IPPR Commission on Economic Justice

The Digital Commonwealth

From private enclosure to collective benefit

Discussion Paper

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The IPPR Commission on Economic Justice

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The IPPR Commission on Economic Justice

The IPPR Commission on Economic Justice is a landmark initiative to rethink economic policy for post-Brexit Britain.

Launched in November 2016, the Commission brings together leading figures from across society – from business and trade unions, civil society organisations and academia – to examine the challenges facing the UK economy and make practical recommendations for reform.

The Commission is undertaking a wide-ranging programme of research and policy consultation on issues including industrial strategy, macroeconomic policy, taxation, work and labour markets, wealth and ownership, sub-national economic policy and technological change. Through a major programme of communications, events and stakeholder engagement it aims to contribute to both public debate and public policy on the economy. Non-partisan, it has been welcomed by both government and opposition parties.

The Commission's Interim Report, *Time for Change: A New Vision for the British Economy*, was published in September 2017. Its Final Report will be published in autumn 2018.

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Summary

Digital technology is delivering a huge range of benefits to businesses, citizens and wider society. Platforms – online applications that intermediate between the provider of a service and its users – have unlocked many of these benefits by sorting and connecting an enormous range of services and products, both online and off. At the forefront of the platform economy are Facebook, Alphabet, Amazon and Apple – they have accumulated the most data, developed the most advanced analytical capabilities and gained greatest ownership of the foundational infrastructure, from mapping to cloud computing, that underpins all digital technology. As such, we refer to them as the 'universal platforms' and their ambitions are the focus of this report.

Increasingly, the operations of the universal platforms are driving negative social and economic outcomes. Critically, these outcomes are not aberrations but a result of the universal platform business model: the extraction and analysis of data for profit. Data is the source of their economic and, increasingly, social power. Maximizing the potential of digital technology requires managing data and digital infrastructure as a collective good.

This conclusion is based on four propositions.

1. Platforms are diverse in form but share common features. The major platforms dominate the digital economy.
    - Platforms are multi-sided online arrangements between suppliers and users, with the platform acting as an intermediator. Types of platform include those that use data insights to promote products and those that provide the digital infrastructure, including cloud computing, on which other platforms operate.
    - Platforms all benefit from a number of factors inherent in digital markets, including low marginal costs, powerful network effects, and an emphasis on growth in users and other measures over profitability.
    - These effects tend dominant platforms towards monopoly. In the UK: Facebook has 74 per cent of the social network market share; Amazon is responsible for 90 per cent of all e-book sales and an estimated 80 per cent of online physical book sales, and Google has an estimated 88 per cent share of the desktop search engine market and 95 per cent of searches on mobile.
    - The 'universal platforms' have the most data and ownership of digital infrastructure. Facebook, Alphabet, Amazon and Apple have accumulated the most data, developed the most advanced analysis capabilities, and gained greatest ownership of the foundational infrastructure, from mapping to cloud computing, that underpins all digital technology.
    - This means the universal platforms are poised to dominate artificial intelligence markets. Dominance in the fields of data extraction and analysis means that the leading platforms are likely to develop the most advanced artificial intelligence (AI) technologies, positioning them to dominate the application and development of new, potentially transformative, products and services.

2. Data extraction and analysis are central to the platform business model. Platforms share common features because they have the same core revenue model: the extraction and analysis of data for profit.
    - Data is generated by users of the platform, aggregated and analysed to create insights that are sold for profit. They are also used to improve the platform, expanding artificial intelligence capabilities that underpin the development of the platform's insights. This process is immensely valuable, with Alphabet generating revenues of $32.3 billion in the fourth quarter of 2017, up from 24 per cent the year before, with 85 per cent of that revenue generated from its advertising business. The combined annual revenue for the world's five largest companies by market value - all of them platforms in some form - already exceeds the GDP of 90% of the world's countries.
    - Profiting from the extraction and analysis of data generates a circular, expansive dynamic: the more data that is captured, the greater the potential for revenue. As such, the impulse to capture, analyse and monetise data sits at the heart of the platform business model, dominating their strategies and dictating how they develop and deploy digital technology.

3. The universal platforms have boundless ambition. With revenue predicated on the extraction and analysis of data, platforms seek to expand into new markets and to enclose users into their ecosystem of services, maximising data throughput.
    - Platforms provide many positive benefits. For consumers, useful services are provided at low to no immediate economic cost, with greater convenience through coordination, and with more personalisation. For businesses, market access is expanded, transaction costs can be reduced, and service is provided. At a societal level, access to information, social connections and material efficiency is improving.
    - But this business model drives platforms to behaviours that are creating serious economic, social and political problems. By acquiring innovative start-ups and limiting access to their large datasets, platforms could be limiting the innovation potential of the economy; platforms are increasing economic rents and contributing to a declining share of national income going to labour; dominance in advertising markets has eroded existing means of developing and accessing news content; and social network platforms have potentially been used to unduly manipulate democratic proceedings.
    - These outcomes are not aberrations or temporary phenomena, but are rooted in the purpose and revenue model of most major platforms. Furthermore, the greatest benefits and threats come from the universal platforms, as they are expanding vertically and horizontally, and have large and growing AI capabilities.
    - We stand at a crossroads. So far, the development of the modern digital economy has largely been determined by powerful market actors, with little proactive response from government. Without action, the boundless ambition of the universal platforms threatens to undermine democracy, accelerate inequality and concentrate economic power.
    - Whether digital technology works for or against the collective good will be decided by politics – or the lack of it.

4. Data and the digital infrastructure should be organised as a collective good. Public policy should seek to shape the production and distribution of data and its use for the common good, moving from conditions of monopolistic data enclosure to a thriving, creative and pluralistic 'digital commonwealth', where the vast potential of socially generated data helps develop the wealth, creativity and capacity of all society. This should cover data generated by the interaction of users with platforms as well as the data on individuals collected and stored by the state. In pursuit of these goals, we recognise the limits of the UK's domestic levers given the international nature of the digital economy and challenges of jurisdictional power. Nonetheless, we do not believe we are powerless, and indeed think more can be done with bolder policymaking. To that end, we propose four measures:
    - Strengthen competition law to foster innovation by reforming the Competition & Markets Authority and a new requirement for major platforms to open up their data upon entry to new markets in which they have a major advantage as a result of their existing data.
    - Regulate platform giants as public utilities through a new Office for Digital Platforms, including the opening-up of data in cases and markets that are deemed to be in the public interest.
    - Create a Digital Britain public service that drives the curation and productive use of public data (establishing a Digital Citizen Account and public data stores through which useful insights from aggregated, anonymised data could be broadly shared) and oversees the creation of a national data portal, which would provide a single site linking to opened-up private and public sector data.
    - Introduce Local Digital Commonwealth Strategies to drive the development and adoption of local platform services, from community decision-making apps to innovative businesses, leveraging public sector data sources and personal data from the opening-up of private sector data. Local authorities should develop place-based Digital Commonwealth Strategies that reimagine how data is generated and used, and ensure value is retained and circulated among communities where data is generated to provide economic, social and environmental value.

Digital technology could deliver enormous socioeconomic benefits across Britain, but at the moment the development and adoption of these and future technologies have been almost entirely market-led, with little to no strategic policy response from governments around the world, and are dominated by a small number of powerful firms which monopolise our data. Data should become more of a collective resource so we should move from enclosure of data to a model of digital commonwealth; only then can we realise the potential of the digital technology to enrich the lives of all.

Introduction

Platform companies occupy the commanding heights of the digital economy. From Facebook and Amazon to Uber and Airbnb, they provide a new set of digital arrangements that organise and structure economic activity. These take the form of 'multi-sided markets', where the platform functions as an intermediary between the provider of a service and its users. In the case of Uber, the provider is the driver of a vehicle and the user is the passenger; for Facebook, you as a user are linked to content from providers who themselves are users, including immediate friends and media companies.

Platforms provide substantial benefits. They enable flexible, on-demand services which meet consumer needs and wants and, in making these widely available, they improve access to information, opportunities, communities and networks, often internationally. The cost of these services has, in many cases, been lowered through reductions in transaction costs and the more efficient mobilisation of under-used assets, such as homes and vehicles. More efficient use of assets and lower levels of ownership could also have positive environmental outcomes through, for example, more shared vehicle journeys lowering overall car use. Access to information, opportunities and online forums for discussion and organisation could be having a positive political effect, lowering the costs of economic and social cooperation and allowing for a more informed and engaged citizenry.

Yet on current trajectories, we risk limiting the range of possibilities opened up by digitalisation. The digital economy is dominated by those platforms whose business models are founded on the extraction and analysis of data. These firms are Facebook, Amazon, Alphabet (the parent company of Google) and Apple – what we call the 'universal platforms' due to their expansive reach and ambition to dominate markets – and they are the focus of this report. While the dominant platforms will continue to deliver important benefits, their concentrated power, control over data and analytical capability, and narrow ownership structures – in which control is typically vested with the founders – risk hindering broad-based innovation, increasing inequality and undermining democracy. Rather than a flourishing ecosystem of open innovation and enterprise, and a complex and informed democratic life, we risk creating a 'paradox of plenty', where digital technologies concentrate economic reward rather than spreading the value they create.

While data is increasingly the engine of profit in today's economy, it is also critical to 'training' the artificial intelligence (AI) technologies which will play a central role in the economy of the future. As their power grows, the major platforms are becoming the leading arbiters of how AI technology is developed and how it is used. The transformative potential of AI to improve the efficiency and accuracy of current technologies, while inventing a plethora of new products and services, could precipitate rapid socioeconomic change at a scale and pace not seen for generations, with attendant impacts on the distribution of power. Whether this shift works for or against the public good will be decided by politics – or a lack of it.

The current trajectory is set towards the development and benefit of digital technology remaining in private hands. A central conclusion of this paper is that this dynamic is a necessary feature of platforms, not an unfortunate anomaly or a result of a given CEO's leadership style; the private extraction and analysis of data (and ownership of the resultant products and services) is rooted in the business model of the major platforms and the current regulation, ownership and operation of the infrastructure of the digital economy. Though their activities are broad, the

business model of platforms is characterised by a seemingly insatiable impulse: the extraction and analysis of data to maximise profit.

We find ourselves at a crossroads. With the pace of innovation quickening, and the power of the platform monopolists growing, tinkering with the status quo is no longer an option. Instead we need systemic action to lay the foundations for a more open, collaborative and creative digital future. This paper argues that public policy should seek to shape the production and distribution of data and its use for the common good, aiming for one unifying goal: to move from conditions of monopolistic data 'enclosure' to a more open and pluralistic use of data and digital technology, much of which becomes part of a digital 'commons'.

