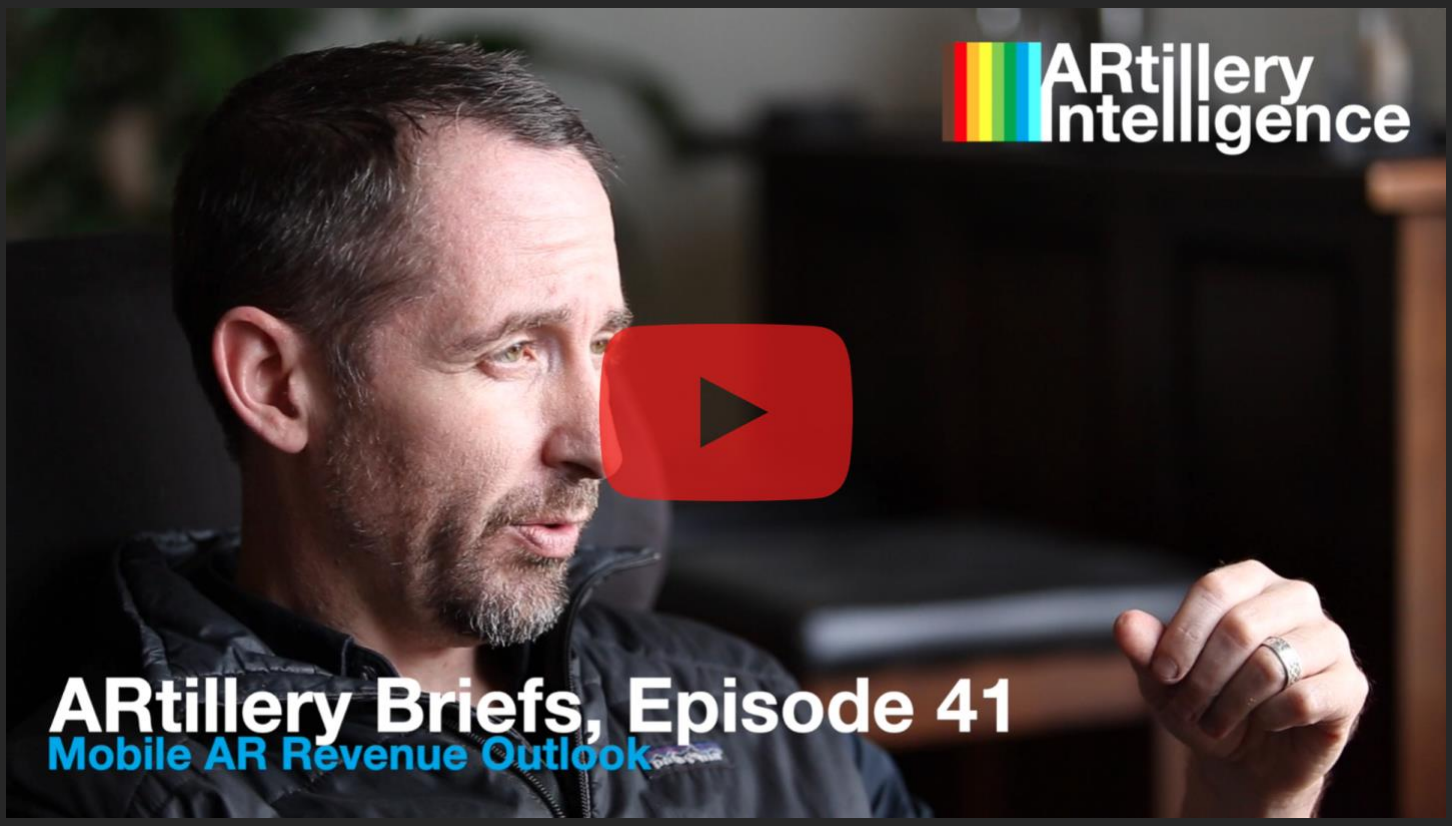
Meanwhile, AR product visualization will grow from **$2.13 billion** last year to **$30.2 billion** by 2024. Again, these figures define the consumer spending that is influenced in some way through AR product visualization. As shown below, this will happen in a variety of channels and formats, which we'll break down later.

Now that we've introduced and quantified AR visualization and visual search, let's go deeper on each one... starting with AR visualization.



Video Companion

Click to Play



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Drilling Down: Visualization

To go one level deeper on camera commerce that happens through AR visualization, what are its proof points? Who's making it work? And what are the results they're seeing? This happens on a few levels including boosting product conversions and reducing returns.

These are both valuable activities and outcomes for brands and retailers. Indeed, boosting conversions is the most tangible form of marketing ROI, as it offers clear attribution of a given media's sales impact. In this case, AR visualization increases purchase likelihood.

As for returns, this is likewise music to the ears of several brands and retailers. Over the past decade, escalating competition in eCommerce has created downward pricing pressure on e-tailers, forcing many to offer free shipping. Amazon has been a big cause of this pressure.

The result is that e-tailers' margins are compressed, forcing them to operate on the same razor-thin margins that Amazon does... but without the volume to make up for it. So with such little margin to work with, additional expenses cut deeply into profits. And the biggest culprit is returns, especially when two-way returns are offered to customers.

With that backdrop, e-tailers welcome any technology that can help lessen this pain point. Because AR visualization gives consumers a better sense of product size, color and dimension (especially in an eCommerce-accelerated pandemic), those products are less likely to be returned.

To go deeper, let's tackle these outcomes and performance indicators one at a time, starting with product conversions...

Image Credit: Facebook

Cultivating Conversions

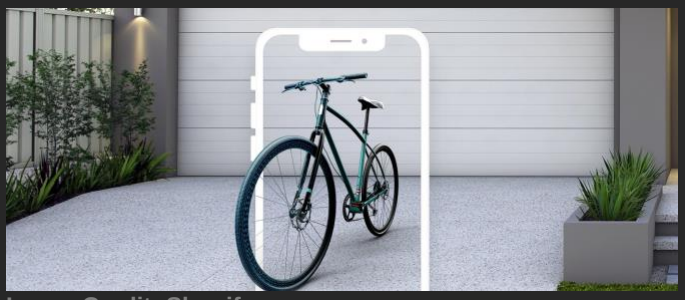


Image Credit: Shopify

One of AR's bright spots is its ability to boost sales by demonstrating products with greater dimension. Product attributes can be exposed more effectively through 3D and AR interfaces than traditional 2D images in eCommerce. This engenders a more informed buyer.

This has gone into hyperdrive over the past year as eCommerce has inflected due to retail lockdowns. AR has become more valuable under these circumstances as it can bring back some of the real-life dimension and product interactivity that's been yanked away from consumers.

Of course, all of the above speaks on conceptual levels in terms of AR's value. The real proof is in the figures and performance data. Does AR actually create more immersive product experiences — in Covid and non-Covid scenarios — and does that translate to the bottom line?

Here are a series of data points we've assembled to answer these questions.

— **Shopify** reports that products with 3D and AR visualization features achieved **94 percent** greater conversions on average than non-AR benchmarks.

