


THE FUTURE OF FRONTIER TECH



*Analyzing trends in
drones, space, and AR/VR
technology*

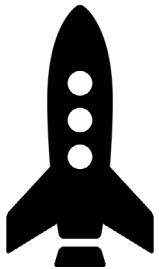
AUGUST 28, 2015



DEFINITION OF FRONTIER TECH

Frontier Tech | noun | \Fruhn-teer Tek\:

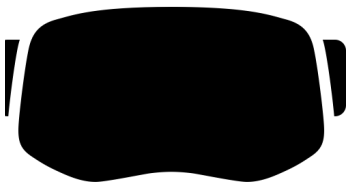
Technology related to drones, space, augmented reality, and virtual reality.



Space companies include those that are working on a variety of problems related to “The Final Frontier”. That includes startups tackling more traditional space-related technology such as space travel and rocket propulsion, as well as more contemporary technologies like satellite imagery, asteroid mining, space debris cleanup, and much more.



Drones includes all unmanned aerial vehicle (UAV)-related companies including the manufacturers of the drones themselves, technology related to the operation of drones, as well the supporting infrastructure around it.



Augmented reality & virtual reality includes all companies related to the usage or support of these platforms. This includes AR/VR advertising platforms, software, and hardware, as well as companies that utilize AR/VR for other commercial purposes.

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5	Frontier Tech Summary	\$3.2B, 183 deals since 2014
11	Space	\$1.9B, 45 deals since 2014
22	Drones	\$285M, 58 deals since 2014
37	AR/VR	\$1B, 80 deals since 2014



SUMMARY OF FINDINGS

FRONTIER TECH INVESTMENT ACTIVITY EXPLODES

Overall investment activity to startups within the space, drone, and AR/VR ecosystems has come on strongly since 2014, raising \$3.15B across 183 equity investments. This has been driven by breakout funding rounds to category leaders such as SpaceX, Magic Leap, OneWeb, and DJI.

GOOGLE A LEADING INVESTOR

Google (now Alphabet) has been a strategic investor and acquirer within the frontier tech space over the years. Google Ventures tied for the most active VC since 2012, while Google corporate has made multiple investments of its own, as well as a \$500M acquisition of Skybox Imaging, a satellite imagery company, in 2014.

NANOSATELLITES DRIVING MULTIPLE SPACE INVESTMENTS

While SpaceX has dominated overall funding to space startups, multiple companies focused on either the deployment or utilization of nanosatellites have received funding since 2012. With an estimated 2000 nano and microsatellites to be launched over the next 5 years, startups ranging from Accion Systems to Orbital Insights all will be participating in this segment of the space startup ecosystem.

DRONES GAINING MOMENTUM

Drone investment activity has now increased for 4 straight quarters, reaching an all-time high in Q2'15 at \$109M raised across 16 deals. Investments since 2012 have largely been focused on the hardware, software, and services side, with just 18% of funded companies tackling infrastructure.

AR/VR BOLSTERED BY GAMING EARLY ON

Augmented reality and virtual reality investments have reached double digits in 6 of the last 7 quarters. Multiple use-cases continue to drive investment activity, however gaming could be the first leading use-case, as it accounted for 76% of all VR content made last year. In addition, major corporates such as Valve, Tencent, Sony, and Microsoft have shown significant interest in AR/VR gaming.

A low-angle, upward-looking photograph of the Space Shuttle Columbia against a clear blue sky. The shuttle is white with blue and yellow stripes on the solid rocket boosters. The words "UNITED STATES" are visible on the side of the orbiter. The perspective makes the shuttle appear to be rising steeply towards the top of the frame.

Since 2014 nearly

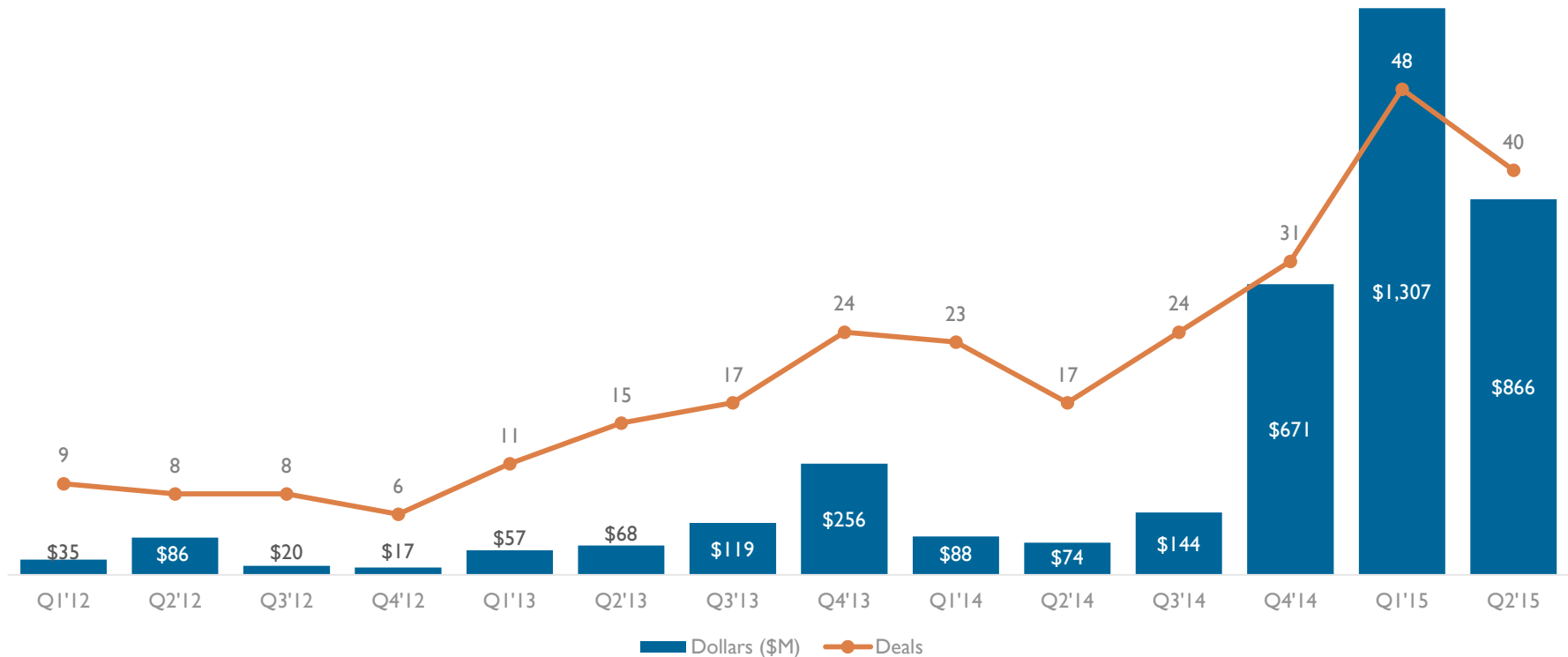
\$3.2B

raised in equity financing to frontier tech companies

FRONTIER TECH STARTUPS RAISE NEARLY \$3.2B SINCE 2014, CLOSE TO \$2.2B IN FIRST HALF OF 2015

Frontier tech startups (focusing on space, drones, and AR/VR) have raised a combined \$3.15B in equity financing since 2014, across 183 deals. Funding has now topped \$500M and 30 deals for three straight quarters, with Q1'15's \$1.3B in funding being the highest quarterly total of all-time, largely buoyed by SpaceX's \$1B Series D financing. As the industries develop, there have been 9 \$50M+ financings to frontier tech companies since 2014.

FRONTIER TECH INVESTMENT ACTIVITY Q1'12 - Q2'15



ROTHENBERG VENTURES AND GOOGLE VENTURES LEAD MOST ACTIVE VC INVESTORS SINCE 2012

Rothenberg Ventures and Google Ventures have been the most active VCs in frontier tech companies since 2012. Rothenberg Ventures has made multiple early-stage bets including Altspace VR, Matterport, and Dronebase. A number of VC firms rounded out the top 3.

MOST ACTIVE VCS IN FRONTIER TECH

Unique Companies, Q1'12 - Q2'15

RANK	INVESTOR	RANK	INVESTOR
1	Rothenberg Ventures	3	Intel Capital
1	Google Ventures	7	Felicis Ventures
3	Andreessen Horowitz	8	Founders Fund
3	Qualcomm Ventures	8	Bessemer Venture Partners
3	Lux Capital	8	Promus Ventures

NOTABLE INVESTOR-BACKED FRONTIER TECH EXITS SINCE 2012



The maker of the Oculus Rift, a virtual reality headset with use-cases ranging from gaming to media and more.

Acquired by Facebook, 3/14
\$2 billion



A commercial remote sensing company that utilized satellites for to provide insight into daily activity on the planet.

Acquired by Google, 6/14
\$500 million



URTHECAST

Aims to provide a near-live HD video feed of earth with multiple cameras attached to the International Space Station.

