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White Paper

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Regulating Big Tech in Europe:

Why, so what, and how understanding their business models and ecosystems can make a difference

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Abstract

Europe is currently undertaking a frenzy of regulatory action against Big Tech. But the question arises: what will be the actual impact on Big Tech, and how will it actually improve the tech ecosystem in Europe? On the one hand, it is clear that the rise of very large digital platforms and their ecosystems raises new regulatory challenges, as existing tools are unfit to grapple with true power in the digital economy. On the other hand, it also is clear that geopolitics is driving much of the debate, with the EU reacting with profound scepticism to firms based in the USA, which also engage in unfair practices. How do these two driving forces combine to drive regulatory action? What are the key issues raised, and where do we see the power of Big Tech (and in particular, GAF – Google, Apple and Facebook) manifest in Europe? What are the current regulations likely to achieve, and how much might GAF be affected? While other Big Tech firms like Amazon surely deserve a closer look, we focused on firms with a disproportionate impact on media- and focus on information.

This white paper draws on an extensive project that engaged senior leaders in policy, politics, tech, industry, regulation, consultancies and academia, and also involved deep dives into how the current regulatory fervour might affect GAF, focusing on their business models and their ecosystems of complementors. We report on our expectation for the impact of regulations on GAF: limited, yet not trivial. We argue that the current regulatory discussion is missing two vital elements: an understanding of Big Tech business models, and an appreciation of how regulation will affect the broader ecosystem, both of which we review. We then consider what principles should underpin regulation, stressing the role of business models, monetization and the use of data. We argue that Europe's best interests lie in a level playing field on the regulatory side, which allows fair competition between participants from Europe, as well as the US and China, coupled with a solid set of principles on business models. Finally, we suggest that neither competition policy nor geopolitically motivated restrictions will suffice to address the real malaise underlying European tech: proactive strategies from industrial leaders alongside a thriving and open ecosystem of tech participants will be equally important in building the foundations for future success.

Executive Summary

The problem with Big Tech

- In recent years, Big Tech firms such as Google, Apple and Facebook ('GAF') have become even more powerful, partly helped by our reliance on technology during the pandemic. This has raised concerns over competition, user choice, privacy and even the health of our democracy.
- The EU, also concerned about staying behind technologically, is making a concerted effort to rein in the power that Big Tech has over consumers, data and commercial partners, but there is a limited understanding of how these new regulations will affect Big Tech.
- Clearly, current legislation is not up to the job, and the regulatory toolkit is ill suited to tackle issues of dominance in platforms and ecosystems. The EU is leading the way in crafting new regulation, some (DSA/DMA) just released, but to be debated until 2022.
- However, the regulations in prospect may not fix the problems either. Some are more motivated by geopolitics than technology or commerce, while others simply won't achieve the results that regulators are hoping for- as a result of lack of understanding of how Big Tech firms work and how their ecosystems are affected.

Competition and growth

- The EU's regulatory overdrive covers many initiatives (DSA, NCT, Market Definition, e-Privacy, etc) and is aimed at two themes: competition (i.e., fairness) and growth.
- In terms of competition, the concern is that Big Tech firms exploit final customers or the complementors (such as app developers) who support their ecosystems.
- On growth, the problem is the lack of key platform firms based in the EU. US tech giants such as GAF dominate the consumer market, the major B2B cloud providers are US-based or Chinese, and hardware (increasingly bundled with software) comes from Asia.
- The EU feels cornered by the US/China conflict (amplified by Trump) and much initiative appears driven by the quest for digital sovereignty, which some take to mean European rules, others European champions. Brexit has increased the Franco-German influence in the debate.

New tasks demand new tools

- We need new ways to think about Big Tech. The neoclassical economic model, with its neatly divided markets, doesn't always give a clear view of what is really happening today.
- Big Tech firms are the orchestrators of ecosystems based on tech platforms. They both deliver linked services across multiple markets and rely on many different partner firms ('complementors') to deliver value for the end customer. This power differs by nature from that of traditional 'big firms' of the past, as regulators are now recognizing.

- If we want to regulate such Big Tech platform owners effectively, we must understand how they make money and exert power. Otherwise, we risk treating the symptoms rather than addressing the cause, and we will be unable to gauge the impact of regulation.

Understanding Big Tech: Business Models & Data

- Much of this debate seems to ignore the differences between the Big Tech, and the exact nature of their business models. To design regulation, we need to understand Big Tech monetization and track ecosystem impact.
- The ability to create a deep understanding of customer's interests, the breadth of activities covered and the time customers spend engaging with Big Tech are the key drivers of their success. These draw on data to enable customer targeting, but each Big Tech leverages this information and exploits the depth and breadth of its access in a different way.
- The business models of both Google and Facebook depend directly on data that customers generate. While Apple is less reliant on data directly, it still profits from a huge fee ($10bn+) that Google pays to be the default search engine on Apple devices- leaving Google to do the "dirty work" of using the data and learning from it.
- Apple focuses on keeping its customers within its own 'walled garden': an exclusive ecosystem built on its own hardware, covering an expanding scope. Complementors such as app developers help to enhance this experience and pay a significant price (such as a 30% fee to the App Store) for access, with restrictive terms.
- Facebook and Google, meanwhile, leverage their users' engagement with various downstream services to generate advertising revenue. Google gathers data from its own services, complementors and Android phones, while Facebook combines data from its online properties (including Instagram and WhatsApp) plus user activity across the web. While much of the advertising revenue is often generated on 'contextual data' (as is the case for Google), collection of data in this vertical provides an incredibly vast but at the same time detailed picture of users' priorities and preferences that allows advertisers to target customers effectively with other advertising products/verticals- and pay Big Tech for it (while Big Tech is also active in the advertising value chain).
- Other Big Tech like Amazon also sponsor numerous platforms and benefit from extensive customer information; yet the fact they are directly related to e-commerce and bridge the digital and physical world (offering infrastructure and fulfilment) mean that a detailed business model analysis would go beyond the scope and resources for this project.

Why Big Tech is so powerful

- For consumers, having their preferences and habits known is a double-edged sword. On the one hand, it allows Big Tech to bring them highly customised and convenient services. But on the other, it may restrict their choices, as there is a fine line between convenience and lock in.
- We can see the impact of Big Tech in the EU through the transformation of advertising, where it accounts for roughly 70% of digital advertising revenues, with dramatic repercussions for

other ecosystem participants. For instance, publishers' funding model has been crippled, threatening the free press and independent reporting that underpin our democracy.

- Digital platforms' economics, bundled with strategy, allow a handful of firms to become supremely powerful. Their data-driven network effects create 'winner-take-all' dynamics. Firms who become 'gatekeepers' can make themselves into a 'bottleneck' between users and their environment – then exploit that position.
- Big Tech firms build multi-product ecosystems and exploit their unparalleled knowledge of consumers to strengthen their advantage. By hanging on to users' data, and broadening their scope, they can woe them in, making it effectively impossible to switch to a rival service.
- Big Tech also builds multi-actor ecosystems collaborating with many smaller firms that depend on them. For such complementors, the problem is that Big Tech may increasingly represent the only possible way to access a market. The Platform-to-Business (P2B) regulation of 2020 aimed to set fairer rules for them, but its success remains to be seen.

How will the regulation affect Big Tech? Deep Dives in Facebook and Google

- Regulation currently debated (in particular, the Digital Services Act and the Digital Markets Act, whose first version was unveiled on December 15), and other regulations such as e-Privacy each tackle slightly different and related topics, which we review in more depth in the paper.
- The proposed regulation is aimed at curbing unfair practices, encouraging competition and improving Europe's position. But what impact will it actually have on Big Tech? Our paper provides a novel analysis of Big Tech's business model, and thus of the way they might fare.
- For instance, stricter privacy regulation will make it harder for Facebook to deliver hyper-targeted advertising by gathering user data from across the web. In response, it might downplay or even divest its wider Audience Network, which accounts for 20% of total ad revenues.
- If Facebook had to share its data with third parties, it might face new competitive pressures in the future. However, its core 'walled garden' offering would probably remain intact, as would its user base and its ability to maximise their 'eyeball time' on its properties.
- Overall, then, Facebook might find it tedious to comply, but it will probably not be hugely affected by regulatory challenges, because they do not significantly affect its core business model.
- Like Facebook, Google makes most of its money from ads. Its ability to gather ultra-fine-grained data from users of its widely used free services allows it to deliver a best-in-class contextual or hyper-targeted advertising product.
- Google may suffer if regulations ultimately prevent it from self-preferencing its products – for example, by making Google the default search engine on Apple products, or by showing Google Maps as the first result for a search. While Google would still catch a huge volume of online traffic, it would lose some opportunities to steer users towards its own offerings.
- DMA regulations aim to give users more choice in terms of search, by sharing Google's click and query data under fair terms. However, Google would still offer the best search engine available, and users would still have to make an effort to switch.

- Overall, Google arguably faces more challenges than Facebook from regulation – but its core business, advertising, will probably not be seriously harmed.
- In its defence, Big Tech might argue that if it is hampered by regulations, it will no longer be able to deliver valuable innovations. However, other firms might be able to deliver them instead – plus the 'innovations' Big Tech has in mind might simply lead to even more user lock-in, or even less competition.
- In considering future regulation, it is worth reflecting on the past. The GDPR was meant to protect consumers – but it inadvertently allowed Google to require publishers to obtain users' consent for data sharing, while remaining the 'controller' of the data itself. So Big Tech doesn't just withstand regulations; it can thrive on them.

How will the regulations affect other players? Understanding ecosystem impact

- The objective of regulation is to improve the plight both of the final consumer, and of the smaller complementors working with Big Tech ecosystems. However, there is little systematic analysis of the impact these regulations have- which is what we offer.
- The theory is that new regulations would create more of a 'level playing field', where Big Tech firms compete more directly with each other. While smaller players still could not challenge them, they might be able to compete more in downstream services, such as video and audio streaming.
- The impacts, though, are very unevenly distributed. Small publishers, e.g., are likely to lose out from the regulation, because curbs on data sharing and consent could curtail their ad revenue. Larger publishers with their own subscriber base may fare better.
- Also, regulations might backfire. For instance, privacy regulations that restrict data sharing might actually end up reinforcing 'walled garden' ecosystems, by making them even more closed off.
- Complementors who are reliant on Big Tech may also suffer, unless they have non-advertising revenue to fall back on.
- Hardware complementors, mostly based in Asia, are an interesting case. Huawei, banned by Trump from the Google Mobile Services ecosystem, had to resort to its own operating system (Harmony OS) and seems to be positioning itself as a flexible alternative to Google. Yet, while it does not monetize data, it still faces Western suspicion even in its device business (i.e., not network equipment).
- The Huawei device example raises a broader point. Should we regulate actors based on their country or origin and geopolitics, or on the business models which drive their incentives?

What regulators need to do

- To tame Big Tech, regulators need to stay focused on business models, monetization, data and their implications for competition and welfare. Otherwise, there's a real danger of being side-tracked by geopolitics, or missing the broader, ecosystem view.

- What is at stake are fundamental questions about users' rights, data ownership, access to information and Big Tech's power over other firms. To answer them, we need to stay ruthlessly focused on which business practices and models are appropriate – and which are not. We may also need to revisit some of the definitions used- such as what constitutes a gatekeeper platform, where the focus may need to broaden to consider the multi-product ecosystem role and structural features of gatekeeper power.
- Europe naturally wants to reassert its power in a fiercely competitive market. At the same time, it wants to humanise the digital world by putting strict limits on the use of data, shaping how people and machines work together, and it could shape the future of global tech regulation through the "highest common denominator" principle, as Tech firms will probably want to conform to *all* key jurisdictions' desires.
- The EU also wants to achieve industrial superiority in the digital world, which we argue should happen explicitly, without mixing up geopolitics and competition regulation, as we risk doing now. It's an exciting challenge – and an exciting path ahead.
- The next two years will see significant negotiations within the EU as the European Parliament and Nation-States negotiate the final version of the regulations, while the regulatory appetite seems to be growing in the US and elsewhere- including China. Understanding how regulations relate to Big Tech business models and to their ecosystems should be useful, though we expect politics to play a key role in these debates.

This project- method and approach

- This report summarizes work done by Evolution Ltd drawing on archival work and literature search, financial data and analyst reports, and regulation analysis. We focused on GAF to preserve focus; other firms like Amazon, but also Netflix, Microsoft, Spotify are also worthy of analysis, each with their own business model, monetization, strategy and regulation concerns
- We also engaged in 70 in-depth interviews with senior executives in Big Tech firms, complementors, entrepreneurs, senior executives, techies, analysts, industry and advertising lobbyists, senior regulators (NRA & EU), competition law experts, anti-trust lawyers, EU and global policymakers (EP, EC, OECD), politicians including MEPs and academics.

Setting the context: Big Tech competitive dominance and economic nationalism

The last few years have seen explosive growth in the power of platform-based firms, which now occupy all of the top-five spots in terms of market capitalization worldwide, and their ecosystems.[1] Platform firms, aka Big Tech, have grown even stronger through the COVID-19 crisis, as we have all become ever more dependent on our smart devices to stay connected with our personal and professional worlds.[2][3] Big Tech firms such as Google, Apple and Facebook ('GAF') have undoubtedly brought users great convenience in the form of an ever-increasing array of services – offered both by themselves, and by a set of co-specialized ecosystem participants. However, they have also become significantly more powerful and posed significant challenges to competition. Thus, the last two years have seen vigorous debate about whether the frameworks, laws and regulations currently in place are sufficient to address this new type of threat to market competition. It is becoming clear that in order to assess market power, we may need something beyond traditional metrics that consider one market at a time, with clearly defined boundaries, and rely on focused market-definition tests and the core neoclassical model of economics. While the Big Tech firms themselves, and a few pundits and researchers, assert that their success is the natural result of their own commercial prowess, there is growing unease about platforms' increasing dominance and potential abuse of their position. The key concern lies in our ability to identify and address how platform firms restrict competition and potentially limit innovation, to the detriment of both final consumers and firms that participate in the ecosystems that Big Tech controls.[4]

In 2019, three influential reports considered why digital competition is different from traditional competition: the Stigler Report in the US, the Furman Report by the UK Treasury (HMRC) and the Data Report from the EU. All three identified significant shortcomings in analysis, monitoring and regulatory enforcement, and pointed to the need for a new, or at least stronger approach.[5] Since then, Big Tech's meteoric growth, lateral expansion and acquisitive appetite have only added more weight to calls for a 'New Platform Deal'.[6] Yet there are also broader societal

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[1] For a definition of digital platforms and ecosystems, see the World Economic Forum White Paper on the topic: Jacobides, M.G., Sundararajan A., Van Alstyne, M. 2019, *Platforms and Ecosystems: Enabling the Digital Economy*, World Economic Forum White Paper, March. On their power Jacobides, M.G., Amazon's Ecosystem Grows Bigger And Stronger By The Day. Should We Be Worried?, Forbes.com, May 9.

[2] For indicative references, see Cusumano, M.A., A. Gawer, and D.B. Yoffie, 2019. The business of platforms: Strategy in the age of digital competition, innovation, and power. *New York: Harper Business* and Iansiti, M., Lakhani, K.R., 2020. *Competing in the Age of AI: Strategy and Leadership when Algorithms and Networks Run the World*. Harvard Business Review Press.

[3] This dependence on big tech was also reflected in the disruption to professional & personal commitments following Google's technical break-down on 14th December 2020.

[4] For Big Tech supporters, see Voelcker, S. and Baker, D. ,2020. *Why There Is No Antitrust Case against Apple's App Store: A Response to Geradin & Katsifi.* (July 26) Available at SSRN; Bitton D.S and S. Lewis, 2020. *Clearing up Misconceptions about Google's Ad Tech Business*, ACCC Submission, May 5. For more critical voices, consider Khan, L., 2019. "The Separation of Platforms and Commerce". *Columbia Law Review* 119(4): 973, or, more moderately, Gal, M, Petit, N 2020. "Radical Restorative Remedies for Digital Markets", Working Paper, CPI

[5] See Digital Competition Expert Panel, UK, 2019, *Unlocking Digital Competition: Report of the Digital Competition Expert Panel.* online; Cremer, J, de Montjoye, Y-A, Schweitzer, H, 2019. Competition Policy for the Digital Era. *European Commission Directorate-General for Competition,* online*;* Scott Morton, F., Bouvier, P., Ezrachi, A., Jullien, A., Katz, R., Kimmelman, G., Melamed, D. and J. Morgenstern, 2019, *Committee for the Study of Digital Platforms, Market Structure and Antitrust Subcommittee,* online.

[6] See Jacobides, M.G. 2020. Big Tech: Time For A 'New Platform Deal'?, Forbes.com, July 30

concerns, such as social media's corrosion of the democratic process, or Big Tech's power to cultivate dependency and increase consumption at the expense of consumer welfare.[7] Perhaps the most evident challenge, to which we will return, is the existential threat to news outlets and publishers, who have traditionally played such a crucial role in the democratic process.

Separately, economic nationalism has run rampant in the last few years. In 2016, the joint shock of Brexit and the Trump presidency, with its unabashedly nationalistic tone, shattered the previous trend towards ever-deepening international collaboration, which involved significant division of labour in the technology sector. China has been transformed from a backward country where IPR was not respected to a technological powerhouse. As China's own tech giants emerged in the late 2010s, the sheer volume of patenting from China, especially in sensitive areas like AI or advanced telecommunications, overtook both the EU and the US. For Western firms, concerns over IP theft were overshadowed by a simple fear of being surpassed by China. Détente has devolved into mutual suspicion, and concerns over national position are paramount.

