***Advanced Introduction to Platform Economics***

**Chapter 1: Introduction**

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# Introduction

Companies such as Amazon, Apple, Facebook and Google,[[1]](#endnote-1) as well as Alibaba and Tencent, have experienced phenomenal economic performance. Many other companies offering online services are expanding rapidly, sometimes through profitless growth. These companies are sources of both wonder and consternation. Known as digital platforms – they are a striking 21st century development. They are not just novelties. They are delivering benefits in the economic, political, social and cultural realms. At the same time, their business operations are widely believed to be infringing upon people’s fundamental rights such as the right to individual privacy and the right to freedom of expression. In this book, we hope you will find answers to questions about the benefits, costs and hazards that digital platforms are implicated in creating. We also hope you will acquire a working knowledge of how several traditions in economic analysis address how and why digital platforms are influencing every facet of society. We also examine options to influence platform market competition and we discuss how platforms might better engage with public values.

## What is novel about digital platforms?

Digital platforms are unprecedented. Never has it been possible to gather or process as much data about individuals’ choices, behaviours and characteristics or to link these to their potential interests, buying preferences and worldviews. Modern digital platforms are distinguished by their use of technologies for linking multiple suppliers and consumers or citizens. They establish these links by making use of data gathered either directly from users or by observing their behaviour. The commercial platforms collect massive amounts of data. This data is monetised, typically, through the sale of marketing and advertising services. This means of generating revenue - or business model - figures centrally in many peoples’ lives around the world due either to their participation on digital platforms or to their exclusion. The attention of platform users is being directed and shaped in the interests of making money. The potential for generating revenue is creating strong incentives to devise attractions for platform users, even when those attractions are morally or legally dubious.

Platform owners are intent on developing their capacities to predict attention. They seek innovative ways to intensify their bids for user attention – all the while improving the targeting of users for advertising – commercial and political. The economic outcomes of these processes for the platforms are higher revenues and the removal of oxygen (advertising revenue) from rival sources of attention (e.g. the traditional media). The resulting digital environment offers substantial benefits from access to information, wider choice and desired social connections. It also is associated with risks and harms with the potential to damage cultures and democracy.[[2]](#endnote-2) These benefits and costs are linked to economic value and public values.

Whereas economic value is about wealth creation and distribution, the term, “public values” may refer to issues of fairness, equality and both individual and collective solidarity. In the discussion of platforms, among the public values of interest are fundamental rights to freedom of expression, individual privacy and freedom from monitoring or surveillance (Van Dijck *et al.*, 2018). These values, in turn, are affected by the platforms’ influence on the desirability and provision of diverse information in the public sphere. All these values exist in tension both with each other and with the desirability of generating economic value. It is for this reason that the platform phenomenon is sparking intense policy debate about how their operations should be governed. There is limited scope in this book to examine how the relative importance of private or economic value and public values might be decided in decision making processes. However, since traditions in economics make different assumptions about this crucial matter, we consider how they influence efforts to achieve platform accountability and socially acceptable approaches to platform governance.

### Digitalisation

The rise of the technologies underlying digital platforms has been underway for several decades. Different choices might have been made concerning the pathway of their development. A step that was essential for their development was the digitalisation of the communication infrastructure.[[3]](#endnote-3)Digitalisation involved a large increase in the volume of data of all types that is gathered, the capabilities for analysing data and the purposes for which it may be used. It resulted in data resources that could be used to extract, process and create economic or other kinds of value. Innovations that enabled digitised information to travel through a communication network occurred in the 1950s and 60s. By the early 1970s, computerisation was enabling “a storehouse of virtually untapped new and improved services to the public”.[[4]](#endnote-4) By the 1980s, new digital telecommunication capabilities emerged (e.g. Calling Line Identification which displayed a caller’s number on the recipient’s phone). The new technical capabilities were applied initially for customer billing, identifying sources of emergency calls and tracing malicious calls. As these capabilities were developed, they raised concerns about the surveillance by companies and governments of the private spaces and interations of individuals. Privacy and civil liberty issues became prominent subjects for policy debate (Mansell, 1996; Samarajiva & Mukherjee, 1991). It was recognised that behaviours and practices, outside the usual social norms about privacy and surveillance, were being fostered by these developments: and the ability to collect and process data was characterised as an all-seeing “electronic eye” (Lyon, 1994; Zuboff, 1988). The application of these systems to enable discriminatory “social sorting” of groups or classes was also noted (Gandy, 1993).

