



ARTILLRY INTELLIGENCE BRIEFING

AR CLOUD AND THE 'INTERNET OF PLACES'

APRIL 2018



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Executive Summary

Among several areas where AR will apply, one of the most exciting and potentially lucrative is local commerce. This includes consumer spending that's consummated offline, and usually in proximity to one's home. AR will join the tools that help us discover products and qualify buying decisions.

As background, it's often overlooked that most consumer spending happens offline in the physical world. Despite the attention to e-commerce over the past decade, it only accounts for eight percent of consumer spending. The remainder – about \$3.7 trillion in U.S. spending – is brick & mortar.

But that's not to downplay digital technologies. Online media – including desktop and mobile – have a big *influence* on that offline spending, to the tune of about \$1.7 trillion in U.S. consumer spending. This is known in the search and advertising worlds as “online-to-offline (O2O) commerce.”

This is where AR could have an impact. Just think: is there any better technology to accelerate O2O commerce than one that literally melds physical and digital worlds? Indeed, AR can shorten gaps in time and space that currently separate digital interactions (e.g. search) from physical-world outcomes.

This will play out in several ways, including informational overlays that add context and commerce to items you point your phone at. It's everything from restaurants, to shoes you see worn on the street. Not only does it offer consumer utility but it taps into high buying intent, which leads to monetization.

But before we get too utopian and carried away in blue-sky visions – as is often done in XR industry rhetoric, trade shows and YouTube clips – it's important to acknowledge realistic challenges. There are several interlocking pieces required, including hardware, software and the AR Cloud¹.

The latter is perhaps most impactful. The AR cloud underpins the AR future many of us discuss. In short, it's a cloud repository of geo-relevant data and object blueprints that will empower far-flung AR devices with contextual and situational awareness. It's the active ingredient in an “internet of places.”

But how will the AR cloud be built? Who will own it? How will information be indexed and accessed? And how will AR devices translate that data into AR magic on the front end? These are key questions that will define the next era of mobile AR. And they're the questions we begin to tackle in this report.





Introduction: Buy Local

It's often forgotten that about **\$3.7 trillion** is spent in consumer retail purchases in the U.S..ⁱⁱ Of that total, **\$300 billion** (8 percent) is spent in e-commerce. This means that offline brick & mortar spending – though often overshadowed by its sexier online counterpart – is where the true scale occurs.

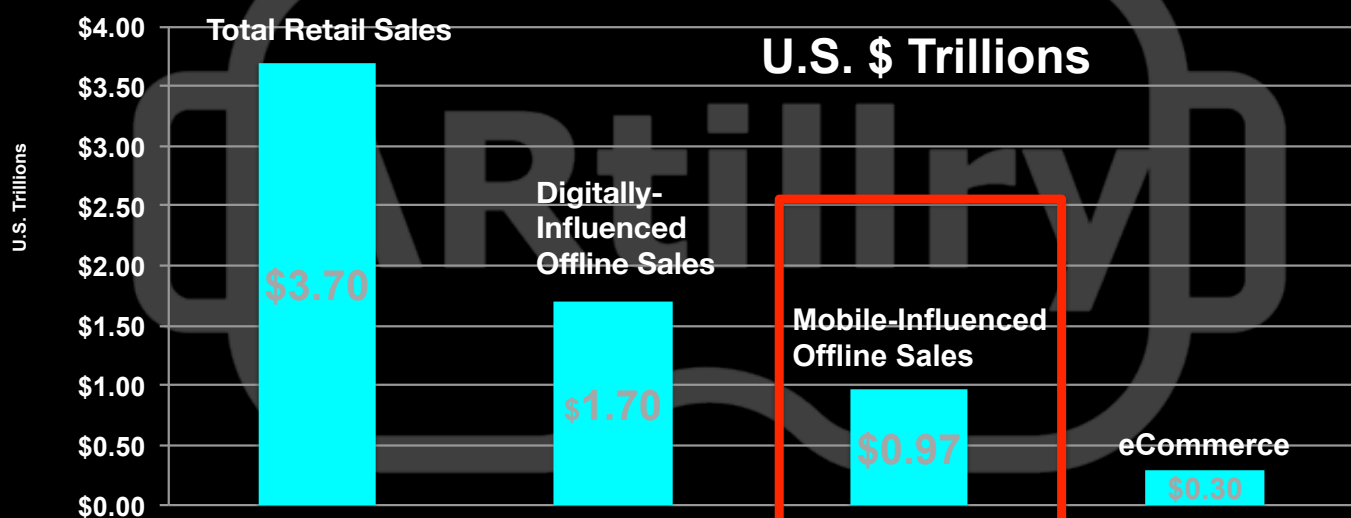
But digital media like mobile search is still impactful. Though spending happens predominantly offline, it's increasingly *influenced* online. Specifically **\$1.7 trillion** (46 percent of that **\$3.7 billion**) is driven through online and mobile consumer interactions. This is known as **online-to-offline (O2O) commerce**.

