Amazon Strategy Teardown

AMAZON'S BARRELING INTO PHYSICAL RETAIL, FINANCIAL SERVICES, HEALTHCARE, AND AI-LED COMPUTING

CBINSIGHTS

Seattle-based Amazon is doubling down on AI for AWS and the ecosystem around its AI assistant, Alexa. It's seeking to become the central provider for AI-as-a-service. But it's not leaving retail behind either, running grocery, book, and convenience stores across the US.

Amazon is the exception to nearly every rule in business.

Rising from humble beginnings as a Seattle-based internet bookstore, Amazon has grown into a propulsive force across at least 5 major industries: retail, logistics, consumer technology, cloud computing, and most recently, media & entertainment.

Notably, Amazon's **$13.7B purchase of grocery chain Whole Foods** last year shook up the grocery industry, highlighting Amazon's increasingly deep push into brick-and-mortar retail.

Of course, the company has had its share of missteps — the expensive Fire phone flop comes to mind — but Amazon is also rightly known for strokes of strategic genius that have launched it ahead of competitors in promising new industries.

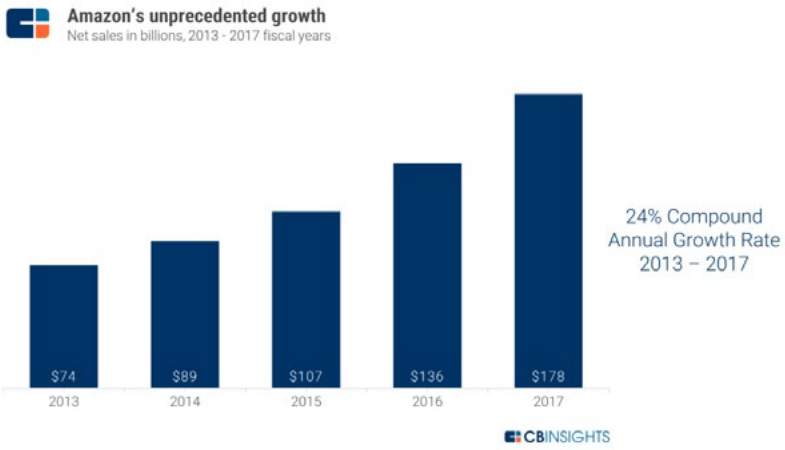
This was the case with the launch of cloud business AWS in the mid-2000s, as well as the more recent consumer hit Amazon found with its Echo device and Alexa AI assistant.

Today's Amazon is far more than just an "everything store;" it's a leader in consumer-facing AI and enterprise cloud services. And its insatiable appetite for new markets means competitors must always be on guard against its next moves.

As the United States' biggest online retailer, the company accounts for about 4% of all retail and about 44% of all e-commerce spending in the US. While the company has been publicly traded for more than two decades, its market capitalization has swelled in recent years.

Wall Street banks like Morgan Stanley **expect** Amazon to continue growing at a rate that no company its size has ever done before, estimating 16% average compound growth in sales through 2025.

Morgan Stanley analysts have also set a **price target** at $2,000/share — or a market capitalization exceeding $1T — within the year. If Amazon is able to satisfy these lofty goals, it will be "the most aggressive expansion of a giant company in the history of modern business."



Understanding the many-headed beast that is Amazon is no easy feat, especially because the company is so much less transparent than many its peers. As the ***New York Times*** reports,

> *"[Amazon] isn't just secretive, the way Apple is, but in a deeper sense, Jeff Bezos' e-commerce and cloud-storage giant is opaque. Amazon rarely explains either its near-term tactical aims or its long-term strategic vision. It values surprise."*

In this report, we dive into that "opaque" strategic vision, from Amazon's investment and M&A history, to analysis of its patents, to initiatives across AI, media, AWS, and more.

Key takeaways

Given Amazon's enormous breadth, we won't be covering every aspect of its business. But highlights from our analysis include:

Amazon is growing more acquisitive. Amazon acquired 10 startups in 2017 — more than any other year on record.

In addition to its purchase of Whole Foods, the company bought **Harvest.ai**, a cybersecurity player, **GameSparks**, a game development platform, and **Blink**, a developer of home security cameras, while also expanding geographically with its acquisition of **Souq.com**, a Middle Eastern e-commerce site.

This acquisition-heavy year, in comparison to the company's generally more conservative M&A history, could mean Amazon is shifting to a more proactive stance to fuel its AI and enterprise ambitions.

Amazon's next pillar is AI. In a letter to shareholders published in April 2017, Bezos wrote extensively about AI and machine learning as a focus when it comes to the company's efforts to maintain its relevance and edge over its competition.

Voice, virtual assistants, and natural language processing will continue to be a focus for Amazon. But the company is also focused on AI-as-a-service, putting the basic tools of AI in the hands of its cloud computing and developer community. More than ever before, Amazon is aspiring to become a platform company.

Amazon is going after healthcare. Its investment into cancer detection company **GRAIL** was a vote of confidence in genomics, which with its massive data and processing needs, will be a major area for computing. In addition, Amazon's recent partnership with JP Morgan and Berkshire Hathaway to provide employees with better health insurance signals broader ambitions to upend traditional healthcare.

Amazon is proactively creating a valuable ecosystem around its Alexa voice computing platform. Currently, the Alexa platform offers software development kits (SDKs) that allow third-party developers to build skills for the AI assistant and other manufacturers of hardware to integrate the Alexa assistant into their products.

Meanwhile, the Alexa Fund & Accelerator's investments point to new interfaces — like gesture controls developed by **Thalmic Labs** — and new hardware category possibilities, as with GPS tracking companies **Mojio** and **TrackR**. In addition, Amazon continues to show interest in the mobile hardware market despite recent failures, with the Alexa Fund participating in a $300M Series B round to mobile phone developer **Essential Products** in Q3'17.

More recently, Amazon has acquired two Alexa-enabled smart home security camera companies: **Blink** (acq Q4'17), which was acquired primarily for the energy-efficient chips used by its wireless security cameras, and **Ring** (acq Q1'18), which was acquired for its success in the smart doorbell market. Ring will continue to operate independently and will complement Amazon's new delivery program, **Amazon Key.**

Lab126, Amazon's secretive R&D lab, is behind the company's recent consumer tech hits. Is this the new Bell Labs or Xerox PARC?

The secretive Silicon Valley-based R&D lab is behind hardware hits like the Echo and Kindle. And although it was also where the ill-fated Fire phone was developed, the lab is an often under-appreciated example of Amazon's internal dedication to innovation.

Amazon aims to grow market share in physical retail and CPG, as well as consumer goods in general. The company operates its own shoe line (**The Fix**) and apparel brands (**Ella Moon**, **Good Threads**, **Paris Sunday**) as well as consumer goods grouped under its AmazonBasics label.

Amazon has also begun opening brick & mortar bookstores and recently launched Amazon Go, its cashier-less convenience store, with plans to expand the stores nationwide.

But Amazon's largest acquisition to date, the $13.7B purchase of Whole Foods, is the company's most aggressive expansion into the grocery market and will introduce new opportunities for hyper-local distribution. Since the Whole Foods acquisition, Amazon has also started a restaurant delivery service that offers free delivery to Prime members.

Amazon's search for its second US headquarters highlights the company's economic muscle. Cities have aggressively competed to attract Amazon after the company announced a search for a city with the talent and entrepreneurial streak to host its second US headquarters.

(Notably, Amazon also maintains a European Headquarters in Luxembourg, which is said to help the company avoid billions in federal taxes to the US government).

The selected city will reap 50,000 new jobs and $4B in total investment. Rumors have circulated for months as to which city Amazon will call (its second) home. Austin, Boston, Denver, Fairfax, and Raleigh are all popular, while **Atlanta is the favorite** among CB Insights' **newsletter** readers.

Table of contents

1 Background
- History & funding
- The three pillars
- Structure & hiring

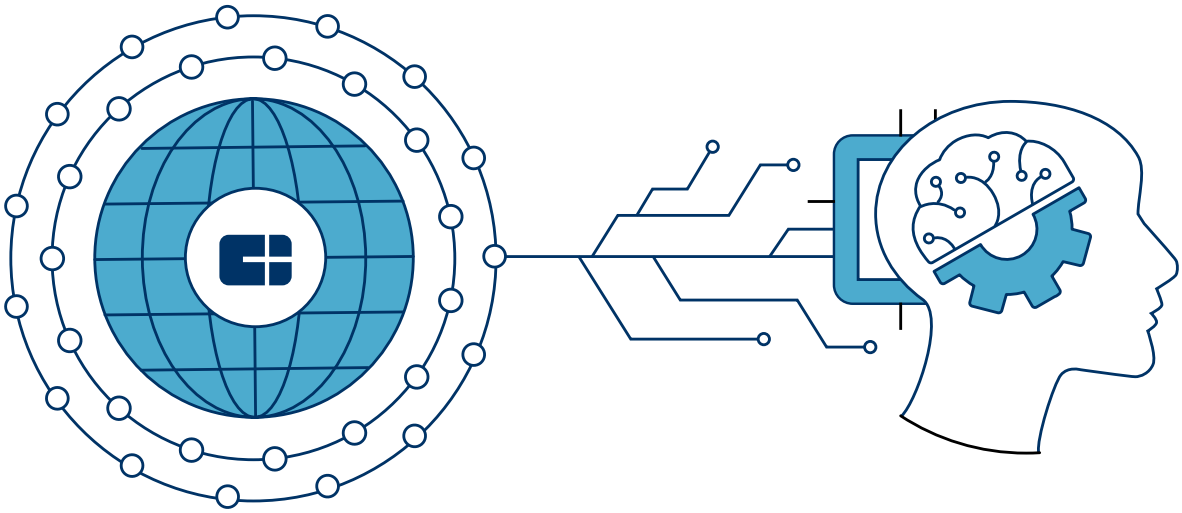
2 Acquisitions
- Acquisition activity is on the rise
- Largest acquisitions
- Acquisition trends

3 Investments
- Alexa Fund & Accelerator
- Amazon corporate

4 Patent Data Analysis

5 Amazon Initiatives by Sector
- Core business in e-commerce & retail
- Transportation & logistics
- AI & voice
- AWS & enterprise cloud
- Media & advertising
- Hardware & devices
- Other new business

6 Closing words



At CB Insights, we believe the most complex strategic business questions are best answered with facts.

We are a machine intelligence company that synthesizes, analyzes and visualizes millions of documents to give our clients fast, fact-based insights.

From Cisco to Citi to Castrol to IBM and hundreds of others, we give companies the power to make better decisions, take control of their own future—and capitalize on change.

WHERE IS ALL THIS DATA FROM?

The CB Insights platform has the underlying data included in this report

CLICK HERE TO SIGN UP FOR FREE

"We use CB Insights to find emerging trends and interesting companies that might signal a shift in technology or require us to reallocate resources."

Beti Cung,
CORPORATE STRATEGY, MICROSOFT

Microsoft

TRUSTED BY THE WORLD'S LEADING COMPANIES

citi IBM GE BARRICK Castrol
SEQUOIA DASSAULT SYSTEMES CISCO salesforce

1 Background

HISTORY & FUNDING

Jeff Bezos, the company's founder and longtime CEO, first hatched the idea for Amazon while working on Wall Street at the hedge fund and tech private equity group D. E. Shaw & Co.

For a while, Amazon was a bootstrapped internet bookstore, funded by Bezos' money and contributions from friends and family. In 1995, Bezos **raised** nearly $1M in small checks from 20+ local angels, with a typical check size of $30K – $50K. Among those angels, Nick Hanauer, Eric Dillon, and Tom Alberg (of Madrona Venture Group) were brought on as company advisors.

In 1996 Bezos sought outside investment from John Doerr of Kleiner Perkins Caufield & Byers. In Amazon's only round before IPO, KPCB invested $8M at a $60M valuation for a 13% stake. In 1997, Amazon went public at a $382M valuation.

Just over twenty years later, as of February 2018, Amazon's **stock** price is up over 88,000%, while its market capitalization hovers just over $735B.

Over the past two decades, the Seattle-based company built an e-commerce-centric business that now appears to be at an inflection point.

THE THREE PILLARS

In a 2016 interview, Bezos said Amazon rests on 3 pillars:

1. **Amazon Prime,** which offers membership e-commerce bundled with elite digital media products.
2. **Amazon Web Services,** which leads the tech pack in cloud computing.
3. **Marketplace,** Amazon's third-party seller business.

Bezos has mentioned there are several new pillars in the works, but on the subject of how those will pan out, said to "ask him in 10 years."

Many newer (possibly "pillar") initiatives — such as the Alexa platform for voice-enabled apps — align with Amazon's core e-commerce business and are already beginning to pay dividends by enabling more frictionless commerce. Amazon's customers

can already order and purchase items directly through Alexa, and Prime members can access exclusive discounts and content through the platform.

Success in these newer bets has cracked open new opportunities and established Amazon's position as **the company top executives are most eager to talk about.** At the same time, Amazon must defend and build on its new businesses — something it can only do if it continues to innovate faster than rivals Apple, Facebook, Google, Microsoft, and others.

To see how Amazon is stacking up to its peers, we analyzed the number of times top tech giants were mentioned during earnings calls. Amazon was mentioned nearly 3,000 times in 2017 – more than Facebook, Apple, and Microsoft combined.

The sharp uptick in Amazon mentions highlights how the company's success has begun to rattle companies across industries. In 2017, the companies discussing Amazon were an eclectic mix, ranging from **CVS** and Macy's to Netflix and **Oracle**.

However, the question still remains of whether or not the famously customer-obsessed Amazon can successfully transition to becoming a conglomerate with stakes in vastly divergent business models. Amazon's newest offering with AWS is a business-to-business product, as are many of its newer tools and services, like voice and AI-as-a-Service.

STRUCTURE & HIRING

Presently, Amazon is comprised of over 100 business entities held across the world, many of which are affiliates of its

e-commerce and media businesses. Some subsidiaries — many of which are the product of acquisitions — focus on specific categories, like Audible in audiobooks, Whole Foods in groceries, or Zappos in shoes.

Among these, Amazon has separate retail websites for the United States, the United Kingdom and Ireland, France, Canada, Germany, Italy, Spain, the Netherlands, Australia, Brazil, Japan, China, India, and Mexico.

Across these 100 worldwide business entities, Amazon collectively employs approximately 560,000 people — nearing the collective population of Wyoming.

Despite recent job cuts, which are rare for the company, Amazon claimed to have hired about 130,000 new employees in 2017, excluding employees of Whole Foods. The company also plans to ramp up hiring in the future, especially with imminent plans for HQ2.