During the 1990s, the internet emerged with global data communication capability. Its neutrality in serving all information producers and users was promoted as upholding a right to freedom of expression, and in some countries, with the prospects of a libertarian bypass of social norms and government control. The internet’s openness would, however, be contested (van Schewick, 2010; Zittrain, 2003). For better or worse, the platform services built upon this network infrastructure and further advances in digitalisation came to be regarded as a major “driver” of economic growth in what has come to be known as the “digital economy”.[[5]](#endnote-5)

### Mobility

Innovations in mobile technologies freed users from fixed terminal nodes of the network (Katz & Aakhus, 2002). Cellular (or mobile) communication was invented in the United States (US) in the late 1940s, although radio communication has a much longer history (Raboy, 2016).. The first handheld mobile phone was available in the early 1970s, smart phones from the mid-1990s (IBM Simon, BlackBerry) and Apple’s iPhone and its App Store from 2007 and 2008. Users, untethered from their desk top computers, now had even greater abilities to create and circulate text, audio and visual content.

By the late 1990s, mobile service providers had started to adopt a platform model integrating the power of computing and software in their networks (Ballon, 2009; Bresnahan & Greenstein, 2014), and building on the spread of the internet to offer early mobile media services (Funk, 2003; Ibrus, 2010). These platforms began to be used for the distribution of both professionally produced and user-generated content. Continuing improvements in connectivity, combined with the linking of businesses and individuals to a mobile and increasingly accessible internet, encouraged the development of cloud-based services, such as those offered by Amazon Web Services, Microsoft Azure or Google Cloud (Mosco, 2014). Faster next generation mobile networks (5G) promise to carry enormous quantities of data captured from human communication and from communication among things - the Internet-of-Things (IoT) (which had been discussed earlier as ubiquitous or ambient computing). The IoT uses **sensors embedded in physical objects and connected to the internet. It enables novel applications, including** autonomous vehicles, smart cities, new health services, and innovative retail systems as well as wearables such as health monitors. Like previous developments in digitalisation, IoT components are becoming part of everyday life and invisible, even while they vastly extend the ability to track, observe and anticipate people’s activities.[[6]](#endnote-6)

### Datafication and artificial intelligence

Digitalisation greatly augments the means for creating value from the collection and processing of data. This value need not be directly monetary.[[7]](#endnote-7) For instance, data about patients or students can deliver social benefit through improved health or learning. For much of the 20th century, developing means for collecting data to improve control was a major business activity. Companies built customer loyalty based on information about customer shopping habits long before the internet, but the computerisation of networks allowed them to manipulate and use data in new ways. Multimedia applications in the 1990s, alongside data communication services (including e-commerce) and digital content started to be treated as major “drivers” of economic opportunity in a dawning information age. By the end of the 1990s, as early platform-like services developed, conflicts between customer or citizen and advertiser interests were recognised. Negotiating these conflicts became a priority for companies that needed to retain user interest and loyalty while preserving advertiser support. Earlier, some had hoped that computerised systems embedded in networks would be “programmed so that *users dictate* the nature and extent of computer processing applications”.[[8]](#endnote-8) During the first decade of the 21st century, this expectation evaporated. Platforms as well as other parts of the online world were operating in ways that were beyond the knowledge or consent of their users.

A further phase of innovation in the form of artificial intelligence (AI) and machine learning is now underway. Substantial changes in user online interaction practices are complicating the boundaries between public and private life. The platforms are implicated in the reshaping of civic and political discourse, the dissipation of social cohesion, and, for some, the enslavement of human learning and imagination (Zuboff, 2019).

