



Next-Generation Regulation for Next-Generation TV

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The Emerging Video Cloud System

Few questions are fraught with more long-term implications than the way we shape our communications system. If the medium is indeed the message, and if these messages influence people and institutions, then tomorrow's media, and today's media policies, will govern future society, culture, and economy.

It is therefore important to understand that we are on the verge of one of humanity's greatest leaps in media communications, and consequently also of one of its major disruptions in social and economic arrangements. Based on technological and economic trends, change in media will keep speeding up, and generate an unprecedented acceleration in the transformation of culture and politics.

When we look ahead, we conclude that the central players in the next generation of TV will be online video platforms that may be called ‘video clouds’¹ These are operators that provide intermediary functions of content curation, production, storage, content delivery, advertising placement, data mining, financial settlements, and technological interoperability. Such providers will play a dominant role in the emerging media environment; there will be relatively few of them in number; and they will operate globally. They will provide many advantages and opportunities for unprecedented creativity and innovation in technology, content, and business models, but they will also create new problems, or be required to deal with old problems in new ways.

Technology is the driver, and it proceeds to improve performance and lower costs exponentially at the rate of ‘Moore’s Law’. The result is rapidly evolving media technology and economics. Putting together vastly cheaper and greatly more powerful transmission, storage, processing, interactivity, and display enables TV as a high-resolution, immersive, participatory, individualised, social, worldwide experience. This is part of a more general trend to an ‘experience economy’ created on an industrial scale.²

Of course, a significant part of the emerging television will continue to be in the linear, traditional, 25-minute, classic television format, surviving in the same way that newspapers, books, magazines, radio, and broadcast TV have. But that kind of content and its providers will decline in their economic and cultural role. The leading edge of creativity, both technologically and culturally, will be in those new media activities.

Just as the media and tech industries are in a state of flux, so is the terminology. The terms OTT (over the top), online video, video platforms, internet video, web-TV, AVOD, SVOD, TVOD, and TV-Everywhere, are

1 Eli Noam, *Video Clouds: The Next Generation of Video*, forthcoming book

2 Joseph Pine & James Gilmore, 1999, *The Experience Economy*, Boston: Harvard Business School Press

bandied about. Many of these terms are conveniently vague. It is most useful to decompose the emerging video environment into six major stages – from the production of content, to its aggregation in content platforms, enhancement with data inputs, storage and upstream transmission in infrastructure platforms and content distribution networks, to the last-mile internet service provider (ISP) distribution and display on the user end. These stages are shown in Figure 1 below. The vertical combination of video content platform, infrastructure platform, and data platform are what we call a video cloud.

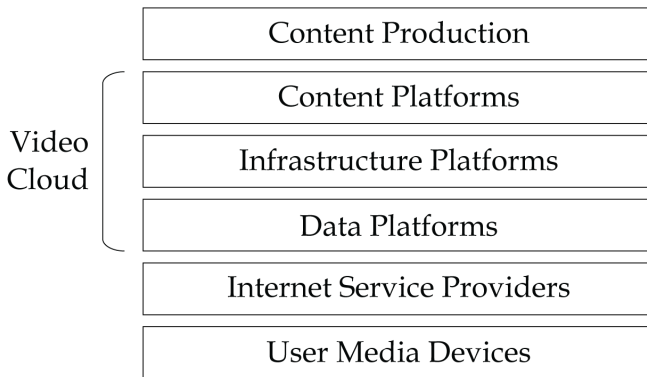


Figure 1. The stages of online video provision

What will be the impact of the new media system? Predictably, it will be full of exciting advances but also of disturbing problems – such is always the case with fundamental innovation. As these problems emerge and become recognised, they lead to debates over how to deal with them, if at all. The regulation of the next generation of video media is an issue on the minds of policy makers and media companies around the world. In the past, television was tightly controlled through restrictive licences and rules that did not exist for print media. Yet, there were expectations that television would follow a similar historic path as print, from tight control to free exercise. It would be set free when television migrated from the limited over-the-air broadcasting of the first generation of video to a delivery over the wide-open internet.

But this is unlikely to happen. Media regulation is not premised on a particular technology. First, many of the old regulations were not truly based on the scarcity of broadcast spectrum but rather aimed to address an issue of societal concern, such as the protection of children, social harmony, or the democratic process. It was convenient to link it to a frequency shortage and a licensing requirement. But if necessary, another hook would be found.

Second, regulations tend to outlive the problem they address. They develop constituencies that cherish a rule that often benefits them, and often argue that it is an integral part of their society's culture and tradition.