— **Shopify** separately reports that some products at the highest end of the performance spectrum can achieve **250 percent** conversion boosts.

— **Home Depot** reports that its AR product visualization feature boosts conversions **2x-3x** over eCommerce benchmarks.

— **Seek** reports that the company's work with **Overstock.com** resulted in conversion increases from **10-200 percent**.

— **NexTech AR Solutions**[iv] reports that its campaign for **Miele Vacuum** saw a conversion boost of **300 percent** over non-AR equivalents.

— **Gunner Kennels** has achieved a **40 percent** lift in conversions using AR visualization.

— **Herschel Supply Co** reports that its AR furniture visualization feature led to a **152 percent** increase in revenue per visit.

— 3D and AR design platform **Vectary** announced that it has seen a **300 percent** increase in AR product views since the beginning of the pandemic.

You may notice that the terms "3D and AR" are used above. For those unfamiliar, 3D product visualization involves models you can spin. AR has the additional distinction of activating your camera to place the model in your space. **Google Swirl** is a good example of both.

Image Credit: Google

Case Study: Google Swirl

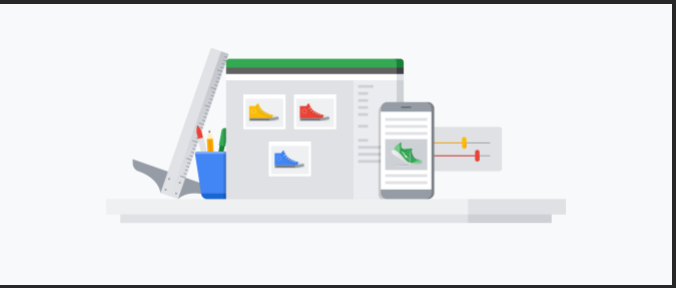


Image Credit: Google

One of the factors that's driving camera commerce is brands' realization that AR lets them demonstrate products in immersive ways. That appeals to creative sensibilities, erstwhile confined to tiny 2D banner ads. More importantly, the feedback loop generated by results – as demonstrated in the previous section – 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 shopping. We're seeing that as **Snap** continues to double down on AR[v]; and as **Facebook** does similar… now including AR sleeping giant, **Instagram**.[vi]

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 – as introduced earlier – and AR-infused search results for 3D visualization.

Google is known more for the former, but it's worth noting that it's also pursuing the latter. This makes **Google's** overall AR play rather broad and multi-dimensional. Its product visualization efforts specifically take form in **Google Swirl.** Available previously on a limited basis, the eCommerce tool was recently expanded globally to all 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 (3D) or overlaid in your space (AR) with camera activation. Offering both options means that 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. They're otherwise faced with a fragmented set of tools to offer (and get analytics from) 3D shopping.

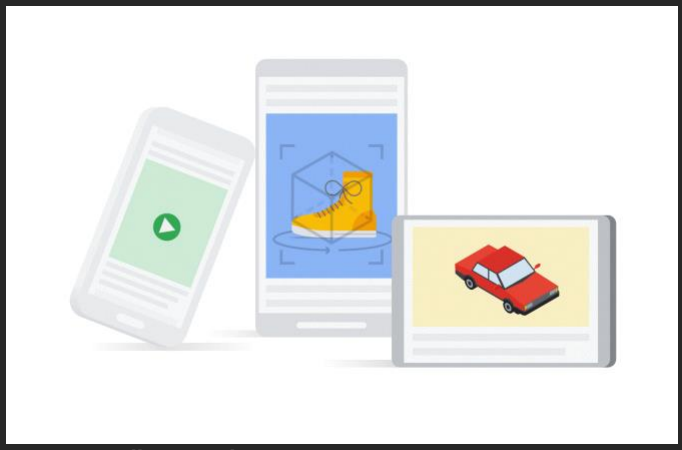


Image Credit: Google

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. We've outlined them below. One thing to note from this 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.

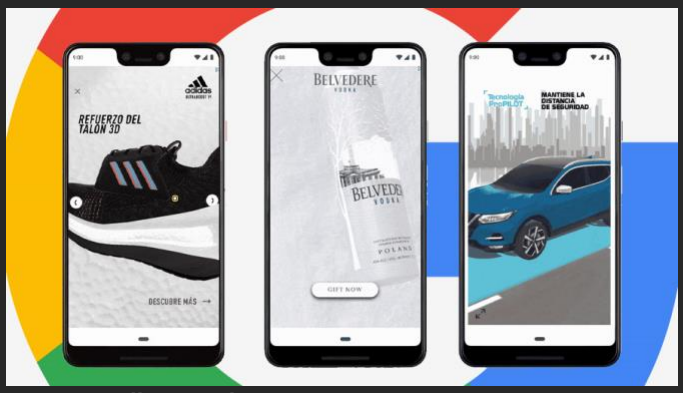


Image Credit: Google

Time to Shine

All of the above represents an ongoing evolution of the search engine results page from the standard "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** overall AR ambitions.

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 in AR marketing and commerce, which in turn stimulates AR 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. But even as the retail world recovers, eCommerce innovations like Swirl could experience sustained or growing usage.

Case Study: 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's refocused its 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 has inflected due to Covid-19. So the retailers and brands that are shifting with it are the survivors of the Covid era. That can also 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 who meet that demand could develop a first-mover advantage in a post-Covid world.

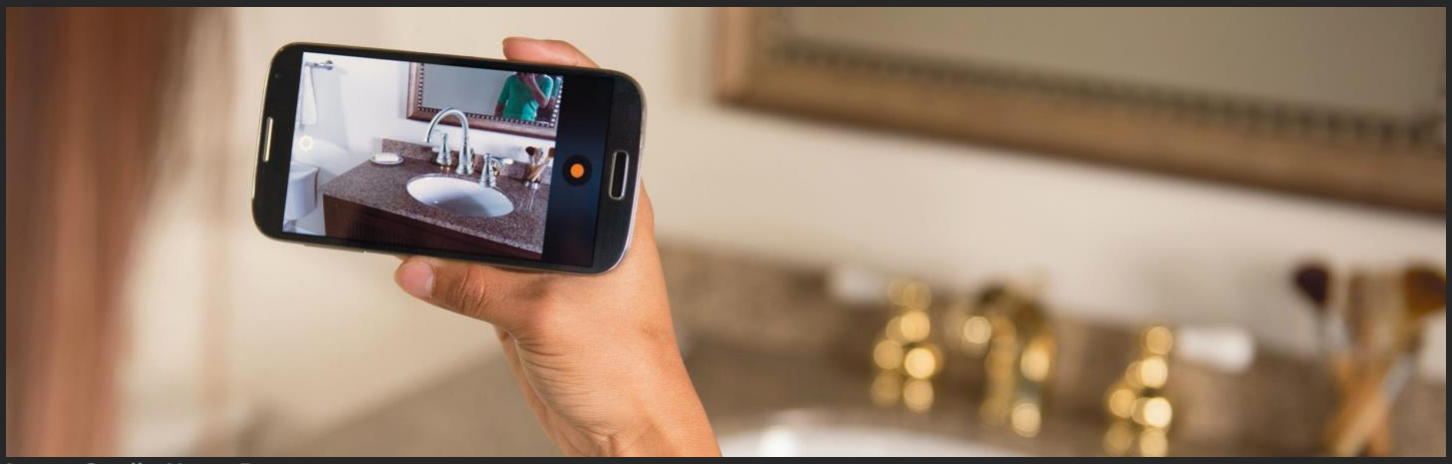


Image Credit: Home Depot

Reducing Returns

After covering conversion rates, it's time to dive into the second major outcome for AR product visualization: mitigating returns. The same "informed purchase" that drives conversions can lessen return rates. As noted earlier, consumers can have a better sense of style, fit, dimension and texture. That in turn makes them less likely to return a given item.

