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RSCAS 2018/41
Robert Schuman Centre for Advanced Studies
Florence School of Regulation

A Programme for the New Network Industries

Matthias Finger and Juan Montero

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EUI Working Paper **RSCAS** 2018/41

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ISSN 1028-3625

© Matthias Finger and Juan Montero, 2018

Printed in Italy, July 2018

European University Institute

Badia Fiesolana

I – 50014 San Domenico di Fiesole (FI)

Italy

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Florence School of Regulation
Robert Schuman Centre for Advanced Studies
European University Institute
Casale, Via Boccaccio, 121
I-50133 Florence, Italy
Tel: +39 055 4685 878
E-mail: FSR.Secretariat@eui.eu
Web: <http://fsr.eui.eu/>

Abstract

Digitalisation is transforming network industries. The new data layer on top of infrastructures and transport services improves efficiency in the management of traditional networks. However, traditional network managers can be disrupted as their infrastructures and services become intermediated by digital platforms in situation to create more powerful network effects by coordinating previously fragmented or isolated infrastructures and services (indirect and data network effects). As a matter of fact, digital platforms present the transformative characteristics of network industries: network effects, efficiency, scale, concentration, market power, etc. Digital platforms are ‘the new network industries’. This paper identifies the key challenges of digitalisation for traditional network industries and defines a research programme for the new network industries.

Keywords

Digitalisation, platform, multisided market, network industries, regulation.

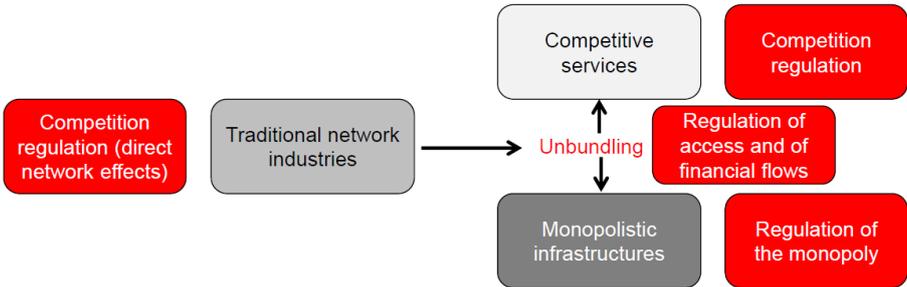
(Traditional) network industries and their regulation

We have acquired, over time, a solid understanding of the various technologies of the different network industries, as well as of their economics. In particular, the economics of the network industries defines the main arguments for their regulation. It is not by chance that these industries are qualified by the term ‘network’, as it underlines the relevance of the increase in value of a service/infrastructure as more and individuals make use of it (also called direct network effects).

Monopolisation was the initial response to such network effects in these traditional network industries. The ‘universal service’ moto behind AT&T’s monopoly might be the best example. But in more general terms, national monopolies ensured the full exploitation of network effects. One network would exhaust network effects and reach the maximum efficiency. Regulation was the instrument to control concentration and market power (and also political power).

A different approach has been followed over the past 25-35 years of de-regulation and liberalisation. Network industries have been fragmented (unbundled) both vertically and horizontally (competition). This has led to two immediate consequences in terms of regulation, both pertaining to the newly created interfaces between the monopolistic and the competitive elements (also called ‘layers’) of these network industries, i.e., the regulation of the access to the monopolistic/dominant infrastructure on the one hand and the financial flows between the two layers on the other. As for the monopolistic infrastructure, regulation was no longer seen as pertaining to market power, but was now seen as a question of regulating an efficient monopoly. Further complications and needs for additional regulation arose from public policy objectives and ensuing market distortions. Most of these regulations were however developed at the national level and applied to the various national network industries. Only the European Union developed a comprehensive supra-national framework for network industry regulation. Figure 1 illustrates the regulatory challenges of the traditional network industries before and after unbundling; to recall, unbundling was precisely done so as to protect the direct network effects of the traditional network industries, and share them with all the downstream service providers thanks to access regulation.

Figure 1. Regulatory challenges of the traditional network industries before and after unbundling



Source: Authors’ own compilation

Digitalisation

The digital revolution is transforming our societies. A new data layer is not only ‘mirroring’ the physical world, but moreover such data can now easily be communicated and managed by increasingly sophisticated automated systems. Efficiency gains are the result of such digitalisation in more and more industries.

This is of course also the case of the traditional network industries. Each organisation is increasing its efficiency as digitalisation empowers them to have better information about their processes, as well as to automatise some of them: for example, digitalisation has already improved the capacity, the reliability and cost of the telecommunications networks; smart meters are increasing the efficiency of energy and water networks; and automatisisation is transforming transportation.

But digitalisation is having an even more profound impact in the network industries, in the rest of the economy as well as in most social activities. Digitalisation is deeply transforming how individuals and organisations interact with each other, creating new models of industrial and social organisation, and so-called ‘digital platforms’ are at the center of this transformation.

Digital platforms

Indeed, a new type of industrial and social organisation model is rapidly emerging in the form of digital platforms leading to multi-sided markets. These digital platforms allow groups with millions and even billions of users to interact via the internet and match their respective needs by way of sophisticated algorithms. Network effects play a central role.