As of February 2018, Amazon has over 13,200 current job openings. AWS is the biggest area Amazon is scaling up: with more than 5700 job openings, AWS accounts for over 43% of all the open listings (compared to 33% a year ago).

Fulfillment & Operations is the next-largest hiring area, representing nearly 13% of open positions (down from 19% a year ago). Other notable hiring areas are the Alexa Team, with more than 1130 jobs (9% of current open positions, 5% a year ago) and the Amazon Devices team, which includes the recommendation algorithm team MAKO, which accounts for over 5% of job listings (4.5% a year ago).

While there are approximately 4,000 fewer job openings than there were a year ago, this could be attributed to a growing pool of quality candidates and improved retention for the company.

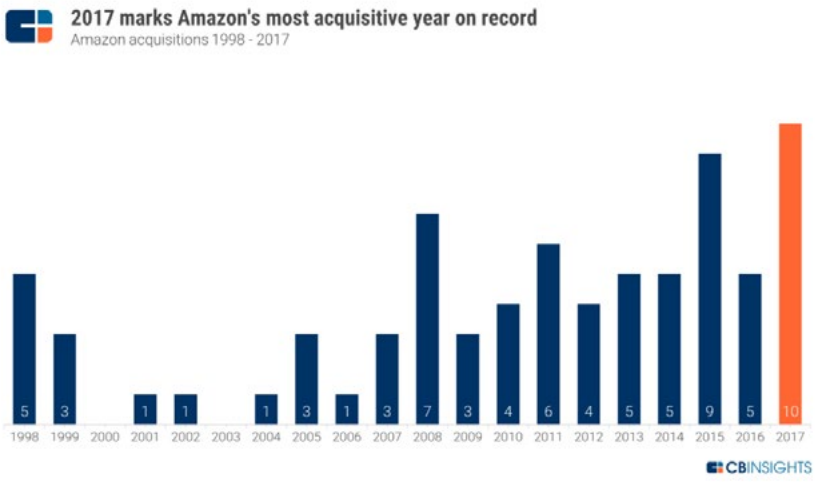
2

Acquisitions

Amazon has earned a reputation as a conservative M&A player, but now the tide may be turning.

ANNUAL ACQUISITION ACTIVITY IS ON THE RISE

With 10 M&A deals in 2017, the company's acquisition tally exceeded the previous record set in 2015, and far outpaced activity in 2016. The uptick in M&A is particularly notable given that the company has rarely had more than 5 deals per year.



Looking at Amazon's annual acquisition history, activity has grown since the dot-com bust, especially in recent years. That said, more acquisitive years are interspersed with years of conservative activity.

While Amazon only **spent $103M on acquisitions in 2016**, M&A spending far exceeded $14B in 2017, which saw the acquisitions of **Whole Foods** ($13.7B) and **Souq.com** ($750M), the so-called "Amazon of the Middle East".

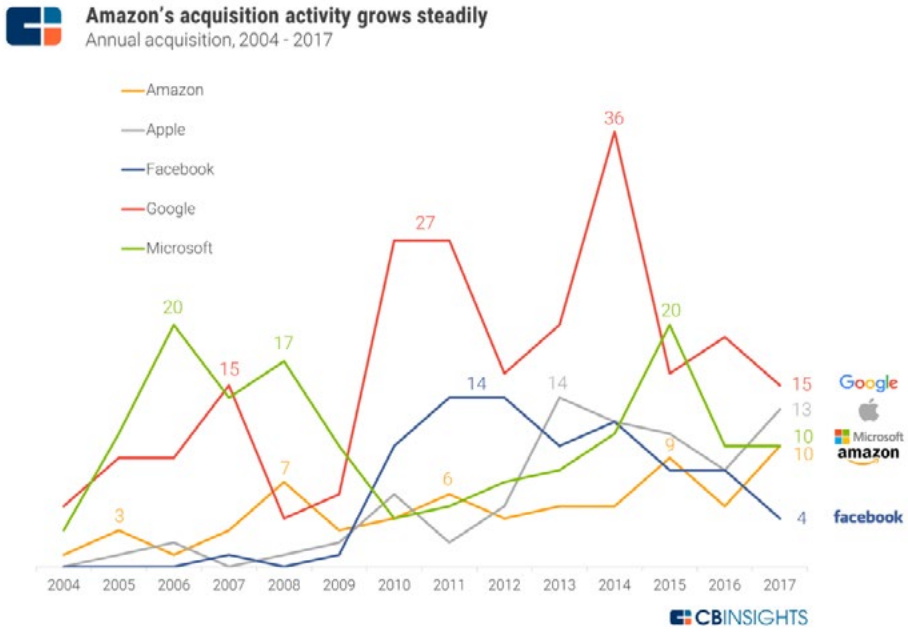
These recent acquisitions could mark a new approach for the company. It's clear that Amazon is willing to spend, but only when it finds the right opportunity. As Nat Burgess, an M&A specialist at TechStrat, **remarked**,

*"**Amazon is a conservative buyer.** They think long term and they don't get seduced by high-flying valuations…. **Amazon is unlikely to overpay for a high-flying, fully baked platform as the basis for the next dreamy business."*

The data backs up this idea that Amazon moves more cautiously in the M&A arena.

Compared to its tech giant peers, Amazon is less acquisitive: its highest years saw 9 and 10 deals (in 2015 and 2017, respectively), while Amazon bought only 5 companies in 2016.

In comparison, Apple has annually completed 8 – 14 M&A deals in recent years, while Facebook, despite trending downward lately, once hit back-to-back years of 14 acquisitions. Google is an outlier in M&A activity, having acquired 36 companies in 2014 — more than 7x Amazon's 2014 total of 5.



LARGEST ACQUISITIONS

What exactly does Amazon look for in a potential acquisition? Jeff Bezos himself outlined what constitutes a must-have "dreamy business" in a 2015 **shareholder letter**:

"A dreamy business offering has at least four characteristics. ***Customers love it, it can grow to very large size, it has strong returns on capital, and it's durable in time*** *— with the potential to endure for decades. When you find one of these, don't just swipe right, get married."*

Notably, many of Amazon's largest deals meet some or all of these criteria, proving to be capable of growth and durability in the long run.

Amazon's largest deals to date include **Whole Foods** ($13.7B, 2017) shoe retailer **Zappos** ($1.2B, 2009), smart doorbell and security camera **Ring** (~$1B, 2018), e-sports streaming site **Twitch** ($970M, 2014), and warehouse robotics maker **Kiva Systems** ($775M, 2012).

Even years later, many of these are still fast-growing, significant parts of the company. Kiva's robots have **helped cut operating expenses** in fulfillment centers by 20%. While Zappos is still reeling from experiments with its org structure, it played a crucial role in building Amazon's retail business and its creation of **private label clothing brands.**

Of course, some of these acquisitions were initially met with skepticism. But despite much of the tech industry being skeptical when Amazon bought Twitch back in 2014, analyst Gene Munster now **expects** the subsidiary to be worth $20B and generating $1B in revenue by 2020.

While it's too early to assess the success or failure of the Whole Foods acquisition, some skeptics wonder whether Amazon's choice to lower Whole Foods' prices will deter shoppers who associate low costs with low quality.

But even so, the company is likely to see a net gain in shoppers, especially with offers like **5% cash back to Prime members and cardholders.**

amazon
June 2017
WHOLE FOODS MARKET
$13.7B
The deal is Amazon's largest ever acquisition, and points to expanding ambition in the grocery and brick-and-mortar space.
WHOLE FOODS MARKET
March
AUDIBLE
$500M
July
ZAPPOS
$1.2B
June
QUIDSI
$500M
Mar
KIVA SYSTEMS
$775M
Sept
TWITCH INTERACTIVE
$970M
Jan
ANNAPURNA LABS
$370M
Mar
SOUQ.COM
$580M
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Audio programs and entertainment
E-commerce footwear and apparel
E-commerce platform
Warehouse robotics maker
Video platform and community for gamers
Software solutions for data centers
DVD rentals & movie downloads / streaming
Video streaming technology
$312M
LOVEFILM INTERNATIONAL
Jan
$296M
AWS ELEMENTAL
Sept

While Amazon's biggest-ticket M&A deals helped it establish itself in new markets and technologies, the recent theme has undoubtedly been about fortifying its AWS offerings.

A number of Amazon's recent acquisitions appear to reinforce its blossoming cloud services business: Irish company **GameSparks** (July 2017) provided a back-end development platform for game developers, Italian startup **NICE** (February 2016) made software for technical computing, **Graphiq** (July 2017) created data-visualization tools for databases, and **Cloud9 IDE** (July 2016) made a collaborative development platform for software developers. All of these help AWS cater to developers and become the go-to place for deploying code.

ACQUISITION TRENDS

Amazon's M&A spree in 2017 indicates a strategic desire to bolster AWS, as well as the company's newer desire to expand overseas.

Expansion into Asia & the Middle East

This geographic expansion effort is exemplified by the recent acquisition of Dubai-based **Souq.com**, mentioned above. The purchase will allow Amazon to expand its e-commerce footprint into Egypt, Saudi Arabia, and the UAE, and comes at a time when Amazon's overseas efforts, particularly in Asia, are beset by intense competition.

Amazon faces a number of well-funded competitors in the region, including **Flipkart** in India (which was launched by two former Amazon employees in 2007) and **Alibaba** in China. Notably, Alibaba has moved into foreign markets through recent acquisitions, including its April 2016 purchase of Singapore-based **Lazada**, which provides e-commerce services throughout Southeast Asia.

Some of Amazon's competitors seem to be banding together as well: in 2017 Flipkart raised approximately $4B from Softbank, Tencent, eBay, and Microsoft, which all compete with Amazon in various ways.

Bolstering AWS

The vast majority of Amazon's 2017 deals fall under the purview of AWS.

Cybersecurity startup **Harvest.ai** was **likely bought** to strengthen cloud offerings, while **Goo Technologies**, a platform that improves

online rendering for graphically sophisticated games, may attract game developers to AWS.

Meanwhile **Body Labs**, which provides 3D body scanning and mapping software, may be used by AR/VR developers as well as by Amazon's internal **Echo Look** team for virtual dressing rooms.

Traditional digital video also makes up a lot of the data stored on AWS, and has been a focus for content creation toolmaker **Thinkbox Software,** which will build on video editing assets like **Biba Systems**. And it's been **speculated** that Amazon's acquisition of enterprise meeting productivity tool **Do.com** (March 2017) will roll-up into AWS' new Chime initiative, which is a video conferencing suite for business.

Another notable acquisition in 2017 was Amazon's purchase of battery-powered home monitoring system, **Blink**. At first glance, it may appear to be just another smart home device designed for Alexa integration, but a deeper look reveals the deal could be much more than that.

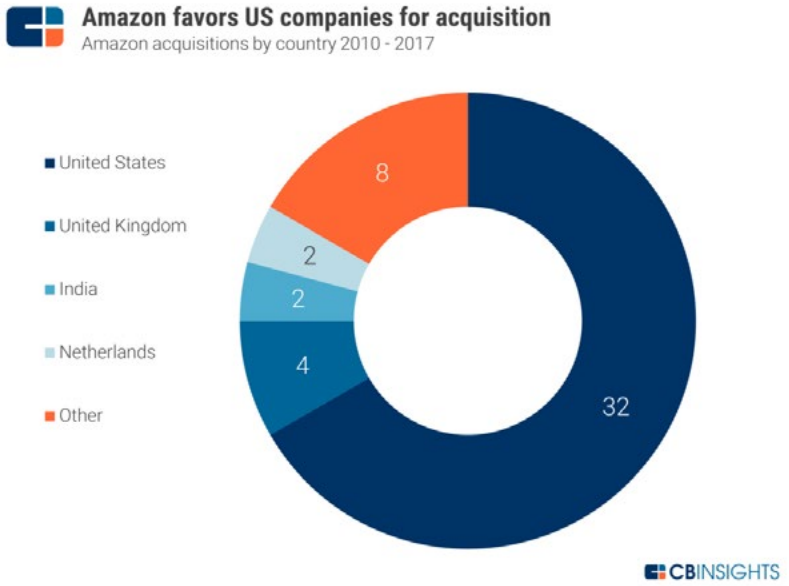
While the device could certainly add value to Amazon's new in-home delivery program, **Amazon Key**, Blink's underlying hardware will likely find its way into all future Amazon devices. Prior to developing its smart camera, Blink developed energy-efficient chips. After the company found the pure-play chip market too competitive, it leveraged its technology to create an energy-efficient, battery-powered, connected consumer device.

These chips are the foundation of Blink's business and are, arguably, the main value-add to Amazon. Blink was still in its infancy at the time of the acquisition, having raised a single seed round for $5.8M in 2015.

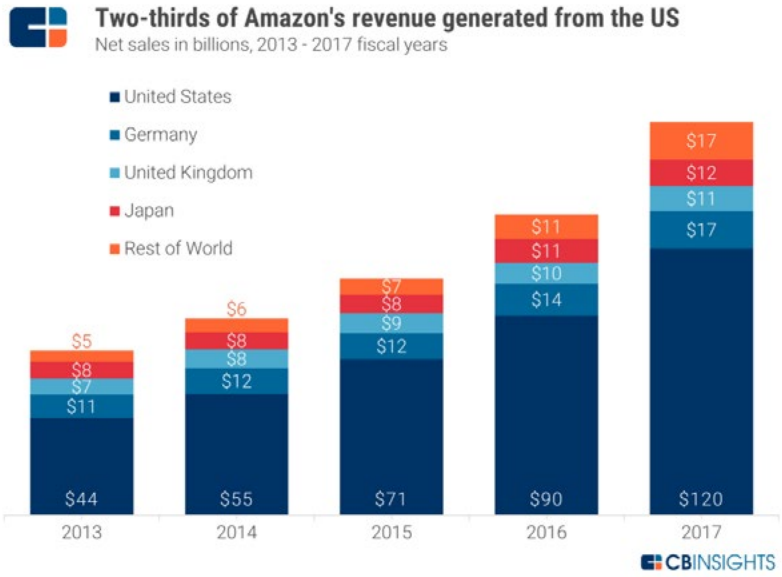
Focus on early-stage, US

Since 2010, Amazon has favored buying early, acquiring 10 Series A-stage companies, followed by 8 seed/angel-stage companies.

Notably, Amazon's Souq acquisition bucked the company's geographic norm. Despite its desire to expand overseas, almost all of Amazon's acquisitions have been US-based companies.



Morever, the majority of Amazon's revenue is generated in the US, though its "rest of world" revenue has steadily grown, rising more rapidly than US revenue in recent years.



