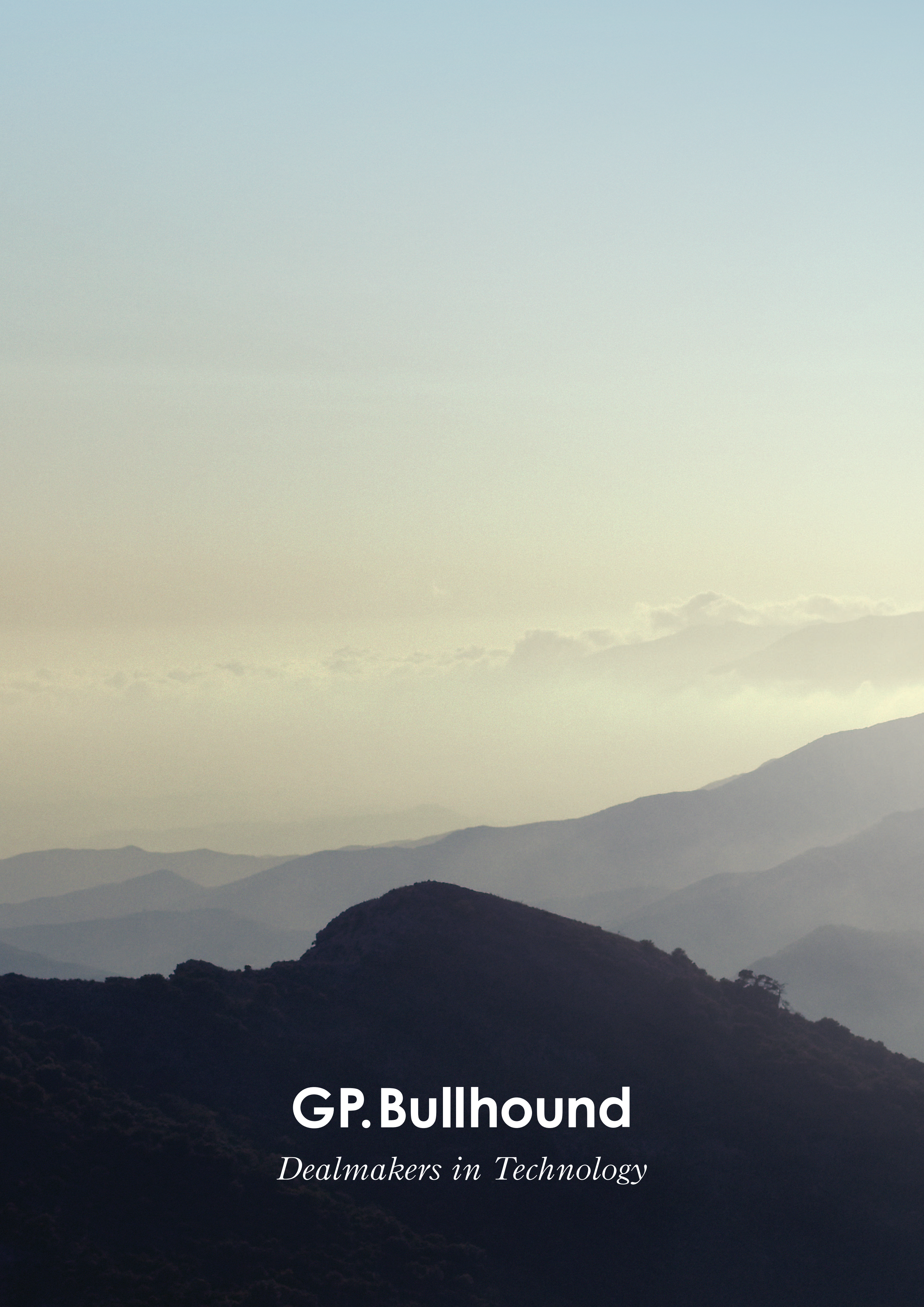
2019
TECHNOLOGY PREDICTIONS

Trends & innovations shaping the global tech sector

GP.Bullhound

Dealmakers in Technology


GP. Bullhound
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Per Roman

Managing Partner

THE VIEW
From GP Bullhound

Technology's transformative effect has touched every corner of today's world. Its commercial, social and political impact has been unprecedented. At GP Bullhound we are proud to work with the entrepreneurs and the world-leading companies that appreciate technology's potential – and work hard to turn its promise into reality. Now entering its twelfth year, our Technology Predictions report reflects our optimistic mindset and demonstrates what technology and its leading minds could achieve over the next 12 months.

It has been a year of trials and tribulations for technology as regulators have sought to match its evolution with existing frameworks; yet this report shows that technology does not just move the goalposts, it reshapes the world as we know it.

How we bank, shop and the type of money we carry are all covered. Our predictions on the rise of digital banks, the influence of crypto currencies, and retailers' attempts to upgrade delivery systems exemplify how technology impacts everyday decisions, as well as shedding light on what businesses are doing to speed up transactional processes and introduce safeguards.

We also make our predictions on employee engagement, subscription models and the future of app stores, considering how we can expect them to change and grow in 2019. Each one shows how technology's impact can be laser-focused, laying strong, specific foundations for future industries.

Meanwhile, we investigate what the next 12 months may hold for developments in AI, advertising and retail. In each, we unearth an unrelenting pace of change, which could bring countless benefits – if pragmatic decisions are made.

To do that, technology must be viewed as friend not foe, which is one of the macro themes of the report. Treating tech as a negative force will limit the good it can do. How to balance fears of technology with optimism of the better world it can build looks set to carry on being a question that defines our time.

Consumers are expecting technology to give them a lot in return for very little: giving rise to a second macro theme that emerges. Pressing questions over what we get for what we give will continue to be the focus of boardroom and consumer debates.

The scope and scale of technology means challenges will inevitably exist, so it is important that we remain faithful to our belief that technology is a positive force. This report is intended to act as a roadmap to readers, shedding light and expert opinion on the trends that matter. We hope you find it useful.

Alec Dafferner

Partner

RECAP OF GP BULLHOUND'S
2018 Predictions

Before we dig into 2019, here is a brief recap of last year's predictions and how we saw their development throughout the year.

1. AN UNEASY FUTURE
For Politics and Technology

Much has happened in the realm of politics and technology over the course of 2018. The top digital advertisers have enacted a multitude of measures to counteract nefarious influences on democratic elections, as well as increase the transparency of legitimate political advertising. Both Facebook and Google have released their archives of all political advertising on their platforms and have bolstered security spending in a big way[1]. Facebook is ratcheting up spending on AI initiatives to counter rogue accounts and it plans to double the number of its security engineers – from 10,000 to 20,000[2]. Though the reputational damage done by these kinds of activities far outweighs the monetary cost, the financial impact cannot be understated and it is certainly felt by their bottom line.

2. CYBER SECURITY
Exposure and Adoption

There is no doubt that consumer cybersecurity continues to be an incredibly important topic for consumer brands and consumers themselves. Awareness, and unfortunately the number of victims, of cybersecurity continues to rise – with 54% of people more concerned with protecting their personal data after the Cambridge Analytica scandal than they were previously[3]. With more awareness comes increased action. This consumer security trend can be seen in the cybersecurity space, for example with the IPO of Avast in May 2018, which is one of the largest providers of consumer antivirus and VPN solutions.

3. MOBILE TRUMPS TV
In China

Remarkably, we weren't strong enough with last year's prediction. Mobile usage continues to skyrocket in China, and overtook TV usage in April of this year, with adults spending two hours and 39 minutes a day on mobile devices, accounting for 41.6% of their daily media time – compared with two hours and 32 minutes a day watching TV, which represents 39.8% of daily media time[4]. Some 98% of China's internet users are mobile, which is a bewildering statistic, and further underlines their mobile-first culture, underpinned by their all-in-one super apps[5].

4. TRANSLATION TECHNOLOGY
Takes Hold

While the Pixel Buds have not been the success we, or Google, imagined they might be, translation technology as a whole has still taken off this year. Neural machine translation has given translation technology a more accurate and faster way to provide context to different words or phrases, which has revolutionized the efficacy and adoption of tools like Google Translate[6]. As a global bank, we are constantly in need of translation services for our own personal use. Voice translation and text translation have reached a point where, with connectivity, anyone can seamlessly travel in foreign cities and communicate with the people that call them home.

Accurate prediction   Inaccurate prediction   Partially accurate prediction

Sources: **1.** Tech Crunch, Facebook launches new weekly ad archive report for political spending, August 15, 2018 **2.** The Hill, Facebook launches new weekly ad archive report for political spending, October 23, 2018 **3.** Tech Republic, Consumers are more concerned with cybersecurity and data privacy in 2018, November 7, 2018 **4.** eMarketer, In China, Mobile Usage Will Overtake TV This Year, April 19, 2018 **5.** Tech Crunch, Consumers are more concerned with cybersecurity and data privacy in 2018, August 21, 2018 **6.** Wbur, Translation Technology Is Getting Better. What Does That Mean For The Future?, July 19, 2018

5. OVER AND OUT
Email

We were only partially correct in our prediction about email in the workplace. It seems people are more reliant on aging forms of communication than we thought, with both workplace instant messaging tools and email growing at a clip in 2018. We sent roughly 281 billion emails per day in 2018, with that number forecast to grow to 294 billion in 2019. However, messaging services have grown dramatically in popularity and usage over the last year. Slack, for example, now has 8 million daily active users, with users spending an average of 320 minutes a day (!) on the platform per week day[7].

6. INTERNATIONAL LABOR
Arbitrage Flourishes

The movement of tech companies to areas outside traditional hubs has continued over the past year. While key drivers of this migration were once economic, politics now play a larger role e.g. Thiel Capital's move from San Francisco to LA. The passing of Proposition C in San Francisco has caused a deep divide in the tech community. Capital is abundant outside of target cities - Seattle and San Diego have both attracted over $1 billion in VC investment[8], leading to a more geographically distributed ecosystem. In Europe, Brexit has caused many entrepreneurs to move to cities such as Brussels – throwing into question London's title as the start-up capital of Europe[9].

7. THE UNLIKELY COMEBACK
Of the Software Suite

We were spot on in our prediction that the HR software market is moving towards suite solutions rather than 'best-of-breed' point solutions. In a big shock to the market, LinkedIn announced a move into the Applicant Tracking System ("ATS") market with the launch of Talent Hub[10]. This is a natural extension of its 'top of the funnel' sourcing and it will be interesting to see how it plays out in a crowded and well capitalized ATS market. LinkedIn clearly sees the value of the suite, choosing to enter into a space that it has previously avoided.

8. INDUSTRY
4.0

Industry 4.0 has officially arrived in 2018 in a meaningful way. We mentioned that consulting firm activity was the leading indicator of a slow moving but massive opportunity in Industry 4.0. As manufacturers begin to retrofit legacy factories with smart robotics, they are leaning on consultants for their expertise. Deloitte posted record revenue for FY2018 and explicitly stated one of the main growth drivers of their consulting business to be digitally-enabled business transformation opportunities[11], many of which are created by Industry 4.0. Accenture has been busy in the space, as usual, acquiring Mindtribe and Pillar Technology, which further bolster its "Industry X.O" practice[12].

9. REGULATORS RULE ON
Boom and Bust of ICOs

Regulatory bodies reported a significant increase in enforcement actions and civil monetary penalties due to cryptocurrency oversight. The largest court case of its kind in 2018 saw cryptocurrency established as a commoditiy, which allows the Commodity Futures Trading Commission to police the market[13]. Bitcoin has experienced a sharp decline, crashing through the $6k barrier and reaching its lowest level since October of last year. Notable Bitcoin thought leader Barry Silbert famously tweeted "capitulation" in the face of the continued Bitcoin rollercoaster. The concerning factor in the Bitcoin market is the magnitude of the volatility – sometimes dropping and rising over 10% in a single day.

