

# ARTILLERY INTELLIGENCE BRIEFING

SOCIAL AR: SPATIAL COMPUTING'S NETWORK EFFECT, PART III  
MAY 2019



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# Executive Summary

One of the biggest questions facing the Augmented Reality (AR) sector is what will be its killer app? And when will it arrive? The medium needs such an accelerant to legitimize and bring AR into mainstream acceptance – something it's failed to do in the two years since Apple's ARkit launch.

We've speculated in past Intelligence Briefings that killer apps will likely extend beyond the novel and "sexy" attributes that have thus far driven the industry's speculation, imagination and design principles (e.g. games). It will rather be something more mundane that provides all-day utility, like visual search.

But another category will also vie for the position of AR killer app: social. Indeed, you could argue that a social AR killer app has already arrived and accelerated mass acceptance: social lenses. We see these as an important AR "gateway drug," but only a glimpse into social AR's true potential.

One thing missing from social AR lenses – though quite popular through Snapchat and Facebook – is meaningful social immersion. More "augmented media" than augmented reality, they're created in isolation then shared with friends to be consumed asynchronously at a different time or place.

But true social AR will combine this time/place-shifted paradigm – which will still be valuable to achieve scale – with *synchronous* AR. This will rely on technically complex multi-player functionality, a key tenet of the AR cloud. But when it arrives, it will unlock new possibilities and use cases.

Moreover, the multi-player use case inherently accelerates usage and adoption through viral growth. It also has the potential to benefit from the fundamentals of network effect. With each node (user) added to shared AR experiences, the value and appeal of those experiences can grow exponentially.

Beyond the multi-player angle, augmentation is generally a natural fit for social interaction. Extending from social lenses (face filters, etc.), next-generation social AR will include real-time layers of information that people choose to share with others through live overlays as they walk around.

These shared titbits could be everything from mood to relationship status to stylistic accouterments. The latter opens the door for business models around the exchange of virtual style items. This builds on the concept of marketplaces for digital identity, manifesting today in communities like Fortnite.

Speaking of which, one construct for socially-oriented AR is – as Ubiquity6 CEO Anjney Midha puts it – "an MMO for the real world." This envisions layers of virtual worlds all around us which can be dynamically activated by users through AR interfaces, while managed and permissioned by creators.

But questions remain. Who will build this? What will the ecosystem consist of? Will there be open platforms for developers to create shared spatial experiences? Parts I & II of this report tackled these questions. Now we embark on Part III to drill down further into case studies and company profiles.

# Key Takeaways

*Key takeaways are also highlighted throughout the main body of this report.*

- **Social engagement is an early leader among AR use cases, mostly through AR lenses.**
  - Snapchat alone reports **130 million** active users for its AR Lenses, and **15 billion** viewed to date.
  - Active social AR users will grow to **468 million** by 2022 according to ARtillery Intelligence data.
- **Along with Pokémon Go, this social use case has validated AR's mass appeal**
  - Though not "true AR" these early AR successes have served as a key "gateway drug."
  - Snapchat has also validated an ad revenue model, with more than **\$400 million** in 2018.
  - Though it has a later start, Facebook could outpace Snapchat as a social AR powerhouse.
- **ARtillery Intelligence survey data further indicate demand for social AR.**
  - **37 percent** of AR users report that they actively engage with social AR, such as lenses.
  - **One third** of AR users choose social as a top AR use case for the future.
- **Social AR's potential is grounded in an innate human need to connect with others.**
  - Historical evidence points to social infusion as a technology accelerant (e.g. web 2.0).
  - Mobile AR could counteract social media isolation due to an upheld/outward focus.
- **Social AR will also benefit from the principles of network effect.**
  - Connections, value and utility grow with each person added to a given social graph.
  - Social interactions fuel any technology's growth through virality.
- **Social AR so far lacks meaningful interaction because it is asynchronous**
  - Social AR lenses are recorded in isolation then shared for remote consumption.
  - True potential will be reached with more synchronous (same time and place) interaction.
  - This involves technical challenges of the AR cloud such as multi-player functionality.
  - Google and Apple have built multi-player support into ARkit and ARcore.
  - Focused startups like Ubiquity6, 6D.ai and YouAR are taking the technology further.
- **The AR Cloud will be the great enabler for building meaningful social AR**
  - Multiplayer, image persistence and localization are all key tenets of the AR cloud.
  - The AR cloud will be a "plurality" that maps to the strengths of participating companies.
  - Social players like Facebook will build social identity layers for dynamic AR interactions.
- **Tech giants could be disadvantaged by data collection conflicts and legacy business models.**
  - Nimble startups examined in this report could have an edge in native focus and lack of conflicts.
- **Several business models are developing from startups, including advertising and marketplaces.**
  - Niantic (increasingly considered social AR) has derived more than \$2 billion in in-app purchases.
  - Snapchat and Facebook are building AR businesses around existing ad revenue models.
  - Ubiquity6 will stay away from advertising and instead create a marketplace for 3D digital goods.
  - Snaapy, Meo and Aura will experiment with revenue models and expose social AR opportunity.

# Looking Down Market

To continue our report series on social AR, we now turn to the smaller players that are innovating several parts of the value chain. Compared to Part II in which we examined heavyweights like Facebook, Snapchat, Google and Apple, we now turn attention to the startups and tool builders.

This segment of the market spans a wide range – in both size and focus. For example, a well-funded and growing “startup” has been an important AR pioneer: Niantic. We’ll also look further down market to innovative AR cloud companies enabling social AR, like 6D.ai, Ubiquity6, Snaappy, Meo and Aura.

We’ll examine companies you may have heard of and some you haven’t. And though we can’t exhaustively cover the market, we’ll look at a cross section of representative examples. These stem from interviews we did with these players to examine how they’ll shape the social AR opportunity.

We’ll start with the company who brought AR to the masses: Niantic. Though its flagship, Pokémon Go, isn’t “social AR” in terms of gameplay, it enables real-world social interaction. And the tools it’s currently building have key implications for the multi-player AR components explored in part I.





