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Net Neutrality in the Age of Internet Monopolies

Net neutrality may appear to be a complex and an esoteric issue, and a concern only of the netizens. This is missing the point. Today, control over the internet is of vital importance to all of us; and this is what net neutrality is all about.

The internet has emerged as a major instrument in our communications with each other, accessing knowledge, buying and selling of goods. It is the new media, not only as social media, but also as traditional media: print, and television are increasingly migrating to the internet.

Shorn of technicalities, net neutrality is that those who control or own the physical network on which the internet runs, shall not discriminate between the different kinds of services or websites that are provided over it. It is a non-discriminatory principle that prevents the telecom companies, who have the monopoly of the wires, or the spectrum in the case of mobile communications, to extract monopoly rent from the users.

Writers such as Robert Mcchesney have identified the fight over net neutrality as one of the most important battles over democracy. If net neutrality is lost, then the telecom companies who control our access to the internet, can decide what we see and for how much. It would freeze out the small, progressive media that cannot pay every telecom company in the world to ensure that their websites are seen everywhere; or force them to climb on to the bandwagon of the internet biggies.

The Telecom Regulatory Authority of India (TRAI), in its recent controversial consultation paper, talks about Over-the-Top (OTT) services, meaning services that are offered over the top of the telecom network. In this definition of OTT services, TRAI concedes that all web services (or applications) or web sites are essentially OTT services. In other words, the entire internet, by this definition, is a bunch of OTT services. This is a different view of the internet, from the one in which the internet is seen as a data service, provided through the telecom network. If TRAI's definition of the internet is accepted, net neutrality goes out of the window. Each website or web service would have to be separately licensed, and the regulator could also prescribe separate license fees or charges to be paid to the telcos, for each such service or site.

However, unlike in earlier times, the internet companies are no longer united on net neutrality. We not only have the telcos wanting to throw out net neutrality, but also the bigger internet players – e.g., Google, Facebook – who see the “benefit” of joining hands with the telcos to freeze out *their* competition. While the telcos are explicitly asking for abandoning the net neutrality principle, the internet monopolies are promoting, along with the telcos, schemes such as zero rating (Airtel Zero), or limited internet at lower costs (Facebook's Internet.org with Reliance). All of these violate net neutrality, not in an omnibus

way as telcos are proposing, but in narrower ways. That is why they all pay lip service to net neutrality in general, while violating it in specific ways.

FROM DECENTRALISED, NONCOMMERCIAL NETWORK TO CENTRALISED MONOPOLIES

The internet was born from ARPANET, a defence network created by the US government. The US government had then offered the infant internet to AT&T, who saw no commercial value in it and turned down the offer.¹ It then grew into a network that connected various educational and research institutions in the US, later in other parts of the world as well. In this phase, the internet was explicitly for non-commercial use.

The internet initially was a means of communications between researchers, and later, a repository of information. Its success as a communications network made the US government and big business aware of its strategic and commercial potential.² By 1995, the internet had become fully commercial and the big companies moved into it as the new sphere of expansion of capital.

Even when the internet became commercial, it carried in its DNA, much of the promise that characterised its earlier development. It had no centralised node, and allowed anybody to connect, send or receive any material they wanted. This was built into the network structure and the communications protocols of the internet. This gave rise to the euphoria among some that it was a new, sovereign space of the people. This is best exemplified by John Perry Barlow, a libertarian, who in his “A Declaration of the Independence of Cyberspace,” issued in 1996, asserted that governments shall have no authority over the Internet.³

The reality was of course always different. From the beginning, the US asserted its legal control over the global internet, as have all countries within their sovereign jurisdiction. As the internet uses the telecommunications networks that are under the laws of countries, it means that all countries have legal rights over what material can be viewed or sent through the internet.

