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Net Neutrality and Over The Top services: a complex relationship in the telecommunications ecosystem

Neutralidad de la red y servicios over the top: una compleja relación en el ecosistema de telecomunicaciones

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ABSTRACT

If we consider the expansion of digital technologies and their penetration in all spheres of life in our contemporary societies, we can appreciate various processes of change in relation to the previous socio-technical configurations where the regulations about these technologies, especially the Internet, and the battles for imposing or repealing a regulation are fundamental to understanding many of the processes, practices and subjectivities of our contemporary societies. This paper analyzes the relationship between the debates about the services and Over The Top applications in direct connection with the debates, regulations and strategies to consolidate or repeal the Net Neutrality focusing on the different actions of the actors at stake, mainly in the USA since 2003. Net Neutrality is addressed from the battles to impose or repeal a regulation that defends and generates certain obligations and responsibilities for certain actors at stake –and not others– directly or indirectly affecting users. Likewise, OTTs are analyzed because they are the main digital spaces, platforms, applications and services existing and operating on the Internet, whose development and expansion influence and is strongly linked to the debates over Internet regulation crystallized in the Net Neutrality issue. As a result that we found, the current regulations on Network Neutrality mostly favor the OTT as privileged actors. That is why, in our conclusions we advocated for a broad norm that includes them without favoring over other actors.

Keywords
Neutrality; internet; regulations; battles

RESUMEN

Al considerar la expansión de las tecnologías digitales y su penetración en las esferas de la vida en nuestras sociedades contemporáneas, apreciamos diversos procesos de cambio respecto a configuraciones socio-técnicas anteriores donde las normativas acerca de estas tecnologías, especialmente internet y las batallas por imponer o derogar una reglamentación son fundamentales para comprender muchos de los procesos, prácticas y subjetividades sociales contemporáneas. El presente trabajo aborda la relación entre la problemática de los servicios y aplicaciones over the top (OTT), en directa vinculación con los debates, reglamentaciones y estrategias para consolidar o derogar la neutralidad de la red y se enfoca en las distintas acciones de los actores en juego, principalmente en los Estados Unidos desde 2003. Se aborda la neutralidad de la red desde las batallas por imponer o derogar una reglamentación que defienda y genere obligaciones y responsabilidades para determinados actores en juego –y no otros–, que afecte directa o indirectamente a los usuarios. Asimismo, se abordan las OTT por ser tanto los principales espacios digitales, plataformas aplicaciones y servicios existentes y operantes en internet en la actualidad, cuyo desarrollo y expansión influye y se vincula fuertemente con los debates por la regulación de internet cristalizados en la neutralidad de la red. Se evidencia como resultado que las normativas vigentes sobre la neutralidad de la red favorecen a las OTT como actores privilegiados y se aboga en las conclusiones por una normativa amplia que los incluya sin favorecerlos por sobre otros actores.

Palabras clave
Neutralidad; internet; regulaciones; batallas

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Introduction

Since the 1970s, information and communication technologies (ICTs) have been a way out of the economic problems presented by welfarist societies in coordination with the nascent process of globalization and the adoption of the neoliberal theory to address and plan social, economic and cultural policies in the articulation of a neoliberalist axis + digital technologies + globalization with strong participation of growing financial sectors (Gendler, 2016) that has permeated different processes, institutions, policies and issues.

In 1989, the protocol of a hypertext distribution system known as World Wide Web (www or Web) was designed, which would greatly expand not only the collaboration between the different users of the network but also create a toolbox so anyone who wished to create his/her own site or application, modify an existing one and access another without any problem of browser or code compatibility, could do so (Movia, 2012).

This was the cornerstone of what we know today as *over the top* (OTT), since the original design of the Web was intended to function and exploit the infrastructure of the Internet to create different contents available to all without any impediment whatsoever. Soon the OTTs modified the panorama and disrupted the value chain of the traditional cultural broadcasting industries by proposing new and attractive business models that would allow accessing the content in a different way and even provide the possibility to select, modify or create contents easily and efficiently.

A debate related to these processes sparked among the different stakeholders for the management, control and distribution of the streams of data and digital information materialized in bits (Cafassi, 1998). This debate was first proposed by different digital projects, then, it was addressed in the World Summits of the Information Society; in 2003, it was revisited by Tim Wu, the North-American academician, and materialized in the network neutrality (NN) concept from which multiple battles, opinions, practices, regulations and legislations have arisen.