To that end, this paper sets out four propositions. The first two characterise the features and core business model of platform giants. The third concludes that these platforms possess a universal ambition – to enter and control a vast array of markets – which is spurred on by a core revenue model that compels platforms to extract and analyse data. The fourth provides a number of policies by which we can channel the boundless potential of digital technology for the common good.

1. Platforms are diverse in form but share common features. Platform-based companies occupy the commanding heights of the contemporary economy. They provide the intermediary digital infrastructure that organises and structures most online economic activity. While they operate in a wide variety of markets, they share core features: powerful network effects; very low marginal costs of production, and winner-takes-all markets, which mean platforms tend towards monopoly in their market.
2. Data extraction and analysis are core to the business model. Data is generated by users of the platform and aggregated, then analysed to create insights. These are both sold for profit and used to improve the platform, including expanding the platform company's artificial intelligence capabilities. The centrality of data generated by use of the platform as the core asset of the platform creates a circular, expansive dynamic: the more data that is captured, the greater the potential for revenue. This process is generating extraordinary wealth: Jeff Bezos, the founder of Amazon, became the richest man in history in 2018, with a net worth of over $150 billion, while the market value of the big five (Amazon, Apple, Alphabet, Facebook, and Microsoft) topped $3.048 trillion in 2018.
3. The universal platforms have boundless ambition. Platforms provide many positive benefits. But at the same time, the business model of these platforms could create a number of economic, social and political problems. Furthermore, the drive to extract and analyse data means platforms are expanding vertically and horizontally and have large and growing AI capabilities, giving them ever more social and economic power.
4. More data and digital infrastructure should be organised as collective goods. We need to reimagine how these technologies are used, how data is governed and owned, and how the digital infrastructure is developed and controlled. Underpinning this should be a new vision for how the digital revolution can deepen justice and prosperity. We propose four prongs: a revised competition framework to limit monopoly power; increased regulation of digital firms; realisation of the potential of public and private sector data, and the development of local data and digital infrastructures to better address problems and generate community value.

1. Platforms are diverse in form but share common features

Platforms provide the intermediary digital infrastructure that organises and structures most online economic activity: coordinating the supply and demand of other parties, and facilitating three-sided online market arrangements between users, suppliers and the platform infrastructure. Goods are matched with consumers on Amazon, information with searchers on Google, and social networks are connected on Facebook. Offline, Uber matches passengers with transport, Airbnb allows homeowners to rent housing for short-stay letting, and Siemens helps industrial manufacturers improve their production processes by monitoring the use of their products.

The platform economy is made possible by the growing capability of machine-learning algorithms, computing power, geo-locational technologies, smartphones and other devices, and ubiquitous internet connectivity.[1] Across this array of physical infrastructure, the digital spaces created by platforms provide a diversity of functions and structures, with important distinctions between those platforms that intermediate labour, information or physical assets. Types of platform and the activities they cater for can be organised into five broad areas (Srnicek 2016).

- Advertising (eg Google, Facebook): extract data from the users of the platform, analyse it for behavioural insight and sell those insights for profit, primarily to advertisers.
- Cloud providers (eg Amazon Web Services, Salesforce): own the hardware and software that provides the backbone of a cloud-based digital infrastructure, generating revenue by renting it out.
- Product (eg Rolls-Royce, Spotify): generate revenue from transforming traditional goods into services, collecting rents and/or subscription fees.
- Lean (eg Uber, Airbnb): intermediate between the owner of an asset or provider of a service and the user of that asset or service; these platforms charge rents in the process and have minimal asset ownership.
- Industrial (eg General Electric, Siemens): provide the hardware and software that enable the large-scale capture and analysis of data from manufacturing processes to improve those processes.

This paper shall primarily focus on the most powerful platforms. These dominant platform 'giants' are those that have accumulated the most data, have developed the most advanced analytical capabilities and have gained greatest ownership of the foundational infrastructure, from mapping to cloud computing, that underpins all digital technology. As we shall explore, their business model is founded on the intermediation, extraction and analysis of data, as opposed to physical assets, as is the case with platforms in the 'lean' and 'product' categories above. As such, these platforms are clustered with the advertising and cloud provider groupings

1 Throughout this paper we define algorithms as finite, structured, sequential, explicit sets of instructions for analysing flows or stores of data to produce information or patterns. Artificial intelligence (AI) is defined as any technique that allows computers to undertake useful tasks and mimic human intelligence. A subset of AI is machine learning, which enables computers to improve performance of a task over the course of its experience in performing the tasks – such as the Amazon 'recommendations' function. Deep learning is a further subset of machine learning and entails the ability of computers to independently learn how to undertake tasks, including speech and image recognition.

and include Facebook, Alphabet (the parent company of Google and its associated services), Apple and Amazon.

The dominant platform companies often combine multiple forms of platform activity within their overall operations. For example, Amazon is a dominant player in the provision of cloud-based services alongside its original retail platform business, while Alphabet's Google Play entertainment platform, which offers entertainment streaming services, is intimately linked to the Google Search advertising platform, which primarily acts to generate advertising revenue for Alphabet (Google's parent company).

In providing a range of services across these categories, these platforms are increasingly performing a series of vital social and economic functions (Oxera 2015). These include the following.

- Building core digital infrastructure: leading platform firms have built a number of online platforms that enable more effective use of the networking and information-sharing potential of the internet.
- Reducing transaction costs: for example, platforms such as Facebook more effectively match organisers of events with attendees, reducing transaction costs for both parties.
- Collecting, organising and evaluating information: allowing for a reduction in search costs for both users and suppliers of goods and services, such as Amazon's e-commerce site, which now increasingly dominates the product-search market.
- Facilitating social communication and information exchange: including allowing for aggregated feedback on goods and services, such as the 'location rating' function of Google Maps, and the creation of shared virtual spaces for learning and conversation, such as Facebook.
- Aggregating supply and demand: consumers are provided with a greater variety of available products and services and more immediate access to purchases, with an expansion of the available market for supplier businesses.
- Facilitating market processes: this is experienced by customers as improved competition among product offerings through greater choice, more relevance or lower price.

Overall, platforms are fundamentally reorganising economic activity, lowering barriers to market entry and changing how value is generated.

Despite the diversity of platform types and the variety of functions they perform, platforms share a number of important features which help explain the behaviours and strategies of the dominant companies.

- Platforms provide digital spaces that facilitate the coordination of work and other activities, all of which are not undertaken by platforms themselves. Platforms outsource production to the users of and suppliers to the platform. Instead, they focus on coordination, sifting and sorting those goods and services supplied to the platform, and orchestrating the interactions of users on the demand side (Schmidt 2017). This makes platforms distinct from businesses in a traditional industrial economy in which profit is generated by the production and selling of the company's products or services.
- While production is outsourced, reward is centralised. Platforms typically take a significant proportion of the value generated by the activities they coordinate and host. Risk is typically pushed on to the service providers or users of the platform.
- Platforms have marginal costs almost independent of scale that enable them to grow rapidly at relatively low cost. As digital spaces, platforms typically have very low marginal costs per extra user and so have the potential to grow

exponentially without having to spend proportionally more on staff or other costs of production (though many platforms fail to achieve this potential). Given the reliance of platform companies on the pre-existing infrastructure of the internet, and on users generating content, the usual barriers to rapid growth are minimised, including access to capital and new markets. This has enabled rapid scaling, both in value and in the growth of users. For instance, while it has historically taken Fortune 500 companies an average of 20 years to reach a billion-dollar valuation, digital platforms have taken an average of four years (Accenture and World Economic Forum 2016). An example is the communications platform WhatsApp (owned by Facebook), which in just nine years since its foundation has acquired 1.5 billion monthly users, a rate of growth far outstripping the growth of incumbent telecommunications companies (Constine 2018).

- Powerful network effects mean dominant platforms tend towards monopoly. 'Network effects' – whereby the more people who participate, the more useful the network and its services become for all users – powerfully shape the behaviour of platforms, incentivising more users to join and existing users to stay. These dynamics mean that a dominant platform typically becomes a monopoly. For example (BIS Committee 2016):
  - Facebook has 74 per cent of the social network market share in the UK and two billion monthly users, 66 per cent of whom use it every day (Lanchester 2017)
  - Amazon is responsible for 90 per cent of all e-book sales in the UK and an estimated 80 per cent of online physical book sales, while Amazon's Audible also has an effective 90 per cent of the digital audiobook market
  - Google has an estimated 88 per cent share of the desktop search engine market and 95 per cent of searches on mobile, and over 90 per cent of the search market in Europe as a whole.
- The incentive to scale rapidly and the rewards of dominating a winner-takes-all market encourage platforms to employ aggressive business plans. In particular, the advantage of platform-based companies often rests on exploiting the difference between the practices adopted by platform firms and the rules by which established companies operate, which are intended to protect customers, communities, workers and markets.
- Platforms generate revenue in different ways, but increasingly depend on monetisation of the data they collect. Although platforms charge for various aspects of their services, including through access fees, behavioural data generated by the users of the platform is their critical economic asset. This is a crucial and ongoing shift in how value is produced and distributed in the economy.

2. Data extraction and analysis are central to the platform business model

Platforms share common features because they have the same core revenue model: the extraction and analysis of data for profit. Data is generated by users of the platform and aggregated, then analysed to create insights. These are both sold for profit and used to improve the platform by expanding artificial intelligence capabilities that underpin the development of the platform's insights. This generates a circular, expansive dynamic: the more data captured, the greater the potential for revenue. As such, the impulse to capture, analyse and monetise data sits at the heart of the platform business model, dominating the firms' strategies and dictating how they develop and deploy digital technology. In this chapter, we explore the growing role of data in the economy, its large and growing economic and social value, and the revenue model of platform firms.

DATA AND THE DEVELOPMENT OF PLATFORM FIRMS

Data is information about the world that can be collected and analysed to extract meaning and generate value. As an asset it is both non-rivalrous and non-fungible: a single piece of data can be used by multiple algorithms or applications at once. At the same time, one piece of data cannot be substituted for another, because each carries different information. The aggregation of data and its large-scale analysis enables the creation of better insights and is more valuable than data examined in isolation.

Collecting, analysing and acting upon data is not a new economic activity. Firms have been collecting data – on their customers and production processes – to improve performance since at least the birth of industrial capitalism. However, historically, data has been scarce. Society has lacked the tools and techniques to collect and analyse data on a large scale. A series of broad technological and economic trends are now transitioning our world from one of data scarcity to one of increasing abundance, with profound economic and social consequences. Platform companies are increasingly both a cause and an effect of these trends.