Though the anarchist paradise of the internet was not realised, the flat structure of the internet and its lack of centralised control, did foster the belief that communications and media would be democratised by the internet. Foster and Mcchesney, write about this promise of the internet, “There was going to be a worldwide two-way flow, or multi-flow, a democratization of communication unthinkable before then. Corporations could no longer bamboozle consumers and crush upstart competitors; governments could no longer operate in secrecy with a kept-press spouting propaganda.”⁴ They then continue on to the reality what happened, “The Internet, or more broadly, the digital revolution is truly changing the world at multiple levels. But it has also failed to deliver on much of the promise that was once seen as implicit in its technology.”

The internet allows anybody, with a computer and internet access, to become a producer of news and views, not just a consumer. With platforms such as YouTube and a video camera, one can even become a television station. It is also true that there are more than a billion websites on the internet, with about 850,000 of them being designated as active sites (Netcraft’s Active Web Server Survey⁵). Despite this diversity of websites, there has been an enormous concentration of internet companies. In the US, by 2010, the top 10 internet companies had 75% of all the page views.⁶ A few US companies dominate the global internet, with the only exception being China, where they have been kept out due to protectionist policies (including the Great Firewall of China) and the intricacies of the Chinese language. In spite of the huge number of websites that exist, the bulk of the netizens go to only a few.

The concentration is even higher if we look at different sectors – search engine, videos, e-retail, etc. Google has 90% of web searches. Facebook and Twitter dominate the social media. Google’s YouTube is the dominant video channel on the internet.

Clearly, the democratic promise of the digital technologies has not been realised. Foster and Mcchesney write, “What seemed to be an increasingly open public sphere, removed from the world of commodity exchange, seems to be morphing into a private sphere of increasingly closed, proprietary,

even monopolistic markets”. Foster and Mcchesney calls this dichotomy – internet’s democratic potential and the rise of monopolies — as the *paradox of the internet*, and attribute this to the economic context of the internet. It arose not only under capitalism, but also in the same period that saw the rise of neoliberal form of capitalism, in which public good has taken the backseat to private greed.

Even though the democratic potential of the internet has not been realised, it has made one difference in how mainstream media handles news. It is no longer possible to keep out “unwanted” news, it is only possible to “shape” news. Social media, a multiplicity of websites has meant that an active censorship that filters what citizens should see, does not work. The manufacturing of consent has become the primary tool of capital and not direct censorship of news and views.

The architecture of the internet has also changed. From its initial architecture of no centralised servers or nodes, and directly connecting computers to each other, today the users generally connect to the centralised servers of the internet monopolies. This is what is being called as cloud computing. This fundamental change in the way the internet has been reconfigured is the consequence of the rise of global internet monopolies.

However, two characteristics of the internet still continue from its initial architecture. As the internet was not intended initially for commercial purposes, billing, an essential component of all commercial activity, was not built into the transmission protocols of the internet. This has made charging for the transmission of data packets between the sender and the receiver very difficult. This is quite different from the way telecom traffic is treated, where all the commercial transactions for voice calls are built into the voice networks. The second is the lack of encryption in the transmission protocols of the internet – the way data packets are sent over the internet — making it easy for the state, particularly the US, to carry out surveillance on all internet traffic.

I am not going to discuss in details the rise of the “new” digital economy and how it is based on commodifying private data of users, its relationship with intellectual property and the free labour of all the users in creating content and tools for the new digital companies. What we would like to register here is that from a decentralised network, the internet today has become centralised, and dominated by a few global monopolies, located largely in the US. They are the ones who get the most eye-balls and are the ones sitting on a pile of cash that is larger than the GDP of most countries.⁷

THE NET NEUTRALITY WARS

In the period that the internet companies were still in their infancy, the telcos were the big players. They were already dominant monopolies in their markets and provided the only way, either the subscribers or the websites (or web applications), could reach each other. Whether anyone uploads content and stores it on a server on the internet, or if anybody wants to view this content, all of them have to go through the telecom networks. This gives rise to the possibility by telcos of gate keeping: they could charge a toll tax from either the internet service providers, or the consumers.

The communications over the internet take place, by converting at the sender’s end, the text, voice or video, to a set of data packets. Each of these packets are transmitted from the sender to the receiver via the telecommunications network and are then reassembled at the receiving end. Net neutrality demands that telecom service providers should not discriminate between these data packets based on source, ownership, type of application or content.

