

U.S. Internet

# A Framework For Generative AI Success In Consumer Internet

Why read this report? A 70+ page framework for analyzing Consumer Internet companies and the coming opportunity/risk as the world embraces new Generative AI technologies. The next few years are likely to change the way traffic flows through the internet, and the market cap of many stocks.

**The market cap gains/losses during big technology platform shifts historically have been profound, hence why the investor attention around the Generative AI boom is warranted. Since the launch of ChatGPT and the broader introduction of GenAI to society, this debate has been raging within consumer internet. We think it's too early to make any strong declarations around the "AI winners/losers basket." Instead, we have tried to come up with a framework that can be applied today to assess winners and losers as things play out. To put this together, we have collaborated with many experts, had background conversations with covered and non-covered companies, and worked globally across Barclays analysts.**

**Key conclusions are as follows. 1) Usage/Engagement:** AI likely increases overall engagement with consumer internet applications, including finally delivering the promise around voice-enabled services (page 12). **2) Plumbing/Acquisition:** We think the customer acquisition path (or what some call the "interaction layer") might change from today's version to something new with various AI agents at the top of the funnel and generative search more common place. We also think the way that services plug into AI agents is going to change the plumbing of the internet, and hence the economics that companies earn. **3) How to Pick Winners/Losers?** This is the hard part. We have a framework with 14 key criteria, ranking 72 US and Euro internet companies, to assess whether a company is well positioned or not. This report focuses specific conclusions on the US; an equivalent report out this morning ([see link](#)) focuses on Europe. **4) Timing:** We think AI adoption and subsequent changes to consumer internet plumbing will come in waves. ChatGPT started one wave for consumer adoption (the first big one, arguably), but things have stabilized since. We think subsequent waves will come with META's AI agent launch, Apple's much anticipated entrance (Apple-GPT, Siri-GPT, or whatever they end up calling it), upgrades and new services launched by Google, and many new start-ups entering the fray. We provide lots of trend data around new services we are following.

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**Please see analyst certifications and important disclosures beginning on page 67 .**

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**POSITIVE**

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## Executive Summary

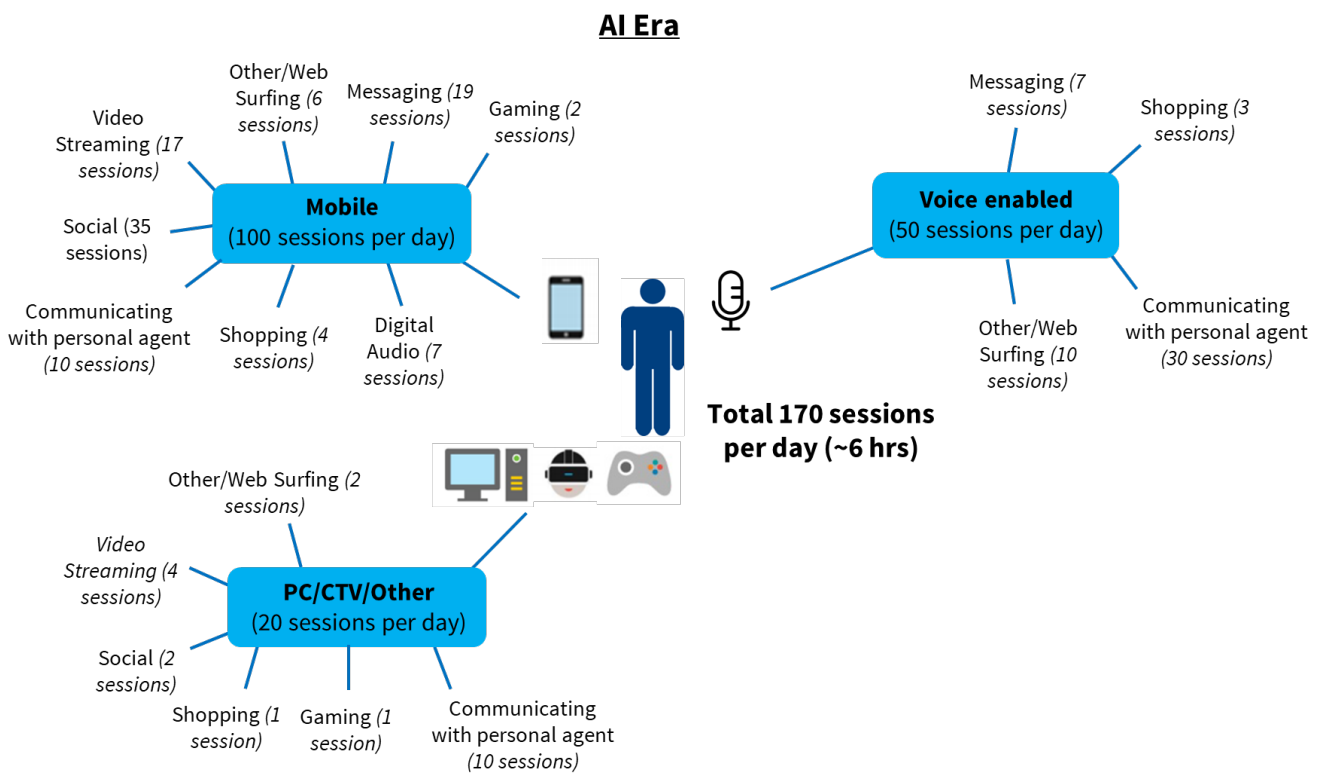
The market cap gains/losses during big technology platform shifts historically have been profound, hence why the investor attention around the Generative AI (using AI to create content) boom is warranted even if we fully acknowledge there is also a lot of hype. Since the launch of ChatGPT and the broader introduction of GenAI to society, this debate is raging within consumer internet investors.

We think it's still too early to make any strong declarations around the "AI winners/losers basket" within consumer internet. Instead, we think the right thing for investors to do at pivotal times like today is to analyze prior big technology shifts, and come up with a framework that can be applied today to assess winners and losers as things play out, which is the purpose of this report. To put this together, we have collaborated with many experts, had background conversations with covered and non-covered companies, and worked globally across Barclays analysts.

### 1. Usage / Engagement

The first section of this report considers how consumer engagement with the internet may change in the next few years. We think AI likely increases overall frequency with consumer internet applications, albeit we see consumers' time spent using applications increasing at a slower rate. We think this could include finally delivering the promise around voice-enabled services. It isn't as clear that AI will increase the number of users on the world-wide internet as materially as mobile technology has increased mobile users.

FIGURE 1. AI Era Likely Continues To Increase Engagement With Digital Services



Source: Barclays Research

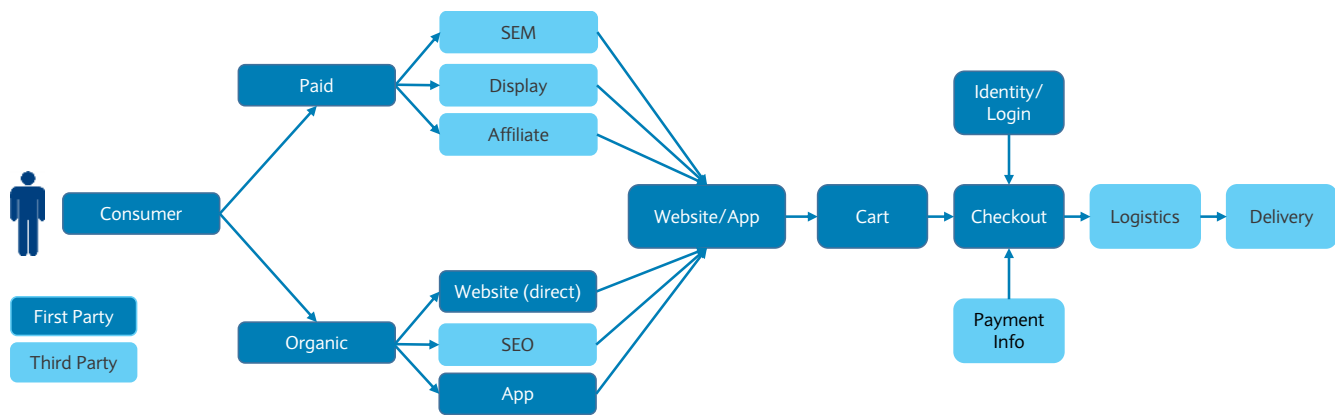
Further, it's not clear how the sessions are likely to be divided between previous use cases and future use cases. Our base case is that, for some time, consumers will continue to navigate to websites and apps on their phones the same way that we do today, many of which are infused by AI-based services. But, in the longer term, a far more disruptive view of the consumer journey

is one whereby each user has a set of AI agents that act on their behalf, executing tasks throughout the day in the best interest of the individual. This is somewhat analogous to the role that Google has played in the PC and mobile internet eras whereby it directs traffic to websites, and more or less controls the destiny (or at least the ability to acquire new customers) of many downstream businesses relying on said traffic. In this scenario, the AI agent could be from a single company like Meta or Google, or could fragment out to a bunch of companies offering AI agents.

## 2. Plumbing of the internet and customer acquisition

We think the customer acquisition path might change from today’s version to something new, with various AI agents and generative search products at the top of the funnel. We also think the way that services plug into AI agents is going to change the plumbing of the internet, and hence the economics that companies earn. Our second section dives into this in detail, considering at length changes to customer acquisition that seem to be on the horizon as generative search gets more commonplace, as well as ‘plug-ins’ and ‘extensions.’ There are many questions posed to think about in the next few years.

FIGURE 2. The Value Chain Of A Consumer Internet Transaction



Source: Barclays Research

## 3. How to pick winners / losers?

This is the hard part, and ultimately what this report is meant to help with. We have a framework with 14 key criteria to assess whether a company is well prepared or not for the coming changes brought on by AI everywhere. Companies that score well on these criteria *could* be big beneficiaries of Gen AI in the next few years. Companies that don’t score well are ones that *might* have some vulnerability in the post-Gen AI era (as many analogue businesses did after the creation of the internet, and desktop businesses did after the creation of the connected mobile phone).

The bulk of this report elaborates on why these barriers are important: we use a linking system in Figure 3 below to click through. We have ranked companies 1 (worst) to 5 (best) on these criteria. Of course there is subjectivity and we hope this acts as a point of debate with investors. Then we have summed up to get an overall exposure ranking. Of course this is simplistic - these factors are not evenly weighted in reality. But the point is to at least provide the basis of a framework to analyze and debate about who is most and least at risk.

1. **Data.** We favor companies who have unique user or industry data that can drive bespoke functionality leveraging Gen AI. (5 = lots of unique data, 1 = little data)
2. **Ease of replicating selection.** Offering relevant content / selection is a necessary (but not sole) criterion to gain share in consumer internet. Some platforms have easier to replicate content than others. (5 = exclusive content / hard to replicate, 1 = commoditized offering)

3. **Logistical intensity.** We view companies that own and fulfil assets as harder for horizontal Gen AI platforms / new entrants to replicate the user experience. (5 = heavy logistics capability / invested capital, 1 = totally balance sheet light)
4. **Value of good.** We see trust being particularly important for high-value items, where users are likely to revert to the platform with the best information, curation and reliability. (5 = very high value, 1 = very low value)
5. **Transactional capability.** We view trust and capability required to facilitate payment flow / broader fintech services as important. (5 = facilitate payments / managing processing / manage credit, 1 = zero transactional capability)
6. **Today's user experience.** We look at Trust Pilot scores and app scores as test cases for the quality of the user experience (and therefore the room for a new, Gen AI-driven, product to improve). (5 = high user scores, 1 = low user scores)
7. **Customer reach / engagement.** We think platforms with very high usage and engagement will be harder for competition to disrupt. (5 = very high, 1 = very low)
8. **Regulatory barrier.** Some of our verticals have regulatory overlays that make it hard for new competition to scale. (5 = big regulatory barrier, 1 = no regulatory relevance)
9. **How much does Gen AI transform the user experience?** We see inspirational, heterogeneous categories with lots of research time as categories where Gen AI can drive the most material improvements. Of course this could be positive or negative, but we view categories with more changes to come as also presenting more risk. (5 = current structured search / transaction works well, 1 = entire transaction can be changed)
10. **Reliance on search engines to acquire traffic.** Potentially material changes are coming to the Google acquisition funnel. This could be positive or negative but high-paid and natural search exposure presents more risk. (5 = high app usage / direct traffic, 1 = high exposure to paid / natural search)
11. **Can the end customer be disrupted by Gen AI?** This may be big-picture thinking but our thesis is that services offerings (e.g. estate agency, job boards / jobs, podcasts) could be quite impacted by Gen AI whereas physical goods (e.g. food, clothes) will be much less so. This could impact the value chain. (5 = services, 1 = goods)
12. **Headroom to invest.** Either organically into tech or inorganically into start-ups we think are likely to emerge in coming years. (5 = material headroom on BS / FCF generation, 1 = high leverage / FCF burning)
13. **Willingness and ability to ship product.** We think companies should be moving right now. We reward companies where we see evidence of product releases or strategy heading in this direction. (5= clear product innovation, strategic focus, foundational model, 1 = zero evidence of any Gen AI strategy at all)
14. **Market share - factor in whether cost savings actually emerge?** We view dominant platforms as more likely to benefit from cost savings vs. passing them through, as well as have more of a moat around the business. (5 = very high online market share, 1 = very low market online share)

Results for US Internet

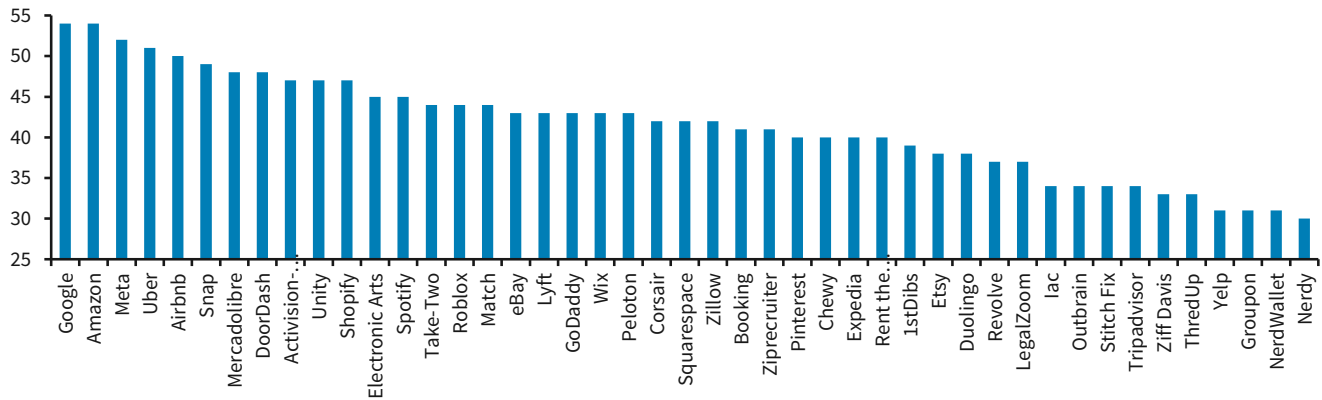
FIGURE 3. Our Screen For Exposure To Generative AI - US Internet

Variable	Data	Replicability of Content / Selection	Logistical Intensity	Value of good / Trust	Transactional Capability	Today's User Experience	Customer Reach / Engagement	Regulation Barrier	Does Gen AI transform category discovery?	Relyance on search engines for audience	Can end customer be disrupted by Gen AI?	Headroom to invest	Willingness and ability to ship product	Market share	Total
<b>Digital Advertising</b>															
Google	5	5	1	3	3	5	5	1	4	5	2	5	5	5	54
Meta	5	4	1	2	3	4	5	1	5	5	3	5	5	4	52
Pinterest	4	2	1	4	2	3	4	3	2	3	2	4	3	3	40
Snap	4	4	1	3	3	4	4	3	4	5	2	4	5	3	49
Iac	3	2	1	3	2	3*	2	4	3	2	3	2	2	2	34
Ziff Davis	3	2	1	3	2	3*	2	4	3	1	3	2	2	2	33
Outbrain	1	3	3	2	2	3	3*	3*	3	3*	3*	1	2	2	34
<b>E-Commerce</b>															
Amazon	5	4	5	3	5	4	4	1	2	3	3	5	5	5	54
Mercadolibre	4	4	4	3	5	3	3	3	2	3	3	4	3	4	48
eBay	5	3	3	2	5	2	3	3	2	3	3	3	3	3	43
Chewy	3	3	4	3	5	4	2	3	2	3	3	2	1	2	40
Etsy	3	3	2	2	5	4	3	3	2	3	3	2	1	2	38
Revolve	2	2	4	3	5	5	2	3	1	3	3	2	1	1	37
Stitch Fix	2	2	4	3	5	3	1	3	1	3	3	2	1	1	34
ThredUp	2	2	4	2	5	3	1	3	2	3	3	1	1	1	33
1stDibs	2	4	3	4	5	5	1	3	3	3	3	1	1	1	39
<b>Ride-Hail/Delivery</b>															
Uber	4	5	3	2	5	4	3	2	4	4	3	4	3	5	51
DoorDash	3	5	4	2	4	4	3	2	4	4	3	4	3	5	50
Lyft	2	5	3	2	5	3	2	2	4	4	3	2	2	4	43
<b>Travel</b>															
Booking	3	4	1	3	5	3	2	3	3	1	3	3	4	3	41
Airbnb	3	5	1	4	5	4	3	3	3	5	2	4	4	4	50
Expedia	3	4	1	3	5	3	2	3	3	1	2	3	4	3	40
Tripadvisor	3	4	1	3	2	3	2	3	2	1	2	2	4	2	34
<b>Gaming</b>															
Activision-Blizzard	3	4	2	3	4	3	4	3	4	3*	3	5	3	3	47
Electronic Arts	3	4	2	3	4	3	3*	3	4	3*	3	4	3	3	45
Take-Two	3	4	2	3	4	3	3*	3	4	3*	3	3	3	3	44
Roblox	4	4	1	1	4	3	4	2	4	5	3	3	4	2	44
Unity	3	4	2	4	4	3	3*	3	4	3*	3	3	5	3*	47
Corsair	2	3	3	4	4	3	3*	3	4	3	3	2	2	3*	42
<b>Web Tools</b>															
Shopify	4	2	1	5	5	3	2	3	3	3	4	3	5	4	47
GoDaddy	3	2	1	5	4	3	2	3	3	3	3	3	4	4	43
Wix	3	2	1	5	4	3	2	3	3	3	3	3	5	3	43
Squarespace	3	2	1	5	4	3	2	3	3	3	3	3	4	3	42
<b>Subscription</b>															
Spotify	4	2	1	4	4	4	5	3	1	4	2	3	4	4	45
Match	3	3	1	4	4	3	4	3	3	4	3	3	3	3	44
Duolingo	3	1	1	4	3	4	3	3	1	4	1	3	4	3	38
Peloton	1	4	4	4	4	4	1	3	4	4	4	1	2	3	43
Rent the Runway	1	4	4	3	4	3	1	3	4	4	3	1	2	3	40
<b>Local</b>															
Zillow	3	4	1	4	2	3	4	3	4	3	2	3	3	3	42
Yelp	2	2	1	3	2	3	3	3	3	1	2	2	2	2	31
Groupon	1	2	1	3	4	3	2	3	3	2	2	1	2	2	31
<b>Financial/Professional Services</b>															
LegalZoom	3	2	1	3	4	3	4	3	2	2	2	2	2	4	37
Ziprecruiter	3	4	1	3	4	4	4	3	4	2	2	2	2	3	41
Nerdy	2	2	1	3	3	2	2	3	2	2	2	1	2	3	30
NerdWallet	2	2	1	3	2	3	2	3	3	1	2	2	2	3	31

Note: 5 = strong score, 1 = weak score. \* denotes not applicable (to which we give a 3 rating as standard)

Source: Barclays Research

FIGURE 4. Ranking US Internet Names On Our 14 Criteria



Source: Barclays Research

### The names that screen well are:

- GOOGL/META:** The best companies in AI are likely to have a combination of: 1) distribution advantages, 2) strong technical AI prowess, 3) the resources to invest aggressively, and 4) a willingness to ship and execute. GOOGL's over 3B+ Android users, its five apps with 2B+ users and nine more with 500m+, give it a huge leg up from the peers. Google's infrastructure is world class and arguably the best suited for the coming AI shift. Similarly, META is well positioned with four mega apps each with 1B+ DAUs, and with some of the highest engagement in the industry. Both companies have best-in-class AI research departments and deep technical talent in this domain.
- AMZN:** AWS gives Amazon a unique vantage point whereby the company can provide a wide range of services to AI start-ups and enterprise customers as the largest and most-neutral hyperscaler, from Sagemaker to Bedrock. On the retail side, the company has the largest e-commerce customer base world-wide (ex-China) and the widest selection, and has invested in machine learning and AI to improve its service levels for years. Amazon's physical asset investments in logistics and fulfilment should also prove to be an effective barrier from some of the disruption we expect to see as new Gen AI start-ups enter e-commerce.

### The names that screen poorly are:

- Smid Cap E-Commerce:** Names that demonstrate low customer retention, have relatively weak position in their respective end markets, have limited headroom to invest in Gen AI projects, and lesser amounts of data from the smaller user bases. We do point out that the logistical intensity of these names could help protect the companies from disruptors.
- High Dependency on Other Traffic Channels:** Companies that rely on Google and other organic and paid marketing channels to grow, often have limited scale and limited headroom to invest, are the kinds of companies where we see GenAI start-ups and more powerful larger incumbents, causing disruption.

### Where We See Risk But It's Too Early to Tell:

- Asset-Light Mobile Applications:** There are a number of categories where companies with basically a free or paid consumer-facing mobile application, who are generally asset light and high margin, could be subject to risk. This is where a Duolingo, or a Tinder/Match Group, or a Spotify fit in. All these companies have very strong technical prowess and various degrees of scale dominance in their respective category. But we can't ignore the potential threat of something new coming along and moving consumers elsewhere or changing the unit economics of the business. The Drake-Weekend AI music, AI infused

dating services and AI romantic partner concepts, language learning apps that leverage transformer technology in new and lower cost ways, all are early “shots across the bow” for these incumbents. But just like ChatGPT shook Google into action, we think the competitive threats around these businesses will draw a forceful response from these public companies.

Results for European Internet

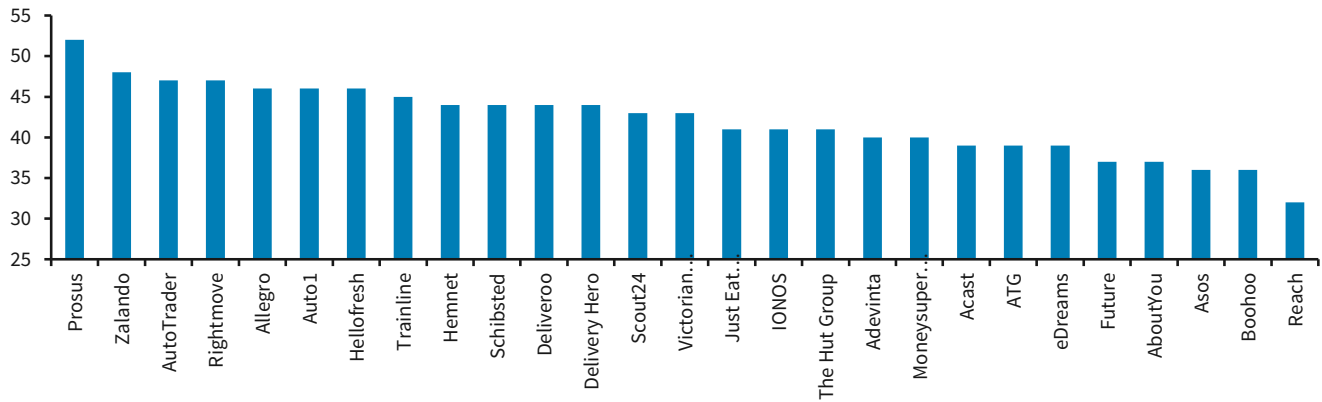
FIGURE 5. Our Screen For Exposure To Generative AI - European Internet

Variable	Data	Replicability of Content / Selection	Logistical Intensity	Value of good / Trust	Transactional Capability	Today's User Experience	Customer Reach / Engagement	Regulation Barrier	Does Gen AI transform category discovery?	Reliance on search engines for audience	Can end customer be disrupted by Gen AI?	Headroom to invest	Willingness and ability to ship product	Market share	Total
<b>Classifieds</b>															
Adevinta	3	3	1	4	2	3	4	4	2	4	2	2	2	4	40
AutoTrader	4	3	1	4	2	4	4	4	2	4	3	4	3	5	47
Hemnet	3	3	1	5	1	3	5	4	2	5	2	3	2	5	44
Rightmove	4	3	1	5	1	4	5	4	2	5	2	4	3	4	47
Schibsted	4	3	1	4	2	3	4	5	2	4	2	2	4	4	44
Scout24	4	3	1	5	1	3	4	4	2	4	2	4	2	4	43
<b>Marketplaces</b>															
Acast	3	5	1	3*	2	3	3*	3	3	3*	2	2	3	3	39
Allegro	4	3	3	3	5	3	4	3	3	3	4	2	2	4	46
ATG	4	3	1	3	2	2	4	3	2	4	3	2	2	4	39
Deliveroo	3	3	4	2	4	3	3	3	4	4	4	3	2	2	44
Delivery Hero	3	3	3	2	4	3	3	3	4	4	4	2	3	3	44
eDreams	3	3	1	4	4	2	2	4	3	1	4	2	4	2	39
Just Eat Takeaway	3	3	2	2	4	3	3	3	4	4	4	2	2	2	41
Moneysupermarket	3	4	1	4	3	4	1	5	2	1	3	3	4	2	40
Trainline	3	1	1	2	4	5	4	4	3	4	4	3	3	4	45
<b>Content Owners</b>															
Future	4	3	2	4	1	3	4	3	1	1	4	2	2	3	37
Reach	2	2	2	3	1	1	3	4	1	2	4	2	1	4	32
<b>Online Enablement</b>															
IONOS	3	2	1	4	4	3	2	3	3	2	4	2	5	3	41
<b>E-Commerce</b>															
AboutYou	3	3	4	2	4	4	2	3	1	2	3	2	2	2	37
Asos	2	3	4	2	4	4	3	3	1	2	3	1	2	2	36
Auto1	4	4	5	5	5	5	2	4	2	1	3	2	2	2	46
Boohoo	2	2	4	2	4	4	3	3	1	2	3	2	2	2	36
Hellofresh	3	2	5	2	4	4	4	3	2	2	4	4	3	4	46
The Hut Group	3	4	5	2	4	4	3	3	2	1	4	2	2	2	41
Victorian Plumbing	3	4	4	3	4	3	2	3	3	1	4	3	2	4	43
Zalando	4	4	5	2	5	4	3	3	1	3	3	4	4	3	48
<b>Investment Companies</b>															
Prosus	5	4	2	3	5	3	5	4	2	2	3	5	5	4	52

Note: 5 = strong score, 1 = weak score. \* denotes not applicable (to which we give a 3 rating as standard)

Source: Barclays Research



**FIGURE 6. Ranking European Internet Names On Our 14 Criteria**

Source: Barclays Research.

**The names that screen well are:**

- **Prosus (Naspers subsidiary).** We think Prosus is well positioned given its Tencent (covered by Jiong Shao) assets represent 75% of NAV); Tencent has development of foundational models ongoing, huge troves of data, massive distribution and impressive tech capability (see our detailed take on “[China’s Economic and Social Progress in the Coming Decade May Depend on How It Harnesses AI](#)”, dated 14 August 2023). The non-Tencent assets are more mixed - Stack Overflow appears an early casualty of Chat GPT, whilst it will be interesting to see how the rest of EdTech plays out.
- **Zalando.** This isn’t totally risk-free in our view - we think fashion is a category that can be disrupted by Gen AI and there is a chance of marketplaces being disintermediated in a world of personalised agents. So this does present risk for Zalando. But, on balance, we think this works out OK - we think Zalando’s brand relationships, logistics capability, fintech capability, scale, data and willingness to invest in Gen AI still position it well, all in.
- **Rightmove & AutoTrader.** Both dominant classifieds with lots of relevant industry and user data that could really help to train Gen AI models. No asset intensity or transactional capability as a moat, but huge distribution and engagement.

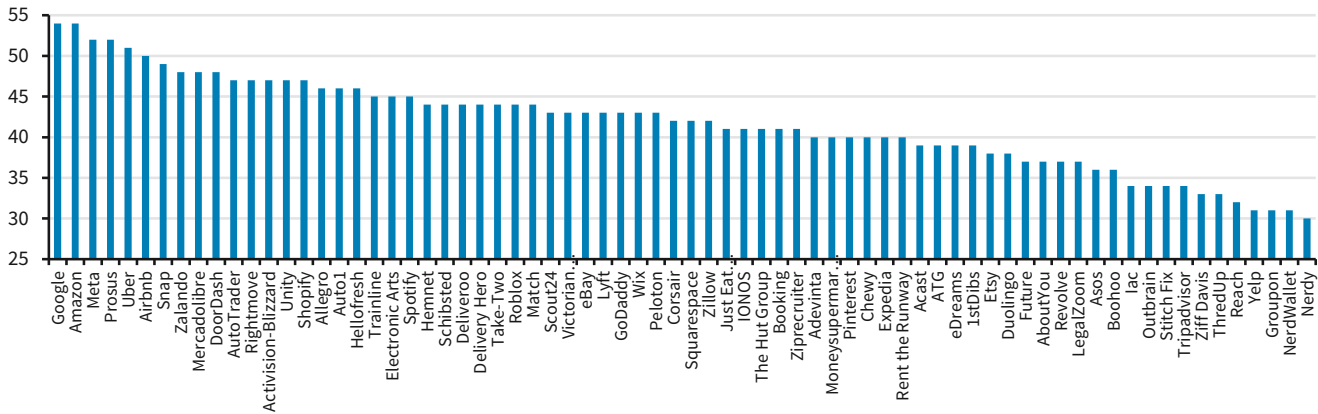
**The names that screen poorly are:**

- **Reach.** Screens poorly on replicability of content, data, capacity to invest and doesn’t have a moat around it in the form of logistics or transactional capability.
- **Future.** Whilst there is valued, niche, content, there are some risks that Gen AI search makes audience acquisition more difficult (even if early evidence from Ziff Davies is contradictory to this; it is early days) and the company doesn’t have moats from logistics or transactional capability.
- **ASOS.** This screens poorly as we see fashion as a vertical that can be shaken up, whilst capacity to invest is limited and we don’t see private label as much of a barrier with low-cost competition likely to continue.
- **Boohoo.** Similar to ASOS.