IPO via Reverse Merger, 7/13
\$63.5 million**

Other Notable Exits

While the splashiest acquisitions in recent years in frontier tech were acquisitions by Facebook and Google, there have been few investor-backed exits overall. However, multiple companies have made acquisitions within the space, drone, and AR/VR industries.

These notable M&A transactions include:

- **KMel Robotics**, acquired by Qualcomm in January 2015
- **Modelco**, acquired by Goliath Games in April 2014
- **Composite Engineering**, acquired by Kratos Defense & Security Solutions in May 2012.



Provides end-to-end solutions across geospatial value chain including satellite operations, imagery distribution, and more.

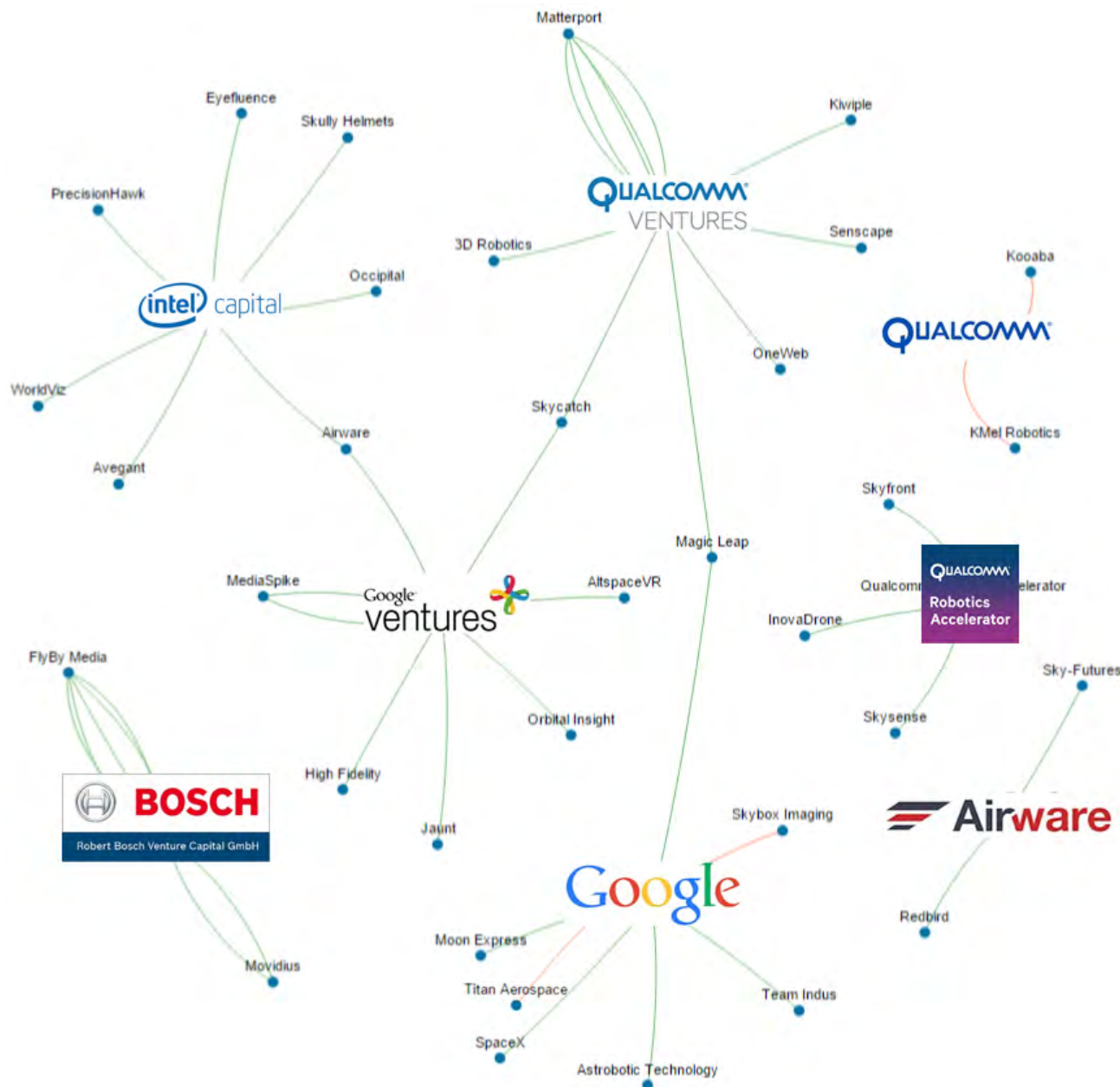
Acquired by Planet Labs, 7/15*
Undisclosed

* This acquisition took place in Q3'15, however was included in report for informational purposes.

** There is some uncertainty due to the reverse merger in Urthecast's valuation at time of IPO. For up to date valuation data the company's ticker is UR:CN.



CORPORATE INVESTMENTS AND ACQUISITIONS



Google & Qualcomm Lead Strategies

As the graph to the left shows, Google and Qualcomm, through both their corporate and venture arms, have been very active in the frontier tech space with multiple investments and acquisitions.

Other corporates visualized include Airware, which has made multiple investments through its recently launched Commercial Drone Fund, as well as Bosch, and Intel Capital.

DJI & Accel Partners (not visualized) recently announced a similar fund to Airware's called the SkyFund.

OTHER NOTABLE STRATEGIC INVESTMENTS

INVESTOR

INVESTMENTS



KONICA MINOLTA



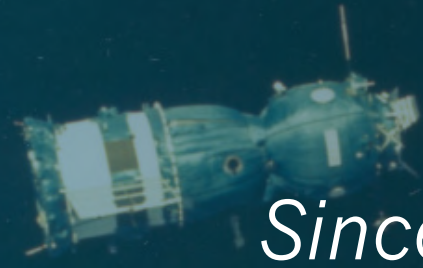
"It's one of the few things I've ever experienced in my life where I came out and said, 'This changes everything. This is a marker of the future.'"

Thomas Tull

*CEO, Legendary Entertainment,
speaking about Magic Leap*

Source: [Fast Company](#)

Image Source: [Gage Skidmore](#)



Since 2014

SPACE

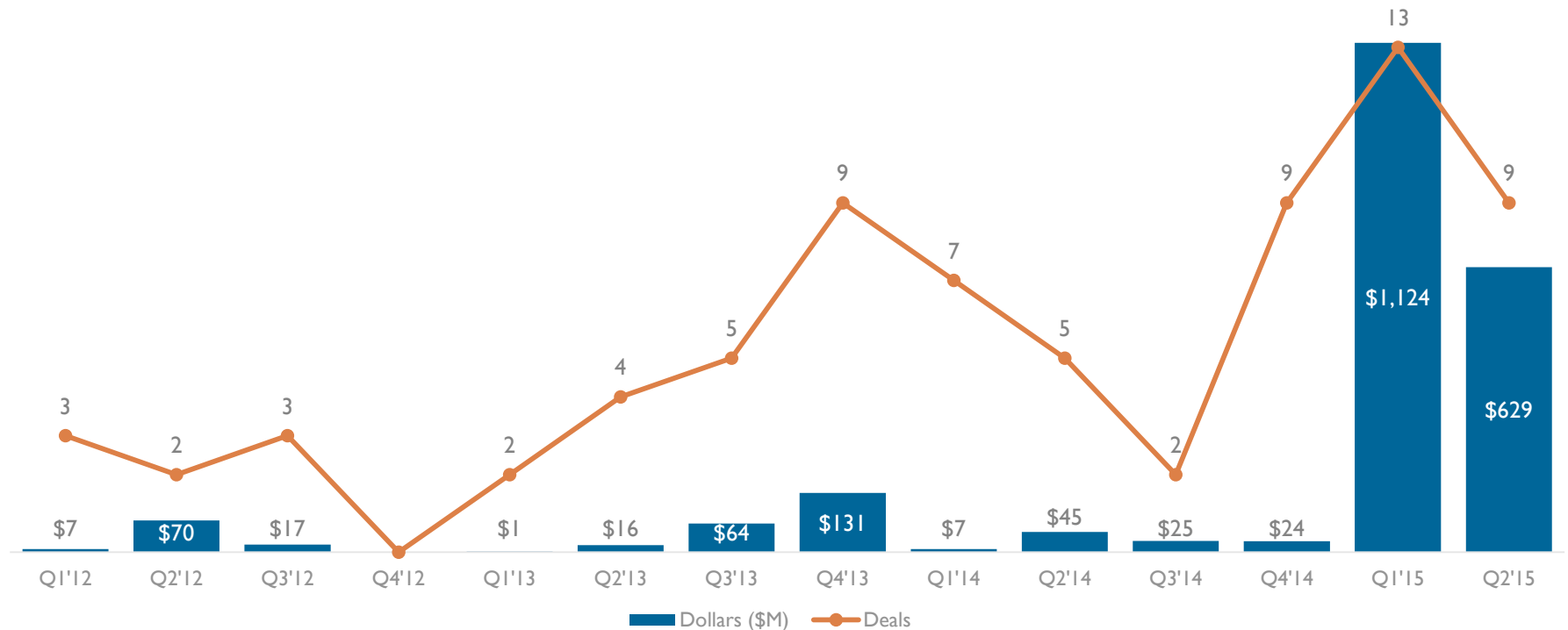
companies have raised more than

\$1.8 billion

SPACEX BUOYS SPACE INVESTMENT ACTIVITY, DEALS REACH MULTI-YEAR HIGH IN Q1'15

Space startups raised \$1.76B in the first half of 2015 as both funding and deal activity have increased in recent quarters. Mega-rounds to SpaceX (\$1B) and OneWeb (\$500M) have buoyed funding totals. Other notable financings in 2015 include Planet Labs' \$70M Series C, which valued the company at \$500M, Mapbox's \$50M Series B, and Spire's \$40M Series B.