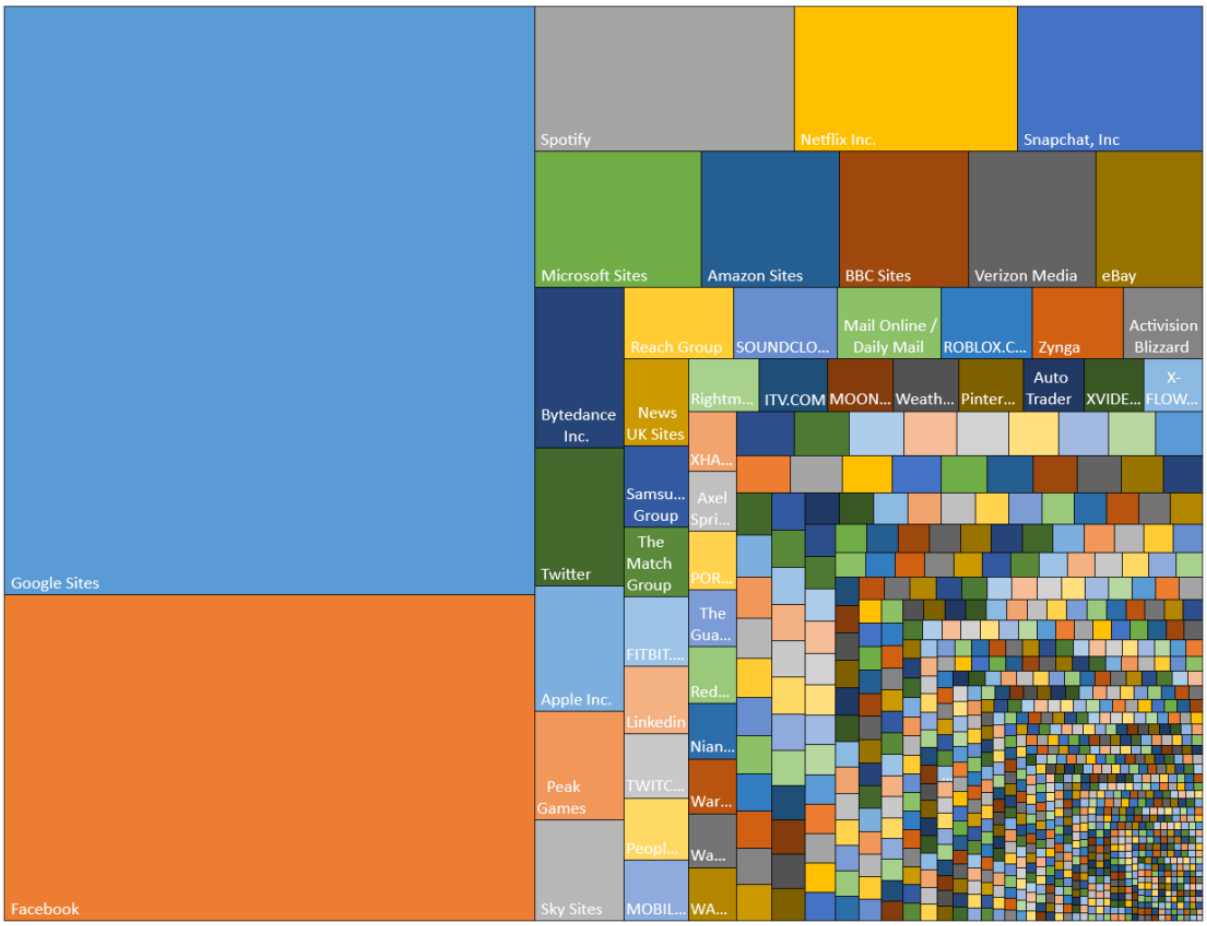
This process has fomented a deep technological divide. Huawei was in the ascendant, especially in terms of telecommunications transmission equipment (particularly in 5G, where neither Europe nor the US could really challenge). But then the Trump administration, concerned with national security, shook the status quo. Pushing the limits of extra-territoriality, the US forced its allies to sever their relationships with Huawei. America's willingness to use rules reserved for organizations supporting terrorism reinforced the notion, on both sides of the Atlantic, that this was nothing less than a technology war. The hostilities intensified when the US took aim at the consumer side of Huawei, cutting it off from the Android (Google-led) ecosystem. This effectively obliged Huawei to create its own, China-based ecosystem (HongMeng/Harmony OS and Huawei Mobile Services (HMS)) – ironically, risking Google's dominance in mobile operating systems for the sake of a salvo in the trade war.[8]

This set up the context for a different set of priorities. EU politicians were becoming uncomfortably aware that Europe was falling behind in terms of technology. It was losing ground in telco, in platform-based businesses and also, increasingly, in AI – despite its claims to be on the cutting edge. There were many variations at the level of individual countries and their polity – including the use of data for monitoring citizens. Such sensitive topics, so close to European liberal traditions, underscored the divides between the EU and China – but they also threw problematic practices at US firms into sharp relief. And all this was happening, as the figure below shows, with EU-based sites becoming increasingly insignificant in terms of customers' engagement with the web. While the data below reflects the UK only, it demonstrates the nature of the EU's digital problem more broadly.

[7] For selected references, consider Allcott H. Braghieri,L., Eichmeyer, S, Gentzkow, S. 2020 "The Welfare Effects of Social Media" *American Economic Review* 110(3): 629-76; Cohen J.E., 2019, *Between Truth and Power*, Oxford University Press; Zuboff, S. 2019, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, Profile Books.

[8] See Jacobides, M.G. 2019. Trump's Huawei Ban might Backfire Badly, *Financial Times* Opinion Column, June 9.

UK consumer time spent on top 1000 online properties



Source: Comscore MMX Multi-Platform, Total Digital Population, Desktop aged 6+, Mobile aged 13+, February 2020, UK. Adapted from CMA (Link)
https://assets.publishing.service.gov.uk/media/5fa557668fa8f5788db46efc/Final_report_Digital_ALT_TEXT.pdf

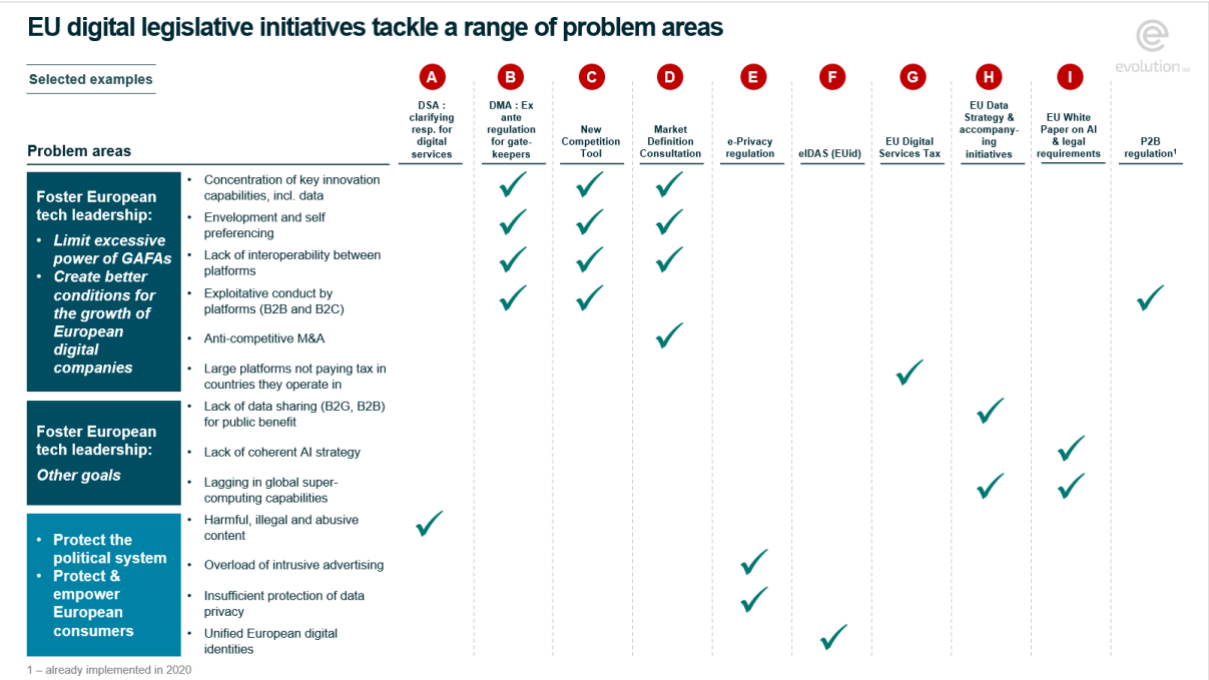
Notes: Top 1000 properties account for 83% of total user time spent online. * Where 'Google Sites' includes all Google owned properties e.g., YouTube and Google Search. †Where 'Facebook' includes Facebook, Instagram and WhatsApp.

A window on EU regulation: Explaining the 2020 regulatory push

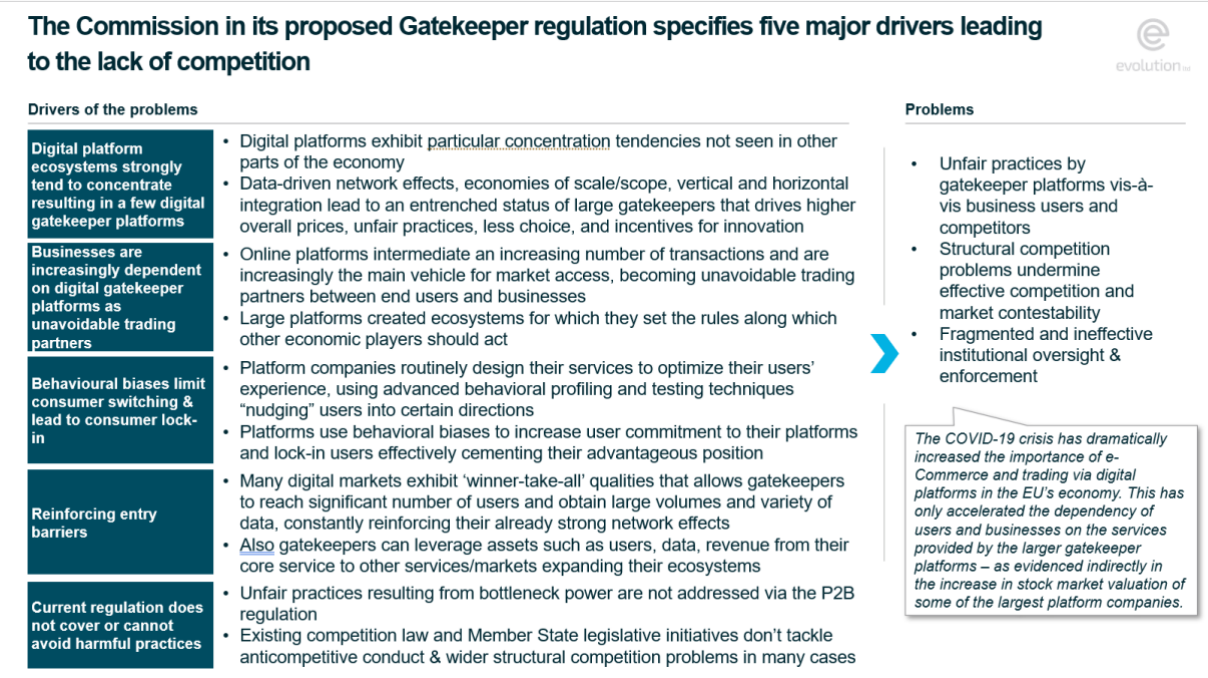
2020 has been a defining year in terms of the EU's approach to tech regulation. A new European Commission, with a more political mandate, has made it clear that tech and digital are a top priority. It wants to empower the European tech ecosystem, reshape the rules of the game in the digital space, and is determined to grapple with the increasing power of (non-EU) tech firms.[9] While the power of Big Tech has also raised concerns in the US, it is clearly harder for

[9] As indicated in a recent working document from the European Parliament, seven of the large platforms account for around 69% of the total €6 trillion platform economy (i.e., turnover that goes through digital platforms including marketplaces, social media, digital intermediaries, etc). The European Commission's Internal Market Commissioner Thierry Breton summarized it well in a September address to the European Parliament: 'This crisis has shown the role and the systemic character of certain platforms that often behave as if they were too big to care about legitimate concerns about their roles.'

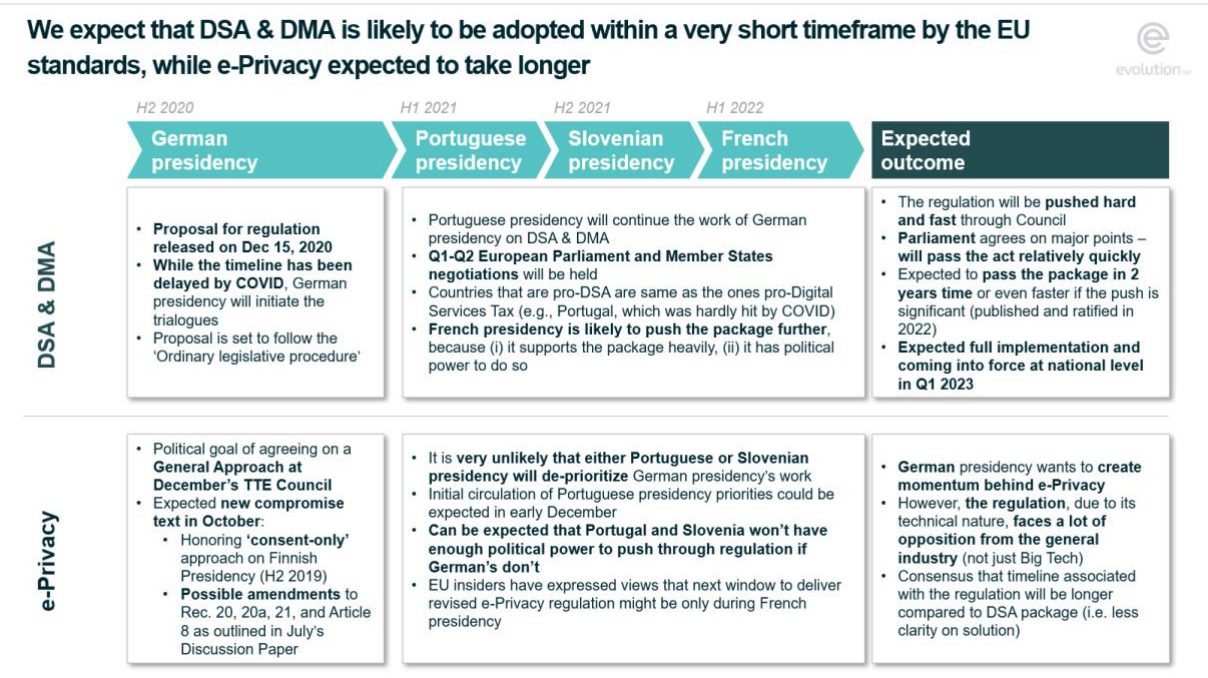
them to push back against their own global champions – which, incidentally, top the ranks of political lobbying spend in the US. Moreover, the EU has historically taken a firmer approach to tech power, using a broader conception of influence and market abuse – such as in the Microsoft case. Thus, we have witnessed a flurry of activity, among European countries and at EU level, with a particular focus on the Digital Services Act (DSA), Digital Markets Act (DMA) and the New Competition Tool (NCT). A whole host of new initiatives have been put forth, with the EU taking much stronger positions than many were expecting at the beginning of the year. Expectations are running high in several areas – not just levelling the playing field and fostering the European tech ecosystem but also, as it emerges from our discussions, raising the questions of geopolitical power, and the risks of dependencies on firms both American (software and services) and Chinese (hardware, infrastructure, IoT and AI). Traditionally, neoclassical economic approaches had made it difficult to tackle power in the context of platforms and their associated ecosystems, which often impose lock-ins and involve markets that can 'tip'. But the Commission's approach to these questions in 2020 seems to suggest a new and different way of looking at Big Tech. The graph below illustrates the current key initiatives undertaken by the EU relating to curbing the power of Big Tech.



These initiatives bridge two separate but linked objectives: competition and growth. In terms of competition, the concern is that platform orchestrators can exploit either final complementor or their final customers; when it comes to growth, the problem is the lack of key platform firms based in the EU. Competition-focused initiatives (i.e. DMA & NCT) cover a number of distinct but overlapping problem areas and drivers, summarized in the graphs above and below. These provide the context of the European concern with the current setup, both in terms of what activities are monitored and curtailed, and in terms of how the current European institutional setup operates.



Finally, while 15th December 2020 was an important date, as the initial DSA & DMA proposals have been put forth, these will be followed by an intense period of negotiations within the EU at the Parliament and the Council before these are amended and ultimately ratified. The Figure below summarizes our view on the possible timeline for the DSA, DMA, and the e-Privacy regulations that impinge on the digital sphere.



Let us now consider the EU's most pressing worries. First, there is mounting concern with competition and a need to accelerate tech innovation in Europe. This has galvanized the EU into action, and its traditional focus on data sovereignty, and individual rights, along with a drive

to create economic value through improved data sharing,[10] explicitly underpins this concerted effort. However, when we peel more layers from the onion, geopolitics come to the fore. The drive for the EU's 'digital sovereignty' reflects the sense among key politicians and policymakers that the global economy has moved from an industrial to a digital era, and that the EU's global economic leadership depends on its global digital leadership – or, at least, staying on par with the US and China. The concern is thus related both to the undue dominance of several major US tech platforms, and EU industry's growing inability to keep up with them. On the one hand, we have US tech giants dominating the B2C side, and US-based hyper-scalers (such as AWS, Microsoft Azure, Google and Salesforce.com) dominating the rapidly growing cloud market (where SAP is the only sizeable EU entry). On the other hand, Chinese tech giants such as AliBaba and Tencent, or equipment manufacturers like Xiaomi and Huawei, are also on the rise. Small wonder, then, that the EU feels itself marginalized – caught between a rock and a hard place.

Taking a step back, it is clear that this process has, if anything, been hastened by Brexit. While the UK has one of the more advanced national authorities in terms of digital competition, its departure from the EU has helped shift European discussions towards more proactive industrial policies. Currently, Franco-German collaboration is driving the conversation on multiple EU levels, going well beyond advocating for their own country-based champions (from SAP to Spotify). Philosophically speaking, a more traditionally interventionist approach seems to be gaining ground over the more 'pragmatic' policy approach of the Nordics or Anglo-Saxons, who have typically been in favour of 'smart' co-regulation with the industry.