**Results for US and European Internet combined**

Below we combine the scores for US and European Internet for global investors.

**FIGURE 7. Ranking US + European Internet Names Together On Our 14 Criteria**



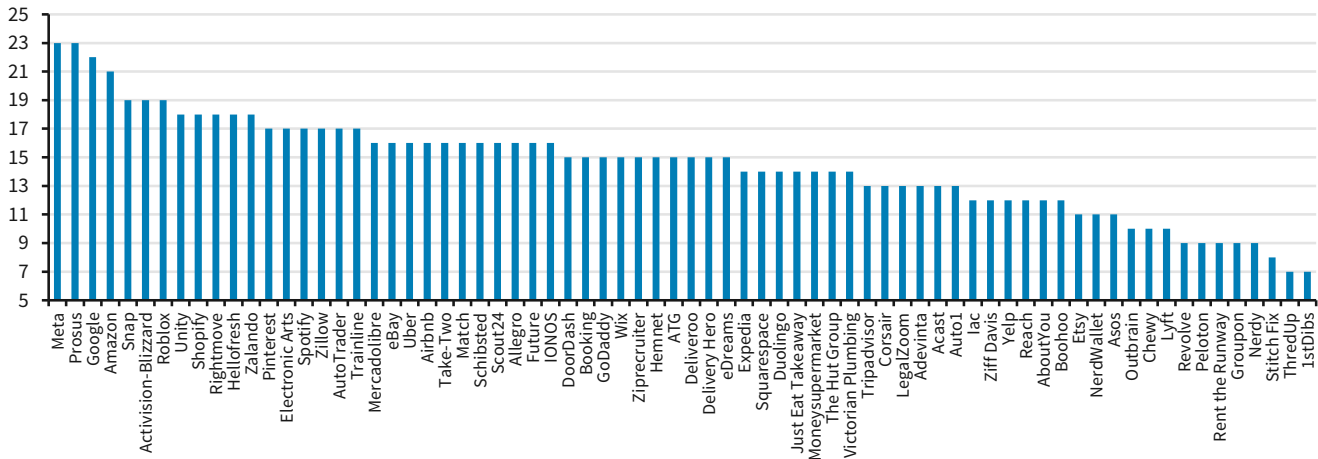
Source: Barclays Research.

**Is 14 criteria too many? What if we take the top 5?**

We fully accept that 14 criteria is a lot and quite complicated. So below we show a comparable chart taking just the most important five criteria, which we believe are 1) Data, 2) Reach / engagement, 3) Degree to which Gen AI impacts category experience, 4) Headroom to invest, 5) Evidence of executing on Gen AI so far.

The conclusions look pretty similar to the 14 above. But we are open to flexing this for individual investors on request.

**FIGURE 8. Ranking US + European Internet Names Together On Our Top 5 Criteria**



Source: Barclays Research.

**Timing**

We think AI adoption and subsequent changes to consumer internet plumbing will come in waves. ChatGPT started one wave (the first big one arguably), but things have stabilized since. We think subsequent waves will come with META's AI agent launch, Apple's much anticipated entrance (Apple-GPT, Siri-GPT, or whatever they end up calling it), upgrades and new services launched by Google, and many new start-ups entering the fray. We provide lots of trend data around new services we are following.

**It is early days - execution is going to be crucial**

But ultimately the single biggest variable here is probably “*how well do management teams execute*” and time will tell. We don't want to make dramatic conclusions in this note - it is too early to be certain with any degree of confidence and we are not making any rating changes. We plan on revisiting this theme regularly.

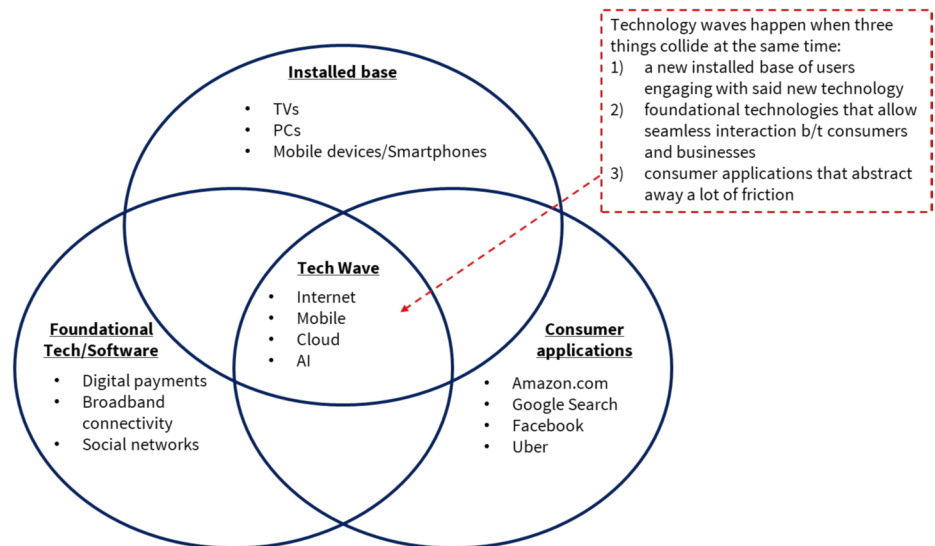
## The Internet Consumer In A Decade - How Will It Look?

We see Gen AI as a driver of great engagement with the internet - much like the shift to the mobile internet did in the last big wave of value creation in consumer internet. We are also fully expecting a plethora of new start-ups to emerge, offering new solutions and this to drive more competition for our companies. But we are also wondering if there might be wholesale changes to the way in which we engage with the internet as a platform - something that becomes more personalized and maybe not consumed through a flat screen. This section explores how the internet consumer might look in a decade.

### What Users Do Today and What They Might Do in the AI Future State

Technology waves usually happen when three things collide at the same time: a new installed base of users engaging with said new technology (TVs, PCs, mobile devices, etc), foundational software and plumbing technologies that allow seamless interaction with consumers and businesses (think payments technology or broadband connectivity in the PC and mobile eras), and lastly consumer applications that abstract away a lot of the friction (think mobile apps like Amazon or Google that allow one-click buying or browsing).

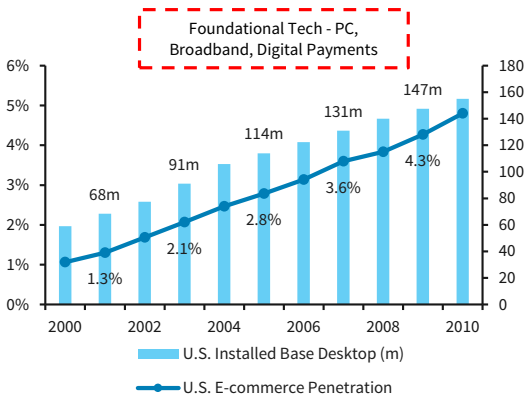
FIGURE 9. The Components Of A Tech Wave



Source: Barclays Research

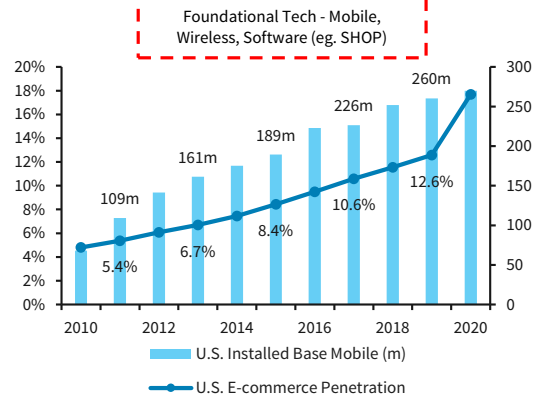
As these three things combine, a new wave of companies are typically hatched. E-commerce was introduced in the mid 1990s by eBay, Amazon, and others. As the installed based of desktop users increased, and foundational technologies were introduced, the industry grew several-fold from 2000 to 2010. Mobile only accelerated the penetration and size of e-commerce compared to traditional retail from 2010 to 2020, illustrated below.

**FIGURE 10. E-commerce Was One Of The First Consumer Applications To Take Off**



Source: Census, BLS, Barclays Research

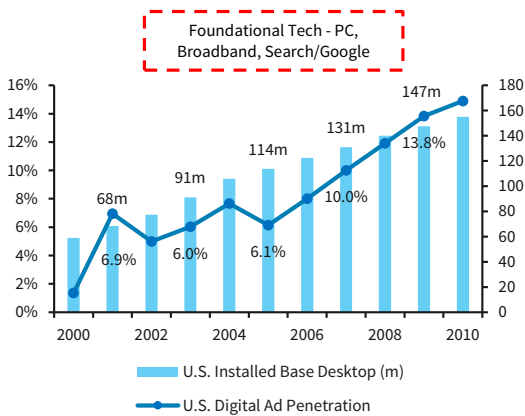
**FIGURE 11. ...And The Size Of The Market Expanded With More Users And New Foundational Technology**



Source: Census, BLS, Newzoo, Barclays Research

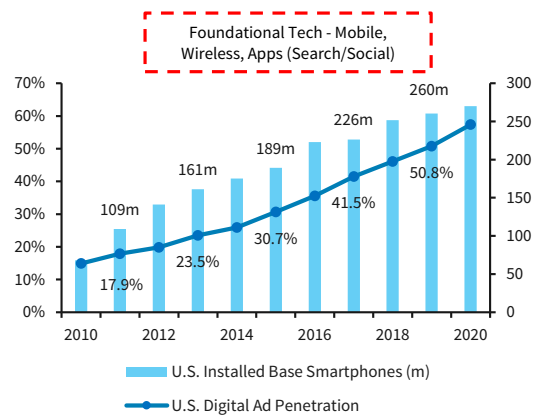
The same story can be told around the digital advertising industry. The installed base of desktops/laptops and foundational plumbing technology like search and social networks allowed digital advertising to gain meaningful share of traditional advertising in the 2000-10 era. Mobile took a while to adapt to the smaller screen size, but the time period between 2013 and 2020 saw an even greater percentage of dollars shift to digital and away from traditional, illustrated below.

**FIGURE 12. Search And Social (ie - Digital Ads) Are Consumer Applications That Gained Share**



Source: Magna Global, BLS, Barclays Research

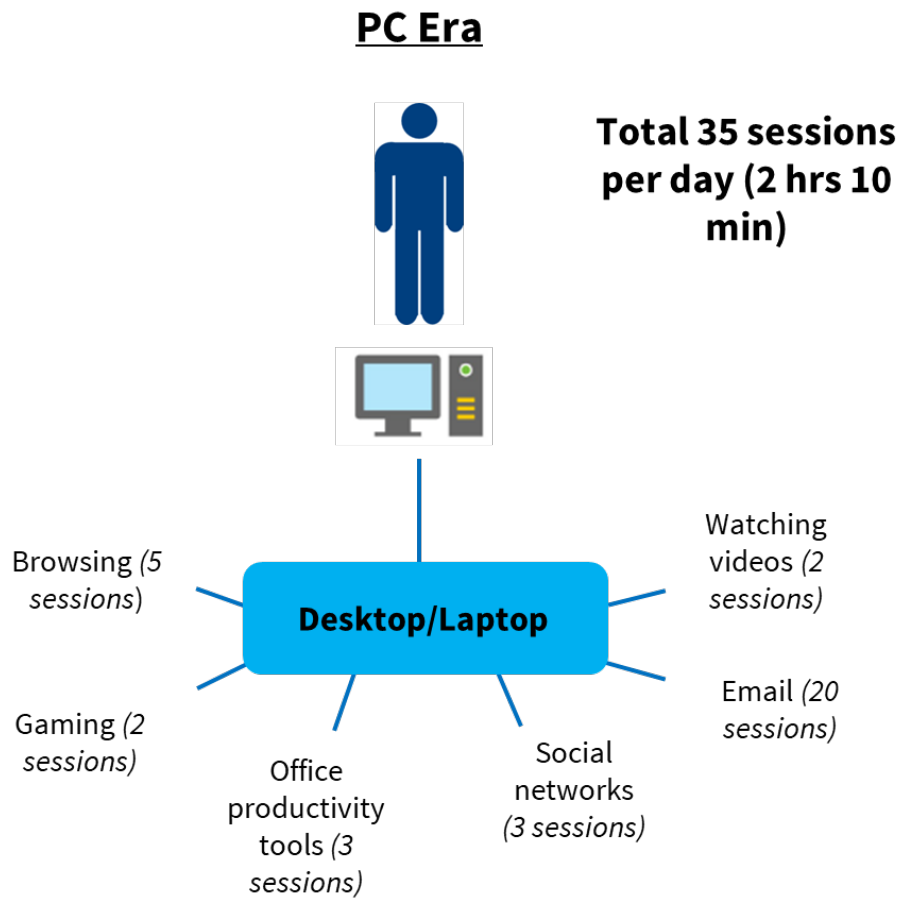
**FIGURE 13. ....But Really Took Off In The Mobile Era As More Users And Time Spent Shifted**



Source: Magna Global, Newzoo, Barclays Research

Each advancement in technology typically brings about increased consumer engagement and adoption. Both the total number of users in the installed base increases and the session frequency per user also typically increases. Illustrated below, during the desktop era, the average consumer spent 2 hours and 10 minutes per day online, across approximately 35 sessions. The desktop era reached around 1B online users in 2007 worldwide ex-China, with only around 200m of those having broadband connections.

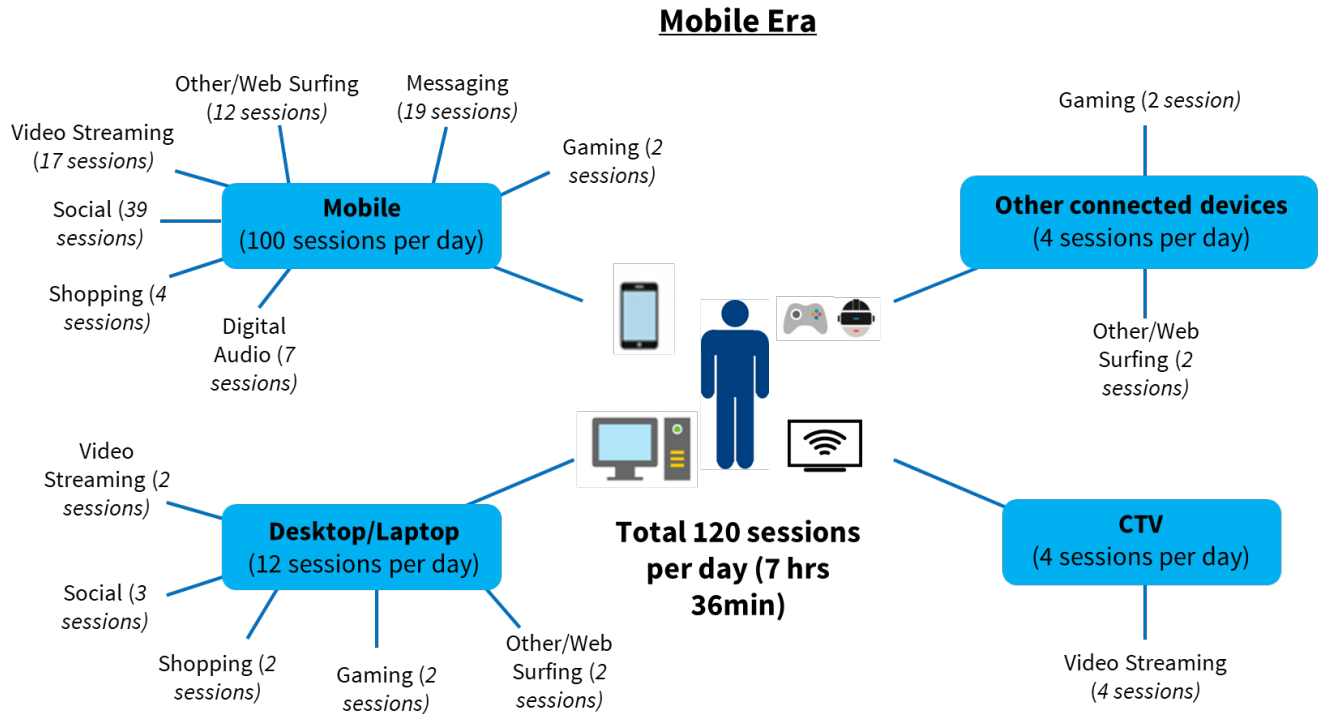
**FIGURE 14. The PC Era Was The First Big Digital Unlock, But Had Limitations (sessions per user per day)**



Source: Barclays Research, Nielsen

Mobile massively increased both the installed base of consumers accessing the internet and the session frequency, for obvious reasons like accessibility and affordability. Apple disclosed in 2016 that the average iPhone user opens their lock screen (a proxy for sessions) 80x per day, and with new technologies like FaceID we think that session frequency is up to around 100x per day per user today in 2023. Mobile has also massively increased the installed base of consumers accessing the internet and applications, with around 4B users worldwide ex-China today in 2023. If we add the desktop and CTV/other sessions into the mix, the average user is spending over 7 hours on the internet today, across 120 sessions.

**FIGURE 15. Mobile Really Changed The Game, With Accessibility And Affordability (digital users and time spent increased massively)**

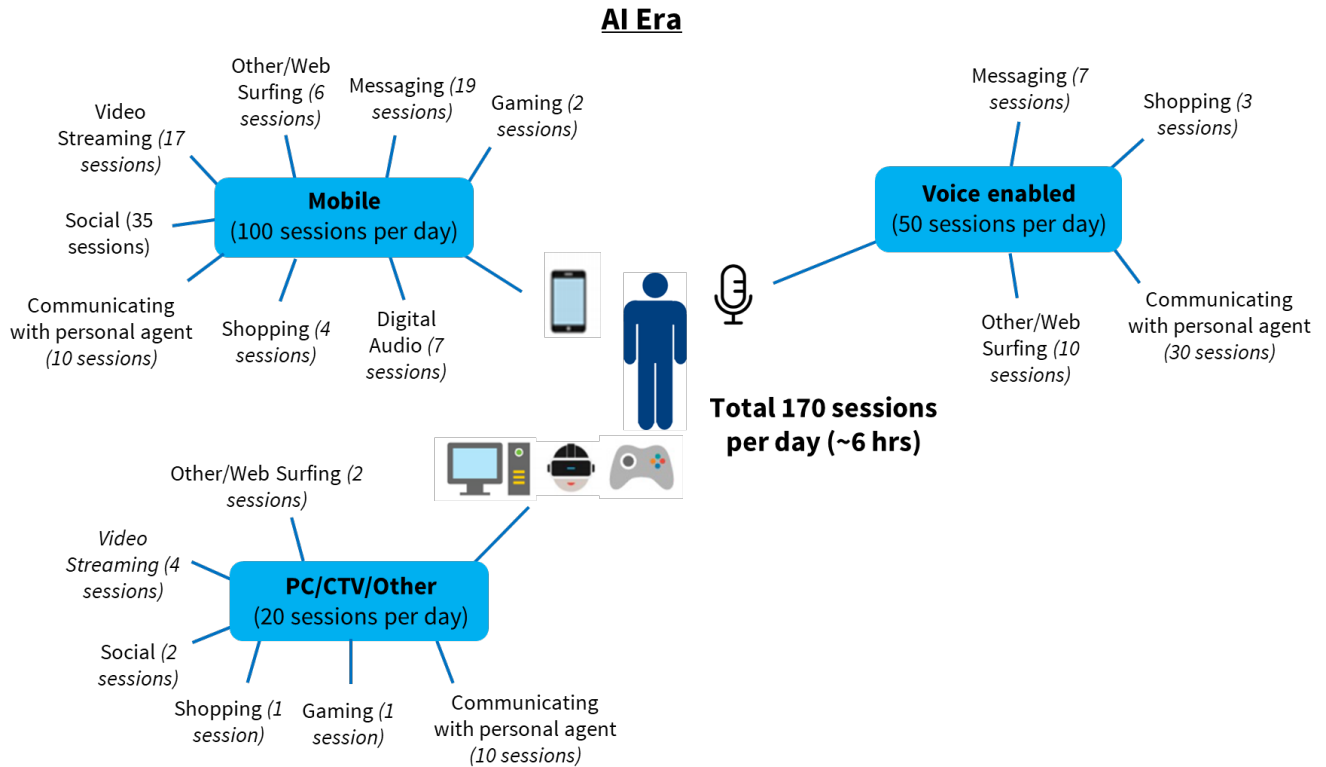


Source: Emarketer, Apptopia, Nielsen, BLS, Barclays Research

The Appendix outlines a few of the genuinely useful things that Gen AI can do to experience and the cost to serve in terms of consumer internet. As we look into the future and think about how AI could change everyday consumer behavior, we conclude the following:

- A)** Session frequency is likely to increase meaningfully, with AI Agents taking up a large percentage of per user engagement. We think engagement with real people will remain constant, but engagement with AI agents will be additive.
- B)** Overall time spent online is likely to increase at a slower pace than sessions, as the AI Agents work “on behalf of” the consumer, helping complete basic tasks and research much more efficiently than today.
- C)** Voice is likely to have its much anticipated arrival, as services like Google Assistant, Siri, and Alexa become much more capable, and more things can actually be done via voice as the interaction layer using LLM technologies.
- D)** It’s not clear if AI brings more users online compared to the trend we are already on with mobile. Further, it’s not clear how the sessions are likely to be divided up between previous use cases and future use cases. One can imagine that time spent thumbing through shopping apps and travel apps and various other research-intensive consumer behaviors is likely to be reduced meaningfully with the onset of AI Agents working on behalf of the consumer.
- E)** As we will discuss below, it’s also not exactly clear which business models are likely to see the greatest acceleration or disruption from AI technology being integrated. There are some who believe that large horizontal AI Agents like ChatGPT, Bard, and others have a major role to play like Google.com in the desktop and mobile eras, but others who believe that there is too much pressure and too great incentives to reduce the dependency on a centralized traffic distributor like Google.com.

**FIGURE 16. AI Era Likely Continues To Increase Engagement With Digital Services**

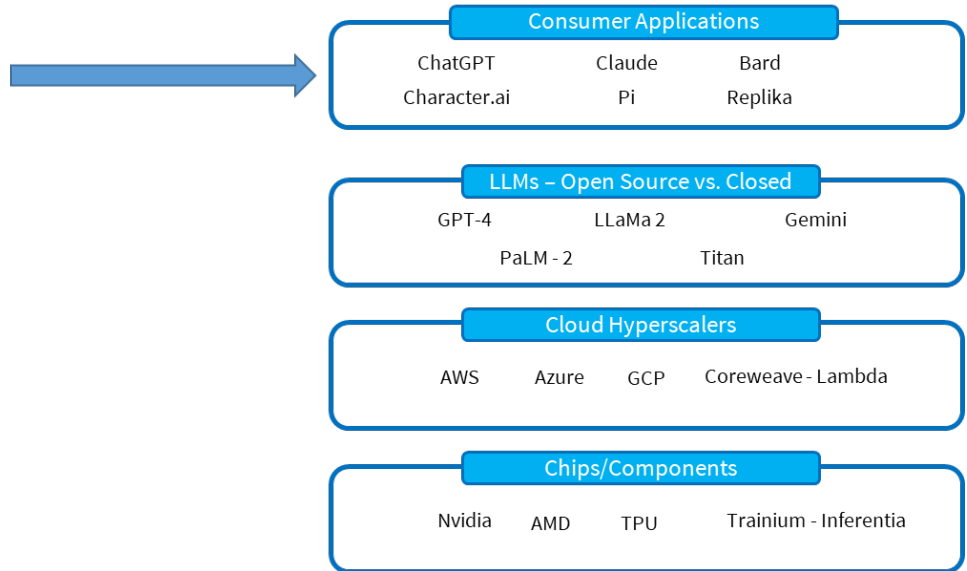


Source: Barclays Research

There has already been a significant amount of market cap gained at the bottom layer of the AI stack, or the chips/components and hyperscaler layers, with names like Nvidia and Microsoft. And much of the discussion in tech is around the model layer, with GPT-4/5 (Open AI models), Gemini/Palm-2 (Google) and Llama-2 (Meta). We suggest investors read “[A guide to the New Age of AI](#),” dated February 3rd and [U.S. Software: rAlmo’s AI Series - Vol 1: Software With a Side of Chips](#), dated September 5th) for these themes. This report focuses solely on the top layer of the AI stack, the consumer application layer, how the consumer internet might change, and what to watch out for as new applications are introduced.



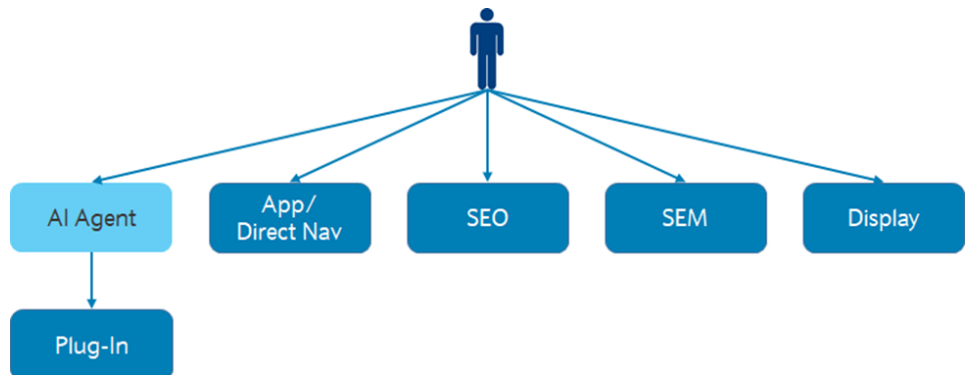
**FIGURE 17. Our Framework Assesses Winners/Losers In The Consumer Application Layer**



Source: Barclays Research

As we look into the next era of AI consumer applications, a huge amount of potential market cap won or lost is likely to come down to how new experiences serve as a starting point for customer acquisition. A very plausible scenario is consumers will continue to navigate to websites and apps on their phones the same way that we do today, many of which are infused by AI-based services. Think of a consumer using Doordash’s app for ordering dinner. Today we go into the app and tap a few buttons. In the future state one could imagine the user doing the same thing, or potentially using a chatbot or some voice-enabled AI that Doordash implements to execute the same order, still inside the application. In this scenario, we don’t see a ton of disruption in terms of market cap lost for incumbents, more likely we will have less friction and more digital sessions by which to execute various tasks. We see a role for new chatbots and AI-first services like ChatGPT and Bard to play, but more as a supplement to what we already do, particularly around information retrieval and not transactions. This is illustrated below in Figure 18. This is our base case thinking today, but subject to change as new AI products are introduced.

**FIGURE 18. How Traffic (ie “The Interaction Layer”) May Flow In The AI Future State - Our Base Case**



Source: Barclays Research

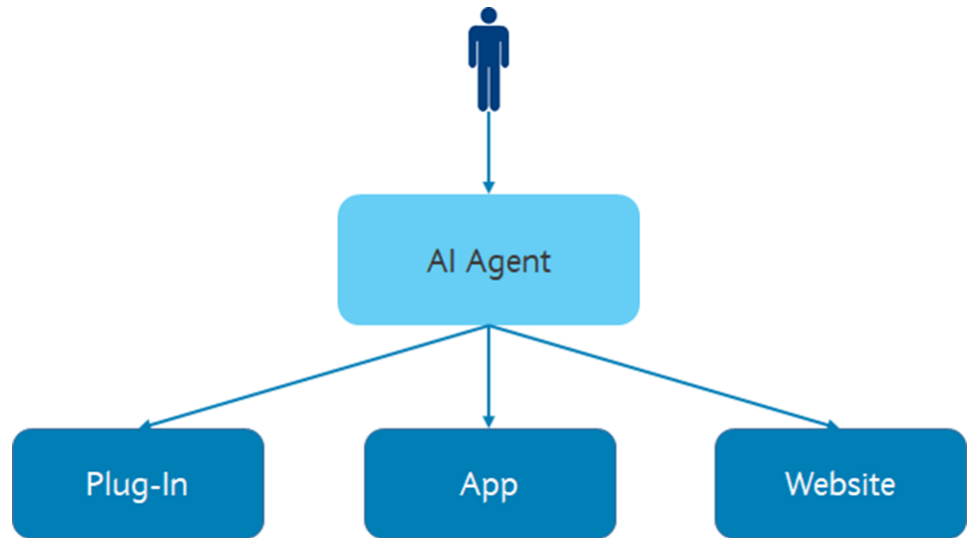
A far more disruptive view of the consumer journey is one whereby each user has a set of AI agents that act on their behalf, executing tasks throughout the day in the best interest of the individual. This is somewhat analogous the role that Google has served in the PC and mobile internet eras whereby it directs traffic to websites, and more or less controls the destiny (or at

least the ability to acquire new customers) of many downstream businesses relying on said traffic.

In this scenario, the AI agent could be from a single company like Meta or Google, or could fragment out to a bunch of companies offering said AI agents. One can envision a shopping AI agent specifically tailored to selecting woman’s clothing from a celebrity or influencer. Or a food AI agent tailored for selecting meals and groceries from a famous chef or health influencer. The horizontal chatbots like ChatGPT or Bard could also step into this role and parse through various consumer categories with the help of other AI tools and services. There is even one train of thought whereby AI agents connect with other AI agents to execute tasks, all in a continuous loop, and on behalf of the user.

It is quite possible that business models that used to be perceived as high quality get attacked. We think the example of a jobs marketplace is an interesting one here. Today, this is basically an interaction between a human uploading some information about themselves to a marketplace (e.g. a CV to LinkedIn) and a staffing agency / employer. But in the world of AI, an AI career coach could understand far more about the job seeker and then find a fully personalized solution with an AI seeker on behalf of an employer. This should result in a far better matching success than today. And so what we used to think of as ‘quality’ marketplaces could be disrupted. We can imagine similar types of disruption from AI agents in e.g. dating, real estate, financial services.