SPACE INVESTMENT ACTIVITY *Q1'12 - Q2'15*



LUX CAPITAL, RRE VENTURES, BESSEMER ARE MOST ACTIVE VCS IN SPACE STARTUPS

Lux Capital, RRE Ventures, and Bessemer Venture Partners have been the 3 most active VCs in space startups since 2012. Both Bessemer and RRE invested in Spire, a company hoping to put over 50 small satellites in space over the next few years to achieve daily imaging of earth. Bessemer also invested in Skybox Imaging, which was acquired for \$500M by Google in 2014.

MOST ACTIVE VCS IN SPACE

Unique Companies, Q1'12 - Q2'15

RANK	INVESTOR	SELECT INVESTMENTS
1	Lux Capital	Planet Labs, Orbital Insight
1	RRE Ventures	Spaceflight Industries, Spire
1	Bessemer Venture Partners	Spire, Skybox Imaging
2	Khosla Ventures	Rocket Lab, Skybox Imaging
2	Promus Ventures	Spire, Mapbox
2	Founders Fund	Planet Labs, Accion Systems

THE MOST WELL-FUNDED VC-BACKED SPACE STARTUPS



Designs, manufactures, and launches advanced rockets and spacecrafts.

Total Funding
\$1.19 billion



Plans to put more than 600 satellites in space to enable global internet access.

Total Funding
\$500 million



Collects/analyzes data about the earth via agile satellite constellation development.

Total Funding
\$196.1 million



Develops a new form of satellite antenna to connect mobile networks and communication satellites.

Total Funding
\$82 million




Collects/analyzes data via satellite constellations related to global trade, weather, and more.

Total Funding
\$69.4 million



Map data, design, and publishing platform.

Total Funding
\$60.6 million



“Compared to other industries, I have never seen such an enormous margin for improvement. There’s this canonical thing about a startup needing to pitch a 10X improvement to be a worthwhile investment. You rarely see an entrepreneur pitch a 100X improvement. But in space we’ve seen 1,000X, and really we’ve seen 10,000X.”

- Steve Jurvetson
Partner, Draper Fisher Jurvetson

Source: [Fortune](#)

SATELLITES AND ROCKET TECH ARE LEADING CATEGORIES

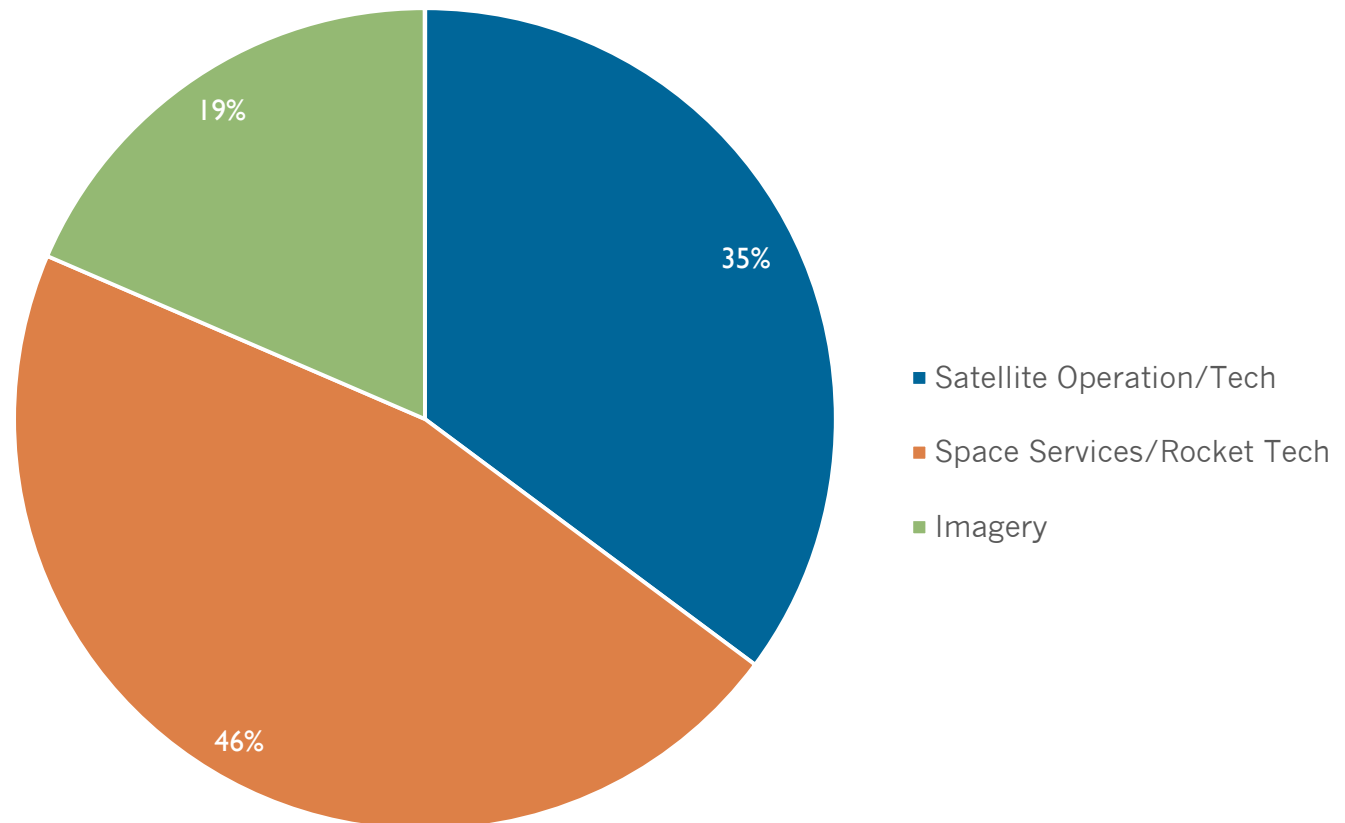
Of all space companies funded since 2012, 46% have been focused on space services or rocket tech. These include companies like SpaceX, which is developing reusable rocket technology, as well space debris cleanup startup Astroscale.

Satellite startups accounted for 35% of the funded companies, which includes multiple startups aiming to capture images of earth via satellites on a daily basis, such as Planet Labs, and Spire.

Imagery startups, like Orbital Insight and Windward, which utilize satellite imagery to derive unique insights about earth, accounted for 19% of backed companies.

FUNDED SPACE COMPANIES BY FOCUS

As % of all funded companies, Q1'12 - Q2'15



SELECT SPACE STARTUPS BY SEGMENT

SATELLITES



SPACE SERVICES/ROCKET TECH



IMAGERY



SPACE STARTUPS: LAUNCHES, AMBITIONS, AND SETBACKS

Startups gathering and analyzing data from space utilize emerging satellite imagery technology to provide unique insights to a wide range of industries, including maritime, weather, wildlife conservation, and economic indicators.

The surge in innovation has not come without setbacks. Recently a launch failure by SpaceX negatively impacted many satellite startups, which utilize SpaceX rockets as launch vehicles to put satellites into orbit.

PARTNERSHIPS & USE CASES	BROADER TRENDS
Startups Mine Market-Moving Data From Fields, Parking Lots Even Shadows <small>Firms Seek Insights on Business Outlook for Investors Seeking an Edge</small>	Members of Congress raise questions about SpaceX investigation in wake of explosion
Forest protection is about to get a major boost from satellites and AI	What SpaceX's launch failure means for the private space industry
Big Data Is Stopping Maritime Pirates ... From Space	Cutting the costs of a human return to the Moon
Spire plans to use tiny satellites for more accurate weather forecasts	Earth's Orbit Is A Junkyard, But There Is A Clean-Up Plan
How much oil is Iran storing? Windward is watching	The Potential \$100 Trillion Market For Space Mining

Industry Analysis: Nanosat/microsat Imagery Enablement

Nanosatellites are significantly smaller and affordable satellites that many of today's space technology companies are utilizing. Cubesats, which led the nanosat movement, emerged in 1999 out of Cal Poly San Luis Obispo and Stanford in an effort to get aerospace companies to launch low-cost satellites for research. Since then, multiple startups have raised financing to deploy larger constellations of these satellites into low-earth orbit in an effort to upend existing players such as Airbus and DigitalGlobe in earth imagery. These startups, such as Planet Labs and Spire, look to utilize the lower-cost, larger constellations to gather imagery of the earth at a much higher rate (called the "revisit rate"), with eventual goals to have daily or even multiple daily satellite images of any given location on earth.