Two broad technical advances underpin platforms and broader digitalisation. First, the growing capability of geo-locational technologies and digital infrastructures that can trace and track our lives, generating ever-more detailed forms of data about ourselves, our networks and relationships, and our physical environments. Second, the accelerating capacity of machine-learning systems, algorithms and other AI technologies to create insights out of the sheer volume, variety and velocity of data being generated by digitalisation. This combination – the ability to collect ever greater volumes of data and the ability to apply growing computing power to extract value from it – underpins the platform business model and the centrality of data to these companies.

WHY DATA IS SO VALUABLE: IMPROVEMENT, REVENUE, AI

The Organisation of Economic Development (OECD) has concluded that in the digital economy 'big data' married to analytical power is a 'core economic asset' (OECD 2016). It is valuable in three key ways: it can improve company performance through the fine-tuning of goods and services produced, including platforms themselves; it can be analysed to create insights that can be sold to generate revenue, and it provides the raw material for the training of increasingly powerful AI systems.

As well as enabling the development of new business models, products and services, analysis of high-quality data can improve company performance in a number of ways. It enables greater transparency and accountability, the better managing of performance, the detailed segmentation of users to customise products and services, and radically quicker and improved decision-making through supporting or replacing human decisions with automated algorithms.

Companies that use 'data-driven decision-making' show higher performance: a study of 179 large publicly traded firms, for example, found that the ones that adopted this method are about 5 per cent more productive and profitable than their competitors (Brynjolfsson and McAfee 2014). In the UK, Nesta has also found data-driven companies are over 10 per cent more productive than those that do not exploit their data. It estimates that if all such 'dataphobes' were to make good use of data in driving their business decisions, it would produce a 3 per cent increase in UK productivity (Bakhshi et al 2015).

The dominant platforms, with their deep and expanding pools of data, are at the forefront of benefitting from these trends. In particular, behavioural insights gleaned from the analysis of large datasets are a direct source of revenue to many of the platform giants. An examination of the composition of the revenue of the major platforms underscores how central the selling of analysed data is to their business models. Google (now a subsidiary of Alphabet) has generated more than 90 per cent of its total revenue within the last decade from the selling of advertising space tailored to advertisers via analysis of user data. This trend shows no sign of abating; Alphabet generated $32.3 billion in the fourth quarter of 2017, up from 24 per cent the year before, with 85 per cent of that revenue generated from its advertising business (Rodriguez 2018). Data and insights gained from the users of Alphabet's services enable advertisers – for a price – to target potential customers more effectively, selling tailored online advertising over the internet through Alphabet's Google AdWords and Search advertising and the AdSense Network. Revenue from other sources, including Chromecast, Google Cloud Platform, Android and Chromebooks, constitutes a much smaller share of Alphabet's revenue compared to selling space to advertisers based on the data profiles of users (D'Onfro 2018).

The value of the data generated by those interacting with the dominant platforms means that these platforms often provide their services free at the point of use; we provide unremunerated digital labour in exchange for access to them (Fuchs 2013). As such, those whom we typically view as the service user are in fact the 'product' being sold, in that their interactions with a platform are being captured and monetised. In other words, the customers of the dominant platforms are the advertisers or companies who buy the data or access to spaces made more valuable by analysed data, such as tailored advertising spaces, that is generated by platform users through their interaction with the platform.

Finally, the accumulation of data enables the training and improvement of AI systems. The analysis of unstructured data allows for AI processes to learn and act without being explicitly programmed; so-called 'deep-learning technology'. In turn, this improves their capability. Dominance in the collection and analysis of data today could be a major determinant of the distribution of economic and social power in a future where AI critically shapes how the economy operates. There are many historical examples of rapid technological change disrupting existing social and economic relations and enhancing the power of certain interest groups. One was the development of shipping technologies by Britain, which saw the nation own nearly half of the entire global trading fleet by the late 1800s and emerge as a global hegemon (Ojala and Tenold 2016). Another was the original information computer technology giants, with Microsoft using its dominant position to engage in anti-competitive practices across the world (Economides 2001). Similarly, AI

technologies have the potential to transform many social and economic functions across the world (from mass automation of work to development of more effective healthcare technologies) in a way that could primarily benefit those owning the technologies and those wealthy enough to access them, increasing inequality. Or they could be adopted in such a way that broader sections of society can gain the benefits from the goods and services that use AI technologies.

The current intense competition between platform companies to marshal the greatest amount of data and analytical capacity is therefore a struggle to dominate the AI systems of the future that will offer transformative capabilities. Who best controls, analyses and owns data will help determine the winners of that process. With much data generated by the dominant platforms and the digital infrastructures they own and are developing, data becomes a hugely valuable asset to platform owners and a source of deep infrastructural power in the AI-rich economy of the future.

THE NEW GIANTS

The three uses of data – platform improvement, a source of revenue generation, and material for AI training – are immensely valuable. This can be seen in the economic value of the major platforms. As table 2.1 shows, seven of the 10 most valuable companies globally by market value in 2017 provided platform services – Apple, Alphabet, Microsoft, Amazon, Facebook and the Chinese firm Tencent Holdings and Alibaba. They have also driven a major shift in the concentration of economic power, driving the rise of the data oligarchs (McAnn 2018). In the last 10 years, the world's five largest companies by market capitalisation have all changed, save for one: Microsoft. ExxonMobil, GE (General Electric), Citigroup and Shell are out and Apple, Alphabet, Amazon and Facebook have taken their place (Taplin 2017).

The market value of the big five (Amazon, Apple, Alphabet, Facebook, and Microsoft) has topped $4 trillion in 2018, with their combined annual revenue already exceeding the GDP of 90 per cent of the world's countries (Gallagher 2018). The platforms giants are also pulling away from the rest: June 2018 quarterly results are expected to show the big five have achieved a 'combined growth of 26 per cent year-over-year compared with 8.7 per cent growth projected for the S&P 500' (Gallagher 2018). Indeed, the forward profit margin of S&P 500 listed information technology companies is diverging radically from ex-information technology companies listed; the average for the index is 12.2 per cent, whereas for digital companies it is 22.8 per cent (Yardeni, Abbott, and Quintana 2018). This is generating extraordinary riches: Jeff Bezos has seen his net worth increase by $52 billion in 2018 alone, adding an estimated $405 million to his net wealth every 24 hours (Carville and Metcalf 2018).

Nor is it just the big six. The market capitalisation of the top 15 public platform companies in 2016[2] was $2.6 trillion. At the same time, the latest wave of high-value companies are data-driven platforms: more than 70 per cent of 'unicorn' start-ups (companies worth a billion dollars or more) are platform companies (Accenture and World Economic Forum 2016).

2 Alibaba, Alphabet, Amazon.com, Apple, Baidu, eBay, Facebook, JD.com, LinkedIn, Netflix, Priceline.com, Salesforce, Tencent, Twitter and Yahoo!

TABLE 2.1

The 10 largest companies in the world by market value in 2018

	Company	Market value in 2018 (in billion US dollars)
1	Apple	962.9
2	Amazon.com	777.8
3	Alphabet	766.4
4	Microsoft	750.6
5	Facebook	541.5
6	Alibaba	499.4
7	Berkshire Hathaway	491.9
8	Tencent Holdings	491.3
9	JPMorgan Chase	387.7
10	ExxonMobil	344.1

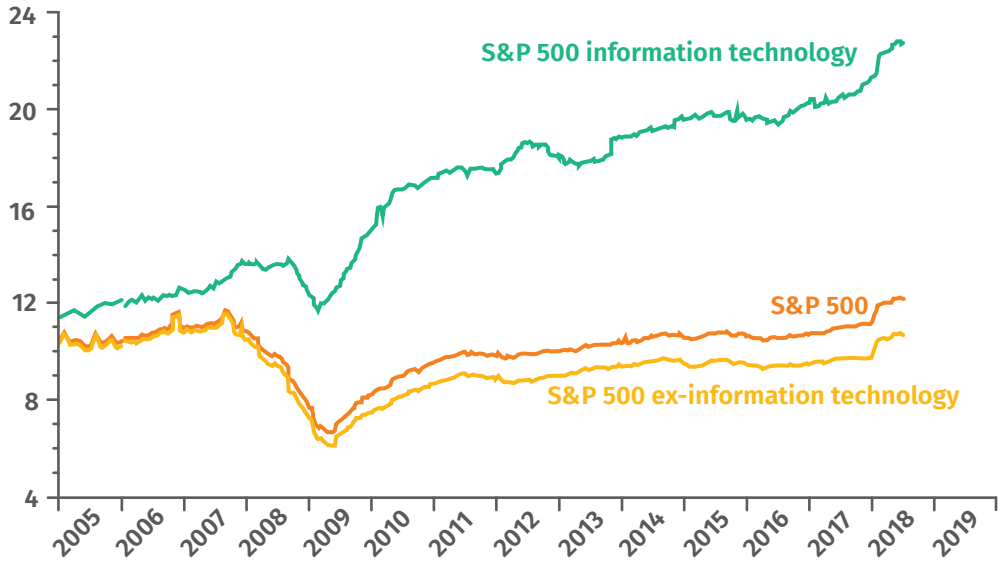
Platform businesses	Companies that also sell hardware/software but are increasingly platform businesses

Source: Statista (2018)

FIGURE 2.1

Forward profit margins in the tech sector are diverging from the non-IT companies, driven by the performance of the giant platforms.

S&P 500 forward profit margin (%) of the information technology sector and index as a whole



Source: Yardeni and Abbott (2018)

Projections also suggest the increasing importance of personal data for private and public organisations. Applications built on personal data are expected to provide quantifiable benefits of as much as €739 billion annually within the EU by 2020, with a third of the total accruing to private and public organisations,

and two-thirds accruing to consumers (European Commission 2017). This means a benefit for firms of about €330 billion annually by 2020. These applications will provide 22 per cent of the annual growth of revenues for public and private sector organisations in the EU economy.

THE PLATFORM BUSINESS MODEL: EXPANSION AND ENCLOSURE

The importance of collecting and analysing data on an ever-greater scale and with ever-greater detail powerfully shapes the nature of the business model of the dominant platforms. In particular, it drives a circular process of expansion and enclosure of the generation and use of data.