**FIGURE 19. How Traffic (ie “The Interaction Layer”) May Flow In The AI Future State - A New Model**



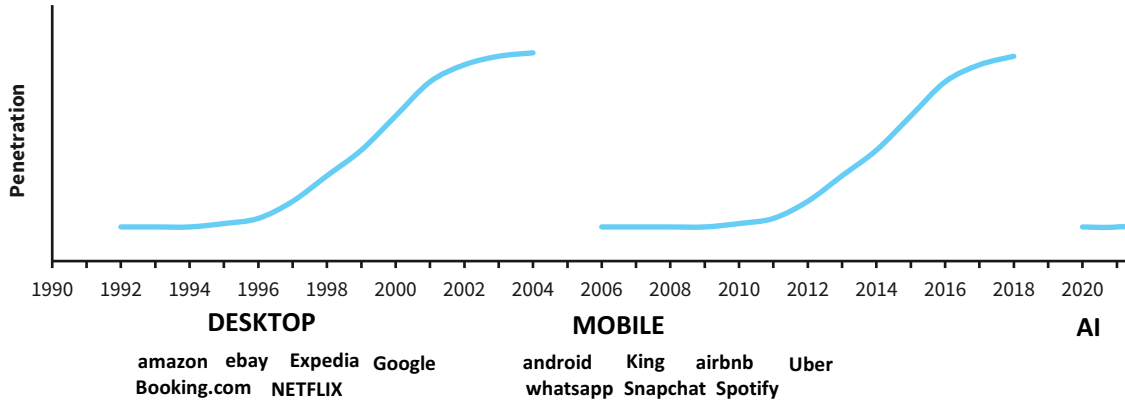
Source: Barclays Research

A key thing for investors to consider is that entities that can provide a vehicle for (or control) customer acquisition tend to accrue a lot of value. Google provided a vehicle for accessing the web in the internet era. Amazon provided a vehicle for third party merchants to sell products to its shoppers. Apple provided a vehicle for accessing apps in the mobile era. Similarly, Facebook controlled a lot of time spent across various use cases and built a huge customer acquisition oriented ads business on top of its services. These are all companies that amassed enormous market caps by controlling customer acquisition.

AI is likely to play a similar role, to what end is to be determined. And with that, we expect the underlying plumbing of the consumer internet to change along with it, which we explore below. The timing is still unclear, and noted previously, we think AI will come in waves. The first wave was on the back of ChatGPT, BingGPT, and Bard. We expect another wave to perk up once Meta introduces its AI agent strategy in late September 2023. We see a huge wave of change happening once Apple finally rolls out its consumer facing AI strategy on iPhones (likely in

2024). Apple controls north of 1B western market users, all at the high end of the demographics scale in each country, so whatever the company does should have a downstream impact on other consumer internet applications, like the App Store did in the mobile era. Apple and Google have tight hardware/software/OS integration, so are arguably in the best position to have the most differentiated and complete consumer facing experiences. Finally, we are expecting foundational models to improve from the current versions, which in itself should unlock more possibility on the consumer application layer.

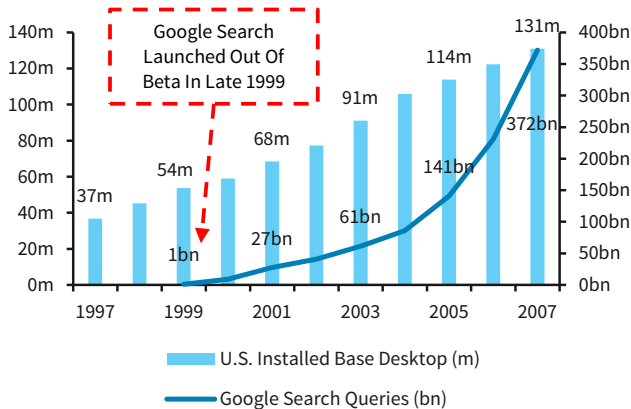
**FIGURE 20. Gen AI - The Next Wave For Consumer Internet?**



Source: Barclays Research

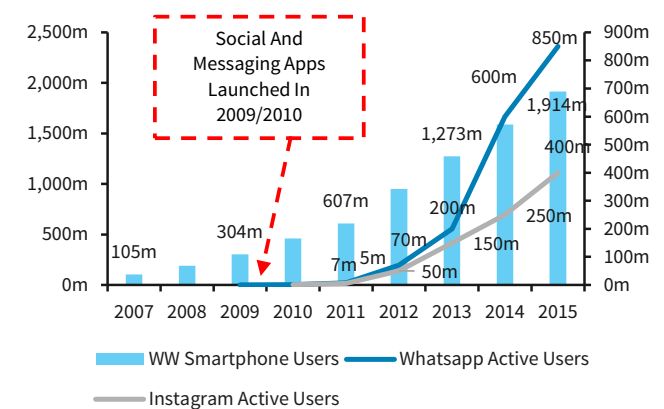
Noted below, killer applications often take time to develop on a new tech stack. Search was arguably the killer app in the PC era, and Google.com didnt really hit its stride until the early 2000's, about 5-10 years into PC adoption. In mobile, social and messaging were two of the biggest killer apps (among many) and took 5-6 years to really emerge following the launch of the first iPhone.

**FIGURE 21. Killer Apps Take A Few Years To Emerge - As Seen In The PC Era With Google Search**



Source: BLS, InternetStatsWatch, Barclays Research

**FIGURE 22. ... And The Mobile Era With Messaging/Social**

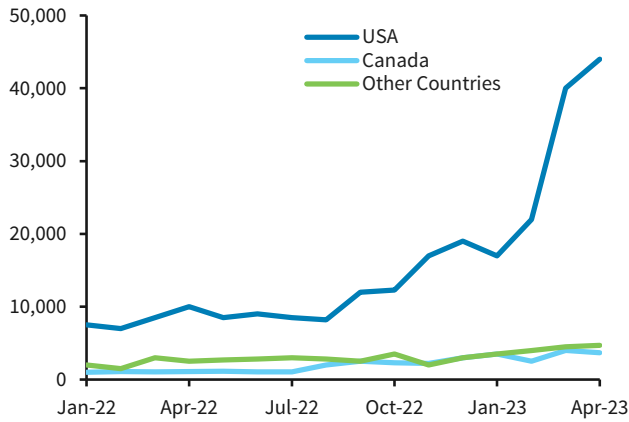


Source: Emarketer, Apptopia, Media Reports, Barclays Research

It is very, very early days to know who the new big AI companies are going to be. We are sure there will be many failures along the way. The next generation of vertical specialists is just being formed now and has accelerated dramatically now that open-source LLM models are generally available from e.g. Meta, allowing start-ups to create genuinely differentiated user experiences. Many of these start-ups are able to innovate at a rapid rate with a much greater output of software developers than their pre Gen AI peers as Gen AI tools such as co-pilot are put in place to accelerate this. With this in mind, we think it is likely that the venture capital money required

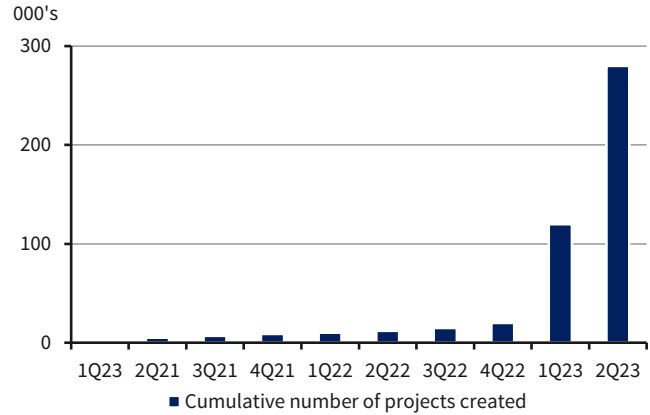
to scale these businesses will be materially less than historically - again supporting the argument that the pace of change might happen very rapidly as these businesses scale.

**FIGURE 23. Growth In Commits In Gen AI Repositories On Github**



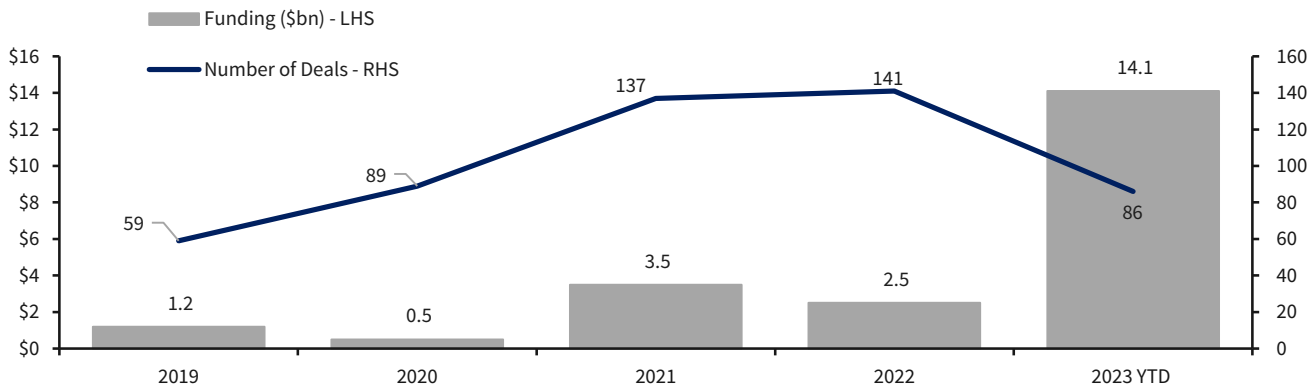
Github is a platform for software developers.  
Source: Github, Barclays Research

**FIGURE 24. AI projects On Replit - Up 80% QoQ in Q2**



Replit is a community for programmers to interact  
Source: Replit, Barclays Research

**FIGURE 25. Gen AI funding Ramping Up Fast**



Source: CB Insights, Barclays Research

There are still several verticals in our coverage with relatively low online penetration. Whilst we fully accept there are many, many factors at play that will drive relatively different terminal levels of penetration by vertical, our general view is there is still plenty of room for online penetration to shift higher over time - but to do so requires improving the online experience.

## How Is The Plumbing Of The Internet Value Chain Going To Change With Gen AI?

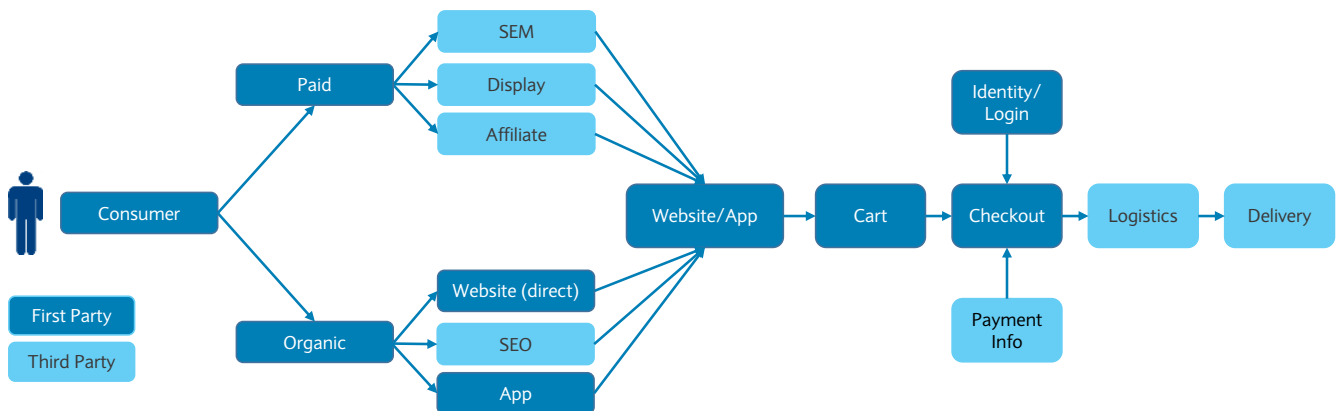
This section presents the puts and takes of changes to the top of the user acquisition funnel on the internet as Gen AI interfaces (Bard, Chat GPT / Bing, etc. etc.) start to become a common touch point. Whilst it will probably take time for material adoption, there could be quite material changes here in the medium term, which could impact how paid and natural search works and could impact the traffic acquisition of companies in our coverage.

As is a common theme in this note, there are many, many unknowns and few datapoints to anchor at this stage. Our first instinct is that companies that have high direct traffic and high app usage are going to be less at risk to this change. But it isn't necessarily the case that those companies with high paid / organic traffic from search engines and low app usage will be impacted negatively - it might be they execute well and adapt successfully to any changes. But we do think, on balance, they have more risk. Our view is companies should be thinking about this right now. Execution is perhaps the single most important factor in the outcome.

### The value chain of an internet business

Over time, we actually think Gen AI can impact pretty much all aspects of a consumer internet business model. Below, we show a simple illustration of the flow of a user in a consumer internet business model. We show the flow for a transactional business where it is all about driving conversion as opposed to an ad-driven model, where the primary objective is engagement. But the core concept is similar for both – audience flows through some kind of traffic acquisition funnel onto the platform, which then offers relevant content or inventory to the consumer with the purpose of driving engagement (ads) or a transaction (ecomm), which in the case of a transaction then needs to be fulfilled.

FIGURE 26. The Value Chain Of A Consumer Internet Transaction



Source: Barclays Research

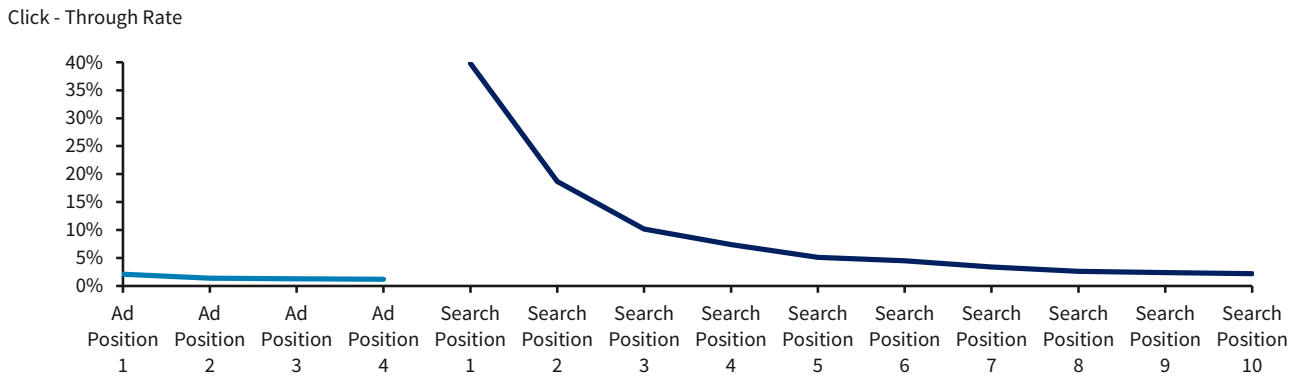
### How is the top of the funnel going to change?

**Searching on the internet has been about Google.** For over twenty years, consumers in the West have engaged with searching for content via a web browser in basically the same way - text-based search, starting the journey with a horizontal engine (typically with Google) and then being funnelled through to a vertical specialist to find the end product or, in some cases, typing the URL / web address directly to go straight through to a website they already know. Yes the

mobile platform shift that brought with it apps and the opportunity to shift some top-of-funnel user engagement away from e.g. Google slightly changed things for high frequency / engagement products. But the searching journey hasn't really changed beyond this for websites.

**Companies understand how this works.** Most consumer internet companies have built their customer acquisition strategies to compete in the paid and natural search rankings of Google (or find ways of funnelling traffic direct). Whilst this will of course vary by category and search term, there is a fairly well defined conversion curve that companies are used to optimising on Google. There will be some differences between mobile and desktop but the high level idea is the same - there is a fairly predictable return and relationship from each search slot.

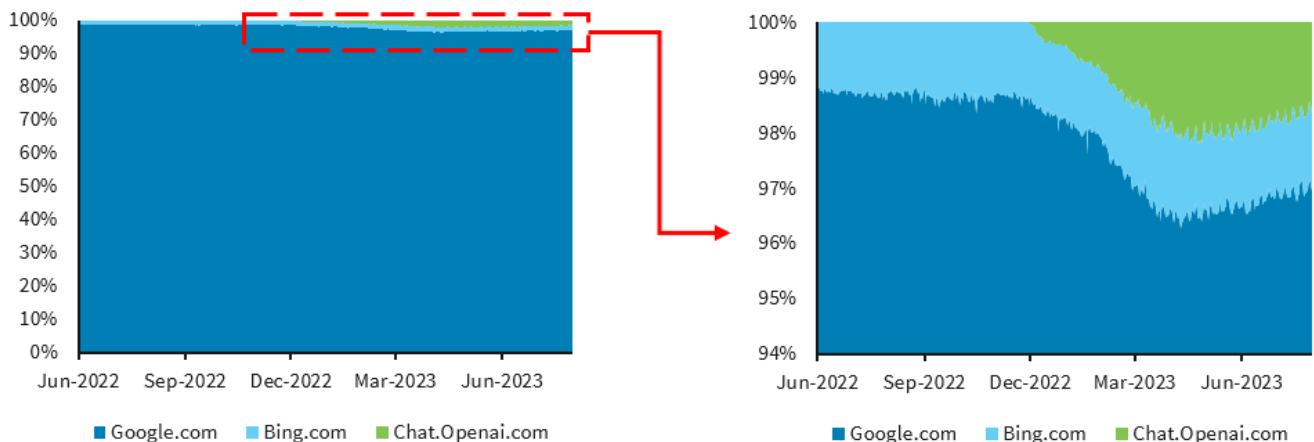
**FIGURE 27. Decay Of Google Search Positioning**



Source: Firspage, Barclays Research

**Gen AI - Chat GPT has gained some share.** This mode of engaging with consumers *might* be changing with Gen AI. Gen AI-driven search results via chatbots (be that Chat GPT, Bing, Bard, etc.) deliver much more detailed, personalized and contextual answers than legacy text-based search. Despite being \$20 / month for Chat GPT 4, usage of Chat GPT initially increased quickly. However, it is still a small share in the overall picture and this has plateaued more recently (our data below doesn't capture app traffic, which is likely growing for Chat GPT). Bing has already integrated this functionality into its search. Google has responded, previewing its Gen AI search product / Search Generative Experience in May (see [“Don't Call It A Comeback, AI Has Been Here For Years”](#), dated 17 May 2023).

**FIGURE 28. Global Search Market Is Seeing Some Changes Albeit Chat GPT Usage Plateauing**



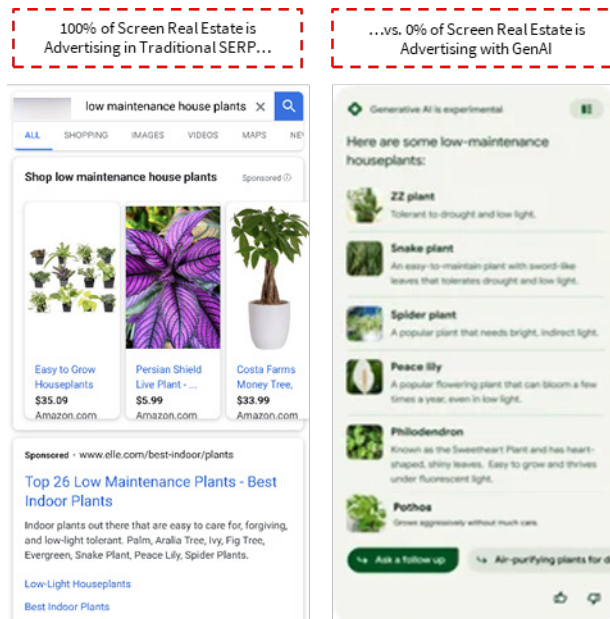
Source: SimilarWeb, Barclays Research

**Others are following.** We are still in the very early innings of this. Whilst Microsoft / Bing / Open AI / Chat GPT seems to be moving more quickly (having integrated Gen AI functionality into Bing), we are still waiting for the widespread roll-out of Google’s Search Generative Experience (in trial in the US). Apple’s long-term intentions are also not fully clear (currently Google is paying Apple for being the default search engine on iOS) - as explored in “[What if Bing Goes Over-the-Top on iOS?](#)”, dated April 4 2023. Meta is also likely to make moves to integrate assistants into its products and there could well be other new entrants.

**This is all still largely text-based.** This is all assuming that text / image-based search remains the default (as it has been for >20 years). This seems likely to us in the next few years but we might expect that less internet consumption is transacted by text-based mediums via websites in the longer term as AI becomes more developed; instead pivoting to e.g. voice, images or VR (something that both Meta and Apple have clearly thought hard about given hardware releases). This could clearly change things very materially beyond the scope of what we discuss below. However, the concepts we refer to in this section are still very much relevant.

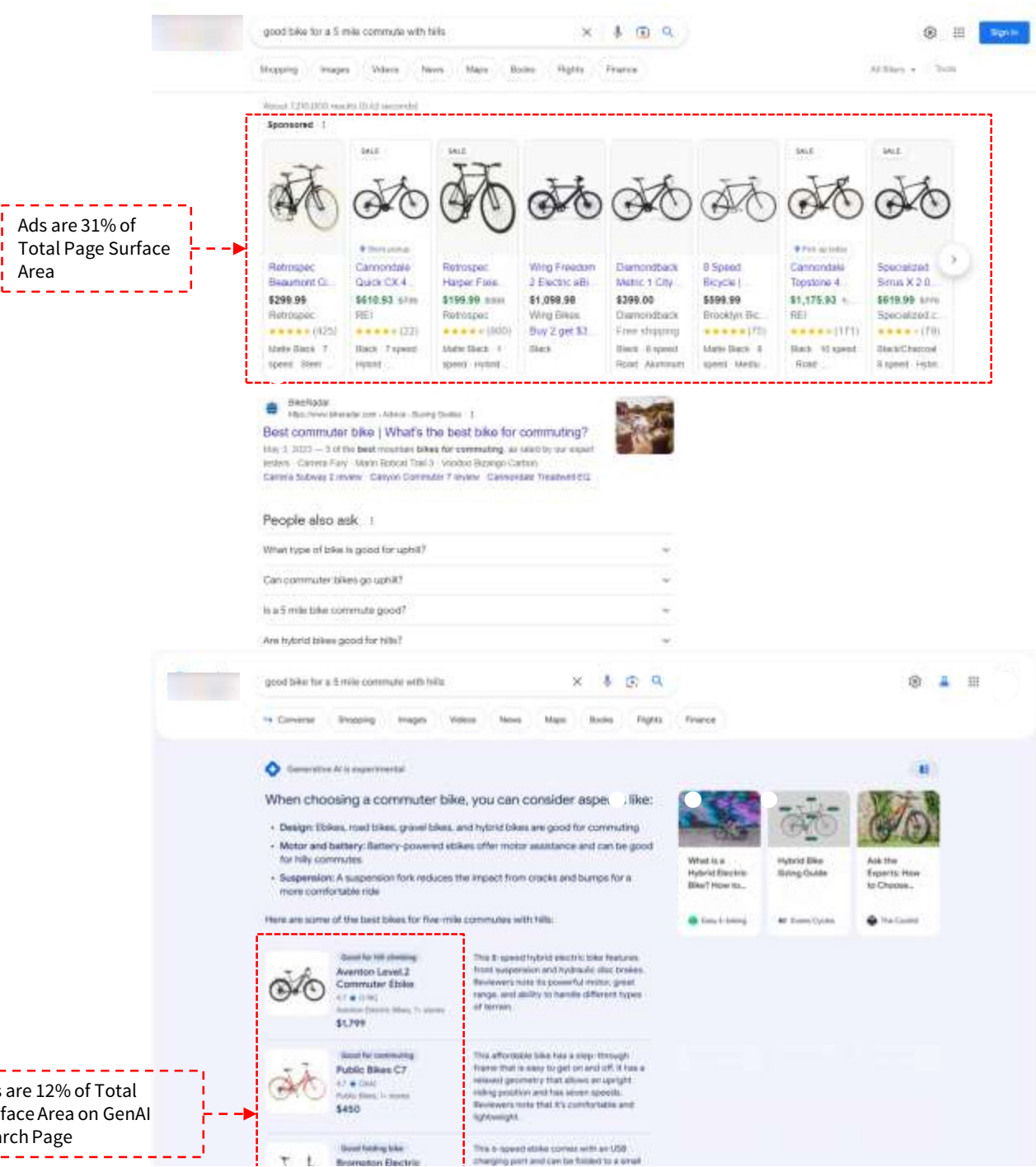
**ROI on search might change in world of Gen AI.** Below we provide some extracts of search generative experience given at Google’s AI session back in mid-May. These are just a couple of examples and likely *don’t reflect* the reality in the long term. But on mobile, 100% of the page was taken up by advertising formats in traditional search, whilst 0% was taken up in the Gen AI search. In desktop, the ratio was from c1/3 of the surface area to c10% of the surface area.

**FIGURE 29. Moving From Traditional Search Engine Results To Search Generative Experience Had Big Impact On Ad Visibility In The Google Demo For Mobile...**



Source: Barclays Research, Google.

FIGURE 30. ... And Also For Desktop....



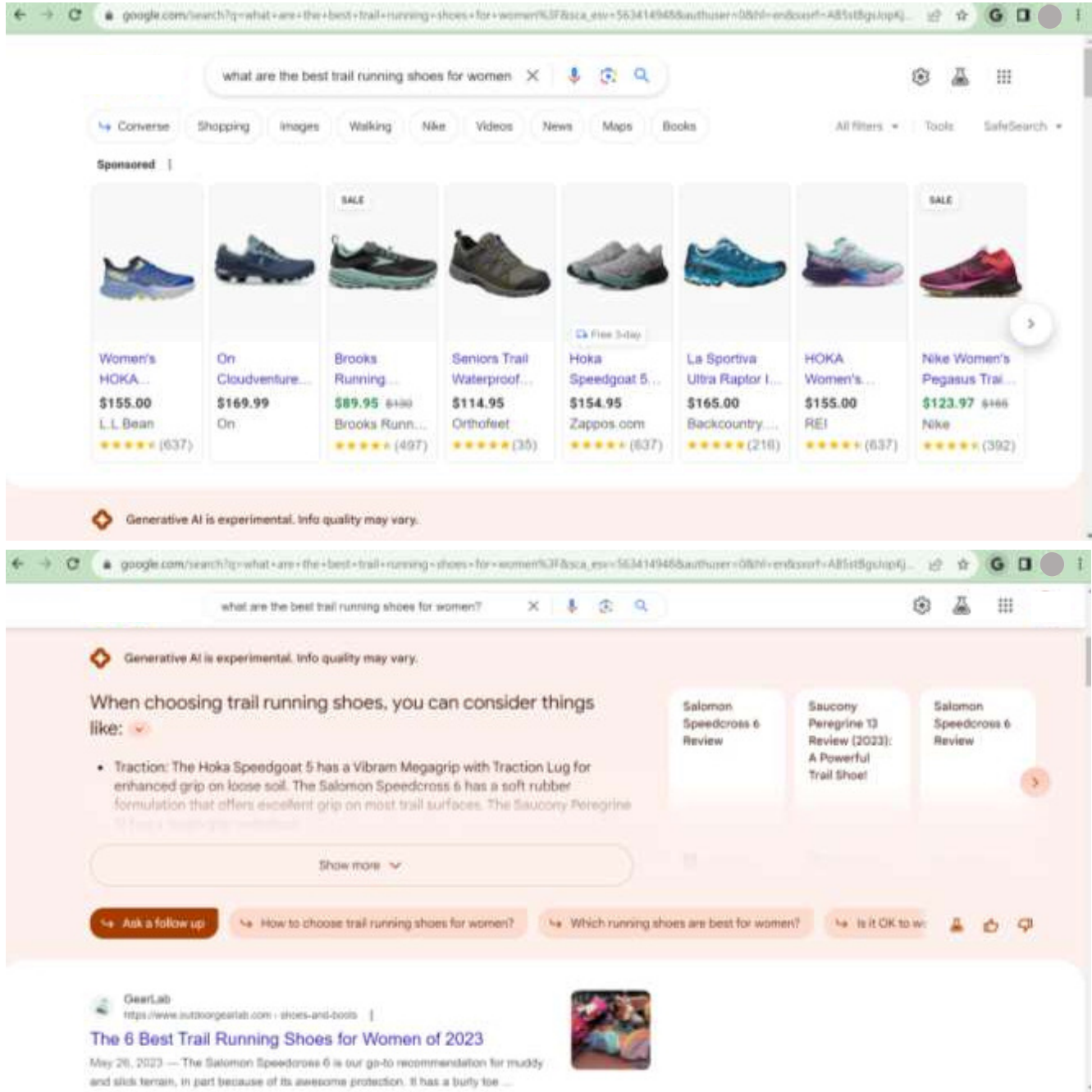
Source: Barclays Research, Google.

Below we show a couple of more recent extracts from the Search Generative Experience in trial in the US. Relative to the images given in the May trial, some versions of SGE prominently display ads across the top of the search engine results page, very much the same as traditional



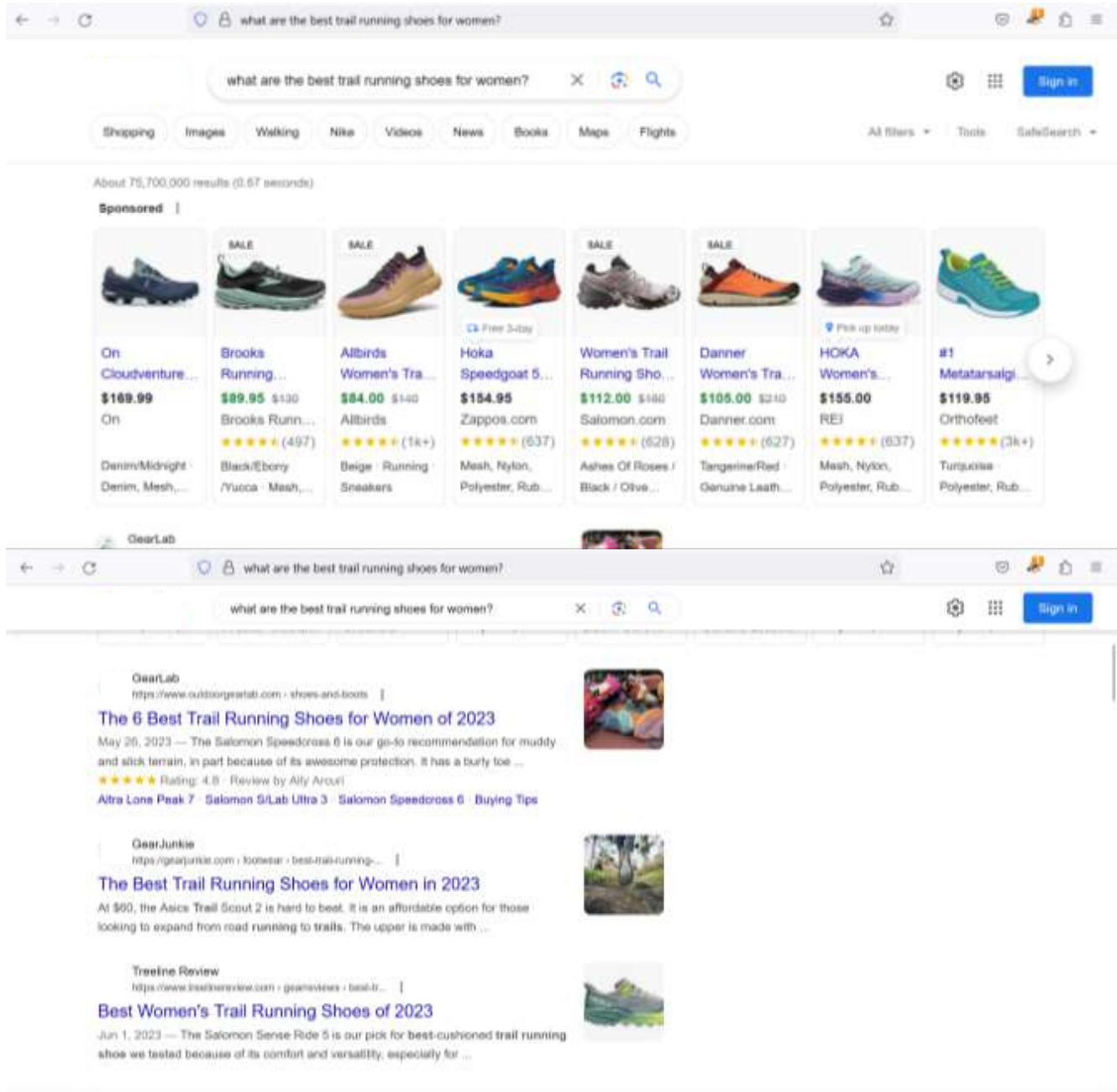
search. So, relative to the initial trials, the paid side of Google may hold up better than the organic side once rolled out. This is logical when thinking about direct monetisation for Google. But clearly this creates some questions for advertisers who score well in organic search traditionally.