The remainder of this White Paper sketches out where we are in the process, and focuses on some aspects that appear to be lacking in the current debate – which is driven by understandable political considerations, regulatory concerns, and questions of principle.

Our focus in this White Paper is on Google, Facebook and Apple not because other players, and in particular Amazon, are not a competitive threat; they surely are, and deserve close scrutiny. However, Amazon combines digital presence with significant presence in the logistical infrastructure of e-commerce, and also plays an important role in Cloud Services through AWS. Proper analysis would require significantly more depth than the scope for this project provides for. We thus opted to focus more narrowly, but thoroughly, on these three firms which also have a disproportionate impact on media and advertising (an area that other Big Tech are also increasingly attracted to).

In all, we take a pragmatic approach to explore what the current EU regulations mean (since they may become the "highest common denominator" that will drive the context for Big Tech), then consider how regulations may affect the key players, and what this will imply for other ecosystem actors.[11]

[10] European Commission is also stepping up efforts via the Data Governance Act (DGA) to ensure that the increased data flows between various stakeholders are secure by ensuring that management and processing of data falls in line with "European values".

[11] For the DSA/DMA regulations which were proposed by the EU Commission on December 15, 2020, see https://ec.europa.eu/commission/presscorner/detail/en/QANDA_20_2348 and https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/digital-markets-act-ensuring-fair-and-open-digital-markets_en

Insert: About this project

This project was undertaken by a Europe-based team with strong complementary skills. It draws on previous and parallel work done by Evolution Ltd focusing on the strategic challenges of platforms and ecosystems.[12] However, our focus in this first large-scale investigation was on understanding the nature of the EU regulatory landscape, as this has the potential to redraw the map of strategic opportunities within Europe, and reshape the prospects of the EU as a whole. Our investigation drew on the authors' involvement in academe, policy, and work with organizations such as the World Economic Forum,[13] and engagement with Big Tech firms, yet it represents our personal views on a complex and sensitive set of topics.[14] The project drew on a diverse team of Evolution Ltd affiliates.[15] We examined current regulatory, geopolitical and strategic dynamics, through research (including cutting-edge academic and industry work), online information and official and (quasi-publicly) leaked documents. More in-depth information came from a more than 70 in-depth interviews with leading experts and officials. We spoke with senior executives in Big Tech firms, their key complementors, from leading and entrepreneurial firms, officials from EU industry, industry and advertising lobby groups, senior regulators including Heads of National Regulatory Agencies and those involved at the EU level, competition law experts and anti-trust lawyers, EU and global policymakers (EP, EC, OECD), politicians (especially MEPs) and academia.

Understanding Big Tech Business models and their reliance on data

To understand Big Tech regulation and its impact, we must first 'follow the data'- and, more important, to consider how Big Tech is aimed at a better understanding of consumer patterns, which can both drive customer satisfaction, and increase the chances customers are locked in. As such, data use is a key component in Big Tech's business models: it is one of the main sources of their prosperity and quite often also the primary target of legislative interventions. For simplicity, we will focus on Google, Apple and Facebook ('GAF') – both individually, and in terms of their mutual interactions.

First, we see that Google and Facebook have business models that primarily depend on user engagement, data and data flows. Having said that, with Apple's largest growth driver have been services; and, within services, about a third relate to a massive payment from Google. This payment (the "TAC deal") is estimated at USD 10–15 billion annually, goes straight to its

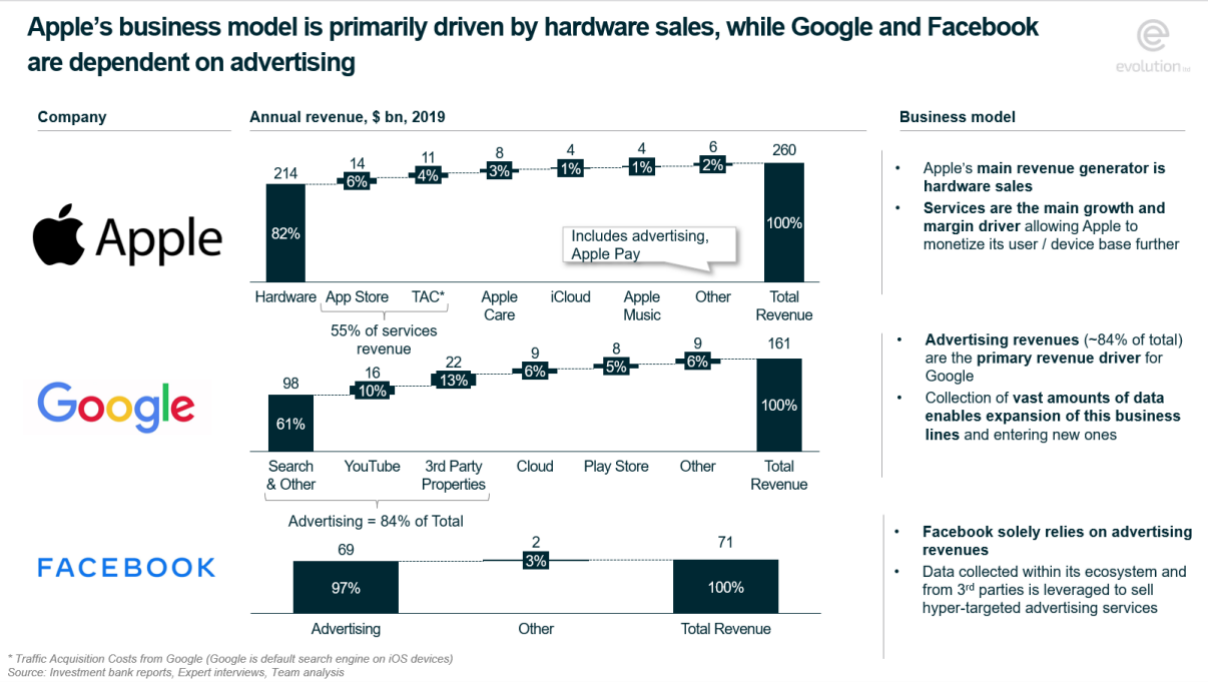
[12] See Jacobides, M. G. S. Levi, J Tas, 2020, First Steps, Far to Go: The Promises and Pitfalls of Platforms and Digital Ecosystems in Healthcare, White Paper, Evolution Ltd, and Evolution Ltd's Ecosystem Development Framework, 2020, both available at https://www.evolutionltd.net/thought-leadership.

[13] See, for instance, the workshop on regulating platforms and ecosystems, co-organized by London Business School and UCL's Centre for Competition Law, under the auspices of the World Economic Forum, which took place in London on February 27-28, 2020, and panels organized by the lead author in the 2020 Academy of Management, the Strategic Management Society meetings, or events hosted by academic institutions and leading firms.

[14] EvolutionLtd has received funding for research projects from a variety of organizations, including some mentioned in this report, though they have not affected our views. For a list of clients, see www.EvolutionLtd.net

[15] Part of the team that helped structure this report were Kriss Cerpins and Nikita Pusnakovs, Consultant and Engagement Manager for this study, supported by Harsha Potluri, Analyst. A team of specialists including Marie Markosian, Policy Expert; Spiros Tassis, Legal and Data Privacy Advisor and Michalis Vafopoulos, Data Science Advisor, contributed to the project.

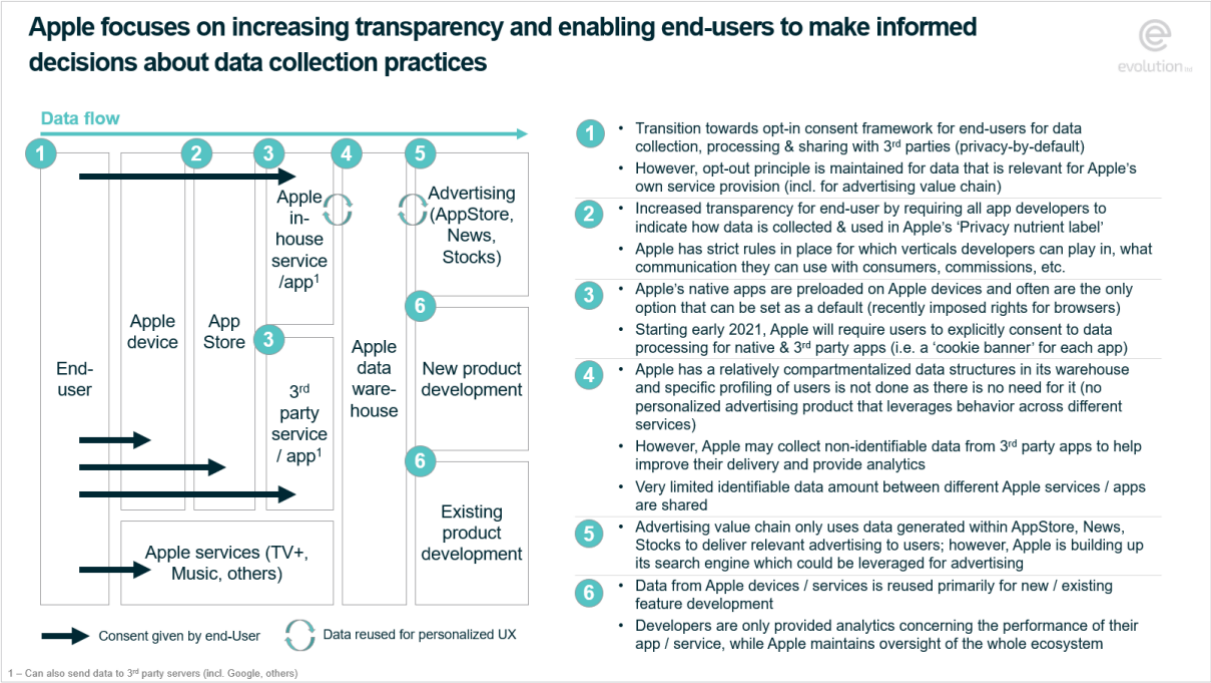
bottom-line and is intended to preserve Google's search dominance within Apple's ecosystem. On average, about 20%–30% of Big Tech revenues come from Europe, or EMEA.



Taking a closer look at GAF's individual business models, we can clearly see that while they are very distinct, they are also complementary in terms of how they use data, and how they create value from advertising or information.

Starting with Apple, its primary focus is on keeping clients engaged and spending time within its own ecosystem. Apple builds walled gardens on the foundation of its own *hardware* products. Having done so, it created the App store as a means to broaden the range of the Apps that could be provided, and where they lacked the capability or focus to compete. However, Apple has engaged in both some Apps and associated services, and it has tried to cement its hold on the customers by engaging in self-preferencing (i.e., preferentially promoting and in some cases protecting its own services, such as Apple Music, from competitors like Spotify). Apple's services had a mixed record to date and it actively engages with complementors while being mindful of ecosystem robustness and customer experience. Leveraging the "locked in" final customers, Apple treats its complementors quite aggressively, thus enhancing its own revenues while maintaining a tight grip on its ecosystem as evidenced from Epic Games (i.e., Fortnite) recent lawsuit against Apple and the concern with the 30% fees charged by its AppStore.[16] For a brief (non-exhaustive) outline of data flows within Apple's ecosystem, see figure below.

[16] See Jacobides ,M.G. 2020, *What Drives and Defines Digital Platform Power? A framework.* Evolution Ltd White Paper, forthcoming https://www.evolutionltd.net/thought-leadership. For other concerns raised by Apple by the complementors, see Coalition for Fair Apps (https://appfairness.org/)

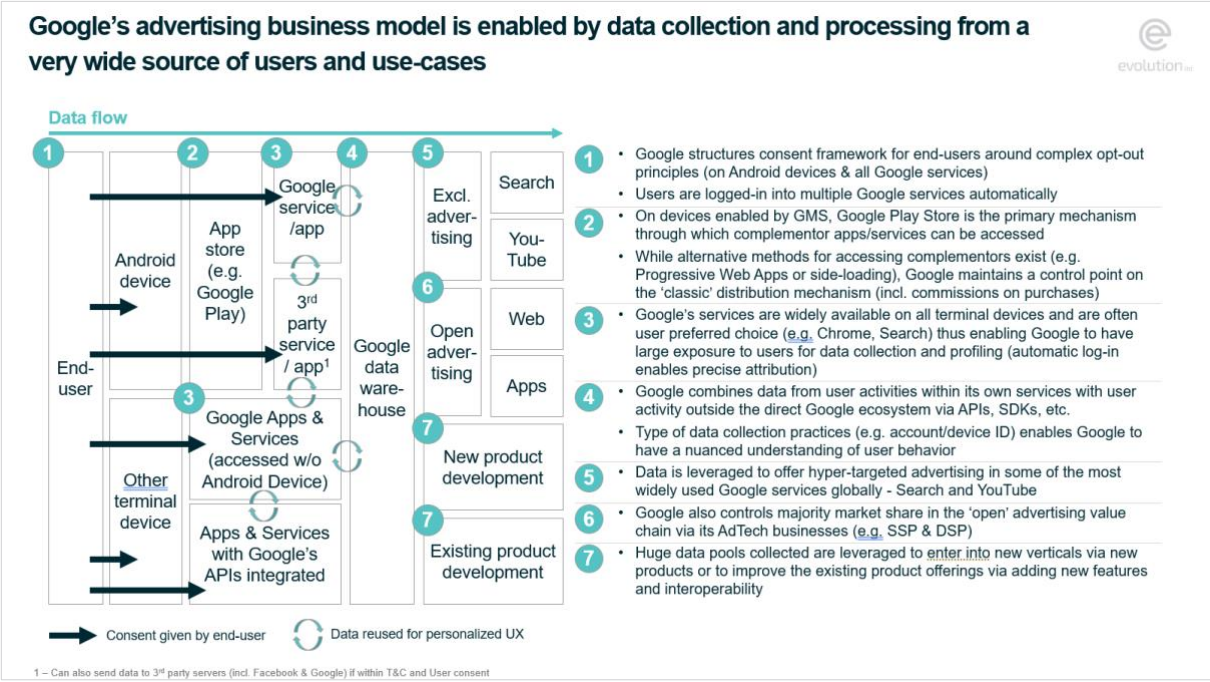


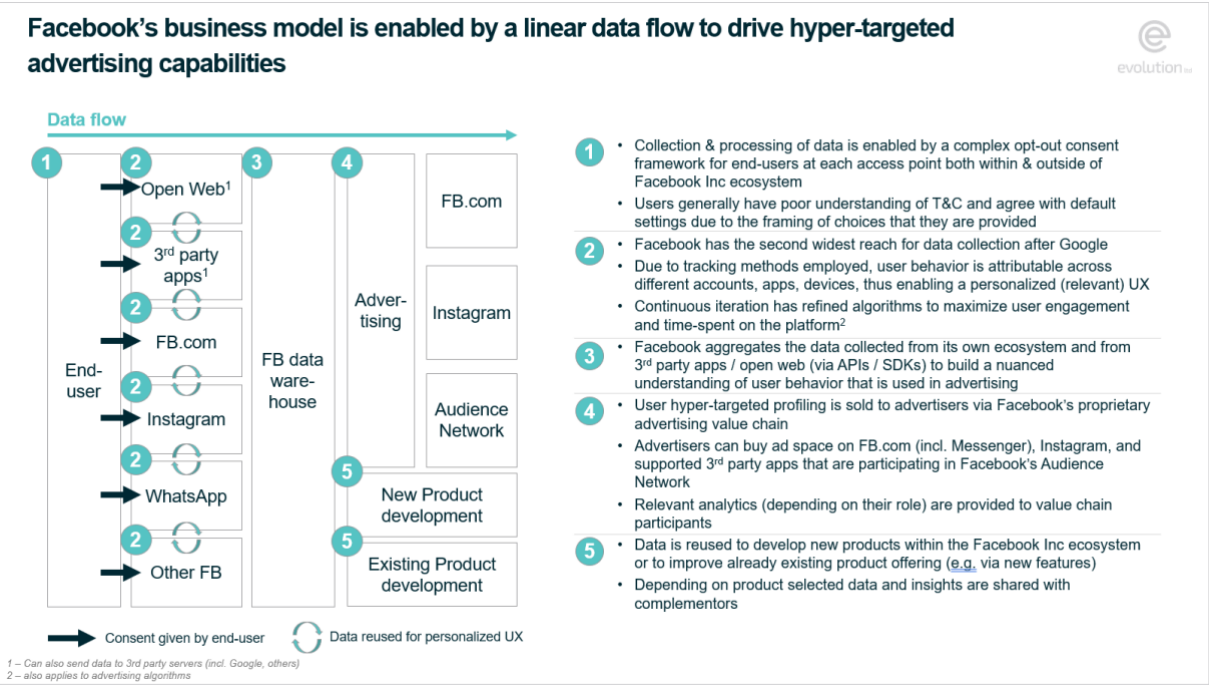
Facebook and Google, on the other hand, do not rely on hardware to monetize their advantage. Instead, they leverage their users' engagement to create advertisement-based revenue, which then translates into cash flow. Google gathers a remarkable amount of information, not only from users' search activities, but also from the information that Android phones (which use Google's Mobile Services, or GMS) send over on a wealth of users' activities, which in turn provides Google with real-time granular information. All this insight is enhanced still further by data that Google's complementors provide when they use its Software Development Kits (SDKs)[17] and Application Programming Interfaces (API).[18]

Facebook combines data from all of its digital properties, including Instagram and WhatsApp, generating granular information that is then used to generate revenues from selling hyper-targeted access of to advertisers. Like Google, Facebook creates significant value for itself through interactions with complementors, gathering information from a wider realm (using SDKs & APIs) – any time a user 'likes' something, even outside Facebook, information on their usage pattern is sent to Facebook, which then sells it on indirectly to advertisers via user profiling capabilities.

[17] A software development kit (SDK) is a collection of software development tools in one installable package. They facilitate the creation of applications by having compiler, debugger and perhaps a software framework. They are normally specific to a hardware platform and operating system combination. For example, the development of an Android app on the Java platform requires a Java Development Kit, and the orchestrators of big digital ecosystems provide them.