First, users of the platform generate behavioural data through interaction with the platform which the platform company collects and has control over. Second, this data is aggregated and analysed by the platform to generate insights. These insights are sold for profit, for example to advertisers, as well as being used to improve the platform. In turn, these improvements allow the platform to gain new users and generate more data, allowing for more effective insights to be generated, further improving the potential profitability and functioning of the platform. As more data is captured, the greater the potential for revenue becomes, incentivising platform companies to extract ever more data from their users. The dynamic is therefore circular – platform use creates data, which is analysed for profit and platform improvement, enabling more users to be attracted to generate data, and so on – and expansive, in that the more data, the greater the revenue potential.

This dynamic is reinforced by the features common to digital platforms examined in the previous chapter: they have low marginal costs, powerful network effects, strong first mover advantage, and agglomeration effects (a large data set beats a smaller data set, all other things being equal). As a result, platforms experience rapid growth, tending towards monopoly, as can clearly be seen in the market position of dominant platforms today. In monopoly stage, where platforms dominate their market, two core behaviours can be observed: expansion to gain more users and data, and enclosure to maximise their data advantage.

Expansion

Platforms are driven to expand their operations to aggregate ever greater volumes and quality of data. This is motivated by a combination of factors, including the centrality of data to revenue generation, the importance of gaining market share over profitability, and the role of network effects in scaling.

Expansion of data collection partly occurs through improvements in existing platform services to enable the extraction of increasing levels of detail from its users, such as by providing more services that require direct input of data, like games, or by more efficiently capturing the array of user data revealed by existing activity, such as capturing the amount of time a user spends looking at a post before clicking into it. Expansion is also achieved by entering other markets, which generates both additional revenue and data. The major platforms have expanded both horizontally – into entirely new sectors – and vertically, dominating the infrastructural underpinnings of the digital economy. For example, Facebook has expanded into communications and virtual reality systems and also provides cloud-based internet connectivity to a significant proportion of the global population, while Amazon has built market share in cloud computing, food delivery, e-books, and physical retail stores, among other areas.

The cross-subsidisation of services as they enter new markets is a critical strategic element of platform expansion, with data allowing for personalisation to a degree not achieved by non-platform firms engaging in cross-subsidisation strategies. Taking Google services as an example, a user could be attracted by free access to

an email account (Gmail). The data extracted and analysed during the use of the email function enables Google to personalise advertising for paid services, such as entertainment content through YouTube or Google Play, cloud computing and collaboration products through G Suite – all of which are attractive because of brand recognition, product quality and their ease of access if you already have a Google account. All extracted data is then used to improve the analytical capability of Alphabet's full suite of machine-learning and artificial intelligence technologies.

Enclosure

Having achieved a monopolistic position through the mass extraction and analysis of data, platforms typically move to control access to this data and to limit the ability of users and other suppliers of data to migrate to competitors, 'enclosing' more and more of the digital world within their private sphere.

Platforms' data is jealously guarded, because of the revenue model that directs the major firms and because of the incentives – or lack thereof – they as businesses face from current regulatory policy. At the same time, platforms increasingly dominate the development and ownership of the infrastructure underpinning digitalisation. This includes the technologies that enable data collection and analysis at scale, including cloud computing, geo-locational technologies, networked consumer devices, and machine-learning systems. This enables them to act as gatekeepers to the valuable insights generated through data analysis as well as collecting rent from the users of the digital infrastructure they now own and control.

The example of Amazon

Amazon provides a useful example to illustrate the twin dynamics of expansion and enclosure, and how they are driven by a revenue model that seeks to extract and analyse ever-growing quantities of data – as illustrated in figure 2.2. Amazon started by selling books online through a platform that accumulated data on purchasing tastes and provided useful functions that recommended new books based upon these tastes (Foer 2017). At the beginning, Amazon benefited from the low costs of shipping books relative to other consumer goods, economies of scale from mass purchasing, and a global macroeconomic environment in which investors poured money into digital platforms, seeking returns from tech start-ups in lieu of higher returns elsewhere. As the business grew, more purchases enabled more data extraction and the attendant improvement in its recommendation function, driving more sales and better consumer targeting, attracting more suppliers and users. More products were added to the store, increasing users, which led to further improvement in its recommendation and other services, attracting sellers. Furthermore, through monitoring those goods that sold well, or were frequently viewed or added to a customer basket, Amazon soon started producing own-brand products, such as AmazonBasics, which provides Amazon-branded consumer products, from electronics accessories to bedding (Russell 2018).

Amazon then entered new markets, including finance and grocery shopping, while deepening its hold on the general retail market by lowering barriers to consumption through quick delivery options, among others, and diversified its revenue model by adding a subscription service with additional benefits. At each stage of expansion, more data has brought higher revenue and improved analytical capability, demanding further data extraction. In Amazon Web Services, Amazon also owns and leases much of the digital infrastructure, like cloud computing, used by other platforms and internet users, as well as governments, gaining analytical insight of the data passing through its systems. Furthermore, by expanding into 'gatekeeper' devices, such as the virtual assistant Alexa, Amazon is enclosing users into a 'walled' ecosystem of Amazon services, exploiting brand recognition across an increasing array of services, using extracted data to improve vocal command technologies, and potentially limiting access to competitor services through Alexa (Perez 2018).

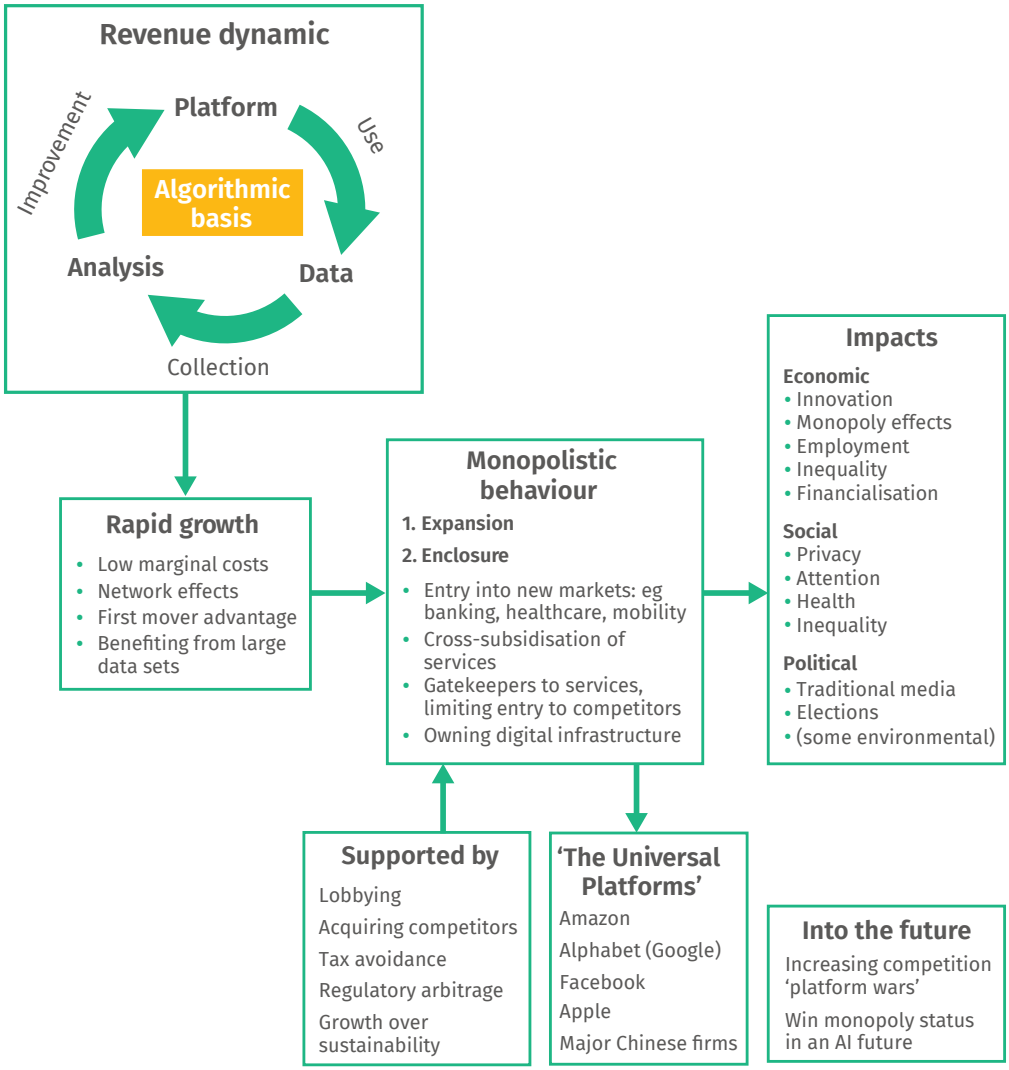
Amazon is also entering other markets, increasing its potential to provide a broadening suite of social and economic functions, and increasing the possibility that users will no longer have to use a competitor for their provision, enhancing monopolistic effects. With data increasingly becoming key to many socioeconomic functions – from transport, through healthcare, to finance – platforms should be confident that they could gain a significant position in sectors they have yet to enter. For example, the platform giants are increasingly penetrating finance services and the financial sector's existing stores of data, analytical capability and easy-to-use platforms could provide a competitive advantage over banking rivals with less data and less popular platforms through which customers use their services (Williams-Grut 2018). Meanwhile Amazon has recently announced that it will enter healthcare markets (Crow and Gray 2018).

Platforms are likely to enter new markets if two central conditions are met: that the platform's existing data and data analysis capabilities confer a competitive advantage; and that the market opportunity is profitable enough over a given time horizon. With the accelerating rollout of small, internet-connected devices, the range of markets that may interest platforms is large. For example, in the wake of recent concern over single-use plastics, it is not implausible to imagine a time when Amazon even enters the coffee cup market, producing cloud-connected multiple-use cups that enable immediate refill at Whole Foods Market stores, its grocery business, and are linked to its Amazon Dash Button service, which reorders products, such as instant coffee, at the press of a button. This example is not beyond the realms of possibility. Amazon have filed 5,860, from the extraordinary to the mundane, reflective of an effort to create 'world in itself, a totality' (Stewart 2018)

Furthermore, a series of behaviours both enable and sustain the strategy of expansion and enclosure., These include political influencing (with platform giants now outspending most other sectors on lobbying), the voracious acquisition of competitors (with Amazon acquiring 23 companies between 2015 and 2017 alone), exploitation of regulatory uncertainty over how to value and tax digital services, uncertainty on how to adapt labour market regulation to intermediation between users and providers of services (HM Treasury 2018), and an emphasis on growth over profitability among platform investors (Srnicek 2016).