10. AUGMENTED REALITY
Adapts for Early Adoption

For all the hype surrounding Apple and Google's forays into augmented reality, the early market reacted with a tepid response, but then proceeded to take off. Data from Sensor Tower suggests ARKit has been downloaded over 13m times just six months after launch[14]. In unsurprising fashion, consumers are mostly interested in gaming titles, which comprised 47% of AR installations. Consumer interest remains bullish, and AR continues to become more and more mainstream with the introductions of advanced handsets and pre-installed AR apps. With the news that Magic Leap does not live up to expectations, we are unsure of the near term prospects for enterprise applications, but we remain true believers in the long term opportunity.

Sources: **7.** Expanded Ramblings, 55 Amazing Slack Statistics and Facts (August 2018), November 10, 2018 **8.** Pitchbook, November, 2018 **9.** ZD Net, The Brexit dilemma: Will London's start-ups stay or go?, October 16, 2018 **10.** LinkedIn, LinkedIn Announces new Recruiter platform it's first ATS and new diversity insights at Talent Connect Conference, October 10, 2018 **11.** PR Newswire, Deloitte announces record revenue of US$43.2 billion, September 18, 2018 **12.** Accenture Newsroom, Accenture Expands Industry X.0 Capabilities with Two Acquisitions in North America, August 9, 2018 **13.** Wall Street Journal, Cryptocurrencies, Trading Scams Draw Increased Federal Enforcement, October 5, 2018 **14.** Venture Beat, Sensor Tower: ARKit apps rack up over 13 million downloads in 6 months, March 28, 2018

TECHNOLOGY
Predictions 2019

Over the course of more than a decade, GP Bullhound's Technology Predictions report has established a reputation as an industry-leading analysis of the trends and innovations shaping the global technology sector. What follows are the ten trends we believe will define tech in 2019.

1. DIGITAL BANKING
Continues to Rise

Between 2017 and 2018 there was a 24% increase in digital transactions, with more than two-thirds of millennials in the US using their smartphone as a wallet. This is creating an environment where traditional financial institutions are implementing innovative digital banking solutions, while start-ups grow at a rapid rate due to the demand from venture capitalists to invest in fintech.

2. APP DISTRIBUTION
Moving Away From Apple and Google

Income from apps makes up 20% and 18% of Apple and Google's respective revenues, charging a commission to app developers to host and distribute on their platforms. However, a backlash is beginning with the tech giants becoming a leech on app developers that have the product popularity to stand alone.

3. EMPLOYEE ENGAGEMENT
Goes High Tech

Recruitment processes, data analytics and capital management are just three areas of HR set to be disrupted by new technology. HR tech could have a major impact on the way teams manage their internal processes, but artificial intelligence used in HR will have to be tuneable in order to avoid institutionalizing the biases it aims to eliminate.

4. RETAIL TECHNOLOGY
Gets Smarter

Traditional bricks and mortar retail still dominates over e-commerce, making up 88% of global retail purchases. Tech giants and online start-ups are even turning their attention to physical rather than online exclusive retail. A new age of retail is emerging, with the combination of innovative technology and the social dimension consumers enjoy in traditional retail.

5. ARTIFICIAL INTELLIGENCE IS THE
End of Repetition, not the End of Life

The media narrative has often portrayed technology as the end of the white-collar workforce, but like all previous industrial revolutions, humans will adapt to new technologies. Artificial intelligence is set to improve working conditions, create more flexible ways of working, and remove the need for humans to take on time-consuming menial tasks.

6. CONSUMER SUBSCRIPTION
Set to Eclipse Advertising

As concerns of data misuse grow, and content quality increases, it is becoming clearer that consumers are more interested in reliable paid subscription services. Growth in the digital ad market is slowing, while subscription models have grown in popularity, with more incentive for companies to improve their products for a loyal user base.

7. A BREAK-UP
of an Advertising Duopoly

Advertisers spent $4.6 billion on Amazon's platform in a watershed year that has seen advertising money move away from the Google-Facebook duopoly, which currently hold 58% of the market combined. With the development of its own end-to-end service, brands will begin to allocate budget to specialized performance partners in order to get their product in front of Amazon's consumers.

8. LAST MILE DELIVERY
Going the Distance

More than half of shoppers under-35 expect to have an option of same-day delivery, despite only two of the top 50 online US retailers offering this. But with next-day delivery already a staple, and Amazon leading the way in developing fulfilment centers for rapid delivery, more retailers will turn their attention to last mile delivery solutions.

9. END OF
The Boys Club

Though the technology sector has been among the most progressive when it comes to corporate initiatives for reaching gender balance, veteran female investors and executives are now taking a different angle by improving accessibility to the venture backed tech ecosystem for new and prospective female entrants.

10. CRYPTOCURRENCY
Will Grow Up

We are yet to see the best of cryptocurrencies. Blockchain activity is picking up with even traditional financial institutions ensuring they do not get left behind. 2019 should be the year institutional capital flows into cryptocurrency, with previous obstructions and tight regulations lifted.

DIGITAL BANKING
Continues to Rise

1,765
Bank branches closed in 2017 in the US

46%
increased their mobile banking usage from last year

91%
Prefer using mobile banking apps compared to a physical branch

COMPANIES TO WATCH

- acorns vs STASH
- ally
- Atom bank
- AVANZA
- BankID
- BREX
- chime
- cleo.
- C-zam
- ID FINANCE
- Klarna.
- MAMBU
- Margo Bank
- monese
- monzo
- N26
- orange bank
- qonto
- robinhood
- SIMPLE
- SoFi
- STARLING BANK
- swish
- yoyo

Tech-savvy millennials have driven – and continue to drive — a seismic shift towards an uptake in digital banking. According to the latest data available, there are 71 million millennials in the United States[1], with 68% using their smartphone in tandem with their wallet to handle transactions[2]. The transition towards digital banking will continue to be facilitated by payment services like PayPal and Venmo, which have seen a combined 24% increase in transaction volume from $6.1bn to $7.6bn from 2017 to 2018[3]. This should continue to grow as most millennials conduct at least some of their banking-related activities via digital channels, such as checking account balances, transferring funds, and performing account maintenance.

From a macro perspective, the combination of regulatory relief and reductions in corporate tax rates alongside rising interest rates could help US banks reach pre-crisis return on equity levels. This has resulted in banks and other enterprises flexing their investment muscles, with investments contributing to $40bn in M&A activity in the first half of 2018 across 140 transactions[4].

Despite high funding activity surrounding financial technology start-ups, many traditional players are developing their own digital banking solutions to compete with the newer players in the field. Commission-free trading and investing platforms spurred JP Morgan to create a digital investing service that provides free or discounted trades and no-fee access to the bank's stock research. Venmo's rise led to the development of Zelle, a competing digital money transfer system developed through the combined efforts of seven of the largest banks in the US. Meanwhile, Goldman Sachs responded to the proliferation of digital savings accounts with Marcus, which provides middle class customers with access to products that once existed solely for high net worth clientele.

There are some areas in the banking ecosystem that remain uncapitalized by larger players, which leaves start-ups to grow at rapid rates until traditional players realize the opportunity. Brex, which recently reached unicorn status in under two years, is changing the face of credit cards by issuing them to small start-ups and charging based on company revenues or credit history. ID Finance is pioneering the fintech market by providing digital access to banking services in areas where traditional methods are inaccessible. Both Brex and ID Finance have developed a proprietary scoring model to determine the risk of their users, providing a technological edge compared to larger banks.

However, despite growing interest and investment in digital banking, there are associated risks and uncertainties in these solutions. Due to low unit economics, as the average balances across digital accounts are quite small compared to their acquisition costs, most digital accounts are unprofitable.

Banks combat this by expanding their offerings to increase cross-selling opportunities. However, this may be especially difficult as the market becomes increasingly saturated as banks target the same tech-savvy demographic. Furthermore, most customers prefer dealing with humans on matters like setting up financial goals or getting investment advice, while about half of US banking customers aged 18 to 44 said they banked digitally but prefer to resolve some matters in-person[5]. Thus, digital banks need to recreate the branch network virtually to the greatest extent possible, aiming to offer digital-only customers the comfort that larger institutions can.

However, despite these difficulties, the future looks bright for digital banks. As greater investment, more considerate regulation and increasing innovation pushes the industry forward, we will continue to monitor the market with the hope that more choice and lower costs will encourage and incentivize a fully digital consumer financial system capable of global reach.

Sources: **1.** Pew Research, Millennials projected to overtake Baby Boomers as America's largest generation, March 1, 2018
2. Citibank: Mobile banking use is up 25% in the last year, April 27, 2018 **3.** Paypal, 10-k, filed February 7, 2018 **4.** Pitchbook, 2018

EXPERT VIEW

Norris Koppel

Founder & CEO, Monese

Like many great things in life, Monese was born out of frustration. After moving to a new country and trying to open a bank account, I couldn't believe how difficult the process could be. Not one to be put off, I started to look at why banks behave the way they do and why certain processes can be tricky for a customer to navigate.

I discovered that regulators and governments are generally supportive of streamlining processes – like making it easier for people who have recently arrived in a country to open a bank account. The blocking force, in fact, is the traditional banks.

Outdated technology, archaic paper-based compliance processes and old ways of working combine to inhibit traditional banks from offering their customers a modern, seamless experience.

That's where we spotted our opportunity: to create a banking service that truly supports customers living their financial lives across multiple countries, whether it is for work, study or retirement. Through our ability to verify customer identity and background globally on their mobile devices in real time, we have removed the biggest barrier to accessing financial services in new countries. From there, we are building a globally connected service that gives customers an easy and smart access to accounts, credit, mortgages, savings and more - a locally smart and globally portable banking service.

Our innovation – and the work done by businesses like ours – has not just been welcomed by millions of customers around the world, but increasingly by the big banks that once stood in our way. A mindset shift has crept into traditional providers – a move that has seen them get on board with fintech.

A few years ago, when the fintech revolution really started, it felt like big banks were ignoring the change. But as digital banks opened, grew and began to take market share, traditional banks realized they could soon be made obsolete.

In response, they've invested heavily into redeveloping their digital offering and are pumping money into their digital mobile apps. They are operating faster, finding ways to be consumer friendly and – importantly – on the hunt for partnerships.

When we started, it was difficult to get in the same room as the traditional banks. As a financial services company, we have to hold customers' funds in a traditional bank, so their collaboration was vital to success. Big banks didn't know what to think of us – or those like us – so many just kept the door closed. However, as fintech has grown, banks now actively approach us.

Thinking ahead, it's likely that some banks will want to retain as many product offerings as possible, but I predict there will be some banks that completely relinquish control, working in tandem with newer players like us to provide services instead – and doing a better job at it.

In the next five to ten years, I see many traditional banks playing an essential role in the financial services process but having less customer-facing points and being more reliant on digital channels like Monese to offer products.

Going forward, there are plenty of digital players entering the arena, but there is little overlap in what they do. As each one finds its identity and builds its own customer base, the most successful ones are those that go after different customer sectors. The market, in the grand scheme of things, is still young.


GP.Bullhound

APP DISTRIBUTION

Moving Away From Apple and Google

$34.4bn
In app revenues combined for Google and Apple in H1 2018

30%
Initial sales commission

15%
Sales commission for iterative sales

COMPANIES TO WATCH

- alto
- amazon
- Discord
- EA
- Epic Games
- Fingersoft
- green man gaming
- Kolibri Games
- OhBiBi
- Playdemic
- Robot Cache
- splash damage
- Spotify
- Sumo Digital
- Supercell
- team17
- Ultra
- unity
- Valve
- Voodoo

App revenues represent a significant contribution to Apple and Google. Through the App Store and Google Play, the tech giants generated approximately 20% and 18% of their respective total revenues for the first half of 2018[1]. These distributors charge a 30% commission on every sale in the first year after app launch, decreasing to 15% in subsequent years.

Generally, app developers are happy to pay this initial price for viewership and distribution. However, once apps reach a critical mass of users, this can turn from a launchpad into a leech. Some developers are even considering cutting their ties with the App Store and Google Play as a means of sidestepping the sales commission. For example, Epic Games, developer of the viral success "Fortnite", has been taken off the Google Play Store, with Android users able to download the game to their phones directly from its own website.

Apple is now even facing a class action lawsuit in the U.S. arguing that they are using monopoly control to overcharge customers for apps.