[18] An application programming interface (API) is a computing interface that defines interactions between multiple software intermediaries. It defines the kinds of calls or requests that can be made, how to make them, the data formats that should be used, the conventions to follow, etc. Each firm, whether an orchestrator or partner, chooses its APIs- its virtual "pores".

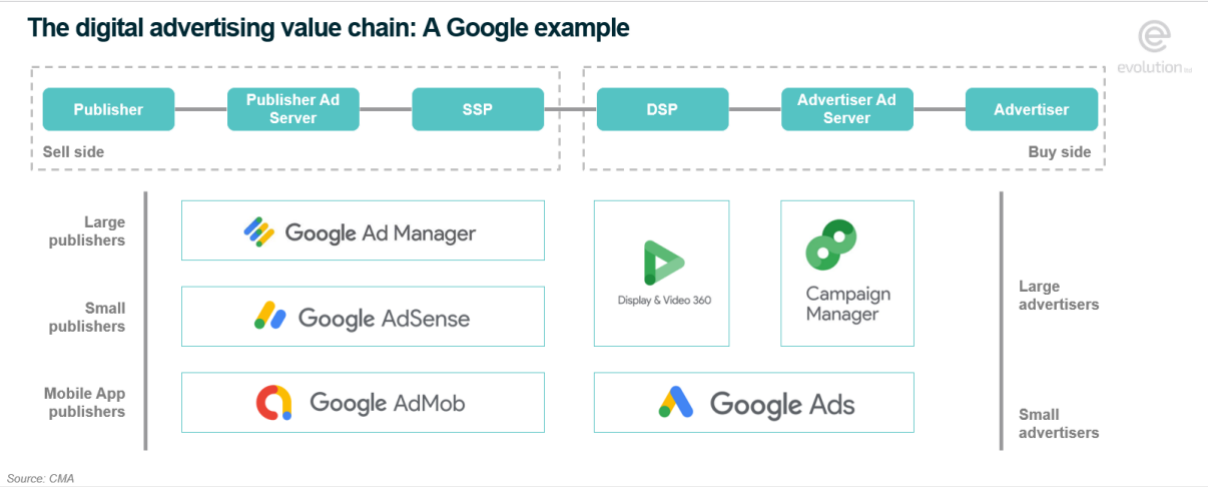




Each of these three Big Techs takes a slightly different approach to leveraging the benefit from the data it generates – although for Google and Facebook, it's the information itself that creates the cash flows. The valuable data on customers and their browsing interests are analyzed by the Ad Tech business, which is done in-house by some of the Big Tech, and by outside firms for others. As we have seen, Apple prefers to monetize the information in its ecosystem by giving itself a competitive advantage for product development and allowing Google to be the default search engine, and capture data from its users. By doing so, Apple can maintain its privacy-conscious image while generating just under a quarter of its services revenues from Google. This, so far, has made more sense than attempting to build and monetize its own search

engine, but current challenges, especially due to the recent Google/DoJ case,[19] may force Apple to reconsider, creating its own search engine. This will force it to confront the uncomfortable tradeoffs of data monetization, which had been brushed aside through Google's massive side-payment that allowed it to advertise its own propriety. The result could be whole new architecture which could help transform the sector.[20]

Facebook, unlike Google, does not use search to get consumers hooked. Instead, it sells advertising access through ad networks that cover Facebook and Instagram, but also extend further out into complementors such as game developers, who can be integrated with Facebook's Audience Network. While Google has a broader spectrum of offerings, from search to content (with properties such as YouTube) for which Google controls its own proprietary advertising value chain, Google is also actively involved in the 'open' advertising value chain (from advertiser to publisher) with its Ad Tech stack.[21]



[19] See a very readable case detailed at https://www.justice.gov/opa/press-release/file/1328941/download

[20] Our analysis is an illustration of what researchers call "industry architecture" (see J e.g. Jacobides. M.G., Knudsen T, Augier M. 2006. Benefiting from innovation: Value creation, value appropriation and the role of industry architectures. *Research Policy* 35(8): 1200–1221; Pon, B, Seppälä T, Kenney, M, 2014. Android and the demise of operating system-based power: Firm strategy and platform control in the post-PC world, *Telecommunications Policy*, 38 (11): 979-991.) The idea here is that industries do not have fixed, pre-determined boundaries, but are characterized by a set of rules, roles and relationships that reflect the conscious efforts of key industry players to shape their environment and benefit as a result. The challenge of regulators then are to ensure that the architecture of the sector is robust and enhances competition- see Jacobides, M.G., Drexler, M., Rico, S, 2014, Rethinking the Future of Financial Services: A Structural and Evolutionary Perspective on Regulation, *Journal of Financial Perspectives*, 2 (1).

[21] As the figure below shows, the chain goes from the 'sell side' (i.e., those who sell the 'digital storefront' space to advertisers – e.g. newspapers, game developers, YouTube, Facebook) to the 'buy side', (i.e., advertisers who have campaigns or offers to place on behalf of their clients). This includes servers run by either the publishers (sell-side) or advertisers (buy-side), and also platforms that auction off activity on both sides – Supply-Side Platforms (SSPs), which sell inventory on behalf of publishers, and Demand-Side Platforms (DSPs), which buy inventory on behalf of advertisers. As the figure suggests, Google is active throughout this chain, and the other Big Techs are also considering changing their scope – expanding to take advantage of their opportunities, or potentially retreating if regulators pile on the pressure by accusing them of preferential and anticompetitive vertical power.

Where the rubber meets the road: Data, GAF, advertising and the role of regulation

Regulation rarely creates strategic excitement, usually conjuring up images of drudgery and box-ticking. Yet digitization is changing this, since regulation is playing a bigger part in shaping business models, driving monetization, prescribing scope and ultimately determining a firm's strategic prospects. While academics have started to become more aware of the complex interplay between firm agency, regulatory policy and the nature of an industry's boundaries and business model (or 'industry architecture'), this raises a fascinating new set of priorities at the intersection of strategy and regulation.[22] The ability of GAF to reshape multiple industries is a vivid reminder of just how important regulation (e.g., in terms of privacy) may be. To see how this works, let us consider the nature of advertising – a crucial part of the Big Tech ecosystem.

To understand the current debate in advertising, we need to look once again at how data is used, and the associated question of consent in using personal information. Consent has been one of the thorniest issues at the intersection of GDPR, the e-Privacy Directive and online platforms – but also the web more broadly. Metadata or cookies (i.e., digital markers identifying the visitor to the site owner) can be used legitimately, in order to facilitate particular online features or services. Consumers can receive customized recommendations or save browsing data[23], among other benefits. However, such data can potentially benefit the online business too, since it can track and get a better understanding of its visitors.

This raises an interesting dilemma, because (as Big Tech firms and some academics have argued), customization and targeted advertising add value – evident through higher conversion rates for targeted ads. Yet, at the same time, 'there is a fine line between customer convenience and customer lock-in'.[24] As Nobel Laureate Richard Thaler points out, customers engage in mindless choosing, overwhelmingly settling for the 'default', or what is presented to them – and, conversely, firms become 'choice architects'.[25] Such behavioral propensities may give Big Tech the irresistible power to dictate choice. This challenge is best illustrated by an overview of how Big Tech has transformed the advertising space.[26]

Let us zoom in on the digital advertising value chain outlined above, and how it differs in terms

[22] The evolution of sectors such as mobility or healthcare shows how regulation combines with strategy to drive the competitive context. This raises a host of new challenges for firms, especially in light of the current COVID19 re-shaped environment. See Jacobides, M.G, N. Lang, K von Szczepanski, 2020, When the Default Just Won't Do: Resilience as the New Competitive Driver, *Management and Organization Review* 16 (4): 741-746.

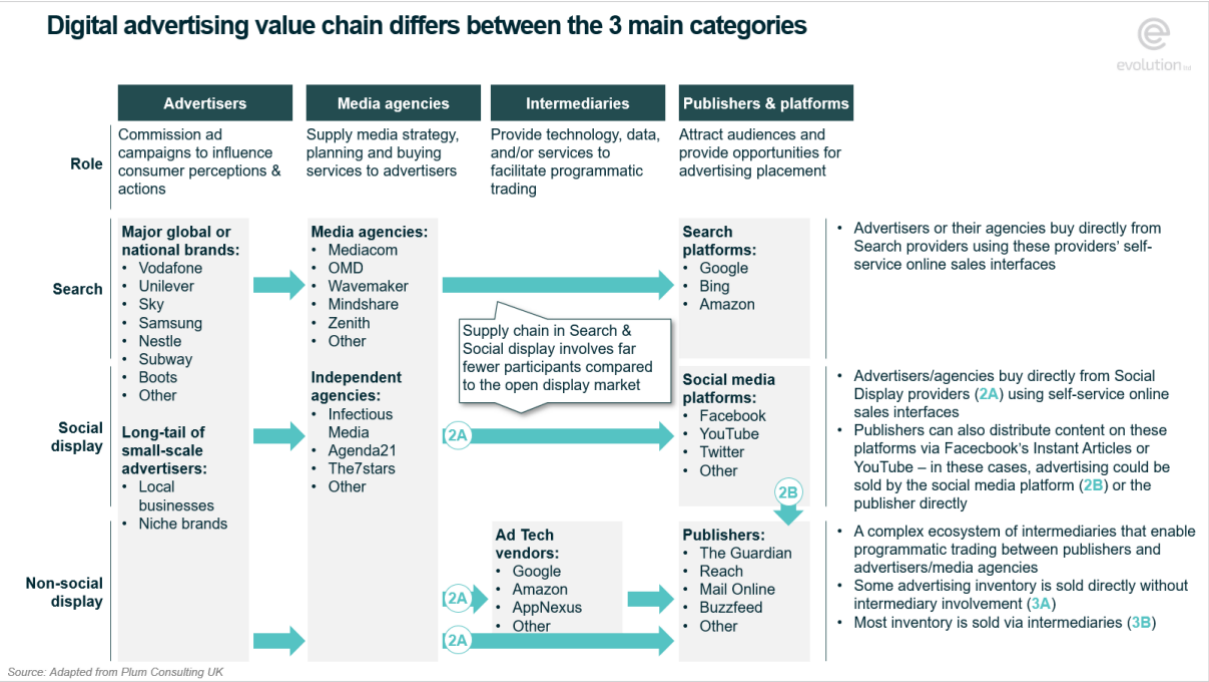
[23] E.g. next time a user visits a webpage, they can continue browsing from the place where they left the domain previously, remember login data, etc.

[24] Vint Cerf, Google Chief Internet Evangelist and VP, in plenary panel with M.G. Jacobides, Drucker Global Forum, Hoffburg, Vienna, November 2019.

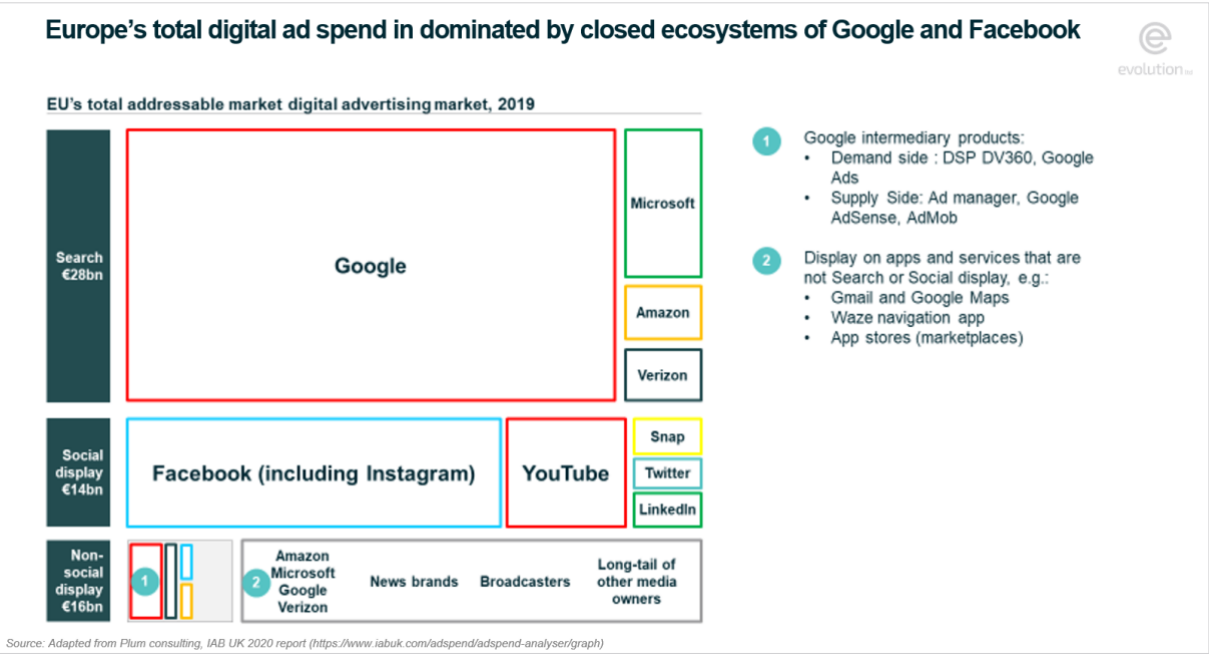
[25] See Thaler, R.H. and C.R. Sunstein, 2009, *Nudge: Improving Decisions About Health, Wealth and Happiness,* New York: Penguin.

[26] See an excellent report by the UK regulator, CMA, 2020 https://www.gov.uk/cma-cases/online-platforms-and-digital-advertising-market-study

of the three main categories of online advertising (see graph below[27,28]).



The challenge for Europe is that US-based players dominate the search (Google) and display (Facebook, Instagram, YouTube) digital advertising categories – and together, these two firms control 70% of the overall *European* digital advertising market (see figure below).



[27] There are other aspects of the advertising value chain which are not depicted, e.g. Traffic Acquisition Costs (TAC) which Google pays Apple & others for defaulting its Search engine. Likewise, regarding publisher monetization capabilities of Social Media platforms, refer to CMA's Digital Advertising report, *supra* (Appendix S).

[28] In general, the online display advertising value chain involves a complex ecosystem of intermediaries that enable programmatic trading between publishers and advertisers/media agencies. Some advertising inventory is sold direct without the involvement of these intermediaries; however, a large proportion of inventory is sold via intermediaries.

As outlined previously, search and social display represent walled gardens, dominant players and a closed attribution model. This means that Big Tech has a dominant role in Europe that goes well beyond its potential anti-competitive impact, addressed by the recent CMA report in the UK.[29] The substitution of Big Tech firms as the key recipients of advertising revenues in the digital ad space not only challenges players in the advertising value chain, but also undermines publishers' funding model. They include news outlets that have also been squeezed for content by the inclusion of information in social media, engendering a threat to a foundation of society and democracy.

While new ad-focused regulations are being considered, it is sobering to consider how past regulatory efforts have failed to curtail Big Tech power, leading to several unanticipated consequences. To illustrate the point, we next consider how the EU's effort to tighten its regulations in terms of privacy, via GDPR, affected the advertising landscape in Europe. While GDPR was meant to protect consumers and ensure Big Tech players would not abuse their power, it actually allowed Google to cement its role and leverage its position as a key advertising partner. Google used GDPR strategically, to reduce competition in programmatic advertising and gain access to large pools of publisher data. In particular, in 2018, weeks before GDPR came into force, Google surprised the publisher community with changes to the terms and conditions (T&Cs) that publishers had to include in their consent forms if they wanted to remain within the Google ecosystem and use Google products for advertising. The new T&Cs said that Google would now be able to use certain data for purposes beyond serving ads to publishers' sites, e.g. testing algorithms, improving user experience (UX) and ensuring the accuracy of Google's ad forecasting system.[30] Moreover, Google claimed that under the new GDPR guidelines it now acted as a 'controller' of personal data, which the EU defines as a body that 'alone or jointly with others, determines the purposes and means of the processing of personal data'. Although Google was not violating any laws or regulations, it had shifted all the pressure on to publishers, who were now on the hook for establishing users' consent, yet had little control over what Google did with their data after they left the publisher's site. Upset publishers argued, with little traction, that Google was abusing its position: it had obtained broader rights over all the data in the ecosystem, without full disclosure and without giving publishers any option to restrict Google's role as data processor.

Google also provided a tool for publishers to gather consent in line with GDPR and Google's policies – Google Funding Choices (GFC). Publishers using Google's default consent technology were only allowed to pass data to 12 supply chain partners, including Google itself. Strictly speaking, GFC was not mandatory for publishers, because they could use another Consent Management Platform (CMP) of their choice, or even develop their own in-house. However, many small to mid-sized publishers, lacking the financial means to develop their own CMPs, were likely to use Google's out-of-the-box CMP and buying model, because it was seen

[29] The 2020 CMA report also recommends some remedial actions, to enhance competition in markets dominated by Facebook and Google, through the use of an Enforceable Code of Conduct for platforms of 'Strategic Market Status' (see Furman et al, 2019), and of Pro-competitive Interventions, such as the provision of third-party access to data and measures to increase interoperability, monitored by a new Digital Markets Unit. In November 2020, the UK Government announced the creation of the Digital Markets Unit as recommended by the CMA.