FIGURE 2.2

The platform dynamic is based on expansion and enclosure



3. The universal platforms have boundless ambition

The dominant platforms generate significant benefits and costs across different groups in the economy and society. How these are distributed between the platform company, users and suppliers to the platform, and wider society, is shaped by how a platform is governed and owned, and in whose interest. Crucially, the strengths and weaknesses of the platform approach are rooted in the business model. The expansion of data and its analysis generates products and services of enormous social and economic value, but also is at the heart of the potentially negative outcomes generated by platform companies, which we explore in this chapter.

PLATFORMS PROVIDE MANY POSITIVE BENEFITS TO CONSUMERS AND BUSINESSES

Consumers can benefit from platforms in a variety of ways.

- Low to no cost: provision of some services is often free at the point of use, albeit in exchange for control over the user's data, while lower consumer prices for goods and services can occur due to an increase in supplier competition, caused by reduced barriers to entry, especially for small providers.
- More choice: improved access to markets for suppliers of goods and services, greater range of options available to customers and other types of user, and goods and services can be more easily supplied across geographies.
- Greater convenience: including the rise of flexible, on-demand services – albeit with a cost, typically borne by the provider.
- Improved experience: more relevant products, services or content (though potentially at the cost of path dependency, in which past choices model future options, reducing diversity of choice over time); greater personalisation of services.

Businesses, whether platform-orientated or not, also benefit from the growth of platforms, including from the following.

- Market expansion: platform allows businesses to operate across a larger potential pool of buyers and sellers, with firms able to potentially advertise and connect with any consumer using digital technology capable of hosting the given platform.
- Cost reduction: online platforms such as e-commerce or recruitment platforms may benefit from economies of scale; provide consumers with ways to find potential products/services more efficiently (for example by increasing the candidate pool of potential hires); reduce the time and cost of searching for staff, and lower the costs of sales transactions.
- Information expansion: online platforms such as social media platforms may improve firms' ability to collect and organise information, such as customer feedback, allowing them to observe aggregate patterns.
- Divisibility of risk: for instance, crowdfunding platforms allow businesses to aggregate small investments over a large market in order to generate the capital needed, expanding the funding options for small start-up businesses.

Platforms and the connections and relationships they enable aggregate social power, amplify networks and mobilise purposeful action. They subsequently have a number of key positive and social and political effects.

- The networked world: platforms radically improve access to opportunities for connection and network-building, including communities and networks, and information. They are a place for organisation and discussion in ways that could strengthen the public realm.
- Improved performance: platforms, through their aggregation and analysis of data, enable more efficient processing and decision-making in public institutions, as well as the regulation of critical markets.
- Environmental gains: platforms could help drive much-needed dematerialisation as assets are digitalised, reducing the need for the production and distribution of material goods with higher environmental footprints. Relatedly, platforms enable the more effective sharing of goods, reducing the need for individual ownership in key areas (such as cars), which also reduces consumer imprints on the environment.
- Artificial intelligence and the explosion of social intelligence: a critical potential benefit, if managed for the common good, is the development of powerful forms of AI that can be applied to social and ecological problems, dramatically improving economic productivity, and could lay the foundations for a future of shared economic plenty.

In short, the growth of platform services throughout the economy is providing substantial gains for consumers, businesses, citizens and society at large.

THE NEGATIVE IMPACTS OF PLATFORMS ARE GROWING

However, the business model of most platforms – data extraction and analysis for profit driving a dynamic of cycle of expansion and enclosure – is creating serious economic, social and political problems. Crucially, these negative impacts are neither glitches nor temporary phenomena, but rooted in the purpose and revenue model of most major platforms. As such, episodes such as the Facebook/Cambridge Analytica revelations are not scandals in the sense of something going wrong, but rather symptomatic of the business model of data capture, analysis and monetisation (Naughton 2018).

Dampening innovation through monopoly behaviour and rent-seeking

In an effort to maintain monopoly status, large platforms are buying a growing number of innovative start-up firms, to incorporate the products, customers and revenues of the acquired firms, to buy up technical 'talent', or to stop rivals from developing further. For example Alphabet, has acquired over 190 businesses (Reynolds 2017) and Facebook over 60 since their respective foundations (Toth 2018). These acquisitions serve to both expand the data extraction and analysis capabilities of the large platforms, including into new markets such as finance and mobility, and limit the ability of competitor firms to emerge. For those companies not acquired, by limiting access to their large datasets, platforms could be limiting the innovation potential of the economy and the emergence of other start-ups, who are prevented from developing new insights and products from the enormous data banks of the platform monopolists (Stoller 2017). Others have argued that market concentration – above a certain size – is associated with falling investment in terms of capital expenditure and innovation in terms of research and development (Diez, Leigh and Tambunlertchai 2018). Acquisitions are enabled by large cash reserves accrued by platform firms, with, for example, Apple having $252 billion in cash reserves, Microsoft $133 billion, Alphabet $94.7 billion and Amazon $24.1 billion (Pelisson and Rapier 2017). The financial power of the universal platforms allows them to undertake mergers and acquisitions on a scale and range unlike the industrial giants of old. It is also worth noting that the large size of these

reserves may impose the opportunity cost of foregone investment in the real economy, with platforms now using cash reserves to invest in financial market speculation and store large cash reserves offshore, limiting tax (Foroohar 2018).

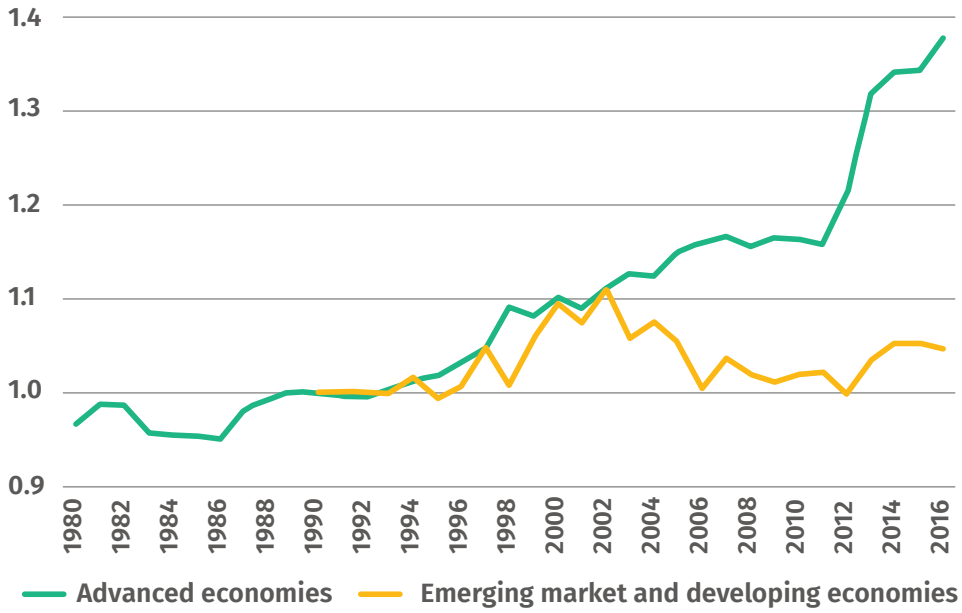
Increasing inequality

The rise in digital monopolies appears to be driving rising inequality by increasing economic rents and contributing to a declining share of national income going to labour (wages and salaries). Since 2000, economic rents have been increasing within the economy and have been a central factor in the increasing wage inequality observed during this period (Furman and Orszag 2015). They attribute this in part to the growth of digitalisation and the platform economy. Firms with greater market power can behave monopolistically, charging higher prices and earning monopoly rents above competitive rates of return. Recent research suggests that declining market competitiveness is driving income inequality and stagnant wage growth, as platforms' profits, gained from the spending of workers, are invested in capital gains, dividends and executive compensation for the few (Diez, Leigh and Tambunlertchai 2018; Khan and Vaheesan 2017).

FIGURE 3.1

Markups in advanced economies have been rising since the 1980s

Average markups of listed firms in each country income group, index 1990=1



Source: Diez and Leigh (2018)

Similarly, a group of economists from MIT, Harvard and Zurich found that industries where top firms' share of the market had most increased – the rise of the 'superstar firms', among which the major platform companies are the leaders – had experienced the largest declines in the share of income going to workers, with a growing share going to capital and high-income workers (Autor et al 2017).

Tax avoidance

Since digital transactions are not territorially located, it is relatively easy for platform companies to profit-shift to the lowest tax jurisdictions. Amazon, eBay and Google have all been accused of underpaying UK corporation tax in this way (Hadzhieva 2016).

Privacy, autonomy and the attention economy

Platforms extract personal data for profit. Individual privacy is consequently threatened by a business model that seeks to know more and more about people, often with little awareness by the individual or social group of how much information is being extracted, what type, and for what use (Which? 2018). At the same time, platforms sell the promise of our attention; that the information they have on us can get third parties to gain our attention and affect our behaviours. This threatens personal autonomy by its ability to command our attention and increase dependence on platform use (BBC 2017), as well as threatening our health, with, for example, social media use associated with worse mental health outcomes among young people (RSPH 2017).

Erosion of the public sphere and democratic weakening

The scale of personalisation of advertisements, news and products enabled by platforms has benefits but has also eroded the idea of a shared common life, with common reference points and narratives. This weakens democratic life and the public sphere, as suggested by concerns around the rise of 'fake news'. Moreover, Facebook and Google between them attract 84 per cent of the global digital advertising market in 2017 (excluding China), with huge consequences not just for other forms of advertising but also for journalism, both national and local, since newspapers have lost significant income as a result of their growth (Garrahan 2017).

Environmental impacts

While major platforms may be increasing material efficiency in the economy, through, for example, reducing the need for face-to-face meetings, their services could also have negative environmental impacts. These may include the energy requirement of servers, which are growing (Vidal 2017), and the lowering of barriers to consumption, as is the intention behind the Amazon Dash Button, which allows the customer to reorder goods at the push of a button, to be delivered by a vehicle (Boztas 2016). Researchers estimate that digital communications platforms could create up to 3.5 per cent of global emissions by 2020 – surpassing aviation and shipping – and up to 14 per cent by 2040, around the same proportion as the US today, and use 20 per cent of the world's electricity by 2025 (Vidal 2017).

THE UNIVERSAL AMBITION OF PLATFORMS AND ITS POTENTIAL IMPACT

Overall, the business model of the dominant platforms drives them towards a new and universal ambition: entry into more and more markets to enclose customer access to those markets within the infrastructure of the platform for the ever-expanding extraction and analysis of behavioural data for profit. As such, it may be more accurate to call these platforms 'universal platforms', to highlight the scale of their ambition.