Why is this important? Returns are a **$550 billion** problem in the aggregate.[vii] And for e-tailers that operate on extremely thin margins, returns can cause quite a bottom-line blow, as explored earlier. That pain point is amplified by bulky items that are expensive to ship, such as couches and TVs.

With that backdrop, what validation are we seeing for AR's ability to lessen returns? Like we did earlier for conversion boosts, here's a quick list of proof points.

Image Credit: Amazon

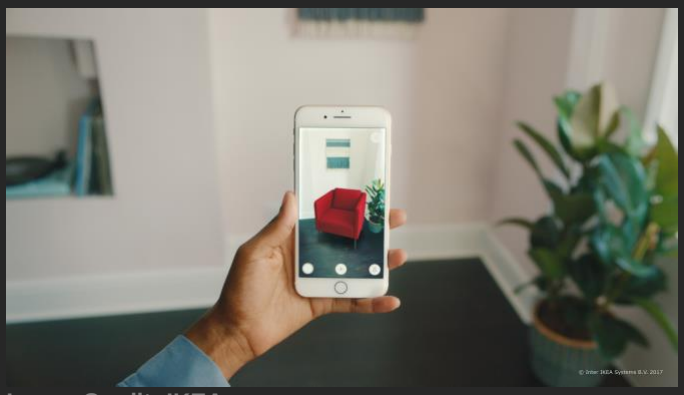


Image Credit: IKEA

— **Shopify** reports a **40 percent** decrease in returns from 3D visualization.

— **SeekXR**, reports a **25 percent** decrease in returns from AR-guided purchases. This comes directly from its work with large-scale e-tailers like **Overstock**.

— **Build.com** reports that the return rate for shoppers that use its AR product visualization features is **22 percent** lower than non-AR benchmarks.

— **Gunner Kennels** has achieved a **5 percent** decrease in returns and a **3 percent** boost in cart conversion rates.

— **Macy's** used in-store VR (similar concept) to reduce returns to less than **2 percent**, versus industry-standard retail return rates of **5-7 percent**.

Beyond robust sample sizes, these data points are validated by their consistency. Many return-rate deltas in the examples above are in the same **20-40 percent** range. In all cases, AR is proving its ability to improve margins and thus demonstrate a tangible business case.

By the Numbers

As noted earlier, total consumer spending that's influenced by AR product visualization (sans visual search) is projected to reach **$30.2 billion** by 2024. But how does that break down by channel?

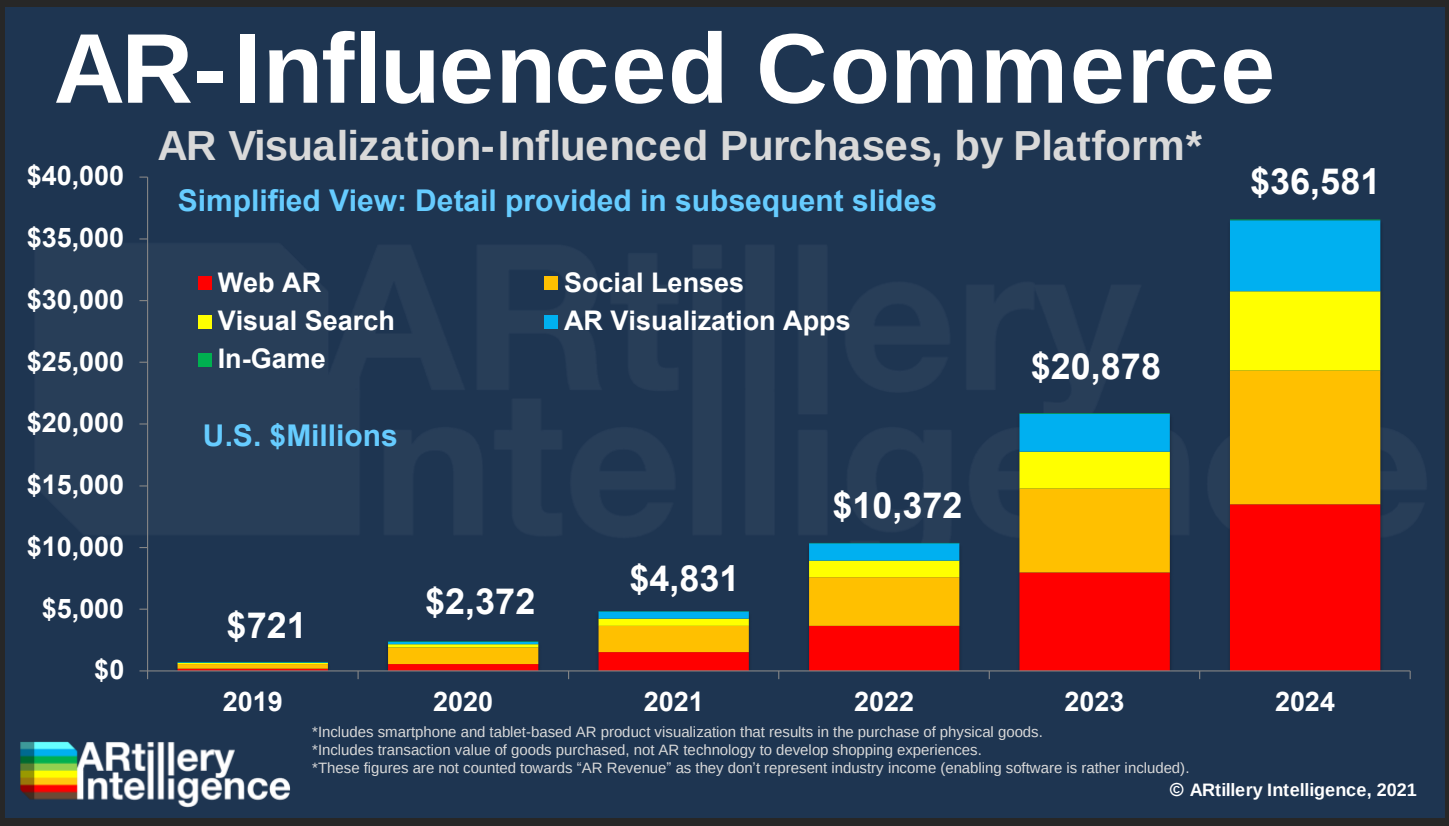
AR product visualization channels include popular social outlets for AR lenses such as **Snapchat** and **Facebook**. It also includes brands' own apps. Lastly, it includes the less-developed but promising web AR. This involves AR activations that happen using the ubiquitous mobile browser.