[30] Google also spelled out certain things it won't do, but publishers claimed that Google hadn't provided enough information for them to solicit consumer consent that meets GDPR criteria, potentially exposing publishers to liability.

as an easy and reliable way to comply with GDPR and remain in Google's advertising ecosystem for minimal outlay. Ultimately, the policy restricted the partner ecosystem choices for publishers and exerted enormous pressure on ad-tech companies, while strengthening Google's own position.[31]

Thus, Big Tech does not merely withstand regulations; it thrives on them. Moreover, with the increasing shift to digital advertising, Big Tech dominates not only as a property but also as an intermediary. This raises some broader issues. The pragmatic challenge here is that advertising has been the main revenue source for independent media, and such resources are dwindling. News outlets that liberal democracies have traditionally relied on for (costly) independent reporting were funded by ad revenues. But now, this is being substituted by Big Tech spend from the advertisers' side, while consumers are gravitating towards obtaining 'echo chamber' content from social media, which is incentivized to create customer stickiness via engaging (often controversial) content to generate revenues.[32]

This explains part of the urgency over Big Tech regulatory overhaul, and also explains why EU publishers are pushing through other initiatives to withstand the continuous squeeze from Big Tech. One of the key areas of concern for publishers is that, under the guise of 'customer convenience' and 'simplification', Big Tech has plotted a path that would further enhance its own power. For example, currently, owners of digital properties use 'cookies' (digital visitor IDs) to learn more about their customers and either customize or advertise to them better. However, privacy advocates highlight that use of cookies often creates privacy concerns and are intrusive, so Big Tech has pushed to eliminate them.[33] On the face of it, that would protect web users, however, upon looking through the window dressing, it actually puts the Big Tech ecosystems at a more advantageous position vis-à-vis the open web. It would give GAF licence to muscle in on the entire value chain, drawing on their unparalleled understanding of customer habits and preferences derived from within their closed ecosystems, which would now be at more limited level for the publisher side. The risk, though, is that it would restrict data access to those who manage the overall experience – which, in many cases, means GAF. It would give GAF licence to muscle in on the entire value chain, drawing on their unparalleled understanding of customer habits and preferences. Similarly, Apple, in its iOS14 release, included a new provision that would force other users (including Facebook) to explicitly ask the user for permission to use their data in their apps. This ostensibly reduces the imposition on customers – yet it also makes Apple the sole owner of information (which, it claims, it would use more sparingly and with greater aggregation).

To tackle this risk, various EU industry-led initiatives have explored alternative ID solutions, in order to reduce the reliance on Big Tech and cookies, and build more 1st party data outside of

[31] Time Inc., Business Insider and ESPN, for instance, respectively have 153, 68 and 22 homepage partner tags that would have become unusable if these publishers had chosen this path.

[32] A 2018 Eurobarometer survey found that "61% of surveyed EU citizens say they have come across illegal content online, and 65% say they do not think the Internet is safe for use. https://ec.europa.eu/digital-single-market/en/news/flash-eurobarometer-illegal-content

[33] Apple started eliminating 3rd party cookies on its Safari browser in 2017, Google is planning to do so by end of 2022 on its Chrome browser (which ~70% of the population use today globally). More details: https://www.theverge.com/2020/3/24/21192830/apple-safari-intelligent-tracking-privacy-full-third-party-cookie-blocking

the GAF ecosystems. A number of country-level efforts have popped up to offer alternatives to traditional Big Tech unique identifiers. Ultimately, the various foundations have the goal of establishing a European alternative to US single sign-ins to providers such as Facebook or Google. Some notable examples are the NetID initiative (Germany), PassMedia (France) and Nonio (Portugal). The success of these ventures, and details that may appear to be technical (or, on the surface, customer-friendly) may have a profound impact on the evolution of power in advertising, and the relative plight of Big Tech, advertisers and publishers, with potential knock-on effects on the very foundations of democracy.

What competitive issues does EU regulation aim to address?

Our analysis so far has demonstrated the dramatic rise of Big Tech's power, and how it is transforming important sectors, with broader repercussions in areas such as advertising. It is also clear that there are a number of concerns over these changes and, as the insert suggests, existing tools for competition are ill suited to the digital era. But what are the specific issues that regulators are concerned with? This section briefly summarizes them.

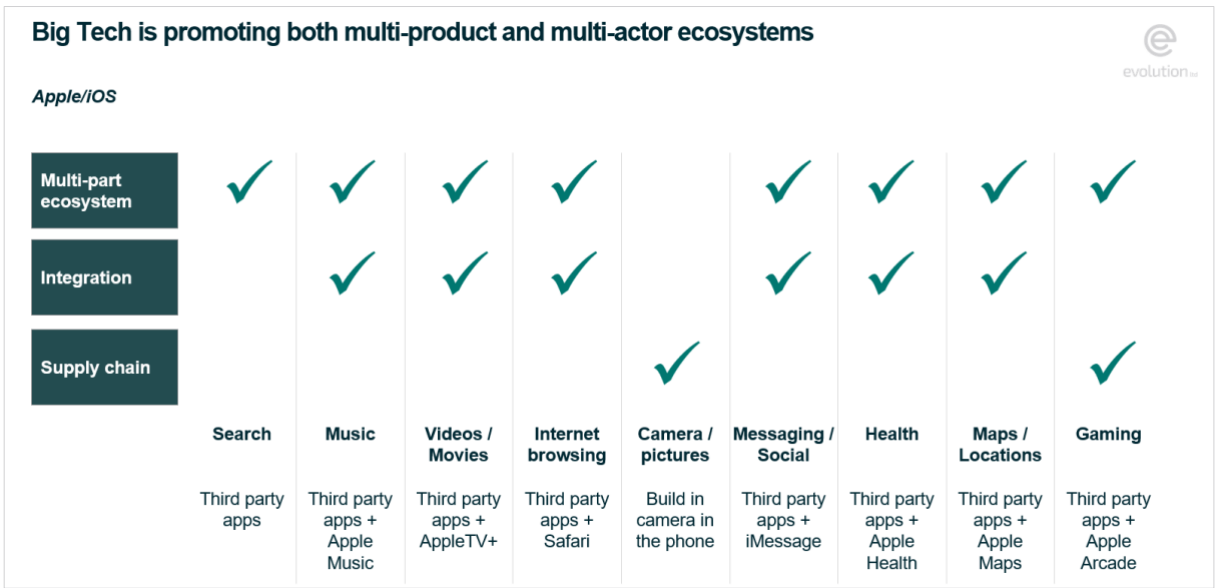
Insert: New problems, old tools

One of the drivers of the current regulatory overhaul is that the status quo is not well suited to responding to the challenges it is facing. This difficulty has its roots both in the history of (social) science, and the political economy of regulation. To give a brief and overly simplified account, the dominance of the Chicago school led to the dominance of the 'welfare criterion'. In this view, structural inequality did not justify intervention, and regulators had to prove harm via SNIP (small but non-transient increases in price). This approach, though, ignored the fact that in today's economy, capital markets are patient and prefer growth over margins. Doctoral student Lina Khan demonstrated this in her thesis on Amazon, which had been steadily growing – and abusing its power – without falling foul of regulation. This, and the meteoric growth of GAFAM, raised significant questions over the appropriateness of the existing analytical apparatus, triggering an existential crisis among regulation scholars.[34] The difficulty was particularly acute when it came to goods such as those offered by Google and Facebook, which appeared to have zero price. Of course, this was a misapprehension – the price was simply exacted from a more complex chain of interactions, and paid by advertisers rather than users. Relatedly, the reliance on platforms led to a discussion of network effects. However, it is increasingly clear that such a view does not capture the totality of the challenges – hence the need for the Stigler, Furman and Cremer et al reports in the US, UK and EU (respectively) in 2019. Significant blind spots remain – including the role of ecosystems, such as those discussed in this paper. But at least the academic debate has begun, at long last, and we can expect significant action in the months

[34] Khan, L.M. 2017. Amazon's Antitrust Paradox, Yale Law Journal, 126 (3), January: 564-907; Dolmans, M, Pesch, T. 2019. "Should we disrupt antitrust law?" Competition Law & Policy Debate. (May); Lianos, I. 2019. Competition Law for a Complex Economy, IIC – International Review of Intellectual Property and Competition Law, 50, June: 643-648. Also, see the forthcoming Special Issue of Industrial & Corporate Change on Regulating Platforms & Ecosystems edited by Jacobides & Lianos (2021), including their paper "Ecosystems and competition law: From theory to practice".

and years ahead. That said, there still is limited understanding of the impact of regulation – hence this report.

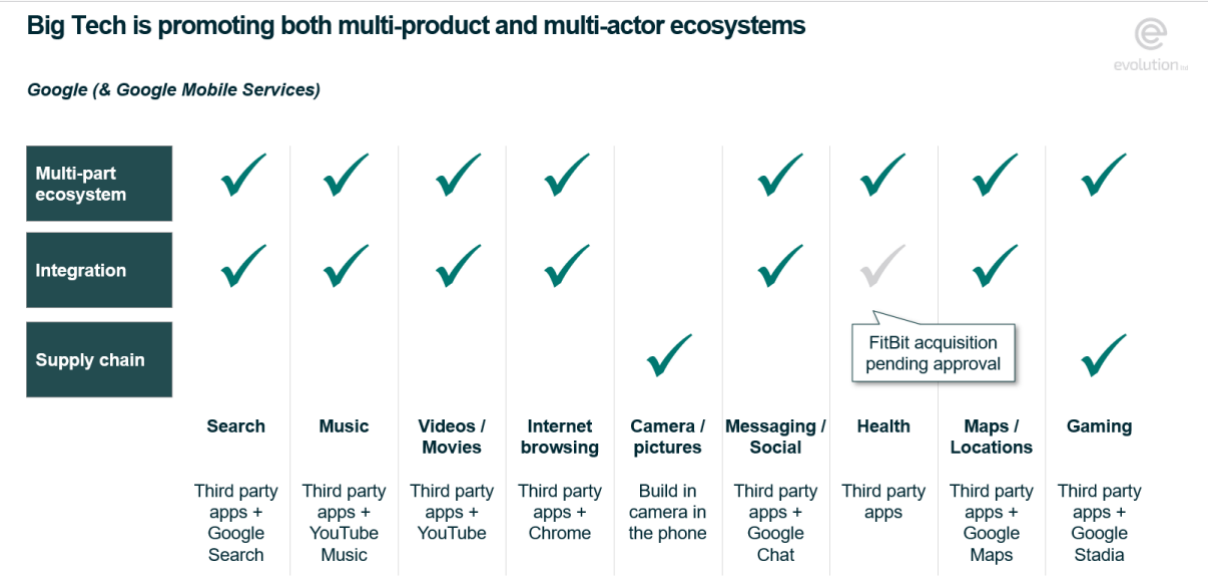
First, digital platforms exhibit particular concentration tendencies that are not seen in other parts of the economy. This incurs the risk of abuse, as the recent US, EU and UK landmark studies explain. Data-driven network effects and lock-ins create the condition for 'winner-take-all' (or at least 'most'), and AI-driven learning effects amplify traditional concerns with economies of scale and scope. Firms that play a 'gatekeeper' role may become a bottleneck between customers and their environment. This leads to concerns of competitive dominance that are qualitatively different from anything we had seen before.[35] Also, as our preceding analysis shows, data can be collected and used by Big Tech with incredible focus and thoroughness, including in ways still not well understood by many regulators. One of the challenges (only tangentially addressed by EU regulation) is that Big Tech is creating *multi-product* ecosystems, which link different types of services together with the aim of achieving maximum customer lock-in.[36] Moreover, as part and parcel of their design, they also employ *multi-actor* ecosystems – that is, groups of co-specialized firms that collaborate to add value.[37] The figure below illustrates the multi-product and multi-actor ecosystems of Apple and Google.



[35] See Jacobides, M.G. 2020, What Drives and Defines Digital Platform Power? A framework, and why Apple's strategic success should stop resting on competitive dominance. White Paper, Evolution Ltd (pending).

[36] While this is considered by some provisions of the recently proposed regulation- such as Articles 6(a), (b), or (c), 43 and 48 of the regulation, which aim to reduce lock-in in a multi-product bundle, there is no clear focus on the role of multi-product ecosystems. In particular, the definition of Gatekeeper firms which are held to higher standards does not refer to the extent to which they have a developed ecosystem.

[37] For a theoretical discussion, see Jacobides, M.G., Cennamo C., Gawer A. 2018. Towards a theory of ecosystems. Strategic Management Journal 39(8): 2255–2276. For a managerial guide, see Jacobides, M.G. 2019. "In the ecosystem economy, what's your strategy?" Harvard Business Review, September/October. For an applied framework, see the Guide on Ecosystem Development, Evolution Ltd, 2020, through www.evolutionltd.net/thought-leadership



The EU's concerns are that large platforms can obtain vast volumes and variety of data, which reinforce their (already strong) network effects. Such data dominance also enables them, if they wish, to engage in unfair practices that are hard to capture adequately through traditional antitrust tools and rules.[38] Gatekeepers can leverage assets such as users, data and revenue from their core service in other services or markets to expand their ecosystems and enhance their position. Alternatively, they can build barriers to entry into new verticals and thereby reduce market contestability, while cementing their own advantage. They will often do this using their intimate knowledge of behavioral propensities and customer context to promote particular content and encourage its consumption.

On December 15, 2020 the European Commission proposed the DMA regulation, which covers core platform services of (i) online intermediation services, (ii) online search engines, (iii) social networking, (iv) video sharing platform services, (v) number-independent interpersonal electronic communication services, (vi) operating systems, (vii) cloud services, (viii) advertising services. Within this regulation, a number of practices are defined as 'Obligations for gatekeepers', while an additional list is proposed as 'Obligations for gatekeepers susceptible of being further specified', for which the gatekeeper can engage in a dialogue with the Commission to find an adequate solution.

This stipulation is meant to ensure that we do not impose the same requirements on all firms, regardless of their strength, as happened, e.g., with GDPR, making things harder yet for smaller players. It is also meant to support innovation, ensuring key actors will not abuse their dominance. To be deemed a Gatekeeper, platforms must (a) have a significant impact on the internal market; (b) offers a core platform service which as an important gateway for business to reach end users; and (c) does so in a durable way (or is expected to do so in the near future.)[39]

[38] To support this, see the recent case of the US against Google, or the US House of Representatives Judiciary Committee Report (October 2020) in addition to the Furman, EU, and Stigler reports of 2019 referenced above.

[39] Impact is measured by having a turnover of €6.5B and above in the last three financial years, or an average market capitalisation / fair market value *of the undertaking to which it belongs* of €65B in the last financial year, if it provides a core platform service in at least three Member States; and the impact of them as a gateway is satisfied it provides a core

As such, issues of business model design, monetization, or the breadth of the ecosystem are not considered as criteria. Thus, de facto the GAFAM all qualify as Gatekeepers, but this regulation might also cover firms like SAP and, in the near future, Huawei and other tech giants (depending on their strategy choices). While an initial list of gatekeeper obligations has been put forth with the DMA, we expect it to be vigorously debated in the forthcoming year or two, as the proposal passes from the EU Commission, to the Council, and then on to the European Parliament before being transposed into the national legislation of individual EU member states in late 2022 or early 2023. Despite its multi-year timeframe, this is still regarded as a significantly fast-tracked regulatory timeline compared to typical packages of this size.

Examples of 'Obligations' would include the old case of Microsoft enveloping Netscape by bundling its Windows Explorer browser with Windows OS; platforms favoring their native services at the expense of others through pricing mechanisms (e.g. Apple Music vs. Spotify); customer steering (e.g. Google Shopping, which led to another EU antitrust case) and other mechanisms such as direct data-sharing relationships between the consumers and business users of these ecosystems (e.g. Amazon only provides an aggregate view of data for the business user).[40].

Big Tech's global scale, and its level of integration into the consumers' lives, enables it to collect enormous amounts of user-activity data which is then leveraged in adjacent verticals. This is a key concern that has been voiced over Google's acquisition of FitBit, the maker of digital health trackers. Critics see this deal as a way for Google to obtain vital healthcare data, giving it a new depth of customer knowledge and even greater powers of customization. And while Google is at pains to reassure regulators about the use of FitBit data, many are skeptical, given Google's poor record on privacy and the fact that the alliance would eliminate another rival to Google-mediated services, and also reduce competition.[41]

Today, gatekeepers' market position is secured by powerful lock-in. While users are often able to technically move their data to alternative ecosystems, and Big Tech have initiated such systems, this is often a hard and unintuitive procedure to undergo for the 'average-user', thus creating a lock-in (we believe users are more likely to leave all their data on the previous ecosystem when moving to a new one). While there are industry-led initiatives such as the 'Data Transfer Project', they provide only very limited interoperability, and don't necessarily increase competition in the market. Plainly put, the ability to up sticks and move your personal data to a new platform sounds attractive in theory – but it has limited utility if all your network is still on the old platform, and there is little you can do to bring it with you. Moreover, gatekeepers retain full control over proprietary APIs that can be changed so as to refuse or degrade interoperability with other platforms or app developers at any time. This limits the incentives for complementors

platform service to more than 45 million monthly active end users and more than 10 000 business users in the EU, with durability demonstrated if these thresholds have held for three years.

[40] For a discussion of different instances of unfair behavior from the Commissions point of view, see the proposal for DMA. Link: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/digital-markets-act-ensuring-fair-and-open-digital-markets_en

[41] See Bourreau et al, 2020, at https://voxeu.org/article/googlefitbit-will-monetise-health-data-and-harm-consumers

to build solutions on top of the APIs that challenger platforms may provide.[42]

Turning to complementors, a major concern is that online platforms intermediate an increasing number of transactions and are increasingly the main gateway for market access, thus becoming unavoidable trading partners. This raises issues over the lack of written contracts and ambiguous terms, unfair transfer of commercial risk, retroactive contract changes and unfair termination. All these are the purview of the Platform-to-Business (P2B) regulation, enacted mid-2020.[43] The objective of the Commission was to create first-ever set of rules creating a fair, transparent and predictable business environment for smaller businesses and traders on online platforms. The goal was to curb the potential harm to businesses, as well as the possibility for such harm, which would undermine the innovation potential in the digital landscape.