The seemingly boundless ambition of the platform giants is driving the rise of so-called 'surveillance capitalism' (Zuboff 2018). Whereas profits once flowed from goods and services under industrial capitalism, then financial speculation under financial capitalism, profits are increasingly derived from the surveillance of platforms users and service providers by the platforms and the monetisation of that aggregate data through analysis and the selling of insights to third parties. Surveillance mechanisms have also extended deeper into the everyday operation of both the physical and digital economy. For example, Amazon has patented technology that tracks the movements and efficiency of warehouse workers (Solon 2018), while Facebook has experimented with the mass psychological manipulation of user behaviours through its newsfeed without user permission (Talbot 2014). In doing so, the drive of surveillance capitalism and the universal platforms to enclose and 'know' their subjects and their behaviours reflects a deep neoliberal rationality, which seeks to increase marketisation into larger parts of society. This includes the penetration of economic transactions into social interaction, with, for example, blockchain technology potentially enabling social media platforms

to monetise social interaction through charging micropayments to contact other users (Kuchler and Cornish 2018).

In lieu of a proactive policy, this ambition will continue to impact on our liberty, the balance of power in society, and the ability of all to benefit from the potential of these new technologies. In the extreme, the Chinese government is reported to be developing a 'social credit system', which would allow for the monitoring and rating of citizen behaviour on a national scale (Botsman 2017); appropriate regulation is required to ensure Western firms are unable to engage in similar activities.

In response, an alternative ambition is needed to match the universal goals of the universal platforms. Our data is driving a dramatic expansion in collective social intelligence, which could enable enormous progress in almost all areas of society – from improved diagnostic technologies in healthcare to dramatically increased efficiency of resource use across economic activity. If we want to reshape the behaviour of platform companies and ensure that the collective intelligence explosion enabled by the mass analysis of data helps solve our most pressing challenges, we will have to reshape the governance and ownership of digitally generated data. We turn to this challenge in the next chapter.

4. Data and digital infrastructure should be organised as collective goods

We are at a crossroads. There is huge positive and negative potential in the digital economy. As yet its development has been almost entirely market-led, with little to no strategic policy response from governments around the world. As the last chapter explored, the risks of business as usual are high.

Under the current paradigm, the development of which has been led by the major or universal platforms, data is a commodity that is captured and stored privately to be monetised for private gain. Crucially, the means of collecting data, gaining insights and the data itself are mostly owned by private interests, with limited rights enjoyed by the individuals or groups who produce the data. Moreover, the potential of that data is constrained through limited access, fragmentation and non-interoperability, meaning the development of products derived from the outcomes of data analysis are driven by private interests rather than to address collective problems, and their (largely monetary) benefits are privatised. Under such an arrangement, transparency is minimised, and regulatory and enforcement mechanisms are limited. In turn, individuals have lost control of much of their data, eroding personal privacy, security and autonomy. Similar problems exist for public sector data, with the value inherent in this data largely untapped due to factors including non-interoperability and limited access for a range of citizens and organisations.

Private ownership over data, analysis and insights means that the universal platforms, and other potential platform monopolies, are set to both own and direct much of the foundation of future social and economic relations because they are leading the development and ownership of AI technologies. This could limit access to opportunities in much the same way that concentrated land ownership resulting from enclosure contributed to an exponential rise in inequality over the course of the Industrial Revolution (Allen 1992). Land enclosure was a proximate cause of the British Agricultural Revolution, which, in increasing labour productivity and the urban population, set the preconditions for the Industrial Revolution. In turn, the power dynamics in society and the economy established by the Agricultural Revolution helped determine the distribution of rewards from industrialisation over the course of the Industrial Revolution, opening up large inequalities. The enclosure of digital information is a contemporary form of struggle over economic resources and power. The development of AI technologies by a few firms, and the clustering of access to these firms' products in certain countries and sections of society, could be creating the conditions for large inequalities to open up when AI technologies become more widely adopted.

Prior to its enclosure and the introduction of a legally enforced private property system, land was a common resource through which an enormous variety of products were created, all of which could confer wealth and opportunity upon broad sections of society or, when enclosed, on private interests. Similarly, data could be pooled as a common resource for shared gain, or captured for private benefit.

FROM ENCLOSURE TO COMMONWEALTH

Another world is possible. Data could become a common resource, available to be used for a wider variety of ends by a broader range of actors (Mazzucato 2018). Many places, from nations to cities, particularly in Europe, are developing products that

allow for common ownership and use of data, offering an alternative to the private, monopolistic ownership and development model of the universal platforms. At the national level, the e-Estonia programme in Estonia has built digital infrastructure that allows for the secure storage of personal data, accountable and enforceable control over that data by citizens, as well as the convenience of access to public services through personal e-citizenry accounts and interoperable services (Lufkin 2017).

At the municipal level, city authorities and private start-ups are offering similar services. In Barcelona, Decidim Barcelona provides a secure platform for participating in petitions, reporting civic issues, interacting with other citizens, taking part in participatory budgeting, and gaining control over what data is captured by certain devices and how it is shared (Bria 2017). The platform is open source and has over 30,000 users. FairBnB is a cooperatively owned platform that is being established in a wide range of European cities, and hosts a short-stay rental register that limits the number of rentals that can be made and is owned and managed by users and neighbours, who collectively decide how profits are reinvested in projects that reduce the impact of tourism, protect residency and lower gentrification (ibid).

Across these and other examples, the means of collecting and using data are often open access, as is the code through which products are created, and rules-based systems are in place that ensure privacy and security protections. This allows for individuals, public bodies, private firms and charitable/community organisations to build products and services that respond to local needs and community priorities. Crucially, this means that products can be tested and achieve scale, driving community participation and entrepreneurship, while ensuring the benefits remain in the hands of a broader range of stakeholders, from those who provide data to those who analyse it.

We require a reimagining of how these technologies are used; a new vision for how the digital revolution can deepen justice and prosperity. This requires recognising that data and the value generated from it is a collective achievement. It is made possible by complex and connected layers of public and private infrastructure and investments, in people, machines, software, standards, processes, practices and cultures. Moreover, the power of data is in aggregation, in the relationship of data to other data, at scale, rather than in isolation. It is a socially produced asset, whose value is primarily in its collective scale. These complexities require policymakers and the public to think more critically about how digital spaces and data-worlds are created and to act to shape them in ways that deepen their potential to generate broadly shared public value (Gray 2018).

Public policy should therefore seek to shape the production and distribution of data and its use for the common good. At the heart of that should be a unifying goal: to move from conditions of monopolistic data enclosure to a thriving, creative and pluralistic 'digital commonwealth', where the vast potential of socially generated data helps develop the wealth, creativity and capacity of society. Policies are needed to build a digital infrastructure and support business frameworks that open up data and expand who owns and uses it, facilitates its broad and creative use through democratising the power of analysis, and changes the structure of ownership and governance of platforms, repurposing them to achieve better, more equitable, innovative and democratic outcomes.

BUILDING A DIGITAL COMMONWEALTH

In pursuit of that goal, we recognise the limits of the UK's domestic levers given the international nature of the digital economy and challenges of jurisdictional power. Nonetheless, we do not believe we are powerless, and indeed think more can be done with bolder policymaking. As such, from an analytical perspective, it is best

to break the economy and society down into areas in which the universal platform giants currently have operations, such as social networks and e-commerce, and those areas in which they do not, such as healthcare and public transport. While the challenges inherent in the former are great – with monopoly power and the problem of regulating digital services that do not respect nation state jurisdictions – there is much that can be done with existing powers when it comes to better regulating the power of platforms, particularly as they seek to enter new markets.

Across both areas, in responding to the ambition of platform giants, we propose a combination of two approaches.

1. Regulation: limiting the power of universal platforms by introducing conditions to new market entry, improving standards over existing operations, and requiring increased openness of data.
2. Promotion of local platform services: the increased entry of new platforms with different forms of ownership, including cooperatives and social enterprises and those owned by local authorities, into markets both with and without existing operations from the universal platforms. This should occur primarily at a geographically local level, drawing on the large stores of public sector data that exist across the UK and building local services, by communities, that provide more useful and democratic tools for local people.

Together, these two approaches could create a more 'mixed' digital economy, improving the conditions for the common benefit of the digital revolution – we call this a 'digital commonwealth'. In developing a policy programme to deliver a digital commonwealth, policy should have four main objectives.

1. Prevention of platform companies growing too dominant through both vertical and horizontal integration.
2. Limiting how much personal data – that leveraged by platforms from a user, such as consumer preferences and social details – is aggregated and privately owned by dominant platforms, making this data available to a much wider range of companies, public bodies and community organisations.
3. Making public sector data – that collected and used often by the state – interoperable, reliable and more secure.
4. Making public sector data more widely accessible to entrepreneurs, companies (including social enterprises), civil society and public authorities.

To meet these objectives, we recommend four main measures.

1. Reform of competition law to foster innovation through change of the Competition & Markets Authority and the requirement for major platforms to open up their data upon entry to markets in which they have a major advantage as a result of their existing data.
2. Regulation of platform giants as public utilities through a new Office for Digital Platforms, including the opening-up of data in cases and markets that are deemed to be in the public interest.
3. Creation of a Digital Britain public service that drives the curation and productive use of public data (establishing a Digital Citizen Account, a network of public data stores through which useful insights from aggregated, anonymised data could be broadly shared) and oversees the creation of a national data portal, which would provide a single site linking to opened-up private and public sector data.
4. Introduction of Local Digital Commonwealth Strategies to drive the local development and adoption of local platform services, from community decision-making apps to innovative businesses, leveraging public sector data sources and personal data from the opening-up of firm data.

Overall, this strategy could deliver the systemic change needed to redirect the development of the digital revolution towards realising the potential of digital technology to improve the public good. Its central aim should be to ensure common access to the increasing digitalisation of society, making the UK the world's most open, democratic and equitable data jurisdiction by 2030 and realising the economic and social benefits of doing so. We explore each strand of the strategy in turn.

1. REFORM OF COMPETITION LAW TO FOSTER INNOVATION

The nature of the digital economy and data-driven business models poses challenges to traditional competition authorities. If the power of the universal platforms grows, as we expect it will, these challenges, and the potential for a variety of negative impacts on consumers, citizens and businesses, is likely to increase.

Regulators typically use price as the core measurement of whether markets or companies are competitive. However, the typical pricing structure of platforms, which are often free at the point of use, makes this model less applicable, while the growth model of platforms – focused on scaling quickly rather than on generating profit, at least in the beginning – makes assessing whether they are competitive through an analysis of profitability less useful (Coyle 2018). Furthermore, the speed and breadth of platform expansion driven by their rapid acquisition of other businesses, and their penetration into new markets (such as finance and mobility), makes it difficult to assess the potential synergies, and benefits and disadvantages to consumers, producers and the wider economy. The universal platforms, which often operate from outside the UK or even the EU, also pose jurisdictional challenges for traditional regulators.