The NN concept refers to the bit flows that circulate through the Internet that must not be discriminated (favored or rejected) by the intervening stakeholders (Wu, 2003) by partly ensuring the spirit of openness and collaboration that Berners Lee and Caileau imprinted to the Web by freeing and making the tools, codes and protocols open and easily available to create Webs and personal contents. The different debates surrounding its regulation sought to offer a regulatory framework that would ensure that no stakeholder would discriminate, favor, diminish or block the flows of circulating data.

With the emergence, rapid growth and popularity of the different platforms and OTT enterprises, the debate took on a new relevance since these gradually prevailed over

another type of interactions on the Internet and created a great volume of circulating data that required a strong investment in the layers of the infrastructure of the Internet to be able to support them, an investment covered above all by the Internet service providers (ISPs) and, in some regions, also by the States, but not by these OTTs or the users.

In this research, we address the relation between the problem of OTTs directly linked to debates, regulations and strategies to consolidate or override the network neutrality, and we focus on the different actions of the main stakeholders. In turn, we made a cut focusing on the United Sates since it is the country that centralizes most of the problems besides being the place where the Internet and the most known or consumed OTTs were created worldwide.

***Over the Top*: *Free-riding* and Check (but not matt) the Traditional Cultural Industries**

The Internet is structured into five layers: infrastructure, *hardware*, *software*, contents and a sociability layer (Zukerfeld, 2014). The infrastructure layer mainly refers to submarine cables and associated products that allow the connection and transfer of data streams; the hardware layer is made up of the different physical devices (routers, servers, computers, optic fiber, etc.); the software layer consists of the logical programming codes structured in different existing programming languages to dictate different orders to the bit flow (that allows the functioning of the hardware as well as the content and sociability layers), in addition to shaping a system of rules and possibilities of action for users in interfaces (Scolari, 2004); the content layer represents bits and data logically grouped in form of text, audio, image and video files. Lastly, the sociability layer refers to the different links, connections, groupings, interactions, comments, votes, etc. made by individuals during their activity on the Internet.

The Web would comprise the software layers (given their design and logical operation), contents (that which would contain) and sociability (that which could be done or not, directly or indirectly, synchronically or asynchronously, etc., with other users); while the inferior layers of the Internet that support them and give them the possibility to exist and be transported, are left out.

The different OTTs are named for being effectively webs that use the infrastructure and the hardware that make up the network of networks but without investing in it. While there is no agreed definition of OTT, one of the most concrete ones is the following:

> An OTT application/service can be understood as a service related to the information or communication through the Internet that does not depend on the network of the telecommunication service provider. These applications/services solely depend on the access to the Internet and are therefore omitted or they "bypass" the telecommunication network without investing in said network. An OTT invests exclusively in its own contents or in the way of distributing them (Ramneek *et al*., 2015, p. 666).[1]

OTTs are webs but also private or state-owned enterprises that play a fundamental role on the Internet since they concentrate and enable a large amount of the contents the users require.

We can see that OTTs are structured around four integrated functions: content creation and production, content accumulation and distribution, network management as well as the production of devices and connection options (Bullich and Guignard, 2016). Oftentimes, they participate in these four functions, but sometimes they do so in fewer.

OTTs in the Telecommunication Ecosystem

In some cases, it is the state-of-the-art technological enterprises that own OTTs that distribute a variety of contents. It is even possible to find different types of businesses in the different OTTs of the same enterprise.

This is partly due to the fact that these enterprises form an ecosystem (Van Dijck, 2016) where they compete, innovate and buy (or are bought by) another enterprise to reach new market segments or to monopolize those already existing, in a battle that has as focal common ground point to pre-empt the flows of attention of the users (Bullich and Guignard, 2016; Celis Bueno, 2017) which can later be translated into streams of personal data to be stored, processed, applied and sold (Rouvroy y Berns, 2015) or merely into monetary flows.

The irruption of OTTs grew strongly in the early 2000s. On the one hand, the Internet had been open to the "market game" since 1995, which allowed its exponential growth of equipment and users. The quantity of circulating contents increased in a direct proportion with users, oftentimes content creators or modifiers, in addition to the mere consumers, situation that later was amplified by the arrival and expansion of smartphones (Kokaram, Crinon and Catania, 2015; Sujata *et al*., 2015).

Likewise, the improvements in infrastructure and service-quality technology, in addition to a market with regulation always behind the technological innovation, laid the foundation for the growth of different OTTs. It soon became evident that the irruption of these innovative enterprises would open two new battlefronts.