At present, social lenses are in the lead in terms of the transaction value they drive through AR product visualization. This is largely due to these' channels popularity and market share when it comes to AR lens engagement. **Snapchat** especially has established itself as an early AR leader.

That success will continue among social channels, including more recent AR entrants like **Instagram** and **TikTok**. But the channel that will see the most growth is web AR. This is due to its practical advantages such as compatibility among mobile devices[viii], 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. Asking them to download said app while trying to activate an AR experience will suffocate 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.



Video Companion

Click to Play

Drilling Down: Visual Search

Introduced earlier, visual search is a promising form of camera commerce. Though it's smaller than AR product visualization today, it has potentially greater revenue capacity due to its high-intent orientation. Visual searches happen when consumers want to actively identify an item visually.

This makes visual search a natural evolutionary step from web search. Indeed, one of the things that has made web search so lucrative for **Google** and others is the same "high-intent" orientation where consumers explicitly indicate a specific need. That makes contextual advertising natural.

Visual search takes that principle into the next generation of camera-based experiences and visual media. This won't replace web search of course, but it will supplement it with an alternative visual input. This will resonate among camera-forward millennials and Gen-Z.

In fact, these are reasons that **Google** is so keen on visual search. Along with voice search, it sees it as a way to boost search query volume by letting people search from more places and modalities. It's also a play to future proof its core search business by leaning into emerging tech.

But it doesn't end with **Google**. There are several others making a play for visual search. Most notable is **Pinterest**, as noted earlier. The company has already positioned itself as a visually-oriented product search and discovery tool. So visual search is a natural step.

Though there are other players developing visual search products – such as **Snap Scan** – we'll zero in on **Google** and **Pinterest** as representative examples of the models that are developing. One is a search giant and the other is a narrower and more focused approach. Let's take those one at a time...

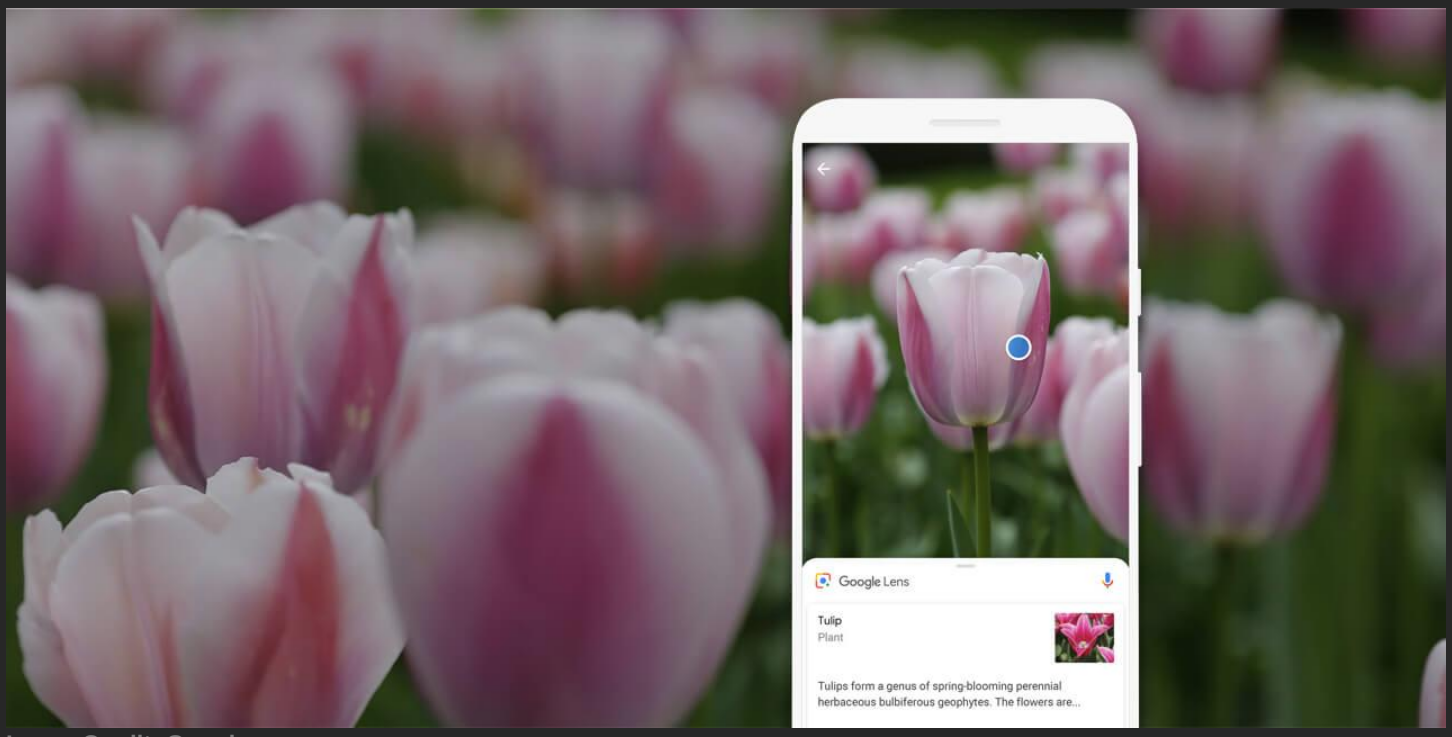


Image Credit: Google

Google

Buried deep in **Google's** recent Search On 2020 event was a notable announcement. The company's visual search tool, **Google Lens**, now recognizes **15 billion** products. This is **15x** growth in two years, given the December 2018 announcement that it recognized **one billion** products.

Beyond sheer numbers, this growth validates **Google Lens'** broadening capability. Launched initially with promoted use cases around identifying pets and flowers, the eventual goal — in true **Google** fashion — is to be a "knowledge layer" for monetizable searches like shoppable products.

This raises the question of what types of products shine in visual search? Early signs point to items with visual complexity and unclear branding. This includes style items ("who makes that dress?") and in-aisle retail queries.

Another fitting use case is local discovery. Visual search could be a better mousetrap for the ritual of finding out more about a new restaurant — or booking a reservation — by pointing your phone at it. The smartphone era has taught us that search intent is high when the subject is in proximity.

In fact, **Google** has already begun to develop this opportunity with its **Live View** urban navigation feature. When using it, consumers can see businesses along their route identified visually though AR overlays – the first step towards a visually-driven local search tool.

These are all things that **Google** is primed for, given its knowledge graph assembled from 20+ years as the world's search engine. This arms it with a training set for image matching, including products (**Google Shopping**) general interest (**Google Images**) and storefronts (**Street View**).