Could this pushback be putting a significant portion of Apple and Google revenues at risk? The backlash from app developers and consumers could disrupt the entire app distribution ecosystem, leading to the emergence of two strategies that could potentially challenge Google and Apple's dominance in the sector:

1) Tech giants creating their own separate platforms to host their applications

2) Smaller players developing competing distribution models that are more consumer and developer friendly.

Some tech giants, with well-established user bases and business models, are asserting their position with competitive offerings of their own. An example of this is Facebook Lite, a less robust version of Facebook targeted at emerging markets. Facebook's instant games were originally separate apps available on the Android and Apple stores that would be downloaded separately. However, to sidestep these platforms, Facebook has integrated its instant games into Facebook Lite, meaning they can be accessed and launched through a mobile browser rather than a separate app.

The advantage of this approach? It keeps Facebook Lite's file size small to the benefit of international users with slow connections or limited data plans and provides its 90 million monthly active users easier access to engage with their community of 270,000 Facebook groups[2].

Other tech players have been demonstrating similar behavior, with Netflix and Spotify moving their subscription services off the App and Play stores and onto their own websites.

However, despite these efforts, both still list their apps on these stores and are unlikely to stop doing so anytime soon.

Why? Most apps are in a highly competitive marketplace full of copycats with similar offerings, so proximity to the consumer is vital for continued thriving and surviving. Thus, despite Facebook's entrance into app distribution, and Netflix and Spotify's middle ground strategy, we should not anticipate the tech titans taking a clean break from Apple and Google's distribution.

But on the other end of the size spectrum, a number of innovative start-ups, such as Robot Cache and Ultra.io, are disrupting the market by offering more consumer and developer-oriented alternatives to the traditional distribution model. These new platforms can charge a lower sales commission (e.g. 5% on each sale and microtransaction instead of 30%), creating new revenue streams for developers, such as facilitating in-game trading through a digital marketplace. Furthermore, consumers can interact with these platforms in new ways; reselling their games and earning money by testing new ones, providing more meaningful ways to interact with their apps.

So, what will happen next? Google will likely be hit harder as its platform is more open to applications from outside the store, whilst Apple makes it more difficult for companies to download apps from other platforms.

But even Apple will have to react if these new start-up distributor disruptors are able to gain traction and develop large, consistent user bases. This ongoing discussion will only help the industry move forward – with more competition meaning a better experience for consumers and a more considerate one for all developers.

Sources: **1.** Techcrunch, Apple's Appstore revenue nearly double that of Google Play in first half of 2018, July 16, 2018
2. Techcrunch, Sidestepping Appstores, Facebook Lite and Groups get Instant Games, October 17, 2018

EMPLOYEE ENGAGEMENT
Goes High Tech

47% of organizations are involved in automation projects

24% of organizations are using AI to make tasks routine

$6bn of investment has been made in over 1,000 start-ups in the last three years

COMPANIES TO WATCH

betterworks, Bonusly, Clustree, coople, fœderis (RÉVÉLATEUR DE TALENTS), LinkedIn + GLINT, jobtalent, lantum, Lattice, lucca, neosphere, Peakon, QUINYX (ENJOY WORK), Reflektive, salesforce, servicenow, slack, talentia, TALENTSOFT, Ultimate SOFTWARE, workday, zugata

The enterprise world has discussed the impact of AI and Machine Learning on human resources for years. Recently, this discussion has shifted from how to replace human decision making to how to streamline it using AI and Machine Learning, especially in relation to HR functions such as performance reviews, gender diversity, inclusion, compensation, and workforce forecasting.

One key area where technology will make a great impact on HR is the recruitment process. Human decision-making is indelibly tinged with bias, and whilst a recruiter may not overtly show it, variables will subtly impact the decision-making process.

Firms are exploring how AI-based innovation can find the right talent and do so with zero bias and a laser focus on the traits that make a successful hire: ambition, learning agility, passion, and sense of purpose. Entelo and Wade & Wendy are using AI to enable more natural engagement with candidates during the process. According to AllyO, AI and Machine Learning have helped clients increase capture and conversion rates up to six times over a more traditional recruitment approach[1].

Another way for technology to enhance HR functions is through data analytics. With the increased proliferation and sophistication of analytics, HR firms can develop a better understanding of what roles in which markets will pose challenges for their recruitment team, when they can expect to ramp up hiring, and how they can best plan for growth initiatives based on the talent available. Overall, analytics is not just a buzzword. Rather, data will become fully integrated into the candidate life cycle and its power will drive how firms recruit.

M&A activity shows that there is greater interest in integrating Human Capital Management (HCM) capabilities across the software space, with many notable acquisitions occurring recently. Not only has the number of acquisitions in the space increased – from 55 in 2015 to 76 in 2018 – but the median deal size has also increased by more than 10x – from $28m in 2015 to $300m in 2018[2].

Transactions such as LinkedIn's acquisition of Glint demonstrate how traditional players are finding ways to increase user engagement by facilitating more career development services and moving beyond traditional recruiting and HCM software.

Workday's recent acquisition of Adaptive Insights, a follow up to the acquisition of Rallyteam and Skipflag, conveys a desire from existing HCM firms to transition from a Software as a Service (SaaS) model to a Platform as a Service (PaaS) model, indicating a changing model that sees firms expand their reach with a broader base of products.

Despite the impact that HR tech and AI will have on HR functions, there are risks and concerns regarding the technology. As AI requires training data, it must learn from current management styles to develop its own practices. Therefore, if a firm's current practices are biased, discriminatory, punitive or overly hierarchical, they may be institutionalized rather than eliminated through the technology.

To avoid this, AI needs to be transparent and "tuneable", thereby allowing iterative tweaks to the algorithms to make sure they do not incorporate biases. There's also the risk of data exposure and inadvertent misuse of AI. We must learn how to apply behavioral analytics carefully, so we do not let AI turn against individuals. AI has been a "tool" for suggestion and improvement – not an independent decision-making system as it stands today.

To conclude, HR tech will have a major impact on the way HR teams manage their internal process and could provide greater efficiency and accuracy in talent management and retention processes. However, the success of an HR tool will be dependent on the accuracy of its algorithms, the ease of use of its systems, and the ability to provide what is called "narrow AI" (or specific solutions that solve your problems). This can only be done when the vendor has massive amounts of data to train the system, as well as following several revisions based on feedback. That's why we believe the key barriers to implementing HR tech are going to be leadership, company strategy, and employee comfort – not forgetting the need for great engineers.

Sources: **1.** Randstad Sourceright, Talent Trends Quarterly, Q3 2018, **2.** Pitchbook

RETAIL TECHNOLOGY
Gets Smarter

61%
Prefer brands with physical stores than online only brands

58%
Use smartphones to research products whilst in a store

40%
Would pay more for a product if they could experience it in AR

COMPANIES TO WATCH

- Alibaba Group
- Alltricks.com
- amazon
- APPTUS
- beabloo
- DYNAMIC ACTION
- EXTENDA
- FIT ANALYTICS
- IBM
- INDITEX
- LVMH
- MADE.COM
- NCR
- PERSADO
- reply.ai
- Santédiscount
- Telefónica
- THEHUTGROUP
- theia interactive
- ZeroLight

It is not a new concept for tech companies to open physical stores. Microsoft and Apple were the first major players to do so for their own products, but more recently we have seen Amazon enter physical commerce with its 4-star stores and Amazon Go supermarkets. Alibaba similarly has its own supermarket, Hema, and its own clothing retailer. This is even happening to relatively smaller companies such as Warby Parker, which was born online in 2010, and this year will have almost 100 physical stores[1], similarly Bonobos now has 48 current locations[2].

It seems almost counterproductive in our increasingly digital world for these tech giants, who dominate our lives through their online presence, to have entered the physical market. But, to paraphrase Mark Twain, rumors of physical retail's death have been greatly exaggerated.

Some 88% of all global retail purchases are still made physically, contributing between $23-25 trillion compared to less than $3 three trillion through retail e-commerce[3]. Despite considerable effort to entice consumers to online – and mobile traffic has increased in popularity, representing more than half of digital retail traffic and 26-30% of purchases[3] – most still prefer interacting with product experts face-to-face.

Good old bricks and mortar will survive and thrive alongside e-commerce for as long as consumers want a social dimension to their shopping experience. But this is not to say we are at an end point in retail disruption. Technology is still set to make a greater impact in the sector.

Alibaba's clothing store comes from a partnership with the company Guess and uses mobile IDs from online shopping website (also owned by Alibaba) Taobao, to monitor customer behavior, tracking items they try on, purchase and recommend. They are then able to target these customers as Amazon or Google do through online searches[4].

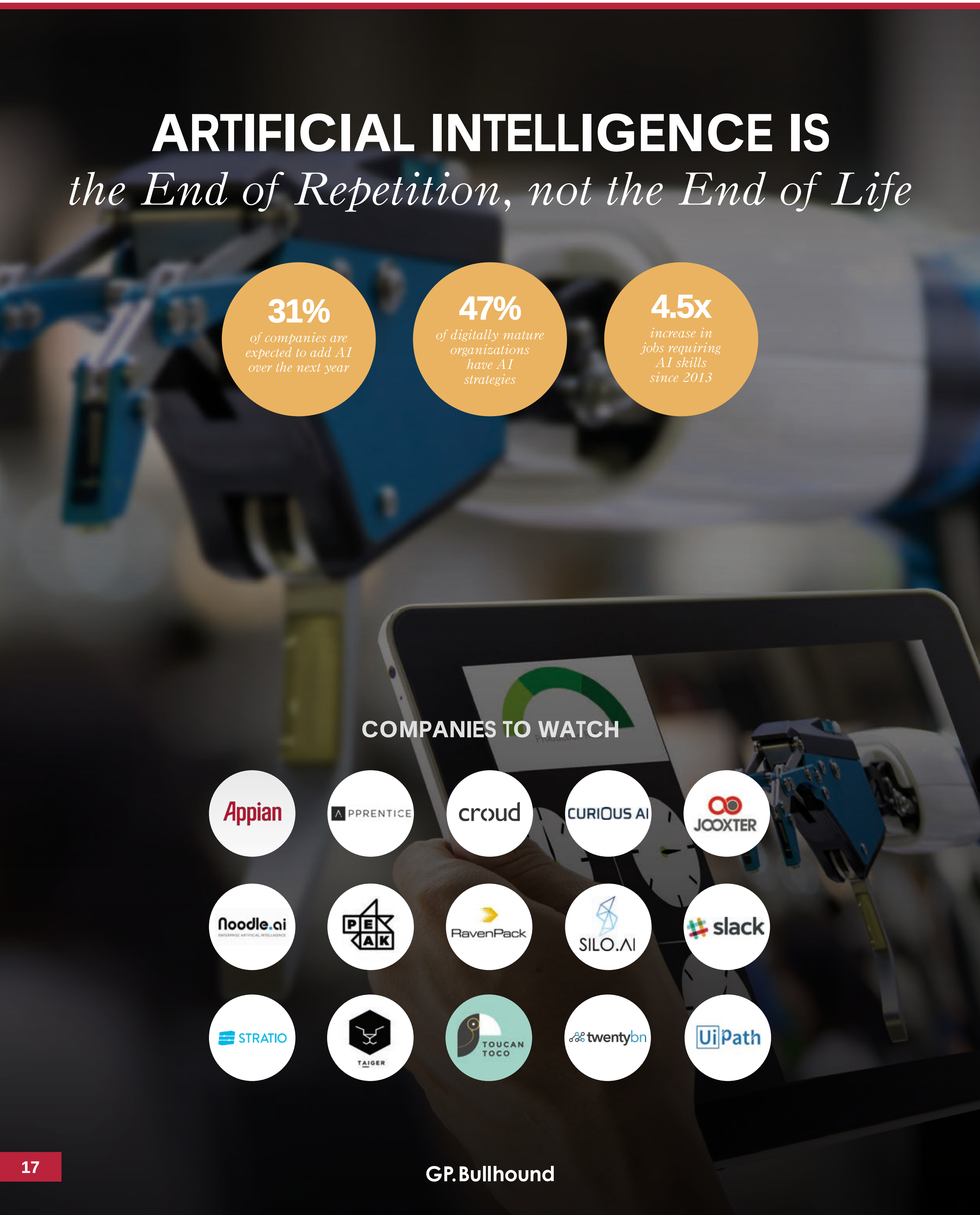
Amazon Go meanwhile has experimented with the elimination of cashier checkouts, simply tracking the movement of customers and putting the bill on a user's account afterwards. It also uses machine learning algorithms to decide what items are stocked and uses data analytics to customize the in-store experience for every customer.