The use-cases borne out of this unprecedented cost efficiency and agile development when it comes to satellite imagery frequency are abundant. However, the imagery analysis often lays in the hands of companies like Orbital Insight and Windward, which utilize deep learning to analyze large datasets.

The addressable markets span both public and private sectors. These include financial institutions, which analyze construction, parking lot traffic, crop health for commodity trading, and more, to national weather services, which can utilize sensors on the nanosats to gather better data and provide a clearer picture of weather patterns, to governments, which can analyze imagery to detect deforestation and environmental impact of areas over time.

Image credit: [Planet Labs](#)

Market Sizing

2000+

Nano/microsats projected to launch
from 2014 to 2020

\$5B

Projected global commercial satellite im-
agery market in 2019

56%

of nanosats will be for commercial use
through 2016

Source: [Spaceworks](#), [The Economist](#), [Transparency Market Research](#)

NANOSATELLITE/MICROSATELLITE IMAGERY RELATED CORPORATES



Diversified aerospace and defense company with a small focus on larger commercial satellite development

Market Cap
\$98.2 billion

HQ: Chicago, IL



Diversified aerospace and defense company which has delivered more than 300 observation satellites for commercial use

Market Cap
\$66.2 billion

HQ: Bethesda, MD



Diversified aerospace company which builds a range of satellites, including the 900 satellite OneWeb constellation

Market Cap
\$54.6 billion

HQ: Blagnac, France



Provides launch services to largely smaller telecommunication satellites

Market Cap
\$4.8 billion

HQ: Dulles, VA



Leading American provider of high-resolution satellite imagery including powering Google Maps

Market Cap
\$1.8 billion

HQ: Longmont, CO



Acquired Skybox Imaging, a small satellite company focused on twice-daily imaging of earth

Market Cap
\$465 billion

HQ: Mountain View, CA

Since 2014

DRONE

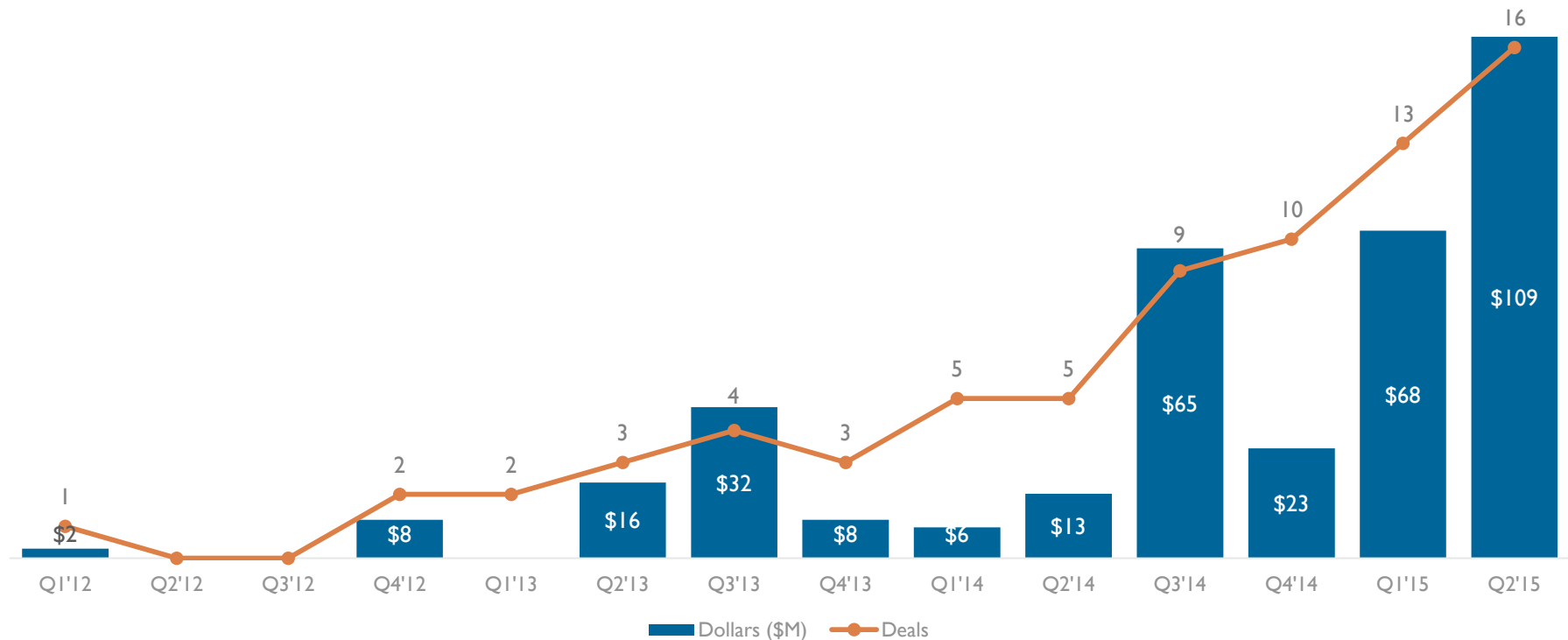
companies have raised

\$285 million

DRONE INVESTMENT ACTIVITY PEAKS IN Q2'15

Drone investment activity has picked up markedly over the past three quarters, reaching an all-time high in Q2'15, with \$109M invested across 16 deals. The funding total was buoyed by the \$75M Series B financing to DJI Innovations, the largest consumer drone manufacturer in the world. Other notable deals include 3D Robotics' \$14M Series C-II, and Squadrone Systems' \$5M Series A.

DRONE INVESTMENT ACTIVITY *Q1'12 - Q2'15*



NUMBER OF VCS WITH MULTIPLE DRONE BETS IS STILL FAIRLY LOW

Few VCs have made multiple bets on drones thus far. The 9 VCs below are those with multiple unique company investments in the drone ecosystem. Notably 5 of the 9 VCs have invested in Airware, the developer of an operating system for drones.

MOST ACTIVE VCS IN DRONES

Unique Companies, Q1'12 - Q2'15

INVESTOR	INVESTOR
Promus Ventures	Commercial Drone Fund
Google Ventures	Qualcomm Ventures
Andreessen Horowitz	Draper Associates
Felicis Ventures	Intel Capital
Accel Partners	