In summary, Amazon mainly acquires companies that align with its Prime, AWS, and Marketplace pillars. There are some blockbuster deals to "dreamy businesses" that have scaled up well, but more often Amazon uses small, practical purchases to develop. After all, this is the same company whose CEO drove a Honda and proudly made new employees fashion **desks out of doors** as "a symbol of frugality and a way of thinking."

3

Investments

When it comes to corporate venture, Amazon is beginning to get more active.

As a fledgling internet company in the late 1990s, Amazon lost hundreds of millions investing in now-infamous dot-com startup failures such as **Drugstore.com**, Pets.com, and **Kozmo.com**, among a host of others (the company reportedly lost $60M on Kozmo alone).

Narrowly evading death itself in the bust, the company would be licking its wounds for years and was decidedly inactive in investment until the mid-2000s.

In recent years, Amazon's investment focus has shifted to more forward-looking ventures across industries spanning healthcare, voice, IoT, and communications platforms. The majority of these investments are thematically linked to the AWS ecosystem, which now encompasses voice, AI, development tools, and cloud computing, among others.

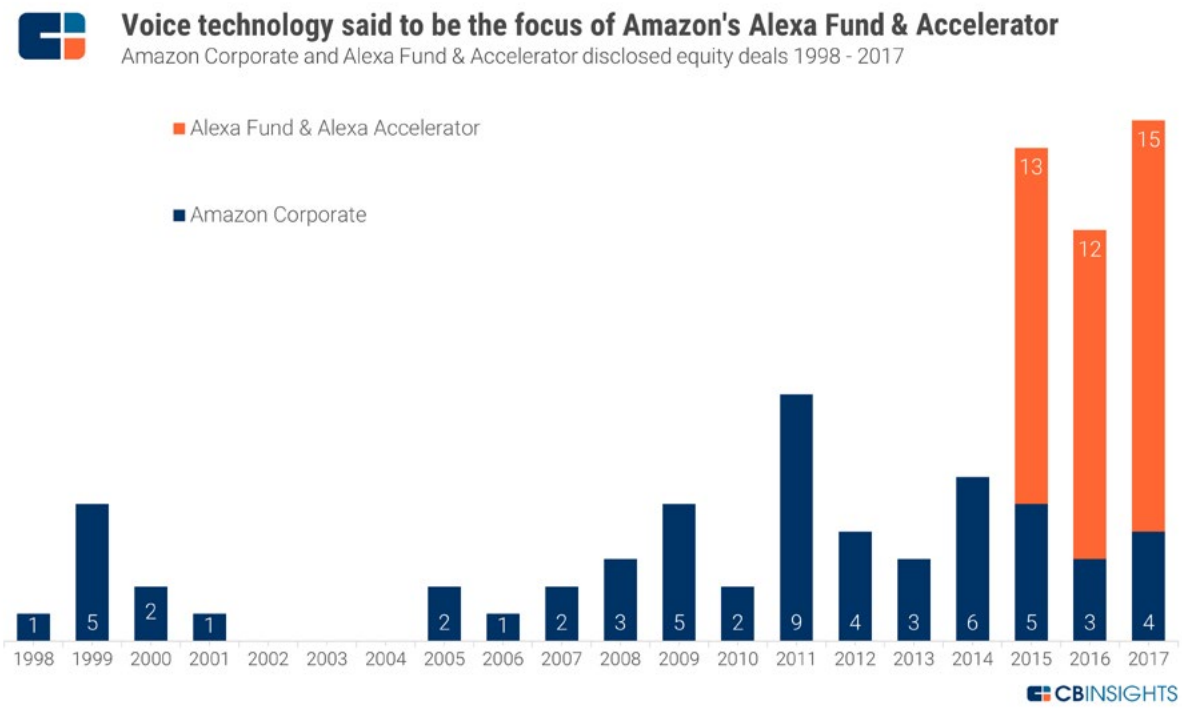
In June 2015, Amazon committed $100M to found its first standalone corporate venture capital (CVC) unit, the **Alexa Fund**.

The fund, which specifically invests in voice and IoT technology to bolster its Alexa Voice ecosystem, is relatively small (Google Ventures, for reference, started with a $100M per year investment goal that's since grown to $300M+) and lags far behind other tech CVCs like Google Ventures and Microsoft Ventures.

However, the fund is also growing. Amazon committed an additional $100M to the Alexa Fund in November 2017, in addition to starting its accelerator program, **Alexa Accelerator**, in July 2017.

Moreover, the **Amazon Catalyst** program has operated for a number of years, providing dozens of grants to university students attempting to find technological solutions to world problems — from genetically engineered pollution-reducing plants to low-cost water desalination.

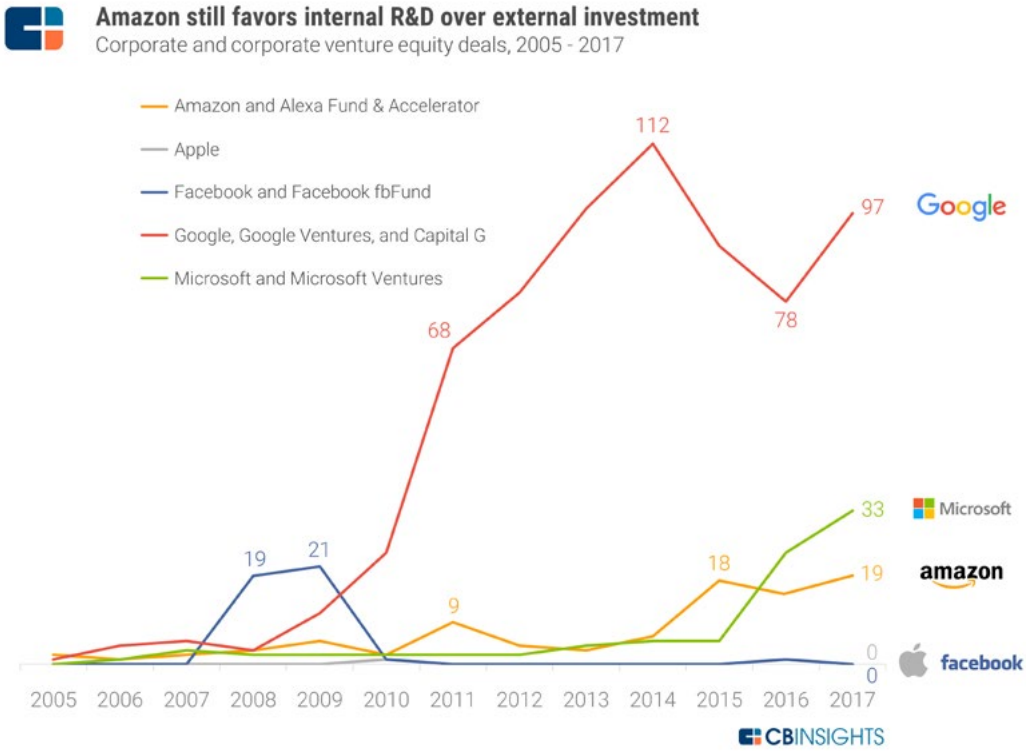
Here's a look at Amazon's investing frequency for both Amazon proper and the Alexa Fund & Accelerator (Amazon Catalyst not included):



Last year, Amazon's investment activity was bolstered by its Alexa Accelerator program. Amazon corporate made 3 investments directly, while the Alexa Fund & Accelerator made 15. Of these 15 investments, 10 were completed as part of the accelerator program in July 2017, while 5 were made independently of the accelerator program.

Amazon's corporate deal activity remains on par with its numbers over the last decade, when the company was expanding its modest e-commerce business.

Compared to its tech competitors' investments, Amazon falls in the middle. Google is far and away the biggest deal-maker, whereas Facebook and Apple hardly invest, opting instead to purchase companies outright or not invest at all.



With the Alexa Fund & Accelerator propelling Amazon's investment effort, the company is showing a renewed interest in investing, with its activity reaching its highest levels ever.

ALEXA FUND & ACCELERATOR

As Amazon makes its big foray into the AI world with its Alexa platform product, its corporate venture fund serves as a bellwether for its efforts to build the go-to platform for voice tech.

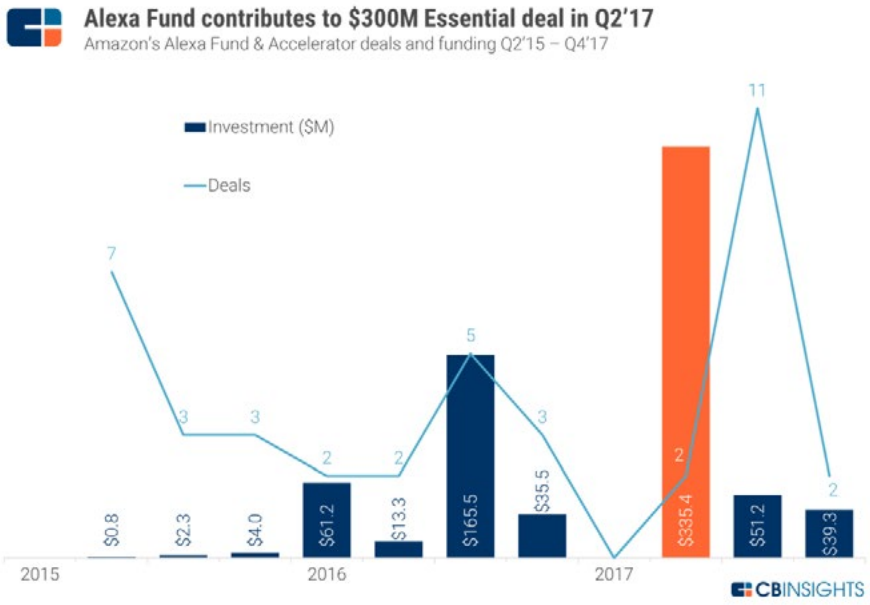
The fund has existed for nearly 3 years, and to date (2/26/18) has completed 40 deals, 7 of which were announced at the fund's inception. These include investments from both the primary Amazon Alexa Fund and the Alexa Accelerator started in 2017.

The Alexa Fund mostly invests in **early-stage** companies (seed & Series A), though it has participated in Series B rounds to consumer IoT heavyweights **Ecobee** (home automation) and **Owlet Baby Care** (baby monitors).

While later-stage investments are rare for the Alexa Fund, the CVC group backed connected doorbell maker **Ring** as part of a Series C and smart toy maker **Sphero** as part of a Series G. (Toys actually had a significant impact on Amazon Corporate's bottom line in 2017, estimated to earn $4.5B in revenue throughout the year.)

Notably, these startups all play into the voice category, the primary use case for Alexa, or into new human-computer interaction models.

Here's a quarterly breakdown of the fund's investment history:



The Alexa Fund has historically done just a deal or two per month, which, as previously mentioned, is **well below** the activity level of Google Ventures. However, the fund completed a record high number of deals in 2017. The Alexa Accelerator, Amazon's new IoT accelerator operated by TechStars, was responsible for 10 of the 15 deals.

After a successful inaugural class in July 2017, Amazon recently announced a second Alexa Accelerator program, launching summer 2018.

Nearly all Alexa Fund & Accelerator investments so far have a potential integration into Alexa's smart home **voice controls.**

These include **Rachio** (connected sprinkler system), **TrackR** (small items finder and **Tile** competitor), **June** (smart oven),

Nucleus (connected intercom system), Mojio (connected car device), Novel Effect (read along sound effects), Petnet (smart pet feeder), Musaic (connected speakers), and Scout Security (security camera).

Investments here likely offers more strategic and synergistic value in bringing these products closer into the Alexa ecosystem than a chance at serious returns.

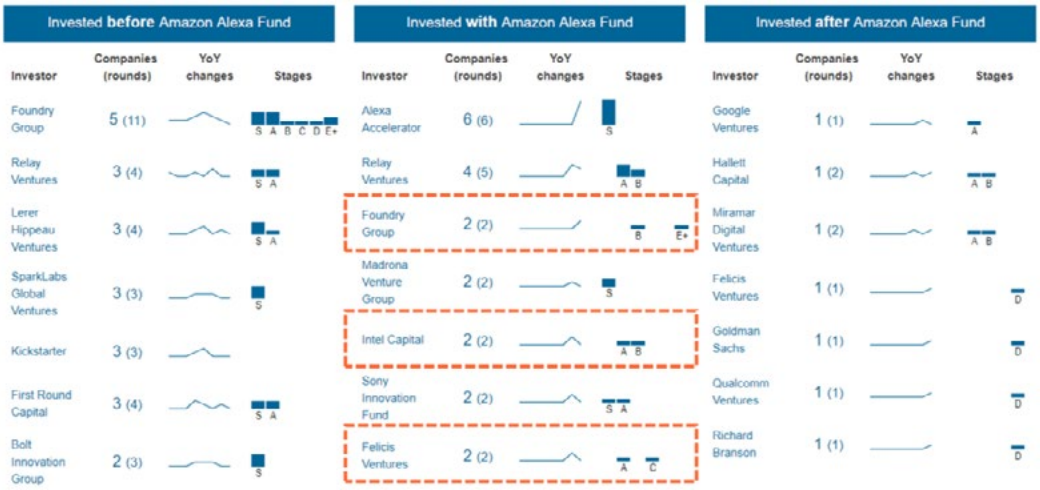
Other notable bets have included Thalmic Labs, whose gesture-tracking arm band could add a new mode to control the Echo, and DefinedCrowd, which supplies crowdsourced natural language processing (NLP) training data for 90% of world languages. (Presently, Alexa Voice Service only works in English.)

A more forward-looking move might be detectable in Alexa's 2015 investment into Invoxia, which makes portable GPS trackers. More recently, the fund backed Mojio, a developer of connected car devices for tracking and vehicle diagnostics, and Tinitell, which provides wearable mobile phones and GPS trackers for kids. These investments signal Amazon's interest in expanding Alexa integration beyond the home.

In a deviation from the its other investments, the Alexa Fund also backed mobile phone developer Essential Products as part of a $300M Series B in June 2017. Despite failed attempts to build a mobile phone within Amazon (Fire Phone), the company continues to show interest in the mobile hardware market, if in less direct ways.

The Alexa Fund has also invested in artificial intelligence companies Comet and Semantica Labs. While Semantica Labs uses machine learning to predict possible user responses — ideal for Amazon's Alexa — Comet offers a platform for tracking machine learning projects and experiments, a tool that supplements Alexa as much as it does AWS.

Alexa Fund's typical deal partners include familiar names among the **most active IoT investors** such as Intel Capital, Foundry Group, and Felicis Ventures.



Notably, the Alexa Fund has seen a high proportion of exits in the last few years. The first exit for the fund was realized in December 2015, just 6 months after the Alexa Fund's initial investment: while **The Orange Chef**, which made a connected food scale, was sold to food discovery platform **Yummly**, the exit was no home run as the company was essentially sold for parts.