Third, incumbent industries and companies will fight tenaciously to expand any regulation that keeps restricting them and make it apply also to new platforms, in the name of a 'level playing field'. An example is, in Europe, the extension of broadcast regulatory rules onto 'linear, regularly scheduled' video transmission, even without a spectrum scarcity or a licensing requirement.³

Fourth, incumbent media wield their power over public opinion and politics to advocate regulatory barriers and roadblocks to a new medium, beyond mere symmetry.

Thus, one should not expect the new medium of online video to be left unregulated.

Competitive Advantages of Video Cloud Providers

Most of the concerns that can be predicted for online video have been with us for a long time, some are now exacerbated, and others are new. The issues are numerous and include: privacy, data security, consumer

3 European Parliament & Council of the European Union, 15 April 2010, 'Directive 2010/13/EU of the European Parliament and of the Council of 10 March 2010 on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the provision of audiovisual media services (Audiovisual Media Services Directive)', *Official Journal of the European Union*, L. 95, vol. 53: pp. 1–24. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0013&from=EN>

protection, societal fragmentation, the intermingling of fantasy and reality, the acceleration of cultural change, the weakening of national culture, new levels of sex and violence in content, sensationalism, market power, content diversity and affordability, impact on elections, and the strengthening of political and commercial marketing.

It is not possible to analyse all of these problems in this brief format. Nor should they obscure the vast positives that the emerging media system can bring on almost any level. We will deal here with the one issue that is arguably the central problem for the future: media market power on a global scale.

It is often believed that in comparison to traditional media, online media are cheaper to produce, distribute, and operate. They also enable providers to raise revenues directly from users, without intermediaries with gatekeeping powers. Hence the online video market would be more open to small commercial- and non-profit providers, and be less dominated by large companies. But that is a flawed analysis.

There will be, of course, numerous providers of video content. But in the future of media, a few video clouds – the vertical integration of content platforms and infrastructure platforms – will become the main media players. There are strong reasons why such clouds will dominate the media environment, and these are as follows:

“Scale economies”: There is a relation between the equilibrium market structure and the economies of scale of an industry. Where the latter are high, an industry is likely to consist of a few firms only. In the digital environment more generally, the incremental costs are very low and the average costs therefore keep dropping as production increases. For example, for the new style of content, scale provides an important advantage. Creating the functionalities of interactivity, peer-to-peer connectivity, virtualisation, immersion, all require high capital outlays to create, but are relatively cheap to operate subsequently.

“**Distance economies**”: Average cost per delivery, per unit of distance, drops as distance rises. It costs almost the same to move a film to a customer who is 300 miles away or 3000. This has been called the ‘death of distance’⁴ It means that domestic media companies lose the protection from their market being invaded from afar. Thus, a large provider with the advantages of scale domestically can leverage such advantages across the world and amplify them. Our analysis finds that for transatlantic communications, the cost to transmit a 90-minute film per 1000km is \$0.000043, or about one half of one hundredth of a cent. This is a trivial cost. To be sure, there are also local distribution costs incurred by ISPs and other parts of the internet or mobile telecoms system. But those are independent of the distance between the server of the content platform and the end-user.

“**Data economies**”: The incremental cost of gathering more information – and its storing, securing, and processing – declines with the size of a company’s operation. One can decentralise the data storage, which reduces the response time to internal and external users’ requests and makes such a provider more effective. This is helpful to advertisers, marketers, and often to consumers. As a company gains data advantages, the positive effects are self-reinforcing. It becomes a more effective user of data, its business grows, and this generates still more data.

“**Scope economies**”: These are advantages of producing several product lines and benefitting from common resources, expertise, and reputation. For example, a publisher of multiple magazine titles can create effective packages for advertisers for different types of products and target audiences. Such scope economies have grown with *digital convergence* that enables the sharing of resources that used to be separate. They favour the creation of multiproduct digital conglomerates.

“**Vertical economies**” are related but distinct. Scope economies are horizontal in nature, among relatively parallel activities. In contrast,

⁴ Frances Cairncross, 1997, *The Death of Distance*, Boston: Harvard Business School Press

vertical economies refers to the advantage of an integration of stages of activity that are supplier or buyer of each other. Examples are TV producers and TV networks. The advantage here is that a company will have an assured supplier or buyer, and can coordinate product design, production levels, and marketing.

“Bridging economies”: These are advantages available to large video cloud firms to create interoperations among various providers, different technologies, and across legal jurisdictions. Examples are bridging and coordination of multiple technical standards and protocols; compliance with the diverse laws of multiple countries; financial settlements among the various participants in the creation and distribution of content; as well as marketing, branding, and quality control.