THE MOST WELL FUNDED VC-BACKED DRONE STARTUPS



Autonomous drone/UAV manufacturer with a focus on enterprise

Total Funding
\$99 million



Consumer and semi-pro drone manufacturer

Total Funding
\$75 million



Develops autopilots and an operating system for drones/UAVs

Total Funding
\$40.2 million



Enterprise services for capturing data at scale with autonomous drones

Total Funding
\$21.4 million



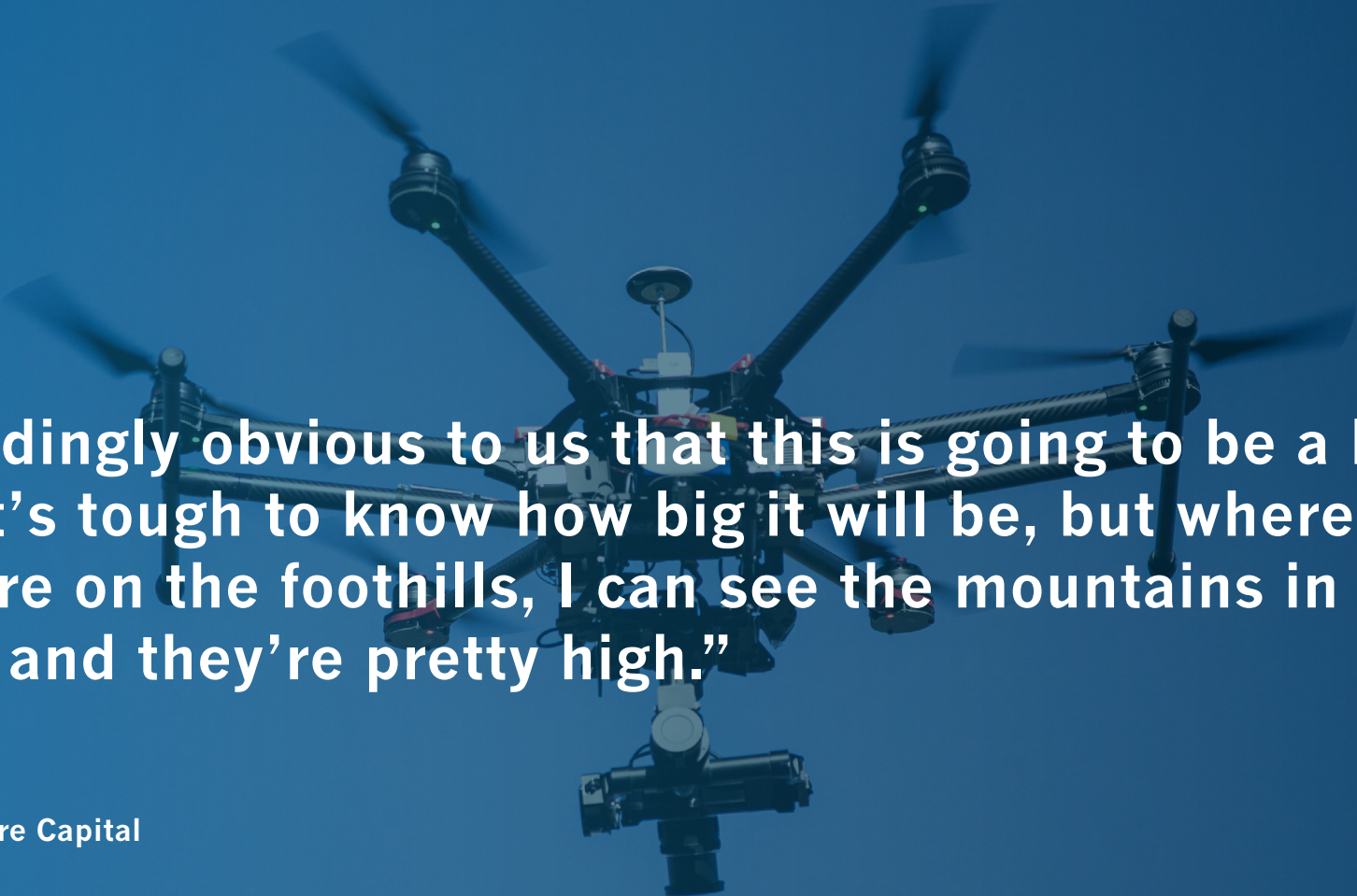
Manufactures multi-rotors and various hardware for drones

Total Funding
\$20 million



Develops tethered drone technology for persistent flight and secure streaming

Total Funding
\$14.9 million



“It’s blindingly obvious to us that this is going to be a big space...It’s tough to know how big it will be, but where I stand here on the foothills, I can see the mountains in the distance and they’re pretty high.”

- John Frankel
Partner, FF Venture Capital

Source: [Bloomberg](#)

HARDWARE, SOFTWARE & SERVICES DOMINATE INFRASTRUCTURE DRONE STARTUPS

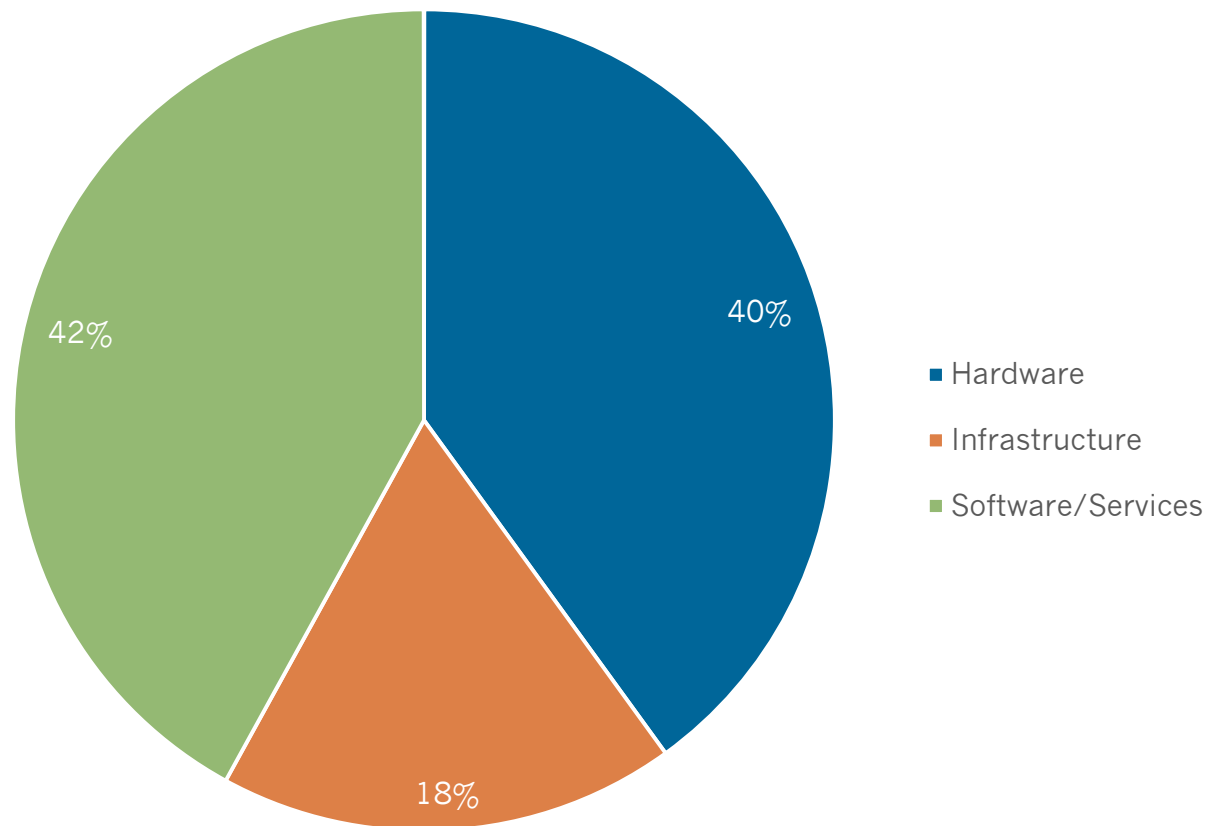
42% of all funded drone startups since 2012 have been focused on software/services. This includes “Uber for drones” startups such as Dronebase, as well as more industrial focused companies like Skycatch.

Drone hardware startups were a close second in terms of funded company share at 40%. However, hardware startups have garnered the most investment dollars, as the two most well-funded companies (3D Robotics and DJI) are focused largely on hardware.

Drone startups focused on infrastructure, such as drone defense startups DeDrone and Droneshield, made up just 18% of funded companies since 2012.

FUNDED DRONE COMPANIES BY FOCUS

As % of all funded companies, Q1'12 - Q2'15



SELECT DRONE COMPANIES BY APPLICATION

HARDWARE



SERVICES/SOFTWARE



INFRASTRUCTURE



DRONES MOVING FORWARD: NEWS HEADLINES

Multiple companies have developed innovative partnerships or experimental trials within the drone space. Ranging from military use to agriculture to industrial monitoring, drone utilization currently spans a wide array of industries.

But not all is perfect. A mix of slow regulation of drones in the US, as well as a slew of infrastructure issues still remain. Below are relevant news headlines for each aspect of the emerging drone space.

PARTNERSHIPS & USE CASES

GROWING CONCERNS

CyPhy Works Lands Military Deal For “Pocket Drone”	Soaring investment and lagging legislation — it’s a Wild West for drones
Matternet To Test The First Real Drone Delivery System In Switzerland	Do we need to put drones on a tighter leash?
How DroneDeploy’s app is about to make farming more efficient	Next Step for Drones: Defending Against Them <small>Antidrone defense systems are a rising new business as military, aviation concerns mount</small>
Workmode: Start-up creates Uber-like drone service	Tech Firms Collaborating to Make Drone Air Traffic Safe
Amazon wants a special air zone for its fancy delivery drones	2 Airliners Have 100-Foot Near Miss With Drone Above New York