Since then time there have been 4 other exits. Artificial intelligence chatbot development platform **KITT.AI** (acquired by Baidu), home smart alarm system **Scout Alarm** (IPO), and manufacturing services firm **Dragon Innovation** (acquired by Avnet) all exited in 2017. Most recently, **Luma Home**, which develops home Wi-Fi extenders, was acquired by Newell Brands in January 2018 at a valuation of $10M.

AMAZON CORPORATE INVESTMENTS

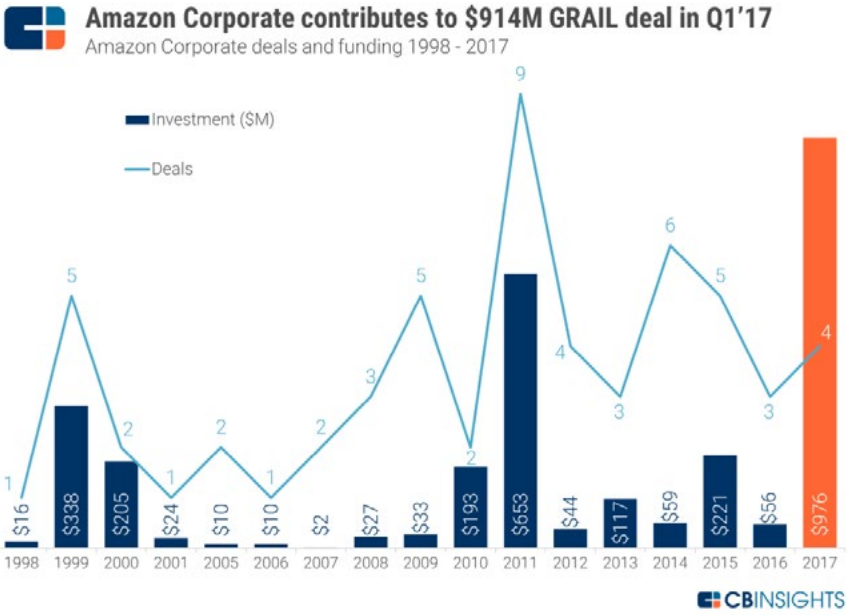
Investments coming from Amazon's corporate entity are relatively infrequent — which perhaps comes as a surprise for a company with a **stated strategy** to "experiment patiently, accept failures, plant seeds, protect saplings, and double-down when you see customer delight." As we'll later explore, however, Amazon is beginning to make more diverse bets.

The investments the company has made include bets within **logistics, cloud apps,** and **media**, with Amazon's recent forays

into logistics and media foreshadowing areas of new business interest.

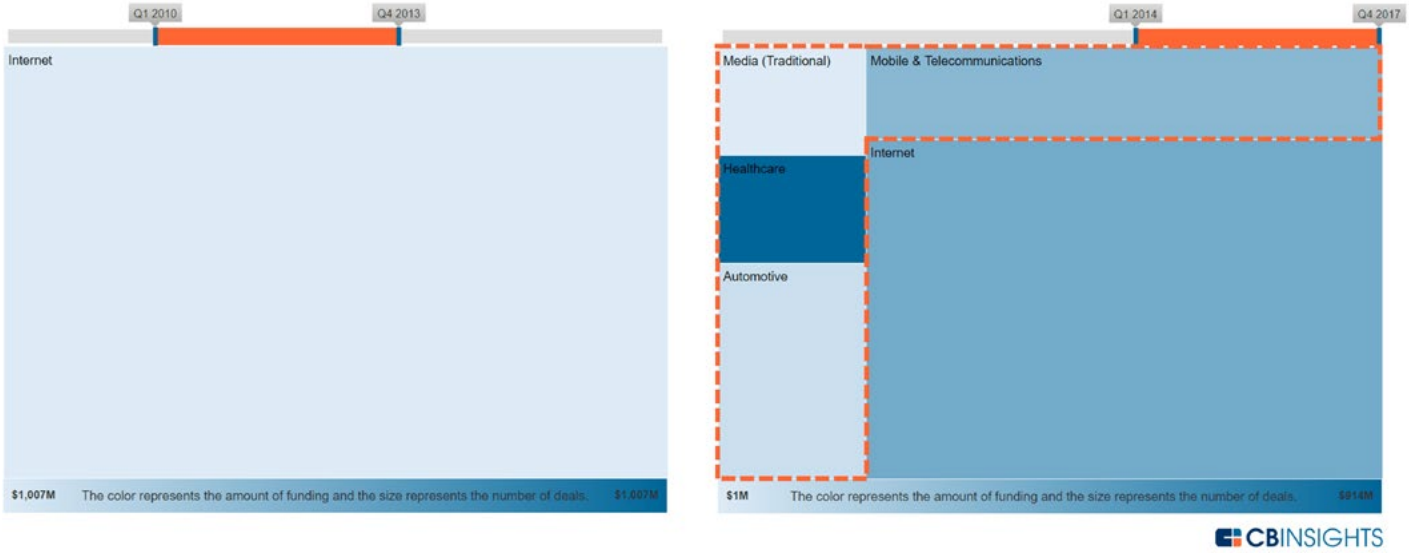
Since 2015, Amazon's stock **has grown** at nearly 5x the rate it did from 2012 – 2015. It may seem counterintuitive that a company with such a meteoric rise in stock price would *slow down* its corporate venture efforts — but that seems to be exactly what Amazon has done.

The company's already-sparse activity slowed in 2016 and remained limited in 2017. Investment peaked in 2011 with 9 deals. Since then, annual investments have averaged less than half of that peak.



Despite this recent slowdown in activity, Amazon is putting capital behind a wider variety of industries. From 2010 – 2013, the company solely did deals to internet companies, whereas between 2014 – 2017, it has also invested in media, healthcare, auto & transport, and mobile.

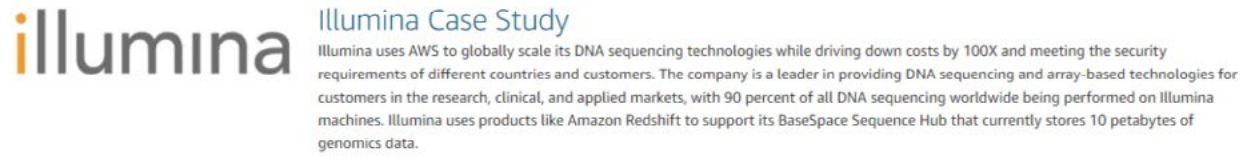
This parallels some of Amazon's broader new business initiatives: live online business broadcasting startup **Cheddar** aligns with Amazon's initiatives in **proprietary video content**, while on-demand home services marketplace **HouseJoy** aligns with Amazon's growing **home & office services** marketplace.



But perhaps the most intriguing new investment area for Amazon is in the **healthcare sector.**

Early in 2017, the company invested in its first biotech startup: **GRAIL**, which focuses on genomics for cancer diagnosis. The deal marks interesting new territory for Amazon, and because genomic sequencing requires intensive computing power, GRAIL and other genomics applications could align nicely with Amazon's existing AWS business.

Unsurprisingly, gene sequencer **Illumina**, from which GRAIL spun out, is featured as a customer success story on the AWS website.



Notably, Amazon tends to invest mainly where it can make **strategic partnerships.** For example, Mumbai-based **ShoppersStop** may help to expand Amazon's e-commerce reach in India. **Twilio** and other tech companies have partnerships with AWS, while Amazon's investment in **Cheddar** will provide insight into live online streaming. In 2016, Amazon's investment in **Ionic Security** also **featured** a "collaboration" with AWS to create data protection infrastructure for regulated industries.

The **Charts tab** from the CB Insights database shows how Amazon's corporate team has heavily favored **mid-to-late-stage deals** over the past 5 years. Most of Amazon corporate's deals have fallen into the $15M – $25M range, and nearly one-third of deals have been at Series E+.

Showing deals from Jan 01, 2013 - Feb 25, 2018

	Seed / Angel	Series A	Series B	Series C	Series D	Series E+
% of deals	0%	14.28%	21.42%	21.42%	14.28%	28.57%
Avg deal size	$0	$3.48M	$314.8M	$31.3M	$30M	$80M
Median deal size	$0	$4.7M	$22.5M	$19M	$45M	$100M

CBINSIGHTS

Interestingly, Amazon has frequently co-invested with the same investment syndicate that helped the company launch.

As mentioned above, Amazon originally raised from **Kleiner Perkins Caufield & Byers** (KPCB) and angel Tom Alberg of **Madrona Venture Group** — so it's worth noting that both firms and Amazon continue to do deals together today.

Other Amazon co-investors include a number of **"smart money" venture capital investors** — in other words, firms with the best combination of portfolio valuations and investment outcomes.

In addition to KPCB, other smart money investors investing before, alongside, or after Amazon include Bessemer Venture Partners, New Enterprise Associates, General Catalyst, Accel Partners, Lightspeed Venture Partners, and Andreessen Horowitz. All have invested in at least one company backed by Amazon.

4

Patents

Next-generation computing and logistics are two of Amazon's top R&D priorities.

Nearly 40 of Amazon's 2017 patents are focused on developing its **cloud computing systems**, while the company also filed over 30 patents focused on **improving its logistics network**. This logistics focus comes not long after Amazon announced plans to launch its own delivery service (Seller Flex), directly targeting the growing number of third-party sellers on Amazon. This service will allow Amazon to cut costs and reduce reliance on carriers like UPS and FedEx.

Early on, Amazon's zealous use of intellectual property sparked some controversy. One of the company's early patents, "**Method and System for Placing a Purchase Order Via a Communication Network**," perhaps better known by its trademarked name 1-Click, was granted in 1999. The patent is still used today in Amazon's online store, which, as the name implies, allows orders to be completed in one click based on user data saved from previous orders. Notably, the 1-Click patent **expired** in 2017, and a number of e-commerce players, including Google, are already working on one-click browsers.

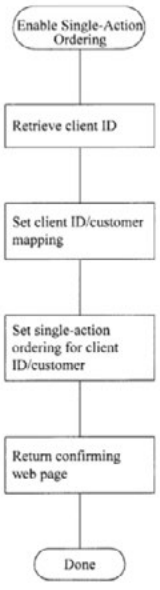
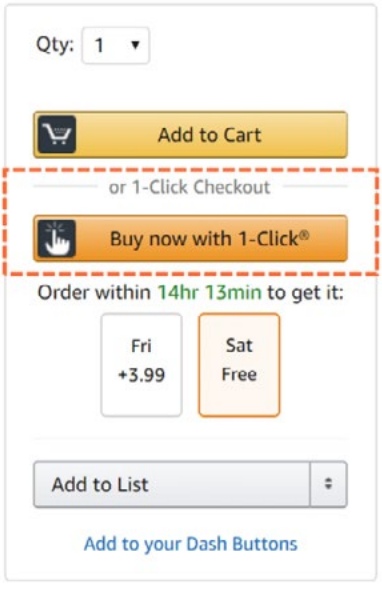


Figure 3 from Amazon 1-Click® Patent - September 28, 1999



1-Click® Option as of February 2018

The 1-Click patent ended up being a central issue in Amazon's early life, and according to Brad Stone's book "*The Everything Store,*" Amazon was aggressive in protecting IP from competitors:

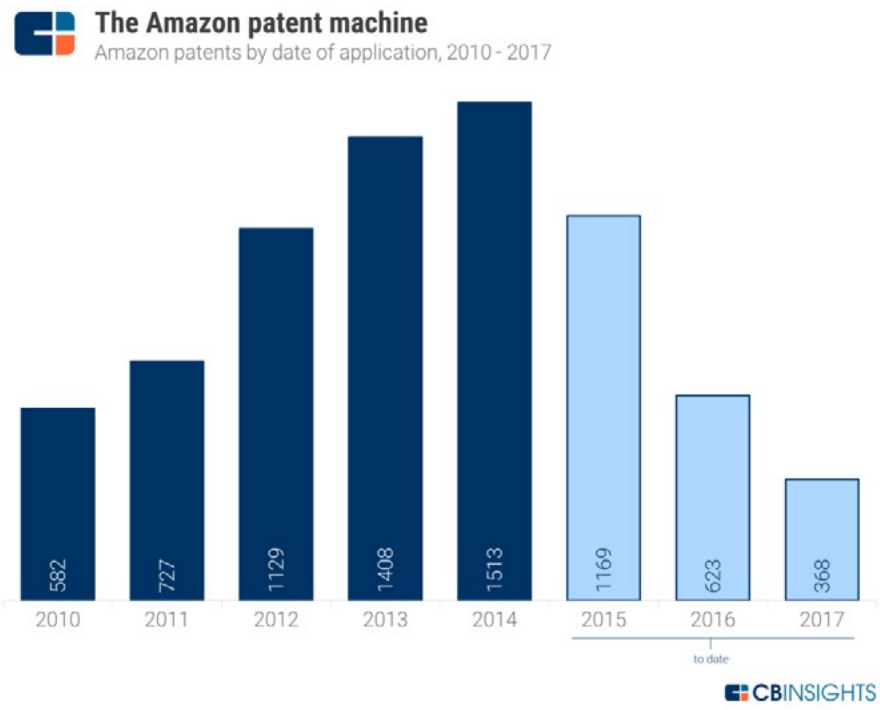
"Critics charged that the idea behind 1-Click was rudimentary and that its approval by the U.S. patent office was a symptom of lazy bureaucracy and a broken patent process. Bezos didn't altogether disagree — intellectually he was an advocate for patent reform — but he was determined to exploit the status quo for any possible advantage. ***He sued Barnes & Noble for infringing on the patent in late 1999 and won a preliminary ruling that forced the bookseller to add an extra step to its checkout process.*** *Amazon licensed the patent to Apple in 2000 for an undisclosed sum and tried to use it, ineffectively, to gain some leverage over a rising and worrisome rival that first showed up on Amazon's radar in mid-1998: eBay."*

Since the dot-com era, Amazon's patents have shifted and tracked Amazon's new business priorities. In recent years, Amazon has built a trove of patents, which we explore below in greater depth.

Note: This analysis comes with a few caveats, primarily that the patent filing process involves a significant time lag before the publishing of patent applications. This delay can range from several months ***to years****. We also focused on Amazon proper for the purposes of this analysis, which would exclude patents absorbed through external acquisitions.*

In recent years, Amazon has put more resources toward intellectual property efforts. From a modest 582 patents filed in

2010, the company filed over 1500 patents just a few years later in 2014. As with investment activity, Amazon is at roughly half as many applications in comparison to **Google's patent efforts**.



To dig deeper into Amazon's strategy focus, we mined each year's applications and teased out recurring keywords from the patent abstracts, using a significance weighting scheme to surface words and phrases.