The platforms’ uses of data derived from user monitoring are what Van Dijck and others have designated as datafication: the use of data gathered about users (Van Dijck et al., 2018). Datafication involves converting any phenomenon, including user behaviour occurring during online interactions, into data: “a quantified format so it can be tabulated and analysed” (Mayer-Schönberger & Cukier, 2013: 78). Datafication, especially when undertaken by very large commercial platforms, raises concerns about the consequences when platform operations transform “online and offlineobjects, activities, emotions, and ideas into tradable commodities” (Van Dijck et al., 2018:38).[[9]](#endnote-9) Datafication may be deployed for functions ranging from price discrimination to user profiling. Advertising may be bundled with content generated by users, e.g. social media, or it may be placed by platform owners, e.g. in search results. User monitoring or surveillance is allowing (largely) automated choices about the placement of advertising content. The aim is to increase the likelihood that platform users will engage with it. Datafication means that economic value can be generated by a platform merely by capturing data about user interests and preferences as revealed by their interactions on the platform.

## Defining digital platforms

The term “platform” in this context is a metaphor and it has multiple meanings (Gillespie, 2010). In the economics and management literatures, the modularity of platform components and strategies for combining them into ecosystems are key concerns and a platform is defined as the “systematic re-use of components across different products within a product family” (Gawer, 2014: 1242). The analytical focus is often on platforms as intermediaries which aim to attract customers who seek to interact on beneficial terms (Evans & Schmalensee, 2016). An intermediary is a third party to a basic exchange between a producer and a consumer (or individuals who wish to communicate for social or political purposes) (Hagiu, 2007; Rochet & Tirole, 2003). A digital platform business model defines the mix of direct and intermediate services that a platform offers. Digital platforms differ, however, from the basic intermediary model in two ways. *First,* they retain information about customer purchases *and* about their patterns of online behaviour that may or may not lead to a purchase. The *second* distinction concerns the wayplatform owners use customer or user-created content to earn revenues taking advantage of network effects.

The definition of what a digital platform is depends on what we want to know about it and there are many ways of defining and classifying platforms (see (Gawer, 2011; Lehr *et al.*, 2019; Nooren *et al.*, 2018)). Our interest is in how platform operations are related to both economic value and a range of public values. To develop a definition of platforms for this purpose, we begin by following (Van Dijck et al., 2018: 4) who characterise a platform as “a programmable digital architecture designed to organise interactions between users – not just end users but also corporate entities and public bodies”. Platforms also engage in the development of ecosystems or “an assemblage of networked platforms, governed by a particular set of mechanisms … that shapes everyday practices” (Van Dijck et al., 2018: 4). Our working definition has four elements: 1) content desired by users; 2) a business model that pays the costs of maintaining and improving the platform; 3) the collection, retention and use of data about users; and 4) the provision of auxiliary services.

These elements are explained in detail in Chapter 2. The first three elements are essential. The fourth is prevalent, though not universal and often involves use of data about users. Our working definition is intended to encompass both commercial platforms and those without the intent of accumulating profits. It excludes the many websites that gather data from or about users but that do not make systematic use of that data to shape or reinforce user attention. This definition is inclusive in that it does not specify the nature of the business model employed other than that it provides the means to maintain and improve the platform. Other authors (such as (Hagiu & Wright, 2015a, 2015b) introduce further distinctions that seek to differentiate platforms from other online activities based upon whether the platform owner is able to participate simultaneously in (and exercise some control over) multiple markets, which we consider further in Chapter 3 (3.2.1). These further distinctions are useful for questions involving market coordination, an important business model, but they neglect other business models based on the simpler principle of monetising or deriving non-monetised social value from user data and the observation of users.