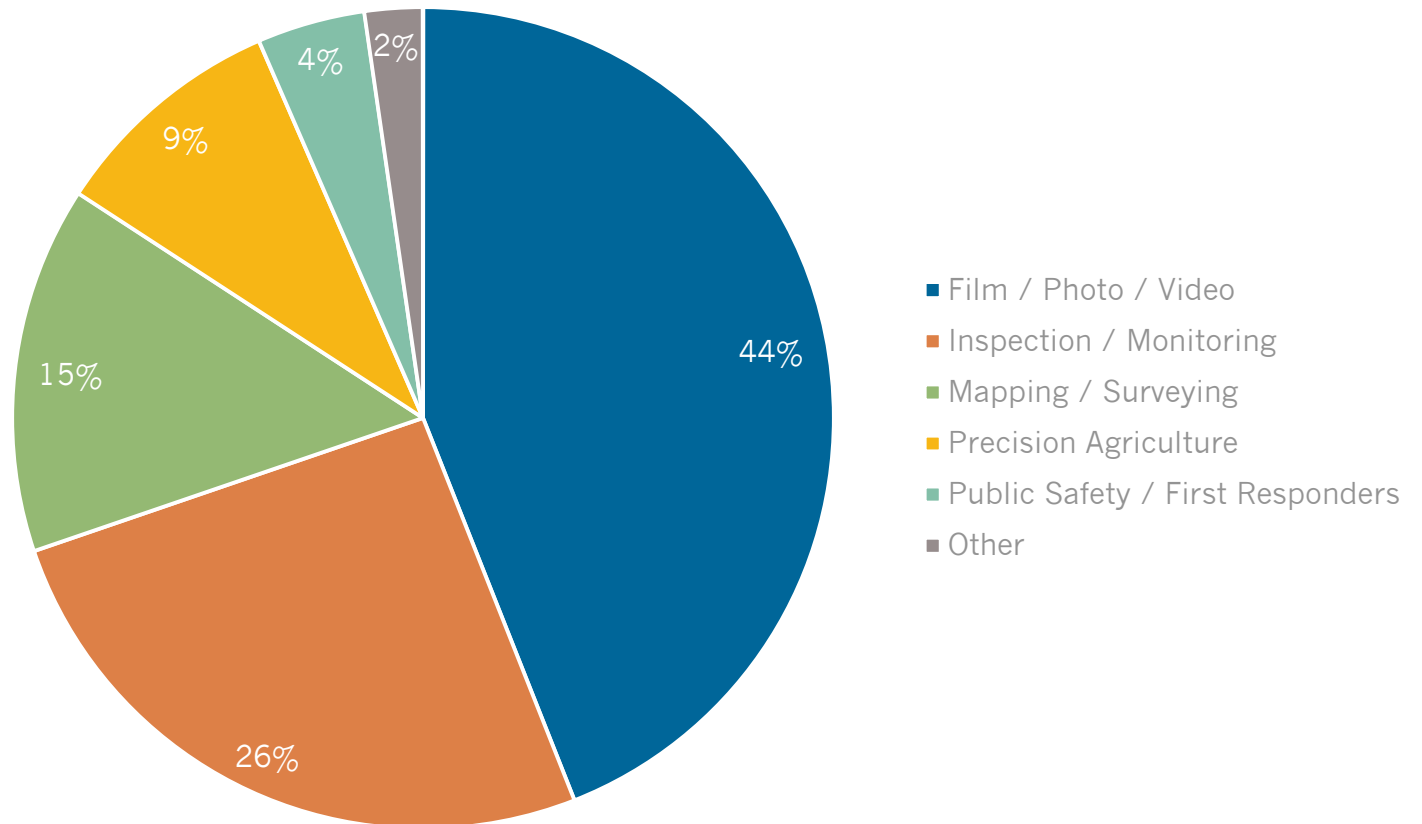
FAA SECTION 333 EXEMPTIONS FOR DRONES

The FAA Section 333 Exemption process allows drone operators to legally utilize drones for commercial purposes. Thus far there has been a relatively slow ramp-up for issuances, however in recent months the FAA has increased the issuance rate.

As of 07/2015, 44% of all Section 333 exemptions have gone to for Film/Photo/Video use-cases. This includes companies that are utilizing drones for movies, as well as applications for real estate agents and artists, among other things.

Inspection and Monitoring has seen the second highest issuance rate, at 26%, while Mapping and Surveying for land and commercial construction, rounds out the top 3 at 15%.

FAA DRONE EXEMPTIONS BY USE-CASE *as of 07/2015*



Industry Analysis: Precision Agriculture

Drones have been combined with other industrial IoT products in a new wave of precision agriculture to increase efficiency of crop yields, mitigate a variety of crop risks, and subsequently lower the costs of key agriculture inputs including water and fertilizer.

Drones' ability to get closer to the land than planes, as well as a low regulatory barrier due to private land and visual line of sight restrictions (if non-commercial) has led to fast adoption of drone technology related to precision agriculture. In fact, of the 850+ FAA Section 333 exemptions (the exemption given for commercial drone use in the US) 81 have been related to precision agriculture, trailing film/video, inspection/monitoring, and mapping/surveying.

The use-cases for drones in precision agriculture largely focus on two areas:

Analysis: Terrain feature detection, estimation of crop yields, and farm surveying/monitoring.

Deployment/Operations: The cost-efficient deployment of fertilizers, precise agricultural machinery routing, and irrigation equipment monitoring.

Market Sizing

2.1M | \$198B | \$2B

Farms in the US

US crops annual cash receipts

Agriculture monitoring market

Source: [Karlsson Project](#), [USDA](#)

PRECISION AGRICULTURE RELATED CORPORATES



Diversified agriculture and genetically engineered seeds

Market Cap
\$48.2 billion

HQ: St. Louis, MO



JOHN DEERE

Agriculture machinery and software manufacturer

Market Cap
\$28.8 billion

HQ: Moline, IL



Agriculture equipment manufacturer

Market Cap
\$4.8 billion

HQ: Duluth, GA



Field management software development through Dupont Pioneer

Market Cap
\$48.8 billion

HQ: Wilmington, DE



Autonomous farm equipment and connected farm software

Market Cap
\$5.1 billion

HQ: Sunnyvale, CA



Precision agriculture deployment and analytics technology

Market Cap
\$702.7 million

HQ: Sioux Falls, SD

Industry Analysis: Drone Delivery

Drones delivery has not yet had widespread adoption, however the advantages are clear. With current technology, drones would allow businesses to deliver products to customers without utilizing a driver, and do so in a near instantaneous fashion. As consumer behavior shifts towards “on-demand”, this trend only looks to accelerate as multiple startups and corporates look to lower fulfillment times to same-day or sooner.

Drones currently have the ability to carry smaller payloads of up to 5 lbs (which Amazon claims covers ~86% of all packages it ships), over distances of 5-10 miles, while utilizing GPS and awareness sensors to navigate between waypoints. Corporates including Amazon, Domino's, Google, and startups like Matternet have run pilot tests in the logistics space.

Outside of the US, developing nations' difficult infrastructure and lowered government restrictions make for an even more readily available opportunity, as prohibitive roads and traffic are removed as factors for delivery over distances. In fact, China's SF Express presently delivers between 500-1000 packages per day via drone.

As drone technology advances, expect to hear more about drone-based delivery, despite government regulation continuing to slow movement toward a drone-riddled sky in the US.

Image Source: [Frankhöffner](#)

Market Sizing

0

FAA Approvals for commercial drone delivery

\$97B

US Courier & Local Delivery Market

7.5%

Drone delivery cost as % of traditional ground transportation delivery

Source: IBIS , John Swope

DRONE DELIVERY RELATED CORPORATES



Largest global package delivery company.

Market Cap
\$92 billion

HQ: Atlanta, GA



Second largest package delivery company

Market Cap
\$46.7 billion

HQ: Memphis, TN



Diversified courier and logistics

Market Cap
\$34.6 billion*

HQ: Bonn, Germany



Has expressed interest in drone delivery tech with Project Wing

Market Cap
\$465 billion

HQ: Mountain View, CA



Multi-product e-commerce with a focus on drone delivery through Prime Air

Market Cap
\$249 billion

HQ: Seattle, WA



Diversified Asian technology entity with heavy focus on delivery and logistics related to e-commerce