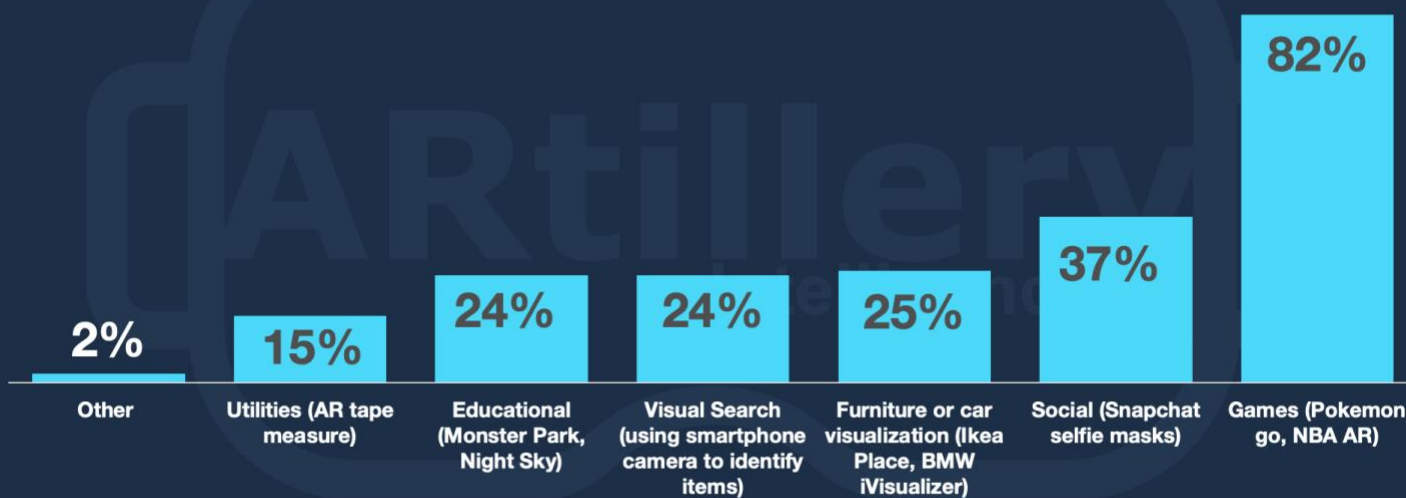
# Niantic

Along with Snapchat Lenses, examined in Part II of this report series, Pokémon Go is the most popular and penetrated form of AR we've seen to date. According to our survey data with Thrive Analytics, gaming (which primarily includes Pokémon Go) is used by 82 percent of mobile AR users.

To clarify, Pokémon Go isn't necessarily "social AR." The AR aspects of the game are mostly experienced in isolation. But there are several converging factors of the game that bring it closer to a social experience and make it worth inclusion in this report's social AR analysis.

## Mobile AR Categories

What types of mobile AR experiences have you used?



**Thrive Analytics**  
smart decisions that drive success

Base = 3,118 US online adults (18+).

© ARtillery Intelligence, 2019

# Social Evolution

Niantic's social components happen on two levels. At a high level, [Pokémon Go's well-publicized goals involve getting young people out of the house and experiencing the physical world together](#). Niantic's founders are outspoken in their mission to counteract digital isolation, as examined in Part I.

For example, a new game feature that tracks and gamifies players' distance traveled should add new dimensions of play. Meanwhile, it appears that after a 2017 lull, lots of players have already re-engaged with the game. [Niantic reports players walked 53 percent more in 2018 than in 2017](#).

On a more acute level, the UX itself is getting more social. A new feature lets game players snap pictures of captured Pokémon in real world scenes to then share with friends. [And recent Niantic acquisitions point to social features that are on the way, such as multi-player functionality](#).

These acquisitions include Escher Reality and Matrix Mill, both of which work towards better underlying functionality for image persistence and occlusion. These are key tenets of multi-player AR. Moreover, these capabilities will extend beyond just Pokémon Go to Niantic's larger platform strategy.



Source: Niantic

# Planet-Scale AR

Niantic is in a strong position with momentum, Pokémon Go's brand and lots of cash. It's now using that to double down on IP and positioning as an AR tech leader. [It will do that by packaging up its AR architecture into a platform on which others can build apps that have Pokémon Go-like functionality.](#)

"Our mission is about getting people outside and exploring the world," said Niantic CTO Phil Keslin at AWE last June. "To achieve this requires the creation of a plethora of experiences, not just our own. And that requires many contributors which means a platform is needed to make it a reality."

[Known as Real World Platform, it productizes the underlying code base for Niantic's popular AR games.](#) And as mentioned, it puts recently acquired IP in play including Escher Reality (multi-player & social AR) and Matrix Mill (occlusion and computer vision) to achieve what it calls "Planet-Scale AR."

The idea is to have more robust computer vision and machine learning to contextualize real world items. Then, scene mapping IP from Matrix Mill can infuse graphics in dimensionally accurate ways, and Escher's social AR capability brings collaborative features for synchronous, social AR.

## The Business Case

From a business perspective, this represents an opportune model we're calling "AR as a Service." [That brings SaaS like economics to Niantic while offering the the industry a tool to democratize advanced AR.](#) It's similar to other famous democratization tools like Amazon Web Services (AWS).

In other words, [just like AWS, Niantic built its engine primarily to drive its own product. But a by-product was the realization that it can be its own platform.](#) And like AWS, it could be a highly scalable revenue stream, making it opportunistic for Niantic and transformative to the industry.

"AWS and GCP [Google Cloud Platform] weren't built as compute platforms for everybody," said Kelsin at AWE. "They were built to support the applications of Amazon and Google. Then they decided 'we have excess capacity, let's turn it into something that our users can use'."

But before developers get the chance to build AR apps and games using the Real World Platform, we'll get to see its first proof of concept: Harry Potter, Wizards Unite. [Niantic's follow-up to Pokémon Go is due out this year and will be an important test for the platform and its new social dimensions.](#)

"One of the things we had to do along the way was respond to player behavior and things that happened in the game," said Keslin. "Network problems, system problems, and fixing those in real time. We're going to take all of that and we're going to pour it into Harry Potter Wizard Unite."