FIGURE 31. A more recent example of the search generative experience on desktop suggests more of a negative impact for natural search than paid search....



Source: Barclays Research, Google.

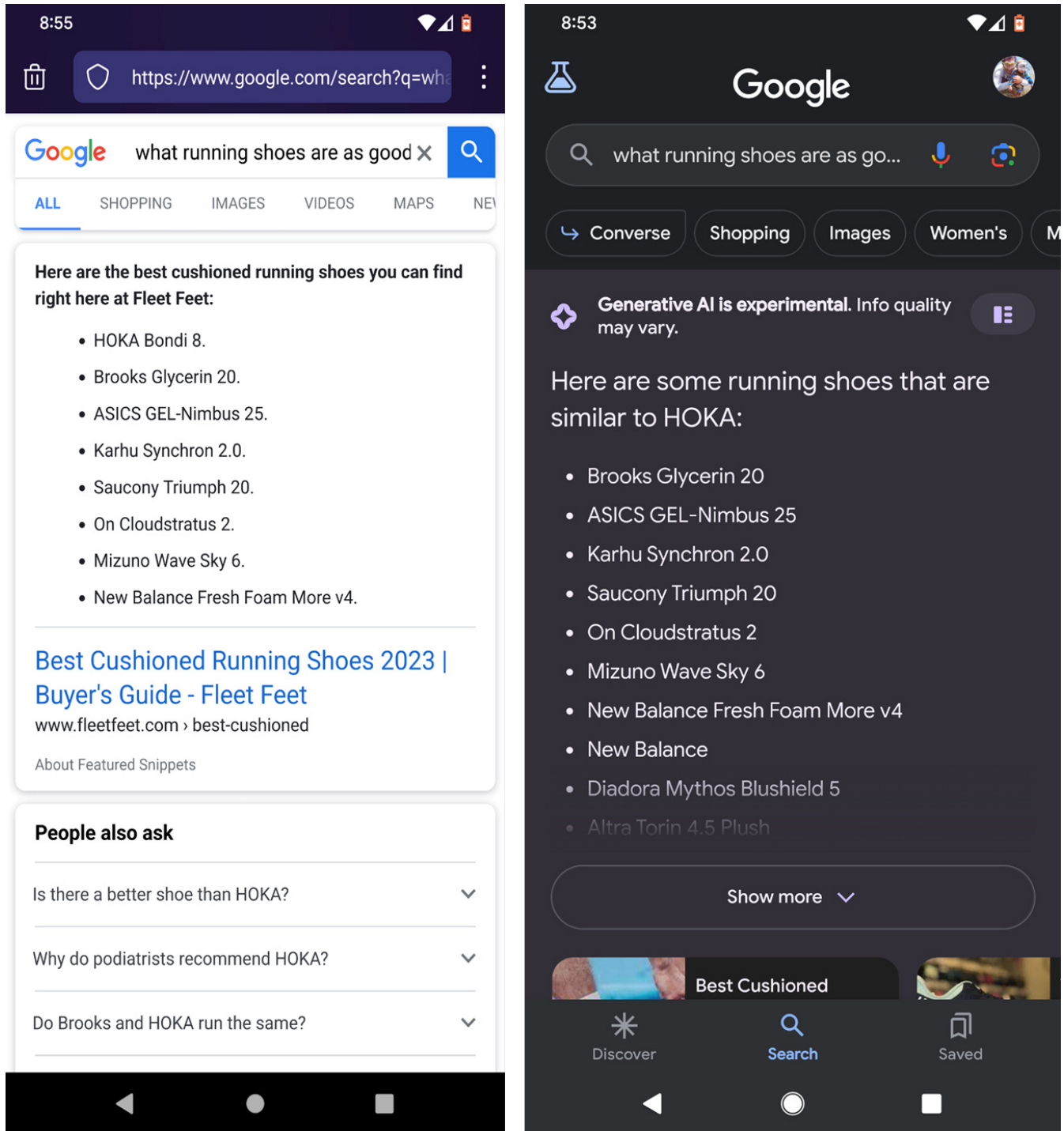
FIGURE 32. ...when compared to traditional search



Source: Barclays Research, Google.

And below we show the same search on mobile - again the generative experience (on the right) looks totally different to the traditional experience (on the left).

FIGURE 33. Comparing a mobile generative search results (right hand side) with a traditional search result (left hand side) also looks very different



Source: Barclays Research, Google.

It remains TBC when Google will roll out this Search Generative Experience more widely and it remains TBC exactly how it is going to look when it does. But this trial example does suggest some evolution vs the initial sample given back in May, so this is a fluid situation and we can't be totally sure how this might change.

Bing has integrated Gen AI into its core search page and then also has a separate page with a chat interface and paid links embedded in search results. Our experience of playing around

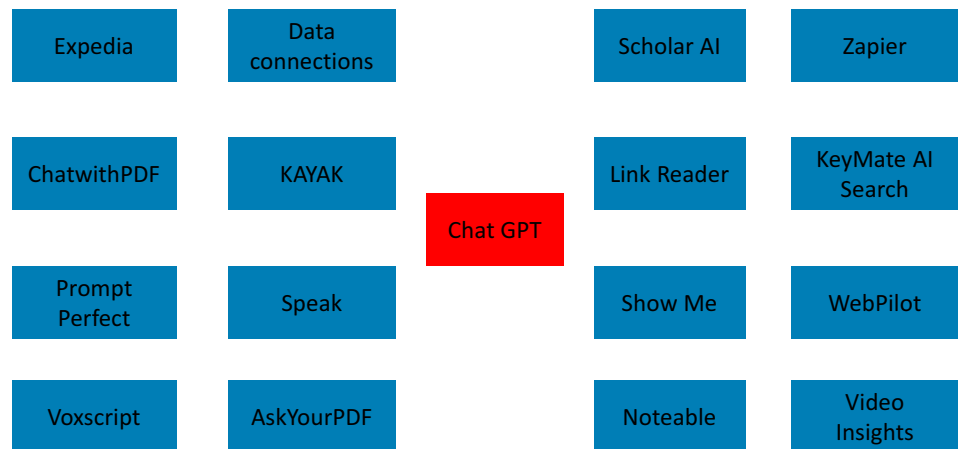
with it is also that things are moving around. In the Appendix, we show the Bing generative search result of the same search term as on Google above. Again, the first traditional organic search result is a long way down (Runner's World).

**What difference will 'plug-ins' or 'extensions' make?**

We look at Chat GPT, Google's Bard and Meta's WhatsApp / Instagram as three examples but there could well be further players here over time (notably Apple). We want to frame this as more of a big picture musing as to how engaging customers at the top of the funnel might change in a world of a horizontal Gen AI front end on whatever platform people use to engage with the internet (potentially not text in the longer term).

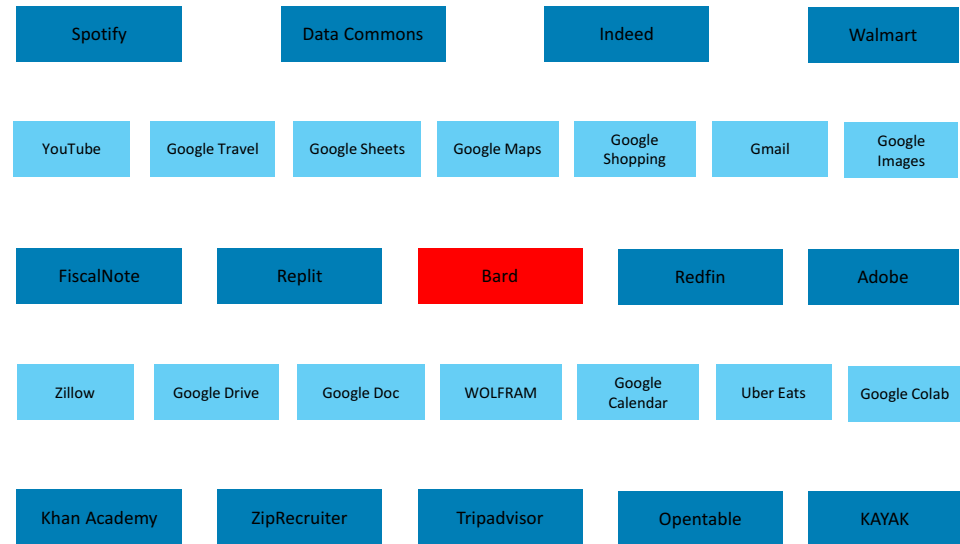
**Chat GPT launched 'plug-ins' in March 2023.** Open AI released its plug-in offering in March 2023. This allows companies to integrate parts of their website offerings into the Chat GPT front end. Several in the US have tested these integrations, such as OpenTable, Zillow, Redfin, Kayak and Expedia. Rather than being able to access relatively generic information under the core Chat GPT (often not that helpful once a search journey becomes more specialized and specific), these integrations give access to specific and relevant data / information to a transaction. Essentially a user is able to bring together the inspiration, planing and transacting phase of a transaction into one place. It seems that, today, the actual completion of the transaction is taking place on the third-party platform with a click-through at the point of completion.

**FIGURE 34. Some Examples Of ChatGPT Plug Ins**



Source: ChatGPT / Open AI, RoeDigital ([here](#)), Barclays.

**'Extensions' on Bard are also up and running.** 'Extensions' (very similar idea to 'plug-ins' from Chat GPT) are up and running for Bard, both Google's own products (Gmail, etc) as well as third-party services (Adobe, Kayak, ZipRecruiter, OpenTable were some examples given). It looks as though this is going to be a relatively seamless integration.

**FIGURE 35. Some examples of Bard extensions**

Source: Google, Barclays.

**Remains to be seen what the Meta playbook is.** Meta has referred to adding personalized AI agents to its platforms to help drive customer utility (e.g. at the Q1 results and on an interview with Mark Zuckerberg on the the Lex Fridman podcast, 8 June 2023). It remains to be seen exactly how this looks but we can envisage a world where WhatsApp evolves from being largely a communication platform amongst friends to driving engagement with a range of personal agents / shopping assistants offering useful products from brands. We also expect innovation on the other Meta platforms.

It is difficult to speculate how this is going to look until the products actually launch (supposedly later this year according to the FT, 31 July 2023). But this is a potential new horizontal channel to drive customer engagement that brings potential opportunity and risk for our coverage, in our view. Quite how vertical agents / bots / assistants are going to compete for audience engagement is very much TBC.

**Could be other players to come - Apple?** Ultimately it would seem that Apple is one of the best positioned players in Gen AI given its tech expertise (both hardware and software), installed base, massive data asset, trust and deep customer relationships. It seems likely to us that at some point a revamped Siri will also be a key player in this top-of-the-funnel conversation. Apple's App Store has clearly been a key distribution channel in a mobile world.

Then we are expecting a flurry of personalized chat bots / assistants to emerge with different specialities. Amongst many others, Inflection AI raised \$1.3bn in June 2023 to develop a chatbot, Pi, which has personalized conversations with users either directly or through an app, text, WhatsApp, Instagram or Facebook. Character AI is another player in this space. Anthropic's Claude is also impressive around its principles-based approach to aligning AI responses to what humans want.

### **There are a few important questions to think about**

There are *a lot* of unknowns here in terms of how this works through. Some musings:

#### *Questions on traditional search*

**How many search enquiries will take place on generative search vs traditional search?** This is still a hard question to answer. On the one hand, Chat GPT usage seems to be plateauing at relatively low overall share, suggesting this is a marginal service to some consumers. But users have to pay \$20 a month for GPT 4. So until Google fully releases Gen AI search and leverages

the huge distribution it has, it is hard to judge what the real demand is. But even then we may not really know and this might take quite some time. As long as the perceived threat from ChatGPT or others is not materializing, we think Google will keep Search Generative Experience in the lab, and hence we won't see dramatic changes to the flow of traffic (organic or paid based) in the near term. Right now, the models are not perfect with issues like frequent hallucinations - plausible but factually incorrect statements given by the Gen AI models - remaining problematic. Trust in these systems matters. **All in, we think this is probably going to take a quite a while to play out.**

But, over the long term and as the tech gets better and better, our instinct is that a reasonable portion of 'zero-click' searches (e.g. one where the answer is on the webpage, such as an FX calculation or weather) will go to generative search, as will a reasonable portion of Google answered searches. These are a reasonable portion of total search volumes (we estimate >30% combined). We also see risk of other research based click-throughs migrating to being zero-click searches if the content that users used to click-through ends up appearing on the generative search results.

Relevant for our coverage is what % of commercial searches (a relatively small % of overall searches on Google) move to Gen AI points of engagement and become 'zero-click' searches or take longer to click through.

Within commercial queries, our intuition is that there is going to be some take up of Gen AI for queries at the top of the purchasing funnel with relatively little upfront purchase intent where the search process is lengthy, requires going to multiple websites and doing lots of research before making a decision. We also think the heterogeneous nature of the product is a key factor - a job or a house is highly bespoke but booking a train or ordering groceries is arguably much less so. We think the more complex the discovery, the more time spent searching for a relevant product and the more personalized the product is, the more that a Gen AI search can help.

**Will the search market become more fragmented?** We think it is probably in the interest of our coverage companies to have a more fragmented horizontal search market given the power that Google controls today and the effective tax the industry pays. But there is only so much they can influence this - ultimately it is a consumer decision and we expect consumers to use the best product. There are many, many unknowns here - our base case is the industry gets somewhat more fragmented but Google will remain a very large player given its enormous distribution, tech and data expertise. However, it seems likely there are going to be more competing products in the next decade than in the last.

**Could there be monetisation changes?** It is possible there will be some trade off between lower ad load and higher pricing (searches provided likely to provide higher end conversion to the merchant and competition to be included in the contextual result of the Gen AI search goes higher). But to what degree and how this nets out is far from clear. In theory, this could be a modest monetisation air pocket for Google as it focusses on driving engagement over monetisation, i.e. potentially positive in aggregate for its customers. But we aren't over reading into this, and long term we assume the incentive for Google and its competitors is to drive revenues through higher pricing / ad load, and it is TBC whether this de-monetisation is a permanent feature. Unless Google starts to structurally lose share in a big way (not the base case), we presume pricing power is going to stay pretty high.

**Is there even more of a premium on being ranked high in organic search?** We think that it is possible that generative search will see advertisers towards the lower end of natural search page results (e.g. 7,8,9,10) more impacted than those who ordinarily would have ranked, e.g. 1. It is simply farther for users to scroll down and the generative results box may well provide relevant answers before they do so. We saw this dynamic play out in the shift from desktop to

mobile, with some companies squeezed in their customer acquisition and impacted negatively. We think advertisers with long tail rankings could be in danger of being effectively squeezed out.

Equally, we think that verticals with one very clear leader should see that player prioritized as part of whatever way Gen AI search algorithms end up working (which historically have done a good job of providing sites with the best user experience). There is, in our view, more of a risk that a more competitive vertical could see one player relatively promoted or impeded relative to its competition versus the status quo today. This will depend how well the SEO / SEM teams within an organisation are able to adapt to changes that are coming.

**How will citations and natural search work?** Both Google's Gen AI Search product and Bing Chat now provide citations when quoting from certain websites, which Chat GPT did not originally offer. But how this is presented in Gen AI-driven search results will be very important for driving free traffic / click-throughs from the generative box. Our base case is that consumers ultimately still want choice - as a user, reasonably one cares what the underlying source of the Gen AI search result is, particularly when today's models frequently produce hallucinations (presenting something as seemingly correct when it is, in fact, not). Building trust that the AI is providing relevant results will be key. But our searching (admittedly with a limited sample size) suggests some variability in this today on Bing and Bard. Quite how this plays through is not clear.

**Search engine and publisher relationship.** Historically, most internet companies have tolerated their sites being scraped by Google, as ultimately the relationship has provided them with audience (and they haven't had much choice). But if they get cut out of the value chain such that a lot of the content on these platforms is 'scraped' and 'summarized' by Gen AI engines with a lack of citations / natural search capability and then consumer engagement shifts to the horizontal Gen AI platforms, we'd expect this to be controversial and likely profitable for lawyers. We have noticed, for example, Future Group preventing Chat GPT from scraping its content as an early example of where this might move.

**Is this definitely negative for publishers / retailers? Could it be positive for those who move quickly?** Up until now, we have largely been hypothesising as this being a potential problem for small cap internet - but we don't have much hard data. But we note language from Ziff Davis (a publisher of niche content) at their Q2 results suggesting that readers acquired through Gen AI search results on Bing were up by 60%, roughly 3x the overall rate of industry-wide traffic growth from Bing. So it seems that actually the shift for them to Gen AI search has been *positive*. This is the one hard data point we have heard - and it's actually a reassuring one. Perhaps an example of a company who has been on the front foot at adapting to these changes.

**Will the marketplace vs D2C balance be impacted?** The established status quo has typically that marketplaces gain superior search terms to brand direct for many general searches - the breadth of offering has been rewarded in the natural search algorithms plus driven higher conversion to fund investment into paid search terms. For companies like Zalando this has been crucial in establishing themselves at the top of the funnel. However, this could conceivably be modified somewhat with a Gen AI search engine on Google or Bing - time will tell.

**Do marketplaces need to exist?** In theory, a bunch of AI agents acting on our behalf to solve every day problems could mean that today's functional marketplaces (finding a partner, finding a car, finding a job, finding a house, finding a good, etc) don't need to exist as they do with today's front end. Could we just remove the store front of e-commerce and marketplace entirely? We think this is a very conceptual idea and don't bake it into our base case but is something to think about. There are still important issues like fulfilling an item and trust that

would matter. But, to take the example of fashion again, could brands such as Nike or Adidas cut out Amazon or Zalando and connect their AI agent directly to your personal assistant?

**Will SEO actually get easier with Gen AI?** We have heard in our checks that content generation on websites from Gen AI could genuinely help drive better SEO, i.e. persuading the search algorithms that the relevance to the consumer of a certain site was increasing, thereby increasing its position in the natural search. This could be an offsetting factor to those who execute well.

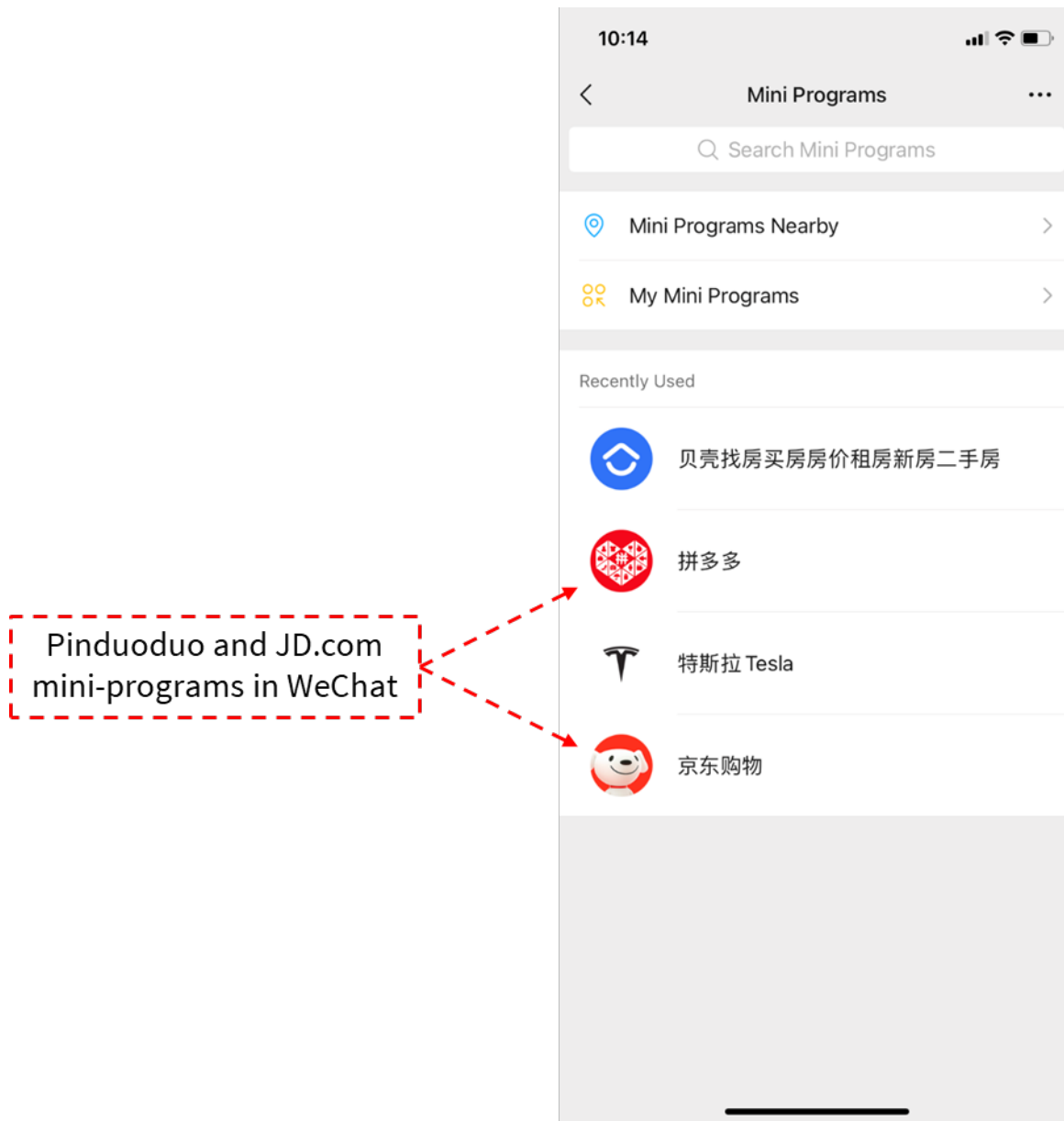
**Will Gen AI mean that customer retention gets better anyway?** One of the potential benefits of Gen AI for those with lots of user data is to drive far more personalized engagement with consumers. So if companies are successful in layering on Gen AI functionality to leverage this data, it is possible that retention can structurally increase, thereby lowering reliance on Google / other search engines. We'd expect this to be a continuation of a theme that has already played out in the last decade for those companies who made an app strategy work.

### *Questions on chat bots, plug-ins and disintermediation*

**Horizontal or vertical chat bots?** Our view is that most likely, for now, there will be a few horizontal interfaces at the top of the funnel (Chat GPT / Bing, Bard, WhatsApp, Siri, etc.) but then many verticals specialists 'plugged -in' (much like a mini-program on WeChat in China today where publishers are able to release an app within an app to present their own specific products within the WeChat ecosystem). This is roughly how it has worked up until this point - horizontals like Google and Meta have made some forays into verticals but in a relatively light-touch way. We think, for now, vertical specialists bring something to the table in terms of user experience - transactional capability, trust, data, content, etc. - and the experience on horizontal chat bots becomes more limited on specialist subjects, with real time information needed. Right now, hallucinations in search results are commonplace and we struggle to envisage a consumer really adopting these types of horizontal search points in their current form for vertical tasks. We can envisage e.g. the Bloomberg chat bot for finance, the AutoTrader chat bot for a car search, the Expedia / Booking chat bot for a hotel search, etc. But time will tell and in the long term the conclusion may be different as the big-tech horizontal chat bots get better and increasingly personalized with the consumer. This disintermediation question is a very relevant one, in our view, and we explore what could prevent it from happening by company later in the note.



FIGURE 36. WeChat Mini Programs - A Good Reference Point From The East



Source: WeChat, Barclays.

**Even with plug-ins, will transactions take place on ChatGPT (or other horizontal chat bots / Gen AI interfaces) in the future?** Again, back into the realms of disintermediation, but we could envisage a situation where transactions take place on horizontal platforms but via a plug-in . We presume there are issues to consider around: 1) companies wanting to maintain user relationships / data, 2) user trust / experience given the high prevalence of hallucinations in the models today, 3) legal considerations, and 4) integration infrastructure. But it isn't a dramatic leap to think this *could* happen at some point. Ultimately, many of these big tech companies have not just top-of-funnel capability but also bottom-of-funnel capability (e.g. Google Pay, Apple Pay) that create an incentive to do this, as well as a lot of trust.

This does matter - we presume the economics of the vertical providers could be squeezed over time if transactions and user engagement starts to migrate to horizontal chat bots even if existing verticals were still a part of the value chain in fulfilling that product.

**Will partners give all the content?** We noticed e.g. Zillow not providing all of the information and tools it provides to users on its own platform. We think the balance using these channels as a source of customer acquisition vs not wanting to lose full control of the customer means this could be a strategy we see more of. This is a key decision for consumer internet companies - we assume some form of Prisoner's Dilemma when choosing when to integrate (if you don't, your competitor will) but it might be smart to keep some functionality on site to avoid total loss of customer engagement.

**Relating back to the app store.** Arguably a 'plug-in' on Chat GPT or 'extension' on Bard or even a personalized agent on WhatsApp or whatever platform emerges in a Gen AI world doesn't look that different to the app store on a mobile phone - yes the point of consumer engagement is shifting but the principle of how to then engage with the consumer is similar. But users are used to being able to search for a particular app on the app-store before downloading it or are routed to download it from the website of a company having reached that website via traditional means (Google). In the new world, the plug-ins might be more naturally integrated into the Gen AI flow. Users today do use multiple apps in the same vertical - whether this behavior continues is TBC.

**Who will win the race for visibility?** At this point it is TBC which plug-in might be prioritized over another one. But we think it is interesting that, in the case of Redfin and Zillow (two players in the real estate vertical), Chat GPT users can only choose to integrate with one plug-in from the property industry at a time. So what would influence who users choose to plug-in with and who they don't? We presume in verticals with concentrated share this is a straight forward conversation - one app will have brand awareness and the best user experience, so that would be the natural partner. This could strengthen the position of the incumbent no.1. But in more competitive verticals, there is potentially more to gain / lose from first mover advantage and specific investment in this bit of the product offering.

**How much is trust and choice a factor?** One thing that users value today on search engines is a range of results and information, to build confidence that the answer is correct.

**What will economics look like?** Today there is no take rate in Chat GPT's plug-ins. But we think it is conceivable this could change over time. Apple makes 30% for digital goods & services transactions over the app store today, for example.

**Might brands choose to integrate Chat GPT or other LLM-driven chat-bots on their own site only?** We have noticed e.g. Expedia choose to integrate a chat bot on its own app powered by Chat GPT. Moneysupermarket has gone down the same route with MoneySavingExpert. We can see the attractiveness of this from the incumbent perspective (keep direct engagement with customer, keep control of data / content) but it relies on consumers finding their way to the site in the first place. This might work for MSE given very high brand awareness and loyalty - but we doubt this is true for many sites. Prisoner's Dilemma means that many, we suspect, will be forced to partner with the big platforms that emerge.

## Our Framework For Analyzing Winners/Losers In The AI Race – 14 Key Characteristics

Historically, when tasked with analyzing a company or a sub-sector within consumer internet, we have tried to develop a framework so that we can benchmark a company against others and try to predict success. This practice dates back to the shift from PC to mobile, where a number of pretty solid companies with high market caps (Yahoo for example) just never made it across the chasm. There are usually a number of reasons why this happens, which we can analyze after the fact, but when you are sitting in 2007 and trying to assess winners and losers in the consumer internet space during the coming mobile transition (the first iPhone launched in June that year), it's a non-trivial task. This is why we try to develop frameworks for moments like now. ChatGPT's November 2022 launch is analogous to the iPhone in June 2007, it's going to take time for things to develop, but once they get going and it's obvious to investors, a lot of market cap will have already been gained or lost.

Hence this section of the report is where we lay out key factors that we think might drive resilience and form moats around our businesses in a Gen AI context, thinking both around risks from disintermediation, new competition and changes to the mode of customer acquisition that might be coming.

**We identify 14 key criteria/characteristics: 1) Data, 2) stickiness / difficult in replicating of supply side or overall service, 3) logistics / asset intensity, 4) value of what is being transacted / importance of trust, 5) transactional capability, 6) quality of user experience today, 7) customer reach / engagement, 8) regulatory barriers, 9) the degree to which Gen AI really improves the user experience (not the same in every vertical), 10) reliance on search engines to acquire traffic, 11) likelihood of end market disruption from Gen AI, 12) capacity to invest, 13) willingness and ability to ship product, 14) market share as a key driver of who might see benefit of cost savings.**

We explore each of these in detail below.

### **Variable #1: Data**

**Training LLMs needs data...** A key element of the efficacy of any machine learning model is the data on which it is trained. Despite having a vast array of parameters that they can train on across the internet and other publicly available sources, LLMs are still not able to access certain types of in-house, firewall protected, bespoke data that can be crucial to creating the correct answer or completing the correct task. We think this data is relevant both to providing a great customer experience.