On the one hand, platforms internalise indirect network effects: the more users in each group use the platform, the larger the benefits for all of them. But also the larger the benefits for users in other interacting groups, such as advertisers, which in turn benefits the users in the first group (as they get the service for free). Interaction is made possible by inexpensive and ubiquitous communications among the users thanks to the internet and mobile communications, but also thanks to algorithms that automatise the intermediation between the huge volumes of users, reducing transaction costs sometimes to nil.

On the other hand, platforms create data network effects, as ever larger pools of data improve algorithms thanks to machine learning technology. For example, a search engine improves as more users search on it; translation software improves as users make more and more automatic translation. As a result, platforms managing larger amounts of data are in the position to better manage the automatized interaction of an expanding pool of users. In this way platforms can pool together billions of users.

These two network effect reinforce each other. The more users, the better the algorithm, and the better the algorithm, the more users can efficiently interact through the platform.

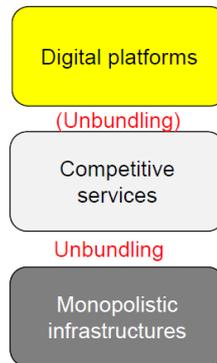
The first such digital platforms emerged in the purely virtual world of internet searches, social networks and alike. These platforms were often built on traditional advertising models (non-transactional multisided markets), taking it to the next level by increasing the scale of the markets. Now, digital platforms are expanding to almost any industry. Smartphones digitalised the individual. The *Internet of Things* is digitalising basically anything, which allows platforms to ‘put a network on top’ of any individual or physical asset.

And now such digital platforms have reached the traditional network industries: telecommunications (Gmail, OTTs, such as Whatsapp and Skype, user generated content platforms such as Youtube, etc.), transportation (Uber, BlaBlaCar, etc.) and energy.

Implications of digital platforms on the traditional network industries

Digital platforms represent an addition layer of ‘unbundling’, which comes on top of the already unbundled competitive and monopolistic (traditional network industries) layers. Figure 2 illustrates this new situation, created by digital platforms.

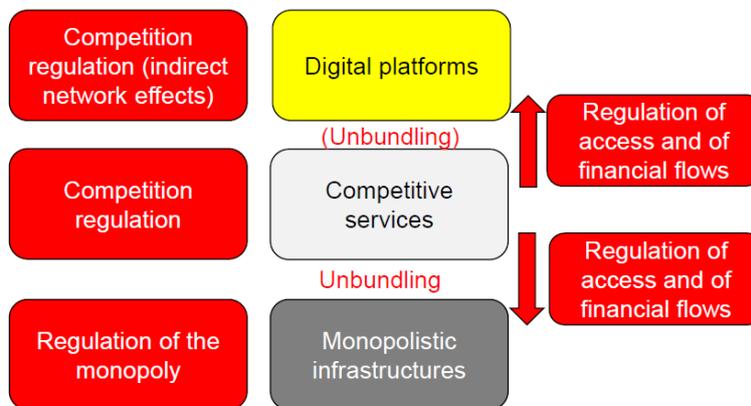
Figure 2. Digital platforms is an additional layer of ‘unbundling’



Source: Authors’ own compilation

Like with the unbundled traditional network industries, this new situation creates new interfaces, this time among three layers. And like with the traditional network industries, regulation of these new interfaces again pertains to access (which has to be redefined when it comes to digital platforms, namely access to the platforms, and not access of platforms to the services and the monopolistic infrastructures, as this is typically believed, see for instance the net neutrality debate) and financial flows. Like with the traditional network industries, public service obligations furthermore complicate the issue. Figure 3 illustrates this new situation.

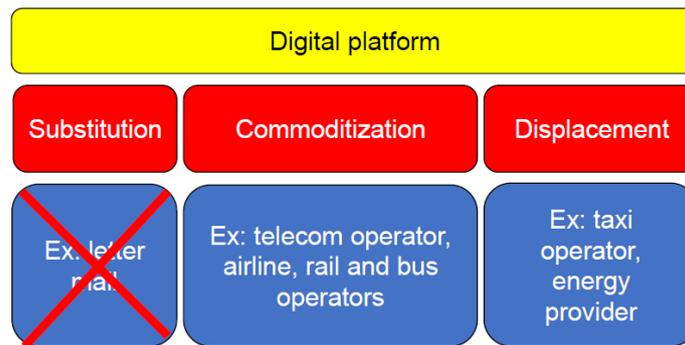
Figure 3. Digital platforms. Regulation of access and of financial flows



Source: Authors’ own compilation

It is increasingly clear that platforms pose one of the most significant challenges for the traditional network industries. As a consequence, they are ‘platformed’ in three different ways, as illustrated by the Figure 4.