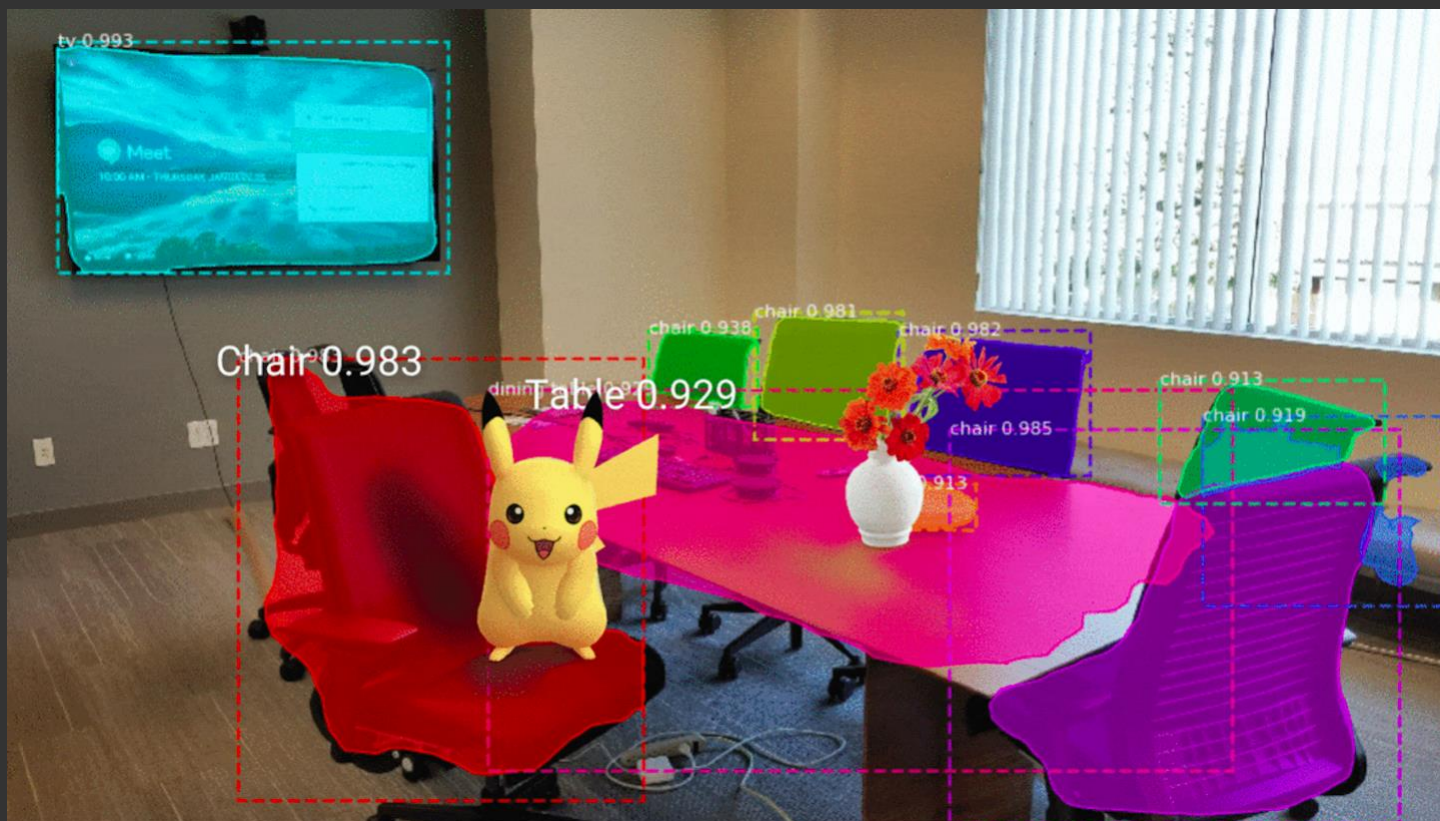
# Semantics

A question has bounced around AR circles for a few years, sometimes contentiously: Is Pokémon Go really AR? It's certainly cited as such. [Our take has always been that it doesn't matter... its AR adjacency has done the technology a favor by acclimating the world as a "gateway drug."](#)

A better metaphor comes from Happy Giant CEO Mike Levine. In a recent conversation at the GDC conference in San Francisco, he compared Pokémon Go to Elvis. He didn't embody the Rock & Roll we'd come to know, but he warmed audiences up to an early version of it, thus paving the way.

Drilling down to more technical levels, what are the arguments against Pokémon Go's AR designation? The first one is that the game's graphical overlays are more floating stickers than AR. They therefore lack key AR attributes like scene awareness and object occlusion.

That part of the argument made sense for a while but is less relevant with the game's new AR+ mode. [With developments to Niantic's Real World Platform, as well as recent IP acquisitions like those mentioned above, it's building better capabilities for image persistence and occlusion.](#)



Source: Niantic

# Contextual Augmentation

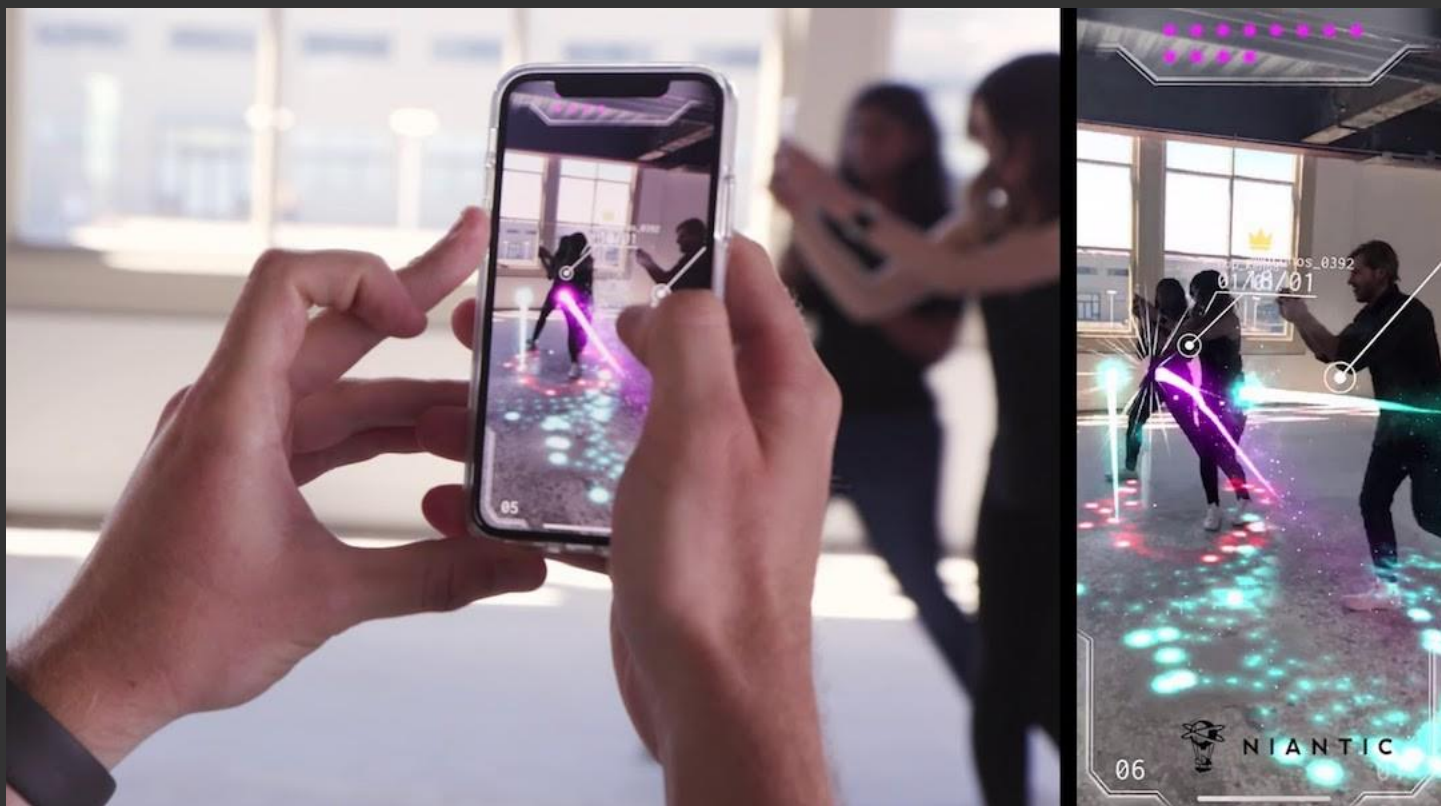
But returning to the non-technical analysis of whether Pokémon Go is or isn't AR, it can be argued that it “augments” physical world realities in a broader sense. In other words, gameplay is dynamically altered based on where you are — a sort of geographic and contextual augmentation.