On the one hand, we have traditional cultural industries where the offer of digital content at low cost, easily replicable (Cafassi, 1998) and available, with the same physical format quality in addition to the possibility of the "catalogue" modality, would put business models and the traditional value chain[2] in check, especially the music, television, publishing and film industries with great economic loses, a problem also spurred by the great expansion of piracy by sites/applications such as Napster, The Pirate Bay, Kazaa, among others (Pouwelse *et al*., 2008), which would also prompt again the debate for the intellectual property of contents. This front led many of the traditional stakeholders to

reconvert part or almost all of their business model to resist jointly the threat of OTTs and piracy. Therefore, the tendency gradually aimed mostly at a model that focused in "accessing" the contents instead of "possessing them" (Martel, 2015), oftentimes creating their own OTTs or similar services (Ganuza and Viecens, 2014).

The second front was against the ISPs, more specifically those telecommunication enterprises providing telephony service (fixed or mobile) and cable television (Leal, 2014). Soon, the ISPs would face an increase in the volume of data consumed by the users in addition to a reduction of their income for telephone or cable television services, which were substituted by the OTTs (Sujata *et al*., 2015). As mentioned above, the OTTs did not invest in the infrastructure and hardware layers necessary to support the increase of the data flow, which was the responsibility of the ISPs that started planning different strategies to be able to address this double front opened by the OTTs.

It should be highlighted that given its transnational nature, besides a few exceptions regarding the countries where their central offices are, OTTs do not pay taxes or at least, not in the same amounts that traditional stakeholders and ISPs do, neither are they, in general, subject to the same regulations than the latter (Marino, 2016).

Network Neutrality

In 2003, Tim Wu developed the NN, a technical concept/principle that refers to the bit flows circulating on the Internet that no intervening stakeholder must discriminate against (favor, diminish, hinder or block) in any possible way. The same author poses four threats to the NN: strangulation or total traffic blockage of the flow of information; the tendency of the Internet service providers (ISPs) to monopolize and favor their own applications, contents, etc. to the detriment of clients and other enterprises; prioritization of specific services, providers, applications or contents according to trade agreements and lack of transparency of the ISPs' actions.

As we can see, those mainly targeted are not the users, governments or service and content providers (CSPs), nor other OTTs such as Facebook, Google, Netflix, etc., nor companies owning submarine cables that make up the main transit channels of the dataflow, but rather those intermediate enterprises that, since 1995, have the legal and factual standing to provide access to the Internet to both users and CSPs, i.e., ISPs.[3]

While ISPs play an important and fundamental role in the architecture of the Internet, they are not the only stakeholders of the exchange.

Said architecture is shaped in form of a mesh where every node is equally centered. It is structured according to the layers mentioned above that intervene in every section of the transfer of the bit streams. These transit in data packages are dispersed in different directions when transferred in routers; further on, they go through the DNS servers that

direct them to their specific destination, after, they are first brought together again in another ISP and then to the specific CPS/OTT server, where they are redirected toward another user or remitted once more to the source user depending on the type of exchange (Cortes Castillo, 2003).

According to its promotors and advocates, the NN concept/principle would "emanate" from "the way the Internet was thought by its designers" and how its current "normal and efficient" operation is without the stakeholders altering this "normality". However, the latter is not so since that, at the beginning of the Internet, the packet switching was accompanied by a "best effort" (BE) protocol that specified that the network had to find the "best possible route" through the routers that direct these packets in order for the information to go from point A to point B. This system did not guarantee that the information would effectively arrive, but it proposed making "its best effort" to find the routers with the fewest packets in queue/standby that would allow the information to reach its destination in an optimal time necessary in order not to lose the information.

In the 1970s, in response to the diverse creation of networks similar to ARPANET in which every network would have a specific protocol incompatible with that of other networks, the TCP/IP protocol was created in 1973 as a general operation protocol that would communicate to the different devices and connect them to all the networks without any inconvenience. Krämer, Wiewiorra and Weinhardt (2013) argued that based on the implementation of the TCP/IP as general protocol, another operation was launched: the implementation of a traffic management protocol known as "quality of service" (QoS), created as a way to give priority to certain information packages over others in order to avoid any congestion in the networks, partly anticipating an increase in the amount of traffic with the incorporation of the new networks to the ARPANET core network.