O2O is one key area where AR will find a home. Just think: is there any better technology to unlock O2O commerce than one that literally melds physical and digital worlds? AR can shorten gaps in time and space that currently separate those interactions (e.g. search) from their offline outcomes.

We're talking contextual information on items you point your phone at. AR overlays could help you decide where to eat, which television to buy, and where to buy the shoes you see worn on the street (offline-to-online). This is what ARtillery Intelligence calls "Local AR," and it will take many forms.

U.S. CONSUMER SPENDING

AR'S ADDRESSABLE MARKET WILL MAP TO WHERE THE MONEY IS BEING SPENT



Source: Deloitte Digital

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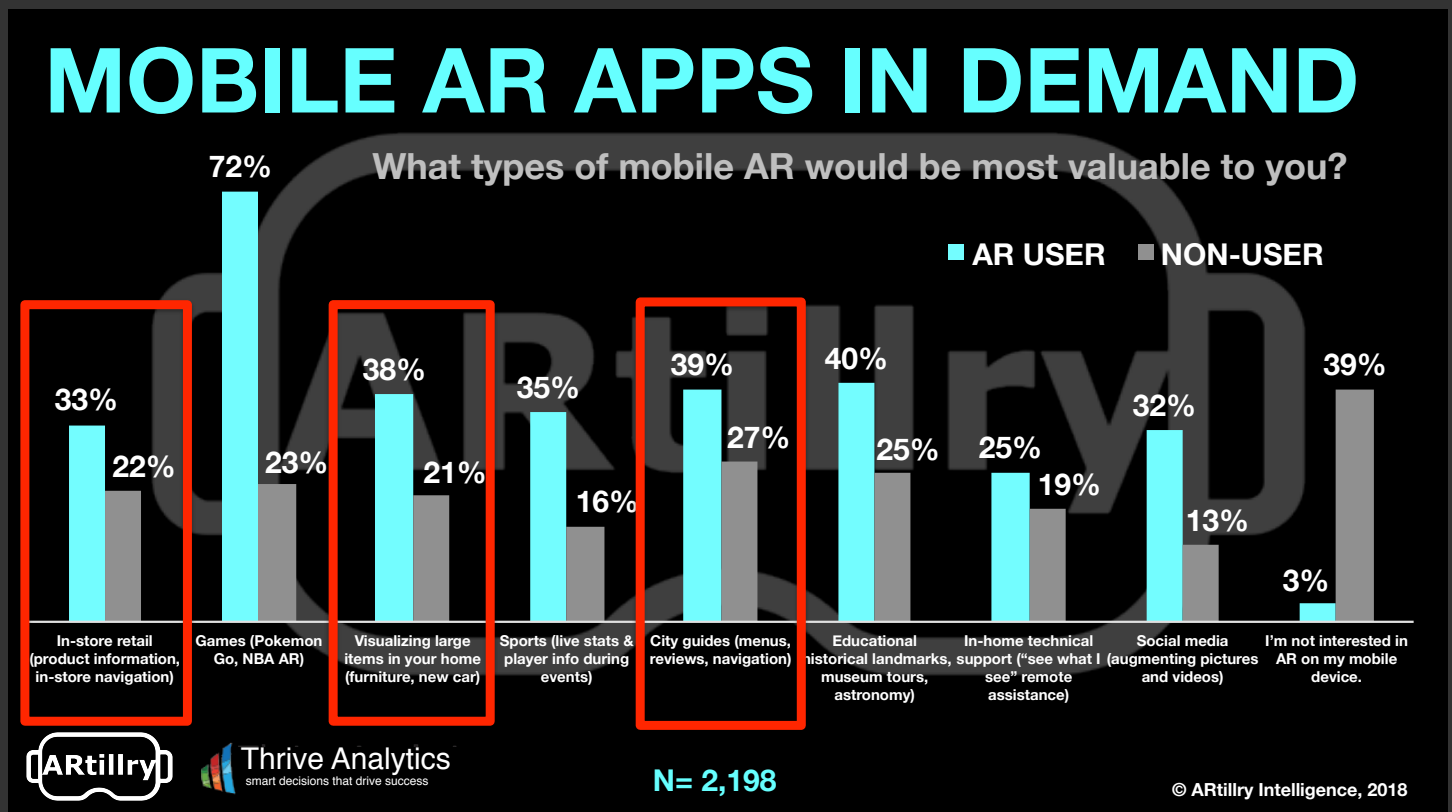