“Around parks, there are more grass Pokémon,” said Niantic’s AR product lead Ross Finman in a recent interview with Infinite Retina. “We’re near water here in the [San Francisco] Ferry Building, and there are more water Pokémon. So it already changes based on location.”

Niantic is working on ways to make this more contextually nuanced. The location-based dynamics currently happen on a city block-by-block basis, but Finman projects forward to the goal of having situationally-relevant game interactions on more granular levels. This includes things like terrain.

“What happens when you get even more specific and fine-tuned to the area?” he posed. “There could be experiences on sidewalks versus grass, versus a flower bed, versus a small pond. As you get more fine-grained, the complexity increases... AI can help us get to the next level.”

**The Bottom line:** Though Pokémon Go may not be AR on a pixel level, it certainly augments reality on an experiential level.



Source: Niantic



# 6D.ai

Components of social AR discussed in Parts I & II of this report include multi-player support, image persistence and occlusion. These are key tenets of the AR Cloud. As explored above for Niantic's Real World Platform, the AR Cloud is a data layer that enables reliable and spatially-anchored AR.<sup>i</sup>

In our ongoing coverage of the AR Cloud and its importance, one question keeps popping up: who will build it? **The answer is that no one entity will do so (and there won't just be one "cloud"), but several specialized toolsets will contribute to the AR Cloud's assembly and maintenance.**

One of those toolsets is 6D.ai. Bringing pedigree, validation and top IP to the table, it's a front runner for potential impact and value creation among AR cloud startups. Its advantage also includes the perspective and AR tenure of co-founder & CEO Matt Miesnieks – a top AR thought leader.

"The high-level objective is to make AR apps engaging beyond novelty," he told ARtillery Intelligence in an interview. "Among all the challenges, the one that personally appealed to me was the computer vision (CV) pieces that need to be built. And then how are those exposed to developers?"

The result is 6D.ai, which packages novel CV and scene mapping technology into an API. By handing that over to developers, it scales up the ability to build a spatial map of the world. **In other words, users of 6D-powered apps can actively or passively map the world while experiencing AR.**

"You start to get a data network effect where every app that uses a 6D-powered app in a physical space contributes to making the description of that physical space more comprehensive," said Miesnieks, "which means that the next person that comes along gets a rock-solid experience."



Source: Google

# AR's Must-Haves

Starting in AR about a decade ago — a lifetime in AR years — Miesnieks gained early perspective on AR's opportunity and challenges at AR pioneer Layar. That was reinforced at Dekko and then Samsung, during which he faced some of AR's stickiest technical challenges.

These include image persistence, occlusion, physics-based graphical interactions, and semantic scene understanding (knowing that a couch is a couch). [These challenges compel the AR cloud: a shared database to deliver scene geometry and enabling-data to far-flung AR devices.](#)

"What occurred to me as an entrepreneur is that these are must haves, not nice to haves that make AR apps a bit better," said Miesnieks. "If you assume that persistence and multiplayer are fundamental for AR, you need some sort of computer vision cloud infrastructure to support that."

Next came a breakthrough for Miesnieks when meeting and seeing the IP of Oxford's Active Vision Lab professor (now 6D's chief scientist) Victor Prisacarui. His algorithm presented ways to solve some of AR's vexing and longstanding issues. He just needed help bringing it to market.

"What Victor had was the ability to build a high-resolution model of the world in real time on commodity mobile hardware," said Miesnieks. "We figured out how to do it with a regular monocular RGB camera that is built into every smart phone today."

## Strength In Numbers

What made Prisacarui's IP particularly compelling was the "real time" part. [Building real-time spatial maps meant for the first time that AR apps could gain more sophisticated spatial awareness and semantic understanding on the spot.](#) And they could do so without advanced optics.

"With Victor's technology, we had a way to tell an app developer, 'you can now presume there's a 3D model of the space, because if there isn't one there, we'll be able to build it for you in real time in the background, and it will be built as the app runs'," said Miesnieks.

[This also addressed a fundamental chicken & egg dilemma.](#) The AR cloud wasn't going to get populated without apps that could ingest scene mapping data at scale. And no one was going to use such apps if there's no scene mapping data to create worthwhile AR experiences.

"No one was going to manually go out and capture that data in the way that Google Street View cars capture street data," Miesnieks said. "They weren't going to do it unless there was some application or use case to incentivize that behavior."

This value exchange is core to 6D's go-to-market strategy. [By benefiting from AR cloud data, users are motivated to collect data.](#) Further incentive could eventually lie in game perks, social interaction or performance. Think of it like Foursquare leader boards or Waze's incentivized data collection.



“There’s a way to build-in intrinsic rewards,” said Miesnieks. “There are status boards and leader boards, and maybe you unlock extra levels or capabilities into an app. That sort of thing can be very powerful to get people to go and scan places they might not otherwise have gone.”