The way the internet and its transmission protocols is designed, it is essentially anti-discriminatory: each and every data packet is treated in the same way by the communications network. This neutrality of the network — or net neutrality — is built into the DNA of the internet. Tim Wu, the law professor in Columbia Law School, who originated the term neutrality, has pointed out, “An important aspect of the Internet’s original design is that many prices were set at zero—what have been called zero-price rules. The price to join the network is zero. The price that users and sites pay to reach others is zero: a blogger doesn’t need to pay to reach Comcast’s customers. And the price that big Web sites charge broadband

operators to carry their content is also zero. It's a subtle point, but these three zeros are a large part of what makes the Internet what it is. If net neutrality goes away, so does the agreement to freeze prices at zero."

Despite the issues of monopoly and surveillance, the anti-discriminatory principle of the internet means that any group or person with very little resources, can create websites or web applications that are available to all the netizens, in the same way as that of the richest companies. This is the consequence of net neutrality.

The anti-discriminatory principle of the internet, instead of a toll-based internet that the telecom companies want, has given rise to the net neutrality wars. The first net neutrality war was the telcos demanding various kinds of rents for connecting the websites and web application to the telecom subscribers. As the telecom companies own the access to their subscribers, they asked the internet companies to pay money to connect to their subscribers.

In this period, high capacity internet access was possible only through wired broadband connections.⁸ Generally, fixed landline services are a monopoly (in the US, for the domestic subscribers, there are only two options for wired broadband services), the telcos have monopoly power over broadband internet access. It can be argued that in India there is no monopoly in wired broadband services, as there are a multiplicity of players. The reality is that there is tacit cartelisation by private telcos, and competition is only notional. This is more or less the scenario in most of the world.

The first net neutrality wars were fought, between the internet companies and the telecom subscribers on one side, and the telcos on the other. The telcos demanded a charge from the internet companies to connect them to the telecom company's subscribers. In telecom parlance, it is a "termination charge"; in economic terms it is a "rent" charged by the telco. In order to realise this rent, the telcos would have to differentiate between the data packets coming from various companies, and either block them, or slow them down.

In the US, there is one peculiarity in the Communications Act, 1996. There are two sets of services defined under the Act. One set is defined as Information Services and are under Title I regulation, or very lightly regulated. The other set are defined as Telecommunication Services and under Title II; they have a much higher regulatory burden. Initially, the broadband services, offered by telcos over the existing phone landlines using the ADSL technology, were designated as Title II and as telecom services. With cable television companies also offering broadband services, they wanted their broadband services to be designated as information services. In 2003, the US communications and telecom regulator, the Federal Communications Commission (FCC), agreed, and designated broadband offered by cable companies as information services. In 2005, FCC followed this by re-designating wired broadband also as information services. These two decision paved the way for the first net neutrality wars. The telecom and cable companies had no regulatory obligation for providing non-discriminatory internet access; they claimed they had now the right to levy toll in whichever way they pleased on the internet.

Lawrence Lessig and Mcchesney wrote in 2006, about these decisions of the FCC, "The protections that guaranteed network neutrality have been law since the birth of the Internet — right up until last year, when the Federal Communications Commission eliminated the rules that kept cable and phone companies from discriminating against content providers. This triggered a wave of announcements from phone company chief executives that they plan to do exactly that." They continued, "The implications of permanently losing network neutrality could not be more serious. The current legislation, backed by companies such as AT&T, Verizon and Comcast, would allow the firms to create different tiers of online service. They would be able to sell access to the express lane to deep-pocketed corporations and relegate everyone else to the digital equivalent of a winding dirt road. Worse still, these gatekeepers would determine who gets premium treatment and who doesn't."

In this battle over net neutrality, the major internet players were on the same side as the smaller players, start-ups and the overwhelming majority of the netizens. All of them jointly opposed the telcos levying monopoly rent on either the content providers or the consumers.