In practical terms, the QoS identified the data packages that arrived to the router and, instead of leaving them in "queue" until the packages that arrived earlier would come out, it detected if it was necessary to prioritize them over others; hence, making possible exchanges such as streaming "in real time" (Ferguson and Huston, 1998; CISCO, 2016). Moreover, mainly OTTs added content delivery networks to the foregoing in order to manage their traffic regardless of the QoS carried out by the ISPs.

Along these lines, ISPs are mainly responsible for the NN economic problem (Gendler, 2015) since they are the "gatekeepers" that manage the passage of data packages and the flow of information that enter and exit the user's digital device; they also manage most of the QoS that ensure the non-congestion of the transmission channels. Therefore, they have the possibility to allow, hinder, impede, increase or diminish the dataflows according to corporate interests to favor their own application or content (or that of a business ally prior agreement) over one or another competing company, to hinder the "correct operation" of certain CSPs and OTTs or directly impede the user's access to

block all Peer to Peer (P2P) traffic "in the name of the defense of the intellectual property" (unless the contents of these P2P traffics are or not data packages that violate said intellectual property, among other alternatives of this nature).

While ISPs are (private of state-owned) enterprises with different trade interests, they are also technologies managed by these enterprises whose criteria, justification, design and application follow the parameters of the market instrumental rationality, only limited by the current laws, norms and regulations that must oftentimes be accompanied by the mobilization in a public space of collectives and social movements.

The NN materialized in laws is of great importance to avoid that this intervention on dataflows be done on a whim or for convenience. In this regard, we must highlight that in most part, the ISPs' consensual position concerning the NN regulations is that these should not exist since they are "old-fashioned" or that they do not take into consideration the investment that these make (and it is not so with the OTTs/CSPs, which are pejoratively classified as free-riders)[4] to operate the network adequately (Gendler, 2015; Ganuza and Viecens, 2014).

The other less known problem with the NN is the control problem (Gendler, 2015; Gendler, 2017), that refers to the identification[5] of the outgoing and incoming data packages for their passage, blockage, favoring or hindering. ISPs are designed in such a way as to access multiple traffic data[6] of these packages and have the possibility to obtain content data[7] for the storage, processing, sale or application (as predetermined profiles) of both types of data, sometimes under imposed obligation of the law or requirement of the governments or their national security agencies.

Regulations

OTT Regulation

According to Levy Daniel (2016) OTTs regulation or non- regulation issue is controversial. A regulation that does not take into consideration the differences of contents, services, tools, etc., being offered and the economic differences between them, could favor in part, the concentration and monopolization of the market since it is clear that a small OTT could not compete with OTTs consolidated in their segment: "Every business model is different and every type of service is also governed differently, and these differences matter at the moment of making regulations. For example, if a transaction tax on Internet and not on subscriptions would be established, it would hurt a specific type of OTT services against others that would not be paying such tax" (Levy Daniel, 2016, p. 14). To recap and facilitate understanding, next – and as a summary – we present arguments for and against regulating OTTs synthesized by Levy Daniel (2016):

- General arguments in favor of regulating OTTs, mainly supported by ISP-Telcos:[8]
  - OTTs offer the same services as traditional communication enterprises and, should therefore be regulated in the same way in order to balance the regulatory situation, also known as the "Level Playing Field", a concept that clarifies that the services that perform the same function must be regulated in the same way (mostly the one available for telecommunication services) besides its particularities.
  - OTTs are *free-riders* of Internet service providers. Currently, they do not share the costs of the obligations with them and, hence, they should pay royalties or fees.
  - OTTs have a negative economic impact on ISPs, which hinders investment.

- General arguments against regulating OTTs:
  - The technology implemented by the OTTs and the ISPs is totally different. Therefore, they must not share regulations, as this could adversely affect the OTTs mode of operation as well as the entire "open, free and decentralized" structure of the Internet.
  - The start-up cost to enter the business of content distribution (*streaming or not*) for traditional ISP-Telcos is low when the entry to contents – and its rights – is available without the need to invest as does an "independent" OTT to acquire contents and services as well as to create an infrastructure. Imposing strict regulations to OTTs could seriously hinder their creation and cause major issues.
  - OTTs would not be *free-riders* since they also need to invest lump sums of money in setting up the technological basis that allows them to function efficiently. The use of the critical infrastructure provided by ISPs (and ISP-Telcos) allows them to invest in different improvements and offer better services, besides increasing the end-user's costs with "justified" reasons.
  - Many of the existing telecommunication regulations were made thinking in limiting possible monopolies. However, OTTs opened the scene to this and made it difficult, for which not only should they not be regulated but fostered by state entities.