Visual Search

One of the first and predominant formats where Local AR will manifest is visual search. If you think about it, AR in some ways is a form of search. But instead of typing or tapping search queries in the traditional way, the search input is your phone's camera and the search "terms" are physical objects.

This analogy applies to many forms of search, but is particularly fitting to local. Traditional (typed) local search performs best when consumers are out of home, using their smartphones.ⁱⁱⁱ This is when "buying intent" is highest, and therefore when click-through-rates and other metrics are highest.

Furthermore, proximity-based visual searches through an AR interface could gain traction if our recent consumer survey research is any indication.^{iv} Among the categories and types of AR apps that consumers want, city guides, in-store retail and commerce apps showed strong demand.



These proximity-based searches are conducive to AR because the phone is near the subject (think: a restaurant you're walking by), and can therefore derive information and context after mapping it visually. This really just makes it an evolution of a search query... but done with the camera.

"A lot of the future of search is going to be about pictures instead of keywords," Pinterest CEO Ben Silberman said recently. His claim triangulates several trends such as millennials' heavy camera use, mobile hardware evolution, and AR software (such as ARkit) that further empowers that hardware.

The Internet of Places

These are some reasons why Google is keen on AR. As is common to all its XR initiatives, Google's AR efforts are driven to advance its core business.^y In other words, to continue dominating and deriving revenue from search, it must establish its place in this next visual iteration of the medium.

"Think of the things that are core to Google, like search and maps," said Google XR Partnership Lead Aaron Luber at ARiA. "These are core things we are monetizing today and see added ways that we can use [AR]. All the ways we monetize today will be ways that we think about monetizing with AR."

For example, a key search metric is query volume (along with cost-per-click, click-through-rate and fill rates). **Visual search lets Google capture more "queries" when consumers want information.** And these out-of-home moments, again, are "high intent" when monetization potential is greatest.

These aspirations will manifest initially in Google Lens. Using Google's vast image database and knowledge graph, Lens will identify and provide information about objects you point your phone at. For example, point your phone at a store or restaurant to get business details overlaid graphically.

This can all be thought of as an extension to Google's mission statement to "organize the world's information." **But instead of a search index and typed queries, local AR delivers information "in situ" (where an item is).** And instead of a web index, this works towards a sort of "internet of places" (IOP).