FCC tried at various times to put in place net neutrality rules on the broadband providers, while keeping the definition of internet services as information services. Both times, the courts struck down such regulations, pointing out that FCC did not have such powers for regulating information services. This is what led to the demand for changing the designation of broadband back to telecom services. With a strong campaign for net neutrality and President Obama also pitching in, the FCC finally decided on February 4, 2015, to change the designation of broadband services back to telecom services and declaring strong net neutrality rules.

NET NEUTRALITY AND EMERGING INTERNET-TELCO CARTELS

The telcos have not given up the battle over net neutrality. They are still slugging it out, country by country and sector by sector. Even in the US, the telcos are lobbying the US Congress for reviewing the FCC decision and have also gone to courts against it.

Meanwhile, the rise of the new internet monopolies, as discussed earlier, has changed the equation between the telecom companies and the internet companies. Earlier, it was the big telcos against smaller internet companies and the netizens. Today, the global internet companies are bigger than the telcos in terms of market capitalisation.¹⁰ The top 5 internet companies (Google, Facebook, Amazon, Tencent, Baidu) have a market cap today (2014) of \$903 billion, compared to the top 5 telecom companies (China Mobile, Verizon, AT&T, Vodafone & Softbank) market cap of \$822 billion. They are no longer small players at the mercy of the telcos.

Comparison between top five internet and telecom companies

Market Capitalisation	2009	2014	Growth in %
Top five internet companies (Google, Facebook, Amazon, Tencent, Baidu)	\$289 billion	\$903 billion	312.5%
Top five telecom companies (China Mobile, Verizon, AT&T, Vodafone & Softbank)	\$689 billion	\$822 billion	119.3%

Source: The Rebirth of the Telecom Monopoly, Citi GPS Report, November 2014

The market capitalisation figures make the internet companies look much bigger than they actually are. Most of them are financed through Initial Private Offerings (IPO's) and issuing of new stocks, with their stock valuation based on future earnings and not their current ones. Nevertheless, the meteoric growth of their stock value give them a market clout that is the envy of the telcos. If the telcos could also tap into the future earnings of the internet companies, they could then piggy-back to realise a much higher share value for their stock.

It is not that the telcos are doing badly. Whether it is in the US or in India, the telco revenues and growth are quite healthy. In the US, the broadband business is generating gross profit margins in the range of 90%, as the physical infrastructure is already in place.¹¹ In India, the telcos' data revenues have grown by a hefty 100% in 2014, as have their revenue from basic voice and SMS services.

The emergence of big internet monopolies has opened the possibility of cartels forming between them and the telcos. This can keep all the small players out, and lock the customers to a small set of internet platforms. Combining with the big internet companies provide a two-fold advantage to the telcos as well. It helps the telcos to offer their subscriber base to the internet monopolies, while in turn, the internet companies sell their users to advertisers; a win win for both. The telcos also remove, at one stroke, the biggest opponents of network neutrality. If this helps them do away with net neutrality altogether, they can get back to their original dream of controlled toll roads for all internet services. Only the websites that pay the telcos will then be available to their subscribers; or they will load so slowly, that effectively they

would not survive in competition with the internet biggies. The last vestige of the democratic potential of the internet would then disappear.

Already, we see various alliances of telecom and internet companies forming in various parts of the world.¹² The forms of net neutrality violations are also changing. Instead of the more blatant forms of violations of net neutrality, such as blocking of websites or creating fast and slow lanes on the internet, newer forms of violations are emerging. These include no or low charge for a few bundled sites (zero rated services); or not charging for data for the subscriber when accessing certain websites.

The emerging mobile internet market is becoming the new battlefield, with mobile companies offering limited internet for lower or no charges. In India, Airtel Zero and Reliance offering Internet.org, are such examples. They offer a few bundled sites at lower rates from the usual internet services; the concerned websites pay the telcos money for carrying their sites. This is similar to what is happening in other parts of the world as well, particularly in the developing countries.

While the battle between telcos, internet companies and users is being fought all over the world, there is an extra element that has come into this battle. Today, the internet companies can offer equivalent voice and SMS services over the internet to what telecom companies are offering through their networks. The price of a voice call through direct dialling is different from that through internet services such as Skype. This has added a new element to the net neutrality wars.