The key phrases data illustrates Amazon's diverse business priorities, albeit with some time lag. In the early 2010s, applications frequently used keywords like "electronic tablet" and "content item," which ostensibly would help dig a moat around Amazon's Kindle efforts.

Similarly, Amazon's AWS business, which took off in the mid-2000s, offers virtualization services through **Elastic Cloud Compute**, or EC2. Evidently, securing IP around **virtual machines** is still a high priority: related phrases like "machine instance" were top patent keywords throughout the years, and "virtual machine" has been a top phrase for 5 consecutive years.

While patents are still being released weekly, the ones that have rolled in from 2016 and 2017 indicate new interest in **drones** and **cybersecurity**, given the sudden prominence of keywords like "aerial vehicles" and "digital fingerprint".

Amazon patent keyphrases

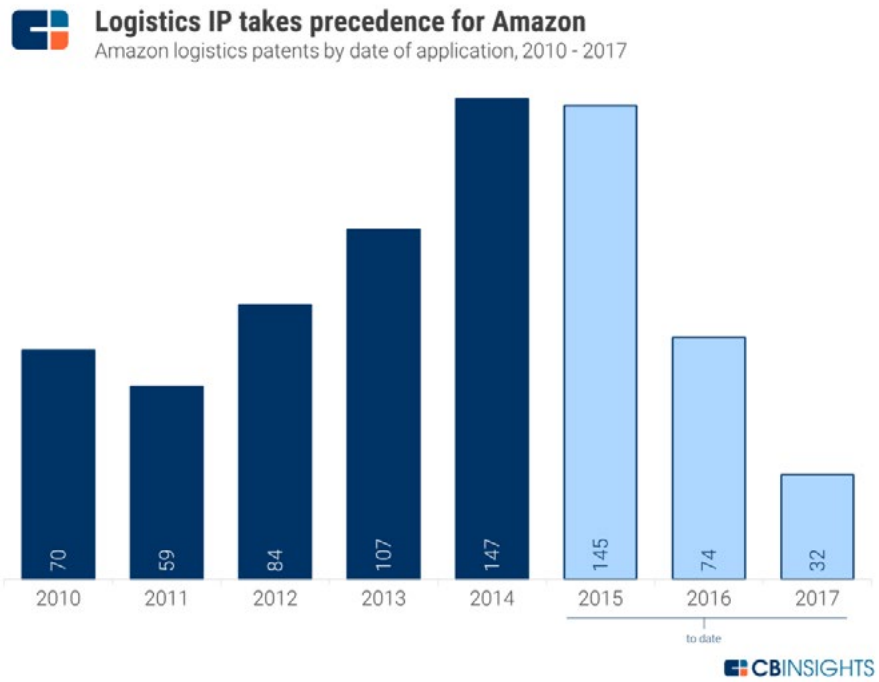
2011	2012	2013	2014	2015	2016	2017
electronic device	user device	electronic device	electronic device	unmanned vehicle	aerial vehicle	aerial vehicle
network page	electronic device	content item	support plate	electronic device	electronic device	virtual machine
user device	content item	medium device	user device	aerial vehicle	drive unit	network location
content item	audio signal	user device	display screen	virtual machine	inventory holder	data volume
resource control device	network page	computer system	inventory holder	computer network	mobile drive	medium content
resource control	data storage	service provider	virtual machine	mobile device	display screen	computer system
digital work	computer network	virtual machine	drive unit	propeller blade	virtual machine	digital fingerprint
network resource	resource manager	inventory holder	color palette	machine instance	food item	mobile device
electronic publication	mobile device	drive unit	first fluid	content item	inventory item	data store
computing device	portable device	client device	graphical user	audio input	propeller blade	storage system
browse session	image information	data center	second fluid	video data	computing device	service image
product category	point of interest	electronic tablet	mobile drive	inventory holder	computer network	robotic manipulator
search query	language model	computer network	user interface	data storage	application state	virtual computer
client device	display device	tablet device	content item	audio input output	data center	digital signature
discussion thread	storage controller	network page	second support	client device	search result	machine instance
web service	social network	load balancer	network page	virtual compute	network page	data portion
supplemental information	power adapter	computing device	processing device	compute instance	content item	network site
relative position	client device	user interface	aerial vehicle	drive unit	client device	network tunnel
device image	digital work	mobile drive	stylus device	output device	data volume	computing environment
reality environment	network gateway	data file	tablet device	application data	application state information	web service

analysis to date

CBINSIGHTS

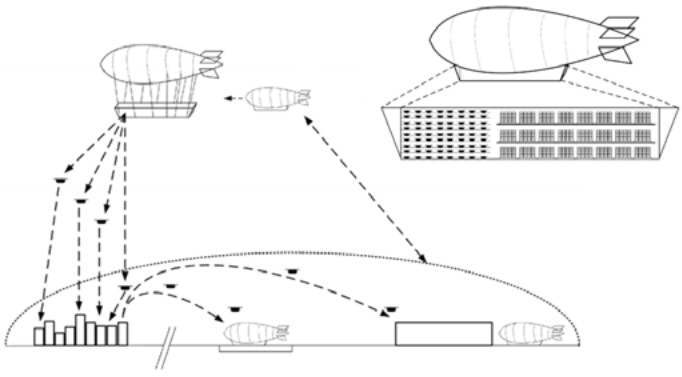
Aerial drones are a large part of Amazon's strategy to expand its Prime Air logistics network, which Bezos **announced** in 2013. In March 2017, the company **began** making demo flights delivering sunscreen.

With logistics and UAVs front-and-center in its patent portfolio, we isolated patents containing logistics-related keywords. 2017 (a year that will likely see even more patents surfacing) already has a record 32 logistics-related patents to date.

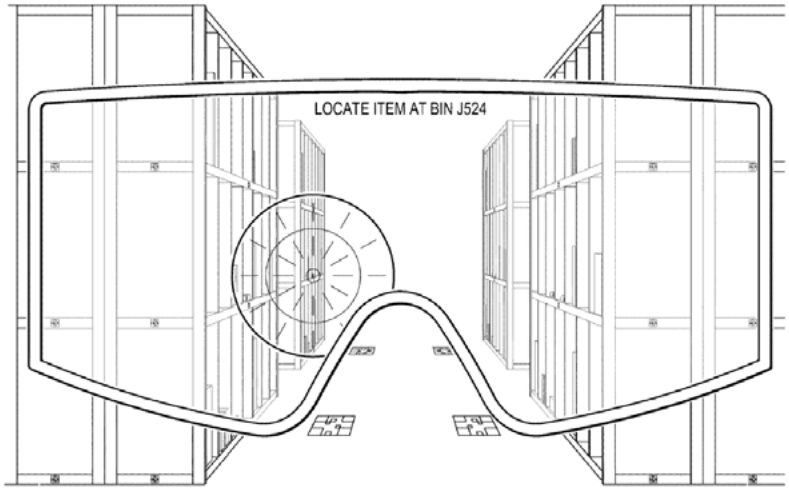


Amazon's patent portfolio also feature some forward-looking patents that give a peek into the futuristic logistics network the company may one day engineer.

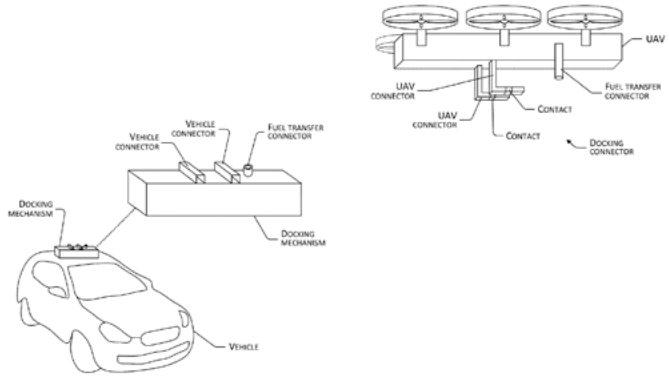
In 2016, an application for a patent came to light that suggests Amazon is trying to create a flying warehouse that would dispatch package-laden drones to the ground. Called an "**Airborne Fulfillment Center**" (AFC), the patent describes the vehicle as "an airship that remains at high altitude."



In the following year (2017), **Amazon was awarded a patent for an augmented reality interface** that may be used by fulfillment center employees to locate goods more efficiently.



And in a more **recent patent** from 2018, Amazon entertains the idea of drones providing energy, whether electric batteries or traditional fuel, to autonomous vehicles while in motion.



All of these above Amazon patents were surfaced using our **patent search engine**.

5

The 'river delta': Where Amazon's many businesses meet

Amazon operates in a wide range of businesses, but at the heart of the company is online shopping and a focus on leveraging technology to offer the fastest, most convenient way to buy things.

The best way to think about Amazon is as an amalgamation of many businesses with solid tech at its core. Ben Thompson on Stratechery **wrote**,

"A more nuanced approach considers the fact that Amazon is not a monolithic operation, but rather a collection of businesses sharing resources, including a channel (Amazon.com), logistics, and a common technological foundation."

Amazon might have its hand in every business imaginable, but underlying it all is the company's technological prowess.

While revenue has grown massively, Amazon has hardly turned a profit because it continually reinvests its cash into new businesses, from building new warehouses to beefing up AWS data centers. The philosophy and motivation behind Amazon's bold **reinvestment strategy** is highlighted by **CEO Jeff Bezos**:

*"I very frequently get the question: What's going to change in the next 10 years? And that is a very interesting question; it's a very common one. I almost never get the question: **What's not going to change in the next 10 years?** And I submit to you*

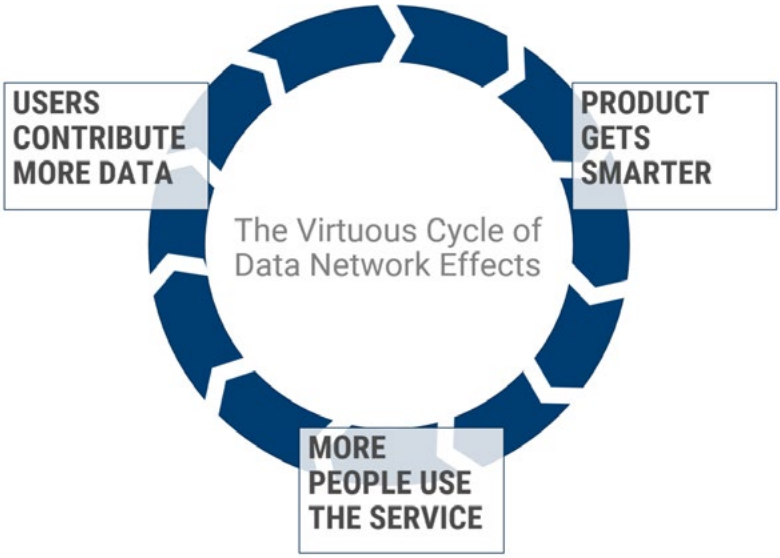
that that second question is actually the more important of the two — because you can build a business strategy around the things that are stable in time.

… [I]n our retail business, ***we know that customers want low prices, and I know that's going to be true 10 years from now. They want fast delivery; they want vast selection.*** *It's impossible to imagine a future 10 years from now where a customer comes up and says, 'Jeff I love Amazon, I just wish the prices were a little higher;' 'I love Amazon, I just wish you'd deliver a little more slowly.' Impossible. And so the effort we put into those things, spinning those things up, we know the energy we put into it today will still be paying off dividends for our customers 10 years from now.* ***When you have something that you know is true, even over the long term, you can afford to put a lot of energy into it."***

Always thinking about how to build tomorrow today, Amazon is investing in and improving its core business by developing new ones. In nearly all its main categories, Amazon's position as a platform works in a **data feedback loop.**

Amazon owns perhaps the richest dataset on how consumers consume, how sellers sell, and how developers develop. This, in turn, allows Amazon to optimize its online shopping experience, logistics network, developer environment, and even its voice AI,

which in turn make Amazon's offerings even richer.



In short, many of Amazon's businesses follow the classic network effect flywheel. And, as we'll explore below, some of Amazon's network effects are starting to collide.

One theme that emerges in Amazon's initiatives is the concept of **diffusing internal tools as products.** The company began as the sole seller on Amazon.com, and eventually opened up its e-commerce platform (and logistics network) for 3rd parties to sell on. It opened up the computing infrastructure it spun up in-house and sold its computing and storage tools through the now-dominant AWS.

Now, Amazon is in a position to do the same in cutting-edge areas like machine learning, workerless retail tech, drone delivery, and voice computing. As these startup-dominated industries gain traction, Amazon may position itself as the necessary middleman for companies looking to succeed through online commerce — benefiting from companies willing to pay the "Amazon tax" that allows them to stay competitive.

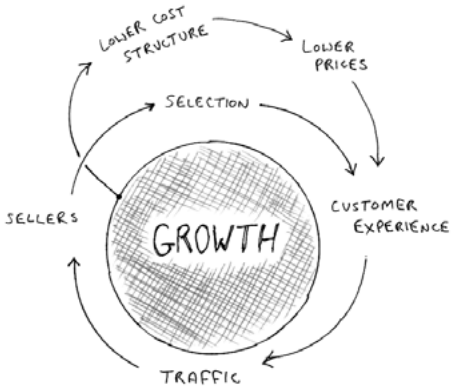
CORE BUSINESS IN COMMERCE & RETAIL

Borrowing from Walmart's "Everyday Low Price" playbook that was popularized in 1990s retail, Amazon delivered value through competitive pricing. After considering a list of 20 different items, Bezos originally **settled on bookselling** because of the markup on books and because no physical store could hold all book titles.

Not having physical stores allowed Amazon to maintain a selection of over 1.1 million book titles, as well as to develop new customer-friendly (and now-standard) e-commerce features like a personalized web page and book recommendation algorithms. By 1998, the company would offer music and DVDs. And today, everything from cars to **uranium ore** can be bought online through Amazon.