Many fledgling start-ups are also entering the space by providing an array of possible solutions to enhance physical retail. AR/VR is being explored by the likes of NanoVR, who are creating virtual interfaces, such as a brand ambassador or a store showcase that customers can interact with. Another start-up, Reply.ai is aiming to develop an AI Chatbot system that learns from conversations with customers, to create a more personable and human assistant at physical stores – the social dimension remains, and the technology enters.

The potential of machine learning meanwhile is being tested by the likes of Persado, building a platform that leverages "emotionally tagged content" such as images, words and phrases in its database. This helps retailers determine what elements of an advertisement work and the form these should take moving forward.

A new age of retail will emerge through the merging of Silicon Valley's innovative technology, with main street's tangibility and social dimension. With companies like Amazon and Alibaba spearheading the transition and smaller start-ups developing solutions to augment physical retail, our current way of shopping may be completely disrupted sooner than we think. Just do not think a purely online model will be the dominant form of retail.

Sources: **1.** CNBC, Warby Parker aims to run nearly 100 stores this year, as other Web shops follow, February 15, 2018 **2.** Bonobos website, October 30th, 2018 **3.**Tune, TAPS, CLICKS, BRICKS: Omnichannel Customer Engagement Is the New Brand Superpower, April 25, 2018 **4.** Digipay, Alibaba rethinks retail with a new Guess store in Hong Kong, July 9, 2018



ARTIFICIAL INTELLIGENCE IS
the End of Repetition, not the End of Life

31%
of companies are expected to add AI over the next year

47%
of digitally mature organizations have AI strategies

4.5x
increase in jobs requiring AI skills since 2013

COMPANIES TO WATCH

Appian, Apprentice, croud, Curious AI, Jooxter, Noodle.ai, Peak, RavenPack, Silo.AI, slack, Stratio, Taiger, Toucan Toco, twentybn, UiPath

"The development of full artificial intelligence could spell the end of the human race… Humans, who are limited by slow biological evolution, couldn't compete and would be superseded," the late Stephen Hawking told the BBC in 2014. Professor Hawking was by no means the only, nor even a rare voice of doom when discussing artificial intelligence (AI), believing that robots will render much of the world's population what historian Yuval Noah Harari calls a "useless class" – unemployable, compared to far superior robots.

Yes, work tasks will change, occupations will disappear, our education system will have to evolve. But this should be viewed as an opportunity for the next generation, not an apocalypse.

AI has the potential to – and increasingly will – solve important issues, particularly highly repetitive tasks that involve analysing, testing and re-testing vast amounts of data and/or decision trees. Medical product development, risk and compliance analysis, information aggregation and predictive analysis are good examples. But AI alone cannot drive the next phase of development, that has to come from humans.

A 2006 study in the Monthly Labor Review by Wyatt and Hecher reported that between 1910 and 2000, the number of farm workers in the United States decreased from twenty-four percent of the labor force, to less than one percent. In a similar decline, other manual labor decreased from ten to three percent.

As these industries faced disruption, others grew with a twenty percent rise in technical professions, the number of teachers doubling, and a seven fold increase in the number of health workers. The concept of an engineer meanwhile went from almost non-existent, to five percent of the workforce.

Through every industrial revolution – and we are now in the fourth – concerns have been raised about what will happen to the human workforce as automation increases. But just as the farm worker went from sowing the seeds to driving the plough, the regular office worker's creativity will be freed and their living conditions improved.

The digital revolution is no different to those preceding it, removing the confinement of sitting in an office for eight hours a day, five days a week, battling rush hour commutes and overpopulated metropolises, to a world of flexible working patterns and new locations. With less time commuting and more personalized office environments, productivity is bound to increase.

As well as improving working conditions, AI will also improve the experience of doing a job. Instead of eradicating jobs, AI will augment the domain of tasks that existing employees spend far too much of their time completing. One example of this AI narrative is driven by companies like UiPath that specialize in Robotic Process Automation ("RPA"), software that is capable of automating many traditional 'white-collar' tasks, including copying and pasting, completing forms and extracting data.

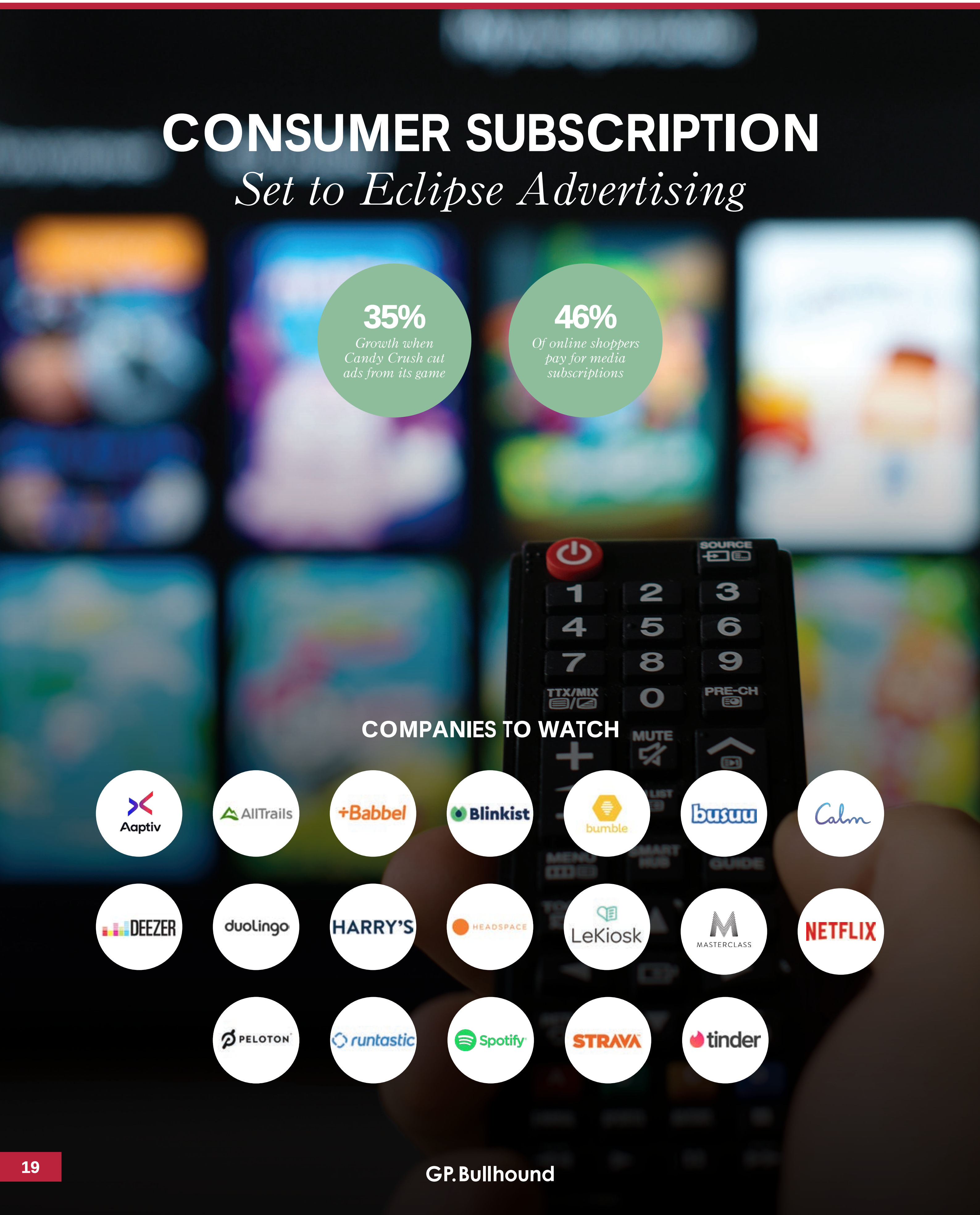
While the prospect of these capabilities may sound threatening to the livelihoods of some workers, in reality they will enhance human productivity by removing menial tasks, allowing people more time to actually analyze the data.

A compelling case for the benefits of this is in the financial sector, where UiPath's virtual robot monitors multiple databases to check income, exposure and expenses, and posts a report for the creditor to analyze[1]. The result is fewer human hours spent pulling data, and more bandwidth dedicated to processing a greater number of applications, with shorter turnarounds.

Many innovators in the space are painting a picture of symbiosis between humans and artificial intelligence. Apprentice.io raised $8 million in September 2018 to enhance productivity for skilled manual laborers[2]. The startup is helping lab scientists easily access standard operating procedures, visualize 3D technique demonstration, and capture data with computer vision, all through a hands-free interface. While Apprentice.io is currently focused on applications in biotech and pharma, the technology has massive potential to assist a wide-range of professionals including surgeons, machinists, soldiers and chefs.

To forecast a future of unemployment, of a useless class, from the rise of AI is bleak and melodramatic. The vast majority of occupations stand to benefit from enhanced decision making and higher productivity. The digital revolution has the potential to fundamentally transform our approach to work and ultimately improve our quality of life. The future is bright, and we see the continued introduction of AI into our daily work in 2019, despite some of the "doom and gloom" narrative in the press.

Sources: **1.** UiPath, RPA for the Banking industry, Copyright 2005-2018 **2.** PR Newswire, Apprentice.io Raises $8M Series A for First Conversational AR and AI Platform, September 18, 2018



CONSUMER SUBSCRIPTION

Set to Eclipse Advertising

35%
Growth when Candy Crush cut ads from its game

46%
Of online shoppers pay for media subscriptions

COMPANIES TO WATCH

- Aaptiv
- AllTrails
- +Babbel
- Blinkist
- bumble
- busuu
- Calm
- DEEZER
- duolingo
- HARRY'S
- HEADSPACE
- LeKiosk
- MASTERCLASS
- NETFLIX
- PELOTON
- runtastic
- Spotify
- STRAVA
- tinder

Consumers are rapidly waking up to what the business world already knows – paying for robust subscription solutions is a superior experience to using free, ad-supported products.

This trend is playing out in the world of media, entertainment, health and wellness, education and a variety of other industries. As consumers push back against ad-supported products, and concerns over the misuse of customer data grow, companies are rapidly transitioning to the subscription model as a way to improve the consumer experience.

Software subscriptions or Software as a Service (SaaS) have become the holy grail of business models, as proven by the performance of leading B2B software companies, including Microsoft and Adobe, which have transitioned from perpetual license to SaaS platforms.

For consumer businesses, relying on ad-support is a major constraint because revenue growth is bound by total ad spend available in the market, as opposed to the platform's intrinsic value to consumers. On top of that, growth of the digital ad market is forecast to slow down from 17.7% in 2018 to 8.6% in 2022[1].

At a fundamental level, the ad-backed model misaligns the directives of management teams to create as much demand as possible for ad space, instead of improving user satisfaction. Companies are forced to pour money into ad sales teams and lure more traffic by appealing to the masses.

For consumers, there is an ocean of free content online, but unfortunately that also means a lot of advertising distractions. Global digital ad spend is estimated to reach $629 billion in 2018[1], and users of "free" apps and media are confronted with advertisements at nearly every touch point in their digital lives. Consumers must increasingly cut through the distraction of ads and low-quality content to find real value, so much so that a growing number of users are willing to pay for quality and reliability.

In 2016, amidst a post-election surge of fake news, the New York Times saw its highest rate of growth from digital subscriptions since launching its pay model in 2011[2]. The media and entertainment sector is rapidly adopting the subscription model, pioneered by leaders like Netflix, Spotify and Match[3].

Subscription-based platforms are incentivized to improve their product and retain a loyal user base. When revenue comes from subscribing customers, management teams benefit from exceptional visibility into consumption patterns, helping to illuminate effective levers for growth. An increasing number of content and media platforms have trended toward the 'freemium' model, offering basic services or content for free, but placing additional features behind a paywall – typically via subscription.