“Network effects”: So far, the advantages discussed are on the *supply side*, that is, they are advantages of production and distribution by the provider. A related kind of size benefits exists on the *demand side* of users. Users of networks (or of content) often gain from the presence of other participants. They can reach or be reached by more people, and they can share in a common experience with friends, colleagues and neighbours. They are therefore willing to pay a premium price.

One must note that these advantages can also become disadvantages. When a company becomes too sprawling it is harder to manage, focus, and inspire. Often, it becomes bureaucratized and unresponsive. It is also harder for various divisions of the company to maximise their business when they are captive to in-house suppliers or buyers.

How will this play itself out? Digital technology has increased these economic advantages. It has shifted the ratio of fixed cost of investment relative to the variable costs of serving people. It has made a product with a wider reach more valuable to users, strengthened vertical and horizontal integration, and reduced the disadvantage of distance. This has given competitive advantages for large firms whose unit costs are lower than those of smaller firms. It therefore led to highly

concentrated monopolistic or oligopolistic markets, and for such large firms to operate and dominate globally and across media and other digital activities.

How to Reduce Market Power of Video Platforms

Given the historic passion over a concentration in the information sector, it is predictable that market power in the cloud and online video area will lead to regulatory responses. Most people desire a greater diversity in their information sources than in their computer hardware. They wish for choices for themselves, and for the political process. They consider media to be a different category from other industries, with a key role in politics and culture.

There are various approaches to deal with media power. One is to affect the diversity of content by regulating behaviour in programming and pricing by media companies. Yet the assurance of a diversity of perspectives and sources – ‘regulated pluralism’ – opens practical problems for a regulatory agency. How does one define a ‘viewpoint’? How does one measure it? Which viewpoints need to find a media outlet in order to establish sufficient diversity?

A second approach is to fund alternatives in content and voices, for example through public media institutions. This has worked well for broadcast TV in several countries, though sometimes at the cost of domestic cultural domination. But in a medium with the vast scale, scope, reach, and dynamism of online video, the required resources will limit such an approach to a supplementary role.

A third approach is to protect opportunities rather than outcomes by assuring nondiscriminatory *access* to and by all voices and perspectives. Elements of such an access policy include common carriage, access rights, interconnection rights, net-neutrality, and universal service.⁵

5 Eli Noam, 2008, *Media Concentration in America*, Part VI, pp. 1–6, Oxford: Oxford University Press

A fourth option is the direct reduction of market power. These are *structural* policies, aiming to create a competitive media system that is believed to result in a nondiscriminatory access. Structural policies include:

- Breakup of firms, and non-approval of new mergers
- Separation of infrastructure platform and content platforms
- Market share ceiling
- Government-provided infrastructure
- Restrictions of extensions to other product lines
- Ownership and cross-ownership restrictions

For example, vertical breakups have been advocated by politicians in North America⁶ and Europe. Though in part driven by electoral politics, this does not negate the basic point, which is that market power, when combined with vertical integration, is a real problem. Vertical market-power extension is the connection of high market share in one segment into another segment where no such market power exists. This ability, or the fear thereof, has often led to restrictions against vertical integration. Often, they are used as an alternative to restrictions on the anti-competitive behaviour itself. Thus, the major governmental attacks against Google or Microsoft, especially in Europe, have been aimed less at these companies' market shares, which were huge, but against their favouring their own vertically related activities.

A vertical breakup means that a company with market power in one stage would have to divest itself from operations upstream or downstream. But this does not really solve the problem. If a monopoly element existed before the breakup it will continue to exist afterwards. The abuse of vertical integration is merely the expression of market power, a symptom rather than the problem itself.

⁶ Elizabeth Warren, 8 March 2019, 'Here's how we can break up Big Tech', *Medium*, <https://medium.com/@teamwarren/heres-how-we-can-break-up-big-tech-9ad9e0da324c>

The Solution – Unbundled Access

The proposed approach blends antitrust, openness of access, and a light-touch structural policy. It does not require company breakups, with their potential loss of synergies, and is without a heavy regulatory intervention in behaviour. It has two elements:

1. An online video platform provider with *significant media market power* in a stage of the industry chain must unbundle its main components and offer them separately.⁷
2. Such a firm must permit customers or rival providers access to such components under conditions like those for similarly situated customers (a ‘most-favoured nation’ approach)⁸ and with interoperability for their own operations.