OTT Regulation in the United States

Leza (2016) points out that in the United States, the OTTs are classified as "information services" and, therefore, are deregulated to the exception of some specific requirements.

This represents a great difference *vis-à-vis* telecommunication services (regulated by Title II of the Telecommunication Act obligations) and the cable-television services (Title IV of the Telecommunication Act).

The existing regulations for OTTs are the following:

- Communication OTTs: obligation to offer free 911 emergency calls, numerical portability, notify if a 911 message has not been sent, allow intercepting calls under the request of security or intelligence forces, notify promotions and discounts.
- Audiovisual OTTs: obligation to include subtitles to video contents for people with hearing impairments. Some states levy a tax on these OTTs.[9]
- Music OTTs: obligation to report the payment of royalties or intellectual property ownership rights.

While OTTs are subject to federal consumer and privacy protection laws, there is no unified regulatory framework that imposes restrictions and obligations to the same extent as those of the ISPs-Telcos. The Federal Communication Commission (FCC) chose to create specific regulations for OTTs instead of adapting the offline regulation in order to include them and avoid the creation of regulatory barriers that "hinder their development" (Bullich and Guignard, 2016); nor is there a federal law that assigns tax burdens or similar regulations to the ISP-Telcos.

In 2015, an intent was made to classify video OTTs under the same rule as that of pay-television services; however, the proposal remained pendent and up to this date, it has not been revisited.

Therefore, we see that a regulatory approach has been set to ensure the users' accessibility to OTTs rather than imposing regulations or norms that allow them to compete under equal conditions to pay-television services or even to similar services to those of the OTTs developed by ISP-Telcos.

Network Neutrality in the United States

Following Wu's proposal in 2003, it would be only in 2005 that the Federal Communication Commission (FCC) decide to publish a "policy statement" urging connection enterprises to comply with the four "Internet freedoms",[10] this after receiving several complaints from users and civil partnership organizations claiming the protection of the authorities from abuses of their ISPs (Castellet Holmet, Aguado Terrón and Martínez, 2014) and mainly following the Madison River Communications case that indiscriminately blocked several OTT services, especially the VoIP (Krämer, Wiewiorra and Weinhardt, 2013).

These freedoms were merely "recommendations", hence, making it impossible to exercise direct sanctions. This first process ended with the acceptance of the infringing ISP in ceasing its practice of strangulating VoIP communications (Rodríguez García, 2011) and the adhesion of AT&T – one of the largest IPSs in the United States –to these recommendations on NN, but also with several questions from other important ISPs based on the arguments of the lack of incentives for innovation.

Following this fact, the FCC would face its first formal case when, in 2007, ISP-Telco Comcast discriminatory practices were disclosed more specifically in reference to the strangulation and blockage of P2P traffic and the different audiovisual traffic, since they argued that these practices generated traffic congestion.

After multiple complaints from Comcast users and civil partnership organizations – including mobilizations in the public space, and after Barack Obama's rise to power in 2008, who would make NN one of his main campaign promises and government policies -, the FCC, under a new democrat government, ordered that this ISP comply with the four freedoms formulated and modify its traffic management policy. While this measure did not involve any legal sanction, it was challenged by Comcast and obtained a favorable ruling from the United States Court of Appeals since the law stipulated that there was no specific regulatory framework that impeded these actions.

As a result, in 2010 the FCC, with the overt support of the President and of certain CSP/OTTs such as Google, Netflix, Facebook, etc., as well as ISPs and allied civil partnership organizations, set forth a regulatory framework that included the four freedoms mentioned above and added three basic norms in order to "defend the neutrality and openness of the Internet"; moreover, for the first time, it included the mobile Internet regulation.

The response to this official regulation was immediate. In this case, the initiative came from ISP-Telco Verizon who filed a lawsuit before the court of Appeal claiming that the FCC did not have any legal jurisdiction to impose this type of regulations to ISPs, since these were classified as "information services" and the FCC did not have the power to regulate them.

In 2014, the Court of Appeal ruled in favor of Verizon's argument and the FCC was severely undermined, so much that different OTTs (especially Netflix, YouTube and Spotify) began analyzing different bilateral trade treaties with ISP-Telcos, including several academicians and members of the Democrat Party began thinking in other institutions that could regulate the Internet.