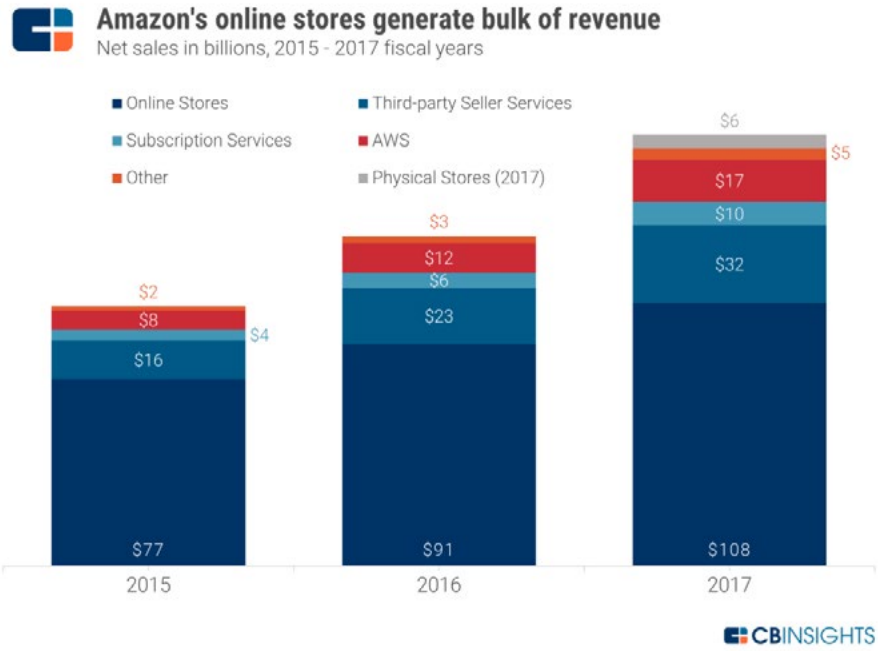
Amazon's dominance is still often linked to its pricing strategy. From the beginning, the lower cost structure of having no stores allowed savings to be passed on to customers. Early on, Amazon would use a web crawler to find competitor prices and undercut them.

As Bezos famously sketched out on a napkin, Amazon's lasting value is derived from the virtuous cycle that it creates.



For most of the past decade, any company that competed with Amazon was either acquired (Zappos, Diapers.com) or simply steam-rolled. On the whole, Amazon seemed relatively unaffected by the rise (**and subsequent demise, in some cases**) of on-demand startups bringing goods via apps, although it did start its own version of these with Prime Now.

As retailers are shuttering stores, Amazon's e-commerce business is still growing. In 2017, Amazon accounted for approximately 44% of all e-commerce spending in America.



In 2000, Amazon gave outside companies the ability to sell on Amazon.com, and this program **now accounts** for over 50% of the goods it ships. Behind the scenes, Amazon's retail marketplace is something like a massive slowed-down stock exchange, where its more than 2 million registered merchants leverage algorithms to undercut competitors. Prices even for commodity goods spike and fall like those in a volatile exchange.

Increasingly, manufacturers are also going through Amazon and its Marketplace division to reach consumers, and Marketplace continues to be the company's largest source of revenue after retail.

Not coincidentally, in April 2017 the company had more than 1,200 open jobs listed for its seller services division alone. In February of 2018, that number has dwindled to less than 400 — though this is possibly attributable to a growing pool of quality candidates or improved retention rates.

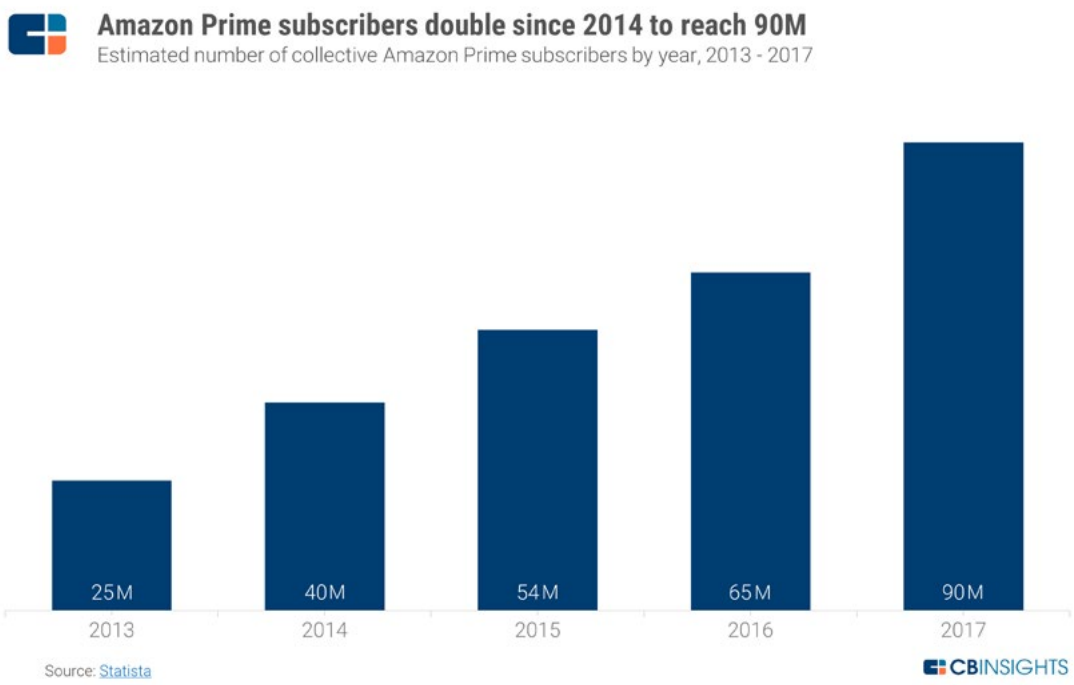
Where Amazon can compete, it will often develop its own products as a competing supplier. About a two years ago Amazon began selling over a dozen **private-label goods** for households. In addition to home essentials sold under its AmazonBasics brand, the company now has private labels in apparel, CPG, luggage, and

diapers, among dozens of other categories. Today, the number of AmazonBasic goods exceed 1,000.

The strategy behind private-label goods is that Amazon can take advantage of higher profit margins: the company doesn't need to spend much on marketing and brand development, and with its e-commerce data it already knows which products will resonate with customers.

However, Amazon's leverage as the seller *and* the platform owner makes for an awkward relationship. Amazon has the power to put its products higher in search rankings, in which case resentful suppliers may want to take their business elsewhere — or, if they can't afford to lose the distribution channel, be forced to compete with the store brand.

Amazon Prime — the membership program created to gratify more time-sensitive and less price-conscious customers — is probably best known for offering two-day shipping with an annual membership fee. But Prime has expanded far beyond free shipping, and now includes Prime Video media streaming, music streaming, unlimited photo storage, discounts from Whole Foods, free restaurant delivery, free eBooks, free audiobooks, and a number of other exclusive services to keep its subscription rates high.



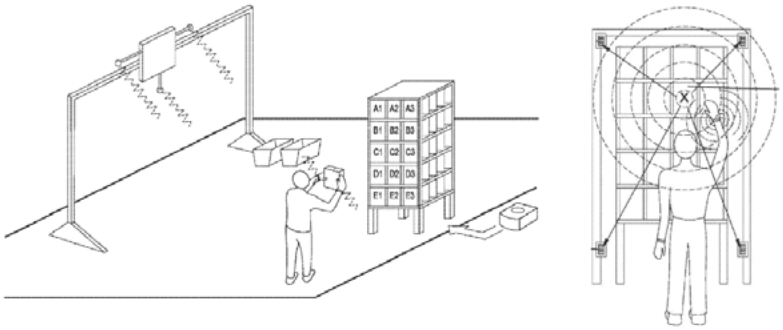
Breaking into brick-and-mortar

After decades thriving as a storeless internet company, Amazon is making its first forays into brick-and-mortar retail on several fronts: Amazon Go, AmazonFresh, AmazonBooks, and even Whole Foods.

Amazon Go is arguably the company's most ambitious brick & mortar initiative to date. The stores will employ RFID tech and computer vision to allow any Amazon Prime member to shop without a checkout process or in-store employees.

Amazon ran into issues with the technology in early trials, but seems to have successfully worked past such obstacles, opening its first Amazon Go store in Seattle in January 2018. The company reportedly has plans to open 6 additional Amazon Go locations in the US throughout 2018.

A **patent recently granted to the company** outlines a wristband that could monitor the performance and efficiency of employees. Needless to say, many shamed the idea of tagging and tracking employee performance with such oversight. But with the increasing adoption of smartwatchs and wristbands by consumers, this technology could prove useful in Amazon Go stores where patrons take items from designated locations throughout the store.



In addition to the cashier-less Amazon Go, AmazonFresh Pickup (now with two locations in Seattle) offers car-side grocery pickup. Both the Amazon Go and AmazonFresh Pickup models may soon be adopted by Whole Foods as Amazon continues to grow its share of the massive grocery market.

Finally, Amazon is also increasing its brick-and-mortar footprint with physical bookstores, now with 13 locations across the US and 3 more on the way (as of 2/25/18).

Moving into brick-and-mortar allows Amazon to expand its reach with an offline presence. Some consumers prefer touching and seeing certain goods in person, especially apparel, which Amazon is now supplying with AmazonBasics and its various private labels.

The move to physical retail may seem counterintuitive, as stores, with their limited selection, were once the antithesis of Amazon. But by having a last-mile channel for books, groceries, and big-ticket sales like furniture and appliances, physical stores may help Amazon effectively sell what it wouldn't otherwise be selling online.

Expansion in India

India is expected to become the world's fastest-growing e-commerce market, and Amazon has said it will invest $3B in its India business, with a focus on its grocery store offerings.

In just the few years it's operated in India, Amazon has **signed contracts** with major delivery services and started its own delivery service to augment these. (It's rumored that the success of Amazon's proprietary delivery service in India is basis for its current shipping initiatives here in the US.)

Amazon's investments in India-based companies like in-home services company **HouseJoy**, e-commerce platform **Shoppers Stop**, and insurance marketplace **BankBazaar** further its involvement in India's tech ecosystem.

However, Amazon faces challenges in the region too, not the least of which is the fact that currently, only 35% of India's population is connected to the internet. Additionally, Amazon faces tough local competition from unicorns like **Flipkart** and **Snapdeal**, which are backed by investors like Tencent and Alibaba respectively.

TRANSPORTATION & LOGISTICS

Shipping items faster and cheaper has long been Amazon's way of making customers happy. As Amazon has grown to deliver hundreds of millions of packages per year, scaling up its fulfillment infrastructure has been a priority.

Early on, Amazon realized its shipments were all unique combinations of goods, and that its warehouse techniques would actually be closer to manufacturing than shipping. It **poached** heavily from Walmart's executives to grow its logistics network.

When Amazon bought warehouse robotics maker **Kiva Systems** in 2012, it might have been difficult to see the immediate value. But now Amazon has more than **45,000 robots** in its warehouses. The acquisition of Kiva, according to **Bloomberg**, "set off an arms race among robot makers and shippers who scurried to keep up with the e-commerce giant" and its efficiencies.

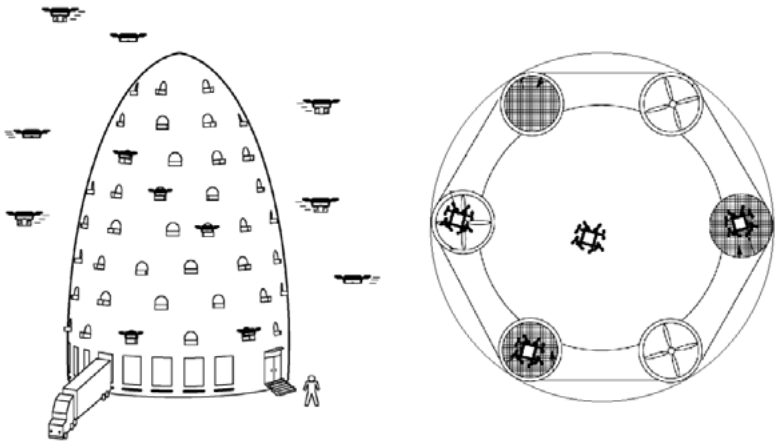
Amazon has been eager to grow its **fulfillment center coverage**. As of 2016, 44% of Americans lived within 20 miles of an Amazon warehouse, compared to just 5% in 2015. In addition to expanding its warehouse coverage, the company is now offering its own shipping services to external parties — namely, its third-party sellers.

In doing so, Amazon accomplishes a number of things: the company becomes less reliant on third-party services (UPS and FedEx), improves shipping times of non-Prime goods, and cuts costs. With an estimated **$20B+ spend** on third-party shippers in 2017, Amazon has plenty of incentive to build a service of its own.

Amazon's efforts to achieve independence by land, air, and sea are bold. The company **recently purchased 210 acres** for the development of a $1.5B air freight center in Hebron, Kentucky. Amazon further plans to lease 40 "Prime Air" cargo jets, and to offer China-based sellers use of its **proprietary delivery network**. In addition, the company is **acting** as a freight forwarder by helping Chinese suppliers book space on ocean vessels.

Drones

Unmanned logistics and delivery capabilities remain an open question with an uncertain timeline, though the company has filed patents in this area. On the drones front, Amazon is heavily focused on an in-house effort to add autonomous aerial drones to its arsenal of delivery methods. While still hypothetical, Amazon filed a patent for a **"beehive" like fulfillment center** just last year. Drones would dispatch to local customers, or **moving vehicles**, to deliver goods and/or services.



While it's been several years since Amazon first announced delivery via drone, the biggest question going forward will be about if and how the company can integrate drones into its logistics network, especially as FAA regulations have made domestic test flights more complicated. To avoid these complications, drone startups like **Zipline International** have tested in less regulated skies in Africa, where others simply focus on terrestrial drones — two options Amazon may show interest in exploring as it tests its own technology.

AI & VOICE

Amazon's work in AI is most obvious in its Alexa Voice Service (AVS), which applies AI to natural language processing (NLP) to offer a voice interface powered by the cloud. A portion of Amazon's voice tech is built atop technology developed by a startup called **Evi Technologies**, which Amazon acquired in 2013, and which lead to a consumer tech home run.

Right around the time Amazon released its ill-fated Fire phone in late 2014, it also quietly released the Amazon Echo, a screenless

cylindrical computer running its AVS cloud software. With NLP that appears to work better than competitors' technology, the Echo has been a smash hit.

Over the last two years, Amazon has expanded its line of Echo products to include smaller devices like the Echo Dot and visually enabled devices like the Echo Show. According to estimates, Amazon has shipped more than **20 million Alexa enabled devices**, while Amazon's app store for voice "skills" now tallies over 10,000.

Alexa also unlocks a new source of revenue: **vocal commerce**. Alexa's "skills" allow users to seamlessly order more Amazon goods, in addition to hailing cabs and ordering pizzas through a growing list of third-party integrations.

It's **estimated** that Amazon is selling Alexa hardware at a 10% – 20% net loss (which totaled $300M in 2016 and was estimated to reach a ~$600M deficit in 2017), all in pursuit of being the dominant platform for NLP. But these might only be short-term expenses. Subsidizing its Alexa-powered hardware is a clear path to becoming the prevailing player within consumer and developer circles, and Amazon has conveyed it has no desire to make its bet solely on hardware.