## Platform consequences

The platform’s datafication practices which exploit user attention are central to the leading commercial social media and e-commerce platforms. These platform developments generate different responses depending on which economic lens informs analysis of opportunities and pitfalls. In this book we focus on different, but sometimes overlapping, traditions in economic analysis - *neoclassical economics*, *institutional economics* (sometimes designated as political economy) and *critical political economy* (inspired by Marxist traditions). Each offers insight into the digital platforms’ rise to prominence, their consequences and, in some instances, what can and should be done to govern them. We pay attention, particularly, to the norms and rules that inform market, civil society organisation, state and individual practice in relation to these platform developments. We focus especially on norms and rules because the way these are institutionalised is inseparable from the way markets work (Freeman, 1988).

Policy makers often turn to economic analysis to inform their decisions about how to govern or regulate the digital platforms. Sometimes platforms are presented positively as empowering individuals and communities, but with little regard for the specific nature of individual or institutional practices or for the agency or consequences of the power that platforms exercise. At other times, the risks of, and actual, harms associated with commercial platform operations are emphasised. The platforms’ operations are of special concern partly because of the increasing invisibility of their operations and partly because of the way they are seen to challenge the “settlements of constitutional democracies, namely democracy, rule of law and fundamental rights”.[[10]](#endnote-10) If digital technologies and platforms are to provide a societal foundation or infrastructure embodying human rights that yields fair and equitable outcomes, platform governance norms and rules consistent with these goals need to be in place. In the 2020s, platform governance in the Western world is likely to be deeply unsettled and this motivates our consideration of self-regulatory approaches and external policy and regulatory interventions in Chapters 5 and 6. Questions about policy and regulation in Western regions and countries are also contested when they present themselves in relation to choices taken in other regions of the world, which we consider in Chapter 7.

### Technologies and societal change

The technical, architectural and organisational features of digital platforms place them at the centre of economies in which the collection, processing and interpretation of data hold enormous promise for wealth creation and improvements in human welfare. In one view, this is because technological innovations are expected to provide the foundations for capitalist economies that guarantee new jobs and greater consumer choice. In this view, digital platforms are said to benefit from the “disruptive” characteristics of the Fourth Industrial Revolution (Schwab, 2017). Disruptive technologies – computer hardware and software, artificial intelligence (AI) and machine learning – are regarded as impacting on society. The challenge is to *adjust* market and societal norms and rules to accommodate the characteristics of these technologies. The term “disruptive” is also used in the business literature to refer to strategies capable of destabilising the established positions of incumbent firms.[[11]](#endnote-11) Such strategies include changes in the design of products that allow them to be produced more cheaply but that are difficult for incumbents to reproduce. This is because they draw upon a different knowledge base, e.g. the introduction of digital copying as a substitute for xerography in photocopier machines.

There are numerous ways in which economic value generation and public values could be organised around digital technologies. The notion of “adjustment” is far more complicated than the standard accounts which focus principally on novel technologies. “Disruption” is viewed in this more complicated context as a process with multiple causes, only some of which are linked to digitalisation and datafication. Processes of adjustment are informed by power relations among multiple actors, relations that are often asymmetrical in practice. In this sense, digital platform companies can be characterised as disruptive innovators insofar as they build innovative business processes that existing companies must react to if they are to survive. They can be “disruptive” when consumers or citizens views or behaviours are influenced by using them or by others’ use of them. “Adaptations” associated with these developments alter societal norms and rules in minor or radical ways. Some adaptations may deepen areas of concern; others may favour alternative approaches for platform operations with greater potentials for public values to be upheld.

We use the term disruptive broadly to refer not only to deliberate strategic choices of businesses, but also to the intersections between the design and deployment of new technologies and established rules, norms and standards – including cultural, social and political as well as economic institutions and practices. Our usage of the notion of disruption is similar to Schumpeter’s evocation of “creative destruction”, a process of change that may begin with innovation but overturns and creates new societal orderings. In this view, risks and harms associated with digital platforms are not in any sense determined by technological innovation: “technological progress is not a force of naturebut reflects social and economic decisions” (Atkinson, 2015: 3). Our analysis of innovation processes must focus on how technology and society influence each other – in economic analysis, how “a better match between the new technology and the system of social management of the economy” can be achieved (Freeman & Perez, 1988: 38).