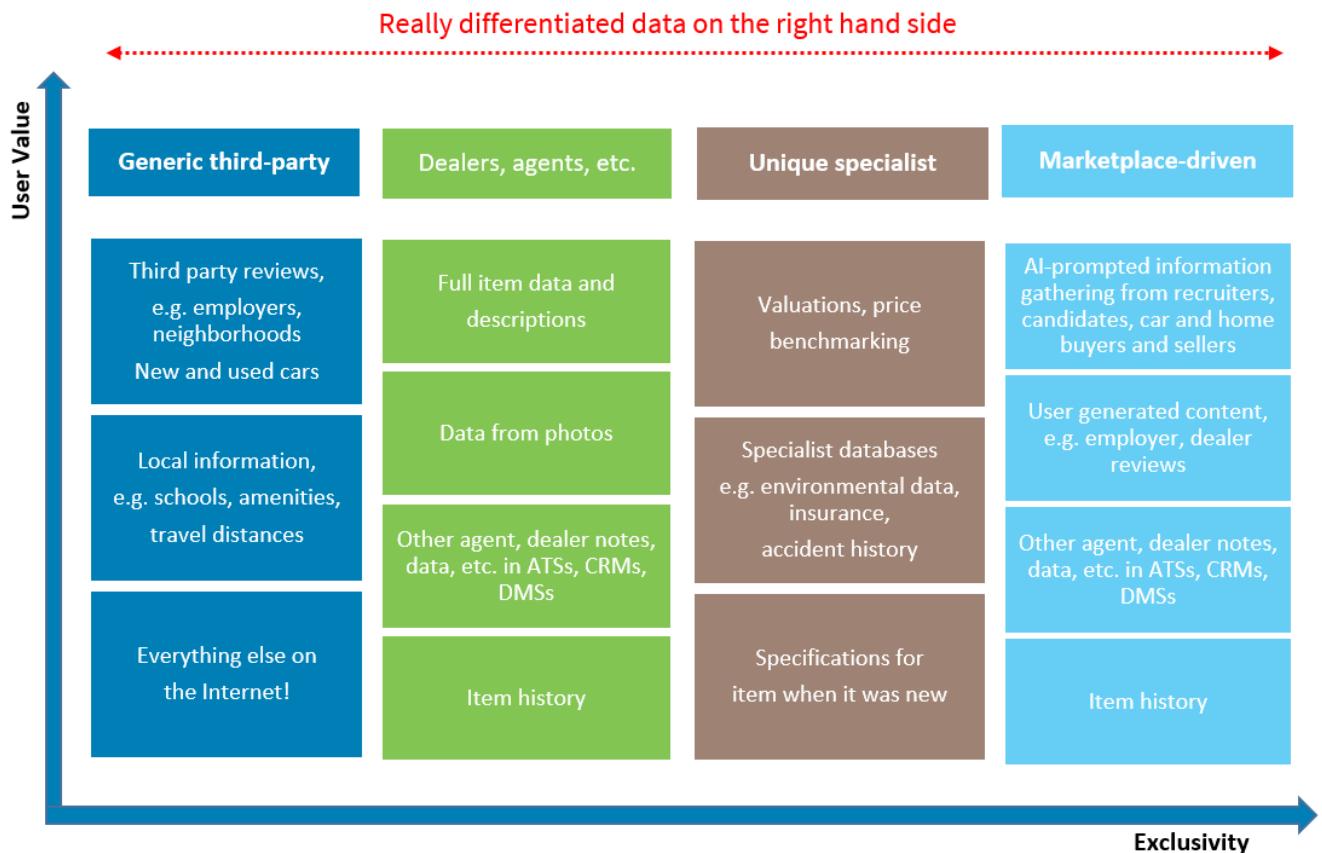
**... and some of our companies have it...** Several of our companies have data assets that are more akin to information services companies than consumer internet companies. Megacaps like META and GOOG have billions of people using their products every day, along with a countless number of businesses that are trying to reach those same users. Some of this sits at the application layer and for Google and Apple sits at the OS layer. This vast amount of data provides a significant area of differentiation vs. some of the smaller companies we cover and all the new small AI start ups. Many companies in our coverage have data that is genuinely unique and proprietary to them (UBER, ZIP, etc.) that cannot be replicated from publicly available sources or through synthetic data. And it isn't just the underlying data asset that matters, but also the workflow and depth of integration to the customer, which drives lock in.

**...and should be able to access foundational models to leverage...** Over time and as cost constraints of training and inferencing LLM models decline (seemingly on an exponential curve), we believe there will be general availability to large and small, open and closed source LLMs to enable small and medium sized internet companies to innovate (much like the Cloud itself), and build Gen AI products and services into their apps. But those with broad and unique data (among other factors) should be able to build services in a more differentiated way, creating features that competition can't easily replicate and driving differentiation in the user experience.

**... but the type of data will matter.** Not all data is the same. Leveraging a framework put forward by AIM Group (which we agree with), we have tried to formulate our thinking by categorizing data into different types:

- **Generic third party:** Data commonly available to anyone - not just the incumbent marketplace but also horizontal platforms or new entrants, eg. public records, third party reviews, generally available content on the internet and in the public domain.
- **Partner data:** Different metadata that can be accessed through APIs and other integrations. for example, size of clothes and descriptions (in e-commerce), specifications of house (in real estate), job description and company ratings (in recruiting). These data are typically accessed with integrations with partners but can sometimes be accessed via scraping.
- **Unique specialist:** Genuinely differentiated data that usually sits in specialized databases that have been created over time via integration of multiple public records over a long period of time layered with own-content.
- **Marketplace driven:** User generated content from profiles, history, reviews and ratings, etc. With a Gen AI interface, we expect user generated data to grow very materially, potentially enhancing competitive strengths.

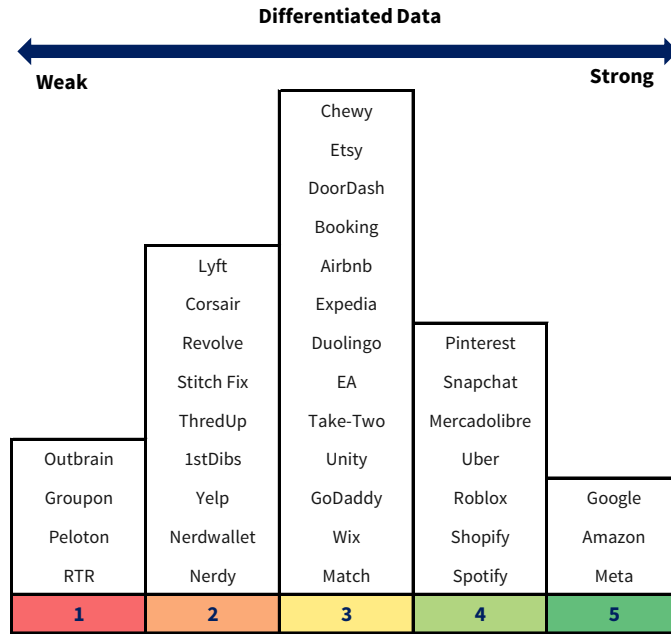
FIGURE 37. Not All Data Is The Same



Source: Barclays Research, AIM Group.

**Summarizing the data quality of our companies.** Below we summarize the data asset of each of our companies, ranking them by green (strong), amber (reasonable), red (less strong). There is inherent subjectivity in this, of course. In general, we feel quite good about the user data moat that our companies have, particularly for those with scale.

**FIGURE 38. Summarizing The Data Capability Of Our Companies**



Excluded from graphic for spacing: SQSP, LZ, ZIP, ZG, ATVI, TRIP, IAC, ZD (all ranked 3)  
 Source: Barclays Research

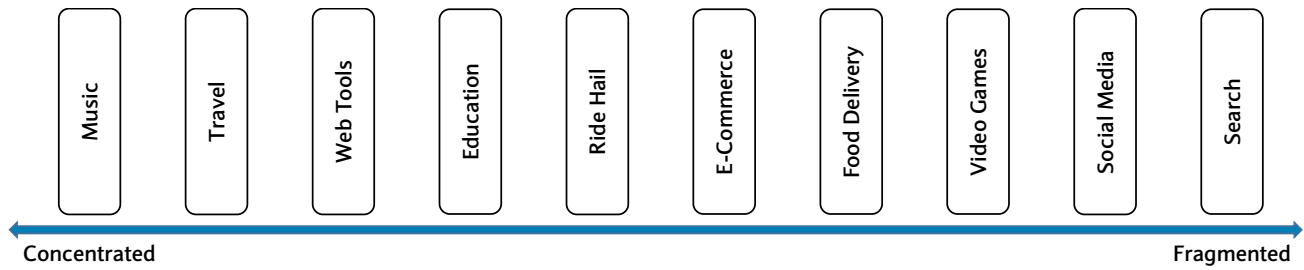
**Can companies actually leverage their data?** The last, and important, consideration is whether companies actually have their data in a positions to be able to utilize it. This is very hard to analyze from the outside. Setting up an infrastructure that is able to be embedded with other technologies can be a fairly arduous process - for example, GDDY has been working on a cloud migration with AWS for 6+ years (a similar timeline to Expedia in the 2010's) - while this isn't an apples-to-apples comparison, it can frame how difficult it is to change a company's data infrastructure. It wouldn't surprise us if there are still a couple of companies in our coverage where this data architecture is not one that is easy to port over to be used to build Gen AI features and services.

**Variable #2: Breadth and difficulty in accessing content; or content creator itself?**

**Selection is key to the consumer experience.** Ultimately we think the consumer will tend to migrate to the platform that offers the best experience - and we don't envisage horizontal chat bots or new entrants cutting the incumbent verticals out of the value chain if they are unable to replicate the content offering of the vertical. Supply of content / inventory is a necessary but not sole condition for a competitor to gain share, in our view (building audience is arguably the much, much harder bit but even more difficult with no relevant content offering).

**Fragmentation matters.** We look at the fragmentation of the supply or inventory base - the logic being a more concentrated structure means only a few suppliers are needed to create a good user experience and therefore it is easier for disintermediation to happen from horizontal platforms / new entrants to get a foothold.

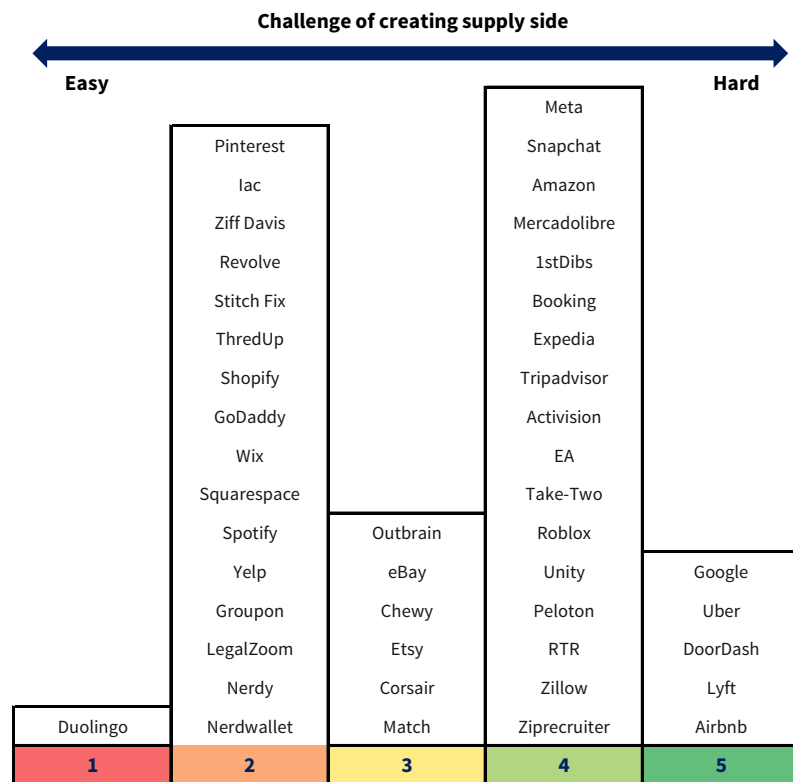
**FIGURE 39. A Wide Range In Industry Fragmentation In Our Coverage Universe**



Source: Barclays Research

Below we show a summary of where we think accruing content is easy / hard across our coverage.

**FIGURE 40. Summarizing The Ease Of Replicating The Content Of Our Companies**



Source: Barclays Research

**Here are a few highlights to frame this factor:**

- **Search:** is arguably the most fragmented space in terms of the supply side. There are billions of web pages that need to be crawled, indexed and presented to operate a search engine, and regulatory filings have shown that Google has a significant advantage compared to other search providers when it comes to breadth and depth of the index. Only few have it, and no one is really competitive with Google today.
- **E-commerce / Travel / Marketplaces:** Supply (inventory or listings) is synonymous with content in e-commerce and travel. Given physical inventory needs to be held on balance sheet (explored more below), it is less obvious how an asset light Gen AI disruptor does this.

The same can be said for food delivery services, whereby supply is long tail and fragmented (restaurant merchants) and not always accessible to new entrants without a lot of work. Travel is a little more concentrated with a few major GDS systems providing flights to all OTAs and metasearch services with little differentiation. However, despite this hurdle, we still wouldn't rule out a new entrant / competitor with innovation on the interaction layer using Gen AI being able to disrupt incumbents. Shopping or travel concierge AI agents could serve as an asset light interaction layer between a user and a brand or retailer.

- **Music Streaming:** On the other end of the spectrum from Search is Music Streaming. The content (or supply side) in this space is very concentrated. All streamers license catalogs from a few major music labels and are forced to differentiate their service through tools, features and new content like podcasts

**Variable #3: Logistics and asset intensity**

**Not clear Gen AI does much for physical logistics at this point.** Right now the advances in Gen AI have manifested in text, voice and video form rather than in physical form. Whilst it is conceivable to envisage AI driven systems being far more involved in physical logistics over time, we don't see this as being a big area of disruption right now. Our thesis is that companies who are actually involved in the movement of goods from A to B or, indeed where they handle a lot of inventory on balance sheet, will be much harder to fully disrupt (though this is not to say that parts of the user journey couldn't be impacted).

**But it doesn't mean a balance sheet intensive business can't be disrupted.** Is logistics capability a barrier in the very long term? We do think there is a risk of a retailer becoming more of a logistics distributor but the transaction taking place between brand / manufacturer and horizontal platform. We still don't rule out continued disruption from low cost providers in China in certain verticals (e.g. fashion).

**Screening companies by logistical moat.** We accept the below chart is a bit simplistic (i.e. there are small % of the food delivery business models that handle inventory in dark stores and several 3P marketplaces that offer 1P products), but we have tried to show a snapshot for the majority of each relevant business.

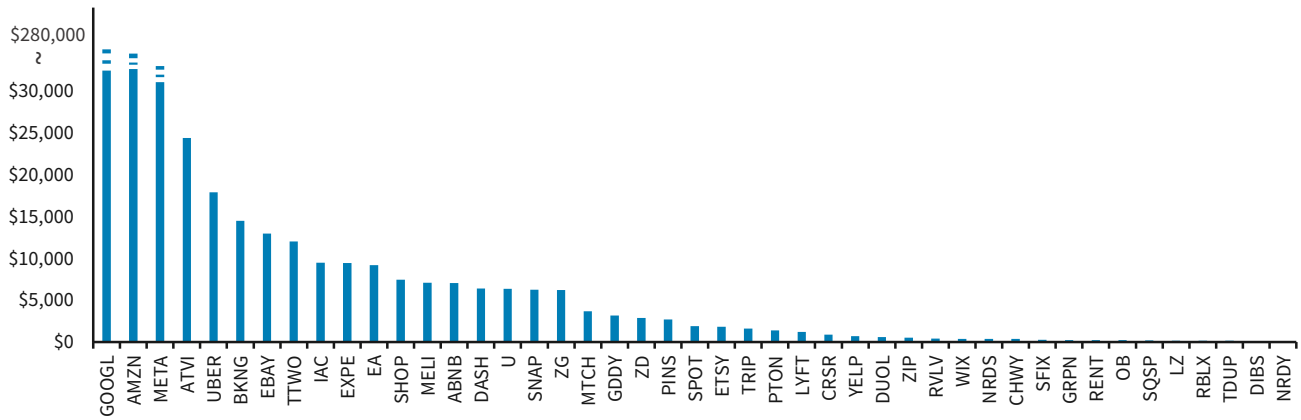
**FIGURE 41. Who Handles Logistics And Inventory?**

	Own Actual Inventory?	Fulfill Last Mile?
<u>E-Commerce Retailers</u>		
AMZN	✓	✓
CHWY	✓	✗
MELI	✗	✓
RENT	✓	✗
RVLV	✓	✗
SFIX	✗	✗
<u>E-Commerce Marketplaces</u>		
DIBS	✗	✗
EBAY	✗	✗
ETSY	✗	✗
TDUP	✗	✗
<u>All Other Companies</u>	✗	✗

Source: Barclays Research

**Invested capital another indicator.** We also think simple invested capital is a relevant metric of an indication of how hard it is for a new entrant to scale.

**FIGURE 42. Who Has Invested Capital In The Business?**



GOOGL (\$280b), AMZN (\$230b) and META (\$150b) values not to scale.  
 Source: Barclays Research

**Variable #4: Asset value of what buying and the need for trust**

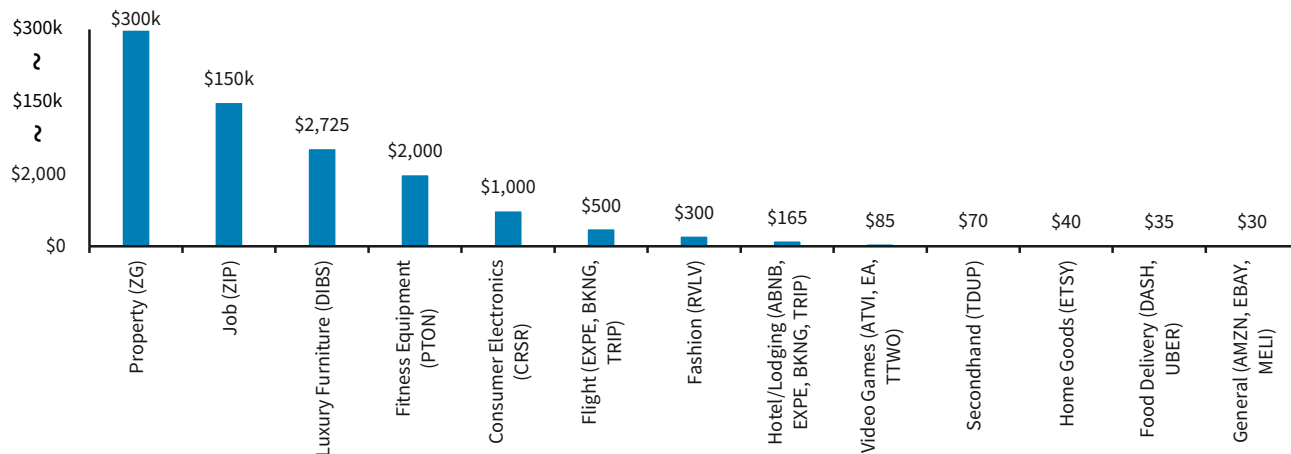
**Higher the value, more the trust factor is relevant?** We believe consumers making an expensive, once-every-few-years (or longer), type of purchase such as a house or a car will really care about making the right purchase decision. And to make that decision they are likely to rely on a platform that offers the relevant content, data and advice. In other words they need to really trust the product or service they are using. There is a very clear reason to come to that platform vs using an alternative such as a horizontal chatbot or new entrant. However, for a less important purchase where convenience or impulse is a bigger factor in the user decision making progress, we can see people being more willing to experiment in e.g. purchasing bots, new entrants and products from horizontal chat bots.

We are curious to see if some of the hype around personalized AI agents that work on behalf of the consumer actually do a decent job in high purchase consideration categories. It would be a much better experience having your AI agent narrow down the search for a used car rather than go to a dealership or even parse through the often unsatisfactory experiences on the consumer internet today for used vehicles. Could the AI ever gain our trust or exceed that of other humans?

**Certain verticals seem to benefit from this.** In general, we think real estate, jobs, luxury furniture, and flights (where finding the best price is important) are all good examples where trust is particularly important to the user.



**FIGURE 43. Asset Value Of What Is Being Purchased - A Key Factor In The Trust Equation**



Property and job asset values not to scale.  
Source: Barclays Research, Company Data.

**Variable #5: Transactional capability**

**Can new entrants gain trust to process transactions?** For now, we also feel that transactional capability is an important differentiator for our companies - these are companies that users have trusted with their payment information and personal details and, much like it took many years for ecommerce companies to gain this type of trust when the internet first developed, we expect the same challenge to present new Gen AI entrants today. Admittedly, this is less of a question for e.g. Google or Apple disintermediation (as they are also trusted assets with payment relationships with consumers). We think websites where user experience is only about search and discovery are probably more vulnerable today to Gen AI.

**FIGURE 44. Who Handles Transactions And Broader Fintech?**

	Handle Transactions?	Broader Fintech?
AMZN	✓	✓
MELI	✓	✓
GOOGL	✓	✓
SHOP	✓	✓
GDDY	✓	✓
WIX	✓	✓
SQSP	✓	✓
All Other Companies	✓	✗

Source: Barclays Research.

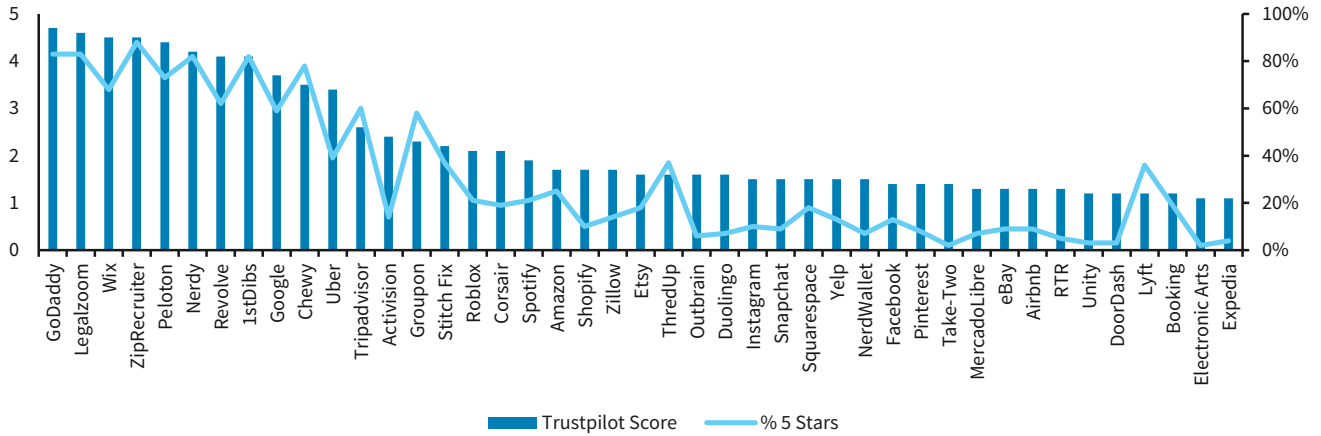
**Variable #6: User experience - is it good?**

**Bad user experience = more risk?** Our thesis is that platforms offering a sub-standard user experience today perhaps are more vulnerable to new competition. Below we show the Trustpilot scores of each of our companies, as well as the app review scores, as a proxy for user experience. Neither is a perfect measure of quality user experience, but we can't think of much better where consistent data is available.

App scores are, in general, very high (except for Facebook with a sub-2.5 rating, no surprise given the polarizing nature of the service, and despite most complainers still using their four apps), with the majority of our companies' apps scoring above 4.8/5 stars. Trustpilot scores are almost the opposite - just 8 of the 47 websites have a 4 or higher score. OTAs, specifically EXPE and BKNG, are both ranked in the bottom three, and unsurprisingly, services that have higher

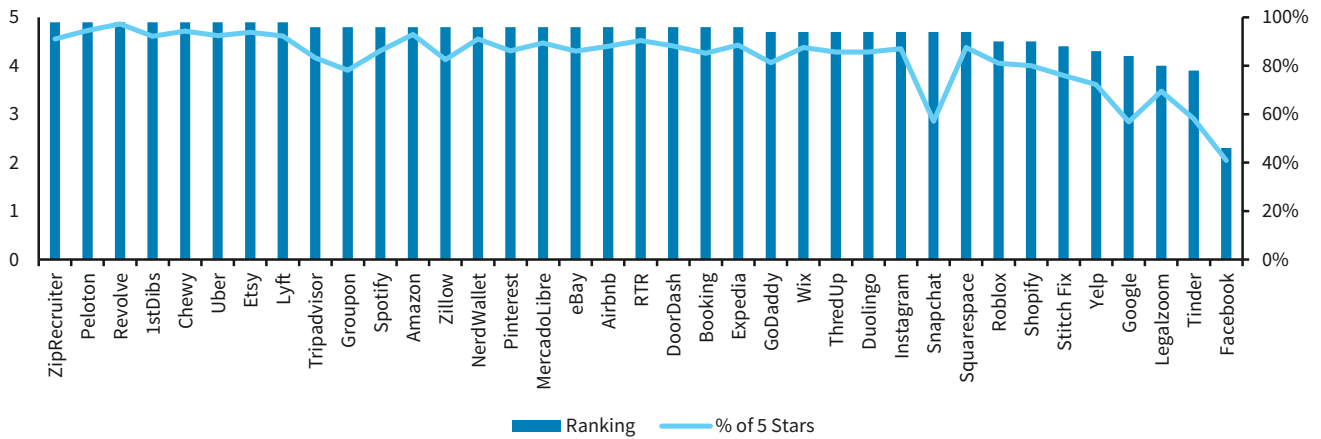
customer service issues, higher order error rates, and lower retention (DASH, ABNB) also rank low.

**FIGURE 45. Trustpilot Scores... Lots Of Hater-ade For Consumer Internet Names**



Source: Trustpilot, Barclays Research

**FIGURE 46. App Store Rankings... Most Score Pretty Well**



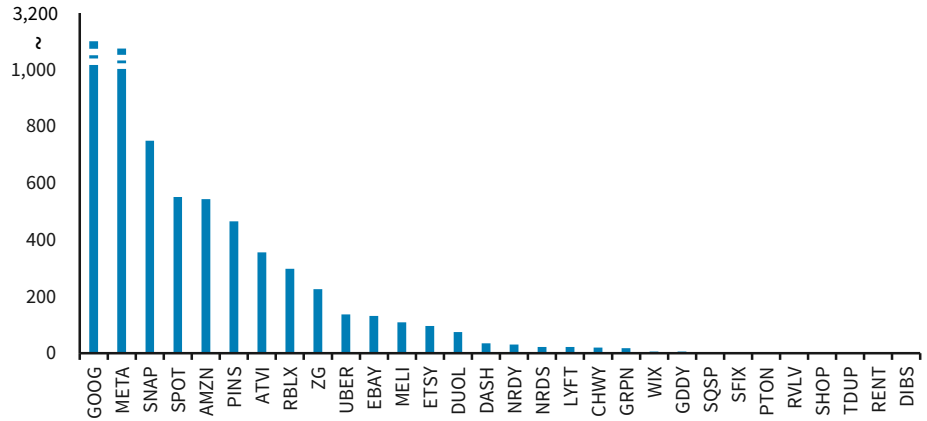
Source: Apptopia, Barclays Research

**Variable #7: Reach and Engagement**

**Scale matters.** We think scale matters in terms of acquiring customers and rolling out new products that might be created by Gen AI, as well as the scale needed for a new entrant to really compete and be disruptive. Below we show the number of monthly active users or equivalent metric for our covered companies.

Unsurprisingly, Alphabet’s huge presence across Android and Search, Youtube and the 15 apps above 500m users provides the company with significant scale and distribution advantage when it comes to AI products. Neeva attested to this in its eulogy, whereby a similar quality product is just unable to compete without distribution. META’s huge scale across its four widely used apps provides a similar advantage.

**FIGURE 47. Number Of Active Customers (MAU or equivalent metric)**



GOOG/META MAUs not to scale, Amazon customers estimated.  
 Source: Barclays Research, Company Data as of 2Q23. Scale: millions.

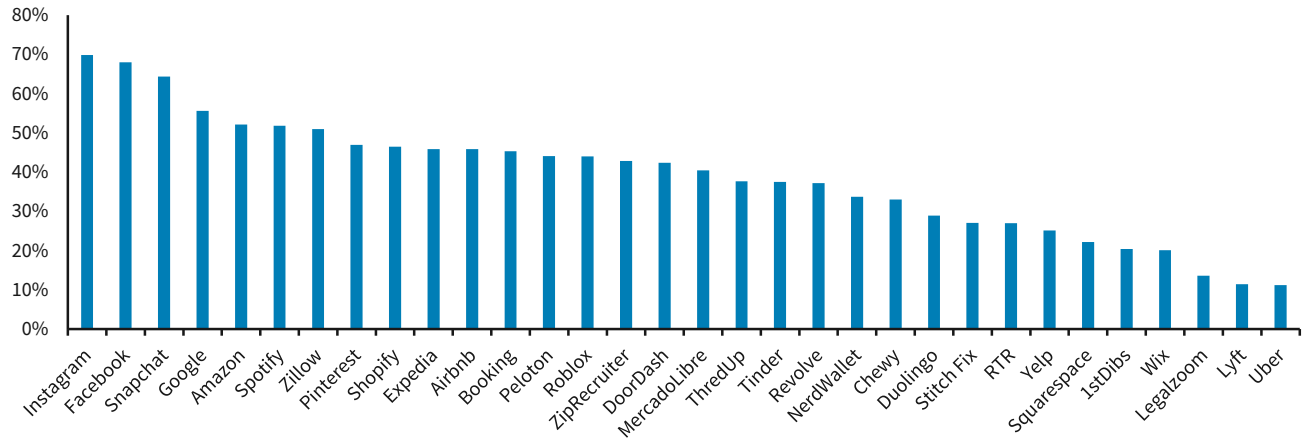
**As do frequency and retention.** When related to low and medium value transaction products, our view is that companies with higher frequency / purchasing habit will be harder to disrupt than those with lower frequency and less customer loyalty. We think Uber, DoorDash and Amazon screen well here.

**FIGURE 48. Comparing Frequency vs. Retention... Top Right Likely Have More Stickiness**



Note frequency and retention often not disclosed = Barclays estimates.  
 Source: Barclays Research.

Finally, we look at app engagement, for which we use the ratio of DAUs / MAUs as a proxy. Marketplaces like Amazon rank the highest, along with social media platforms like Instagram/Facebook/Snapchat. The lowest engagement comes from the ride-hail peers, mainly Uber and Lyft, which is not terribly surprising as users do not tend to take daily rides.

**FIGURE 49. Looking At App Engagement In Our Coverage**

Facebook, Duolingo disclose both DAU/MAU, the remainder estimated using Apptopia.  
Source: Barclays Research, Apptopia

## **Variable #8: Regulation**

### ***Scraping permissions will be important***

Products such as ChatGPT and Google Bard rely on huge training data sets, which today are typically accessed by mining publicly available content, or at least public data in the eyes of “fair use” copyright which has come under scrutiny lately. We are expecting a big debate to emerge between the difference of what is publicly available and what is legally available. We fully expect publishers to be defensive of their data, with paywalls going up everywhere and lawsuits attacking large well-resourced companies like Google, Microsoft, Meta and OpenAI.