OTT SERVICES, NET NEUTRALITY AND THE TRAI

Recognising that principle of net neutrality is important, the Competition Commission, is examining whether the Indian telecom operators are violating this principle through plans such as zero rating. Unfortunately, the telecom regulator, the Telecom Regulatory Authority of India (TRAI's) in its consultation paper, *Regulatory Framework for Over the Top (OTT) Services*, has taken a completely different tack.¹³ The document seems to be arguing that we should accept either licensing of internet services and jettison net neutrality completely; or accept a watered down version of net neutrality.

The definition that the TRAI has given in the consultation paper of OTT services is *any application or service that uses the Internet*, bringing all such services within TRAI's regulatory purview. For the user, the internet is a set of websites and web services (applications) and by this change of definition, the TRAI is redefining the internet as only a set of OTT services.

Instead of regulating telecom services, what are called basic (voice and SMS) services and value added (data or internet) services, by changing the definition of data or internet services to OTT services, the telecom regulator is potentially seeking to subject all internet based activities to its regulation; any business that uses the Internet – e-retail, media, or health care – can potentially be regulated by the TRAI as an “Over-The-Top (OTT)” service. This is indeed regulatory overreach on a grand scale, and certainly not the intent of the TRAI Act.

Internet Services Providers (ISP's) are licensed to provide data services or internet services. While there are many more ISP's than telcos, the telcos have emerged in India as the dominant ISPs. The ISP's transmit data packets generated by the users, or more precisely, users' computers. In the telecom sense, what is in the data packets – video, audio, text or pure data -- is treated as content and generally not subject to telecom regulations. That is why we do not need a license to create a website, provide a service through the internet or provide an app for use on computers, tablets or mobile phones.

By doing away with the concept of internet and data services, and treating it instead, as a set of OTT services, net neutrality also disappears. The concept of net neutrality is based on all traffic on the network being treated equally. If they are all different applications or services, there is neither a concept of traffic nor therefore a necessity to treat all traffic equally.

The issue is not whether the TRAI would ask for licensing of all websites or applications. It may restrict licensing to only a few of the existing services. For example, the TRAI may argue that only Skype (Internet based video and audio chats) and WhatsApp (an SMS service using the Internet, which has

recently also introduced voice calls) needs to be licensed. The problem is that any website that offers real time chat or real time conferencing facility is no different from Skype or WhatsApp. This is built into the current version of the language that is used to build websites – HTML 5. HTML was the hyper text language that Tim Berners-Lee developed, which led to the birth of the world wide web.

Once we start to differentiate between the specific applications over the internet for regulatory purposes, we open Pandora's box. We effectively dismantle the internet as a network that transmits data packets, and introduce in its place, a set of applications or websites. This will allow the ISP's to decide on how they will connect and what speeds each of them will have. It will no doubt strengthen telcos, but will also allow cartels to be formed between them and the internet companies, effectively freezing out the rest.

This definition of the Internet as a bunch of OTT services that may need licensing, has the potential of creating a closed internet. The Internet has grown due to its open character, and what is called permission-less innovation. Anybody can connect to the Internet and offer an application or a service; or provide a website containing blogs and other content. The sort of closed Internet TRAI is proposing, is no longer on the discussion agenda in any country.

Any regulatory exercise has to ask one key question: what is the problem the regulator is addressing? The TRAI states in its document: "Telecom service providers (TSPs) offering fixed and mobile telephony are currently being overwhelmed by online content, known as over-the-top (OTT) applications and services." If the rapid growth of Internet (or data traffic) is indeed "overwhelming" the telecom network, it could be for two completely different reasons. One is that the telecom operators, in spite of making enough money, are not investing in upgrading their infrastructure. This calls for the regulator to crack its regulatory whip on the telecom operators. The other reason is that the growth of data traffic is not generating adequate revenue for the telecom operators. In which case, we need to address why the rates for data services are low, considering that the TRAI has allowed the telecom operators a free hand to set their own rates.