### Challenges to the social order

The operations of the digital platforms are sparking debate within countries and across the world because of concerns that they are diminishing the capacity to ensure that public values are upheld. Critics, especially of dominant commercial platforms, argue they are complicit in promoting surveillance capitalism which aims to modify individual behaviour for profit and by stealth (Zuboff, 2019). Platform practices are being characterised as “data colonialism” (Couldry & Mejias, 2019) and as normalising a culture of surveillance (Lyon, 2018). Judgements about the risks and harms associated with their practices vary in severity in different contexts making it extremely difficult, so far, to introduce changes in norms and rules that the platforms have elected for themselves.

Platforms are operated on the assumption that consumers and citizens want to see personalised or targeted content and messages. Accomplishing this aim requires compromising traditional public-private boundaries to support the commercial platforms’ business models which rely on data to feed their AI-enabled machine learning systems. Platform business models and practices target users based on increasingly granular computations of their demographics, interests, social connections, newsfeeds and mobility. These processes enable individual preferences to be interpreted using automated (algorithm) systems that yield predictions of behaviour. These predictions are being applied in commercial and political contexts with the expectation of improved decision making. Although in practice these predictive systems only offer a veneer of certainty, they are used to guide sellers’ decisions about who is a likely purchaser of goods and services, who is likely to vote for a candidate in an election, or who is a likely criminal suspect.

Among consumers and citizens, there is concern about changes in the boundaries between public and private life and especially about individual privacy (Turow, 2011). Direct causal links between people’s online interactions and online and offline harms are difficult to confirm, but there is broad agreement that people benefit from a degree of privacy and a sense of safety and security (Stoilova *et al.*, 2019). These systems are enabling discrimination through advances in algorithmic techniques using training data that reflect pre-existing economic, racial, ethnic, gender and other discriminations that exist within societies: the result is the “automation of inequality” (Eubanks, 2018).

The amplification of the availability of illegal and harmful digital content which has accompanied the rise of platforms is coinciding with declining abilities to assess the accuracy of online information. Characterised as an information crisis[[12]](#endnote-12) or as a democratic crisis of representation (Pariser, 2011), the sustainability of a democratic public sphere in Western societies is being questioned and it is being argued that “we are now at a crucial juncture where trust and confidence in the integrity of our democratic process risks being undermined”.[[13]](#endnote-13) When measures aim to make platform operations more transparent and accountable to the public, however, the risk is that the right to freedom of expression will be jeopardised by over-zealous or over-cautious censoring by platform owners.

Platforms such as Google and Facebook have strong incentives to win viewer attention to the exclusion of consideration of what it is that is attracting attention, because their priority is securing economic value from data. Attention can be gained by any number of emotive or visceral representational texts or images or with texts and images produced with an intent to accurately inform or educate an audience. The move toward news as entertainment in the last decades of the 20th century was a precursor to today’s platform practices and a growing dependence of professional news production organisations on platform distribution. This dependence arises from the largest platforms’ dominance over revenue sharing with the news publishers whose content they host. The deconstruction of editorial choice threatens the diversity of news content and the credibility of information that is available to platform users.

The digital platforms are also implicated in enlarging the ranks of those living in a precarious position with further challenges to social cohesion. Inability to sustain a living wage in the face of changes in workforce skill requirements associated with digitisation and declines in workplace conditions as the digital platforms facilitate flexible and heavily routinised employment reduce employment security. Together with constraints on entitlements to work due to immigrant or refugee legal status within countries, people are living with a declining sense of predictability in their lives; they are living more precariously. This is exacerbated when decisions affecting consumers and citizens are informed by opaque algorithms and when people have limited resources to contest interpretations of data that affect their lives. The unprecedented scale and reach of the digital platforms’ operations, the absence of a viable opt outs for consumers and citizens, and the biased outcomes associated with their management and use of data mean that the platforms are deeply implicated in reinforcing societal inequalities and injustices, just as they are in generating economic wealth.