Figure 4. Digital platforms vs. traditional network industries



Source: Authors' own compilation

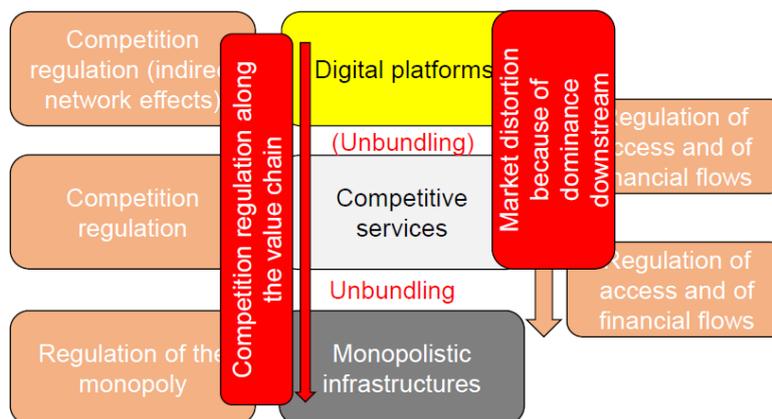
Digital platforms, first, have the potential to simply substitute traditional physical infrastructures, the most illustrative example being here a letter mail.

Digital platforms, secondly, have the potential to displace (traditional) services by creating their own services (e.g., Uber against taxis), which is a form of backward integration along the value chain. Because they are dominant when it comes to the relationship with the customers (e.g., indirect network effects), the competition between the services is additionally distorted (beyond typical market dominance). This problem can be framed as an abuse of a dominant position at the services layer, because of a dominant position at the digital platform layer.

Finally, digital platforms furthermore have the potential to commoditise the underlying competitive services, as well as the monopolistic infrastructures. Platforms might build larger and more powerful network effects that the underlying traditional network. This problem can be looked at as being a problem of creation of dominant positions vis-à-vis a supplier (and not vis-à-vis a competitor) along the value chain.

Figure 5 summarises these additional considerations regarding the regulation of digital platforms.

Figure 5. Regulation of digital platforms



Source: Authors' own compilation

As platforms are acquiring a central position in more and more traditional network industries, they are impacted ever more profoundly, with consequences that are not yet fully understood. This will thus define the main topics for research in the following years.

The new network industries

However, our program is not limited to research on the relationship between platforms and traditional network industries. Indeed, digital platforms display new and even more powerful network effects, namely new direct network effects, powerful indirect network effects and data network effects. The scale of these new network effects has grown exponentially reaching already billions of users.

These new network effects bring dramatic increases in efficiency. The transformations brought by such efficiencies are as powerful as the transformations brought by economies of scale thanks to industrialisation and the corresponding emergence of the traditional network industries during the turn of the 20th century. Back then, industrialisation created tensions and gave rise to social movements by displaced farmers and artisans. Millions of workers and organisations are again being substituted and displaced today (e.g., written and audiovisual content producers, taxi drivers) and millions of individuals and organisations start working for obscure algorithms. Social movements again are on the rise.

As back then, the new network effects are leading to a new round of concentration and market power, this time no longer only at the national or regional, but now also at the global level. Growing concentration and ‘winner-take-all’-effects in media, telecommunications and transport platforms pose a fundamental challenge not only in economic, but in broader social terms, as well as at political levels. At the same time public debate about this can actually be controlled by a few gatekeepers.

Network effects are at the centre of the digital revolution. It is for this reason that we propose to label platforms as the new network industries. We believe digital platforms – for example, in the areas of mobility (e.g., mobility platforms) - or energy (e.g., energy services platforms) constitute a new type of infrastructures, albeit a digital form of infrastructure

Needless to say that these powerful indirect network effects in the new network industries require regulation, ideally also at the global but at the least at the EU level. Given our expertise in the regulation of the traditional network industries, we think that we are also well qualified to address the regulation of these new network industries. At this point, this is mainly a question of competition law, mostly pertaining to abuse of dominant position, but it is our experience that competition law has limited instruments to control market power derived from network effects.

In short, we think that the expertise built over a century of competition and regulation in the traditional network industries constitutes a solid basis when it comes to facing the challenges of the new network industries. We do understand network effects, be they direct or, in the case of digital platforms, indirect, as well as the new data network effects. We know how the network industries have been regulated in the past and can therefore assess how they are affected by digital platforms. Consequently, we can contribute to the discussion how the interfaces between the traditional network industries and the digital platforms should be regulated. Finally, we are sensitive to public service considerations and the need to introduce such considerations into the regulatory equation of the new network industries, and which goes further than the regulation of network effects and market power.

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Authors' contact details:

Matthias Finger

Professor, Swiss Post Chair in Management of Network Industries
Ecole Polytechnique Fédérale de Lausanne
Odyssea 215, Station 5
CH-1015 Lausanne

Part-time professor
Florence School of Regulation Transport Area
Robert Schuman Centre for Advanced Studies
European University Institute
Via Boccaccio 121
I-50133 Firenze

Email: matthias.finger@epfl.ch

Juan José Montero

Professor of Administrative Law and Economic Regulation
Departamento de Derecho administrativo, UNED University
Calle Obispo Trejo, 2
28040 Madrid
Spain

Part-time professor
Florence School of Regulation Transport Area
Robert Schuman Centre for Advanced Studies
European University Institute
Via Boccaccio 121
I-50133 Firenze

Email: jlmontero@der.uned