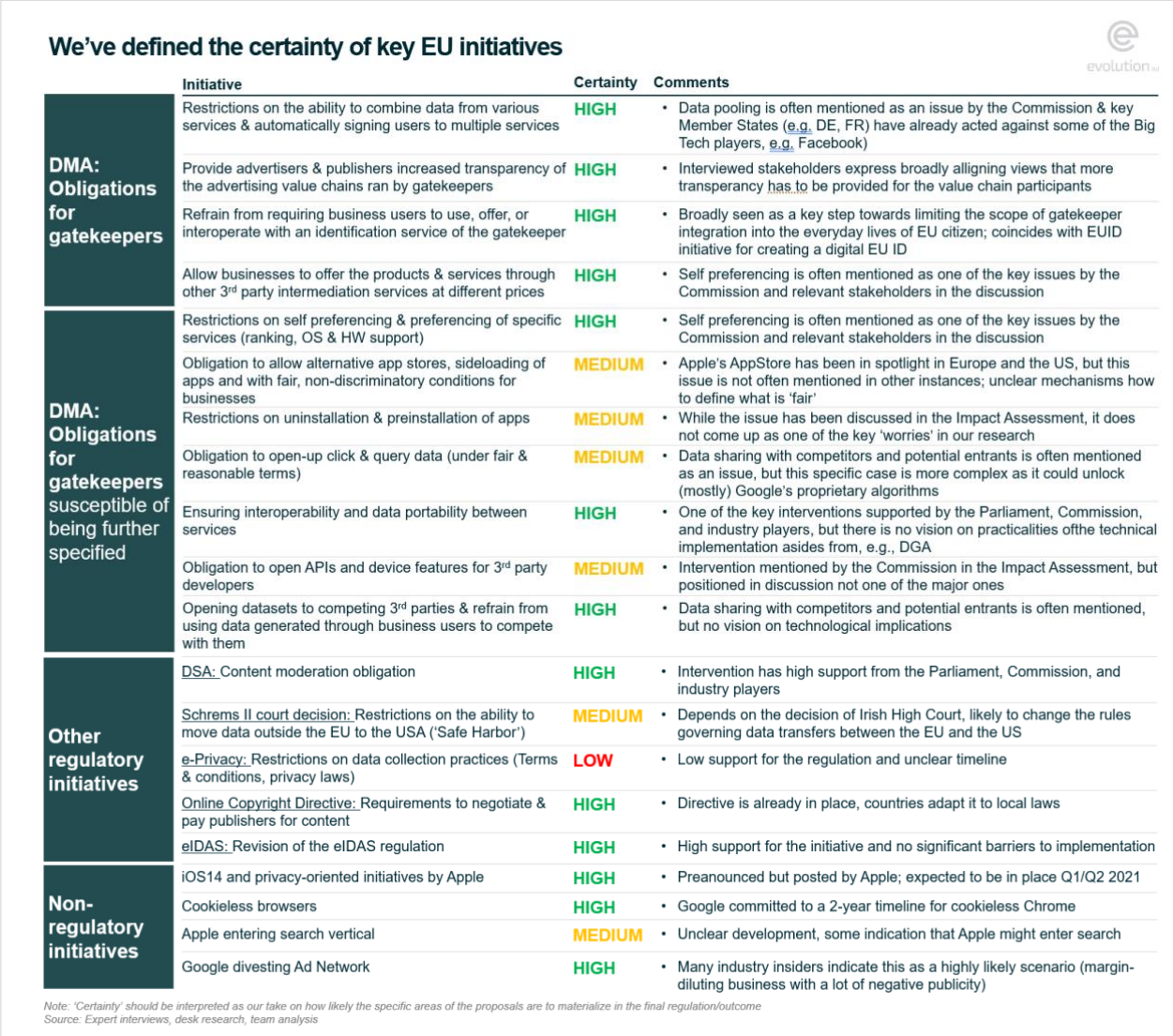
Finally, to make sense of the various strands of regulatory action in the EU[44], the table below provides an overview of the key components under consideration, as well as our subjective assessment of how likely it is that we will eventually see some strong concerted action coming once the processes of negotiation within the EU are completed.[45]

[42] Established players from Financial Services – another sector long regarded as abusing its dominance and benefiting from lock-ins – have been complaining that they are expected to be much more open than Big Tech, including observing stringent criteria for interoperability. The EU's 'PSD2' Directive on payments, for instance, was a landmark template on how to create an institutional and technological infrastructure that reduces incumbent power, and might provide some interesting potential future pathways.

[43] In our view, it is still too early to judge whether this regulatory intervention will achieve its goals. In addition to the broad P2B regulations, other stipulations in Europe, dealing with the power of Big Tech (and, more relevant for Europe, the protection of its entrepreneurial force) lie with Member-State level legislation. In this regard, intra-EU legal fragmentation leads to additional problems, as startups are forced to comply with 27 different regulatory regimes on various topics. This not only lengthens their time to market, but also places a huge strain on their financial resources, which could otherwise be directed to innovation

[44] Note that some practices/ obligations which had significant potential to deliver on the promises of the regulation have been moved from the 'blacklist' to the 'greylist', essentially making them subject to the EC's discretion, allowing companies to challenge the EC effectively navigating their way out or stall the process indefinitely.

[45] We also consider some industry-led changes as they might significantly reshape the ecosystem landscape in which these companies operate.



We've defined the certainty of key EU initiatives

	Initiative	Certainty	Comments
DMA: Obligations for gatekeepers	Restrictions on the ability to combine data from various services & automatically signing users to multiple services	HIGH	• Data pooling is often mentioned as an issue by the Commission & key Member States (e.g. DE, FR) have already acted against some of the Big Tech players, e.g. Facebook)
	Provide advertisers & publishers increased transparency of the advertising value chains ran by gatekeepers	HIGH	• Interviewed stakeholders express broadly alligning views that more transperancy has to be provided for the value chain participants
	Refrain from requiring business users to use, offer, or interoperate with an identification service of the gatekeeper	HIGH	• Broadly seen as a key step towards limiting the scope of gatekeeper integration into the everyday lives of EU citizen; coincides with EUID initiative for creating a digital EU ID
	Allow businesses to offer the products & services through other 3rd party intermediation services at different prices	HIGH	• Self preferencing is often mentioned as one of the key issues by the Commission and relevant stakeholders in the discussion
DMA: Obligations for gatekeepers susceptible of being further specified	Restrictions on self preferencing & preferencing of specific services (ranking, OS & HW support)	HIGH	• Self preferencing is often mentioned as one of the key issues by the Commission and relevant stakeholders in the discussion
	Obligation to allow alternative app stores, sideloading of apps and with fair, non-discriminatory conditions for businesses	MEDIUM	• Apple's AppStore has been in spotlight in Europe and the US, but this issue is not often mentioned in other instances; unclear mechanisms how to define what is 'fair'
	Restrictions on uninstallation & preinstallation of apps	MEDIUM	• While the issue has been discussed in the Impact Assessment, it does not come up as one of the key 'worries' in our research
	Obligation to open-up click & query data (under fair & reasonable terms)	MEDIUM	• Data sharing with competitors and potential entrants is often mentioned as an issue, but this specific case is more complex as it could unlock (mostly) Google's proprietary algorithms
	Ensuring interoperability and data portability between services	HIGH	• One of the key interventions supported by the Parliament, Commission, and industry players, but there is no vision on practicalities ofthe technical implementation asides from, e.g., DGA
	Obligation to open APIs and device features for 3rd party developers	MEDIUM	• Intervention mentioned by the Commission in the Impact Assessment, but positioned in discussion not one of the major ones
	Opening datasets to competing 3rd parties & refrain from using data generated through business users to compete with them	HIGH	• Data sharing with competitors and potential entrants is often mentioned, but no vision on technological implications
Other regulatory initiatives	DSA: Content moderation obligation	HIGH	• Intervention has high support from the Parliament, Commission, and industry players
	Schrems II court decision: Restrictions on the ability to move data outside the EU to the USA ('Safe Harbor')	MEDIUM	• Depends on the decision of Irish High Court, likely to change the rules governing data transfers between the EU and the US
	e-Privacy: Restrictions on data collection practices (Terms & conditions, privacy laws)	LOW	• Low support for the regulation and unclear timeline
	Online Copyright Directive: Requirements to negotiate & pay publishers for content	HIGH	• Directive is already in place, countries adapt it to local laws
	eIDAS: Revision of the eIDAS regulation	HIGH	• High support for the initiative and no significant barriers to implementation
Non-regulatory initiatives	iOS14 and privacy-oriented initiatives by Apple	HIGH	• Preanounced but posted by Apple; expected to be in place Q1/Q2 2021
	Cookieless browsers	HIGH	• Google committed to a 2-year timeline for cookieless Chrome
	Apple entering search vertical	MEDIUM	• Unclear development, some indication that Apple might enter search
	Google divesting Ad Network	HIGH	• Many industry insiders indicate this as a highly likely scenario (margin-diluting business with a lot of negative publicity)

Note: 'Certainty' should be interpreted as our take on how likely the specific areas of the proposals are to materialize in the final regulation/outcome
Source: Expert interviews, desk research, team analysis

What should we expect from (EU) regulation? Considering the potential impact on Facebook, Google, and their ecosystems

While much regulatory action is driven by the desire to curb unfair practices, the concern remains that it may be too blunt an instrument to curtail Big Tech. A quick glance at the evolution of their stock prices in 2020 suggests that the market expects Big Tech's dominance not only to persist, but also to deepen.[46] Given that Big Tech firms already dominate in their segments, the growth rates implied by the multiples these firms are trading at suggest that there is an expectation either of profit margins growing (supported, presumably, by ever-increasing power) or of revenue bases increasing (as ecosystems broaden and extend into new verticals and value-add areas) – or both. At the same time, at least for Europe, there is a clear determination to act, driven not only by concerns with competition, the need to foster tech innovation in Europe (including data governance and use),but also from geopolitical dynamics between US-EU-China. The question thus remains: What impact will the regulation really have?

[46] To illustrate, on December 15th, the day the DSA/DMA was unveiled, Google, Facebook (and Amazon) opened and closed at same price and Apple closed slightly higher.

This section, drawing on Facebook and Google's business models and the current regulatory threats, provides a bottom-up analysis of the expected impacts and latent threats. We consider each company in turn, and then focus on an equally important question: the impact of regulation on the vast ecosystem of the GAF complementors.

Deep dive: Facebook

Facebook's ability to deliver hyper-targeted advertising is likely to come under pressure from increased privacy regulation around data, collection, (re-)use and sharing between various first- and third-party services. Our expectation is that that most significant impact on Facebook will arise from two sources – (a) prohibiting on-site personal data being combined with either data generated on other gatekeeper services or with off-site personal data (i.e. data pooling) and (b) opening up Facebook's proprietary datasets for the use of third parties.

First comes the impact of *ex ante* limitations that may be imposed on the types of data firms collect, share and use. Facebook's ecosystem allows it to enrich the data it collects on its first-party assets (i.e. Facebook.com, Instagram and WhatsApp) with data collected from either the open web (via cookies/Facebook Pixel) or third-party apps (with relevant API/SDK integrations). Both these methods of collecting individuals' data enable Facebook to paint a remarkably complete picture of users – their activity on the web, or within specific apps – and cross-reference this data with specific user profiles on Facebook.[47] For businesses who choose to collaborate with Facebook and offer it information via either route, this looks like a valuable deal: participating developers or publishers get access to tools and features that enable new functionalities and improve their monetization capabilities in Facebook's advertising value chain. In return, Facebook collects data that it can leverage to deliver the advertising product. Limitations on pooling this external or internal data would make Facebook's ad targeting on third-party assets less accurate.

However, while third-party data would suffer (to the detriment of both Facebook and its complementors), Facebook's first-party data would continue to thrive within Facebook's walled garden, yielding the granular information and power to customize that advertisers prize. Consequently, we expect that the only significant impact from regulation will be on Facebook's Audience Network and its revenues. As a proxy for the (limited) expected impact, we can turn to Facebook's recent comments regarding Apple's changes to IDFA rules, which have changed in a similar way to what proposed regulations suggest.[48] Facebook predicts that without the ability to identify users and their activity, it could shut off Audience Network altogether, since revenues for publishers would drop by around 50%, making the product economically unfeasible. While Facebook doesn't officially disclose how big their Audience Network revenues are, industry estimates are that they amount to approximately 20% of its total advertising revenues. So this would be a significant blow, though not a lethal one.

The second area of major challenge for Facebook might be the requirement to open datasets - that were previously kept proprietary - for use of third parties (only applicable to businesses), to limit

[47] Facebook's recent tool 'Off-Facebook activity' enables users to see the third-party sources from which Facebook has gathered data on them: https://www.facebook.com/off-facebook-activity

[48] https://www.facebook.com/audiencenetwork/news-and-insights/preparing-audience-network-for-ios14/

Facebook's role as a gatekeeper in the social vertical and increase the value derived from participating on the platform for businesses. We expect that opening up these datasets to third parties wouldn't create too much competition in the verticals from which the data originates (i.e. social). However, it could enable much easier and faster third-party entry into verticals adjacent to Facebook's core business, such as healthcare and finance, by, e.g. leveraging datasets on user activity to train AI models. As such, Facebook's future growth areas could come under significant pressure, as third-party access to Facebook proprietary datasets will introduce uncertainty into the ecosystem (i.e. Facebook loses a core advantage/asset it has developed over time). As a senior observer told us, 'There is a very strong resolve from EU policymakers to make walled-garden data widely available, as they believe that this will solve most of the competition problems.'

The devil here, as so often with regulation, will be in the detail. Depending on how one defines 'opening of data sets' (which we will not know for a while), it could also mean moving Facebook to the 'infrastructure layer' and allowing third parties to build their own solutions on top of Facebook's data interface (e.g. different providers could have various news-feed and advertising algorithms, while users could pick and choose their favorite). This could have a more significant impact. Likewise, mandating Facebook to offer increased interoperability with complementors could also significantly shift the landscape in favor of (potential) competitors. It means the orchestrator is not the sole designer of the user experience, giving more customer choice- and potentially competition. Overall, while it is hard to estimate whether it will impact Facebook's advertising business directly, it can hurt Facebook's next growth phase (e.g. e-commerce) due to more alternatives being on the market.[49]

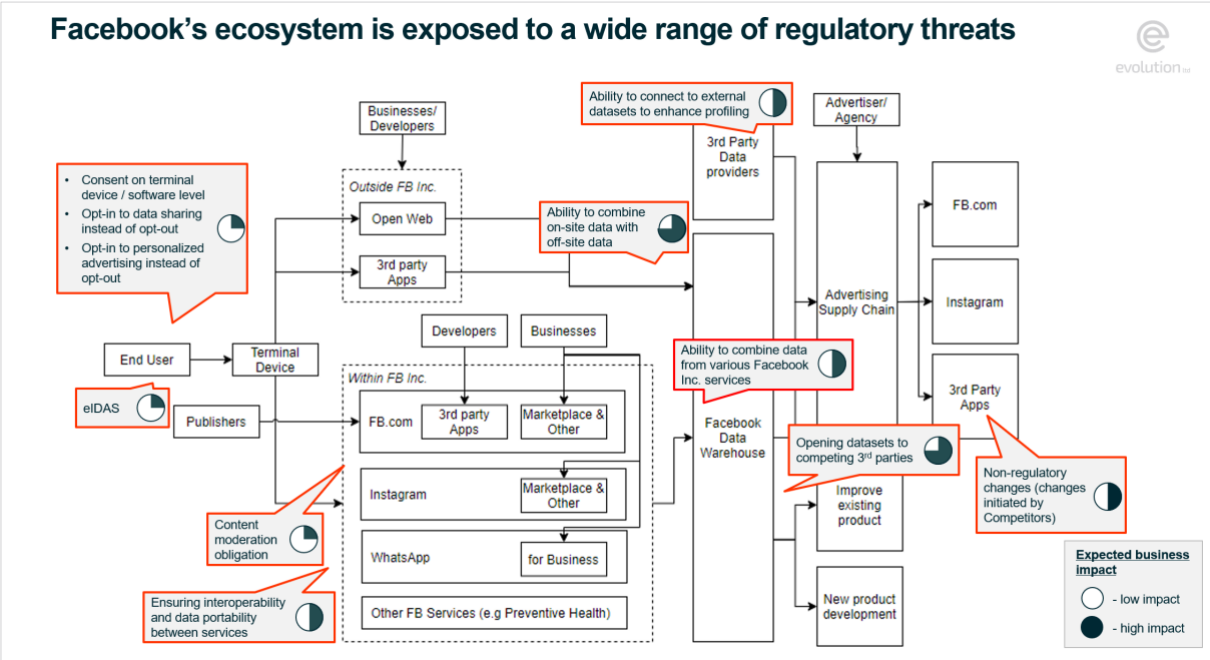
Other regulation-related initiatives are, in theory, expected to have a significant effect on Facebook, but will ultimately merely cause headaches for its engineering teams or require greater reporting and regulatory compliance while barely affecting underlying business dynamics. One example is the so-called "Schrems II" case against Facebook (but which would apply to all tech companies).[50] Upholding this EUCJ case, which has been appealed, and robust implementation would require that all EU user data remain within the EU, until a new agreement is brokered with the US for data transfers that falls under the requirements/is compliant with GDPR. Similarly, a requirement for Facebook to implement data silos between its assets would be an immense and unpopular technical challenge, but one that wouldn't significantly affect its advertising business. Sure, there would be some loss of signals for advertising, but user time-spend on Facebook's two main services (Facebook.com and Instagram) would still enable it to deliver best-in-class user profiling.

Overall, it is not clear that Facebook will be significantly affected by the regulatory challenges. Its ability to attract users globally and engage them to maximize the time they spend on the platform is unlikely to be affected by the current regulation. As a result, Facebook is likely to retain the key components of its business model (large user base, and long user time spent on Facebook's properties) that enable it to monetize advertising. Even if advertising becomes less targeted, advertisers are unlikely to have other options to build reach for their ads, so they are likely to continue advertising through Facebook until other alternatives become popular – e.g. for certain target demographics (as in the case of TikTok). As we see it, the only significant threat to Facebook in the short term would be any intervention that decreases user stickiness or eyeball-time on its

[49] Paradoxically, if Facebook is moved a layer 'down', i.e. to infrastructure, its role as a gatekeeper could be bolstered. As more partners build on top of Facebook's infrastructure, changes initiated by Facebook would be directly passed on to the Partners. Facebook would become more entrenched, and Partners more dependent.

[50] See https://www.europarl.europa.eu/RegData/etudes/ATAG/2020/652073/EPRS_ATA(2020)652073_EN.pdf

assets. This is quite unlikely to happen, as it would mean something like mandating a maximum time that a user can spend on Facebook or Instagram, or forcing Facebook to offer APIs that would allow users of third-party social platforms to invite their friends to a new one *en masse*. Facebook's Audience Network is the only business line that is likely to suffer from the ban on pooling on-site and off-site data, as Facebook will only be able to sell less-targeted ads on third-party assets.[51] The graph below summarizes.