We therefore recommend that the Competition & Markets Authority (CMA) should judge mergers and acquisitions in terms of potential constraints on innovation, not just a traditional assessment based on the consideration of prices and consumer switching behaviour. Assessments should understand the potential negative effects on suppliers to the platform, which might suffer from its dominant power. Crucially, it should be able to limit or block mergers and acquisitions which are likely to reduce innovation within a given sector. This should be supported by stronger powers to regulate horizontal market entry[3] by platforms, with particular reference to the platform's ecosystem as a whole. This should include assessing whether investment decisions are likely to deter innovation.

Ultimately, the CMA should be able to block horizontal market entry where acquisitions would lead to consumer detriment, slowing potential rates of innovation, and excessive market power. The CMA should also be able to require platforms to open up data if they are allowed to enter certain markets. The requirement to open data should occur in markets that a platform is seeking to enter in which they would have an unfair data advantage. For example, the personal and financial data collected by major platforms could provide a competitive advantage in banking markets, as platforms could develop insights on the reliability of a customer and provide more catered financial services. Entry into these markets could be allowed by the CMA if the platform were to abide by open banking principles, ensuring open access to certain data and insights and the use of open source technology, driving competition in banking markets while allowing for third-party developers to build applications and services off the back of a platform's entry (Finance Innovation Lab 2018).

Given that the major platform companies operating in the UK are primarily American, they will primarily be subject to US antitrust authorities. Therefore,

3 Horizontal acquisition is based on companies taking over or merging with companies that operate in a similar market and at the same stage of production.

the UK government and CMA should work with US authorities and the European Commission on a common approach towards regulating platform acquisition, with a focus on innovation in the digital ecosystem as a whole. At the same time, it is worth noting the growing power and capability of Chinese digital platforms, the largest of which are among the wealthiest companies globally. If these were to enter the UK's market at scale, the same approach to competition policy should be applied.

Finally, one immediate step a reformed CMA could take would be to initiate an investigation into the online advertising market and its relationship to the universal platforms, and how it drives particular behaviour patterns. The market is dominated by Google and Facebook and lacks price transparency, and significant concerns have been raised about the detrimental impact to consumers and businesses caused by the organisation of the market (House of Lords Select Committee on Communications 2018).

2. REGULATION OF THE PLATFORM GIANTS AS UTILITIES

Platform companies provide the services needed by many to live, work and communicate in the digital age. These services are becoming increasingly important in opening up key social and economic opportunities for citizens, and therefore could be seen as public goods. As such, we believe the platforms providing them should consequently be regulated as modern utilities.

Utilities provide essential services which societies or economies depend upon to function. They share certain characteristics, which help us identify which platforms – or more precisely, which services provided by platforms – should be regulated as utilities. Typically, they are services that cannot be efficiently or easily replicated, and are provided under monopoly or near-monopoly conditions by the regulated company; the service provided is considered a vital good that people have a right to; demand for the service is stable or rising; maintenance of the services requires large-scale investments over time to maintain the underlying infrastructure or assets, and, crucially, networked infrastructure tends to exhibit powerful economies of scale.

Regulating private operators as utilities when they provide essential functions is of course not new. This is already the case with many services in the telecommunications sector. For example, the Office of Communications (Ofcom) has a range of powers covering the provision of broadcasting, telecommunications and postal services, and a statutory duty to 'further the interests of citizens and of consumers, where appropriate by promoting competition' (Ofcom 2018). As yet, this regulatory oversight has yet to extend to large parts of the digital economy, including the universal platforms, even though they provide services that are becoming arguably at least as important as broadcasting, telecommunications and post in determining socioeconomic outcomes.

Not all services or functions provided by digital platforms are equivalent to public goods or are vital infrastructural services in a digital economy. However, we believe there are five categories of platform activity that, because of the essential and non-substitutable nature of the services being offered (and the market dominance the leading platform in that area typically has), mean they effectively function as utilities.

- Searching: primarily search engines, whose use is ubiquitous and essential to gaining value from the internet, and is dominated by Google Search and Amazon.
- Connecting: creating social connections through platforms, which is dominated by the major social networks.

- Matching: platforms that match consumers with third-party suppliers, where market dominance is particularly strong, including Amazon's e-commerce platform.
- Communicating: core providers of communication services like email, which is integral to modern life.
- Infrastructure: including cloud services that act as the backbone of digital economy, including Amazon Web Services.

These five core activities are increasingly fundamental to operating in a digital society, as individuals, consumers, businesses and citizens.

Not all platforms providing these services should necessarily be regulated as utilities. Metrics for the application of regulation in these five core areas could include whether a platform is in a dominant position within the market, based on total market share by turnover in the UK market or total traffic or percentage of users or other measures of activity. In general, we believe that where services are essential and non-substitutable then the providing platform should be subject to regulation as a utility, regardless of their size.

In practice, for example, this would mean that not all of Alphabet's activities would be regulated like utilities. Research and development like DeepMind, services like Google Pay and products like Chromecast would not be covered. But where it provides infrastructural goods – most obviously in Google's search engine, the dominant search engine in the UK and globally – it would be subject to tighter regulation as a condition of operation.

As such, we recommend that platforms that provide one or more of the five core services listed above should be considered to be regulated as utilities, and should be required to have a licence to provide services to UK customers. In the current market, this would include all the universal platform companies across a number of sectors (though not across the entirety of their business), including Alphabet in email and internet search, Amazon in e-commerce and cloud computing, Apple in smart devices, and Facebook in social media.

The digital licence to operate should be overseen by a new Office of Digital Platforms (OfDig) which should act as the regulator for the platform economy. OfDig should work with a reformed CMA to establish competition rules for major digital platforms, including the universal platforms, monitoring and enforcing these rules. In doing so, there are broad number of roles OfDig could perform to ensure that the provision of vital services and digital infrastructure is regulated for the public good, including the following.

- Oversee the protection of network neutrality, as currently guaranteed in EU law. Network neutrality is the principle that internet service providers should enable access to all content and applications regardless of the source, not discriminating between particular products or websites. The goal is to maintain a level and open digital infrastructure that is crucial to stopping extractive, monopolistic behaviours by dominant platforms, and is a precondition for flourishing digital collaboration and competition.
- Enforce greater transparency over the collection and use of data, including simplified terms and conditions, and stronger public information requirements about the use of personal data. This should build on and embed the General Data Protection Regulation (GDPR) for all individuals within the European Union. More broadly, in regulating the digital economy and data, it would be sensible for the UK and OfDig to seek alignment with the EU digital single market, incorporating EU directives on data and the digital economy, such as the GDPR, into UK regulation and law, with the UK only diverging where

regulatory action can go further and faster than the EU in building a data regime that enables greater collaboration, competition and creativity.

- Enable more data portability, which would increase both individual and collective consumer power and better enable competition between platforms, including platforms that operate on different governance models to the digital giants.
- Require companies (and public institutions) to keep audit logs of the data they feed into their algorithms and be prepared to explain their algorithms to the public on request, or as a result of action taken by OfDig. At present, algorithms (which can have a powerful influence on determining access to socioeconomic opportunities) are opaque, complex and not easy to access, making it difficult for those affected by algorithmic decisions to know how these were reached, or for regulators to understand how platforms companies make decisions (Pasquale 2015).
- Develop and accredit compulsory professional credentials for those programming and operating AI and algorithmic technologies. These credentials would be obtained after passing assessed modules on the ethical and social considerations involved in the creation of algorithms and other digital products, rather than technical competencies. It would be similar to professional standards that exist in other industries with large impact on social and economic outcomes, such as healthcare, through bodies like the Royal College of Nursing, and accountancy, through the Institute of Chartered Accountants in England and Wales.
- Establish a duty of care for social media platforms for their users, ensuring minimum standards around content published on the platform (Perrin and Woods 2018).
- Have the power to intervene and regulate data collection practices and uses, including, for example, banning the use of certain types of social data for the development of credit scoring, as well as being able to restrict or prohibit the collection of data in certain scenarios where there are clear citizen, consumer or economic detriments.
- Divest powers to investigate the potential negative effects to suppliers to the platform, which might suffer from the dominant power of the platform, accompanied by remedial powers if suppliers are being unfairly impacted.
- Consider, in conjunction with relevant institutions, how the development and use of AI should be regulated in the future.
- Allow powers, in conjunction with other authorities, to decide which services fell under a utilities definition. For example, if over time, Google Maps becomes the universal place where transport providers are matched with passengers, OfDig should be able to decide whether to regulate that service as a utility.

To help fund the activities of the Office of Digital Platforms, regulated platforms should pay a licensing fee. This should be fixed as a proportion of their UK turnover.

3. CREATION OF A DIGITAL BRITAIN PUBLIC SERVICE TO BETTER CURATE THE NATION'S DATA

Alongside measures to increase innovation and regulate the provision of core digital services within a utilities regulatory regime, the value of public datasets should be unlocked. There is a wealth of data generated in the public realm, collected by a range of major public institutions, from the BBC and the NHS to local government and transport authorities. We recommend that a new public organisation, Digital Britain, should be established with two main goals.

1. To better curate public data and maximise its productive use, working in close partnership with local authorities, city regions, civil society and national governments.
2. To make the UK the world's most open and accessible digital jurisdiction by 2030 through the creation of a network of public databanks and the opening up of private sector data at scale.