The stages in the online video market are those shown in Figure 1: content production and channel aggregation; content platforms; infrastructure platforms; data platforms; ISPs; and consumer media devices.⁹

What should such a market share test for significant market power be? In the US, for many years the test for highly concentrated markets was an Herfindahl–Hirschman Index (HHI) of 1800.¹⁰ This would be the equivalent of about two firms with 25% each, and two firms with 16%. (It was subsequently raised, under political pressure, to 2500, the equivalent of about two firms with 30% each, and two firms with 18%.) In Europe, led by the UK, the focus was on a single-firm market power, identified as ‘significant market power’ (SMP), which was based on market share plus other factors. Informally, a market share of 30% was considered by company strategists to be the threshold. That figure

7 The firm can offer the elements in bundled form, too, as long as it also offers them separately

8 Disputes would be handled by a self-regulatory board

9 The definitions could be more fine-grained, although that could be a rebuttable presumption

10 The Herfindahl–Hirschman Index is the sum of the square of market shares

might make economic sense for most products and services. However, in the view of the author, the media sector requires a special sensitivity to high media market shares with its gatekeeping potential. We call this ‘significant media market power’ or SMMP, and define it as a company with a market share of over 20% in a segment of the online video media chain. This is still a fairly high threshold, considering that it means that three such companies could together control almost two-thirds of the market. (A stricter or a more generous number could be selected, too, without affecting the basic principle.) A company with SMMP would be under regulatory obligations to unbundle its services and provide access to the segment where it has such SMMP. We will now look at the way this would be accomplished in the several segments of the online video chain.

1. Accessibility to content producers and content aggregators

Content products cannot usually be accessed as a matter of right. The speech rights of content producers mean that they can control whom they speak to. There are exceptions, however, in traditional TV media. In some countries, highly important sports events are accessible to all distribution networks that wish to do so.¹¹

More significant is the arrangement of ‘compulsory licences’. In music, anyone in the US has access rights, for a set fee, to perform song compositions and lyrics created and copyrighted by others, including their modifications. That right does not exist in other media.

Should there be a compulsory licence for online video content? That would mean that anyone could retransmit the content, for fun or profit, as long as they paid a regulated fee.¹²

Under normal circumstances, the free-speech principles against

11 Strictly speaking, the access is to the event, not to a video production by a rival

12 Or, should there be a narrowly targeted compulsory licence that gives such rights only to certain platforms, in the same way that cable channels could be retransmitted in the US, but only by recognised a ‘multichannel video programming distributor’?

compelled speech would protect the content owner or licensee from being forced to let others use and sell its programmes. An argument could be made when there is a clear case of significant market power over content. But what does that mean? The great popularity of a self-produced blockbuster programme, in the way of HBO's 'The Sopranos', should not entitle its rivals to redistribute it themselves. That would seem to be a case of a company's conceiving, risk-taking, financing, and marketing a successful show, with rivals then attempting to piggyback on its success.

It is more complex when it comes to the licensing of content to video platforms. An example would be the licensing of a popular series with a wide following, such as the sitcom series 'Friends'. Where a platform acquires significant market power as a distribution mechanism, it would often insist on exclusivity for content offered by a wide range of producers, as well as on other restrictions. This could be held to be an exercise of monopolisation and market foreclosure. And its remedy would be to require non-exclusive licences. This is not quite the same as full accessibility by compulsory licence. It would still require a licence negotiated with the content provider, with the presumption that the terms of such a licence to others would be governed by a 'most-favoured-nation' principle relative to the terms given to the platform with SMMP, which means that similarly positioned customers or rivals must be treated similarly in terms of price and service conditions.

2. Accessibility to content platforms

When it comes to content platforms such as Netflix, Amazon, Hulu, or Dailymotion, what should be access rights of others? This is not a clear-cut situation of 'freedom of speech'. On one level, content platforms function as a kind of editor, by selecting and curating programmes produced by others (or by themselves, in their role as content producers). They also curate a variety of interactivities. In these roles they should not be required to open up to others' content. Should a platform of content organised by right-wing Fox be required

to accept left-wing documentaries? The answer is no, in the same way that newspapers can select articles or letters to the editor.

But on another level, the platform is part of a distribution arrangement. And where a content platform has SMMP, it might have to open-up to reduce its bottleneck power in the distribution. A main question for access to video content platforms is therefore: can a video content platform select the movies it offers to subscribers with full autonomy, or are there access rights to content that has been left out? Normally, such a platform should not be required to carry content it finds commercially uninteresting, or objectionable in content terms, or created by rivals. However, what if it holds SMMP? In that case, its political and moral judgments and its business interests would create a significant society-wide gatekeeping role over content. That role would create an endless set of disputes.