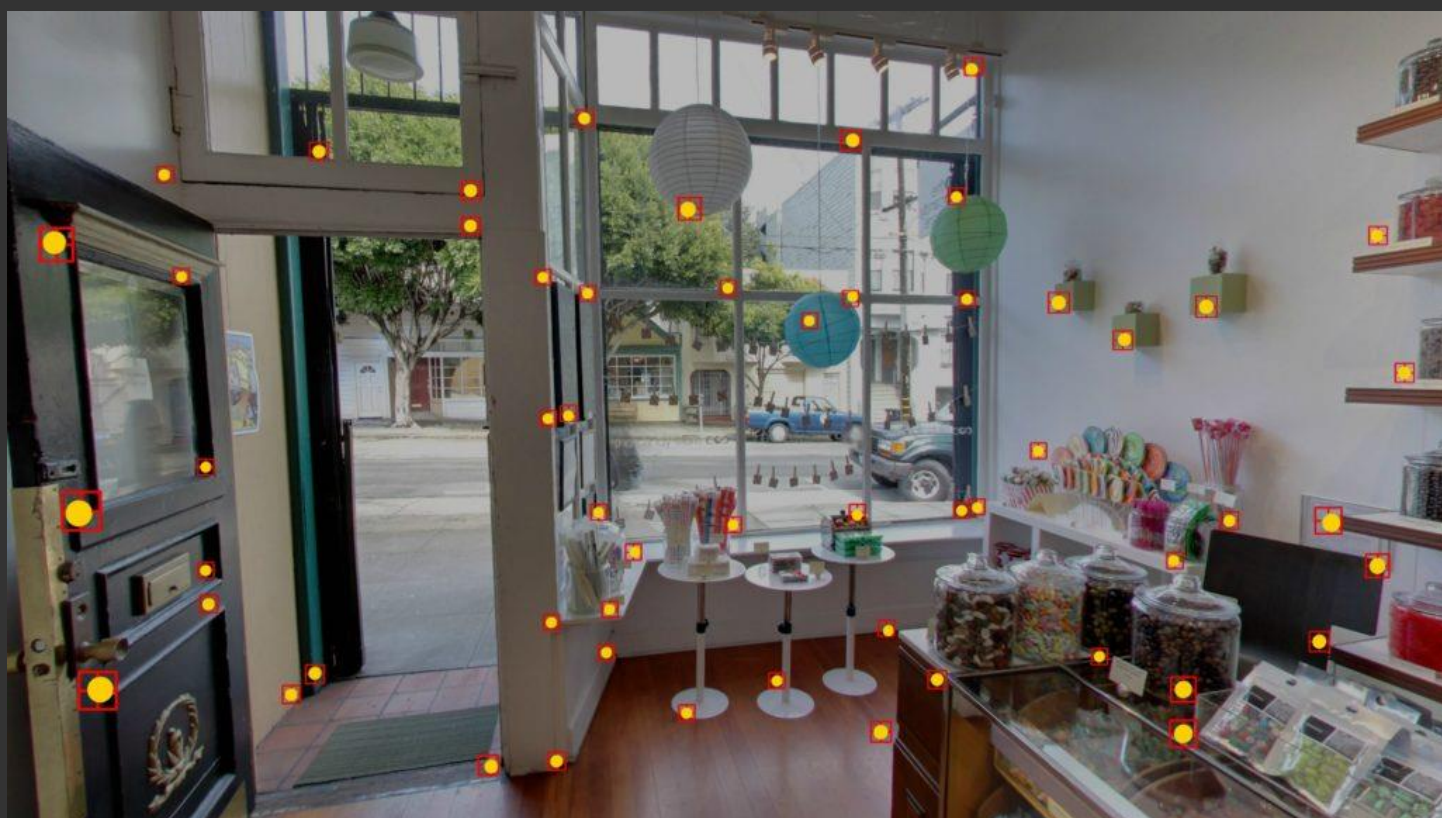
## Privacy Friendly

As for 6D’s positioning and business objectives, it’s currently parlaying technical and IP chops with a fair dose of market validation and interest. **But the company isn’t without challenges, including the current tech privacy environment that scrutinizes data tracking. This will be a key issue in social AR.**

Miesnieks is confident in 6D’s data security, given that image data is processed on device. Then mathematical point descriptors are shared with the cloud, which can’t be reverse engineered, based on any research available today, to reveal anything of consequence or personal meaning.

Data security concerns could even work in 6D’s favor: Phone manufacturers, app publishers, and other potential partners prefer independent companies (read: not Google & Facebook). **In other words, 6D’s interests are aligned with end users, as opposed to something like ad monetization.**

“If we were to say that we’re going to sell ads on the back of this, the Disneys of the world wouldn’t want to work with us,” said Miesnieks. “They definitely don’t want to give that data to Google and Facebook. That’s turning out to be a driver of interest from these big players.”



Source: Google

# Ubiquity6

Continuing the theme of AR cloud-related enablers for social AR, San Francisco-based Ubiquity 6 is tackling many of the same challenges as 6D.ai, but in its own unique ways. Moreover, its proposed end points are more directly social, and they directly enable multi-player AR use cases.

As discussed throughout this report, synchronous sharing and image persistence are key functions enabled by the AR cloud and will unlock social AR's next phase. [Another way to think about this is a sort of real-world multiplayer online game like World of Warcraft, says Ubiquity6 CEO Anjney Midha.](#)

"Our goal is to bring people together in real-world spaces for valuable, shared experiences made by any creator," he told ARtillery Intelligence. "Today, we're focused on a product that lets anyone easily create and launch shared AR moments using the mobile camera they have in their pocket."

This vision will materialize through the company's spatial browser (user-facing) and Reality Editor platform (creator-facing). [By putting deliberately low-friction tools into the hands of users and creators, it hopes to engender a scalable and self-propelled ecosystem for AR experiences.](#)



Source: Ubiquity6



# Democratizing AR

This ecosystem consists of Ubiquity6's three main constituents: Curators, creators and users. Curators establish and moderate AR experiences. Creators build the AR graphics to populate experiences. And users consume and edit the experiences. These can all overlap.

This approach categorizes Ubiquity6 in one of the areas of AR that we're most bullish on: enabling technologies or "building blocks." These accelerate AR by democratizing its creation or functionality. AR cloud startups are in this bucket, as are graphics creation tools such as Adobe Aero.

Ubiquity6 embodies the democratization principle especially by building the platform around a web stack. That means any web developer can create AR experiences using the skill set they already have. This will be key to jumpstart the ecosystem by populating it with content faster.

"The barriers to making shared or persistent experiences in real-world spaces are incredibly high, especially for the 20 million+ creatives and developers who make things for the web," said Midha. "They have to pick a game engine, learn a new language like C#, understand the black magic of computer vision, multiplayer networking, server infrastructure and then duct tape it all together."

Friction is also reduced for users, given that they only need a web link to launch an experience. Today's app paradigm conversely won't work for synchronous AR (see Part I) where dynamic "pick-up" experiences are hobbled by requirements that everyone stop and download an app.



Source: Ubiquity6

## Proof of Concept

To accelerate and seed adoption, Ubiquity6 wants to jumpstart AR experiences that are built on the Reality Editor platform. To do this, it's designing shared AR experiences in well-traveled places. [As explored with Facebook in Part II, this is a sort of inspiration or "lighthouse" to get the ball rolling.](#)

"We think creators should be easily able to publish experiences for users to find in public spaces," said Midha. "Users should be able to easily take those experiences with them to their own private spaces when they want to. We support this flow as a first-class citizen."

The largest-scale effort so far was at SF MOMA in August, where Ubiquity6 created a shared AR experience that let patrons add virtual blocks to a digital installation. The piece built up cumulatively and persistently over time from users' contributions, giving everyone a sense of participation.

Beyond the intended effect of inspiring creators and users, the exercise revealed key behavioral and business model indicators. [The biggest takeaway was that there can be exponential growth in user engagement and value as the number of players increases — a classic network effect.](#)

For example, the average session length was 45 minutes, which far exceeds typical AR "snacking" use cases. [Midha believes this is due to specific game mechanics that arise with large-scale collective play. These include both competitive and collaborative dynamics between players.](#)

"We learned that it's not about the quality of graphics, depth of gameplay, or clever ways to give people badges or points: The shared experience itself is the reward," said Midha. "The ability to place a creation, precise to a few centimeters, in a real-world space in a way that appears and updates for hundreds of other viewers in real time was hugely rewarding for people."