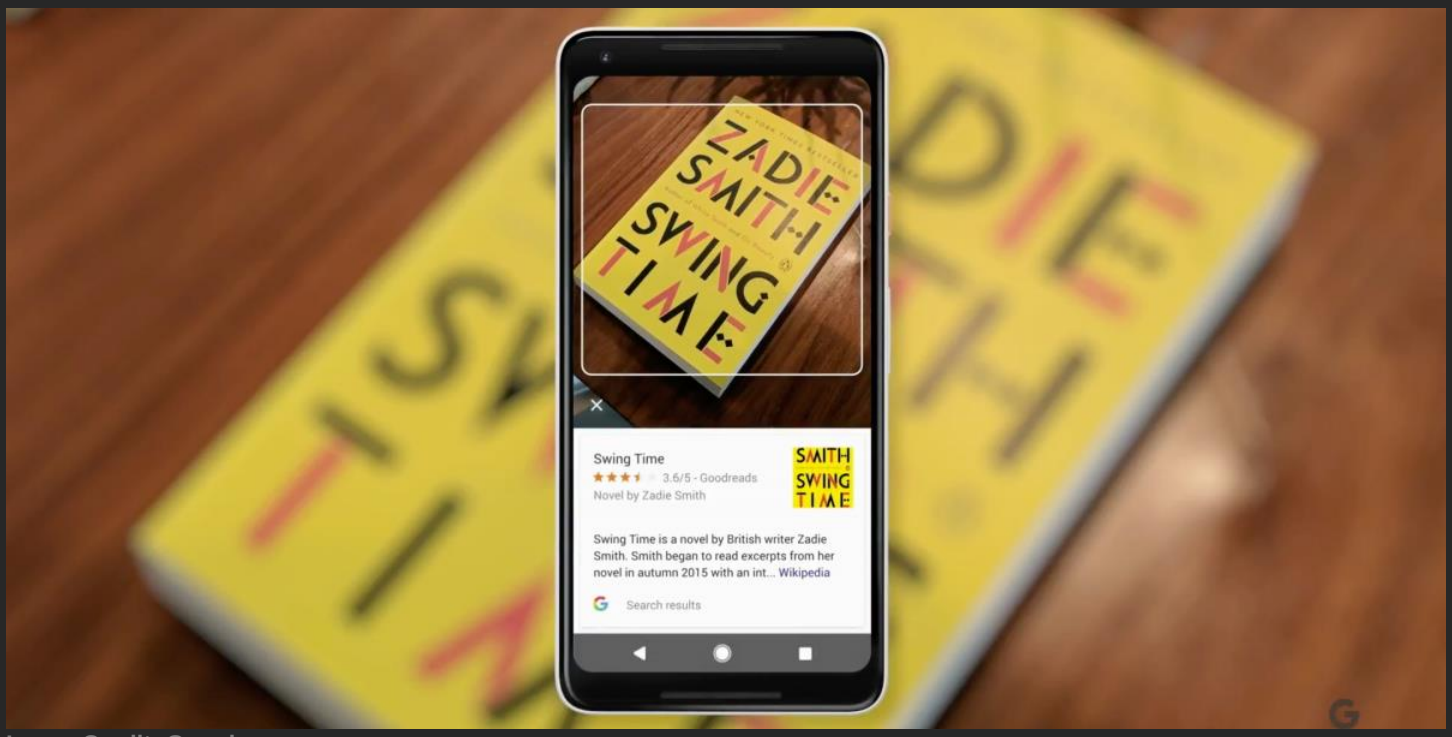


Image Credit: Google

10 Blue Links

All of the above could take a while to materialize — at least the ad monetization components. **Google** is in the process of testing visual search, optimizing the UX, and devising interfaces for sponsored content insertion. A key question is what will be the *results page* of visual search?

The challenge in that question — just like with voice search — is that there isn't a "10 blue links" results page in visual search. So monetization will defy the traditional search model. This could be through enhanced results (think: "buy" buttons) when a visual search advertiser is discovered on **Google Lens**.

Until then, **Google** can use visual search behavior to optimize web search results. In other words, you won't see sponsored results in a visual search flow, but you'll see visual-search-informed results when back on web search – assuming you're signed in to the same **Google** account.

To further grease the adoption wheels, **Google** continues to develop visual search "training wheels." This includes making **Google Lens** front & center in well-traveled places such as activation buttons near its pervasive search bar on mobile devices. This could reduce some of visual search's friction and "activation energy."