We aren’t sure where this debate will end up. But historically Europe has moved more quickly on data protection issues - the implementation of GDPR from 2018 being a good example. This also seems to be the case in AI, with the EU AI Act currently being discussed and likely to be put in place later this year once agreed by the Council and Parliament. The latest language in the draft proposal categorizes AI uses into different risk criteria. From a Gen AI standpoint, the language is clear — it aims to 1) force the disclosure of content generated by AI, 2) prevent models from generating illegal content, and 3) publish the summary of copyrighted data used for training. This third point is clearly interesting and something to keep monitoring (albeit the language could have been much tougher and banned the training on copyrighted data full stop).

For now, our working assumption is that most content on the websites of our covered companies will be available to LLM for training. After all, web scraping has been common place for many years in the industry. But any change to this could have broad implications, and we will be monitoring closely. We are working on the assumption that user data will not be scrapable - and this is still very valuable for the incumbents.

### ***Pace of change***

One thing that is very hard to grasp with Gen AI is the rate of change. It is clear we are on an exponential curve in development - but the factor of that curve will partly depend on improvements in the foundation models. We simply don’t know the pace at which new releases will come and the functionality of applications will improve - partly a technology question and partly a regulatory one.

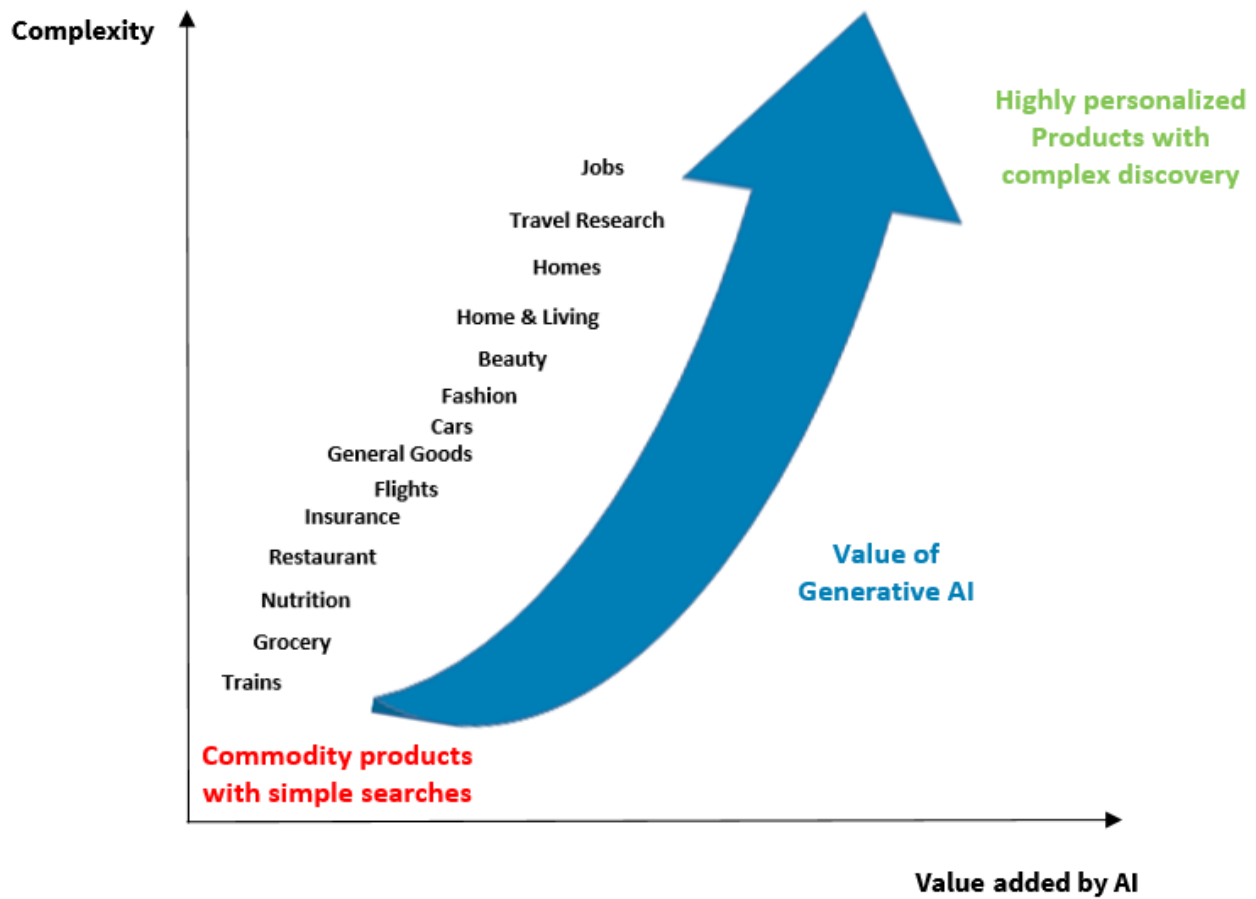
**Variable #9: Does Gen AI transform the product search / discovery experience?**

We believe that the value of GenAI for personalization and discovery is material. We see conversational interactions (text, images, voice) driving personalisation. Then we see a move away from today’s structured search with only certain parameters towards something much less constrained.

We fully expect some live debate amongst investors on the below chart. We think the more heterogeneous and personalized the product, the more Gen AI can transform it. Our view is that aspects of jobs (matching consumers with far more personalized offers than today), travel (particularly in research element and potentially in increasing multi-modal solution), homes (offering far more personalized visuals), beauty and fashion (both offering far more personalized visuals) are verticals that could see the search journey meaningfully changed by Gen AI.

We definitely don’t expect this to happen overnight. We think a combination of products being released, the technology improving and consumers starting to understand the value that Gen AI search brings likely brings a gradual transition in the coming years.

**FIGURE 50. Which Verticals Might The Search Journey Change The Most With Gen AI?**



Source: Barclays Research, AIM Group.

### Variable #10: Exposure to search engines to acquire customers

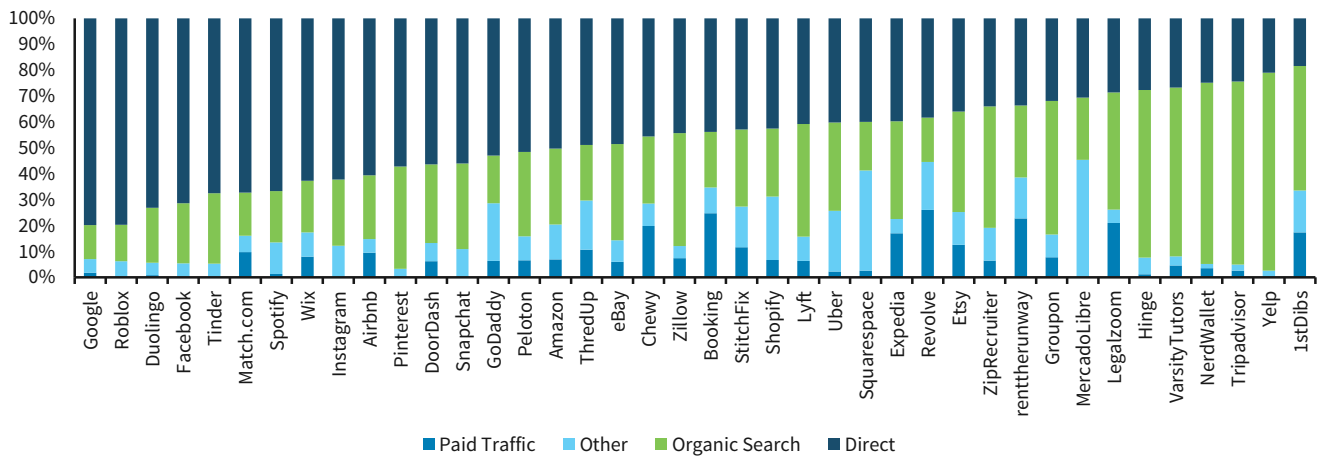
Our view is that companies with a high reliance on paid and organic search channels with little app usage are going to be most exposed to changes in the acquisition funnel. To be clear, this may be both positive and negative - early adaptors could actually gain in complete verticals and may have good teams that are well positioned to think ahead on this. But it could go both ways.

Below we show the share of paid web traffic by platform in our coverage - either via paid search (largely Google) or via other paid channels such as display, emails, referrals, etc.

The companies with the most direct traffic (outside of GOOG/META) include Roblox, Duolingo, Tinder, Match, Spotify, Wix and Airbnb. Companies like Duolingo and Airbnb make sense here as they are largely app-based, rely less on marketing channels, and have very strong brands with a lot of unaided awareness and word-of-mouth. The companies most reliant on paid traffic are 1stDibs, Yelp, Tripadvisor, NerdWallet and Varsity Tutors (NRDY).

Overall the chart displays a fairly mixed bag, but e-commerce outside of Amazon doesn't screen very well. All socials screen fairly well, as they are high engagement and use app-based direct navigation. Within the OTA peers, Tripadvisor seems to be much more exposed to paid search than BKNG and EXPE, but all have some dependency.

FIGURE 51. Ranking Our Covered Companies By Share Of Paid Traffic (either paid search or other referral channels such as display, emails, etc)



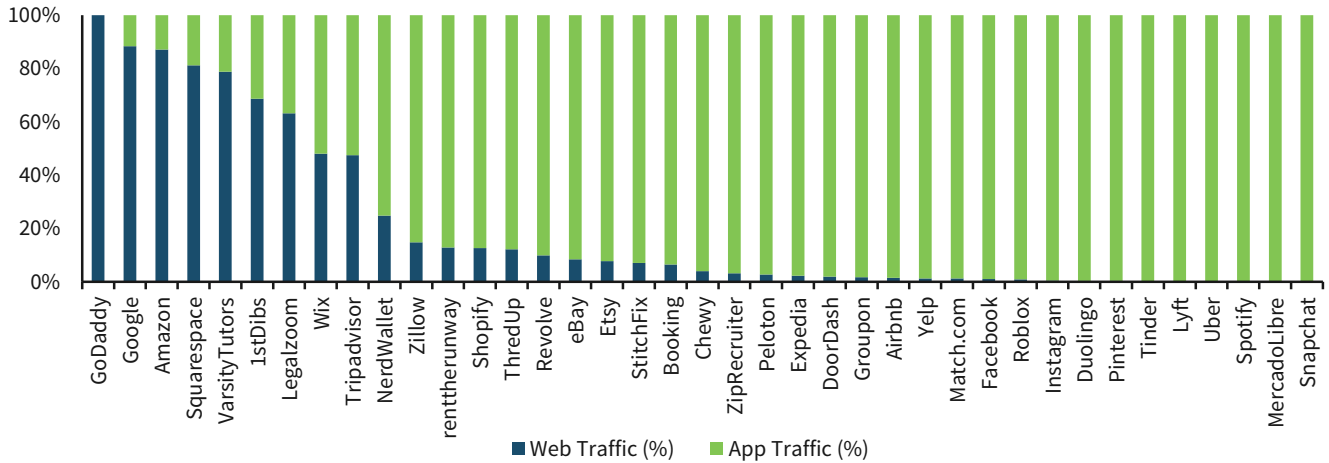
Source: SimilarWeb, Barclays Research

We also think companies with high app usage 1) have an inherent higher stickiness (a user has downloaded the app so presumably sees some regular value in the product to merit doing so), and 2) are less exposed to any changes in web-based customer acquisition on the horizon.

Unfortunately, we don't have consistent data between web and app so the below chart should be taken with a pinch of salt - it is brought together by comparing the time spent on app and web from Apptopia and Similar Web respectively, which may not be fully comparable given different platforms and devices.

We note several of our companies don't have an app and so naturally are going to be more vulnerable to changes in the web acquisition funnel.

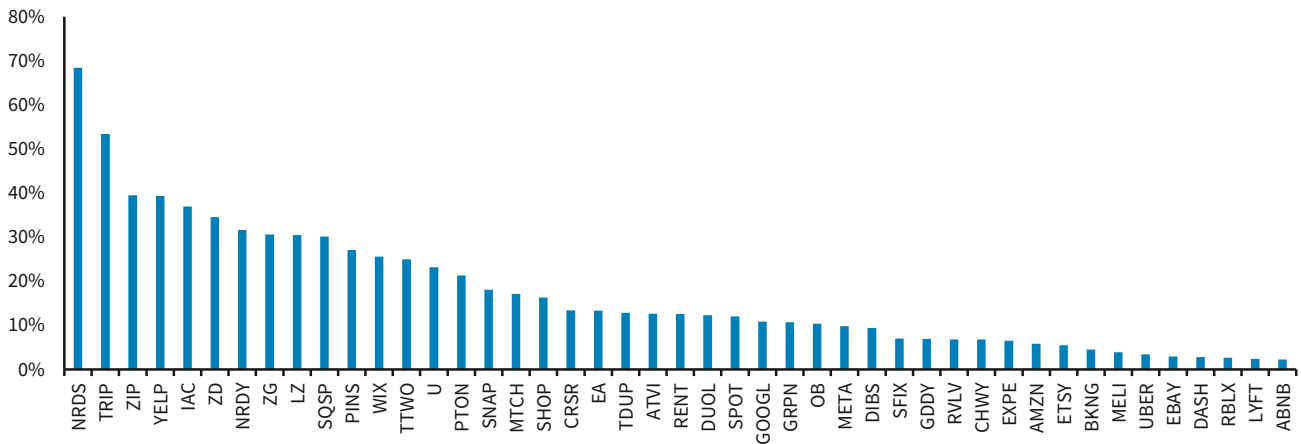
**FIGURE 52. Share Of Audience Through An App**



Source: Apptopia, SimilarWeb, Barclays Research

Finally, we show the marketing intensity of companies in our coverage - a final sign of reliance on paid channels.

**FIGURE 53. NerdWallet & Tripadvisor Have The Highest Marketing As A % Of Revenue In Our Coverage**



Marketing spend as % of GMV/revenue.  
Source: Barclays Research

**Variable #11: Can the end market customer be disrupted?**

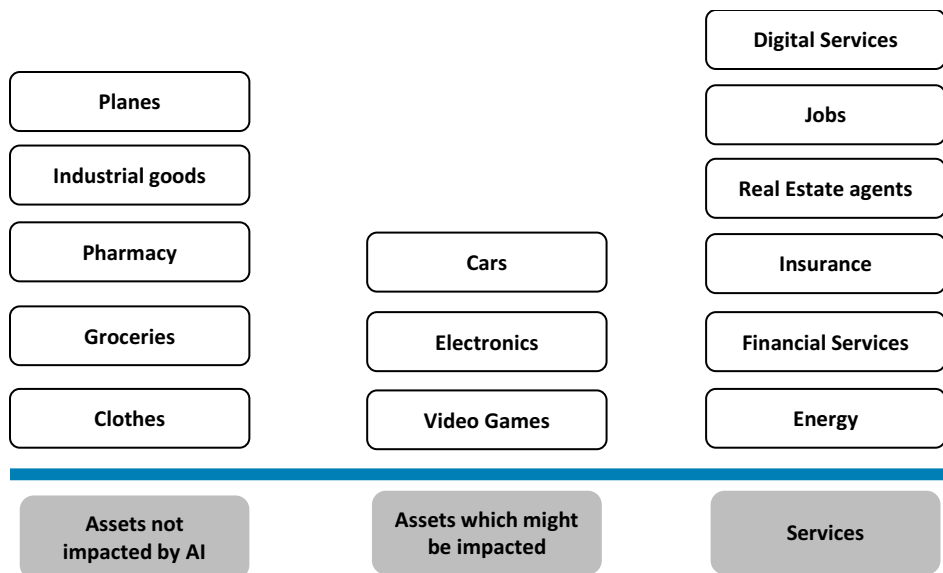
Does the value chain of a marketplace change? Right now the core idea of a marketplace / online retailer is to sit between two distinct categories - typically buyers and sellers of a good or service. Most of the note has focused on whether this relationship could be disrupted. But we haven't really considered whether the actual premise of a seller could change. This doesn't feel likely in the near or medium term. But in the long term, we can't dismiss the possibility of the good or service itself being radically changed by Gen AI. This is quite hard to conceptualize at this point. But our instinct is that marketplaces connecting goods directly with consumers are less at risk than those connecting pure services with consumers.

Not all categories are the same. For example, we feel pretty comfortable that humans will still buy clothes and shoes in 20 years regarding the fashion companies (so long as the existential question of AI doesn't come to pass). Equally, we presume that restaurants and grocers will still need to provide food to humans for the food platforms. And we assume that humans will still want to be driven to places (UBER, LYFT), along with take flights for vacations (BKNG, EXPE).

But could parts of what an estate agent does become automated with a new entrant over time, perhaps meaning that a different type of intermediary starts to connect a property seller with a property buyer? Equally could an employer start to use a pure AI agent to target a potential candidate rather than using established staffing companies? What happens to the freelancer who trades in services that can be easily handled by AI? Do these jobs go away entirely? These are both examples of the sell-side of a marketplace being pure services companies (estate agents or staffers), who don't carry physical inventory on their books. We can also envisage some changes in financial services and insurance over a longer period of time (albeit both are regulated). Similarly, when we look at digital services like language apps and dating sites, how might AI disrupt these providers? Surely a start-up using GenAI could build a language application much leaner than companies like Babbel.

Then somewhere in the middle would seem to be a retailer, who takes ownership of physical goods that we presume humans will still need. But AI will likely be an enhancer towards driverless cars, video games, and a big change in electronics that are sold. So this could have a second order impact. All in, we think this is a longer term consideration, but right now our focus is on the jobs and real estate as areas potentially most vulnerable to change - pure service offerings that don't directly handle physical goods but don't operate in regulated markets.

**FIGURE 54. Which End Market Offerings Might Be Disrupted By Gen AI?**



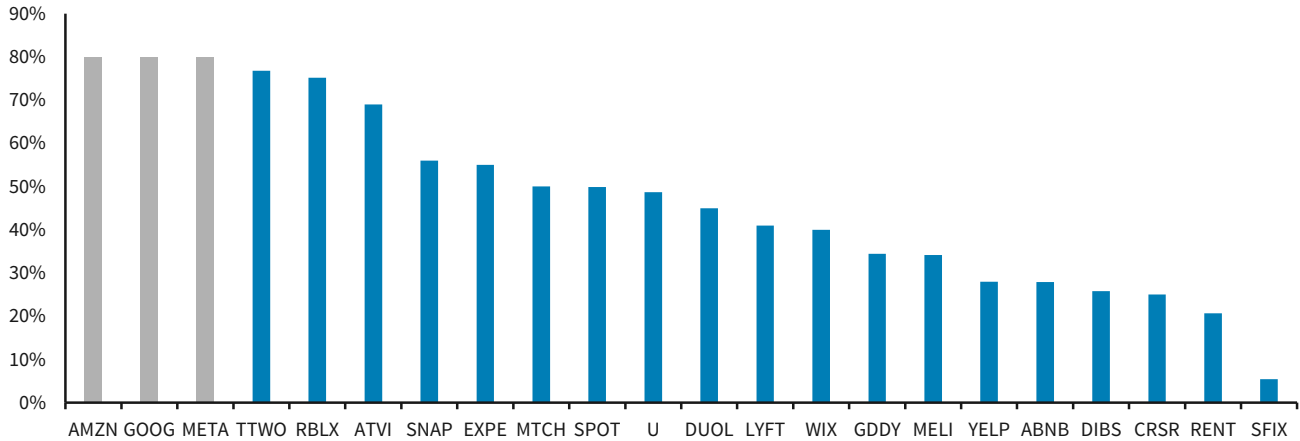
Source: Barclays Research

**Variable #12: Capacity to invest both organically and inorganically**

**Size, technical talent and financial resources matter.** It is important to point out that not all tech employees are the same (just because someone works in tech doesn't mean they are an AI expert) and disclosure by companies is a) patchy and b) probably not apples-for-apples. Google likely has the largest AI talent with over 7,000 engineers, researchers and other staff in the recently combined Deepmind-Google team. Meta would probably come second with one of the larger and longest tenured AI research teams (FAIR). And Amazon likely has the largest machine learning and software engineering team across core retail and AWS. Other companies in our coverage that employ the highest proportion of tech people (of those that disclose this, which is roughly half of our coverage) are three video game companies (TTWO, RBLX, ATVI) as the vast majority of headcount at these companies are game developers. In terms of absolute numbers, MELI employs nearly 14k people within information technology/product development teams, roughly one third of total headcount. Below is the proportion of technology employees to total headcount for the companies that disclose that level of detail.



**FIGURE 55. Number Of Employees Within Product Engineering/Technology Teams**



AMZN, GOOG, META estimated  
 Source: Barclays Research, Company Data

**Capacity to invest both organically and inorganically**

**Bolt-on deals seem a necessary defense.** We view it as likely that there will be Gen AI start-ups that emerge in the next few years that can either meaningfully enhance the capability of incumbent players or, potentially, compete with them. The ability to react to this matters. Organic investment is one way of doing so. M&A another. Already there have been a series of deals in the broader tech space to this end. We expect many more.

**FIGURE 56. Examples Of Recent Gen AI M&A / Funding Events**

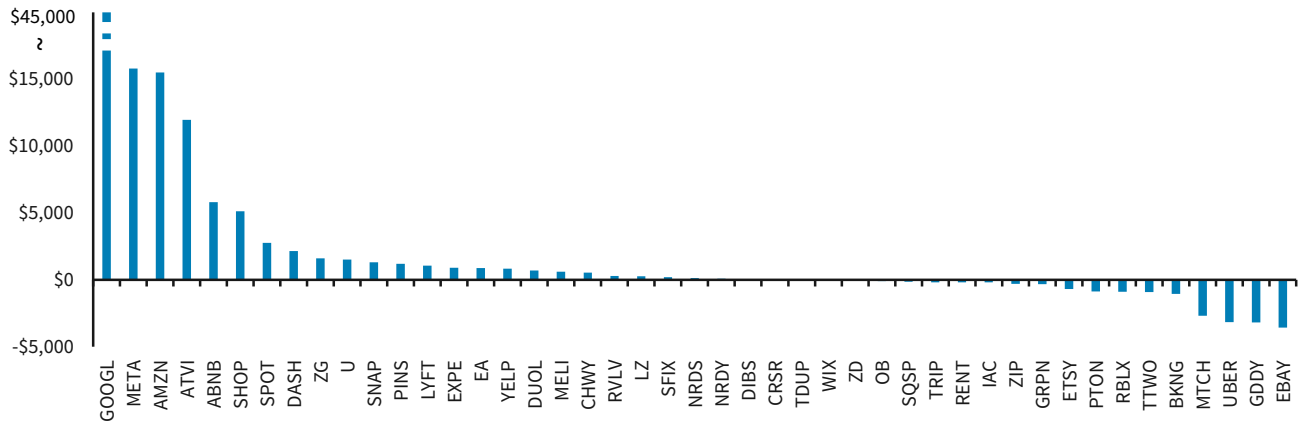
Company	Type	Gen AI Startup	Valuation	Fund Raised (\$)
Microsoft	Equity Funding	OpenAI	\$29bn	\$10bn
Spark Capital, Google, Salesforce & Zoom	Equity Funding	Anthropic	\$5bn	\$450mn
Microsoft, Nvidia & others	Equity Funding	Inflection AI	\$4bn	\$1.3bn
Salesforce	Equity Funding	Hugging Face	\$4bn	\$200mn
Oddity	IPO	Oddity	\$2.8bn	N/A
Nvidia, Oracle & Others	Equity Funding	Cohere	\$2.1bn	\$270mn
Google, Nvidia, Salesforce Ventures	Equity Funding	Runway	\$1.5bn	\$141mn
DataBricks	Acquisition	MosaicML	\$1.3bn	N/A
Coatue, Lightspeed	Equity Funding	Stability.ai	\$1bn	\$101mn
Spark Capital, Microsoft, Nvidia & others	Equity Funding	Adept	\$1bn	\$350mn
Thomson Reuters	Acquisition	CaseText	\$650mn	N/A
Lightspeed Venture Partner, Redpoint & others	Equity Funding	Mistral AI	\$260mn	\$113mn

Source: Barclays, FT, Bloomberg, Crunchbase.

**Process around bolt-ons important.** We think a rigorous process around these types of deals is important - valuations are likely to be very high and understanding how disruptive / sustainable the technology held by start-ups is will be difficult at this relatively nascent stage of Gen AI. Google, Amazon and Meta have all demonstrated savvy acquisitions and investments in AI.

**Wide range of balance sheet strength.** As is common within consumer internet names, a number of our names are not FCF positive or have relatively high leverage (sometimes both). We flag the largest players, namely GOOG, META and AMZN, as having the most dry powder with their significant cash balances, but regulatory oversight likely hinders these companies' ability to close M&A transactions, especially within a highly scrutinized sector like AI. Look no further than the CMA blocking META's acquisition of Giphy, which forced the company to sell the asset at a significant loss (\$53m vs. \$315m purchase price).

FIGURE 57. Net Cash / Debt



GOOG (\$46b) not to scale.  
Source: Barclays Research

**Variable #13: Willingness and Ability To Ship Product**

**Who has a track record of releasing new tech?**

Google is the leader in AI but there was a long period of time from 2018-2022 where the company clearly had the capability to ship new services like chatbots and diffusion models that can create video and images, but chose not to for bureaucratic reasons. It took ChatGPT coming out in its raw initial form in November 2022, and Bing shortly thereafter, for Google to feel motivation to start shipping (a sub-optimal situation that the company is racing to remedy).

But for most names in our coverage, this is inherently a slightly crude comparison as 1) management teams have changed, and 2) verticals are all different, which can mean historical tech evolutions have been more / less important for some companies than others. But we have a few reference points to go back to.

- **Who released an app on time?** The launch of Apple’s App Store in 2008 came with ~500 mobile apps available for download, including several of our covered companies like Google Search, Facebook and eBay. The emergence of the app store itself subsequently allowed for the creation of gig economy businesses like Uber/Lyft and DoorDash. We note that Chewy, NerdWallet and 1stDibs took more than 5 years to develop a mobile app, amongst others.

FIGURE 58. Thinking Back To The Last Platform Migration - When Did Companies Release Apps?

2008	2009	2010	2011	2012
Amazon	Uber	Revolve	Etsy	
Google	Spotify	Airbnb	Pinterest	ThredUp
Facebook	Match	GoDaddy	Snapchat	Lyft
eBay	Squarespace	Shopify	Booking	Duolingo
Yelp	Zillow		Expedia	
			Mercadolibre	

2013	2014	2015	2016	2017-2018
DoorDash			Chewy	1stDibs
Rent the Runway	Roblox	Stitch Fix	Varsity Tutors	Peloton
Ziprecruiter			LegalZoom	NerdWallet

Source: Barclays Research

- **Who has led the move into the cloud?** Companies like Netflix that were “cloud-first/only” started their digital services in the cloud and never had on-prem datacenters, which paved the way for a number of consumer internet services such as Pinterest, Snapchat, etc.
- **When did companies first start embedding AI?** This note is really focussed on Gen AI but clearly the broader AI theme has been going for several years and many companies have integrated Machine Learning processes into the organization. This doesn’t of course guarantee moving quickly on Gen AI but could be an indication of a long-term strategy on the broader theme. Google obviously has been the leader in AI and machine learning for years; CEO Sundar Pichai called out last quarter that 2023 is the “seventh year as an AI-first company”. BKNG has called out AI investments beginning several years ago; the first callout was its AI/ML center in Tel Aviv in 2019. These are just some of the examples of companies within consumer internet embracing AI years before this most recent wave of hype.

**Evidence of innovating in Gen AI so far?**

Some conference calls for covered companies sounded like management was pushing AI onto the listeners, no matter how relevant or disruptive AI may be to their actual business. According to AlphaSense, during the META and GOOG Q2’23 conference calls, AI was mentioned 53 and 80 times, respectively. There is certainly a lot of noise when it comes to public comments on AI; below we have included five comments from our companies we find especially relevant.

**FIGURE 59. Public comments / releases on Gen AI**

Company	Comment
Google	<i>“This quarter saw our next major evolution with the launch of the Search Generative Experience, or SGE, which uses the power of generative AI to make Search even more natural and intuitive. User feedback has been very positive so far. It can better answer the queries people come to us with today, while also unlocking entirely new types of questions that Search can answer”</i>
Meta	<i>“Investments that we’ve made over the years in AI, including the billions of dollars we’ve spent on AI infrastructure, are clearly paying off across our ranking and recommendation systems and improving engagement and monetization.”</i>
Amazon	<i>“Remember, the core of AI is data. People want to bring generative AI models to the data, not the other way around. AWS not only has the broadest array of storage, database, analytics and data management services for customers, it also has more customers and data store than anybody else.”</i>
Booking	<i>“...we mentioned last quarter that OpenTable and Kayak were experimenting with AI plug-ins and we will continue to examine all areas of our company to ensure we are taking advantage of AI created efficiencies. We are confident in our company’s ability to benefit from AI development and improve our products for our customers given our many years’ experience in AI, our travel-related data and connections to our supply partners, and our human and financial capital.”</i>
Shopify	<i>“...unlike other generative AI products, Shopify Magic is specifically designed for commerce. And it’s not just embedded in one place, it’s embedded throughout the entire product. So for example, the ability to generate blog posts instantaneously or write incredibly high converting product descriptions or create highly contextualized content for your business. That is where we feel like AI really can play a big role here in making merchants’ lives better.”</i>

Source: Barclays Research, Company Data

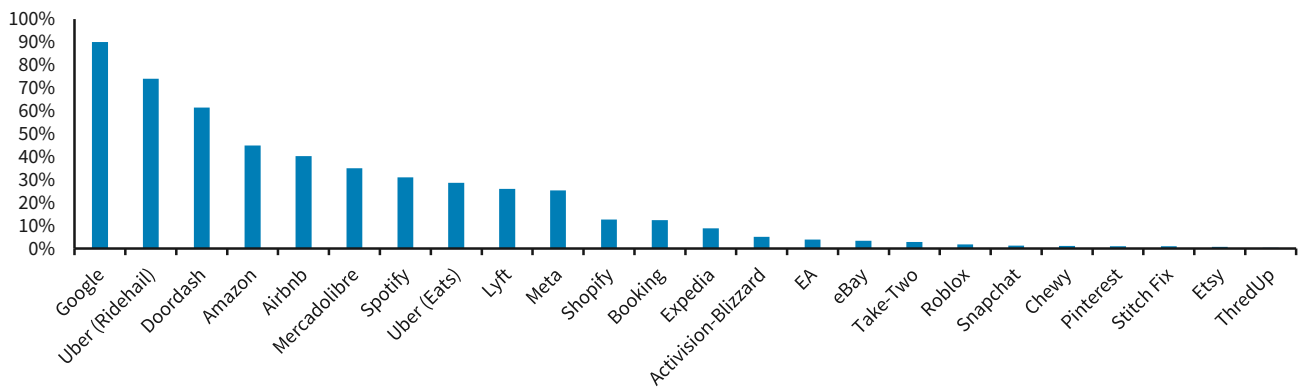
**Variable #14: Market share a key determinant of who benefits from cost savings**

**There will be lots of generic cost savings.** There are several areas of cost that we think that are generally agreed will be optimized by Gen AI. Examples include customer service and software development. But as the technology gets better, it seems reasonable to believe that more and more white collar work will be automated. The purpose of this note is not to conclude whether work will be made redundant or enhanced – but we fully expect overall productivity to be enhanced.