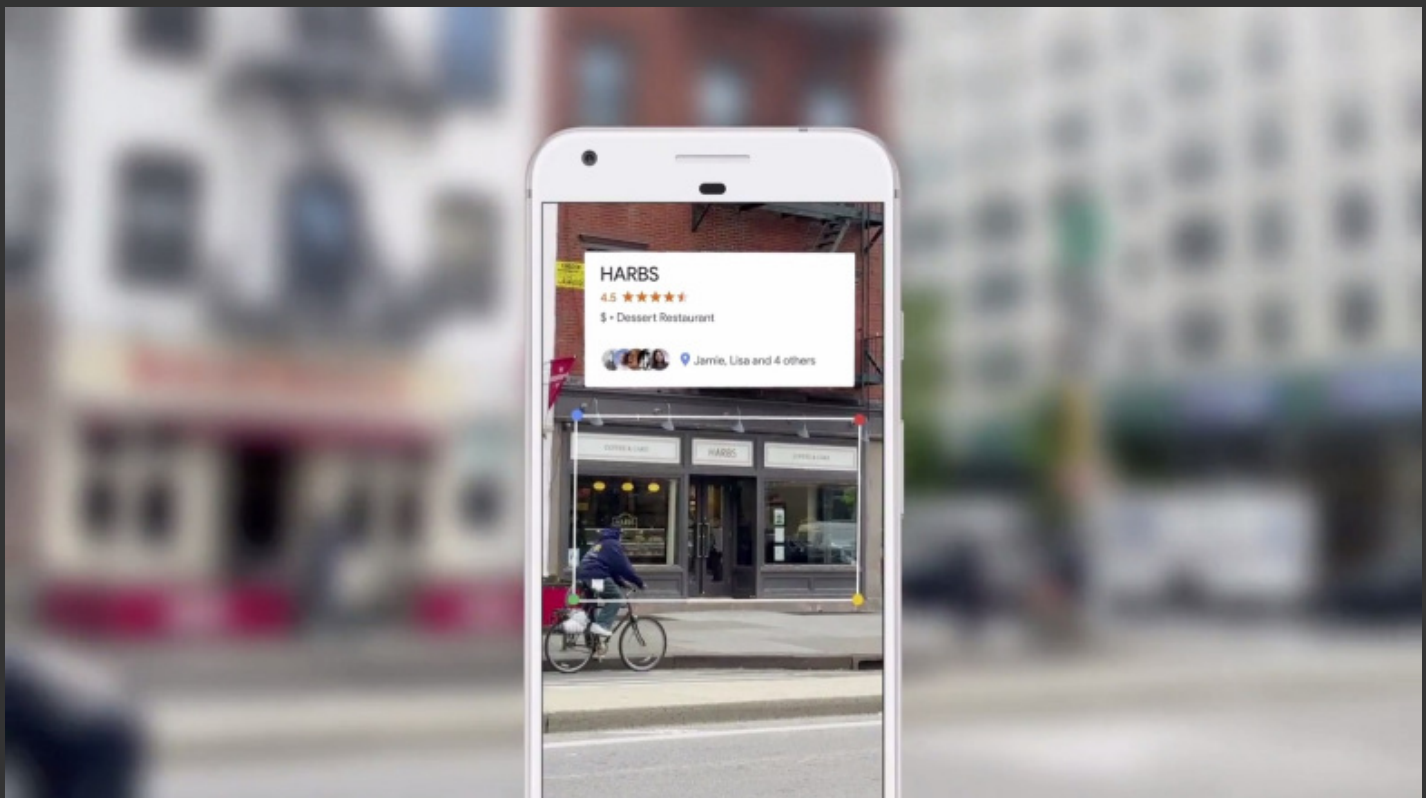


Image Credit: Google



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<https://artillery.co/pro>

About ARtillery PRO

ARtillery Intelligence has launched an intelligence vault containing data, insights and analyst access. Known as *ARtillery PRO*, it equips subscribers in XR sectors to make informed business decisions.

FEATURES

Original Research: Monthly reports and weekly briefs on XR data, opportunities and dynamics.

Curated Research: ARtillery analysts collect, analyze and filter recommended reading and data.

Conference Talks: We watch, select and summarize video from XR events.

Slide Bank: We assemble charts for your presentations and knowledge building.

Data Concierge: We'll help you find what you're looking for.

UPCOMING EDITORIAL CALENDAR

May: XR Global Revenue Forecast

June: VR Usage & Consumer Attitudes

July: The State of XR: Mid-year Review

August: AR & VR Advertising: Strategies & Outlook

September: Social XR: Finding the Killer App

October: Enterprise XR Strategies & Case Studies

November: XR Global Revenue Forecast

December: 2018 Lessons, 2019 Predictions

COST

Three tiers of service start at **\$49/month**

https://youtu.be/dFZVGE_UA8A





Video Companion: Mobile AR Strategies and Business Models

(click URL to open)

https://youtu.be/2fsyMHqR_Vw



About ARtillery Intelligence

ARtillery is a publication and intelligence firm that examines augmented reality and virtual reality, collectively known as XR. Through writings, data and multimedia, it provides deep and analytical views into the industry's biggest players and opportunities. It's about insights, not cheerleading.