With the nuisance of ads in basic offerings, augmented by the value of premium features, this creates a dynamic push and pull incentive for free users to convert to paid subscribers. With this loyal base of subscribers, companies are able to refine their offerings and get better at convincing consumers of the value behind the paywall.

The key to creating value on these platforms is delivering highly personalized and curated experiences. For consumers debating a subscription, there is a strong value proposition for a platform that offers not only consistent format and quality, but highly relevant content discovery. Companies are continuing to implement the formula, and we are seeing a meaningful shift in consumer preferences to valuable end-to-end subscription solutions.

Up-and-comers like AllTrails, Duolingo, Calm, and Masterclass continue to carve out a place in consumers' budgets, demonstrating their value and utility. This shift will only continue to play out across a range of verticals as consumers and platforms cut advertisements out of the equation in favor of subscriptions.

Sources: **1.** eMarketer, eMarketer Releases New Global Media Ad Spending Estimates, May 7, 2018 **2.** The New York Times, Journalism That Stands Apart, January, 2017 **3.** GP Bullhound is an investor in Spotify.

EXPERT VIEW

Jade Van Doren

CEO, AllTrails

In an era when consumers are paying more attention than ever to how their data is used, are subscription models, rather than advertising, becoming a more appealing way for companies to monetize?

The Cambridge Analytica scandal and fake news fuelled by social media have underlined the challenges facing businesses that depend on driving their growth through advertising.

In 2018 we expect services such as search engines and social media platforms to come for free. But as we are seeing, there can be all sorts of downstream impacts of having a business model where a company's users are the primary product.

We realized at AllTrails that our big win would be to build an app that provides enough value to people who get outdoors that they will pay us money for it. Producing accurate hand-curated trail maps for hikers, trail-runners and mountain bikers globally is a big challenge, and we rely on our Pro users to keep the lights on.

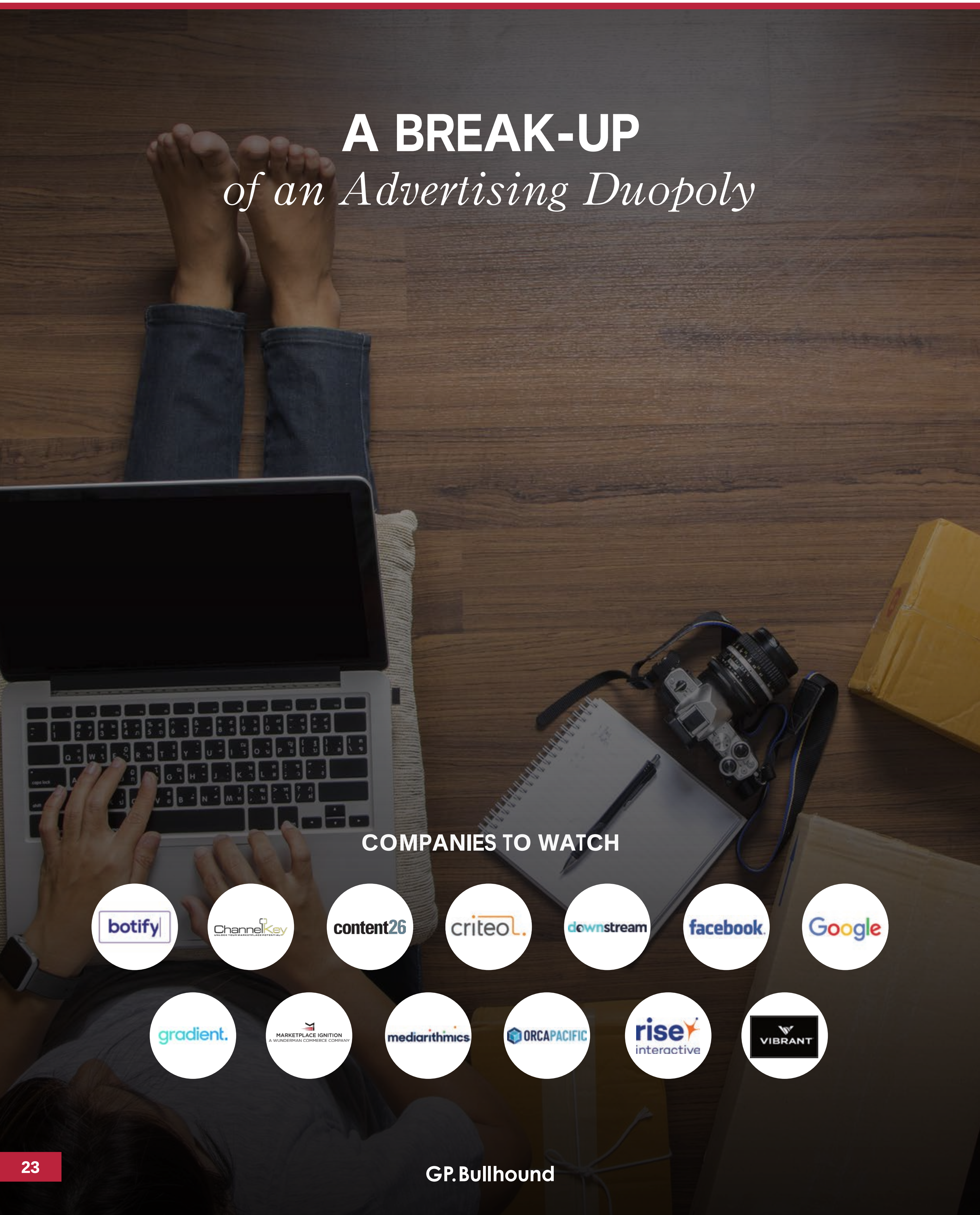
That said, we provide a lot of functionality for free - users can find directions to trails, record and share their activities, and much more. But we charge a subscription fee for things like downloading maps for when you don't have a data signal (but still get a blue GPS dot), real-time weather, air-quality, and fire history, drawing your own maps, and lots more features.

We also work hard to make our paid model appeal to all sorts of users. When I started at AllTrails three years ago, our Pro users were mostly older, white and male, so we decided to try to make the product more useful to a younger, more diverse consumer base by adding Pro features like Lifeline, which lets you share your location with safety contacts that you specify – friends and/or family who will be alerted if you don't make it back when you planned.

Pro users also don't see any ads when they're signed in. Additionally, the ads we do run are only sold directly (not programmatically) which provides us with more control of the quality of the ads we show.

While advertising will never completely go away, I believe companies and their users both win when the companies create products with enough value that users are willing to pay them directly.

I think companies will continue to find innovative ways to provide value through consumer subscriptions in new verticals – you only need to look at how subscription models are moving beyond markets that have always been big like music (Spotify) and news (New York Times), and into what have traditionally seemed like niches - meditation (Headspace) and karaoke (Smule) for example. These last two have become big companies by solving the real problems required to make an activity accessible to a broader audience.



A BREAK-UP
of an Advertising Duopoly

COMPANIES TO WATCH

botify
ChannelKey
content26
criteo
downstream
facebook
Google
gradient.
Marketplace Ignition
mediarithmics
OrcaPacific
rise interactive
VIBRANT

Facebook and Google have established themselves as the primary online advertising platforms, but a shift in the last year has allowed a third tech giant – Amazon – to push into the big leagues of the ad-tech market.

It has been a watershed year for Amazon. Having relaunched its advertising services last year following complaints its ad products were too complicated to use, in Q3 of 2018, the conversion rate of Amazon Advertising was almost three times higher than that of Google Shopping[1].

Logically, Amazon should be the go-to for advertising. It is the primary e-commerce destination for consumers, well-trusted with its broad selection, fast shipping, competitive prices and simple return policies. When customers visit Amazon, they are visiting as shoppers and so have more purchase intent than one would browsing Facebook or Google. The scale of the platform, combined with the intent of its users, means advertisers now view Amazon as another primary distribution channel.

But it is not just intent and scale of platform, it is the extent of the purchasing data available to advertisers, which is far greater on Amazon than on other platforms[2]. For example, consumer goods corporation Proctor and Gamble aims to employ Amazon's consumer ID data to target consumers[3]. Amazon has more visibility into consumer purchasing activity than any other platform and can thus better determine which keywords and marketing strategies ultimately lead to a purchase.

Advertisers will spend $4.6 billion on Amazon's platform in 2018 as marketing money continues to shift away from Facebook and Google, which collectively hold close to 58% of the market[1]. The environment is ripe for Amazon to establish itself as a market leader in online advertising, and the company is looking to extend the reach of its ad platform. It is developing an end-to-end service, and so rather than employing its previous strategy of purchasing ad space on other sites, it is charging some sellers to run advertisements on its own site, going head-to-head with Google.

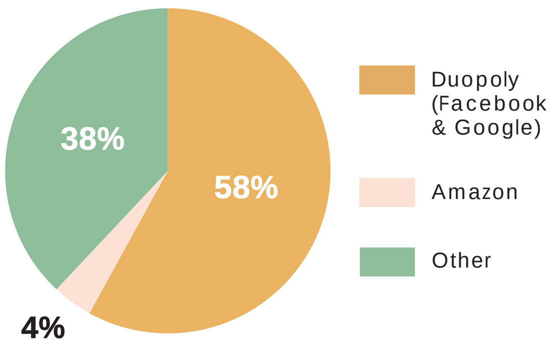
It additionally plans on rolling out premium services to large accounts and vendors, such as Fortune 500 brands, to solidify its position as an all-in-one marketing and distribution platform.

Meanwhile, agencies looking to ride the wave are positioning themselves as specialized brand performance partners, to help typical account managers navigate the massive scale of Amazon's constantly evolving platform. More than half of online product searches begin on Amazon[4], and without specialized agencies, many account managers lack the tools and expertise to optimize all of the levers in the Amazon ecosystem. Amazon already controls multiple touch points of the brand experience, from product visibility to supply chain, and this control will only grow with the introduction of these agencies.

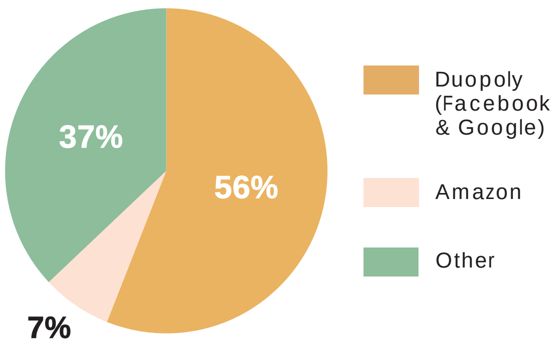
The need for an end-to-end partner is greater than ever, and the challenge has already been set by WPP-owned Marketplace Ignition, which hopes to manage all touch points of the brand experience from creative assets, to ad placement, to packaging, to consumer reviews. Meanwhile, Gradient.io – launched by ad-tech expert Bobby Figueroa, who left his role with Amazon to leverage his inside knowledge and advise brands on advertising with the tech giant - raised $3.5 million in October 2018[5]. And expect accelerating growth from independent Amazon-focused digital platforms and agencies in the next year, including Channel Key, Downstream, Content 26, and Orca Pacific.

As brands continue to allocate more of their marketing resources towards Amazon in order to get their products in front of consumers, the Facebook-Google duopoly will continue to be broken down. In the US, Amazon is still only the fifth largest generator of digital revenues[1], but the e-commerce empire is competitively positioned to grow its piece of the pie and disrupt ad-tech in 2019.

% of Total Digital Ad Spending 2018[1]



% of Total Digital Ad Spending 2020[1]



1. eMarketer, Amazon Is Now the No. 3 Digital Ad Platform in the US, September 19, 2018, **2.** New York Times, Amazon Sets Its Sights on the $88 Billion Online Ad Market, September 3, 2018, **3.** Marketing Week, Amazon reveals how it thinks about advertising, September 15, 2018, **4.** Jumpshot, The Competitve State of eCommerce Marketplaces Data Report Q2 2018, July 1, 2018
5. Bloomberg, Former Amazon Ad Executive Gets VC Funding for Marketing Startup, October 23, 2018

EXPERT VIEW

John Ghiorso

CEO, Orca Pacific

2018 will go down as the year that Jeff Bezos became the world's richest man. With a record $141bn to his name, Bezos has eclipsed his rivals and grown Amazon into the second-most valuable company in the world.