Market Cap
\$185.4 billion

HQ: Hangzhou, China

* market cap reflects Deutsche Post AG, the parent company of DHL

Since 2014

AR/VR

companies have raised

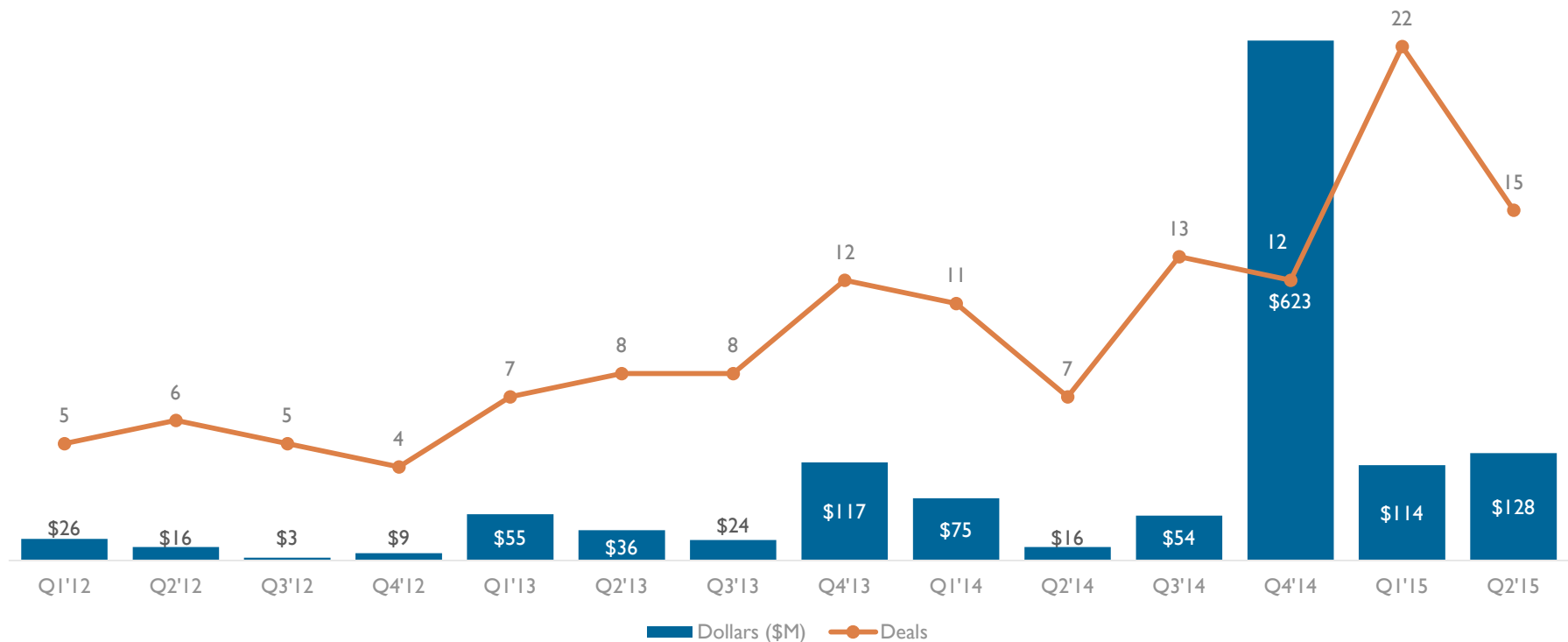
\$1.0 billion

Image credit: [Microsoft Sweden](#)

AR/VR DEALS REACH NEW HIGH IN Q1'15, ABOVE 10 DEALS 6 OF LAST 7 QUARTERS

After Magic Leap's \$542M financing drove Q4'14 funding to \$623M across 12 deals, AR/VR investment activity reached a record high in Q1'15 with 22 deals raising \$114M. Funding increased slightly in Q2'15 on 7 fewer deals, however the 15 deals still meant that 6 of the last 7 quarters had 10+ AR/VR deals. While the bulk of the deals remain at the early-stage, there were over 5 \$10M+ financings in the first half of 2015.

AR/VR INVESTMENT ACTIVITY Q1'12 - Q2'15



THE MOST WELL FUNDED VC-BACKED AR/VR STARTUPS



Developer of augmented reality technology

Total Funding
\$592 million



Visual sensing for connected devices and augmented reality

Total Funding
\$86.5 million



Develops a system for generating 3D digital models of physical spaces.

Total Funding
\$58.3 million



Augmented reality visual browser for brands and publishers

Total Funding
\$47.2 million



3D motion control and sensing hardware and software

Total Funding
\$44.1 million



Cinematic VR experience via proprietary hardware and software

Total Funding
\$35.4 million

ROTHENBERG VENTURES IS MOST ACTIVE VC IN AR/VR

Rothenberg Ventures has been the most active VC in AR/VR startups since 2012. The early-stage fund's investments include AltspaceVR, Matterport, and EmergentVR, among others. Rothenberg Ventures also operates the River program, which is focused on AR/VR opportunities. Google Ventures, Andreessen Horowitz, and Intel Capital all placed second in activity, with both GV and A16Z investing in MediaSpike, a VR native advertising company.

MOST ACTIVE VCs IN AR/VR

Unique Companies, Q1'12 - Q2'15

RANK	INVESTOR	RANK	INVESTOR
1	Rothenberg Ventures	5	Qualcomm Ventures
2	Google Ventures	5	High-Tech Gruenderfonds
2	Andreessen Horowitz	5	Formation 8
2	Intel Capital		

MAJORITY OF FUNDED AR/VR COMPANIES FOCUSED ON HARDWARE & COMMERCIAL APPLICATIONS

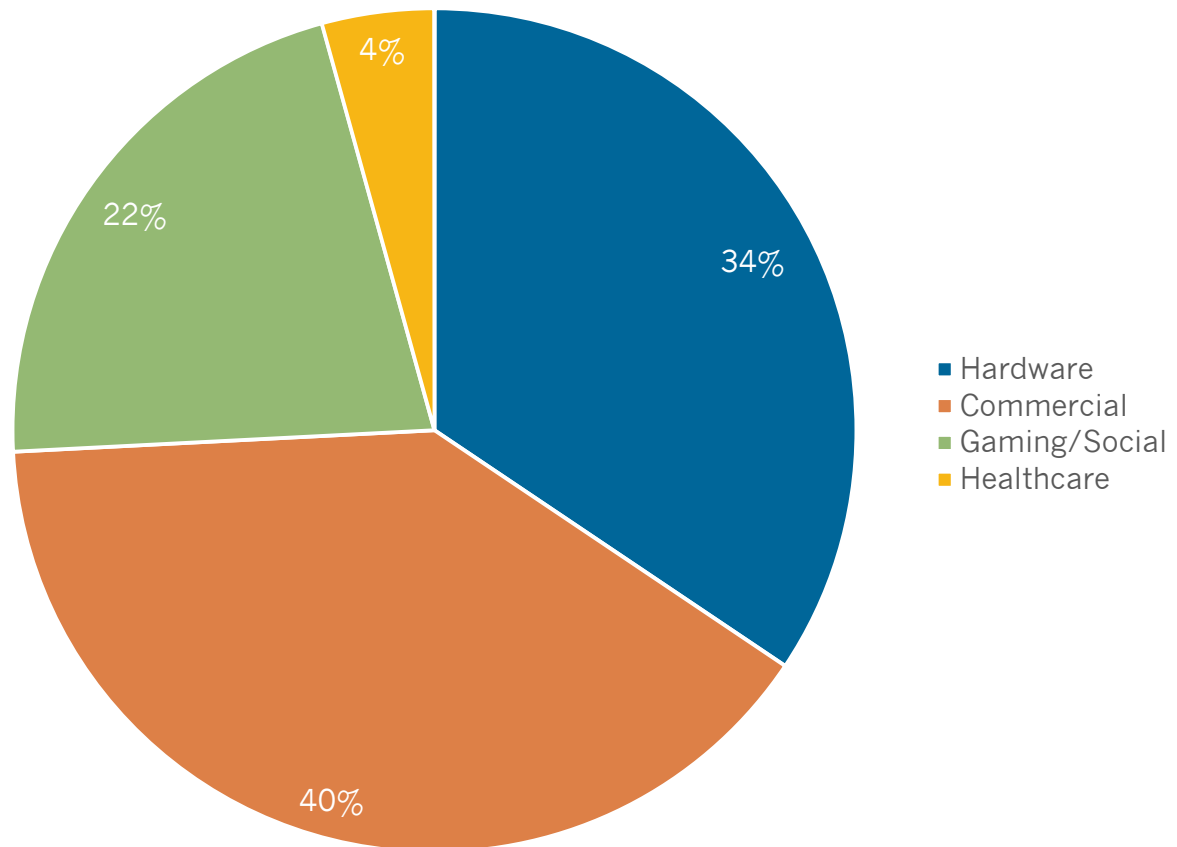
AR/VR startups with a focus on commercial use-cases accounted for 40% of all funded startups since 2012. These include Blippar, which enables augmented reality for brands and publishers, as well as Augment, which utilizes AR for sales and e-commerce.