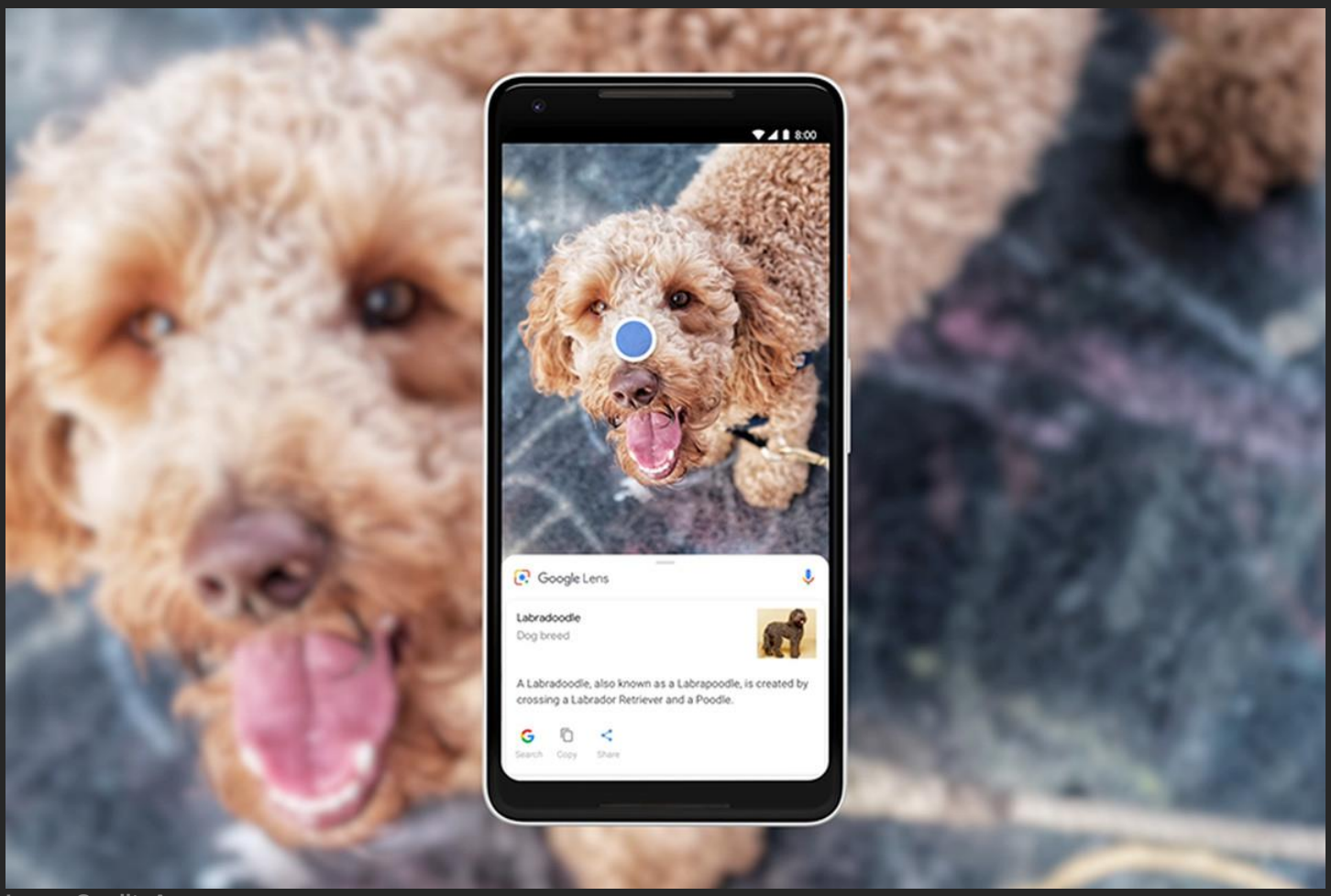


Image Credit: Amazon

Pinterest

Despite the above analysis, visual search may not be a winner-take-all market, nor a **Google**-dominant one. Is there room for specialty players in business verticals, or in horizontal use cases like shopping? If so, a clear candidate is increasingly becoming evident: **Pinterest**.

To set the stage on **Pinterest's** overall positioning, AR is one of many initiatives as it continues to enjoy notable growth and Wall Street performance. This was recently seen in its Q4 earnings where it achieved **76 percent** year-over-year revenue growth.

The number of advertisers on **Pinterest** meanwhile grew **6x** while product searches grew **20x** and active users grew **37 percent** to **459 million**. Much of this was pandemic-driven, as all things eCommerce have inflected over the past year, but it also represents **Pinterest's** organic growth.

The usage and revenue stats above include all the formats – AR and non-AR – that **Pinterest** has developed, including its flagship pins and boards for sharing visual media in popular categories like food and fashion. But its core use case also represents fertile ground to germinate AR and visual search.

Specifically, **Pinterest Lens** is its visual search feature that lets users point their phones at items to identify them. Last year, it extended its "Shoppable Pins" functionality to Lens so that visual search could seamlessly lead into transactions. This fits directly into **Pinterest's** broader ethos.

"We see shopping as this bridge between the two halves of our mission, inspiration and action," **Pinterest** CEO Ben Silbermann said during the company's Q4 earnings call. "For pinners, we've made progress by expanding the number of surfaces to let them shop."

Image Credit: Pinterest

Training Set

Going deeper on **Pinterest Lens**, it recognizes **2.5 billion** products, and its engagement continues to grow. To achieve this, **Pinterest** applies the visual product database it's developed over years of user-pinning behavior. This serves as a sort of AI training set for visual object recognition.

If this sounds familiar, it's similar to how **Google Lens** works. As noted earlier, **Google** is positioned well for visual search because it has served for 20+ years as the world's search engine, including images. **Pinterest** can't rival that breadth of images… but maybe it doesn't need to.

In other words, **Pinterest's** visual database is strong where it needs to be: shoppable products. This is narrower than **Google's** "all the world's information" mission, but it aligns with monetization. That could induct **Pinterest** into the small club of revenue-generating AR players.

In that way, visual search supports **Pinterest's** road map to increase ad inventory by making the physical world "pinnable." That's particularly true in **Pinterest**-strong verticals like fashion, home goods and food, where these products surround us and can trigger shoppable engagement.

Pinterest is likely closer to that point than anyone else, given its established use case for product-based image search. This means that the leap to AR isn't a big one. Camera commerce in the above product categories is a natural extension to everything **Pinterest** has already built.

In View

The remaining question is how visual search will gain traction with a broader base of mainstream consumers. Is holding up your phone easier than typing or speaking a search query? It depends on the search subject, as holding your phone up to a lamp is more effective than describing it.

But visual search isn't culturally mainstream yet, and it requires a behavioral shift that's physical in nature (holding up a phone). History has taught us that this is a difficult and slow-moving process. And it will only apply in situations where the subject is in view/ proximity, versus recalled.

Visual search will continue to progress and gain traction as a feedback loop reinforces its value and reliability. This will be accelerated by camera-native Gen Z as they gain purchasing power. Whether through **Pinterest**, **Google**, **Snap** or others, visual search has strong potential as a camera-commerce format.

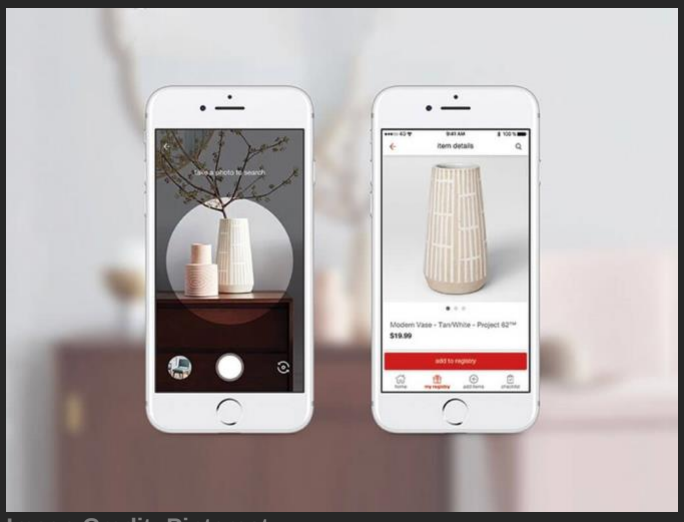


Image Credit: Pinterest

Value Chain: Asset Creation

One gating factor to the overall 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. We're talking graphically-intensive (large file) 3D models.

This presents a few opportunity gaps in camera commerce. One is infrastructure and distribution for product 3D models. That includes things like compression technologies, and rendering workflows to get images to the right places. This subsegment 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**.

Image Credit: CB2

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**[ix] 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 and architecture to lower the barriers to bring it to market.

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

The Post-Covid Era

As this report examines, one of AR's bright spots is its ability to boost sales by demonstrating products with greater dimension. Product attributes can be exposed more effectively through 3D and AR interfaces than traditional 2D images in eCommerce. That engenders a more informed buyer.

This value proposition is evident in normal times but has amplified with pandemic-driven inflections in eCommerce. AR has become more valuable under these circumstances as it can bring back some of the real-life dimension and product interactivity that's been lost in retail lockdowns.

That dynamic is clear, but it's unclear what will happen next. As with events and remote work, AR is being given the chance to shine at a time when physical shopping is constrained. The ultimate question is if accelerated adoption during this period will instill positive and permanent consumer habits.

In other words, those eager to try on makeup and other forms of shopping may discover AR and find that they like it… thus inflecting its sustained adoption. This is known as a "mere exposure effect" and it could drive AR's longer-term traction in shopping and several other areas of the economy.