I remember a decade ago when I bought into the Amazon promise and, seeing the sheer size of its potential market, becoming convinced that it was on track – one day – to be the biggest company in the world.

In recent years, we have seen Amazon use its market share to grow into an advertising powerhouse – and it is my belief that it could become the number one advertisement platform in the US. It currently competes against Facebook and Google and I often find myself thinking about the received wisdom, "'Facebook knows what you talk about, Google knows what you search for, but Amazon knows what you buy."

Think about Amazon's knowledge of the first party shopper and it's clear that the business is poised to take "Adland." It's why at Orca Pacific we developed a level of specialization that would mean we could support Amazon's rise and its customers along the way. We do that by acting as a full-service Amazon agency that works with top first party vendors & third party sellers to increase their performance on the platform's marketplace.

Amazon is not just different from traditional retailers but also its technology rivals, due to the quality of the data it holds, which enables it to be an expert platform for advertisements. Google, for example, may know what people are looking for but it lacks knowledge on what they go on to buy and it generally fails to make sufficient physical connections.

At Amazon, 2018 will go down as a year when physical connections went through the roof with the opening of more Go stores. There are now a handful of them across California, Washington and Illinois. Each one pulls a magic trick where technology tracks consumers throughout the experience and shoppers can leave the store without having to wait at the checkout to pay.

The visual data that Amazon gains from these transactions combined with the digital shopping data that it has collected for years gives them a massive edge over the other advertising platforms.

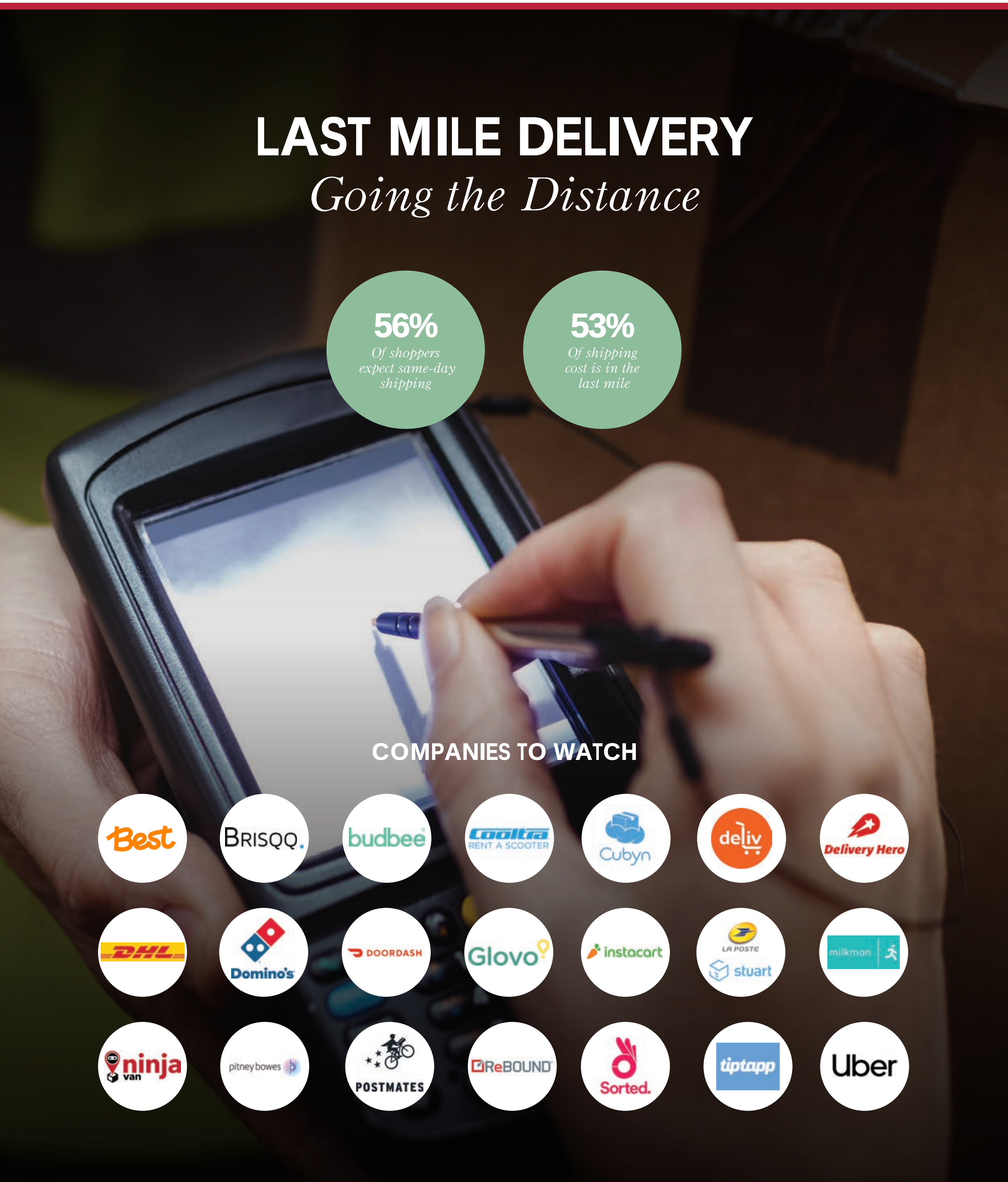
Amazon's focus on bricks and mortar stores is just one physical manifestation of how brands and manufacturers around the world have pursued innovation at a startling pace. The rate at which businesses change today would, not so long ago, have been viewed as foolhardy in certain circles.

Count Amazon out of the advertising race at your peril. In fact, I predict that Amazon will increase its embrace of external technology companies in order to accelerate its ad-tech offering. As has become commonplace with these matters, I would also expect competitors to look on and find inspiration in what Amazon achieves and find their own ways to follow suit.

Finally, getting into specifics, there is one more thing I would like to draw attention to. When people talk about Amazon's advertising, or focus on it, they are mostly talking about search. It was called Amazon Marketing Services ("AMS") and now it is called Sponsored Brands, and it's the bread and butter for advertising for most brands and clients – including us.

But display advertising – through what Amazon calls the Amazon DSP – is so far not widely used and I predict it will become much more prominent in 2019. DSP does not necessarily apply to smaller players, but if you have $500,000 - $1 million in your advertising budget, then display advertising should be a critical piece of your advertising strategy.

Do that, and you may be putting your business on track to enjoy Bezos-like success in 2019.



LAST MILE DELIVERY

Going the Distance

56% Of shoppers expect same-day shipping

53% Of shipping cost is in the last mile

COMPANIES TO WATCH

Best, Brisqo, budbee, Cooltra, Cubyn, deliv, Delivery Hero, DHL, Domino's, DoorDash, Glovo, instacart, La Poste stuart, milkman, ninja van, pitney bowes, Postmates, ReBOUND, Sorted, tiptapp, Uber

As consumers turn towards e-commerce for more of their shopping and retail needs, users expect fast delivery to come as standard. Some 56% of millennial shoppers expect to have same-day shipping be an option when they buy online[1]. However, only 51% currently offer same day shipping to date, with 61% of online shoppers willing to pay for the convenience of avoiding brick and mortar shopping trips[2].

These figures highlight the massive competitive advantage of the front-runner, Amazon, as it expands free one-day delivery options and rolls out one-hour delivery with Prime Now. If retailers want to survive in the era of Amazon, they must meet customer demand for faster shipping. We predict many real time delivery options will be available across various verticals.

The last leg of the delivery supply chain, when a package is out for delivery to the doorstep, is the most expensive and inefficient aspect of the shipping process. Last mile delivery accounts for 53% of the total transportation cost, and with the proliferation of "free shipping", consumers are less likely to foot the bill[3]. Thus, retailers are targeting innovation in last mile delivery to protect margins and accelerate delivery times.

Some companies are trying crowdsourced delivery as a less asset-intensive way to achieve agility and on-demand flexibility in the last mile. Customers are already aware and familiar with on-demand models like Uber, Airbnb, and Postmates, so adoption in the shipping supply chain would require minimal user education. Crowdsourced delivery also provides greater control over the shopping experience for customers and offers faster deliveries with enhanced visibility of delivery hanging.

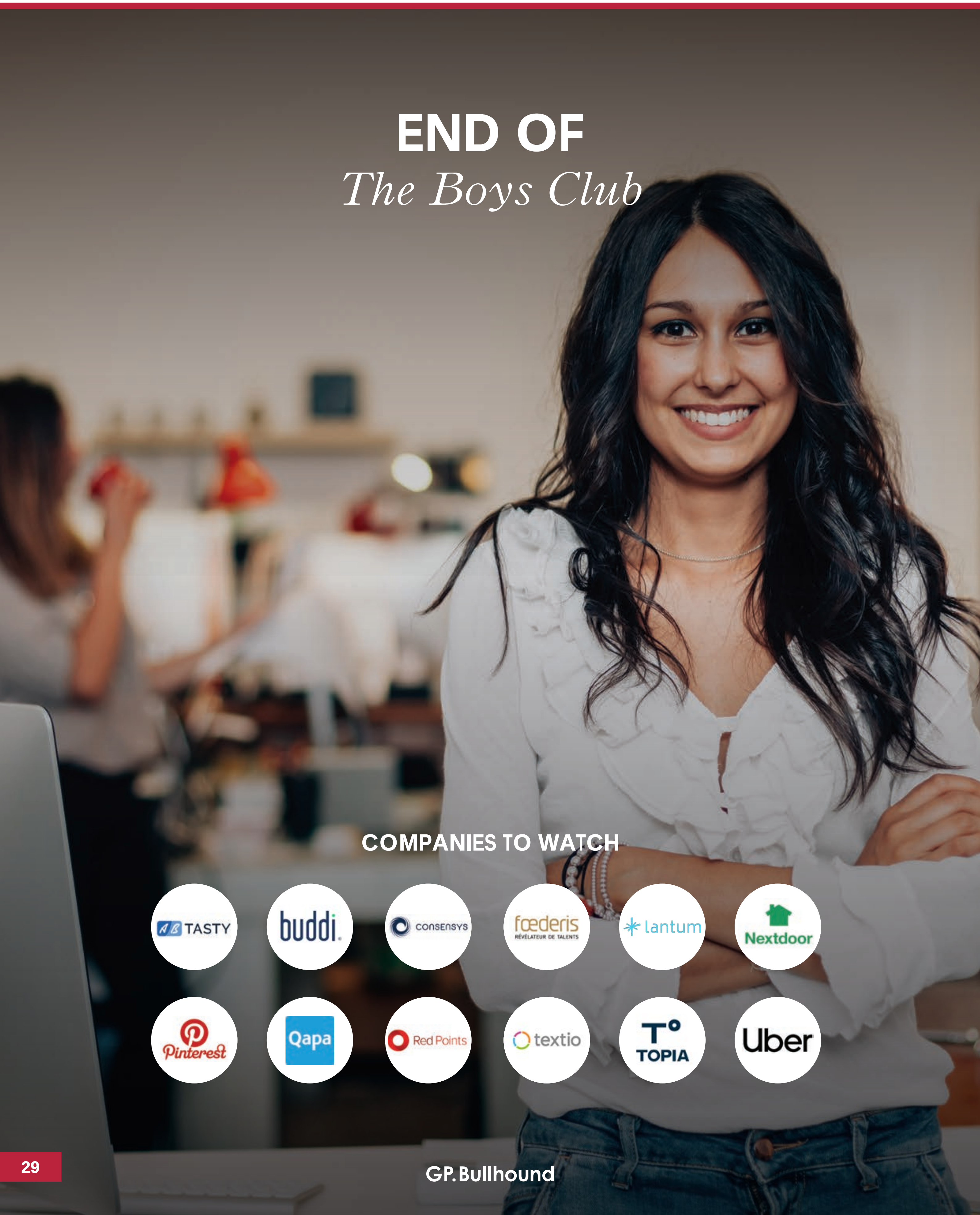
Larger shipping enterprises have started to develop urban warehouse spaces to have nearby access to inventory for fast customer deliveries. Amazon has developed 75 fulfillment centers within 20 miles of half of the U.S. population[4], and it has the first-to-market advantage; large big box stores are offering two-day delivery for a minimum order while Amazon is closing in on free two-hour delivery. Other players are now racing to catch up. Ryder System, a provider of fleet management solutions and supply chain logistics systems recently announced an expansion of its Ryder Last Mile, a two-day home delivery and white-glove installation solution for big-and-bulky goods[5].