Run by career analyst and journalist Mike Boland, coverage is grounded in a disciplined and journalistic approach. It also maintains a business angle: Though fun and games permeate VR and AR (especially the former) long-term cultural, technological and financial implications are primary.

Learn more at <https://artillery.co/about>



About Intelligence Briefings

ARtillery Intelligence Briefings are monthly installments of VR/AR data and analysis. They synthesize original and third-party data to reveal opportunities and dynamics of VR and AR sectors. In addition to data, a layer of insights is applied to translate market events and raw figures into prescriptive advice.

More information, past reports and editorial calendar can be seen at:

<https://artillery.co/artillery-intelligence/>

About the Author

Mike Boland was one of Silicon Valley's first tech reporters of the Internet age, as a staff reporter for *Forbes* (print) starting in 2000. He has been an industry analyst covering mobile and social media since 2005, and is now Chief Analyst of *ARtillery Intelligence*, covering emerging tech.

Mike is a frequent speaker at industry conferences such as VRLA, ad:tech and LeadsCon. He has authored in-depth reports and market-sizing forecasts on the changing tech & media landscape. He contributes regularly to highly read online news sources such as *TechCrunch*, *Business Insider* and the *Huffington Post*.

A trusted source for tech journalists, his comments have appeared in A-list publications, including *The New Yorker*, *The Wall Street Journal* and *The New York Times*.

Further background, history and credentials can be found at:

<http://www.mikebo.land/>





Methodology

This report highlights *ARtillery Intelligence* viewpoints, gathered from its daily in-depth coverage of the XR sector. To support the narrative, 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 2.5 years covering AR & VR exclusively, as seen in research reports and daily reporting.

More about ARtillery's market-sizing credentials can be found here:

<https://artillery.co/artillery-intelligence/forecasts/methodology/>

Disclosure and Ethics Policy

ARtillery has no financial stake in the companies mentioned in this report, nor was it commissioned to produce it. With respect to market sizing, ARtillery remains independent of players and practitioners in the sectors it covers. It doesn't perform paid services or consulting for such companies, thus mitigating bias — real or perceived — in market sizing and industry revenue projections.

ARtillery's disclosure and ethics policy can be seen in full at:

<https://artillery.co/about/disclosure-and-ethics-policy/>

Contact

Questions and requests for deeper analysis can be submitted at:

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





Resources

Friends of ARtillery Intelligence, and sources of AR thought leadership and business opportunity.

Augmented Reality.org: <http://www.augmentedreality.org/>

Charlie Fink: <http://www.chariefink.com/>

Tom Emrich: <http://www.tomemrich.com/>

Super Ventures: <http://www.superventures.com/>

6d.AI: <https://www.6d.ai/>

Augmented World Expo: <https://augmentedworldexpo.com/>

VR/AR Association: <http://www.thevrara.com/>

AR in Action (ARIA): <http://arinaction.org/>

References

ⁱ AR Cloud Origins, Ori Inbar, Matt Miesnieks: <https://medium.com/6d-ai/introducing-6d-ai-and-our-master-plan-a39b58ce58e8>

ⁱⁱ U.S. retail spending breakdown: <https://www2.deloitte.com/us/en/pages/consumer-business/articles/navigating-the-new-digital-divide-retail.html>

ⁱⁱⁱ Mobile users' local purchase intent: <http://www.mikebo.land/forecasting>

^{iv} ARtillery Intelligence Briefing, Mobile AR Usage & Consumer Attitudes: <http://artillery.co/artillery-intelligence/mobile-ar-usage-and-consumer-attitudes/>

^v ARtillery Intelligence Briefing, *Tech Giants Tackle AR*: <https://artillery.co/2017/08/08/tech-giants-tackle-ar-top-takeaways/>