Digital Britain should be established by statute, with an independent governance structure, mirroring that of the BBC. It should draw on the expertise of the Government Digital Service (GDS), given its world-leading and internationally recognised success in leading the digital transformation of the UK government (UN 2016). Digital Britain should perform a number of key functions:

- Be responsible for the standardisation and interoperability of data across the public sector, and the maintenance and delivery of more digital services by government. It should coordinate the management of data infrastructures between major public bodies to ensure data is open and accessible where possible, while retaining control and privacy where necessary.
- Play a leading role in the development of the public realm's digital capacity and steward the UK's digital infrastructure. For example, it could support data scientists and other relevant professionals to work with public institutions to improve their data management and use (which public institutions could bid for) or provide direct funding to public bodies to better produce their datasets and build the capacity of the public sector to support public and private actors to develop innovative products from public data insights. It could also partner with civil society bodies to scale such efforts nationally. Such an initiative should learn from the Office for National Statistics' recently established Data Science Campus, which has matched data scientists with a range of challenges that 'big data' analytical techniques might be able to solve in the field of economic and statistical analysis. Digital Britain could build on and broaden this approach.
- Be a hub and supporter of experimentation and research into national and local digital tools that can make the most of the digital technology for the public good. This will require efforts to address: technical challenges, such as simultaneously ensuring transparency and security and building distributed data storage architecture; political challenges, such as dealing with the legal and economic implications of open access, and barriers to mass adoption, including scaling services beyond the local level and supporting social acceptance at scale. To that end, it should be bold and experimental, supporting small-scale pilot digital projects and experiments capable of delivering value to local communities that can be scaled up. In particular, Digital Britain should prioritise projects that seek to maximise the value of technologies that could be transformative for the provision of public services and the public realm, such as blockchain, and monitor the emergence of new technologies at the frontier.
- Create public stakes in the next generation of innovative digital businesses. At present government funding for innovation supports risk but gains no rewards other than those that come back indirectly in the form of higher job numbers and tax receipts. Yet public equity stakes in new ventures are now being taken by government innovation agencies in several other countries, including the Finnish Innovation Fund Sitra and Yozma in Israel, both of which are generating returns. By supporting digital start-ups, Digital Britain can nurture the UK's technical capabilities while ensuring the public has a direct stake and share in the success of the next generation of platforms, working with Innovation UK and other industrial strategy organisations to coordinate investment.

Transforming the data landscape through public data banks and open Application Programming Interfaces (APIs)

Data is a source of tremendous value in the digital economy. Digital Britain should make the UK the most accessible and open data jurisdiction in the world by 2030 to ensure all of society can benefit from the analysis of data and the development of the valued services and products it enables.

It should do this by first developing a public data bank network, with the goal of creating a national data portal in which private sector data is made transparent and accessible where appropriate to drive digital creativity and value creation. A critical first step in this process would be the creation and maintenance of a Digital Citizen Account run by Digital Britain, providing each UK citizen with an online profile through which they can aggregate, access and manage key personal data – from tax files, through healthcare information, to property rental agreements. Such an account would provide the citizen with private and secure control over their data, while allowing for certain bodies to gain transparent and accountable access. Furthermore, the aggregation of all citizen data, secure and anonymised, could provide a public source through which insights can be gleaned, in much the same way as, for example, Transport for London (TfL) provides open access to its travel data stores, enabling innovative products such as Google Maps and Citymapper to be developed. Companies could potentially pay for access to the data, under strict and regulated conditions and with consent, with the revenue generated supporting the public finances.

The account would require the establishment of a network of public data banks in which the personal data of the Digital Citizen Account is stored, secured and accessed. This could be done at either the national level, or through a network of decentralised, local data banks, depending on technical feasibility, cost and security (Berry and Srnicek 2018; Morozov 2015). One advantage of a distributed decentralised network of banks is that it limits the ability for the infringement of civil liberties, which would be made easier if data was centralised and accessible by state agencies. Similarly, a single, wholly centralised data bank would also be an attractive target for cybercrime. Conversely, a single national bank has potentially substantial advantages of scale.

Data banks – whether distributed and decentralised or centralised - would provide the initial location for other public sector data to be stored, including that from key public bodies, such as the NHS and the BBC. Digital Britain should support public sector bodies in negotiating access to these data by innovative firms, ensuring the NHS and other key public organisations retain ownership over the products created from their data, where desirable and possible. They would also provide the basis for the Local Digital Commonwealth Strategies described below.

A taxonomy of data helps distinguish between different types of data that could be 'banked', which are collected and owned by a wide range of actors and can provide different insights after being analysed. There are a variety of different types of data that public policy could potentially shape or include in the data bank, including:

- user data *generated* by people (eg through use of Facebook, Instagram, Google search), which are almost exclusively collected by the private companies that dominate the platform market
- personal data *about* people (eg health records, employment history, date of birth), which are often collected by businesses and the state, though collection often requires consent
- industrial data *generated* within companies (eg financial information, information on industrial production)

- public sector data *about* populations and systems (e.g. public finances)
- infrastructural data generated in *spaces and flows* but not linked directly to individuals (eg energy grid information; traffic flows, TfL data).

Forms of sensitive personal data, including user data, should be subject to tight regulatory controls, and certain datasets, such as medical history, should only be 'data banked' with the explicit consent of the person whose data it is, pursuant with data regulation and the GDPR. Similarly, there will be some forms of industrial or company level data that is commercially sensitive and not necessarily appropriate to be anonymised and aggregated. We also recognise the significant technical challenges in aggregating and anonymising data, and believe that this will require tailored and often case specific treatment of different types of data to ensure the appropriate combination of privacy, security and accessibility. Not all data is the same and in the construction of data bank network, the particularities of different data types should be recognised and treated appropriately.

Into the future, Digital Britain should work with OfDig and the CMA to explore the opening of APIs for platform incumbents in certain markets, in conjunction with local authorities, based on an assessment of the potential for public benefit and innovation potential from the data.[4] In the five areas of regulated platform utility activity, the presumption should be to open the private data sets as this data comprises a valuable public good.

For an example of how this could work, the three digital bodies and Transport for Greater Manchester, a regional transport authority, could decide that Uber should open its APIs because the value of the data insights gained to innovation are too great to be controlled by one firm for private gain. This would require regulated platforms to provide anonymised access to their datasets under clearly defined conditions, allowing a diverse range of actors to use and generate value from data currently enclosed and siloed by the major platforms. Platforms which did not comply would lose their digital licence to operate.

Alongside the potential opening of APIs in certain sectors, OfDig, Digital Britain and the CMA should move towards establishing a national data portal. This would act as an index for all open data, including that opened up by private companies either voluntarily or as a result of regulatory action to open their APIs (as described above), as well as curating appropriate public data sources, including the public data bank(s). The portal would enable civil society, other businesses, researchers and public institutions to access that data, providing a shared data resource to innovate for the common good. An analogy is TfL's open data users' portal, where all public TfL data is freely released for developers to use in their own software and services. The portal provides clear signposting for people who want to use this data. For example, for those interested in data on air quality, it provides clear links to the relevant datasets, with the data presented in accessible, usable fashion. On a national scale, a data portal in which a much vaster range of data was opened up with clear signposting as to what they relate to could unleash a wave of creation in terms of digital services, products and value.

4 Application Programming Interfaces enable communication between various software components and are consequently critical to the development of digital systems and products. When you visit a website or app, a request is sent to the host's remote server; when your browser receives a reply, it interprets the code to display the page or app. A user of the site or app interacts with the remote server's API, which is the part of the server that receives requests and sends responses. Typically, information imparted to the API by the user is retained by the host, generating data.

4. INTRODUCTION OF LOCAL DIGITAL COMMONWEALTH STRATEGIES

Alongside a national strategy to better realise the benefits of more common access to and ownership of data and the digital infrastructure, towns and cities in the vanguard can help chart a different digital future. The increased entry of new platforms with different forms of ownership should be encouraged at local levels across the UK, including social enterprises and those owned by local authorities, into both markets with and without existing operations from universal platforms. The development of these services should be based on access to the large stores of public data that exist across the UK, building local services, by communities, that provide more useful and democratic tools for local people.

Alongside the regulatory measures set out above, these reforms could create a more 'mixed' digital economy, improving the conditions for the common benefit of the digital revolution – we call this a 'digital commonwealth'. Overall, we recommend that the UK government and local authorities produce and implement local Digital Commonwealth Strategies to drive the development and deployment of local platform services and assets.

Local, place-based Digital Commonwealth Strategies should be at the forefront of how we reimagine how data is generated and used and digital infrastructures are developed and owned. In doing so, they can help towns and cities regain control of data and democratise urban technologies, helping them move beyond unequal neoliberal growth models (Bria and Morozov 2018). Digital Commonwealth Strategies should seek to ensure value is retained and circulated among communities where data is generated, and provide economic, social and environmental value. The wealth of information contained in the public data bank(s) should underpin local digital strategies, enabling local authorities, businesses and civil society to better access public data, enabling the creation of locally specific tools and services. It could also be undergirded by the development of other public digital infrastructures, like a public cloud or publicly funded and accessible computing capacity to broaden who can analyse data at scale, organised on different principles to commercial competitors.

While being flexible to the particularities and needs of local communities and economies, each strategy should be underpinned by four key principles and aims: shifting the legal regime around data to make it accessible and supporting the accumulation of public data; ensuring open and interoperable data wherever possible; reclaiming digital infrastructure, including democratising both access to data and analytical capability, and using public procurement to open up private data. In particular, Local Digital Commonwealth Strategies could include measures that:

- encourage innovation in the digital delivery of local services, including by public authorities, civic organisations and social enterprises. This could range from using data to provide local mobility, healthcare and democratic services to more effective economic coordination or environmental tools
- build local digital infrastructures that are open source and favour interoperable, neutral architectures instead of locking local government into privately provided and closed digital systems that extract and enclose data and its resultant value
- open up data from the private sector through the use of public procurement conditions. As is increasingly happening in leading European towns and cities (Bria 2017), local authorities can use public procurement to open up the data generated by private companies through their interaction with the public realm, making it a condition of procurement contracts
- pluralise ownership within the digital economy through the local authority actively encouraging the development of new digital services by innovative companies with a range of ownership models, including social enterprises and cooperatives.

Conclusion

The products and services created by data and digital infrastructure – particularly the transformative potential of AI technology – should be applied to maximise the collective good. Data and digital infrastructure have the potential to deliver enormous benefits for UK citizens, but only if the development and deployment of platform technologies is moderated for the common good, by an informed and sufficiently resourced public sector. This requires transitioning from our current pathway – a digital economy increasingly dominated by the universal platforms and their voracious desire for data – to a digital commonwealth, where the ownership and governance of data and its supporting digital infrastructures is organised for the common good. Such a goal is an ambition for the UK fit for the great potential of the digital age.

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The Digital Commonwealth

From private enclosure to collective benefit

Discussion Paper

The IPPR Commission on Economic Justice is a landmark initiative to rethink economic policy for post-Brexit Britain. The Commission brings together leading figures from across society to examine the challenges facing the UK economy and make practical recommendations for reform.

Platform companies, from Amazon to Alphabet to Facebook, occupy the commanding heights of the digital economy. Their power is rooted in their control of data and the underlying digital infrastructure. As a result, on current trajectories, despite the substantial benefits platforms provide, we risk limiting the range of possibilities opened up by digitalisation. To avoid that future, data and the digital infrastructure should become more of a collective resource, moving from the enclosure of data to a model of digital commonwealth; only then can we realise the potential of the digital technology to enrich the lives of all.

The IPPR Commission on Economic Justice