Competing models are also in the works, with the likes of Walmart testing a new drop-off program last year, in which employees could voluntarily drop-off packages to customers on their work commutes. While it was only tested in two stores in New Jersey and Arkansas, the potential for expansion is great as 90% of US consumers live within ten miles of a Walmart store[6]. Walmart's existing physical presence could prove to be its advantage in standing up to Amazon's elite shipping operations.

With the rise of big data, some companies are developing mobile warehouses to have inventory on-hand even closer to customers' doorsteps. Companies could use customer data to see what they may want, even if they didn't order it, allowing for delivery services to load non-committed inventory into delivery fleets, which can be upsold during the delivery process. Similar to how Amazon shows customers additional products they might like during checkout, the driver can bring items the customer bought in the past or might need, providing more options to the customer and increasing the value of each sale for the delivery service.

Last mile delivery is a pain point that we see gaining considerable attention from retailers entering the next era. Amazon has already established itself as the front-runner, but as entrants from traditional retailers and crowdsourcing operators invest in their supply chains, we will enter a world of ubiquitous instant gratification in online retail delivery and varied delivery options.

1. Business Insider, Crowdsourced delivery explained: making same day shipping cheaper through local couriers, July 22, 2018
2. GoPeople, Same Day Delivery Trends and Statistics to Guide Your Business, August 2, 2018, **3.** Business Insider, The challenges of last mile logistics & delivery technology solutions, May 10, 2018, **4.** Curbed, 9 facts about Amazon's unprecedented warehouse empire, November 19, 2018, **5.** Ryder, Ryder Expands Last-Mile Delivery Network in 11 North American Markets, October 17, 2018
6. LiveMint, Walmart discovers why the 'last mile' is the hardest, July 30, 2018



END OF
The Boys Club

COMPANIES TO WATCH

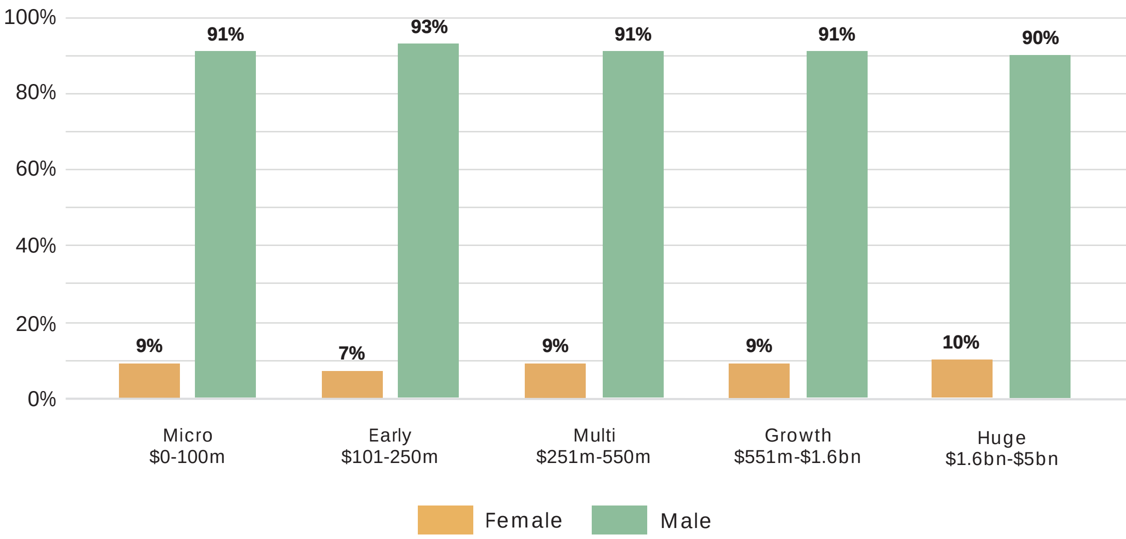
AB TASTY
buddi
CONSENSYS
fœderis RÉVÉLATEUR DE TALENTS
lantum
Nextdoor
Pinterest
Qapa
Red Points
textio
TOPIA
Uber

The technology sector has been among the most progressive when it comes to corporate initiatives for reaching gender balance. However, veteran female investors and executives are taking a different angle by improving accessibility to the venture backed tech ecosystem for new and prospective female entrants. Specifically, equal access to mentorship, funding, business relationships, and job opportunities is critical for gender balance to persist in the technology sector. Efforts to equalize access are originating from organized networks of decision makers, venture capital investors, and exceptional entrepreneurs.

Founded in 2017 by thirty-four female venture capitalists, All Raise is a non-profit organization doing just that. The group is building a community for connecting female peers and decision makers in the tech community, bridging the gap between initiatives and outcomes. All Raise aims to double the percentage of female partners at US tech venture firms and increase the share of venture funding going to companies with female founders[1]. To reach those goals, it hosts a variety of social networks designed to target each piece of the ecosystem, including founders, investors, limited partners, and veteran industry executives. For example, one initiative called Female Founder Office Hours offers female entrepreneurs access to one-on-one mentoring from peers and venture investors who share advice about fundraising or company building. Through these networks, All Raise is changing the template for firms in Silicon Valley and beyond.

Funding is a vital component of the tech ecosystem. Investors like Aspect Ventures ("Aspect") and Cowboy Ventures ("Cowboy") are actively focused on accelerating the success of female founders and rising women in venture capital by promoting access to senior General Partners. Aspect is led by two female General Partners and curates an investment portfolio of founders that is representative of the real societal gender demographic. Founded by All Raise member Aileen Lee, Cowboy backs a large percentage of women entrepreneurs in its portfolio and helps founders build more balanced teams. Further up the capital stream, these investment strategies have garnered support from many LP counterparts. Aspect recently raised $181m for its second fund, drawing support from Melinda Gates and Cisco, among others[2]. Cowboy also recently closed another fundraise, and nearly half of the LP's involved were women[3]. When raising money, Aileen wanted Cowboy to support gender balance in its cap table, embodying the All Raise's mission of facilitating access for women in each segment of the tech ecosystem.

Female Representation in VC Across Fund Size[1]

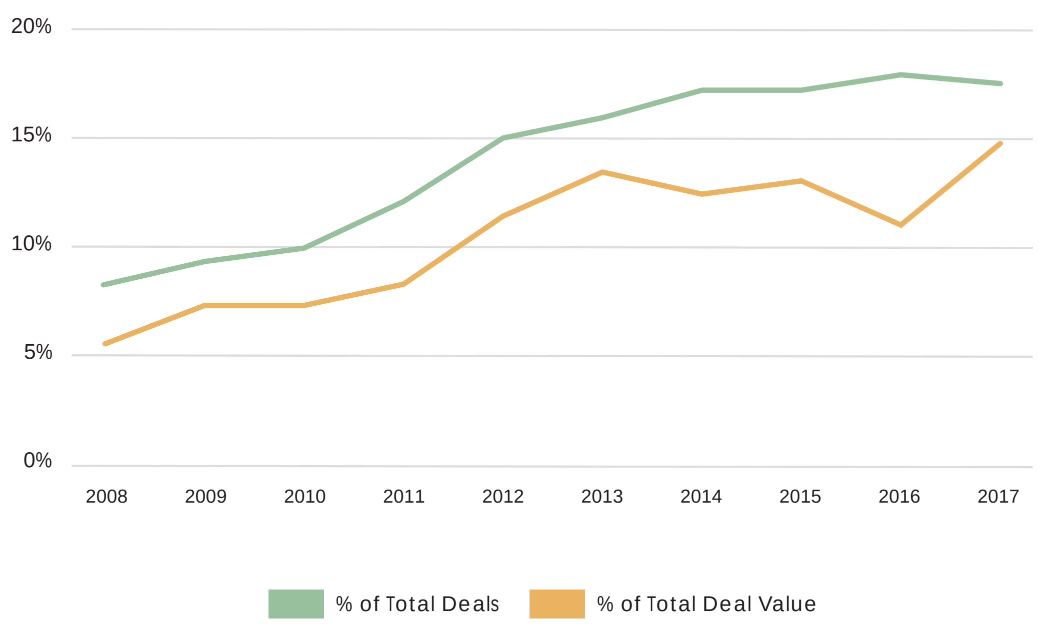


Sources: **1.** AllRaise.com, **2.** Geek Wire, Melinda Gates invests in $181M fund for women-led VC firm Aspect Ventures, January 23, 2018
3. Pitchbook, Q&A: Aileen Lee on Cowboy Ventures' latest fund, getting women on her cap table and what keeps her motivated, August 8, 2018

Female entrepreneurs are rewriting the narrative at the startup level as well. Textio, co-founded by Kieran Snyder, leverages artificial intelligence to correct gender bias and predict the performance of business documents as they're being written. Last year, the four-year-old startup helped Nvidia boost the percentage of women applicants by 28% and increased the number of women Vodafone recruited by 7%, all by rephrasing job listings[4]. To fuel its growth, Textio was able to raise money from Cowboy, serving as a proof point and an inspiration that there are available opportunities and resources for the taking and the time is ripe for women considering the field. Growing from a startup to a valuable enterprise is a challenge that requires access to sources of capital and strong business relationships. With leaders like Aspect and All Raise promoting accessibility and action, we are seeing a growing number of rock star female founders shake up the M&A markets with successful exits. Amy Chang, who founded the relationship intelligence platform Accompany, led her business from startup to disrupter with investments from female forward investors like Floodgate Ventures ("Floodgate"). Last year, Amy, Floodgate, and other stakeholders celebrated a successful exit to Cisco for $270 million[5]. Following the deal, Cisco installed Amy as SVP of its Collaboration Technology Group for her expertise and impact in the space.

We are seeing a push for change from the top to unify the tech industry's decision makers and facilitate the success of prospective female entrants. In 2018, neighborhood networking platform NextDoor named Sarah Friar its first female CEO[6], and Andreessen Horowitz hired its first female general partner, Katie Haun[7]. In an industry historically known for its gender bias, female leaders in the tech ecosystem are taking a new angle at building a community of support and accessibility. These types of initiatives give conviction that there will be a shift in the tide to come in 2019.