Neither the TRAI nor the telecom operators have offered any evidence that their data services are not generating enough revenue. Figures show that revenue of telecom operators from data services has been growing at a dizzying pace. Instead, their argument, repeated by the TRAI, is that internet companies are making a ton of money through the Internet, and they deserve to have a share of it.

In fact, when the telecom companies want to raise money from the investors, they present a rosy picture of a booming data business and how much they will earn from such services. Companies that prepare reports for the investor community — such as Morgan Stanley or Price Waterhouse — like talking about the robust growth of telecom companies and a steep increase of revenue from their data services. Even the voice and SMS traffic in India is growing. The recent high auction price of spectrum shows that the telecom sector has enough revenues for its growth.

So why this campaign by telecom companies against OTT services and other services cutting into their revenues? Worldwide, the telecom companies have failed to get into OTT services, or what we should call the internet-based services. They look at the huge success of a number of Internet companies with a jaundiced eye, and feel that since they "supply" the basic infrastructure, they also deserve to the "partake" of the goodies on the net. If they claim their revenue is too low to build infrastructure, the claim can easily be shown up as false. They know this. Hence the argument on how much OTT vendors earn, and why a part of it should go to telecom companies.

This part of the argument in India of OTT services overwhelming the existing infrastructure, and without getting a cut of the revenue of the internet companies, the telcos will not be able to build the required infrastructure, is a replay of the arguments before the FCC. There also, facts were shown to be otherwise.¹⁴

If net neutrality is violated, the telecom operators would have a perverse incentive to not expand their infrastructure and bandwidths. Once bandwidth is choked, and data flows throttled, the bigger internet players would be willing to pay the network operators to speed up their packets. Net neutrality regulations

thus provide an incentive to expand the network to relieve congestion, rather than constrain the bandwidth for earning monopoly profits. This was an important reason for FCC to classify internet services as a public utility and impose net neutrality rules.

The most cited case – Skype versus voice calls – uses fictitious numbers of loss. The telecom companies calculate by converting Skype call time to equivalent voice call value, as if all people who use Skype now would actually make such voice calls if Skype was not there. TRAI has partially bought into this argument of the telcos by calling Skype voice calls “revenue foregone”.

TRAI also states, “This phenomenon, namely, the growth of OTT apps, providing voice services has started to impact revenues of TSPs from voice services, which constitutes a major portion of their revenues.”¹⁵ This, again, is an assertion for which no data has been provided. Yes, some drop has taken place in international calling. But it has been more than compensated by an increase in revenue from data services, and growing local calls.

Comparing SMS’s on the voice networks to equivalent services such as WhatsApp is also misleading. Mobile services were originally designated as value added services, while voice on landlines was considered a basic service. With mobile services being merged into basic services, SMS services also became a part of basic services. The reality is that telecom companies offer SMS service — what is essentially a data service – as a very high priced service. This high rate also penalises the lower-end users, who use basic 2G services; not the high-end users who have migrated to voice and data services and can use applications such as WhatsApp.

There are a variety of ways in which the TRAI can address the issues of internet monopoly by certain companies, the regulatory issue that TRAI claims it is addressing. Yes, monopoly of a few global internet companies is an important issue. But the solution proposed, violating net neutrality through licensing of OTT services, or in other ways, is worse than the disease. It will penalise the people by denying them access to various websites. It will keep all new players out. It will instead, help to promote cartel between telcos and big internet monopolies. Creating rules by which the telcos share in the monopoly profits of the internet companies, does not solve the problem of monopolies. It is only helping one set of monopolies against another.

If monopoly power of the internet companies are to be broken, this issue needs to be addressed directly. The EU anti trust-regulator has taken up some of these issues with respect to Google.¹⁶ The TRAI could regulate internet monopolies similarly, or refer such issues to the Competition Commission. The TRAI can also regulate the interconnection rates between external networks the Indian networks. All internet companies, such as Google or Facebook, use their home networks to connect to their Indian consumers; their servers are located in their home jurisdiction. The interconnection charge regime is highly skewed in favour of the big, global players. Higher delivery charges from external networks would help in creating extra revenue for the Indian network operators, without violating net neutrality or promoting cartels.