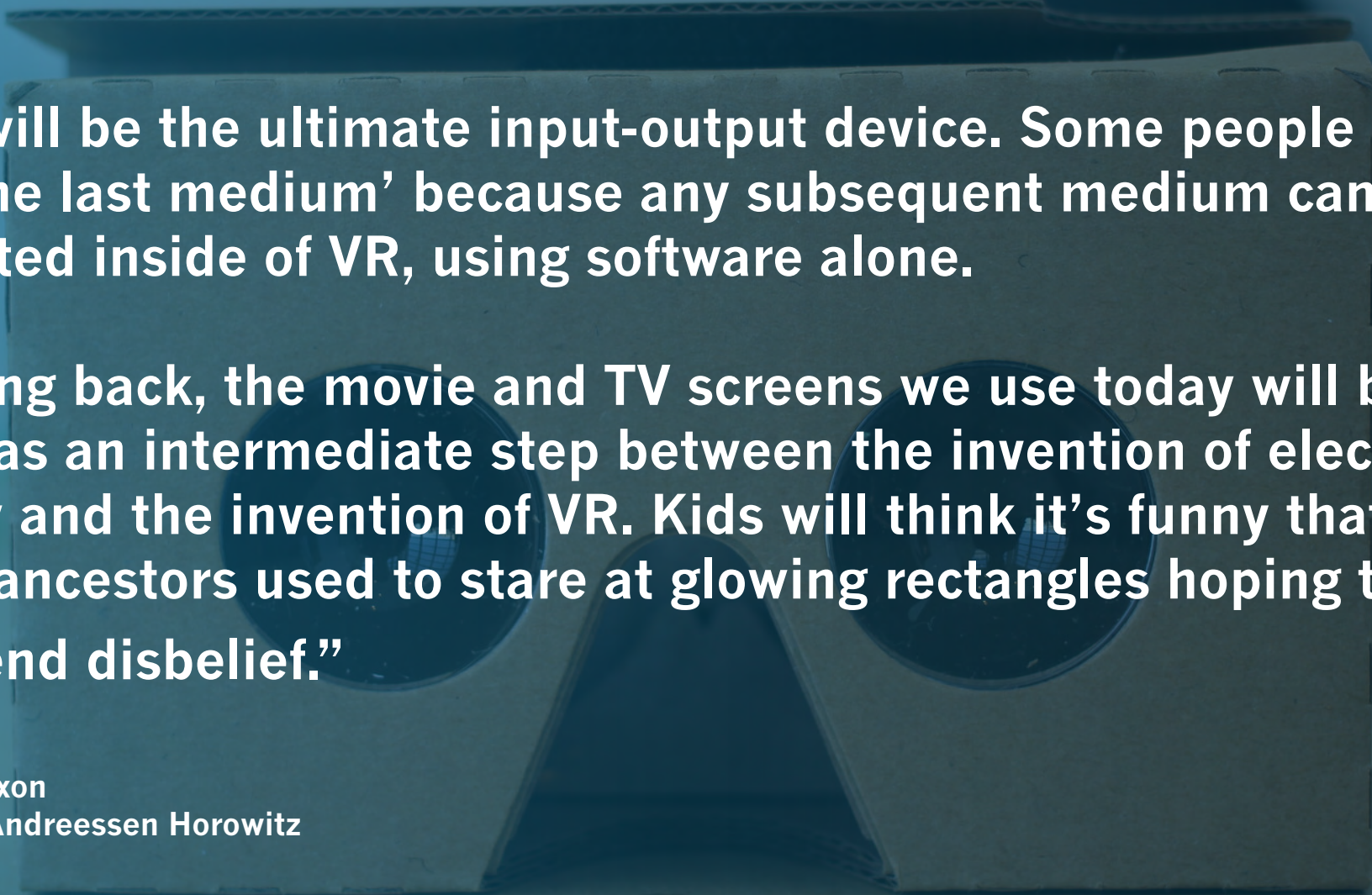
Hardware, which includes multiple companies developing hardware platforms for AR/VR applications, saw the second highest company share at 34%.

Gaming/Social was third, while a few startups such as Deepstream VR and LensAR are focused on healthcare applications within the AR/VR realm.

FUNDED AR/VR COMPANIES BY FOCUS

As % of all funded companies, Q1'12 - Q2'15





“VR will be the ultimate input-output device. Some people call VR ‘the last medium’ because any subsequent medium can be invented inside of VR, using software alone.

Looking back, the movie and TV screens we use today will be seen as an intermediate step between the invention of electricity and the invention of VR. Kids will think it’s funny that their ancestors used to stare at glowing rectangles hoping to suspend disbelief.”

**- Chris Dixon
Partner, Andreessen Horowitz**

Source: Cdixon.org

SELECT COMPANIES BY AR/VR APPLICATION

HARDWARE



COMMERCIAL



GAMING/SOCIAL



AR/VR MOVING FORWARD: NEWS HEADLINES

VR is still at its earliest stages in terms of commercial applications, however multiple partnerships have resulted in experiments with the emerging technology. These include sports teams, healthcare professionals, and even astronauts.

In addition to the commercial applications of today, a wide range of future implementations are in development. From virtual travel to government implementations to long-term health simulations, AR/VR implementation could fundamentally change human behavior.

PARTNERSHIPS & USE-CASES

Astronauts Test Virtual-Reality Headset for Space On Ocean Floor

Unreal: Virtual reality is changing how college football teams train, recruit

Oculus debuts virtual reality film 'Henry'

Singapore just made augmented reality stamps a real thing

LENSAR Partners With Precision Eye Services to Offer Full Service Mobile Laser Cataract Solution

BROADER TRENDS

Jaunt VR Wants to (Virtually) Change the Way We Travel

PAIRED WITH AI AND VR, GOOGLE EARTH WILL CHANGE THE PLANET

Virtual Reality Simulations Offer Potential for Breakthrough in Preventive Care

Simulations show people the long-term effects of current behavior, like drinking soda. It's a powerful message.

AUGMENTED REALITY COMES TO CITY GOVERNMENT

Are virtual reality headsets bad for our eyes?

A person with long, wavy hair is wearing a VR headset. The headset is black and has a large screen in front of the eyes. The person is looking down at the headset. The background is a solid blue color.

Industry Analysis: AR/VR Gaming

Augmented reality and virtual reality are anticipated to have a dramatic impact on the gaming sector in the next 5-10 years. Large corporates ranging from Facebook, with its \$2B acquisition of VR hardware developer Oculus VR, to Microsoft and Sony with AR/VR headsets of their own, to Samsung and Google with their low-cost cardboard headsets designed to work with high-end mobile phones, are positioning themselves within the space.

Alternatively, software providers including game studios such as Crytek and Ubisoft look to benefit from a new, more immersive gaming experience and surging adoption of hardware. Emerging use-cases within gaming include adaptations of adult-focused open-world games and first-person shooters, as well as the teen and young adult-focused social gaming where the role of avatars and digital goods will be increasingly important.

Image credit: [Sergey Galyonkin](#)

Market Sizing

76% | \$74B | \$225M

of VR content related to gaming

Overall gaming market

VR Gaming Market

Source: [Superdata Research](#)

Image Source: [Leonard Low](#)

AR/VR GAMING RELATED CORPORATES



Largest exclusive American developer and distributor of video games including EA Sports

Market Cap
\$22.7 billion

HQ: Redwood City, CA



Game developer and publisher including Call of Duty, World of Warcraft, Destiny, and Diablo

Market Cap
\$20.91 billion

HQ: Santa Monica, CA



Video game developer responsible for Half Life and Dota 2, as well as digital distribution platform Steam

Market Cap
\$3 billion (estimated)

HQ: Bellevue, WA



Diversified investment holding company with largest gaming sales in the world including video game publisher Riot Games

Market Cap // Gaming Revenue
\$171 billion // \$7.2 billion

HQ: Shenzhen, China



Owns Sony Computer Entertainment which produces the Playstation line of consoles and publishes video games across console and mobile platforms

Market Cap // Gaming Revenue
\$34 billion // \$6 billion

HQ: Tokyo, Japan



Owns Microsoft Studios which develops and publishes games for the Xbox, Windows, and Steam platforms including Halo

Market Cap // Gaming Revenue
\$375.9 billion // \$5 billion

HQ: Redmond, WA



METHODOLOGY - WHAT'S INCLUDED? WHAT'S NOT?

We encourage you to review the methodology and definitions employed by us to better understand the numbers presented in this report. If you have any questions about our definitions or methodological principles, we encourage you to reach out to us directly.

WHAT IS INCLUDED:

Equity financings into AR/VR, drones, and space startups as of 6/30/2015

- Fundings of only private companies. Funding rounds raised by public companies of any kind on any exchange (including Pink Sheets) are excluded from our numbers even if they received investment by a venture firm(s).
- Only include the investment made in the quarter for tranching investments. If a company does a second closing of its Series B round for \$5M and previously had closed \$2M in a prior quarter, only the \$5M is reflected in our results for that quarter.
- Round #s reflect what has closed –not what is intended. If a company indicates the closing of \$5M out of a desired raise of \$15M, our numbers reflect only the amount which has closed.
- Only verifiable fundings are included. Fundings are verified via (1) various federal & state regulatory filings (2) direct confirmation with firm or investor or (3) press release.

Additionally, if you feel your firm has been under represented please send an email to info@cbinsights.com and we can work together to ensure your firms investment data is up-to-date.

WHAT IS EXCLUDED:

- No contingent funding. If a company receives a commitment for \$20M subject to hitting certain milestones but first gets \$8M, only the \$8M is included in our data.
- No business development/R&D arrangements whether transferable into equity now, later or never. If a company signs a \$300M R&D partnership with a larger corporation, this is not equity financing nor is it from venture capital firms. As a result, it is not included.
- No buyouts, Consolidations and Recapitalizations. All three of these of transaction types are commonly employed by private equity firms and are tracked by CB Insights. However, they are excluded for the purposes of this report.
- No private placements. These investments also known as PIPEs (Private Investment in Public Equities) even if made by a venture capital firm(s)
- No debt/loans of any kind (except convertible notes). Venture debt or any kind of debt/loan issued to emerging, startup companies even if included as an additional part of an equity financing is not included. If a company receives \$3M with \$2M from venture investors and \$1M in debt, only the \$2M is included in these statistics. When dealing with “most well-funded” companies, debt is included.
- No government funding. Grants, loans, equity financings by the federal government, state agencies or public -private partnerships to emerging, startup companies are not included.



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