It is also important to note that Facebook is pre-emptively working to reduce any industry pushback and strengthen the core of its ecosystem. First, its initiatives as an orchestrator are around driving end-user engagement via attracting and enabling complementors to create new services and apps and helping to monetize complementors' newly created solutions via advertising and in app purchases (IAP) on the Facebook ecosystem – APIs and SDKs, Business Tools, favorable business terms, and other incentives are part of the package. They are also expanding into new verticals of end users' daily lives (e.g. Facebook Pay, Facebook Gaming, Stories, Articles) to drive more innovation from complementors and grab more eyeball time. Moreover, Facebook is working on strengthening the ties *within* its ecosystem, to ensure customers spend more time and provide more insight in its own 'walled garden' – which, ironically, might even benefit from some of the regulatory changes, as limits on data sharing could enhance the position of the (few) firms with broad ecosystems that share data internally. User experience between Facebook.com, Instagram and WhatsApp is transitioning to greater interoperability, i.e. seamless UX across all three platforms for communication.[52] This choice makes sense from a technical perspective, since it ties the back ends of Facebook's digital properties together, and also makes it less susceptible to pressure from potential ecosystem challenges. If, for instance, Apple were to limit cross-app tracking through "ID For Advertisers" (IDFA) consent changes, Facebook could now claim that the two are not distinct features, but part of the same app. This is indicative of changes that Big Tech undertakes – often under the plausible pretense of 'interoperability', 'privacy' and 'user experience' – to protect itself

[51] As an example, Facebook has indicated (in response to Apple's changes to IDFA, which closely resembles the idea that is proposed under the regulation) that limiting data flows for third-party apps reduces advertising revenues by ~50%.

[52] https://about.fb.com/news/2020/09/new-messaging-features-for-instagram/

against its own complementors and rivals. Also, it acts as further ammunition against any proposal that Facebook, as a company, should be broken up. For Facebook, as for other Big Techs, becoming more tightly integrated is a strategic choice.

This raises another, broader point. Some of the regulatory decisions and court rulings, which sound potentially debilitating, may indeed impose significant frictional costs to Big Tech as they rush to implement them. Yet they do not necessarily challenge their underlying business model – and, indeed, may inadvertently serve to strengthen it in some respects. For instance, Schrems II and data siloing will impose some short-term costs, but we expect that long term, Facebook will still be able to offer a complete, advanced advertising product for its ecosystem. On the other hand, regulatory obligations might divert resources that could impede Big Tech's drive to expand and innovate – potentially giving a chance to rivals to catch up, and perhaps even overtake them.

Deep dive: Google

Google's business model, much like Facebook's, is primarily funded by advertising – 84% of its total revenues are generated through this route. Google's first-party properties Search and YouTube, for which it controls the value chain in its entirety, account for 71% of Google's total revenues. Similarly, Google also controls the majority of the 'open' advertising value chain via its ad-tech stack, on both the supply and demand sides. The rest of its revenue comes from various services such as cloud, Play Store and others, which account for 6%, 4% and 6% respectively. Google's advertising business model is enabled by free services that have a global reach and span multiple verticals. This gives the firm a holistic view of its users, whether they are on various Google products (such as Search or Maps) or on the open web through Chrome. The granularity of data that Google can collect enables it to deliver a best-in-class hyper-targeted advertising product.

When it comes to regulation, our analysis indicates that Google is exposed on more fronts than Facebook. Below, we outline our expectations in the key areas: self-preferencing (including app preinstallation), the ability to combine on- and off-site datasets, mandatory sharing of click and query data, contractual agreements and opening proprietary datasets.

Google actively self-preferences various elements of its own services to keep users within its ecosystem and collect data about their activity. Such self-preferencing can be directly attributed to Google – e.g. showing Google Maps as the first results whenever you Google something – or it can take the form of mandating OEMs to preinstall certain apps (such as Search, Chrome or others) on their devices (with no option to uninstall) if they want access to Google Mobile Services (in exchange for traffic acquisition costs). This sort of behaviour enables Google to continuously drive adoption and customer lock-in for its own downstream services. However, it also makes ecosystem partners dependent, and gives Google a strong mechanism of control. Moreover, it enables it to collect vast amounts of data on users that can be leveraged in Google's advertising product.

Prohibiting Google from self-preferencing could have some impact on its ability to keep users within their ecosystem and 'steer the customer'. However, the expected impact is low in the short term, because it would not fundamentally alter its business model. Google will still control a large amount of traffic that it will be able to monetize (and it does have some of the best services today, which are widely preferred by consumers). However, in the medium to long term, prohibiting self-preferencing

could introduce more uncertainty into the ecosystem for Google, thus exposing it to more potential risks and enabling its complementors to develop new services and promote them to consumers.

Like Facebook, Google achieves its wide reach through a combination of its native services (e.g. Search and Chrome) and integration of its APIs/SDKs into third-party services. Combining these two data sources enables Google to achieve, arguably, the best understanding of user behaviour on the market, and further leverage it in its advertising business lines and new product development. As for Facebook, we see that it will affect the third-party (i.e. open) advertising value chain for Google as well (which accounts for 13% of Google total revenues). According to our insights, this segment is also the least profitable service among Google's advertising stack, and many people close to the matter have highlighted that changes in this area might lead to Google ultimately divesting this business unit to avoid margin dilution. Similarly, current antitrust investigations (like the recent case against Facebook and Google for collusion in the advertising market in the US, filed by 10 Attorney Generals in December 2020)[53] may lead to selective divestments and changes of Big Tech collusive practices. Regarding the impact on advertising on Google's first-party assets, we don't expect any significant change to the underlying business model from this type of intervention.

Among those close to EU decision-making, there is a strong resolve to commoditize search by granting third parties access to Google's click and query data under fair terms. There is a belief that this would drive competition within the search vertical and create new, alternative solutions. While this may seem intuitive, there is nuance that leads us to question it. Think about the many places where a user would have to change their default settings away from Google Search to something else; moreover, Google Search is rooted in modern consumer culture, and user habits are hard to change. On top of that, users would still be inclined to use the search engine with the best/most advanced features, and Google has recently stepped up its innovation efforts in this vertical – possibly (a) to show regulators that they are indeed innovating, not acting as a typical monopoly and (b) to widen the gap between Google and competing search engines (whether they would be running on Google or independent data). We expect that changes in this area won't pose a significant risk to Google directly in the short term, but they might create new opportunities for competitors in the medium/long term.

What we see as more impactful, especially if coupled with opening up click and query data, is the prohibition of contractual agreements with third parties where Google's services become the default option. Google is paying Apple an estimated $10–15bn TAC for traffic generated by iOS users as a result of setting Google as the default search engine on iOS devices.[54] This gives Google access to a more affluent group of consumers, which it then monetizes via its advertising products – either directly in Search or in other verticals. Moreover, in this way, Google is also able to steer customers on iOS devices away from Apple's downstream services – e.g. from Apple Maps towards Google Maps. While the potential impact of this change on Google is disputed among the experts we spoke to, multiple industry analysts strongly claim that given a choice, most people would continue using Google as their default search provider, and Google would not lose traffic (due to the many access points through which people can access the service). Plus, it would have a positive short-term impact in that Google would no longer have to pay for the traffic, resulting in lower cost and higher margin on search advertising. However, there are reasons to believe the impact will be more pronounced: (a) as Apple loses this lucrative revenue stream, it could expand its efforts to enter

[53] See https://www.courtlistener.com/recap/gov.uscourts.txed.202878/gov.uscourts.txed.202878.1.0.pdf

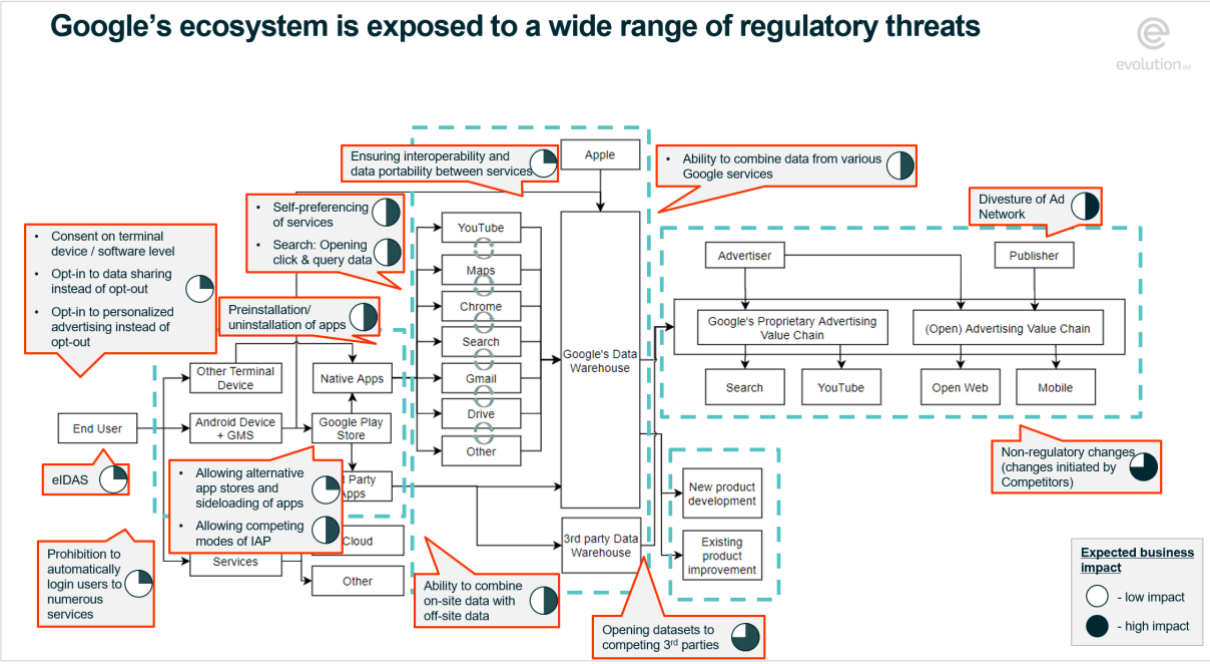
[54] While it is possible to change the search provider, the default is set to Google.

search (there has already been an indication that Apple is building a search engine), (b) Google's willingness to pay for traffic acquisition in the first place indicates that Google places a high value on it, and is significantly benefiting from it. Accounting for the latter, we suspect that it could have some impact on Google, primarily for the reason that it would introduce uncertainty into Google's Search vertical.

Google extensively leverages the data that it collects from its walled gardens and the data that it intermediates for third parties (its complementors) to improve its advertising and to aid in new/existing product development. Most industry stakeholders we interviewed opined that the impact on Google and the ecosystem in terms of competition would be modest – there would be so much data that only the other Big Tech firms will know how to use it (or, indeed, have the competencies to do so). A common thread for expected impact was that more competition might be created on the 'edge' of the ecosystem – not at the very core, where Google is playing. Likewise, it will also be an opportunity for Google if they manage to harness the potential of datasets of Facebook or others to develop new products, or further enhance their core ones. Currently, the initiatives proposed under the DMA attempt to address some of these issues and it will be interesting to see how these proposals get strengthen or watered down in the trialogue process – however, mandating access to data does create some threat for Google.

As with Facebook, there are also regulation-related initiatives that are, in theory expected to have a significant effect on Google, but ultimately will only affect its engineering teams and require financial resources to comply (e.g. Schrems II). In the interest of brevity, we will skip this theme, as it is broadly the same for both companies.

To summarize, Google appears to be more challenged than Facebook as a result of the regulatory push. That said, we don't see any regulatory initiative that debilitate it, affecting the core of its business model – that is, advertising. Google's Search and YouTube revenue is reliant on high user traffic and the ability to serve hyper-targeted ads, which are enabled by downstream reuse of data. While regulation won't affect the first part, it could affect Google's downstream data use, thus potentially affecting the precision of ad targeting. However, given that Google would still retain the eyeballs of end users, it is fair to assume that it would simply adapt its algorithms to work with fewer available data signals (as Facebook would). Also, much like Facebook, Google's third-party ad network could be affected if its ability to pool and combine data were limited, thus hurting the economics of the advertising provision on these properties – which could ultimately lead to this network being divested. The graph below summarizes.



The Empire Strikes Back: What power does Big Tech really have?

When considering the impact on Google and Facebook, we should also consider what scope they have to respond. Big Tech argue forcefully that if its operations are circumscribed by regulation, it will have to rein in its investment in innovation, and therefore innovations that might benefit users, and society, will suffer as a consequence. This argument, of course, often involves some sleight of hand, since regulations might actually change *who* would innovate, rather than whether the innovation happens in the first place. Also, the question remains whether these 'innovations' might offer more convenience at the expense of customer choice, or further curtail the freedom of ecosystem complementors. Yet Big Tech has the power to shape the debate, whatever the merits of the arguments it may make.

Each company appears to be taking a different approach. Google appears conciliatory and constructive, Apple is feverishly secretive and litigious and Facebook has been downright aggressive (though that could be changing). Whatever their current stance, however, we should not underestimate their structural power over the entire tech ecosystem and as such their ability to shape the future. Google has SDK integrations in 85% of the most popular apps in the Google Play Store and maintains a ~70% browser market share with Chrome, without even accounting for its market share in Search. Similarly, it is claimed that Facebook has SDK integrations in ~40% of the most popular apps. These companies have become a part of our culture – 'Just Google it.'

The vast data resources that Big Tech firms have at their disposal, and their ability to restrict access to it, gives them an almost insurmountable advantage over their competitors. Moreover, their success has allowed them to build staggering cash piles, which they can actively invest into new ventures and infrastructure. While less prevalent today, anticompetitive M&A has been a key issue in the past. Leading platforms have acquired their potential competitors (e.g. Facebook's acquisition of WhatsApp and Instagram) or complementors to cement their dominant position and expand into adjacent areas (e.g. Google's aspiration to acquire FitBit).

Another issue is that large platforms are not paying their fair share of tax in countries where they operate. Because of the multi-jurisdictional nature of the internet, Big Tech companies avoid paying national taxes by funnelling their profits into jurisdictions with lower corporate tax rates. Current tax rules fail to recognize the new ways in which profits are created in the digital world – in particular, the role that users play in generating value for digital companies, leading to a disconnect between where value is created and where taxes are paid.

Last but not least, Big Tech focuses on human capital, not just technical excellence. By attracting the world's brightest minds with financial incentives and putting them to work on cutting-edge projects, tech giants make it even harder for challengers to emerge. Even lawyers are in short supply, as Facebook works with more than 400 top law firms and their contracts often prohibit them from working on the prosecutor's side. Similar links to research institutions (not least, those who study competition law) make the environment for potential challenges even more tricky.

What will regulations mean for the broader ecosystem?

Advocates of regulation are clearly fired up by the desire to address unfair competition or abuse of consumer data, or by the goal of cultivating new European tech players. Of course, it is right and natural to focus on the specific problems at hand. However, we feel there is a real risk of neglecting the systemic impact of the regulations in prospect – whether on the shifting landscape that *surrounds* Big Tech or, more consequentially for Europe, on their manifold complementors.

Turning to the landscape first, we expect that regulation could establish a 'level playing field' or 'Darwinian landscape' where Big Tech companies can compete with each other more directly. The obligation to open up key services (e.g. messaging, social media, search) and hardware features will unlock walled gardens so competitors can enter. Whether they will ultimately choose to do so remains to be seen, but similar setups in other places (e.g. China) have shown that active competition among the big players leads to more rapid innovation throughout the ecosystem.

Such a landscape would make it harder for 'Smaller Tech' players to compete at the core of the ecosystem; they could end up being more reliant on Big Tech to innovate towards the edge. However, Big Tech's downstream services (e.g. music, video, cloud gaming) would be less protected than today, and competitors (both large and small) could pursue them more

aggressively, thus driving innovation in the market. Likewise, if gatekeepers lose control over app distribution rules, they might create their own ‘super apps’ that compete across different platforms (e.g. the Chinese app model). Non-preferential treatment of firms’ own services could enable Big Tech AI assistants to directly compete with each other based on functionality and prowess, instead of locking others out of their ecosystem via self-preferencing.

On the other hand, privacy regulations might reinforce ‘walled garden’ ecosystems, as less data can be shared among market players. In effect, this leads to better advertising service provision by already large platforms vis-à-vis smaller competitors (e.g. because of better attribution models, or a more holistic view of consumers within the walled garden). Until new challengers arise that can break down some of the incumbent services’ verticals (the likes of TikTok and other solutions for different demographics), the advertising market will remain dominated by the current digital players.