Among the many sectoral regulators in India, the TRAI has functioned relatively well. Though it failed to stop the 2G scam, it did, at least, caution against it. But the TRAI document in question is almost entirely based on the submissions of the telecom players; they are profusely quoted in the consultation paper. Indeed, the paper reads in large parts as if it has been drafted by the telecom companies. The TRAI has sullied its relatively clean record with such a shoddy document.

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NOTES

¹ AT&T Could Have Bought the Internet in 1971, Joshua Kopstein, Motherboard, January 17, 2012. <http://motherboard.vice.com/blog/remember-that-time-at-t-almost-bought-the-internet>

- ² U.S. Control of the Internet, Problems Facing the Movement to International Governance, Prabir Purkayastha and Rishab Bailey, Volume 66, Issue 03, July-August, 2014. <http://monthlyreview.org/2014/07/01/u-s-control-of-the-internet/>
- ³ <https://projects.eff.org/~barlow/Declaration-Final.html>
- ⁴ The Internet's Unholy Marriage to Capitalism, John Bellamy Foster and Robert W. McChesney, Volume 62, Issue 10 (March), 2011
- ⁵ <http://news.netcraft.com/archives/category/web-server-survey/>
- ⁶ The Web is Dead, Long Live the Internet, Chris Anderson, Michael Wolff, *Wired*, 17, August, 2010. http://www.wired.com/2010/08/ff_webrip/
- ⁷ "Let's put that in perspective. If Apple were a country its cash reserves alone would make it 58th biggest economy", http://www.huffingtonpost.co.uk/2013/10/02/apples-cash-hoard-is-147-billion_n_4028576.html in the world - richer than Vietnam.
- ⁸ Broadband have been defined in different ways in different countries but generally means a high capacity access to the internet with multiple channels (voice and data/internet). The definition of capacity and its efficiency change from regulator to regulator.
- ⁹ No Tolls on the Internet, Lawrence Lessig and Robert Mcchesney, June 8, 2006, Washington Post. <http://www.washingtonpost.com/wp-dyn/content/article/2006/06/07/AR2006060702108.html>
- ¹⁰ The Rebirth of the Telecom Monopoly, Citi GPS Report, November 2014. <https://ir.citi.com/vQdUKn70s9i8%2BLtQGHoh2tf57DUvJYilUzFuGitJh5S40LKxAq2SwOnIzKEr DnDe2PEV8y8P1A%3D>
- ¹¹ <http://www.telecompetitor.com/when-will-cable-start-shifting-bandwidth-away-from-video-and-to-internet-access/>. The net profit margins, taking into account costs of investments, maintenance costs etc., is in the region of 40%, making it still a very profitable business. <http://www.razorsight.com/blog/2012/09/pipe-services-will-always-drive-most-service-provider-revenue.html>
- ¹² 15 leading US internet and telecom companies came together during WCIT to oppose the new ITR's. This was the first public alliance of this kind. <http://newslick.in/india/itu-really-threatening-internet>
- ¹³ Regulatory Framework for Over the Top (OTT) Services, 27/03/2015, TRAI, P: 19. <http://www.trai.gov.in/WriteReaddata/ConsultationPaper/Document/OTT-CP-27032015.pdf>
- ¹⁴ <http://www.freepress.net/resource/106809/free-press-ex-parte-filing-debunking-claims-title-ii-harms-investment>
- ¹⁵ Regulatory Framework for Over the Top (OTT) Services, 27/03/2015, TRAI, P: 19. <http://www.trai.gov.in/WriteReaddata/ConsultationPaper/Document/OTT-CP-27032015.pdf>
- ¹⁶ EU accuses Google of hurting consumers, competitors in Web search case, April 15, 2015, Reuters. <http://www.reuters.com/article/2015/04/15/us-google-eu-idUSKBN0N610E20150415>