We definitely think this might take time to come through however. Right now, the cost of training and inference LLMs is still very high. This will likely come down exponentially but it might take a few years. And it could be even longer dated that AI solutions fully replace humans as hallucinations and other irregularities in the LLM results are ironed out and companies / consumers build confidence in their capability. It also relies on companies actually moving to implement the new solutions and having the data / tech capability to do so. We suspect this isn't 'one-size-fits-all' and some companies will be better adapted than others to do this.

Over time, we think the question is whether those savings be kept by the companies or passed through to the consumer? We think some industries will make it more likely that companies keep the benefit of cost savings vs. being passed onto the consumer. The key variable is likely to be market share – those with high market shares are more likely to keep the dividend than those with low market shares, where there will always be a temptation / need to reinvest. In general, gig economy/megacap digital ads names score well. Ecommerce/marketplaces score less well.

**FIGURE 60. Market share - A Factor Behind The Cost Saving Benefit Being Passed Through Or Not?**

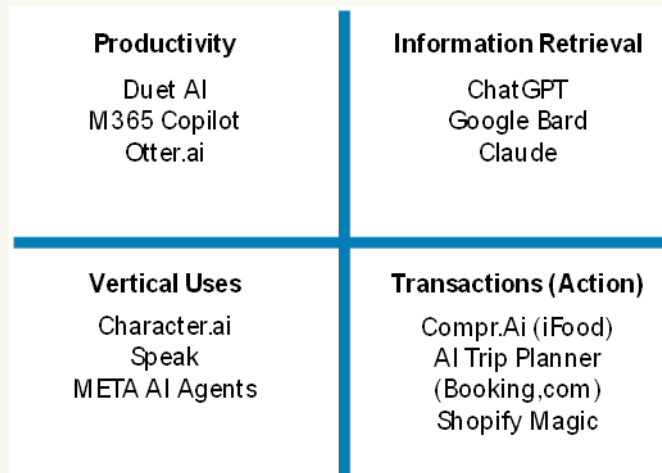


Source: Barclays Research, Company Data.

## Incumbents vs. AI Alternatives - By Sub-Sector

We expect consumer AI products and services to be launched in waves over the coming years. ChatGPT was just an early preview of what to expect. Y Combinator recently stated that 35% of its latest batch of start-ups are building AI services. OpenAI's plug ins have increased from a dozen to 850+ over the past 6 months. AWS has stated that over 100k customers are using Sagemaker and other managed services to build AI into their services. So as all these ideas are launched and scaled, we expect a lot more consumer facing applications to show up and start to have an impact on our coverage universe.

**FIGURE 61. New AI Products Offer Wide Range of Services**



Source: Barclays Research

Illustrated above in Figure 61, most services we see today fall into four broad categories: 1) information retrieval – this would be where the vast majority of Chatbots sit, 2) Productivity – this is where a lot of the co-pilot and other similar services live, 3) transactions (and broadly “actions”) – this is where AI services across various categories can help with shopping, grocery, travel, etc, and actually process transactions often times via Plug ins, 4) vertical experiences (the “all other” bucket) – this is where things like romance, role play, celebrity agents, entertainment, mental wellness, language, gaming, etc are cropping up and is a very broad category.

Our general rule of thumb is the longer time goes on and things (ie – consumer preferences for various services) stay the same, the multiples can start to expand for our coverage. This is generally the story for GOOGL in 2023; as the perceived threat from ChatGPT hit fever pitch in February, GOOGL's multiple compressed to cycle lows. But once the company demonstrated its AI prowess at i/o and again at Marketing and Cloud Next, investor fears started to subside. This was further re-enforced by real time data suggesting that ChatGPT and Bing usage is levelling out and not gaining share as it was early in the year. We expect the same dynamic to play out across various names that have been identified as “at risk” of AI disruption over the coming quarters and years.

We do think there is likely to be some roadkill across the public consumer internet sector from AI, so we don't want to be lulled into a state of complacency just because ChatGPT traffic has stopped ascending. Nothing has really happened yet, and as more

and more services are launched, we will start to see impact.

To prepare for this inevitability, we think tracking real-time usage stats of various services is a good starting point to assess risk. We have divided up our coverage space into 7 subsectors, so we can compare the incumbent players to the new AI entrants within each. We use Similarweb data to track monthly unique users for each service, and we then compare the incumbents to the new entrants. Overall, not surprisingly, thus far most new entrants have not taken significant share from the incumbent players, but it's far too early.

## Digital Advertising

Digital advertising is dominated by Alphabet and Meta, but also has significant market cap among smaller names like Pinterest, Snapchat and the ad technology sector. Noted above, the initial virality of ChatGPT's launch in November 2022 took the public and investors by surprise as the app quickly achieved mainstream popularity. This naturally led investors to question whether Google, assumed previously to be unassailable in its competitive position in the industry, to be subject to new risks, despite being ahead in just about every metric in AI.

**FIGURE 62. Digital Advertising Incumbents vs. New Entrants**

Digital Advertising	SimilarWeb Monthly Unique Users (m)	Barclays MAU Estimate
Google	3200.00	3000
Instagram	1123.00	2310
Pinterest	406.90	465
Bing	135.00	300
<b>AI Alternative</b>		
ChatGPT	180.50	200
Bard	36.90	
Character.ai	13.89	
Claude	5.88	
ERNIE	1.85	
Pi	1.34	
Snapchat MyAI	--	150

Source: Barclays Research, Similarweb

To analyze the competitive landscape, we pulled SimilarWeb data on popular new chatbots and other new AI experiences that could have the impact of pulling users and engagement away from digital advertising incumbents. Google trounces the aggregate of all these new AI start ups in terms of usage, to no surprise, given the strong default position on iPhone, Android and desktop. Character.ai actually has quite a bit of engagement which is a decent precursor for what META's new AI Agent strategy could look like, but with much more powerful distribution advantages and a huge installed base of influencers ready to implement these new tools. ChatGPT seems to have stalled a bit, but is the biggest of the challengers. Anthropic's Claude and Immersions Pi are both great products, but lack the distribution of the incumbents, and haven't had the traction that ChatGPT has had.

## E-Commerce

Within the commerce subsector, AI technologies are currently being developed and used to supplement the experience in a wide range of services. Amazon leads the charge with many AI features being embedded into the core shopping app, from better recommendations (an AI feature that has been in place for two decades), AI generated text and image content for listings,

voice enabled shopping and others. Companies like eBay have even introduced new AI tools for generating quick seller listings.

**FIGURE 63. E-Commerce Incumbents vs. New Entrants**

E-Commerce	SimilarWeb Monthly Unique Users (m)	Barclays MAU Estimate
Amazon	458.20	529
eBay	189.60	148
Allegro	33.40	
Zalando	11.38	
<b>AI Alternative</b>		
Flair AI	0.29	
Booth.AI	0.14	
Coveo	0.06	
Riskified	0.02	
Trigo	0.01	

Source: Barclays Research, Similarweb

Within the start-up space, many companies are focused on specific functions within the e-commerce journey. For example, Flair AI and Booth.AI are both AI photography tools that allow retailers to create unique listing photos using written prompts. Within other aspects of the e-commerce journey, Coveo is an AI platform that focuses on product discovery and recommendation engines; whereas Riskified offers AI-powered fraud management services to merchants. Separately, Trigo uses AI to build the infrastructure used for touch-free checkout in autonomous retail stores.

Outside of these standalone businesses, there are several popular ChatGPT plug-ins that are beneficial within the e-commerce experience, including Paraphraser (product descriptions) and Speedy Marketing (content creation for Shopify store/other e-commerce website).

### Ride-Hail & Food Delivery

We view ride-hail and food delivery as one of the most insulated subsectors from AI risk, as the 'real-world' aspect of driving people and picking up food from restaurants cannot be completely replaced by AI technology. Instead of new companies coming along and disrupting the top of the funnel, thus far we have seen AI as a supplement to make the process of ordering food more efficient. The new chatbot experience recently rolled out by iFood (Latam food delivery company) drove a sharp increase in conversion rate in the first 30 days. Other features like Smart routing and shopper picking, automated shopping carts and checkout, and plug ins have also been implemented by the largest players in the space, while Driverless delivery is also continuing to be worked on, using a lot of AI/GPU based technologies. And then there is driverless ride-hail from Cruise and Waymo among others, that seems to be approaching a tipping point within the next few years as more cities do what San Francisco is doing.

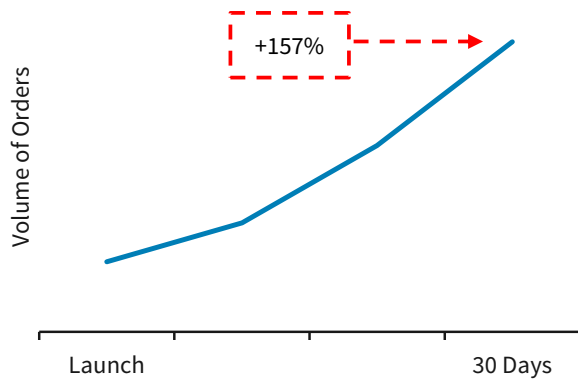
**FIGURE 64. Ride-Hail & Food Delivery Incumbents vs. New Entrants**

Ride-Hail & Food Delivery	SimilarWeb Monthly Unique Users (m)	Barclays MAU Estimate
Uber	35.00	137
Doordash	28.70	35
Delivery Hero	1.40	
Just Eat Takeaway	0.81	
<b>AI Alternative</b>		
Waymo	0.15	
Cruise	0.13	
Starship Technologies	0.02	
Waabi	0.01	

Source: Barclays Research, Similarweb

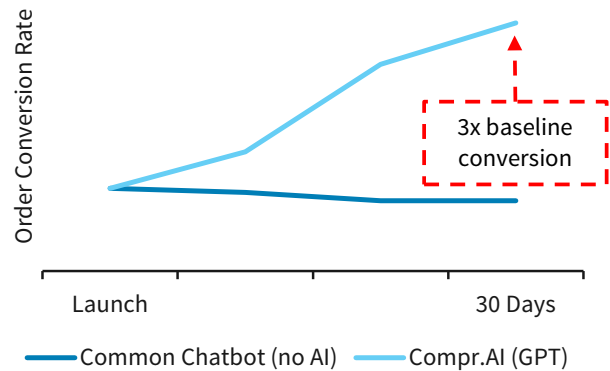
Mentioned above, iFood, the leading delivery platform in Brazil, launched Compr.AI, which allows users to place orders and make purchases through WhatsApp using text and voice commands. This chatbot is currently available for 20 partner supermarkets. Shown below in Figures 65 and 66, the AI chatbot increased both the order volume and conversion rate on the iFood platform; while early, this provided quantitative support of the benefits of adopting AI technology within the delivery space at a large scale.

**FIGURE 65. Volume of Orders of Pilot Participants More Than Doubled...**



Source: Barclays Research, Atlantico Latin America Digital Transformation Report 2023. Y-Axis scaled to 1

**FIGURE 66. ... And Conversion Rate Tripled Following AI Chatbot Launch**



Source: Barclays Research, Atlantico Latin America Digital Transformation Report 2023. Y-Axis scaled to 1

### Travel

As discussed in our recent note, *Framing the AI Opportunity for Leisure Travel* ([link](#)), we believe that OTAs will benefit two-fold from AI: 1) a possible shift away from the heavy dependency on paid search for customer acquisition, and 2) a possible increase in conversion rate as the planning/booking processes become streamlined with AI chatbots. On the flip side, we do see risks from hotels and airlines using AI to further advance their efforts to “go direct” rather than continuing their use of OTAs for customer acquisition and occupancy. Incumbents like Booking, Expedia, Tripadvisor, and Kayak/Opentable (owned by BKNG) have introduced several ChatGPT plug-ins, while Priceline launched Penny the Chatbot that integrates both ChatGPT and Google technology, enabling additional features such as credit card tokenization to allow users to make an accommodation booking directly within the chat.



**FIGURE 67. Travel Incumbents vs. New Entrants**

Travel	SimilarWeb Monthly Unique Users (m)	Barclays MAU Estimate
Booking	277.20	204
Tripadvisor	114.90	
Expedia	49.14	71
Airbnb	40.72	90
<b>AI Alternative</b>		
Triplt	0.55	
RoamAround.io	0.23	
TripNotes.ai	0.27	
Wonderplan	0.07	
BetterTravel.ai	0.01	

Source: Barclays Research, Similarweb

So far, according to SimilarWeb data, the traffic of many of the AI start-ups has yet to see meaningful traction. Triplt is a vacation planner that tracks flights, creates combined itineraries and organizes travel information. The other new entrants, RoamAround, TripNotes, Wonderplan and BetterTravel are all AI trip planners that create full itineraries for vacations based on a user's text-based inputs, including destination, preferences, budgets, etc.

## Video Games

As mentioned in our note, *Key Takeaways from GDC 2023* ([link](#)), AI technology was a key focus during many presentations during the conference. We believe the two main areas where AI will impact game development are 1) code generation and 2) script writing. These tools will have the ability to increase the speed of game development as well as reduce the complexity of game asset creation; it does remain to be seen whether R&D spending amongst the large US publishers will see leverage as standards may be raised across the industry from implementing AI technology. Currently, the new pure AI entrants within the video game subsector are focused on NPC and game asset creation (Convai, Charisma, etc.) and several smaller AI-focused studios have popped up (Spellbrush, Latitude).

**FIGURE 68. Video Game Incumbents vs. New Entrants**

Video Games	SimilarWeb Monthly Unique Users (m)	Barclays MAU Estimate
Electronic Arts	23.50	180
Activision-Blizzard	10.39	92
Ubisoft	8.50	
Take-Two	0.75	
<b>AI Alternative</b>		
Convai	0.02	
Charisma	0.03	
Promethean AI	0.01	
Latitude	0.02	
Spellbrush	0.01	

Source: Barclays Research, Similarweb

Overall, we view AI technologies as being complementary to the traditional publishers that we cover today. While there are elements of a video game that can be replicated by AI technology (mentioned above; NPCs and certain assets), we believe video game players still value a creative storyline and unique gameplay; something that AI technology cannot produce on its own. We

see the adoption of AI technology by traditional publishers as a net positive, but it remains to be seen how much that benefit will be.

### Web Tools

Several of our web tools names were, in our opinion, prematurely bucketed into the “AI roadkill” category, and like we have seen with Google, the longer we don’t see any change in the industry, the more confidence investors seem to be assigning to these names. All incumbent web tools players have introduced AI products within their platforms; Wix Studio and AI Site Generator, GoDaddy’s AI for video generation and product descriptions, Squarespace AI and Shopify AI Sidekick are all examples of the incumbent web tools names developing and releasing products that leverage AI technology.

**FIGURE 69. Web Tools Incumbents vs. New Entrants**

Web Tools	SimilarWeb Monthly Unique Users (m)	Barclays MAU Estimate
Shopify	30.37	2.2
Squarespace	18.18	4.3
Wix	16.00	6.2
GoDaddy	15.63	5+
<b>AI Alternative</b>		
Durable	0.96	
Appy Pie	1.18	
Framer	0.95	
10Web	0.92	
Mixo	0.29	

Source: Barclays Research, Similarweb. \*GDDY estimated website builder tool subscribers. SHOP reflects Barclays estimate

There have been several examples of new AI entrants demonstrating the ability to create an entire website based on simple inputs from the user. And while that is an important monoline feature in the beginning of a business’s online journey, it is important to understand that the biggest web tool players increasingly offer a broad suite of services, not just website building. Domain procurement, payments, site security/stability, marketing, productivity software and integration with other marketplaces are just some of the products that web tools names offer to customers, much of which is more challenging for current AI functionality to replicate or for which compelling AI features have yet to be developed; the incumbents offer a one-stop-shop with competitive pricing.

Several entrants have over 1m unique monthly visitors, according to SimilarWeb, but uniques are a far cry from paying customers. We do believe in the next 3-5 years, those who invest in AI should be in a position to differentiate their service.

### Consumer Subscription

Our “Subscription” sub-sector of coverage is somewhat of a catch-all that includes various types of companies, including dating (MTCH, BMBL), music (SPOT), and education (DUOL). Each of these subcategories have different levels of exposure to AI technologies.

One of the most popular areas of AI is the emergence of AI-based romance apps, similar to the 2013 Academy Award winning film “Her” in which the protagonist develops a relationship with an AI agent. Fast forward to 2023 and we now have those exact products. Services like Character.ai and Replika may have an impact down the road on the propensity for users to pay for dating apps like Tinder but it’s too early to tell. So far, Tinder has announced that it is testing an AI photo selection feature which picks the photos that would perform best in app; the

company has also made some appointments to teams that will be focused on developing other AI tools.

Moving onto music, the mainstream virality of the AI-generated song “Heart on My Sleeve”, which features vocals based on the artists Drake and The Weeknd provided the first glimpse to millions of music fans the quality of content that AI technology can put out. Within a few days, Universal Music Group invoked copyright violation to get platforms like Spotify and YouTube to take down the original audio, but not before garnering tens of millions of streams and sparking a debate on the ownership of AI-generated music. YouTube and UMG have recently partnered on a new lab that could help with AI based watermarking and other features to limit the risk of AI music disrupting the business model.

Rounding out the subscription subcategory is education. When Chegg (CHGG, uncovered) saw a significant spike in student interest in ChatGPT, which resulted in a negative impact on new customer growth rates, many education apps were initially grouped into the “AI losers” bucket, but the question remains as CHGG recently stated that the two are complementary. Another controversial name that has landed on the AI-winner side of the debate is Duolingo, which despite having new services like Speak.ai gaining popularity, in May, launched Duolingo Max, a new subscription tier powered by GPT-4. Nerdy, which is an online learning platform, has used AI technology across many functions within the org, from giving its experts tools assisting lesson-planning to answering 50% of customer inquiries with its AI support bots.

**FIGURE 70. Subscription Incumbents vs. New Entrants**

Subscription	SimilarWeb Monthly Unique Users (m)	Barclays MAU Estimate
Spotify	156.80	551
Duolingo	17.89	74
Varsity Tutors	2.04	
Bumble	3.63	15
Match	3.43	
<b>AI Alternative</b>		
Character.ai	13.89	
Memrise	1.29	
Soundraw	0.82	
ELSA Speak	0.97	
Replika	0.44	
Speak	0.12	

Source: Barclays Research, Similarweb

Shown above, Character.ai has clearly gained significant adoption from users, with around 15m MAUs per Similarweb. This company has been a big winner thus far in this space with around 1/3<sup>rd</sup> of its usage around romantic and personal relationships (the company has more than 15m registered users and 14m different customized chatbots). Replika, another AI chatbot, offers multiple companions focused on combatting loneliness. While we are bullish on the real-life online dating opportunity that services like Tinder and Bumble operate in, there is clearly a large market for relationship-based AI chatbots. It remains to be seen how much of a disruption these players can create for traditional online dating platforms.

Within music, there are several AI-music generation tools available to the public, with the biggest (Soundraw) having over 1m monthly unique users. The tool allows users to create music based on different inputs like genre, mood and tempo, amongst others. This pales into comparison to Spotify, which has over 550m MAUs as of 2Q23. The emergence and acceptance of AI-generated music could be a potential tailwind for the traditional music streaming services

as the amount of content produced increases and barriers to create high-quality music are lowered, ultimately benefitting the platforms that distribute content.

In the education subcategory, new entrant Memrise provides users learning a new language an AI-powered chatbot called Membot, which creates human-like conversations that can be used to practice speaking a language. ELSA Speak is a similar service for non-English speakers that allows users to practice real-world conversations.

## Appendix: SimilarWeb Traffic Heat Maps

In Similarweb’s *Global Sector Trends on Generative AI*, we found traffic data on generative AI companies across a breadth of different verticals and industries. This data includes 12-week % change in total visits for new entrants, and global traffic % y/y change for the incumbent sectors. We would note that for these charts, the 12-week % change data points are not as helpful due to seasonality, as many younger users are offline during summer months; nevertheless, we believe these charts are helpful in framing overall traffic picture for both new entrants and incumbents.

### Broad Generative AI Category Growth

Figure 71 compares the percent change in total visits for each AI player sub-category. The ‘original’ AI tools like ChatGPT, which started the hype cycle, would be included in General, which was the best-performing sub-category in the early stages of AI adoption – with visits growing triple digits through May. Some of the other fastest-growing sub-categories in the beginning months include Character & Chat, Voice Generation, and Writing & Content. Looking to present day, the sub-categories that have maintained traffic include Legal, Human Capital Management (HCM), and Video Generation, which could provide some insight as to which sub-categories will see sustained impacts from AI developments.

**FIGURE 71. Broad GenAI Category Traffic Performance**

12wk Change (total visits)	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
General	362%	242%	170%	104%	68%	47%	14%	-2%	-12%	-8%	-19%	-19%
Character & Chat	145%	150%	112%	142%	190%	156%	82%	48%	19%	-15%	-32%	-22%
Design & Image Generation	41%	49%	31%	14%	6%	9%	-5%	-16%	-14%	-11%	-9%	-10%
Writing & Content	83%	43%	15%	1%	-8%	-13%	-28%	-28%	-25%	-22%	-32%	-30%
Video Generation	37%	21%	26%	15%	8%	19%	15%	15%	-3%	2%	12%	6%
Voice Generation	92%	63%	39%	24%	3%	8%	1%	5%	2%	-6%	-3%	-2%
DevOps & Code Completion	41%	21%	12%	7%	-4%	-11%	-19%	-15%	-12%	-11%	-11%	-9%
HCM	69%	8%	2%	10%	28%	25%	34%	42%	24%	31%	24%	24%
Music Generation	28%	19%	-1%	-10%	-13%	-9%	-5%	-5%	-7%	-16%	-18%	-20%
Legal	31%	16%	14%	27%	18%	10%	7%	17%	2%	-1%	9%	21%
All Other	40%	18%	9%	5%	9%	16%	23%	14%	5%	-2%	-9%	-16%
<b>AI Tools Total</b>	<b>231%</b>	<b>173%</b>	<b>126%</b>	<b>84%</b>	<b>61%</b>	<b>45%</b>	<b>14%</b>	<b>-1%</b>	<b>-10%</b>	<b>-9%</b>	<b>-19%</b>	<b>-18%</b>

Source: Barclays Research, Similarweb

### General AI Tools

These tools provide a wide variety of information retrieval, productivity enhancements, and automation tasks, mainly through a chat/search UI. ChatGPT’s emergence in late 2022 laid the groundwork for the AI moment we find ourselves in, and many other direct competitors have popped up since its launch. Notably, Google Bard’s traffic is holding in relatively well during these summer months (albeit at a fraction of the scale); additionally, Perplexity and Anthropic traffic has performed well in recent months, despite most traffic for other tools declining (likely due to the summer seasonality mentioned previously). These tools would directly impact traditional search, social media, and EdTech players.

**FIGURE 72. General AI Tools Traffic Heat Map**

12wk Change	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Openai	360%	236%	165%	97%	51%	31%	5%	-9%	-19%	-20%	-24%	-22%
Google	n/a	n/a	n/a	21071%	326314%	33966%	300%	122%	241%	382%	18%	5%
Poe	93537%	301965%	250527%	32637%	39505%	2815%	355%	120%	49%	43%	-10%	-21%
Perplexity	291%	256%	143%	47%	32%	38%	47%	57%	42%	51%	33%	21%
Anthropic	971%	434%	925%	175%	621%	481%	82%	11%	23%	231%	153%	108%
Deepmind	0%	-17%	-13%	-6%	-13%	1%	25%	44%	-21%	-32%	-18%	-16%
Neuroflash	48%	-8%	-27%	-27%	-25%	-44%	-47%	-38%	-36%	-30%	-27%	-1%
Inflection	98%	13%	7%	413%	1017%	1394%	1225%	3237%	2339%	254%	62%	-18%
Glean	85%	21%	37%	25%	11%	19%	29%	17%	3%	17%	-2%	15%
Easy-Peasy	499%	57%	3%	-12%	-6%	61%	87%	22%	37%	-31%	-14%	-51%
All Other	109%	25%	-4%	3%	7%	19%	6%	-4%	-21%	-16%	-29%	-28%
<b>AI Tools Total</b>	<b>362%</b>	<b>242%</b>	<b>170%</b>	<b>104%</b>	<b>68%</b>	<b>47%</b>	<b>14%</b>	<b>-2%</b>	<b>-12%</b>	<b>-8%</b>	<b>-19%</b>	<b>-19%</b>

Source: Barclays Research, Similarweb

### Character & Chat AI Tools

These tools include the popular chatbots that use LLMs to replicate natural language conversations. Products like Character.AI and Replika, discussed previously, are found within this sub-category. Character.AI is by far the largest player in this group, and has seen its consistent triple digit growth through early June moderate since then. Replika, the AI companion app, has seen consistent declines since late April, likely due to adult content changes made on the platform that resulted in overall negative feedback from users. The traditional sectors that these AI tools would most directly impact are dating, media/entertainment, and EdTech.

**FIGURE 73. Character & Chat AI Tools Heat Map**

12wk Change	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Character	165%	173%	126%	159%	214%	170%	88%	51%	20%	-15%	-32%	-22%
Replika	24%	4%	-14%	-46%	-59%	-45%	-38%	-27%	-34%	-28%	-27%	-22%
Inworld	226%	91%	65%	128%	44%	67%	25%	-17%	-51%	-20%	25%	12%
Chai	-52%	-71%	-84%	-81%	-82%	-79%	-22%	23%	110%	-13%	-42%	-35%
Readyplayer	39%	-2%	-29%	-41%	0%	-7%	-22%	-15%	-14%	15%	-42%	-33%
<b>Character &amp; Chat Total</b>	<b>145%</b>	<b>150%</b>	<b>112%</b>	<b>142%</b>	<b>190%</b>	<b>156%</b>	<b>82%</b>	<b>48%</b>	<b>19%</b>	<b>-15%</b>	<b>-32%</b>	<b>-22%</b>

Source: Barclays Research, Similarweb

### Design & Image Creation AI Tools

The explosion of Midjourney’s popularity began the emergence of many different AI image generation tools. Overall, we have anecdotally seen the quality of AI-generated images improve drastically over the last several months (on the back of upgraded diffusion models), and while we think these tools are far from completely replacing traditional methods of using stock image and art, it has been interesting to see the progression. Overall, several of the biggest players including Midjourney and Stable Diffusion have seen traffic drop off significantly more than other players like Leonardo, which has seen traffic relatively steady even through summer months (off a lower base). The traditional categories most directly impacted from these players would be content publishers, web tools, and creative/marketing agencies.

**FIGURE 74. Design & Image Generation AI Tools Heat Map**

12wk Change	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Midjourney	93%	91%	50%	10%	3%	5%	-31%	-43%	-37%	-33%	-37%	-38%
Leonardo	1571%	1421%	1528%	2198%	472%	244%	121%	65%	36%	20%	19%	4%
Runwayml	385%	330%	213%	100%	34%	1%	2%	-30%	-27%	-15%	14%	50%
Nightcafe	-16%	-1%	-8%	-18%	-15%	-7%	-9%	-26%	-21%	-17%	-11%	-15%
Artbreeder	-3%	19%	49%	19%	-10%	-20%	-16%	-28%	-43%	-20%	-10%	3%
Looka	56%	30%	34%	22%	15%	14%	7%	5%	-8%	-7%	-5%	0%
Stablediffusionweb	57%	50%	63%	41%	13%	-3%	-17%	-26%	-36%	-35%	-37%	-32%
Craiyon	-5%	11%	27%	5%	-1%	-2%	-6%	-21%	-36%	-21%	-19%	-25%
Deepai	10%	33%	24%	13%	34%	38%	20%	-15%	-13%	-14%	-18%	-11%
Stability	35%	23%	59%	101%	90%	13%	-19%	-3%	-27%	-23%	-26%	-9%
All Other	29%	33%	11%	0%	-4%	5%	-2%	-9%	-3%	-3%	-2%	-5%
<b>Design &amp; Image Generation Total</b>	<b>41%</b>	<b>49%</b>	<b>31%</b>	<b>14%</b>	<b>6%</b>	<b>9%</b>	<b>-5%</b>	<b>-16%</b>	<b>-14%</b>	<b>-11%</b>	<b>-9%</b>	<b>-10%</b>

Source: Barclays Research, Similarweb

**Writing & Content Generation AI Tools**

There are many different players within the AI writing tools sub-category, as text editing/generation is one of the original capabilities of general AI tools. Overall, the category has performed significantly worse than other AI sub-categories comparatively, although we would point out that as work eased through the summer, the necessity of drafting proposals and writing emails lessened, which could have to do with the sub-category’s underperformance relative to the other groups. The sectors most disrupted from these tools would be creative/marketing agencies, communications, entertainment and publishing.

**FIGURE 75. Writing & Content Generation AI Tools Heat Map**

12wk Change	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Tome	846%	262%	156%	75%	47%	20%	6%	7%	21%	51%	-22%	-35%
Writesonic	194%	105%	2%	-15%	-18%	-12%	-25%	-33%	-36%	-43%	-28%	-28%
Wordtune	171%	92%	54%	29%	-10%	-37%	-58%	-52%	-40%	-40%	-37%	-28%
Jasper	0%	-11%	-26%	-31%	-35%	-36%	-48%	-47%	-42%	-42%	-29%	-9%
Copy	31%	11%	-6%	-16%	-15%	-1%	-24%	-34%	-39%	-36%	-45%	-37%
Writer	111%	39%	22%	9%	-5%	-15%	-12%	-12%	-37%	-34%	-42%	-41%
Rytr	-16%	-33%	-30%	-15%	-21%	-25%	-22%	-23%	-27%	-49%	-49%	-30%
Surferseo	2%	2%	-5%	-8%	6%	2%	-4%	-2%	-10%	-2%	-22%	-25%
Originality	138%	10%	54%	24%	65%	46%	-4%	-24%	-38%	-31%	-33%	-34%
Sudowrite	90%	89%	92%	74%	106%	107%	45%	37%	82%	37%	7%	-9%
All Other	13%	-9%	-4%	-2%	-18%	-16%	-2%	-10%	-17%	-19%	-4%	-23%
<b>Writing &amp; Content Total</b>	<b>83%</b>	<b>43%</b>	<b>15%</b>	<b>1%</b>	<b>-8%</b>	<b>-13%</b>	<b>-28%</b>	<b>-28%</b>	<b>-25%</b>	<b>-22%</b>	<b>-32%</b>	<b>-30%</b>

Source: Barclays Research, Similarweb

**Video Generation & Editing AI Tools**

Similar to image generation, the overall quality of AI-generated videos has improved markedly over the past few months, but we would say video is still several steps behind images; mainly due to the complexity of video creation/editing in comparison to still frames. This sub-category has been the best performing out of every group within this analysis in recent months, driven by strength in the largest video generation tool, Veed, which allows users to transcribe audio to text, edit, and add animations. Social media, creative/marketing agencies and entertainment/media are the traditional sectors most likely impacted by these players (some impact positive, some negative).