There are good arguments on both sides – free speech of the platform vs free speech of the content providers.¹³ To some, the content platforms are like public utilities, with a requirement to serve every provider of content on equal terms. To others, the content platforms are more like publishers, who curate content and shape it into branded packages.

Fortunately, there is a less intrusive middle road. Platforms without SMMP need not offer content they do not wish to carry. Platforms with SMMP would also not be required to carry such content, in their capacity as content providers; but in their capacity as a distribution platform they would have to make it possible for their users to find and reach such content elsewhere. A content platform with SMMP would thus have to provide, within its search tool function, a searchability that covers databases of independent content which the platform does not carry, and a link to reach such content. Content linked in such a way can be labelled as independent and outside the scope of

¹³ The First Amendment of the US Constitution is limited to rights against governmental restrictions, not against private ones, a distinction that many people miss

the platform's responsibility.¹⁴ There would be a basic listing charge for such a link, and where there is an additional marketing service provided by the platform, it could get a share of the revenue generated, in a commercial transaction. The outside content linked to would have to meet the same legal requirements that the platform itself is subject to by government regulations, but no additional requirements would be set by the platform.

Thus, the platform with SMMP could control its own content selection and its brand. But it would also have to provide a meaningful connection to independent and rival content, and could not restrict content that is otherwise lawful.

These basic principles would apply to various forms of content platforms, whether they operate under business models of subscription video-on-demand (VOD), sale/rental, live-streaming, or advertising-supported.

3. Accessibility to infrastructure platforms

Content delivery networks (CDNs) move content from video platforms to multiple data centres around the world, store it, and distribute it to the ISPs that deliver it to the end-user. An example is Amazon's AWS (Amazon Web Services). Where SMMP exists for a CDN provider, then the rules of telecommunications would apply: an independent content platform should be able to interconnect to that CDN infrastructure at reasonable points, to collocate their network and server equipment, and to owe a payment on the basis of most-favoured-nation pricing.

4. Accessibility to ISP service

This is the basic issue addressed in the net-neutrality debate. The principle of access by content platforms would operate where SMMP

¹⁴ They would be subject to quality criteria and production quality criteria that are applied non-discriminatively. Such content could be labelled, eg. as 'sponsored content' or 'independently provided content'

exists, just as it does when it comes to other parts of the online video industry chain. And while this might restrict ISPs with such significant market power, it also gives them stronger access opportunities where they operate content platforms and CDNs themselves, which many of them do.¹⁵

5. Accessibility to data

This is the most difficult aspect in protecting competition in online video. Data give competitive advantage in individualising content, recommending programmes, and supporting effective advertising. So in concept, where there is SMMP, data should be accessible to competitors and independents. However, the problem is the protection of privacy. Making that user data accessible to everybody willing to pay a regulated price will spread the personal information widely. There is thus a clash between the goals of protecting user personal information and reducing media power. In that situation, privacy should take a front seat. It should be available to others for only broad aggregates without the possibility to identify particular users, or in small anonymised random samples. For all data operations above a certain size, users should be able to control subsequent use by being offered access to a menu of data-usage preferences. A platform's use of customer data is possible with the consumer's permission and with full disclosure and with an easy ability to stop such usage. Users could be compensated by the company for various permissions, or they can offer the data to other companies, thus creating competition via data brokers and the providers of independent algorithms. Such algorithms might receive software collocation in the data operations of the dominant companies.

Conclusion

Even though they were slow-moving, the previous two generations of TV – broadcasting and cable/satellite – had a tremendous long-

¹⁵ In the US, the three largest ISPs – AT&T, Comcast, and Verizon – all operate online video content platforms or are in the process of doing so

term influence. So imagine the impact of the third generation, that of online video with its rapid technological, economic, and organisational transformations. This calls for an early analysis of trends and their implications.

It is important that the emerging media system is wide open. We conclude that the fundamental economics may well lead to cloud platform providers that are vertically integrated into content and data and dominate the emerging video media system.

If that happens, it would trigger a regulatory response. The proposed approach would assure a dynamic internet-content industry and user activity, operating on an infrastructure that functions with considerable openness to all content providers and viewers, and at the same time is respectful of specific societal goals.

The significance of this discussion lies in the fact that most next-generation media applications will run over the internet, loosely defined. And therefore, the regulatory rules for online video become the rules for much of the media system as a whole. We must understand where we are going and what the issues and options are. Let us think today about tomorrow, and not tomorrow about yesterday.



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