Instead, Amazon's end goal is to offer **cloud-based voice software** powering everything from car dashboards to consumer wearables. As Don Morrill of the Alexa team **explained**, "You can run a skill [as a developer] for pennies a month. And so we find that's the best way: we want to eliminate as much friction to Alexa as possible, and keeping it open and free is the way to adoption."

Amazon has thrown lots of resources behind this effort, including giving free AWS credits to Alexa and AI developers. At a recent product event, the company revealed that it has **more than 5,000 people** working on the company's digital assistant. And as of February 2018, Amazon has over 1,100 jobs listings for additional roles on its Alexa team.

While it's currently the preeminent voice platform, Amazon is up against tough competition. Google's rival offering, Home, is powered by its own Google Assistant, while Apple's HomePod is powered by Siri. Both are becoming popular Echo competitors. Where Amazon might have the first-mover advantage, Google benefits from its extensive AI research, while Apple benefits from seamless integration across its macOS and iOS devices.

Deepening Amazon's moat in voice is important, especially if consumers perceive a quality edge in Google's assistant or

Apple's Siri, or other emerging competitors. The switching costs are low, and very quickly, Alexa could lose luster and market share.

On the subject of **commercial AI**, Bezos has said: "All of the major tech companies will do this… Right now, bigger companies like Amazon have a bigger advantage especially because of the training data sets required to do this. You need a lot of data to do extraordinary things with the algorithms we have."

As with its cloud-based voice software, widely diffusing its AI tools seems to be key to Amazon's strategy going forward. Amazon's AI strategy is about **being everywhere**, or more technically speaking, achieving scale by being the ubiquitous platform that developers use to access AI services.

Amazon recently **began** selling **Machine Learning-as-a-Service** with Amazon SageMaker. This product offers users the ability to create, train, and deploy machine learning models without the need for the weighty and expensive infrastructure typically required.

Similar to how server racks were enormously cost-prohibitive for startups pre-AWS, the same is presently true for training machine learning algorithms. Startups are continually devising creative (and expensive) hacks to train their algorithms. **Amazon AI**'s goal is to serve both big and small developers who want AI without the upfront costs or hassle.

Amazon AI unveiled offerings that will work like an API and allow any developer to access Lex (the NLP inside Alexa), Amazon Polly (speech synthesis), Amazon Rekognition (image analysis), and Amazon DeepLens (wireless deep learning video camera). With a drone effort involving vision for obstacle avoidance in the works, it seems likely that Amazon will continue to move into the vision space and offer more pre-built algorithms.

In a shareholder letter recapping 2016, Bezos wrote extensively about Amazon's AI strategy going forward, highlighting in no uncertain terms how Amazon's tools in voice NLP, computer vision, Amazon Go, and AI infrastructure will carry it forward:

> ***"We're in the middle of an obvious [trend] right now: machine learning and artificial intelligence.*** *Over the past decades computers have broadly automated tasks that programmers could describe with clear*

rules and algorithms. Modern machine learning techniques now allow us to do the same for tasks where describing the precise rules is much harder. At Amazon, we've been engaged in the practical application of machine learning for many years now. Some of this work is highly visible: our autonomous Prime Air delivery drones; the Amazon Go convenience store that uses machine vision to eliminate checkout lines; and Alexa our cloud-based AI assistant. (We still struggle to keep Echo in stock, despite our best efforts. A high-quality problem, but a problem. We're working on it.) But much of what we do with machine learning happens beneath the surface. ***Machine learning drives our algorithms for demand forecasting, product search ranking, product and deals recommendations, merchandising placements, fraud detection, translations, and much more.*** *Though less visible, much of the impact of machine learning will be of this type – quietly but meaningfully improving core operations.* ***Inside AWS, we're excited to lower the costs and barriers to machine learning and AI so organizations of all sizes can take advantage of these advanced techniques.***"

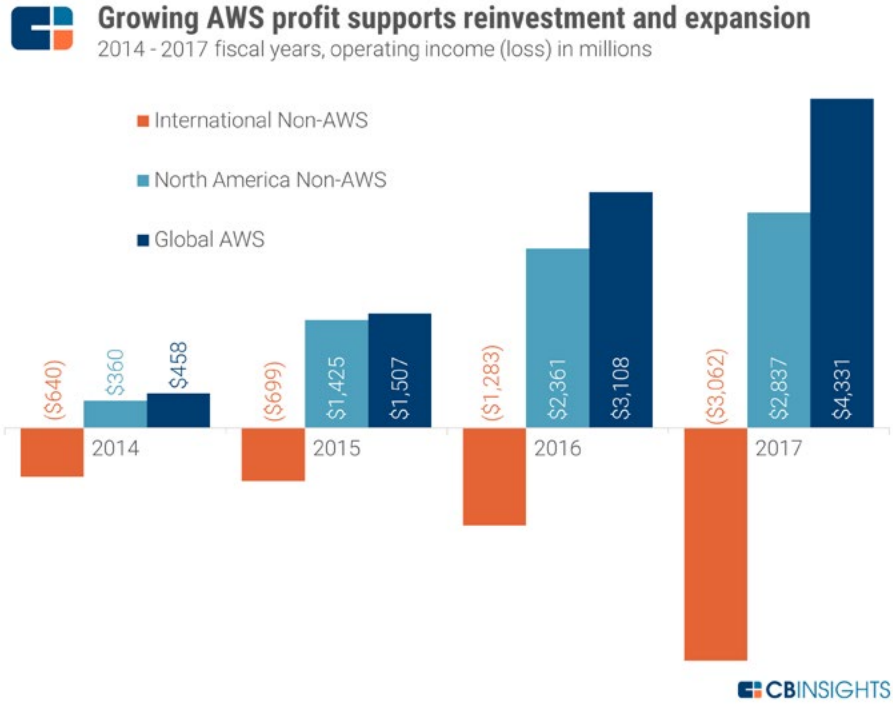
Bezos also mentions “quieter” machine learning and AI products working in the background. Amazon **owes** the development of Alexa hardware to Lab126 and many of its early recommendation algorithms to A9, both of which are secretive divisions in Silicon Valley. These **bold bets on skunkworks teams** have ended up paying off big, and the fruits of these labors are now front-and-center in Amazon’s computing strategy.

Of course, as everything becomes more digitized, applying AI to more novel areas like healthcare could create new breakthroughs. Amazon’s investment in genomics startup **GRAIL** was a vote of confidence in the area, while outside of Amazon, healthcare is already one of the **hottest areas for AI startups.**

With AWS being the go-to place for anything big data-related, Amazon is well-positioned to pivot once AI has its watershed moment. While AI is certainly heating up in the startup world, Bezos’ words seem to suggest that AI could also be Amazon’s next pillar, up there with Prime and AWS.

AWS & ENTERPRISE CLOUD

AWS is now Amazon’s second-largest source of revenue, with nearly $17.5B in sales in 2017 and close to $4.5B in profit according to the company’s recent 10K.



AWS began as a result of Amazon overhauling its own internal capacity for cloud services. Repurpose as a service for external clients, AWS allowed startups to migrate from expensive server hardware and software. Subsequently, Amazon AWS played no small part in the new wave of startups that flourished in the aftermath, including present-day unicorns like **Palantir** and **Slack**.

However, AWS' relationship to the venture world started off as somewhat fraught. Amazon CTO Werner Vogels said that VCs initially **loathed AWS** because it "robbed them of the opportunity to get significant chunks of young businesses" by providing previously unaffordable computer infrastructure.

However, Vogels also noted that AWS has increasingly been accepted because it allows VCs to spread risk across a greater number of smaller startups. Nowadays, VCs often give away AWS gift certificates to their startups.

As Brad Stone wrote, "It is not hyperbole to say that AWS, particularly the original services like S3 [storage] and EC2 [VMs], helped lift the entire technology industry out of a prolonged dot-com malaise." Stone also wrote that, more importantly, Amazon was also able to shake its own image as a simple e-commerce player and transform itself into a big-league tech company:

"Perhaps the greatest makeover was of Amazon's own image. AWS enlarged the scope of what it meant to be the everything store and stocked Amazon's shelves with incongruous products like spot instances and storage terabytes. It made Amazon a confusing target for

Walmart and other rival retailers and gave the company fresh appeal to the legions of engineers looking to solve the world's most interesting problems. ***Finally, after years of setbacks and internal rancor, Amazon was unquestionably a technology company, what Bezos had always imagined it to be."***

With cybersecurity **heating up as a startup category,** it's no surprise that AWS wants to beef up its **cybersecurity offerings**. As indicated by its patents and acquisitions, Amazon is very focused on improving and securing the stack.

In the fall of 2016, AWS suffered DDoS attacks, causing many websites across the internet to be affected due to AWS' status as the go-to solution for corporate computing. It soon released **AWS Shield**, a product intended to protect applications running on AWS.

More recently, however, **Tesla's AWS servers were breached** by cryptominers using the misconfigured AWS servers to earn cryptocurrency free of charge. This in mind, it wouldn't be surprising to see more cybersecurity M&A, such as Amazon's recent acquisitions of **Sqrrl** and **Harvest.ai**, to continue the company's efforts to strengthen its offerings.

AWS likely got a head start due to classic Innovator's Dilemma nearsightedness, where many of its competitors didn't see infrastructure-as-a-service (IaaS) as a threat. Now that AWS has reached a critical mass, the strategy going forward will likely be centered on making code deployment even more seamless.

We'll also likely see more **"as-a-service" offerings** that make deployment flexible and dead simple. One example in this arena is AWS' Lambda's serverless computing, which easily runs a snippet of code upon request, so developers don't need to consider provisioning or managing servers. (In essence, this is the micro-service version of EC2, but EC2 is still a full server that has to be managed — think Airbnb as opposed to renting an apartment.) With Lambda, developers can quickly go live in a way that was previously cost and time-prohibitive, using fast, one-time bits of code.

In addition, **AWS now offers per-second billing** for EC2 Instances, further reducing costs of organizations that used to pay per minute. This strategy seemed so effective that **Google followed suit** just a week later, offering more services within the per-second model. To ward off competitors, AWS will need to offer more services like Lambda, along with its AI and voice APIs, at cheaper costs to attract and empower smaller coders.

MEDIA & ADVERTISING

Amazon upended the **bookselling industry** years back with features like "Look Inside," and later brought books into the digital era with its Kindle e-readers, another product of Amazon's R&D arm Lab126. Its acquisition of Audible continues to supply audiobooks, which is currently the **fastest-growing format** in publishing. Back in its infancy, Amazon would throw its weight around the publishing world by threatening to lower the store rankings of publishers who didn't meet their digitization demands.

Now, the e-commerce giant has expanded far beyond books when it comes to its media and entertainment offerings.

To bolster its Prime subscriptions — which represent Amazon's third-largest source of revenue, after e-commerce and Marketplace — Amazon has introduced another special benefit to membership: **Prime Video streaming.**

Bezos has publicly **explained** the flywheel effect of Prime Video. With a suite of premium streaming, users are more likely to renew their (decently large ticket) Prime memberships, and are also inclined to buy more, which, in turn, makes for more Prime memberships and e-commerce sales.

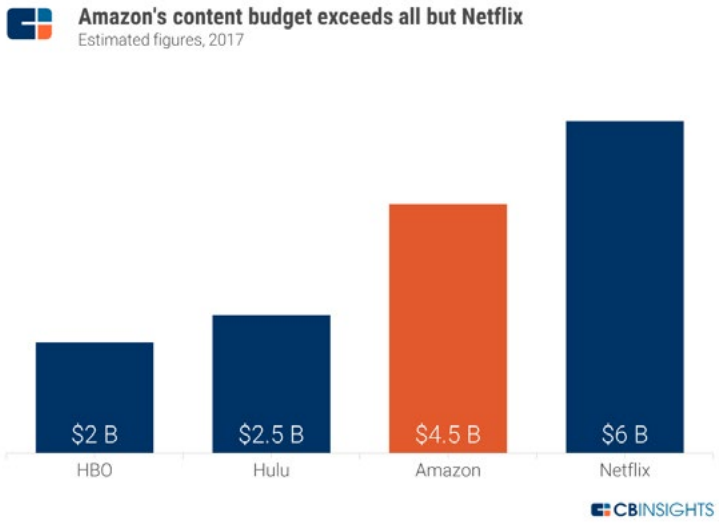
"Amazon Studios is making original content for Prime Video…from a business point of view for us, we get to monetize this content in an unusual way. ***Winning a Golden Globe helps us sell more shoes and it does that in a very direct way.*** *If you look at Prime members, they buy more on Amazon than non-Prime*

members. One of the reasons they do that is because they've paid their annual fee, they're looking around to see how to get more value out of the program. They look across more categories… We've monitored that Prime Video customers renew [Prime] at higher rates, and they convert from free trials at higher rates."

Interestingly, Bezos also said that he doesn't see Netflix as a competitor, arguing that Amazon doesn't necessarily compete head-to-head with Netflix on the demand side: "When it comes to these over-the-top subscriptions, I think people are going to subscribe to Netflix, and Prime Video, and Hulu, and HBO, and so on."

But similar to Netflix, Amazon has moved beyond simply distributing content. Amazon Studios produced movies that racked up three Academy Award wins at the 2017 Oscars: "Manchester By the Sea" won Best Actor and Best Original Screenplay, and "The Salesman" won best Foreign Film. (That's two more Oscars than Netflix, which won for a short-subject documentary.)

Amazon's interest in content could further transform the entertainment industry: Amazon spent an **estimated $4.5B** on content in 2017 — twice HBO's budget. But that's still **trailing** Netflix's aggressive $6B budget for 2017 content, which is double what Netflix spent in 2016.

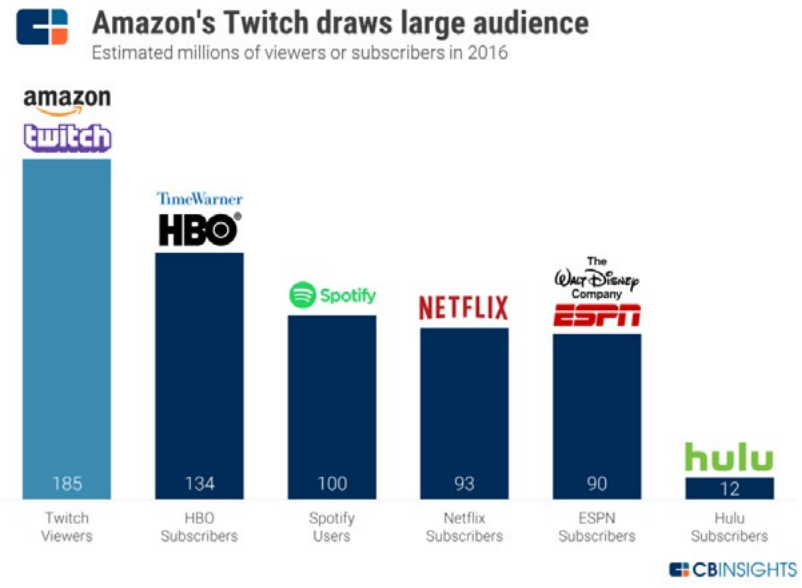


Last year, Amazon also streamed Thursday Night Football as part of a $50M contract with the NFL. It wouldn't be surprising to see Amazon renew this contract, or enter new agreements with additional professional sports organizations for streaming rights in the future.