**FIGURE 76. Video Generation & Editing AI Tools Heat Map**

12wk Change	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Veed	27%	17%	9%	1%	-3%	15%	13%	15%	13%	21%	42%	21%
Heygen	n/a	n/a	n/a	n/a	n/a	n/a	n/a	432%	8%	34%	41%	22%
Flexclip	17%	11%	12%	12%	8%	20%	9%	25%	6%	1%	2%	3%
Synthesia	31%	3%	-6%	-18%	-21%	-22%	-19%	-18%	-18%	-15%	-24%	-11%
Descript	60%	25%	7%	10%	1%	6%	-6%	-3%	-18%	-29%	-20%	-20%
Typecast	103%	73%	51%	41%	7%	-12%	-18%	-22%	-20%	-35%	-33%	1%
Elai	232%	68%	93%	49%	64%	26%	9%	-17%	-26%	-23%	-31%	-16%
Lumen5	43%	30%	32%	-1%	-19%	-6%	-19%	-20%	-38%	-27%	-24%	-31%
Papercup	1328%	1214%	517%	95%	-47%	-18%	-43%	-72%	-76%	-68%	-31%	-45%
Rephrase	44%	96%	67%	39%	-2%	10%	-31%	-42%	-34%	-15%	-24%	-24%
<b>Video Generation Total</b>	<b>37%</b>	<b>21%</b>	<b>26%</b>	<b>15%</b>	<b>8%</b>	<b>19%</b>	<b>15%</b>	<b>15%</b>	<b>-3%</b>	<b>2%</b>	<b>12%</b>	<b>6%</b>

Source: Barclays Research, Similarweb

### Voice Generation & Editing AI Tools

The largest tools within this sub-category like Speechify and Murf, allow users to create audio voiceovers from text inputs, instead of using a paid voice actor for things like videos/commercials. Performance has been mixed, with the early spring months seeing a lot of adoption, but traffic has tapered off more recently. The key areas that may be disrupted from these players include creative/marketing agencies, entertainment, and social media.

**FIGURE 77. Voice Generation & Editing AI Tools Heat Map**

12wk Change	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Speechify	101%	68%	48%	57%	24%	17%	5%	10%	2%	-18%	-9%	-1%
Murf	130%	90%	29%	-2%	-24%	-3%	-6%	-13%	-20%	-18%	-9%	-16%
Naturalreaders	49%	32%	23%	5%	-15%	-11%	-12%	-7%	-8%	-3%	4%	-1%
Play	122%	83%	78%	43%	35%	40%	25%	35%	39%	45%	17%	19%
Lovo	82%	24%	56%	32%	52%	55%	43%	37%	10%	14%	16%	22%
Resemble	186%	179%	76%	39%	5%	-4%	-11%	4%	22%	-15%	-31%	-23%
Listnr	58%	48%	3%	9%	4%	42%	49%	51%	42%	35%	63%	48%
Replicastudios	9%	25%	34%	-29%	5%	9%	58%	37%	120%	178%	272%	89%
Speechelo	-31%	-32%	-21%	-31%	-17%	-5%	-9%	-7%	-1%	-4%	-25%	-46%
Speechmatics	229%	47%	46%	11%	11%	29%	-24%	23%	34%	-3%	-8%	-40%
All Other	14%	39%	-3%	-22%	-51%	-44%	-24%	-75%	-64%	-13%	41%	7%
<b>Voice Generation Total</b>	<b>92%</b>	<b>63%</b>	<b>39%</b>	<b>24%</b>	<b>3%</b>	<b>8%</b>	<b>1%</b>	<b>5%</b>	<b>2%</b>	<b>-6%</b>	<b>-3%</b>	<b>-2%</b>

Source: Barclays Research, Similarweb

### Music Generation AI Tools

All music generation tools have had mixed reactions from music fans and labels alike, but the use cases of these AI tools are clear. Musixmatch uses AI to create lyrics for songs and translate into different languages. On the music creation front, players like Soundraw and Aiva allow users to create music based on inputs like mood, genre and instruments. An interesting note from the traffic data is that Aimi, which uses AI technology to mix and master electronic music, has seen a resurgence in traffic since July. The sectors most at risk of disruption from these players are music publishing and streaming/media.

**FIGURE 78. Music Generation AI Tools AI Tools**

12wk Change	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Musixmatch	-3%	-5%	-5%	-8%	-9%	-7%	-5%	-7%	-5%	-9%	-12%	-13%
Soundraw	149%	93%	0%	14%	17%	19%	18%	-2%	6%	-33%	-36%	-41%
Aiva	92%	52%	-10%	-36%	-40%	-20%	-25%	-10%	-27%	-10%	-26%	0%
Beatoven	640%	344%	-11%	-38%	-53%	-50%	-32%	15%	1%	-14%	6%	-13%
Boomy	123%	72%	47%	-10%	-2%	4%	4%	17%	-24%	-39%	-45%	-53%
Aimi	122%	24%	-26%	-75%	-74%	-68%	90%	101%	353%	366%	370%	372%
Evokemusic	690%	745%	648%	289%	11%	21%	-83%	-82%	-78%	-76%	-44%	-62%
<b>Music Generation Total</b>	<b>28%</b>	<b>19%</b>	<b>-1%</b>	<b>-10%</b>	<b>-13%</b>	<b>-9%</b>	<b>-5%</b>	<b>-5%</b>	<b>-7%</b>	<b>-16%</b>	<b>-18%</b>	<b>-20%</b>

Source: Barclays Research, Similarweb

### Code Completion & DevOps AI Tools

While not directly within the scope of our consumer internet coverage, the existence of AI tools that assist developers with coding tasks would impact all companies – not just our coverage. These tools mainly help code writers analyze and complete existing code, which could



drastically reduce the time spent in development stage for products – increasing the amount of projects companies will be able to ship. Replit, the biggest player in this sub-category, offers a tool called Ghostwriter (alternative to Github’s Copilot), which helps programmers through auto-complete code suggestions and other code generation capabilities. Sectors that would be disrupted from these players are certain SaaS companies and web tools.

**FIGURE 79. Code Completion & DevOps AI Tools Heat Map**

12wk Change	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Replit	36%	16%	9%	12%	0%	-12%	-23%	-15%	-15%	-14%	-12%	-8%
Tabnine	58%	40%	23%	-18%	-19%	-19%	-24%	-30%	-21%	-6%	-19%	-17%
Bito	n/a	n/a	1151%	2358%	n/a	4155%	798%	535%	162%	22%	107%	99%
Arize	92%	90%	-16%	73%	106%	270%	198%	49%	70%	16%	20%	7%
Gretel	35%	36%	47%	108%	9%	11%	84%	31%	37%	-26%	-30%	-34%
Diffblue	31%	37%	7%	57%	52%	-19%	13%	1%	46%	-3%	-53%	-14%
Tonic	-56%	-53%	-39%	-19%	81%	39%	217%	66%	136%	12%	-60%	-51%
K-Explorer	-4%	-36%	-22%	-22%	35%	-78%	-60%	2%	692%	245%	71%	23%
AI-Code-Reviewer	-31%	-90%	-84%	3%	58%	35%	-14%	-8%	65%	-73%	-68%	-67%
<b>DevOps &amp; Code Completion Total</b>	<b>41%</b>	<b>21%</b>	<b>12%</b>	<b>7%</b>	<b>-4%</b>	<b>-11%</b>	<b>-19%</b>	<b>-15%</b>	<b>-12%</b>	<b>-11%</b>	<b>-11%</b>	<b>-9%</b>

Source: Barclays Research, Similarweb

### Traditional Sectors

We also provide a similar analysis for traditional players, comparing growth rates (% y/y, so no seasonality issue with the 12-week metric) for the incumbent players within each sub-category.

#### Traditional Search

Search is obviously dominated by Google, and so far the traditional search players have seen steady to rising traffic over the past five months, with the exception of Yandex, likely due to the continued conflict involving Russia and Ukraine. Despite ChatGPT’s strong performance out of the gate, it seems as if traditional search is holding on, and we would expect these trends to continue as Google’s SGE experience improves within the native program.

**FIGURE 80. Traditional Search Heat Map**

Global Traffic y/y	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Google	-2%	-4%	-2%	-3%	-2%	-2%	-1%	-1%	-2%	-2%	-2%	-2%
Baidu	-16%	-20%	-13%	-11%	-8%	-3%	-5%	-5%	-1%	-1%	9%	11%
Yahoo	-3%	-6%	-4%	-4%	-6%	-5%	-1%	0%	6%	13%	12%	13%
Yandex	-13%	-14%	-13%	-11%	-12%	-11%	-11%	-11%	-12%	-13%	-15%	-15%
Bing	23%	23%	20%	15%	18%	14%	15%	10%	6%	5%	8%	8%
Duckduckgo	-13%	-13%	-14%	-12%	-13%	-12%	-10%	-9%	-8%	-5%	-6%	-8%
<b>Traditional Search Total</b>	<b>-3%</b>	<b>-5%</b>	<b>-3%</b>	<b>-3%</b>	<b>-3%</b>	<b>-2%</b>	<b>-1%</b>	<b>-2%</b>	<b>-2%</b>	<b>-2%</b>	<b>-1%</b>	<b>-1%</b>

Source: Barclays Research, Similarweb

#### Web & Shop Builders

Included in this group is three quarters of our web tools coverage (does not include GDDY), which has been grouped into the “AI loser” bucket several times, mentioned previously. Overall, for the largest players, traffic is steady or rising, which is reassuring for now. We will continue to observe traffic flows coming into new AI players, but overall feel confident that the existing web tools players will be able to ward off most competition if they are able to innovate internally.

**FIGURE 81. Web & Shop Builders Heat Map**

Global Traffic y/y	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Wix	5%	-2%	-1%	-1%	0%	-2%	-2%	-2%	-3%	-3%	-2%	-5%
Squarespace	11%	8%	9%	10%	17%	15%	16%	17%	15%	20%	17%	17%
Weebly	-13%	-19%	-15%	-12%	-13%	-13%	-17%	-15%	-13%	-15%	-15%	-16%
Ionos	-1%	-6%	3%	-3%	-2%	3%	7%	3%	2%	2%	3%	6%
Square	31%	26%	25%	15%	25%	26%	28%	32%	23%	32%	30%	34%
Shopify	30%	36%	51%	45%	39%	46%	42%	53%	62%	59%	50%	43%
Zyro	68%	66%	71%	67%	79%	37%	40%	32%	46%	25%	26%	16%
WooCommerce	7%	-4%	4%	2%	-13%	-8%	-1%	1%	-6%	-4%	-4%	-14%
Hostgator	5%	-9%	2%	6%	-6%	-5%	-5%	-2%	-8%	-11%	-26%	-9%
All Other	3%	3%	4%	1%	0%	-1%	-3%	-7%	-17%	-22%	-28%	-31%
<b>Web &amp; Shop Builders Total</b>	<b>4%</b>	<b>2%</b>	<b>4%</b>	<b>2%</b>	<b>3%</b>	<b>2%</b>	<b>2%</b>	<b>0%</b>	<b>-5%</b>	<b>-6%</b>	<b>-10%</b>	<b>-12%</b>

Source: Barclays Research, Similarweb

### Consumer EdTech

Chegg’s conference call put the legacy consumer EdTech names on watch from potential disruption from AI tools, and the traffic seen at Chegg was in significant decline through the first half of the year, but has since stabilized. Duolingo’s traffic has been holding in fairly well, in contrast to Coursehero, which has been consistently negative since March, showing how the different EdTech offerings can see very different impacts from AI tools (keep in mind the scale differences between many of these services impact the growth rates).

**FIGURE 82. Consumer EdTech Heat Map**

Global Traffic y/y	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Udemy	10%	5%	0%	4%	2%	2%	5%	4%	4%	2%	1%	0%
Duolingo	7%	7%	6%	7%	10%	13%	12%	13%	13%	13%	10%	10%
Quizlet	-12%	-19%	-10%	-13%	-12%	-9%	-7%	-5%	-6%	-1%	0%	-5%
Coursera	20%	17%	11%	10%	14%	15%	10%	16%	19%	15%	6%	8%
Grammarly	-2%	-10%	-8%	-8%	-8%	-5%	-7%	-8%	-6%	-7%	-3%	-6%
Chegg	-15%	-20%	-15%	-17%	-16%	-11%	-7%	-5%	-6%	-3%	0%	-4%
Coursehero	-24%	-31%	-24%	-18%	-20%	-27%	-30%	-30%	-26%	-27%	-28%	-27%
Mathway	-3%	-17%	-1%	-1%	5%	7%	4%	11%	7%	8%	9%	11%
Edx	3%	-2%	-2%	-5%	-5%	-3%	-3%	-6%	-2%	-2%	-4%	1%
Babbel	29%	29%	25%	21%	20%	19%	24%	17%	14%	3%	15%	19%
All Other	2%	-3%	10%	8%	10%	10%	7%	9%	12%	14%	17%	16%
<b>Consumer &amp; Language EdTech</b>	<b>-1%</b>	<b>-7%</b>	<b>0%</b>	<b>-1%</b>	<b>1%</b>	<b>3%</b>	<b>2%</b>	<b>4%</b>	<b>6%</b>	<b>6%</b>	<b>7%</b>	<b>6%</b>

Source: Barclays Research, Similarweb

### Discussion & Q&A Forums

Reddit, the largest discussion/Q&A forum platform saw traffic fall in the first half of the year, and despite changing its stance on third-party APIs in June, traffic has actually ticked back up over the last month or so, likely indicating that the protest against their policy change is losing steam. StackOverflow, a platform in which developers post and answer questions, has seen a sharp drop off in traffic, with no signs of easing; we would see this as a direct result of the success of several DevOps AI tools.

**FIGURE 83. Discussion & Q&A Forums Heat Map**

Global Traffic y/y	24-Mar	7-Apr	21-Apr	5-May	19-May	2-Jun	16-Jun	30-Jun	14-Jul	28-Jul	11-Aug	25-Aug
Reddit	-6%	-8%	-8%	-8%	-9%	-8%	-8%	-5%	-4%	-2%	1%	2%
Discord	-9%	-7%	-8%	-7%	-6%	-6%	-4%	-2%	-3%	-3%	-5%	-5%
Qq	-9%	-13%	-10%	-10%	-8%	-7%	-9%	-16%	-13%	-23%	-22%	-17%
Quora	5%	8%	11%	4%	1%	-5%	-11%	-12%	-17%	-14%	-9%	-14%
Stackoverflow	-14%	-21%	-22%	-23%	-25%	-23%	-24%	-25%	-25%	-28%	-26%	-27%
<b>Discussion Forums</b>	<b>-6%</b>	<b>-7%</b>	<b>-6%</b>	<b>-7%</b>	<b>-7%</b>	<b>-7%</b>	<b>-8%</b>	<b>-8%</b>	<b>-8%</b>	<b>-9%</b>	<b>-7%</b>	<b>-7%</b>

Source: Barclays Research, Similarweb

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**Materially Mentioned Stocks (Ticker, Date, Price)**

**1stDibs Inc.** (DIBS, 08-Sep-2023, USD 4.28), Overweight/Positive, CE/J

**ACAST** (ACAST.ST, 08-Sep-2023, SEK 7.00), Equal Weight/Neutral, D/E/J/K/L/M

**ASOS plc** (ASOS.L, 08-Sep-2023, GBp 401), Equal Weight/Neutral, FA/J/K/M/N

**About You Holding SE** (YOUG.DE, 08-Sep-2023, EUR 5.84), Underweight/Neutral, J

**Activision Blizzard, Inc.** (ATVI, 08-Sep-2023, USD 92.12), Equal Weight/Positive, CD/CE/FA/J

**Adevinta** (ADE.OL, 08-Sep-2023, NOK 73.40), Overweight/Neutral, CD/E/J/K/L/M/N

**Airbnb Inc.** (ABNB, 08-Sep-2023, USD 145.82), Equal Weight/Positive, CD/CE/E/J/K/L/M/N

**Allegro** (ALEP.WA, 08-Sep-2023, PLN 31.80), Equal Weight/Neutral, E/J/L

**Alphabet Inc.** (GOOGL, 08-Sep-2023, USD 136.38), Overweight/Positive, CD/CE/E/J/K/L/M/N

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**Amazon.com, Inc.** (AMZN, 08-Sep-2023, USD 138.23), Overweight/Positive, A/CD/CE/D/E/J/K/L/M/N

**Auction Technology Group PLC** (ATG.L, 08-Sep-2023, GBp 690), Overweight/Neutral, J

**Auto1** (AG1G.DE, 08-Sep-2023, EUR 7.41), Equal Weight/Neutral, D/J/K/L/M

**AutoTrader** (AUTOA.L, 08-Sep-2023, GBp 602), Overweight/Neutral, J

**Boohoo** (BOOH.L, 08-Sep-2023, GBp 33), Underweight/Neutral, J/K/M/N

**Booking Holdings Inc.** (BKNG, 08-Sep-2023, USD 3143.10), Overweight/Positive, CD/CE/FB/J/K/M/N

**Chewy, Inc.** (CHWY, 08-Sep-2023, USD 22.99), Equal Weight/Positive, CE/D/E/FB/J/K/L/M

**Corsair Gaming, Inc.** (CRSR, 08-Sep-2023, USD 15.22), Overweight/Positive, CE/E/FB/J/L

**Deliveroo PLC** (ROO.L, 08-Sep-2023, GBP 1.17), Equal Weight/Neutral, FA/J/L/Q

**Delivery Hero** (DHER.DE, 08-Sep-2023, EUR 30.40), Overweight/Neutral, A/CD/D/E/J/K/L/M

**DoorDash, Inc.** (DASH, 08-Sep-2023, USD 82.17), Equal Weight/Positive, CE/E/J/K/L/M

**Duolingo, Inc.** (DUOL, 08-Sep-2023, USD 156.51), Equal Weight/Positive, CE/J

**Electronic Arts, Inc.** (EA, 08-Sep-2023, USD 121.75), Equal Weight/Positive, CD/CE/J/K/N

**Etsy Inc** (ETSY, 08-Sep-2023, USD 67.13), Equal Weight/Positive, CD/CE/J

**Expedia Inc.** (EXPE, 08-Sep-2023, USD 109.80), Overweight/Positive, CD/CE/J/K/N

**Future PLC** (FUTR.L, 08-Sep-2023, GBp 723), Overweight/Neutral, J/K/M/N

**GoDaddy Inc.** (GDDY, 08-Sep-2023, USD 74.58), Overweight/Positive, CE/J

**Groupon, Inc.** (GRPN, 08-Sep-2023, USD 12.04), Underweight/Positive, CD/CE/FA/J/K/M

**HelloFresh SE** (HFGG.DE, 08-Sep-2023, EUR 29.26), Overweight/Neutral, CD/E/J/L

**Hemnet** (HEM.ST, 08-Sep-2023, SEK 189.40), Equal Weight/Neutral, E/J/L

**IAC/InterActiveCorp** (IAC, 08-Sep-2023, USD 54.11), Overweight/Positive, J/K/M

**IONOS** (IOSn.DE, 08-Sep-2023, EUR 15.66), Overweight/Neutral, A/D/J/L

**Just Eat Takeaway** (TKWY.AS, 08-Sep-2023, EUR 11.77), Equal Weight/Neutral, CD/J

**LegalZoom.com, Inc.** (LZ, 08-Sep-2023, USD 10.09), Overweight/Positive, A/CE/E/FB/J/K/L/M

**Lyft, Inc.** (LYFT, 08-Sep-2023, USD 10.82), Equal Weight/Positive, CD/CE/J

**Match Group, Inc.** (MTCH, 08-Sep-2023, USD 44.05), Overweight/Positive, J/K/M/N

**MercadoLibre** (MELI, 08-Sep-2023, USD 1428.19), Overweight/Positive, CD/CE/J

**Meta Platforms, Inc.** (META, 08-Sep-2023, USD 297.89), Overweight/Positive, CD/CE/D/J/K/L/M/N

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**MoneySupermarket** (MONY.L, 08-Sep-2023, GBp 248), Overweight/Neutral, FA/FB/J/K/L/N/Q

**NerdWallet, Inc.** (NRDS, 08-Sep-2023, USD 8.43), Overweight/Positive, CE/D/J/L

**Nerdy, Inc.** (NRDY, 08-Sep-2023, USD 4.61), Equal Weight/Positive, CE/J

**Outbrain, Inc.** (OB, 08-Sep-2023, USD 5.24), Overweight/Positive, CD/CE/J

**Peloton Interactive, Inc.** (PTON, 08-Sep-2023, USD 5.45), Overweight/Positive, CD/CE/E/FC/J/K/L/M

**Pinterest, Inc.** (PINS, 08-Sep-2023, USD 27.55), Equal Weight/Positive, CE/J/K/M

**Prosus N.V.** (PRX.AS, 08-Sep-2023, EUR 63.08), Overweight/Neutral, CD/J

**Reach PLC** (RCH.L, 08-Sep-2023, GBp 72), Equal Weight/Neutral, J/K/N

**Rent the Runway, Inc.** (RENT, 08-Sep-2023, USD 0.98), Overweight/Positive, CE/E/FA/J/L

**Revolve** (RVLV, 08-Sep-2023, USD 13.06), Underweight/Positive, CE/J

**Rightmove Plc** (RMV.L, 08-Sep-2023, GBp 563), Underweight/Neutral, J/K/N

**Roblox Corporation** (RBLX, 08-Sep-2023, USD 29.01), Underweight/Positive, CD/CE/J

**Schibsted ASA** (SBSTA.OL, 08-Sep-2023, NOK 215.40), Overweight/Neutral, CD/E/J/K/L/M/N

**Scout24** (G24n.DE, 08-Sep-2023, EUR 63.36), Overweight/Neutral, FC/J

**Shopify** (SHOP, 08-Sep-2023, USD 63.01), Equal Weight/Positive, CD/J/U

**Snap, Inc** (SNAP, 08-Sep-2023, USD 9.39), Overweight/Positive, CD/CE/E/J/K/L/N

**Spotify Technology S.A.** (SPOT, 08-Sep-2023, USD 155.47), Overweight/Positive, CE/J

**Squarespace, Inc.** (SQSP, 08-Sep-2023, USD 31.52), Equal Weight/Positive, CE/J

**Stitch Fix** (SFIX, 08-Sep-2023, USD 3.98), Equal Weight/Positive, CE/J

**THG plc** (THG.L, 08-Sep-2023, GBp 85), Equal Weight/Neutral, E/J/K/L/M/N/Q

**Take-Two Interactive Software** (TTWO, 08-Sep-2023, USD 142.77), Overweight/Positive, CD/CE/J

**ThredUp Inc.** (TDUP, 08-Sep-2023, USD 3.36), Overweight/Positive, CE/FA/J/K/M

**Trainline plc** (TRNT.L, 08-Sep-2023, GBp 238), Underweight/Neutral, CD/J

**Tripadvisor Inc.** (TRIP, 08-Sep-2023, USD 15.67), Underweight/Positive, CD/CE/FA/FB/J/K/M/N

**Uber Technologies Inc.** (UBER, 08-Sep-2023, USD 47.24), Overweight/Positive, CD/CE/D/E/J/K/L/M/N

**Unity Software Inc.** (U, 08-Sep-2023, USD 37.68), Equal Weight/Positive, CD/CE/J

**Victorian Plumbing Plc** (VIC.L, 08-Sep-2023, GBp 80), Overweight/Neutral, J/K/L/N/Q

**Wix.com Ltd.** (WIX, 08-Sep-2023, USD 93.07), Equal Weight/Positive, CD/CE/E/J/L

**Yelp, Inc.** (YELP, 08-Sep-2023, USD 43.67), Underweight/Positive, CE/J

**Zalando SE** (ZALG.DE, 08-Sep-2023, EUR 25.08), Equal Weight/Neutral, CD/J/K/M

**Ziff Davis Inc** (ZD, 08-Sep-2023, USD 64.74), Equal Weight/Positive, CD/CE/J/K/N

**Zillow, Inc.** (ZG, 08-Sep-2023, USD 49.63), Underweight/Positive, CD/CE/J

**ZipRecruiter, Inc** (ZIP, 08-Sep-2023, USD 14.99), Overweight/Positive, CD/CE/J

**eBay, Inc.** (EBAY, 08-Sep-2023, USD 43.43), Overweight/Positive, CD/CE/J/K/M/N

**eDreams ODIGEO SA** (EDRE.MC, 08-Sep-2023, EUR 6.40), Overweight/Neutral, CD/D/E/FA/J/K/L/M/N

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In addition to the stock rating, we provide industry views which rate the outlook for the industry coverage universe as Positive, Neutral or Negative (see definitions below). A rating system using terms such as buy, hold and sell is not the equivalent of our rating system. Investors should carefully read the entire research report including the definitions of all ratings and not infer its contents from ratings alone.

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**Overweight** - The stock is expected to outperform the unweighted expected total return of the industry coverage universe over a 12-month investment horizon.

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**Positive** - industry coverage universe fundamentals/valuations are improving.

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**Negative** - industry coverage universe fundamentals/valuations are deteriorating.

Below is the list of companies that constitute the “industry coverage universe”:

#### European Internet

About You Holding SE (YOUG.DE)	ACAST (ACAST.ST)	Adevinta (ADE.OL)
Allegro (ALEP.WA)	ASOS plc (ASOS.L)	Auction Technology Group PLC (ATG.L)
Auto1 (AG1G.DE)	AutoTrader (AUTOA.L)	Boohoo (BOOH.L)
Deliveroo PLC (ROO.L)	Delivery Hero (DHER.DE)	eDreams ODIGEO SA (EDRE.MC)
HelloFresh SE (HFGG.DE)	Hemnet (HEM.ST)	IONOS (IOSn.DE)
Just Eat Takeaway (JETJ.L)	Just Eat Takeaway (TKWY.AS)	MoneySupermarket (MONY.L)
Naspers (NPNJn.J)	Prosus N.V. (PRX.AS)	Rightmove Plc (RMV.L)
Schibsted ASA (SBSTA.OL)	Scout24 (G24n.DE)	THG plc (THG.L)
Trainline plc (TRNT.L)	Zalando SE (ZALG.DE)	

#### European Media

4imprint Group (FOUR.L)	Ascential plc (ASCL.L)	ATRESMEDIA (A3M.MC)
Byggfakta Group (BGNH.ST)	CD Projekt (CDR.WA)	Embracer Group (EMBRACb.ST)
Eutelsat Communications (ETL.PA)	Future PLC (FUTR.L)	Informa PLC (INF.L)
Interpublic Group of Companies (IPG)	ITV Plc (ITV.L)	JC Decaux SA (JCDX.PA)
Keywords Studios (KWS.L)	Lagardere SA (LAGA.PA)	M6-Metropole Television SA (MMTP.PA)
MediaForEurope (MFEA.MI)	MediaForEurope (MFEb.MI)	Omnicom Group Inc. (OMC)
Pearson plc (PSON.L)	ProsiebenSat. 1 Media SE (PSMGn.DE)	Publicis Groupe SA (PUBP.PA)
Reach PLC (RCH.L)	RELX PLC (RELL)	RTL Group SA (RRTL.DE)
S4 Capital (SFOR.L)	SES SA (SESFd.PA)	Stillfront Group (SFRG.ST)
Ströer SE & Co. KGaA (SAXG.DE)	Television Francaise 1 SA (TFFP.PA)	Ubisoft Entertainment SA (UBIP.PA)

Universal Music Group (UMG.AS)  
WPP (WPP.L)

Vivendi SA (VIV.PA)

Wolters Kluwer NV (WLSNc.AS)

### U.S. Internet

1stDibs Inc. (DIBS)	Activision Blizzard, Inc. (ATVI)	Airbnb Inc. (ABNB)
Alphabet Inc. (GOOGL)	Amazon.com, Inc. (AMZN)	Booking Holdings Inc. (BKNG)
Chewy, Inc. (CHWY)	Compass Inc. (COMP)	Corsair Gaming, Inc. (CRSR)
DoorDash, Inc. (DASH)	Duolingo, Inc. (DUOL)	eBay, Inc. (EBAY)
Electronic Arts, Inc. (EA)	Etsy Inc (ETSY)	Expedia Inc. (EXPE)
GoDaddy Inc. (GDDY)	Groupon, Inc. (GRPN)	IAC/InterActiveCorp (IAC)
LegalZoom.com, Inc. (LZ)	Lyft, Inc. (LYFT)	Match Group, Inc. (MTCH)
MercadoLibre (MELI)	Meta Platforms, Inc. (META)	NerdWallet, Inc. (NRDS)
Nerdy, Inc. (NRDY)	Outbrain, Inc. (OB)	Peloton Interactive, Inc. (PTON)
Pinterest, Inc. (PINS)	Rent the Runway, Inc. (RENT)	Revolve (RVLV)
Roblox Corporation (RBLX)	Shopify (SHOP)	Snap, Inc (SNAP)
Spotify Technology S.A. (SPOT)	Squarespace, Inc. (SQSP)	Stitch Fix (SFIX)
Take-Two Interactive Software (TTWO)	ThredUp Inc. (TDUP)	Tripadvisor Inc. (TRIP)
Uber Technologies Inc. (UBER)	Unity Software Inc. (U)	Wix.com Ltd. (WIX)
Yelp, Inc. (YELP)	Ziff Davis Inc (ZD)	Zillow, Inc. (ZG)
ZipRecruiter, Inc (ZIP)		

### UK Mid & Small Cap Leisure/Consumer

Domino's Pizza UK & IRL PLC (DOM.L)	Dr. Martens Plc (DOCS.L)	Dunelm Group plc (DNLM.L)
Greggs plc (GRG.L)	JD Sports Fashion plc (JD.L)	JD Wetherspoon (JDW.L)
Marston's (MARS.L)	Mitchells & Butlers Plc (MAB.L)	Restaurant Group (RTN.L)
The Gym Group (GYM.L)	Victorian Plumbing Plc (VIC.L)	Watches of Switzerland Group (WOSG.L)
WH Smith (SMWH.L)		

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