US VC Activity in Companies with at least one female founder[1]



Sources: **4**. Financial Times, How the tech industry is attracting more women, March 8, 2018, **5**. Tech Crunch, Cisco is acquiring business intelligence startup Accompany for $270M, May 1, 2018, **6**. Nextdoor Blog, Welcoming Sarah Friar to the neighborhood, October 10, 2018, **7**. Recode, Andreessen Horowitz has finally hired a woman as a general partner, as it also officially debuts a crypto fund, June 25, 2018

PROFESSIONAL CAPITAL SOURCES

Scouting for Entry Points into Blockchain

COMPANIES TO WATCH

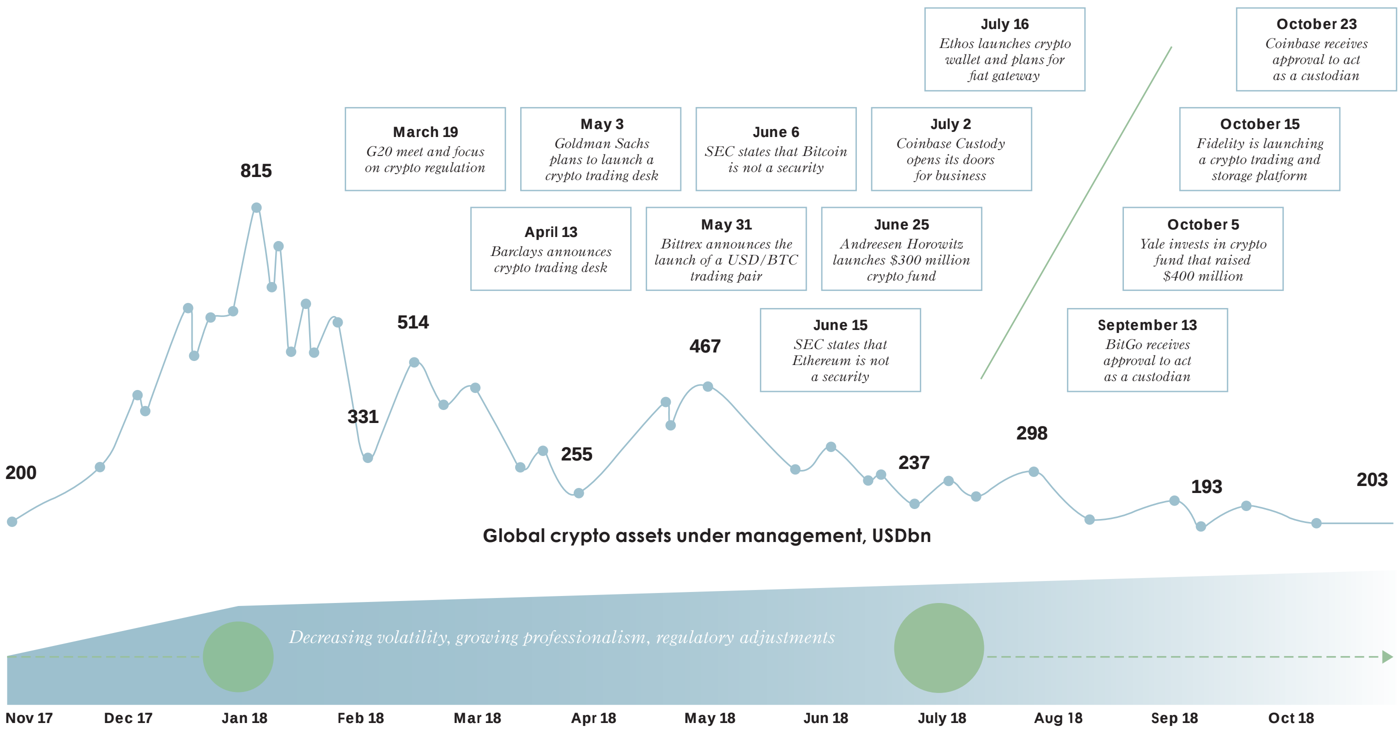
- Alibaba.com
- aws / QTUM
- BINANCE
- bitcoin
- BITFURY
- BLOCKSTACK
- Bloomberg + galaxy
- coinbase
- ethereum
- GEMINI
- SOROS Soros Fund Management
- Goldman Sachs
- IBM / STELLAR
- Ledger
- MONERO
- NYSE Bakkt
- Revolut
- ROCKEFELLER / venrock
- STELLAR
- Tezos
- TREZOR
- Yale
- Stanford University
- HARVARD UNIVERSITY
- Massachusetts Institute of Technology
- Fidelity

Between January 2017 and January 2018, Bitcoin's price rocketed from $800 to nearly $20,000. Over twelve months, we watched the explosion of cryptocurrencies – moving them from the periphery firmly into the mainstream and putting blockchain at the front of the corporate agenda. When we predicted a crypto bloodbath in our 2018 research report "Token Frenzy – The fuel of the blockchain", precisely specified as a 90% correction of the overall market with a wipe out of the majority of cryptocurrencies in the course of 2018, we saw the need for a correction at a time of unprecedented global blockchain and crypto euphoria. The velocity with which the market plummeted and many cryptocurrencies went to zero value after reaching an overall market cap of over $800bn, has nonetheless surprised. Also Initial Coin Offerings ("ICOs") stalled to centre around fewer projects such as Telegram and EOS. But we haven't seen the last of blockchain and cryptocurrency.

Underneath the surface, activity in Distributed Ledger Technology ("DLT") is in full speed, even within financial institutions. Clearly, no one wants to take the lead, but given the pace of innovation, there is a thin line between being first and being last. Since many market participants on the financial and strategic side are aware they largely missed benefiting from the digital revolution, we expect they'll ensure they do not miss out on the blockchain and cryptocurrency revolution.

Institutional money flowing into crypto

Total market capitalization of the cryptocurrency market, last 12 months, USDbn.*



Source: CoinMarketCap; cryptofundresearch.com, *A simplified representation

We predict 2019 will be the year of institutional capital inflow into blockchain, which will not be solely financially motivated, but backed by increasing demand we see on the corporate and family office side and their desire to build positions. Initially this will happen through funds, equity investing into blockchain technology projects as well as financial instruments and derivative products related to major cryptocurrencies. But the question remains: what obstructs professional capital inflow?

Regulation: The regulator has taken a thoughtful approach on cryptocurrencies of which most are categorized as securities apart from Bitcoin and Ethereum. Both now officially classified by the SEC as non-securities, with Bitcoin being considered a replacement for sovereign currencies and Ethereum a commodity, like oil or gold – with the rationale mainly linked to their level of decentralization. The regulatory security, particularly among those two, protocols is expected to be reflected in how capital is allocated in the sector, directly and through derivative products.

Most other ICOs and cryptocurrencies are in fact security offerings and increasingly will need to adhere to regulation and AML/KYC, most of which is troublesome if not impossible ex-post. There is a massive wave of fully compliant security token offerings ("STOs") lined up and also the developments around tokenization of assets ("TOAs") is extensive – both are expected to continue to raise the bar on market standards very fast and hence become a focus area of activity, also because they resemble blockchain equivalents of existing banking products that investors are very familiar with.

Custodianship: The market needs banking-grade custodian solutions of which many promising initiatives are underway. Most of the large volume trades are done over-the-counter ("OTC") mostly via as yet unregulated intermediaries. Absorbing the risks in executing these transactions through standardized and audited processes as well as later on the risk of total loss through errors in managing custody will be key comfort to the broader scale of professional investors. Offerings structured as tokenized financial products are expected to initially absorb substantial volumes and allow avoidance of direct handling of cryptocurrencies.

Liquidity: We have seen an increase in the number of regulated exchanges and large banks getting involved in the cryptocurrency exchange field. There is strong activity in launching index and derivative products as well as Exchange Traded Funds ("ETFs") for Bitcoin and eventually some major altcoins soon. Lastly, stablecoins – 1:1 fiat backed tokens – will serve as a haven for investors to deal with liquidity and to manage the still high volatility. More institutionally backed projects will go live soon and contribute to liquidity and hence adoption.

Overall, the correction is ongoing and healthy for the sector to allow the technology to catch up. The main activities we currently see are around building the products and services aimed at reducing the barriers of adoption both on the retail and institutional side. The capital formation at the exchange and issuance platform level is expected to catalyze near-term consolidation aimed at growing the number of wallets, users and trading volumes. We look forward to an interesting 2019 in DLT and expect another wave of hype - this time more technology and product focused.

EXPERT VIEW

Olga Feldmeier

CEO, Smart Valor

The past 12 months have seen cryptocurrencies become a mainstay of international headlines and face the ups and downs of fast-moving market trends. Speculation in the second half of 2017 led to a cryptocurrency boom as buyers searched for quick wins. However, reality kicked in when market opportunities were not immediately as lucrative as some speculators had imagined.

But, like all major technologies, it will take time to find its feet – this is, after all, a marathon and not a sprint.

Cryptocurrencies have a fundamental security advantage and therefore have a safe place in our financial world. However, there are still hurdles to mass adoption that need to be removed – and these are not just of a technical nature.

Regulations will need to keep up on all things crypto in order to protect investors and provide more trust in these new asset classes, which is the ultimate prerequisite for broader adoption.

Right now, smaller jurisdictions are moving quickly to stay ahead of the regulatory curve, for example the Swiss Financial Market Supervisory Authority (FINMA) recently announced a new fintech license to support innovative financial companies.

Blockchain, the technology that enables cryptocurrencies to operate, is also backing asset tokenization, which is disrupting how we manage ownership of real assets. By converting rights in an asset into tokens, transactions can be handled faster, can be done peer-to-peer without the middlemen taking a margin. But most importantly, the minimum investment threshold are much lower, allowing access to asset classes that were out of reach for many.

At SMART VALOR, we are building the first regulated exchange and investment platform for such tokenized assets. We have requests from over 50 projects so far and we get ten requests every week.

We're only seeing the tip of the iceberg at the moment, with more than $1bn-worth of assets tokenized so far. In H1 2019 I expect this figure to pass $10bn, which is just a tiny fraction of the massive trillion-dollar opportunity that alternative investment methods offer.

Adoption of tokenized assets is occurring most where there is less effort required on the back-end, in terms of complex documentation of ownership and transfer of it.

Alternative investments such as private equity funds, venture capital funds as well as tokenized fungible commodities are three areas progressing at pace. But the biggest challenge remains the regulatory environment, as we are comprehensively leaving the beaten path by pursuing these innovations.

We at SMART VALOR are discussing these topics with the regulatory offices here in Switzerland and Liechtenstein and get strong support for the industry innovations required for these asset classes, while staying 100% compliant with regulations to protect investors.

As for what investors need to do today: as usual, they have to determine what level of risk they are willing to take – remember these are until now unregulated waters, and they are operating under unclear legal and regulatory conditions for now.

But Financial authorities, for their part, have stepped up their efforts to protect investors and are shutting down uncompliant players in the market.

The crypto market is still in its early stage and so high volatility is to be expected. Over the mid-to-long term, cryptocurrency is a new alternative class of digital financial products that offers many benefits. And there will be offerings that are fully regulated and under a reliable legislation like SMART VALOR. That's why I am certain they will find mass adoption – first with progressive, innovative investors, and then others who will follow in their footsteps.

Cryptocurrencies will continue to innovate beyond the well-known bitcoin and Ethereum, and we will see many more coin and payment products emerging. All that will clear the way for mass adoption, which we will see in the second half of 2019.

METHODOLOGY

This report was compiled through the expert insights of GP Bullhound's worldwide team alongside detailed analysis of investment trends in the global technology sector in recent years.

It is intended to provide our predictions for growth, investment, and impact in the digital economy in 2019. Each year, we provide a transparent assessment of our predictions from the previous report to maintain a high level of scrutiny on our own research.

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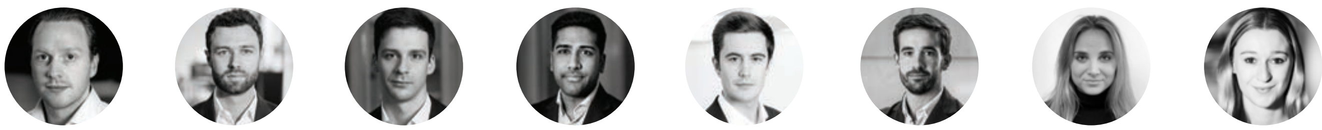

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MERGERS & ACQUISITIONS

We act as a trusted adviser to many of the leading technology companies in competitive international sale and acquisition processes. The firm has completed 396 successful M&A transactions to date, worldwide, with a total value of over USD 18.5bn.

INVESTMENTS

Through our investment team, we provide investors with access to the most ambitious privately-held technology and media companies. We currently manage four closed-end funds for a total value of more than USD 100m and our Limited Partners include institutions, family offices and entrepreneurs.

CAPITAL TRANSACTIONS

We advise companies and their owners on capital related transactions including venture capital, growth capital, acquisition funding, secondary block trades and Initial Public Offerings. The firm has completed 116 rounds of financing for technology companies to date, with a total value of USD 1.5bn.

EVENTS & RESEARCH

Our events and speaking activities bring together thousands of the leading digital entrepreneurs and technology investors throughout the year. Our thought-leading research is read by thousands of decision-makers globally and is regularly cited in leading newspapers and publications.

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SOLITA GROUP
Sold to
APAX DIGITAL

Undisclosed

PRODIGY FINANCE
Investment from
INDEX VENTURES & GLOBAL INVESTMENT BANK

$240 million

INNOGAMES
Sale of equity stake
MODERN TIMES GROUP

€260m valuation

ESSENCE
Sold to
WPP

Investment in
SPOTIFY

LEO VEGAS
IPO
NASDAQ

€11m at €343m Market Capitalization

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