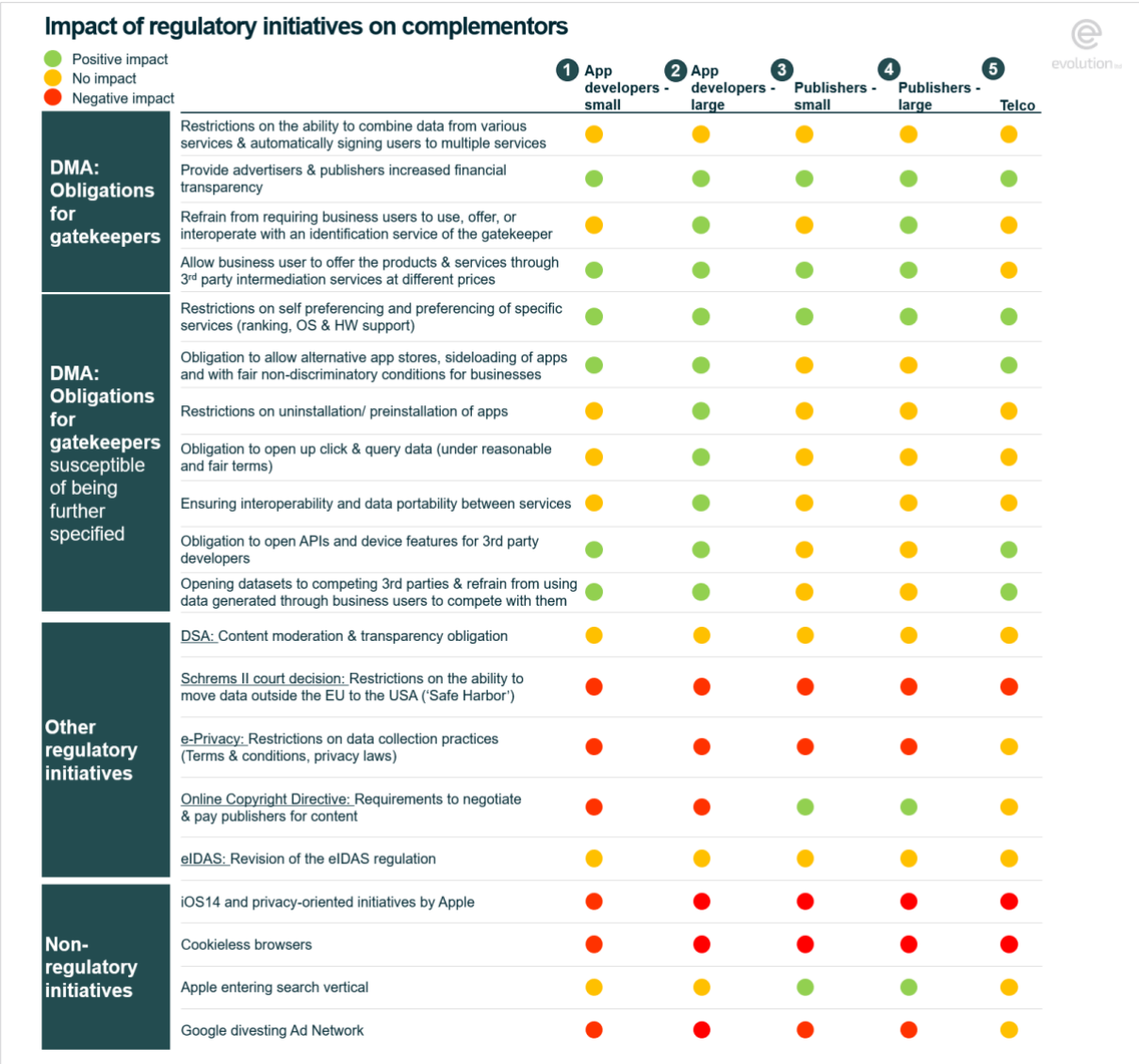
Stepping down a level, we can consider how different regulatory initiatives (primarily DMA, DSA and e-Privacy) might affect other ecosystem participants. For instance, our analysis highlights that the overall impact of these initiatives on small publishers (e.g. smaller blogs, niche publishers) will probably be negative. While certain aspects of DMA regulation might have *some* positive impacts on them (depending on which parts of the regulation are ultimately passed), publishers are highly dependent on the ability to monetize their traffic through advertising, and initiatives aimed at curbing data sharing and changes to consent frameworks will affect this mechanism. Slightly better off will be large publishers (e.g. major national news outlets), for whom we anticipate a neutral impact overall. Larger publishers have more traffic and are better positioned to gather first-party data via user accounts (that can be later leveraged in advertising), or have built up alternative revenue sources such as subscriptions, which are not always a viable option for smaller publishers. The table below shows, in anticipation of these impacts, how different stakeholders might respond to the various regulations that are under way.

Most stakeholder groups support DSA & DMA, while it appears that conflicts on e-Privacy are more pronounced

Non-exhaustive

Stakeholder groups	Support e-Privacy?	Support DSA & DMA?	Comments
Large platforms (e.g. Facebook, Google)	✗	✗	• **e-Privacy:** Claim additional regulation is unnecessary and companies should self-regulate; key topics already covered within GDPR and/or sector specific regulation (e.g. Telco regulatory framework) and should be properly enforced • **DMA:** Claim regulation is unnecessary and that problems identified by policy makers are inherent to how digital markets work
Smaller/niche platforms (e.g. Booking, Deliveroo)	✗	✓	• **e-Privacy:** Like large platforms, support repealing e-Privacy in favor of more clarified enforcement of GDPR; rules relating to cookie-consent should be clarified within GDPR of what is ‘acceptable consent’ • **DMA:** Support regulation if they are not defined as Gatekeepers
Telcos	✓	✓	• **e-Privacy:** Support harmonization of directive’s rules on country level & extension of scope of confidentially requirements for new technologies (e.g. OTT) within sector rules; however, in favor of more clarity in existing regulation instead of new regulation • **DSA/DMA:** Telcos highly support DSA; they are already heavily regulated so they believe large platforms should be regulated as well
Large content producers (e.g. large media)	✗	✓	• **e-Privacy:** Conflicts with GDPR in terms of scope and ambiguity of definitions; overall suggestion to repeal e-Privacy and maintain only GDPR with sector specific regulation where needed; EU harmonization needed regardless • **DMA:** support regulation against self preferencing, because large platforms have great power over them, however, would not welcome regulation limiting data transfers which would limit their abilities to monetize on advertising
Smaller content producers (e.g. small media)	✗	✓	• **e-Privacy:** Favor Member State flexibility in enforcing rules and forbidding access to website if user doesn’t consent to processing of data (against paid alternatives); overall view that a lot of conflicts with GDPR and too much interpretation • **DMA:** support regulation against self preferencing, because large platforms have great power over them, however, would not welcome regulation limiting data transfers which would limit their abilities to monetize on advertising
Small and Medium Businesses / startups	✗	✓	• **e-Privacy:** Against artificial restrictions on ‘permittable’ business models (i.e. Advertising based); GDPR coverage is sufficient • **DSA & DMA:** support regulation in general, because large platforms have great power over SMEs and welcome interventions that open-up competition on the edges of ecosystems; start-ups worried about excessive cost of compliance and reduced M&A activity
Consumers	✓	✓	• **e-Privacy:** Generally advocate for stricter privacy settings (e.g. by design & default) while also at the same time highlight the concern that access to content shouldn’t be discriminatory for those who cannot afford paid content • **DSA:** regulation will ensure platforms police harmful content more diligently and is likely to provide more choice to consumers
Academic community	✓	✓	• **e-Privacy:** support in general (new business models can be developed that are not reliant on hyper-targeted advertising), but not sure about interim implications on business models • **DMA:** consensus that large platforms reduce competition and existing laws cannot deal with the problem
Politicians	✓	✓	• **e-Privacy:** Mixed opinions between Member States on applicability of e-Privacy regulation and interplay with GDPR • **DSA & DMA:** Strong political will to regulate big tech from Commission and Parliament, however some countries don’t like France & Germany effectively imposing their domestic regulation on EU level

Ecosystem participants' reactions are easier to understand once we consider the likely impact of regulation. First off, most complementors – especially small and medium-sized ones – are saying that an abrupt move away from reliance on Big Tech would very likely hit their revenue (primarily via advertising). Larger ones would be more protected, due to either more first-party data, which grants them a better understanding of their users, or alternative revenue models that do not rely on digital advertising. Similarly, developers of major apps (e.g. Spotify, Tinder, Booking, Deliveroo, etc.) would also be likely to gain from some of the regulatory changes, since they will unlock wider opportunities for monetization by avoiding app-store commissions (e.g. by using alternative app stores/IAP modes), improved and more competitive functionality (e.g. full access to hardware & software features), or enhanced discoverability (no preferential ranking by Big Tech). On the other hand, stricter privacy regulations or restrictions of movement of data across various ecosystems and complementors (whether initiated by the ecosystem orchestrators or by regulators) would have a blanket effect of hurting existing complementors. The table below outlines the key provisions of the DSA and other initiatives and considers which types of complementors will benefit or suffer as a result.



This brings us to a final type of complementor: device manufacturers. Most of them are currently based in Asia: Samsung, rooted in the Android/Google ecosystem; Xiaomi, also connected to Android in Europe; and, more intriguingly, Huawei, which had been discredited by the outgoing US administration, with partial support in European capitals, but with an increasing cloud of generic suspicion. The interesting aspect of Huawei is that it is already offering its own operating system, Harmony OS, and its own layer-on-top, Huawei Mobile Services, and is aggressively pursuing a cross-device strategy, leveraging its strong position in the Internet of Things (IoT) market and the prospect of offering an additional pole of competition with its own rules. While the conditions around its links to complementors have yet to firm up, it seems to be positioning itself as a more flexible complementor (possibly due to the smaller size of its ecosystem), with lower fees to app developers. The question is, how will EU regulations affect it? Will EU regulators try to include it as a gatekeeper, even if its size/market share is smaller? Will it be met with the same conditions as American firms, or will political and cultural differences, amplified by the expected US/EU rapprochement that a Biden administration will bring, make Chinese firms an explicit target instead? If technological and economic nationalism continues into 2021 and beyond, where will Europe stand in this regard?

The final piece of the puzzle is geopolitics: the unspoken motivation for at least part of Europe's resolve. Ultimately, much of the urgency in the new Commission, and other European centres of power, is driven by concerns over EU firms losing the battle for digital leadership. While there are some efforts to mount a counterattack – e.g. by creating a European Champion in GAIA-X as a template for a EU-friendly mode of information processing and B2B interchange[55] – there is a significant emphasis on a tough regime vis-à-vis US firms. As we note in the next section, it is far from clear that this will yield all the desired effects. At the same time, the US-inspired pushback against Chinese firms has made Europe wary too – even if its current concern is US-based firms.

What should we be aiming for? From regulation and geopolitics to a healthy base for tech renewal in Europe

2020 has had a remarkable string of legacies. It has helped sharpen the regulatory debate, with Europe taking a very firm stance against Big Tech, as public sentiment and political will soured. COVID-19 has underscored the importance of digital ecosystems, and made the challenge of dealing with Big Tech all the more topical. At the same time, the pandemic has enabled Big Tech to boost its importance, not to mention its market capitalization, still further – regulatory pressures notwithstanding. It has sustained tensions between technologies developed in the US, Europe and

[55] In the September 2020 State of the Union address by Ursula von der Leyen (again) emphasized the focus on GAIA-X as a cornerstone for leveraging industrial data in a B2B context. Currently, roughly 80% of industrial data is collected and never used – however, leveraging it, via data infrastructure mechanisms such as GAIA-X, could give Europe a significant advantage and competitive edge.

China, leading to a renewed appreciation of geopolitics. Amid all these risks, the danger is that we end up creating more confusion than clarity in terms of the way forward.

Our analysis is an effort to explain both the drivers and the implications of EU regulation. A pivotal part of our research has been the focus on the business models through which Big Tech makes money, and a balanced analysis of their implications for competition and welfare. Although we have used it as a hook on which to hang our work, we believe that the 'Big Tech' label may actually be misleading, as there may be more differences than similarities between firms that leverage technology to become big. Instead of obsessing over tech firms' nationality, or the location of their HQs, we must focus on *how they monetize*, and what that means for how they deal with customers and complementors. To provide a provocative illustration, it strikes us as rather ironic that there is such concern over potential illicit information leakage when using Chinese technology, when they are not directly related to the use or monetization of data, while giving Google and Facebook, which make all their revenue from exploiting user data, a free pass.[56] This is not to downplay information and security concerns; but to emphasize that the key focus is the business model and monetization – and that this is, in turn, driven by the institutional context and the set of regulations, such as those being discussed today.

It may also be useful for the EU to consider how the Tech sector is organized elsewhere. Whereas the US and Europe still have two key mobile AppStores, one Android-based and one based on iOS, China has a multitude of co-existing AppStores where OS developers like Huawei, device manufacturers like Xiaomi, eCommerce giants like AliBaba, and all-encompassing social media firms like Tencent/WeChat all have their own co-existing App stores, none having the clout of Android and iOS. While there may be other features the EU might want to steer clear of, it should consider how ecosystems in other settings operate.

In terms of the ecosystems and those who orchestrate them, we think that the definition of gatekeepers may need to be broadened. Rather than relying on the reach and size of the core platform alone, we may want to consider the extent to which they form part of a *multi-product ecosystem* which can increase the chances of a lock in, and which may underpin the overarching business model of the relevant Tech firm in question. We might also consider structural gatekeeper features, such as, does the platform offer *de facto* irreplaceable access to consumers? Is it difficult for users to multi-home or switch platforms? Are sellers substitutable? Do users benefit from network effects, requiring sellers to multi-home across platforms? Does the platform have an established set of buyers and sellers, and to what extend does this create an effective entry barrier to rival platforms?[57]

We should also carefully consider how the choices in the next two years will affect the strength of existing regulation. A number of practices which could have been "blacklisted" were "greylisted" instead- offering the EU Commission leeway in the extent to which they will tolerate such

[56] Note that this refers to equipment, as opposed to the debate on network equipment such as raised with Huawei, as it is a different matter. However even in equipment, in Huawei and beyond, the question of the country of origin has also been raised. For us, the fundamental fact remains: The real incentives to leverage and use data strategically, and prey on human predisposition and behavioral patterns (including addiction) rests with those whose business model depends on data. Inasmuch as we do not explicitly consider the incentives inherent in business models, we will not truly address the problem. In this sense, the use of nationality and geopolitical bloc- be it European, American or Chinese, may be a diversion from the real issue at hand. Let's first focus on the driver, which is monetization.

[57] For a more detailed analysis of a framework for defining Gatekeepers and their power (with application to the Apple/Tinder relationship by way of illustration) see the Evolution Ltd forthcoming White Paper by M.G. Jacobides, 2021, *What Drives and Defines Digital Platform Power: Understanding Bottlenecks and Gatekeepers*

behaviour from gatekeepers. While discretion may be useful, it means that the devil will be even more in the implementation details, and leaves some difficult implementation challenges open. While Big Tech will be quick to point out that such limitations may hamper customer ease, we should not neglect that lock-in and convenience are two sides of the same coin, and that what is at stake here is for outside innovators to be able to challenge incumbents with greater vigour. And, while these decisions will relate to Europe, corporate rhetoric notwithstanding, they are likely to affect technology globally as it is more economical to have one unified tech infrastructure for these globalized firms. Thus, these choices may have an impact beyond Europe's borders.

As policy agendas, economic and technological nationalism – or preferences for blocs such as 'Europe' or 'The West' – are both understandable and sensible. However, we should not confuse them with the regulatory agenda. What is at stake are fundamental questions of the rights of customers and users, and their relationship to information, and how we think about issues like social media cultivating our information addiction, or, in a B2B context, how Big Tech exerts power over complementors. We need ruthless clarity on the factors that determine which business practices and models are appropriate, and which are not. To us, it is evident that the existing regulatory apparatus cannot provide this clarity; as such, we welcome the push for a serious rethink of our regulatory approach in Europe and beyond. In this paper, we argue that the current regulatory discussion is missing two vital elements: an understanding of Big Tech business models, and an appreciation of how regulation will affect the broader ecosystem.[58] Having provided an overview of both, we hope our findings will help both regulators themselves, and firms contemplating their futures in a changing world.

In terms of geopolitics, we would encourage a more open discourse. For instance, say there is a concern that Chinese firms benefit asymmetrically from access to European consumers and complementors. We would all be better served by requiring Chinese firms with European aspirations to offer access to the Chinese market in exchange – so that, for instance, we require Xiaomi or Huawei to grant European complementors access to China.

Last, and perhaps most important, we believe that neither regulatory pushback nor geopolitical games will address one of Europe's key challenges, which is the fact that it is trailing behind both the US and China in terms of Big Tech. While there is some good news in this regard,[59] there is still a long way to go. We believe Europe would benefit from an open strategy underpinned by strong rules –rules that are at least partially harmonized with other leading economies, especially the US and China. Europe has a chance to lead the way in terms of tech regulation, especially if it demonstrates that the key focus is the protection of both individuals and smaller firms, as opposed to geopolitical concerns. The creation of more globally consistent rules would benefit us all.

Given the dynamism in the world of technology, and at least until strong European players that are able to successfully compete on a global scale in the entire hardware and software stack, Europe would be best served by remaining open, with an emphasis on a clear set of rules. It may even be

[58] Caffarra, C, Etro, F. Latham, O, Scott Morton F. 2020. Designing regulation for digital platforms: Why economists need to work on business models, EUVox/CEPR, https://voxeu.org/article/designing-regulation-digital-platforms

[59] To highlight just a few points as illustrative examples of the way the European tech ecosystem is developing – over the last 5 years (2015-2019), compared to 2010-2014, the invested money in Europe has grown 232% from $34B to $113B, number of mega rounds (as in +$100M rounds) has risen 344%, +$100M exits have grown by 94%. Moreover, 2019 has been the biggest investment year ever. See more at https://www.slush.org/state-of-european-tech-2019/

able to set the trail in the tech world by shaping the way we view regulation.[60] It also needs to enhance its ability to support a thriving tech ecosystem, whether that is via intra-European regulatory fragmentation or by improving its financial markets to enhance access to funding for start-ups and scale-ups. Europe's success will also depend on the ability of its major (legacy) firms to adjust. If we want to see a European tech superstar, we may achieve it not through regulation, but by SAP's ultimate success in its increasing shift to the Cloud or its new Industrial Services ecosystem, following the example of Microsoft's shift to Office Online and later Azure. Finally, in addition to the ability of firms such as Philips and Siemens to transform, the extent to which new tech players such as Revolut and Transferwise can scale up to the level of Stripe, let alone Ant Financial, will be critical.

The European conundrum is a challenging one. On the one hand, it wants to defend its place in a fiercely competitive market and reassert some of the power it has lost over the last few decades. On the other hand, it wants to push technology development in a more humanistic tradition, which enshrines individuals' rights over data, and which protects them from abuse- areas where there seem to be significant ideological differences of interpretation both with the US and with China. The balance between corporate power and state intervention, regulatory mechanisms and entrepreneurial drive is a difficult one to get, but it has the opportunity of shaping the debate and impacting the way people and machines will integrate not only within the EU, but also more broadly. It's a fascinating challenge, an exciting path ahead, and one where a solid comprehension of business models and of the shifting basis of power and its abuse will have to trump propaganda and soundbites.

[60] GDPR is an example where the EU shaped much global regulation. More broadly, for the under-appreciated role of the EU in shaping global regulation, see Bradford, A, 2020 The Brussels Effect: How the European Union Rules the World, New York: Oxford University Press.