Beyond video streaming entertainment, Amazon is also making strides in the **gaming space.**

As interest in e-sports (competitive video-gaming) continues to rise, **Twitch**, the video game broadcast site Amazon bought for just shy of a billion dollars, has **grown** to become one of the largest bandwidth users in the US, boasting more than 15 million daily active users.

The company has attracted YouTube gaming **stars** and pop culture **celebrities**. The platform also now sells video games directly on the site, an expansion that competes with the game marketplace world of Steam and Valve. Twitch membership is free with Prime, making joining Amazon attractive to gamers who are already well accustomed to buying their gaming titles online.



With its unique incentive to sell more subscriptions by offering more content and services, Amazon is able to offer a premium media suite at a cost its competitors cannot compete with.

Fred Wilson of Union Square Ventures recently **expressed concerns** that Amazon has an unfair advantage in its ability to bundle content with other Prime services:

"I worry Amazon has an almost unfair advantage in the content business because of Prime. It's the craziest thing ever. ***Who would have ever thought shipping physical products to people at a loss would become this incredible competitive moat in the television business?*** *Who dreamt that up? I happen to believe that it's an accident, that Bezos woke up one day and said 'Wow, actually we can take Prime and we can use that revenue to subsidize our way into the content business.' But honestly, if you're a Prime subscriber it doesn't cost you any more to get their TV. And I gotta come out-of-pocket with Netflix. If you're only going to have one, which one are you going to have? …People who don't have hundreds of dollars a month to spend on entertainment might choose just one [entertainment provider], and Amazon might be the one they choose because they're already Prime. They gotta buy their groceries anyway. It's just this incredible bundle."*

Advertising

The Amazon store's position as a hub for eyeballs makes it a valuable resource for selling ads. Amazon has implemented a programmatic ad product that was **estimated** to generate $2.8B in online ad revenue in 2017, and is expected to continue its growth by generating $4.5B in 2018 and $6.6B in 2019.

If this catches on, Amazon could break up the Facebook-Google duopoly in internet advertising. Martin Sorrell, the head of advertising giant WPP, said Amazon's potential in this area is what keeps him up at night, since it could connect directly with the brands and manufacturers that are now WPP's clients.

Amazon's advertising potential looms even larger as voice becomes an increasingly popular medium for conducting commerce.

When asking Alexa for a generic good or service, say paper towels or house cleaning, the voice assistant won't deliver the plethora of results that can be found online. Rather, it will deliver a single result, or pair of results, that are typically categorized as "Amazon's Choice" — that is, well-rated, lower-priced good that ships via Prime. But these recommendations could very well change if Amazon were to implement a similar programmatic ad product for voice. Brands may willingly shell out to be the top Alexa recommendation.

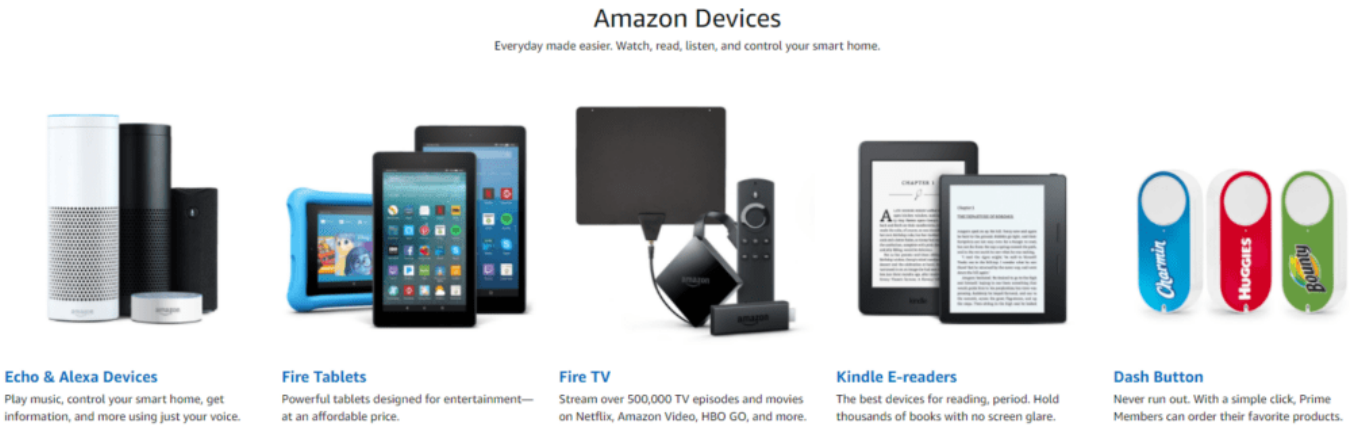
While the increase in advertising revenue may be tempting for Amazon, it presents a slippery slope when it comes to consumer trust. The company will have to execute in a way that keeps consumers' best interest in mind. That said, if Amazon is able to position itself appropriately, advertising would become another example of Amazon's ability to transform markets and ability to capitalize on shifting consumer trends.

HARDWARE & DEVICES

Along with its aforementioned line of Echo hardware products running its voice software, Amazon has a host of hardware products, including Fire TV stick, dash buttons, and a line of tablets.

The hardware R&D group Lab126 was the visionary behind these successes, and the Echo's popularity has allowed Amazon to be the go-to name for voice computing. However, Lab126 was also responsible for the massive failure of the Fire phone, which fell from being priced as a $199 iPhone competitor to selling for just **99 cents**.

Fire phone's flop was caused by a string of strategic errors, with some coming straight from the top: Bezos was known to have played a large part in the demise, obsessing over the 3D feature that fell flat with consumers. (His taste in design also proved questionable with the Kindle, for which he demanded a clunky keyboard that in later iterations was removed.)



Amazon has had its share of mega-hits, but **hardware might be its Achilles heel.** Increasingly, it seems the company has recognized this by playing to its strengths in the cloud and focusing on the software platforms behind its IoT devices.

While Amazon develops **smart security devices of its own**, it's recently strengthened its hardware offerings with the purchase of two **smart security systems**, **Blink** (December 2017) and **Ring** (February 2018). These two acquisitions are clear indicators of Amazon's commitment to frictionless logistics and commerce. While Blink's energy-efficient chips will likely primarily improve the performance of (wireless) Amazon devices, Ring may allow Prime members to provide guests and delivery companies with temporary access to their homes.

In addition to expanding and improving its own line of hardware products, Amazon also allows independent third-party device makers, like **Invoxia** and Sonos, access to its Alexa Voice Service. This highlights a key part of Amazon's apparent strategy when it comes to hardware: **opening its products up to third parties** in order to further product development. It's a bold strategy compared to famously secretive competitors like Amazon, but in the long run this openness may pay dividends.

How Amazon will build on the success of its Echo devices remains up in the air, though third-party creativity is likely to play an important role in developing the hardware of Amazon's future. Going forward, we may also see Amazon's rekindle its interest in mobile phones, a possibility suggested by the Amazon Alexa Fund's investment in hardware startup **Essential**, founded by Android co-founder Andy Rubin.

OTHER NEW BUSINESSES

Amazon has been experimenting with financial technology that could widen its reach. In India, the company is offering thousands of loans to e-sellers so suppliers can expand their operations and manage seasonal spikes. The company's acquisition of Emvantage Payments has also made it easier for Amazon's India-based customer to pay online, which is always a key focus for the e-commerce giant.

Amazon is also expanding its financial reach by launching Amazon Cash, which allows users to add to their Amazon.com balance by showing barcodes at brick-and-mortar checkout locations. The move is reportedly a bid to better appeal to underbanked users who are accustomed to dealing with cash and might be new to online commerce.

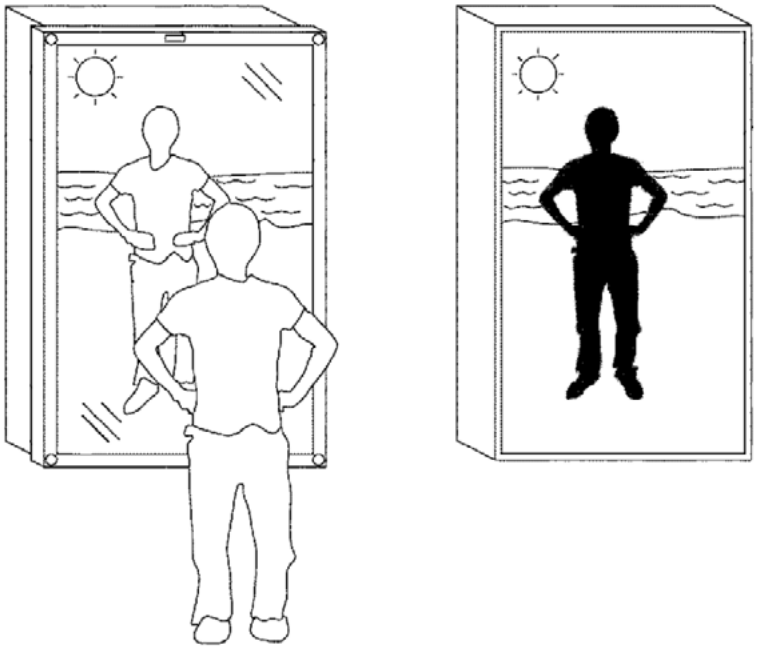
The company has also improved its own line of credit cards, partnering with Chase to release the Amazon Rewards Visa Signature Card. The no-fee card offers an instant $70 Amazon gift card for sign up, in addition to 5% back on all Amazon.com and Whole Foods purchases for Prime members.

In addition to targeting adults, Amazon's investment in Greenlight Financial allows parents to issue and manage smart debit cards for their children. Parents can control spending limits and reload the card with the use of a mobile app.

Beyond fintech, Amazon might have its eyes on augmented and virtual reality (AR/VR). In particular, Amazon's Lumberyard, a game development engine on AWS, could play a role in the development of VR content.

In November 2017, Amazon added an augmented reality feature to its iOS Amazon app, which allows users to visualize certain goods (furniture, kitchen tools, TVs, etc.) in their homes before purchase. It also recently did the same for its Android app in February 2018.

Amazon is also rumored to be integrating more augmented reality tech into its brick & mortar efforts, so patrons can visualize how goods and furniture will look in their homes. Amazon's acquisition of Body Labs, which develops advanced tech for analyzing human body size, shape, and motion, will likely play an important role in the process of building these technologies.



Building off recent efforts to grow its market share in groceries, Amazon is looking to enter the highly competitive **food delivery space** with **Amazon Restaurants**. While the company will be competing with players like Seamless, Grubhub, and Uber Eats, Amazon limits markups and offers free delivery to Prime members.

Such initiatives in fintech, AR/VR, and hospitality could help Amazon provide more frictionless commerce to its customers. But beyond the hypercompetitive commerce markets, Amazon looks to enter the more heavily regulated industries like **healthcare** and **education.**

Today, Amazon offers a variety of **open source educational resources** for the public, including tools to assign coursework, applications for improving math proficiency, and courses to teach programming. The company also recently hired Candace Thille, a specialist in learning science, cognitive science, and open education at Stanford University, a sign of Amazon's focus on strengthening its internal development and educational programs. While this doesn't indicate the development of a consumer-facing program to replace or supplement formal education, it does signal Amazon's interest in understanding *how* people can learn more effectively.

While formal education may be a stretch for the company, healthcare is something it looks to tackle head-on. In partnership

with JP Morgan and Berkshire Hathaway, Amazon is looking to become an **independent healthcare provider** for its US employees. The three companies say this initiative will be "free from profit-making incentives and constraints," but have not detailed the long-term vision of the partnership.

In a January 2018 statement, Jeff Bezos acknowledged the challenges within the healthcare industry: "the health care system is complex, and we enter into this challenge open-eyed about the degree of difficulty. Hard as it might be, reducing health care's burden on the economy while improving outcomes for employees and their families would be worth the effort."

With Amazon's cost-cutting strategies, JP Morgan's access to capital, and Berkshire's experience as a reinsurer, the combined businesses have many of the right tools to better serve their 1M+ collective employees. Whether or not an effective model for the broader population will emerge is yet to be determined.

6

Closing words

Given its mutually reinforcing lines of business in commerce, cloud computing, and AI-as-a-service, it's not easy to find chinks in the Amazon armor. But in the AI arena at least, Amazon is up against more research-oriented peers in Silicon Valley who are aggressively recruiting the top AI talent and have data troves at least as large as Amazon's to train their algorithms on.

And Amazon is fighting the technical AI battle while it is simultaneously working across an ever-widening range of industries, in addition to waging bare-knuckle fights for e-commerce market share in India and the Middle East.

Jeff Bezos, who has made relatively few missteps in twenty years of tenure, seems capable of carrying the company forward. As Brad Stone wrote, "In a way the entire company is scaffolding built around his brain — an amplification machine meant to disseminate his ingenuity and drive across the greatest possible radius."

It's almost impossible to imagine Amazon carrying forward without Bezos at the helm, and there's hardly an inkling that he is going anywhere. At the same time, it's also not clear that Bezos has cultivated the next generation of leadership to move toward a central vision without him driving the company forward.

As Amazon continues to expand, the biggest threat to its growth could be Amazon itself. Its outsized role in the commerce ecosystem, *The Economist* reports, could attract criticism from regulators: "If Amazon does become a utility for commerce, the calls will grow for it to be regulated as one."

Another question Amazon will have to confront is how long investors will stand for deferred profits. As the ***Times*** wrote back in 2013:

"In its 16 years as a public company, Amazon has received unique permission from Wall Street to concentrate on expanding its infrastructure, increasing revenue at the expense of profit. Stockholders have pushed Amazon

shares up to a record level, even though the company makes only pocket change. ***Profits were always promised tomorrow."***

Having earned a reputation as a "profit miser," Amazon only recently began posting profits, largely due to the success of AWS.

As Amazon dips deeper into its coffers to streamline its logistics network, boost web offerings, and develop artificial intelligence, it will face increasing pressure to also reward patient shareholders, balancing the demands of today's investors with its vision of tomorrow.