With this new shift in the conflict, the FCC took an unexpected turn and tried to maintain its legitimacy (or at least its participation) in the debate by proposing a new NN regulation by establishing a fast line (with additional payment) and a slow (simple) one,

which would consist basically in a reformulation (or elimination) of the principle "strictly speaking", since allowing two different speed lines, would mean regulating the discrimination of the data traffic.

This strategy had its corollary, as massive and coordinated protest was soon organized by different CSP/OTTs enterprises such as Google and Facebook, among others, along with different users' demonstrations in the public space, accompanied even by Obama's express request so the FCC would stop and analyze this policy.

Under these strategies, the FCC plays a new card and opens an online public consultation to "know the opinions of citizens", which got more than one million comments on its first day (with the crash of saturated servers caused by the amount of entries) and, according to the FCC, only 1% were contrary to the NN strictly speaking, which was considered a "great victory for the ideals of an open Internet". Following this repositioning at play, the FCC made a request to the President and the Parliament to regulate the information services (as classified by ISPs), request that was strongly rejected by the legislative body currently under a Republican majority.

Without giving up entirely, the FCC and its allies planned another strategy to classify ISPs not as information services – and hence, deregulated -, but as telecommunications, which fell under the FCC powers through a revision of the Telecommunication Act enforced in 1996 and that would put ISPs under its direct legal regulation.

The FCC won by three votes against two before the public Republican resignation and the threat of new appeals by ISPs. In 2016, the Court of Appeal ruled in favor of the FCC on reconsidering ISPs and its power to regulate them and, it also classified the Internet as a "public commodity" and hence, reinforcing the NN.

With Donald Trump's victory in the 2016 presidential elections, an FCC governing board was set up in favor of eliminating the NN that tilted once more the different balances, began also to evaluate new measures to modify the debate and benefit the stakeholders previously disadvantaged.

It should be highlighted that throughout this process, the focus of the debates, conflicts, strategies, practices of most of the stakeholders as well as the different regulations and judgments, was almost entirely on the NN economic issue, generating strong and different effects on the concept, but it produced mainly a fairly consolidated image the economic issue was the only one addressed in this conflict, while the issue of data control which is intimately linked and part of the matter, was masked off, hindered and ignored (Gendler, 2015; Gendler, 2017).

With this, we want to express that these conflict processes produced effects where the control issue was disregarded from the NN and, therefore, they allowed that all the

stakeholders participate with almost no impunity to the storage, processing, algorithmic profiles and sale and information exchange since it is an area that most recommendations, regulations and laws conceal; hence, leaving a free margin to act, produce and exercise power.[11]

In a similar fashion to the previous case, QoS – which never ceased being implemented given the risk of many OTTs stopping their service -, since by not regulating effectively which QoS uses and practices are valid and which are not, it left room for illegal acts.

On December 2017, the Trump administration repealed the Open Internet Order, thus eliminating the NN legislation in effect in the United States which served as a framework for other legislations worldwide (including the Argentinean case).

The FCC, which is now in Republican hands, eliminated these rules, thus creating a situation that greatly benefited ISP-Telcos and opened the door to a multi-speed Internet where ISPs have power and authority to dissect data streams as they wish.

CSP/OTTs and different collectives have led several campaigns and initiatives (both online and through legal means) trying to reverse the situation. While anticipating what would happen in other countries would be making a pie in the sky, as the Open Internet Order was an example to establish the NN regulations, their elimination could create two scenarios, one where a "domino effect" would eliminate or radically modify the NN regulations in countries related to the United States; and the other, in which the current regulation could be sustained or slightly modified.

OTT and NN

As we have been analyzing, the OTT and network neutrality issues are closely related. While the NN concept was raised prior to the expansion of OTTs, the FCC's first measure in pursuit of a NN regulation was to defend an OTT in 2005, while the 2010 Open Internet Order was also created to regulate the Internet ecosystem by defending the OTTs from the discriminatory practices of the ISP-Telcos.

In the United States, the debate and NN regulation (which served as a worldwide example) evolved to face new ISP-Telcos restrictive practices, "threatened" by both the large growth of the data stream traffic and their economic loses at hands of the growing OTTs. In this sense, the option was to protect and foster the "new stakeholders" of the ecosystem to the detriment of the traditional ones who were hindered for the above reasons.