## Structure of the book

Efforts to mitigate or avert risks and harms associated with digital platforms confront the argument that digitalisation and datafication are forces for good in society - we must adjust to the inevitability of technological progress. The counterargument is that these developments involve social processes and choices that change societal norms, rules and expectations – they therefore should be socially deliberated. The chapters in this book highlight the strengths and the limitations of the three traditions in economic analysis in understanding platform developments and for addressing the deliberations accompanying these developments.

In Chapter 2, we explain that a digital platform is best understood as a radical innovation with implications for the way economic value is generated and public values are upheld. By examining the elements of platforms and the complementary developments that aided their growth, we develop a working definition of platforms used in this book. We explain the limits of a purely market-oriented economic analysis for understanding these developments.

Chapter 3 develops the three economic frameworks for examining digital platforms by identifying their assumptions and focus of attention. We show how each framework contributes to an understanding of platform development.

Chapter 4 looks at the emergence of AI as an amplifier of the datafication process underlying platform developments and as a future source of market strength for platform companies. This chapter also identifies platform provision models that provide alternatives to the currently dominant advertiser- supported model.

Chapter 5 considers some of the rationales for and shortcomings of digital platform self-regulation and the potential for alternatives to the commercial datafication-driven business models to challenge the dominance of the advertiser-supported business model.

Chapter 6 explores external policy and regulatory approaches aimed at creating incentives for change in existing platform behaviour or at changing the boundary between public and private supply through structural measures.

Although our primary focus is on digital platform developments in the West, in Chapter 7 we consider global developments, including those in China, in the light of arguments about “catching up” with countries in the global North.

Finally, Chapter 8 summarises what we have learned about digital platforms and their consequences, highlighting choices that will influence future developments.

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1. In November 2019, FACEBOOK was adopted as the corporate logo to distinguish the company from the Facebook app. Alphabet is the corporate owner of Google. [↑](#endnote-ref-1)
2. See O’Neill (2002) and for a list of harms, see UK (2019: 25). [↑](#endnote-ref-2)
3. Digitalisation refers to the practice of collecting, storing, curating and communicating digitally (binary 0s and 1s). [↑](#endnote-ref-3)
4. See Strassburg (1970: 12). [↑](#endnote-ref-4)
5. There is no fixed definition of the digital economy. UNCTAD distinguishes between a core sector (hardware manufacture, software and information technology consulting, information services and telecommunications) with a narrowly defined “digital economy” including the platform economy and digital services and a broader digitalised economy including e-business, e-commerce, industry 4.0, precision agriculture, algorithmic economy, sharing economy and gig economy (UNCTAD, 2019). [↑](#endnote-ref-5)
6. See Ren *et al.* (2019) for a detailed analysis of data sharing by IoT consumer devices in the UK and US. [↑](#endnote-ref-6)
7. Data can be treated as intangible assets because data holdings may elevate the market value of a company beyond its tangible asset value (assuming corporate ownership rights are in place). Assuming such rights, the *asset value* of data is like a natural resource (e.g. oil or fresh water), but this value is only a potential for generating revenue until it is employed for some revenue generating activity such as the sale of advertising or the provision of market research services. [↑](#endnote-ref-7)
8. See FCC (1980: para 118), emphasis added. [↑](#endnote-ref-8)
9. Datafication processes are also discussed in relation to “platformization” (Van Dijck et al., 2018). [↑](#endnote-ref-9)
10. Bayamlioglu *et al.* (2018: 1) quoting Paul Nemitz, Principal Advisor, European Commission Justice Directorate General. [↑](#endnote-ref-10)
11. The use of “disruption” in the business strategy sense was introduced by Christensen (1997) and subsequently broadened in ways that obscured the original intent. See Gans (2016) for a useful restatement and revision of the basic theory. [↑](#endnote-ref-11)
12. See Trust Truth and Technology Commission (2018). [↑](#endnote-ref-12)
13. See UK (2018: 47). [↑](#endnote-ref-13)