Image Credit: Amazon

Touchless Shopping

There are a few ways we see this AR integration playing out in the Post-Covid era. If consumers have indeed developed new sustained habits, AR will play an increasing role in their online shopping. But as the retail world begins to open up, AR could likewise have a key role in in-aisle interactions.

In other words, shoppers may still be apprehensive in the Post-covid era when it comes to bio-hazards and virus transmission. The world may be permanently altered with the lasting psychological effects of the Covid era. If so, AR could be a logical tool to support "touchless" shopping.

This includes digital overlays for product information or animated brand spokespeople. It could also involve retail installations such as **Amazon's** new experimental "Point & Learn" technology (pictured to the left) that lets users point at products on store shelves to activate informational sequences on nearby displays.

As these formats develop, AR's benefits in physical retail could work on a few levels. Not only will it allow consumers to query products visually in stores and avoid touching them… but they can do more product-visualization research before they even get to the store, thus reducing time in-aisle.

Next Up: Local Commerce

Building from the above offline shopping examples, it's often forgotten that physical-world retail accounts for the vast majority of consumer spending... at least in normal times. For example, pre-pandemic offline retail spending accounted for about **90 percent** of U.S. consumer spending.[x]

That number has dipped to about **80 percent** over the past year[xi] and will likely settle somewhere between **80** and **90 percent** in the post-Covid era. Retail shopping will return, but consumers' behaviors have been altered permanently, due to the aforementioned "mere exposure effect."

The question then becomes, what's AR's role in offline local shopping? A few examples are provided in the previous section, such as in-aisle AR activations. But the story is much broader. AR could be used as a tool to search and discover products and businesses the way we now use **Google Maps**.

In fact, **Google** is leading this charge. As introduced earlier, **Google Lens** and **Live View** represent local discovery engines to drive commerce in several business verticals – everything from restaurants to salons to hardware stores. This is a logical extension of Google's existing local search business.

And **Google's** not alone. **Apple** signals interest in location-relevant AR through its geo-anchors and Project Gobi. **Facebook** is building "Live Maps," and **Snapchat** is pushing Local Lenses. These are just a few examples of tech giants that see massive opportunity with geolocated AR.

We'll be back in a report like this later in 2021 to pick up the discussion here: the intersection of AR and local commerce. Stay tuned...