Beyond sociological aspects, there are spatial dynamics. [With such experiences, there's an opportunity to derive value from the fundamental economic principle of scarcity.](#) And users with access to a given AR space feel a sort of exclusivity... potentially to the point of paying for it.

## Spaces and Faces

This all raises the question of how Ubiquity6 will make money. Midha, a former investment partner who founded Kleiner Perkins' Edge seed fund (Magic Leap TheWaveVR), is more pragmatic and finance-minded than most. With \$37.5 million in funding, he's forthright about monetization paths.

He's certain that the business model won't be advertising. [Like we've heard from 6D.ai and Magic Leap, ad models aren't aligned with user interests and are a minefield of data collection conflicts.](#) Instead, Midha wants to cultivate the innate human need to personalize our spaces and faces.

This can be seen in everything from fashion (analog) to Fortnite (digital). [At the intersection of those phenomena is a likely sweet spot to administer a marketplace for accouterments that adorn AR experiences.](#) This could also incentivize AR creators to build things with Ubiquity6.



Along with lowering technical barriers, that incentive could accelerate a network effect by getting over the classic “chicken & egg” hump of supply-constrained markets. This challenge is rampant in online marketplaces, much less ones that are built to the physical scale of the inhabitable earth.

It's a large feat, but Ubiquity6 has the approach and pedigree to pull it off. That starts with digital blocks on museum installations, then use cases that creators run with. [The key is an AR-native toolset to enable that creativity, and to connect it with users](#): “We’re doing it AR-first,” said Midha.

## Video Companion: AR Cloud and the Internet of Places

(click video to open)



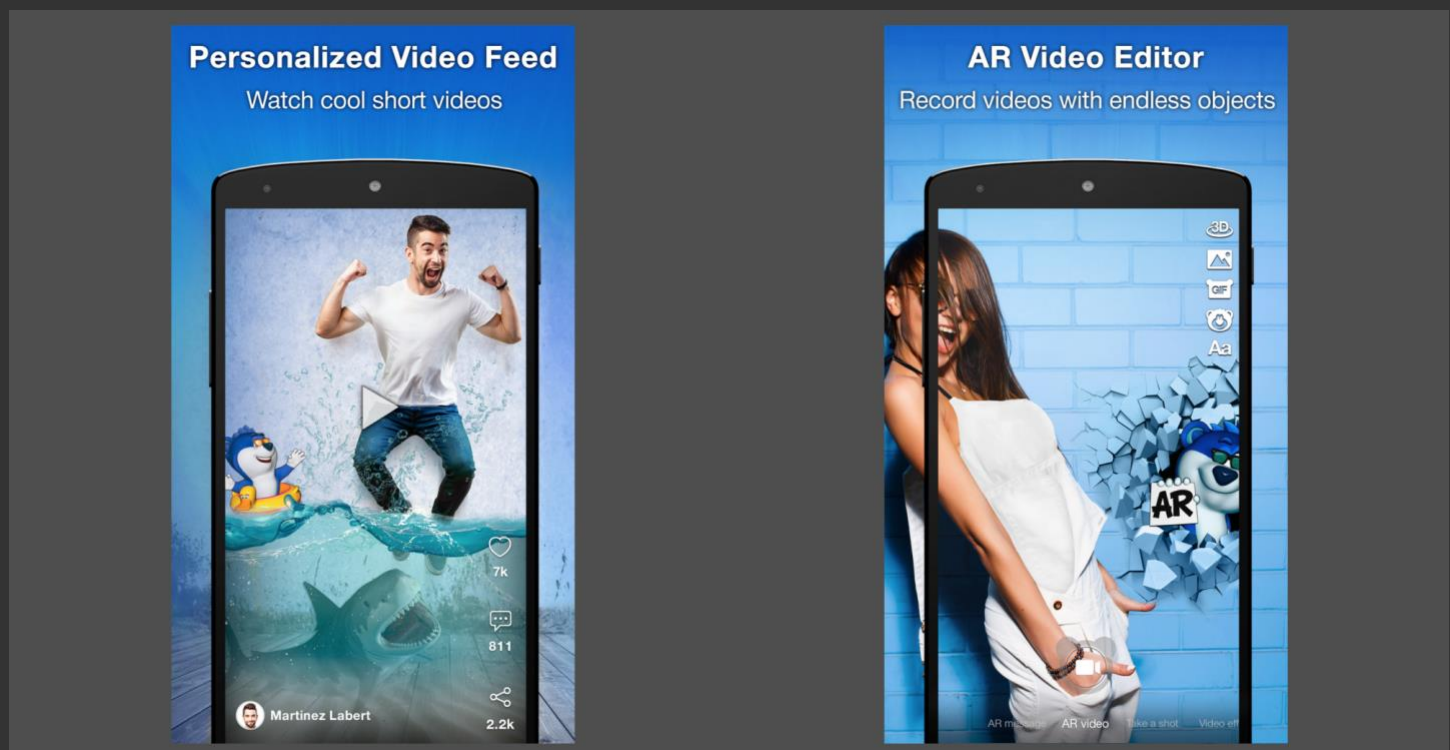
# Snaappy

As mobile AR develops in early stages, the industry is feeling out best practices in app design and user engagement. For example, game mechanics can improve retention and stickiness by infusing a competitive dynamic. This can be seen in successful and increasingly social apps like Pokémon Go.

Another important concept is utility and reusability. The idea is that lots of AR apps have novelty appeal but it wears off quickly. So building experiences around something that has high frequency and utility — such as communications and social engagement — can drive repeat/active use.

This is a principle behind Tel Aviv-based Snaappy. It has developed a cross-platform social AR app that infuses animated stickers and characters into pictures and video to convey mood or sentiment. This is meant to combine AR's novelty with social media's stickiness and popularity.

“Communication is good for retention but bad when it comes to wow effect and engagement,” Snaappy CEO Gal Shvebish told ARtillery. “On the other hand, AR is great for wow effect and engagement, but bad when it comes to retention. If you combine the two into one system, you can take advantage of both [and] really create something that will be here for the long run.”



Source: Snaappy



# Lessons From the Trenches

The latest is a new set of features that come with a fresh batch of learnings from large-scale product testing. Shvebish is forthright about these lessons and necessary pivots in consumer AR's early stages. We recently discussed the new features with him, and the rationale behind them.

Central to the latest app refresh is an AR video editor. It will let users add text, stickers and gifs to any scene, edit in real time, record and share to a public feed. [This takes signals from the newest craze, TikTok, and taps into demand for AR-enhanced video creation and sharing.](#)

The updates will also bring Snaappy from messaging to social discovery. For example, a public feed will appeal to those who want to create and share media with a larger audience (one-to-many). [It also adds a discovery component for those who want to browse AR content.](#)

“In general, our company is starting a big transition from serving as an AR communication tool — or AR messenger if you would like — for selected amounts of friends, to an AR social network where users can also share and discover public content,” Shvebish told us.