The OTTs, driven by an open market and in full development, gradually filled and transformed the layers of contents and sociability of the Internet, concentrating on and capturing the user's attention and activity flow. The NN regulation which focuses

primarily on restricting the ISPs discrimination, is the result of the evolution of this debate in pursuit of protecting OTTs from the ISp-Telcos practices. However, given the focus on ISPs actions, this regulation seems to forget to raise and attend discriminations, not toward OTTs but to those generated by OTTs.

While the Zero Rating issue and others such as that of the Facebook Free Basics (Gendler, 2015), directly involves OTTs since they are the ones that conclude agreements with the ISP-Telcos to promote their services over those of the other OTTs; these practices do not yet have effective regulatory treatment and seem far from being a priority to be regulated.

Therefore, the NN regulation in its current state greatly benefits OTTs by serving as a legal armor that allows them to continue exercising their business model and to protect themselves from any ISP-Telcos discriminatory practice, those adversely affected in the current equation of power (Elias, 1994), and hence, those most interested and insistent in ending this restrictive regulation in the best of their interests.

The entire regulatory process in the United States clearly showed the aligned camps; on the one hand, the OTTs and other CSPs together with the users and the NGOs in defense of a free and open Internet, in favor of an NN regulation that restricts ISP-Telcos, and, on the other hand, the enterprises in favor of repealing these regulations.

The current elimination of the Open Internet Order in the United States means that the balance has tilted to the other side, meaning that OTTs have lost their legal armor and are now facing new issues.

In Way of Conclusion

In this paper, we have followed an extensive path to catch a glimpse of the relations between OTTs and the issues derived from the debate on network neutrality. While NN came about to ensure a type of Internet configuration in line with different ideals of openness and innovation, and a non-discrimination focus, different events, mainly related to the ISP-Telcos restrictive practices toward OTTs, unfolded and oriented this non-discrimination mainly as rules and guidelines of action for ISP-Telcos in defense of OTTs, which application, up to this date, seemed to have been neglected.

Hence, OTTs were given *carte blanche* from the state legislative regulation to expand, innovate, move forward and constitute an almost oligopolistic ecosystem that concentrates the majority of the users' data streams and attention today, and violating significantly the NN itself, who they say to defend to the hilt, when ISPs are targeting it by blockages, restrictions, etc.

These processes have different high points, specially based on the massification of audiovisual OTTs such as Netflix and their "binge" model, since these considerably increased the data traffic to the point of becoming today the main responsible of the data streams, situation compounded by the expansion of smartphones, which considerably fostered the consumption of different types of OTTs (Sujata *et al*., 2015).

This did not only hinder ISPs in general given the obligation to invest in infrastructure to avoid network congestion, but it rather seriously affected traditional cultural industries such as cinema, television, music and publishing by modifying their value chain, besides other services such as fixed telephony, many of these services provided by the ISPs themselves (as ISP-Telcos).

Along these lines, we can see a favoritism association that OTTs received for being considered "novel and innovative" and "heirs" of the Internet early ideals (Morozov, 2016), as well as being seen in many occasions as "the progress" that is going to substitute traditional cultural industries when in practice, they are part of the same ecosystem and have a strong dependence and interrelation with them (Siri, 2015).

Regarding regulations, ISP-Telcos not only have the obligation of not discriminating, but rather to invest, report, be transparent and pay taxes, as well as store personal data even those produced by the users' digital print (Gendler, 2017), and those requested by the State and national security agencies.

In the case of OTTs, the United States only have some minor obligations and taxes are paid in specific cities only. Therefore, for audiovisual OTTs – for example – there is no reference to the payment of taxes at national level, national production audience fees or other elements that could be regulated if a public cultural policy would be implied, since most of the issues regarding the OTTs and ISP-Telcos are being seen as technical-economic matters, forgetting that, in the different legislations, the contents at play are cultural products that deserve to be the focus of public cultural policies from the States as are the contents of the traditional cultural industry.

Likewise, in reference to the NN economic issue, the State, with greater or minor regulation intent, seem to operate as "facilitator" establishing inter-play market forces that favor some stakeholders over others. On the other hand, the NN control issue of the CSP/OTTs as well as the ISP-Telcos and the State itself, seem to become partners coordinating the interweaving of recollections, transfers, requirements, etc., of the users' personal data and of the data produced by the digital print.

The repeal of the Open Internet Order in the United States tips the scale in favor of ISP-Telcos, since it eliminates the restrictions and obligations of these enterprises and allows them to generate a two-speed Internet besides blocking, restricting and increasing the OTTs data traffic at leisure.