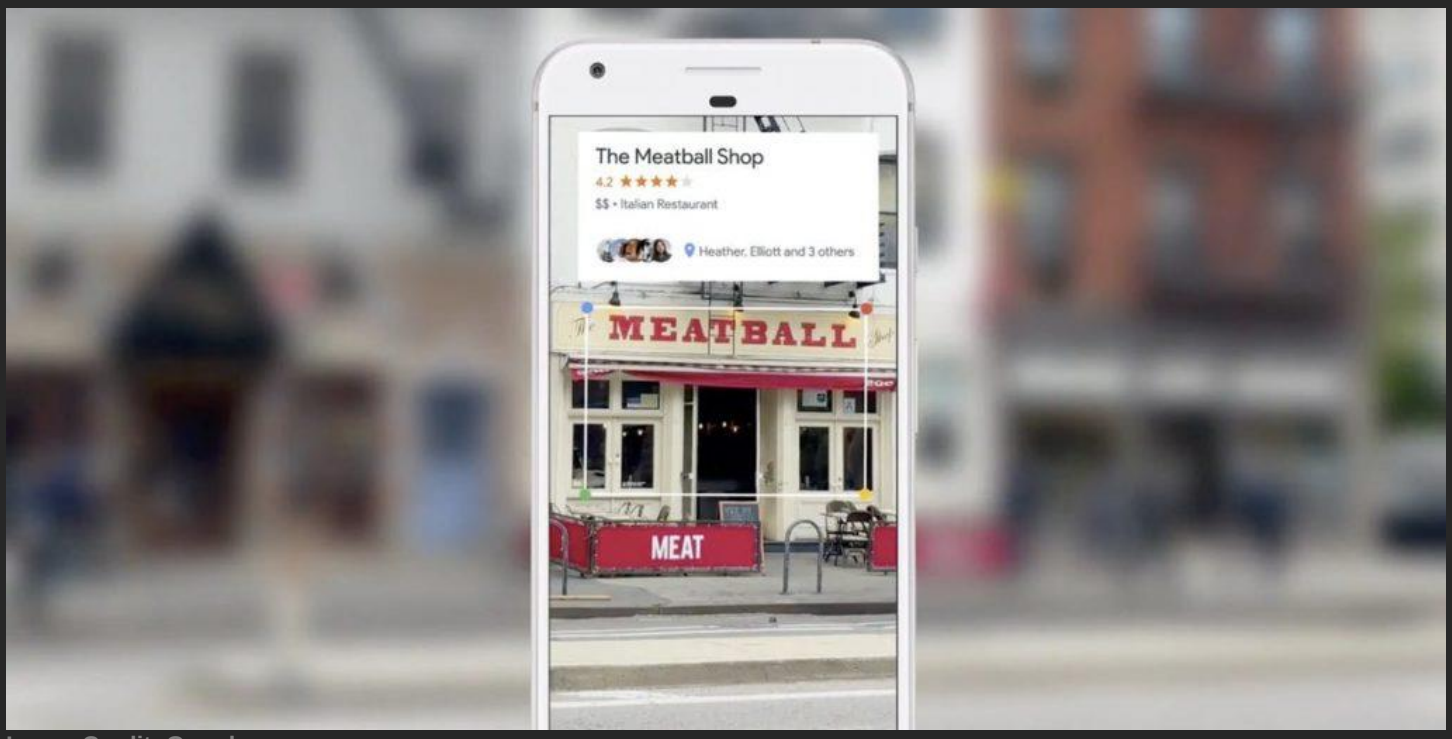


Image Credit: Google

Video Companion

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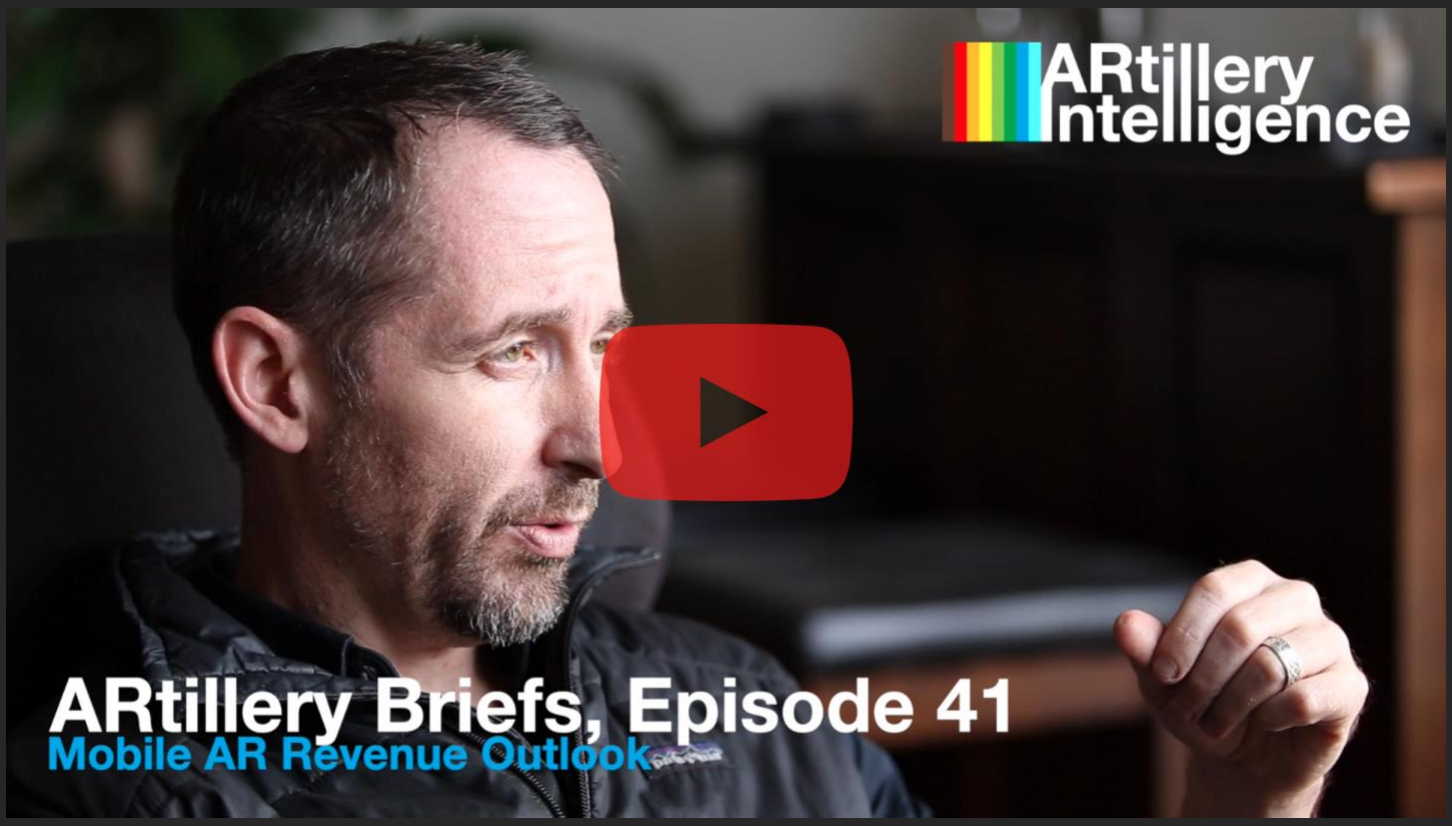

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Key Takeaways

- **Among AR use cases gaining traction, immersive shopping has been an early standout.**
- This is defined by AR that helps consumers visualize and contextualize products before purchasing.
- Otherwise known as *camera commerce*, it's projected to drive $36 billion in consumer purchases by 2024.
- Advantages include bringing visual context and confidence to consumer purchase decisions.
- This area has been amplified in the Covid-era as it brings more dimension to eCommerce.

- **Camera commerce is subdivided by remote product visualization and proximity-based visual search.**
- Product visualization involves remotely simulating commercial items on "faces & spaces."
- Visual search involves pointing one's phone at nearby products to activate informational overlays.
- Product visualization has gained earlier traction, but visual search could eventually surpass it.
- This is due to the high-intent use case (much like web search) of actively seeking product info.

- **Starting with product visualization, it has become a popular camera-commerce modality.**
- AR-informed purchases can boost engagement and performance in shopping contexts.
- This includes higher conversions for product purchases, compared to non-AR benchmarks.
- It can also reduce return rates, given that the initial purchase was more informed and aligned.
- AR visualization will gain value as it expands to the rear-facing camera and a broader set of products.

- **Visual search meanwhile continues to gain traction as a way to visually identify unknown items.**
- Google is starting with general-interest subjects like pets and flowers to seed broader demand.
- But the real opportunity will be with commercial products such as fashion items with unclear branding.
- Beyond Google, Pinterest shows promise in visual search because of its visual shopping persona.
- Snap Scan is also developing visual-search use cases that utilize AI and data from vertical partners.

- **Camera commerce takes place in a variety of channels, which will continue to evolve.**
- Social apps like Snapchat lead the way currently, due to their popularity as AR channels.
- Over time, search will gain ground as a camera commerce channel for the reasons stated above.
- Web AR will also grow as an AR shopping channel, due to its frictionless activation and compatibility.
- Apps will continue to be a strong channel (e.g., IKEA Place), but will recede in market share over time.

- **One gating factor for camera commerce is the supply chain of 3D virtual assets.**
- In order for products to be visualized through AR, the experience requires detailed 3D models.
- This is challenging because creation workflows are rigorous, making it difficult to scale asset production.
- File size is also an issue on mobile devices, so compression and optimization will be valuable enablers.
- These advancements will let large e-tailers scale up production, while smaller players can participate.

- **Camera commerce has been amplified in the Covid era, so the question is if these levels sustain.**
- AR shopping piggybacks on Covid-driven eCommerce inflections as it enhances remote shopping.
- Through this, AR has been exposed as a valuable tool, which could support its longer-term adoption.
- Beyond eCommerce, AR can support "touchless" in-aisle interactions as physical stores reopen.
- Altogether, AR can reduce consumers' time in stores and reduce physical interactions while there.

- **Beyond shopping, AR could grow as a tool for consumers to find and discover local businesses.**
- Even in a pandemic, physical-world retail accounts for 80 percent of consumer spending.
- AR could continue to evolve and replace tools like Yelp and Google Maps to guide local search & discovery.
- This will be tied to geo-spatial AR efforts (a.k.a. AR Cloud) from tech giants like Google, Facebook & Snap.
- We'll follow up later this year with a report that explores AR's role in transforming local offline commerce.

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.**

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Reference

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[i] ARtillery Intelligence Report, **AR Advertising Deep Dive, Part II: Case Studies** (sign-in required)
[ii] ARtillery Intelligence Report, **AR Advertising Deep Dive, Part II: Case Studies** (sign-in required)
[iii] ARtillery Intelligence Report, **Mobile AR Revenue Forecast, 2019-2024** (sign-in required)
[iv] Disclosure: This report's author owns stock in NexTech AR Solutions.
[v] ARtillery Intelligence Report, **Lessons from AR Leaders, Part I** (sign-in required)
[vi] ARtillery Intelligence Report, **Lessons from AR Leaders, Part III** (sign-in required)
[vii] ARtillery Intelligence Article, **Does AR Really Reduce eCommerce Returns** (sign-in required)
[viii] ARtillery Intelligence Article, **How Big is the Mobile AR Market** (sign-in required)
[ix] Disclosure: This report's author owns stock in NexTech AR Solutions.
[x] See Localogy Article, **U.S. Offline Spending: What's the Real Number?**
[xi] See Localogy Article, **How Much will eCommerce Grow in FY 2020?**