Source: Google

## Magic Formula

The new features are inspired by a combination of AR products including Google Playground, Snapchat and, as mentioned, TikTok. It cherry-picks aspects of each, which Shvebish believes represent the magic formula of social AR. That includes examining what they've done wrong.

For example, when studying the phenomenon of TikTok (500 million users), Shvebish learned that the average 15-second video is edited for two hours on average. Snaappy's new features are meant to tap into the same demand but with a more streamlined and speedy editing tool.

Another key finding was that most social feed users view content, while a smaller share actually *create* content. So to maximize compatibility and network effect, that larger camp of viewers don't need AR compatible phones. They just need to see video... a ubiquitous format.

"When we created AR messages, both the sender and receiver needed an AR-enabled device," said Shvebish. "But content creators are less than 5 percent of the community. The rest are just viewing it. So we thought, let's make it video. Video is super popular right now."

## Trading Specs For Scale

Another key finding: At this early stage of spatial computing, scale is more important than specs — a concept we've examined in past reports. For example, Oculus decided to strip down capability in the Oculus Go to achieve greater scale — in its case through lower-price "good-enough" VR.

Google's ARCore did similar: moving from the high end — though cost prohibitive — Tango, it opted instead for a lighter-weight product that could be deployed on hundreds of millions of smartphones. Snaappy's version of this lesson lies in the granularity of its AR animations.

In other words, its previous approach involved a set of characters that were perfected in terms of interactions and animation quality. They're similar in this respect to Google Playground: though impressive in animation, they're limited in utility and repeat usage, as usage data indicate.<sup>ii</sup>

"If you are building a content creation tool based on AR, and you are forcing your audience to create content that will match the characters you designed, chances are that users will not know what to do with it," said Shvebish. "Even if it is super attractive like Google Playground."

Shvebish believes instead that lower-quality animations produced or aggregated at scale create higher-quality experiences. That's because volume and variety enable more combinations of AR experiences that users can customize for self-expression, which is really the important part.



# Big Vision

Snaappy plans to scale up this capacity for self-expression by aggregating AR animations from several sources. It's working with Sketchfab for 3D objects, Bing Image Search for 2D images, gifs from Giphy, and hundreds of additional AR stickers that it will create in-house.

The scale this is hoped to achieve is a key step in Snaappy's vision for a social graph. Though it believes its technology could be licensed out, it's more interested in keeping its eye on the prize of a consumer-facing AR brand — a battle that's won on sustained user engagement.

As for how it will make money, Shvebish is big on in-app-purchases through games that Snappy's social interactions drive. This builds on existing Snaappy-themed mini-games. Brand advertisers are also hungry to create AR product engagement, as Snapchat has shown (see Part II).

Meanwhile, Shvebish knows that the path to this vision requires more capacity for scale. [Highly polished animations are important, but not if they're limited in utility and range, and if they lose appeal after the first use.](#) The ideal combo is quality and quantity, but the latter will come first.

"Instead of having 20 or 30 amazing experiences, I'd rather have 50 million experiences in AR, and I do understand that it will mean compromises," said Shvebish. "We are now willing to compromise quality for quantity in order to be the go-to tool for real content creation."



Source: Snaappy

# Aura

Contrasted somewhat to Snaappy is a social AR innovator known as Aura. Like Snaappy, it's building a consumer-facing social graph (more on that in a bit). But unlike Snaappy, it also wants to position its core technology as a key enabler – licensed to other companies – for Social AR.

What is that technology? Aura has a face scanning technology known as Aura Avatar Creator. [Using only a mobile device \(currently Sony Xperia\), 3D scans can be taken of a user's head, which can then be edited and personalized further, then imported into social AR and VR experiences.](#)

“Facial scanning itself is a key part of the way we are trying to deliver realistic avatars, but it's just one part of the puzzle,” Aura Advisor Oscar Clark told Artillery Intelligence. “AURA is a platform which provides a persistent, authentic identity across applications, which they can then personalize.”

## Personal Space

And it goes beyond avatars. Clark explains the vision of virtual hubs for specific uses (think: shopping, social). This lets users have a consistent personalized space across apps: “We want users to move together and communicate across applications to create a sense of persistence,” he said.

[The scanning approach is meanwhile a potential shift in how avatar-based social media happens in AR and VR: to use your real face.](#) That approach is also taken by MEO, which we explore below. But it contrasts the go-to approach from players like Oculus, whose avatars don't match users' real faces.

One of the challenges in getting a more personalized avatar is the cost of 3D scans. But Aura's technology brings that to smartphones for more accessible avatar personalization. Its value will be fully realized when brought to open market as a licensed technology, but it's already being validated.



Source: Atom Universe

## Long-term Bets

Beyond the strategy for a licensed asset – a prudent approach for potentially-scalable and near-term revenue – Aura is also making big long-term bets. The latter involves a large-scale immersive social network it has built, known as Atom Universe. It's available to PC and PlayStation users.

“AURA users can create authentic and realistic avatars to express themselves across different games and applications,” said Clark. “Atom Universe is just one example of how developers might use such a platform to create virtual social experiences where you can chat, share, broadcast and play.”

Atom Universe will interestingly be a validation of the Aura Avatar Creator, and a potential business in its own right. [Beyond validating its tech, Aura's progress will be important to watch as a signal for the types of avatar representation that resonate with social XR users, and win as the go-to approach.](#)

“We believe that the advances in games can be brought to other applications; and much better replicate the experience of being together in person, while online,” said Clark.



Source: Snap, Inc.



# Meo

One of the most used and successfully-monetized forms of AR is lenses and camera effects. And the most prevalent subset of that is augmenting selfies with various accouterments. But that's just the beginning of a long evolution in avatar-based social interaction, as examined throughout this report.

Meo CEO Misha Leybovich has an approach which is similar to that of Aura: to use your real face — the ultimate embodiment of personality. There's room for modifications, he told ARtillery Intelligence, but the most unique traits of personality are expressed through nuances in our faces.

"There are sections of our brains dedicated to understanding human faces," he recently said at the Zero One Tech Festival. "There are micro expressions we all automatically make and interpret without thinking about it. When we see each other visually, we can better see our humanity."

## Flipping the Script

Meo's app Selfie Sticker is a starting point for this vision. Think of it as a flipped version of selfie lenses: Instead of animations melded to (and obscuring) faces, faces are melded to situational animations. But the larger vision is to power identity for any avatar-based XR.

"Our company's commercial goals are to use our mobile app to drive awareness of our technology," he said of the company's road map, "to help others incorporate our tech into their products and then effectively be the visual identity layer for AR, VR and 3D computing."