Hence, while the legislation in effect until 2017 in the United States – and currently in force in the rest of the world – showed a situation in favor of some stakeholders of the inter-capitalist competition in detriment of others; its elimination, besides shifting the balance, also affects the users since it alters their actions and interactions on the Internet in the way they have been configured up to this date.

With the current NN regulation, the OTTs orient, drive and modulate the users' actions, consumptions and interactions allowing them to weigh up certain contents over others, under an argument of algorithmic selection – and, therefore, allegedly "neutral" even without contemplating the interests and orientations of the programming and the elaboration of these algorithms - in a situation which is in part similar and at the same time different from, for example, the traditional television prescription; the user today has the possibility to choose from the different stakeholders on the market.

This could be aggravated without an NN regulation as the one we know today, since it would be conveyed twice: first through what the ISP-Telcos want the users to use (by blocking/cutting back traffic of some and allowing others), and second, the OTTs own orientation.

This is why we agree with Leal (2014), that an NN regulation is necessary but not any regulation, an expanded regulation that includes obligations and action guidelines of both ISP-Telcos and OTTs where the non-discrimination principle would be the key to a regulation that considers the particularities of both cases to create a fair framework aiming at the rights of citizens and not at the interests of the competing enterprises.

Therefore, the interests and obligations of the ISP-Telcos as well as those of OTTs could be considered in creating a detailed framework that takes into consideration the particularities of each service type (without adapting rules from one to the other) and that considers the power of the market of each stakeholder and avoid a legislation that plays in favor of one and against the other, as these seem, for the time being, the only solutions found with the current regulation or its elimination in the United States. Moreover, by having the non-discrimination concept as a center, progress could be done toward a true NN in order for the user to really choose the actions to perform, which elements to produce and which contents he/she wishes to enjoy without being guided by one stakeholder or the other or both.

The Internet is more than a technology; it is a complex network (networks of) battles, actions, strategies, as well as unstable and changing positions, with which fights regarding what regulation is possible, convenient or desirable for the different stakeholders and the fights regarding the relations that can be generated between the OTTs and the NN are far from developing. The regulation stipulated in the law does not exhaust or end the debate but rather opens it, modifies it and divides it in different paths

or generates new aspects. Continuing the debate (or stopping it) and bring it to new (expected or unexpected) directions, depends on the stakeholders at play.

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[1] Personal translation.

[2] It is along these lines that Bullich and Guignard (2016) claim that OTTs are creators of value, but in turn, they are also destructors of value, thinking in the economic losses generated by their emergence in the traditional cultural industries.

[3] The ISPs mostly mentioned in academic papers are large telecommunication enterprises that provide Internet in addition to other services such as cable TV or mobile telephony. It should be noted that there are also many other small or regional ISPs that do not do so.

[4] It refers to an agent that benefits from resources, commodities or services without paying the cost of the benefit (Ganuza and Viecens, 2014).

[5] Therefore, discriminate, since not all data are stored, processed, applied or sold, or are not at least to the same extent. (Gendler, 2017).

[6] "Superficial" records of data stream: the "who?", "when?", "where?" and "for whom?" of the interaction on the Internet.

[7] The "deep" records of the data stream: the "what?" and "where?".

[8] "Telcos" means large telecommunication enterprises with large capital, technological and economic resources, of infrastructure and influences, that usually own different mass media and other services such as fixed or mobile telephony, cable TV, Internet connection, etc. (Marino, 2014). Here, a "ISP-Telcos" is referred to differentiate telecommunication enterprises that, within their multiple businesses, provide connection to the "ISPs" Internet, for those whose sole or main business is to provide connection to the Internet.

[9] Florida (7,4%), Chicago (9%) and Pennsylvania (6%).

[10] [1] Freedom to choose and access any legal content without the risk of bottleneck or blockage, [2] freedom to use the desired applications and contents provided they be legal, [3] freedom to be able to connect any device to the net without limitations provided it "does not damage the net" and [4] freedom to obtain information about the service retained (FCC, 2005)

[11] The Wikileaks in 2011 as well as those of Snowden in 2013 helps visualize different practices of the North American government, the ISPs and CSP-OTTs regarding the control issue, the production and effects of the marked conflict given the economic issue regarding the NN concept as totally unrelated to these matters (focusing solely on the administration of the data stream and not on their identification, storage and sale).