That includes gaming, social and other top categories of XR's projected future. [And it could be big business, considering proven demand for augmenting one's identity.](#) Selfie lenses are one thing; the massive revenue machine that is Fortnite — through avatar personalization — is another.

"This is just the beginning of avatar customization," said Leybovich with an eye to Fortnite. "It's literally already a multibillion-dollar industry from just one company's efforts. Think about how big this gets as it scales, and now you know why we care for both social and financial reasons."

## Identity Layer

As for how Meo will build that identity, it will be an advanced version of how it currently captures your face in its flagship app. This currently involves a selfie video that's imposed live on situational animations, which are recorded together to then be available to overlay on the real world.

"We plan to use, with the user's permission, millions of video frames as they use our [mobile] technology," he said. "[It] requires that large of a training set for each individual, and only an initially video-based approach can realistically acquire enough data to build that model."



Once that model is built, it can be customized by users while maintaining the core face-based personality. Users can then take that identity model with them across XR experiences. One outcome could be personal identity in VR experiences (think: Ready Player One).

“Establishing a real avatar is just the beginning,” said Leybovich. “It’s an important baseline because it enables preservation of your real emotions and expressions. Maybe you want to change how you look and that’s totally fine, but the smile should still be your smile.”



Source: Meo

As referenced above, MEO’s user-facing app is partly a means to an end. Leybovich stresses that his team is backing the app with all its effort and support. But its long-run purpose is more to expose the underlying tech that will unlock MEO’s grander vision of an XR identity layer.

“The consumer app is our way to introduce the technology to the world,” he said. “The goal was to build the tech for our own products, but then we realized this is really hard and a lot of other people are going to need it. We realized that it’s a more stable business to provide the picks and shovels.”

This puts Meo in the category of AR as a service (ARaaS). Advantages include not tying oneself to a single use case, as a consumer-facing app could otherwise do. [The platform approach conversely positions MEO, or any toolset provider, to ride the wave of social AR use cases as they evolve.](#)

“Our ultimate goal is that every time you see a real person in mixed reality, that’s our tech,” said Leybovich. “Effectively, we’re trying to bring peoples’ humanity into the digital realm. There will be tons of use cases for that – stuff right now that we can’t even think of.”

# Final Thoughts: An Ecosystem

When looking at the above company profiles, and those in Parts I & II of this report, a few patterns emerge. First, a central theme is the importance of social AR components that will be enabled by the AR cloud. That will include synchronous AR experiences and image persistence, a la 6D.ai.

It's also notable to see a division between consumer-facing social AR players (Facebook, Snapchat, Snaappy) and the enablers or "building block" companies (6D.ai, Ubiquity6, Meo). And there are some players that will do both (Google, Apple, Aura). In short, an ecosystem is forming for Social AR.

There's also divergence in business models. Facebook and Snapchat – as a function of their legacy businesses – are pursuing advertising revenue for social AR engagement. Other players like Ubiquity6 will rather pursue commerce-based revenue through the social exchange of digital goods.

Either way, this ecosystem will have lots of different parts, which is analogous to the AR cloud itself. The AR cloud is a bit of a misnomer in its singular tense. It will be more of a plurality of companies that build separate (but sometimes interlinked) clouds that map to their goals and competencies.

As this ecosystem comes together, gaps will form between the above players, which represent opportunities and points of entry. The key will be identifying those gaps, and good timing. Either way, as explored in Part I of this report, Social AR is coming -- driven by a powerful force.

That force is a deep-rooted human need to connect with each other. It's a historically validated principle that has driven many tech revolutions, such as web 2.0, email and social networking. We'll close with our favorite quote from Charlie Fink, invoking this historical lesson. It will apply to AR.

"The internet enabled Amazon and it became e-commerce, and e-commerce is a killer app," said Fink during a presentation last year at the VRLA conference. "But the real killer app of all of our devices — of the smartphone in our pocket or the PC on our desk — is to connect us with other people."



# Video Companion: The Social AR Opportunity

(click video to open)





# Key Takeaways (redux)

*Key takeaways are also highlighted throughout the main body of this report.*

- **Social engagement is an early leader among AR use cases, mostly through AR lenses.**
  - Snapchat alone reports **130 million** active users for its AR Lenses, and **15 billion** viewed to date.
  - Active social AR users will grow to **468 million** by 2022 according to ARtillery Intelligence data.
- **Along with Pokémon Go, this social use case has validated AR's mass appeal**
  - Though not "true AR" these early AR successes have served as a key "gateway drug."
  - Snapchat has also validated an ad revenue model, with more than **\$400 million** in 2018.
  - Though it has a later start, Facebook could outpace Snapchat as a social AR powerhouse.
- **ARtillery Intelligence survey data further indicate demand for social AR.**
  - **37 percent** of AR users report that they actively engage with social AR, such as lenses.
  - **One third** of AR users choose social as a top AR use case for the future.
- **Social AR's potential is grounded in an innate human need to connect with others.**
  - Historical evidence points to social infusion as a technology accelerant (e.g. web 2.0).
  - Mobile AR could counteract social media isolation due to an upheld/outward focus.
- **Social AR will also benefit from the principles of network effect.**
  - Connections, value and utility grow with each person added to a given social graph.
  - Social interactions fuel any technology's growth through virality.
- **Social AR so far lacks meaningful interaction because it is asynchronous**
  - Social AR lenses are recorded in isolation then shared for remote consumption.
  - True potential will be reached with more synchronous (same time and place) interaction.
  - This involves technical challenges of the AR cloud such as multi-player functionality.
  - Google and Apple have built multi-player support into ARkit and ARcore.
  - Focused startups like Ubiquity6, 6D.ai and YouAR are taking the technology further.
- **The AR Cloud will be the great enabler for building meaningful social AR**
  - Multiplayer, image persistence and localization are all key tenets of the AR cloud.
  - The AR cloud will be a "plurality" that maps to the strengths of participating companies.
  - Social players like Facebook will build social identity layers for dynamic AR interactions.
- **Tech giants could be disadvantaged by data collection conflicts and legacy business models.**
  - Nimble startups examined in this report could have an edge in native focus and lack of conflicts.
- **Several business models are developing from startups, including advertising and marketplaces.**
  - Niantic (increasingly considered social AR) has derived more than \$2 billion in in-app purchases.
  - Snapchat and Facebook are building AR businesses around existing ad revenue models.
  - Ubiquity6 will stay away from advertising and instead create a marketplace for 3D digital goods.
  - Snaapy, Meo and Aura will experiment with revenue models and expose social AR opportunity.

# 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 such as AR & VR, 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 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 [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 LeadsCon. 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 3 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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<sup>i</sup> ARtillery Intelligence: [AR Cloud and the Internet of Places](#)

<sup>ii</sup> Android Authority: [Playmojis are Fun, But You Don't Use Them](#)