

Abridged version of TRAI's consultation paper (number 2/2015) on

Regulatory Framework for Over-the-top (OTT) services / Internet services and Net Neutrality

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Deadlines

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1: Internet Licensing

1. The objective of this Consultation Paper is to analyse the implications of the growth of Internet services/Apps/OTTs and consider whether or not changes are required in the current regulatory framework.
2. From a telecom regulatory perspective, there are two broad categories of Internet services/Apps/OTTs: those in direct competition with the telecom operators with realtime services, and those that do not fall under the telecom licensing framework, like apps and content.
3. Over-the-top (OTT) refers to Internet applications and services which are provided via telecom operator networks. These are of 3 types:

3.1 Messaging and voice services: These substitute telecom fixed and mobile telephony and SMS revenues.

3.1.1 Messaging (WhatsApp, iMessage, Wechat, Line): In 2013, the worldwide annual SMS traffic was around 8.16 trillion messages, when compared to 18.3 trillion messages by Apps/OTT players. It's expected to double in 2014. Online messaging traffic includes "one-to-many" broadcast messages, unlike SMS which was "one to one". Online messaging can also include voice and video messages as in Facetime, **messages using geo-location information (Ola, Uber etc.)** photo sharing, as in Instagram, Snapchat etc. There are two types of messaging apps:

- **Third party, such as Whatsapp.** As on January 2015, WhatsApp had 700 million¹³ monthly active users across the globe, delivering on an average about 30 billion messages each day.
- **Operating System specific like Apple iMessage.** Apple said 40 billion iMessages were sent each day during January 2014. This is encrypted and allows secure and confidential messaging.

WhatsApp's subscriber base in India has risen to 70 million¹⁹ and it has a free subscription model. Hike messenger in India claims to have a subscriber base of around 35 million as of August 2014 sending 0.5 billion messages per day. The SMS traffic for the telecom operators has shown declining trends in the recent past. The messaging traffic fell 18% from 5346 million in June 2013 to 4367 million in June 2014. This decline in SMS revenue has an implication of approximately Rs.3700-4000 crores per annum.

3.1.2 Voice (Skype, Viber etc): Voice telephony may migrate completely telecom to VoIP. In India, the impact on voice services is not considerable because India has one of the lowest voice calling rates in the world, low mobile Internet penetration, mostly 2G Internet and poor quality of VoIP. International calling may have been impacted: Globally, Skype carried 214 billion minutes of international Skype-to-Skype calls, almost 40% of the size of the global telecom calling. The revenue from international calls is less than 10% of an Indian operator's total revenue. Airtel, Idea and RCOM showed significant drop in calling in one quarter each in 2013." The drop could be directly attributed to the growth of free calling services such as Skype or Viber.

3.2 Application eco-systems (mainly non-real time): like Facebook, LinkedIn, Twitter, Instagram, WeChat, ecommerce apps, including m-payments, m-wallets- Amazon, Flipcart, Snapdeal, Alibaba. These lead to loss of voice and SMS revenues and in case of ecommerce apps, loss of revenue to existing brick and mortar establishments.

- Dropbox, Google Drive etc allow users to upload all their data on the Cloud at a central location which is then accessed frequently using any device. These services also place huge demands (pressure) on the network. Syncing data with the Cloud every time consumes more bandwidth than traditional back-up or selective uploading and downloading.

- The cost of regulatory compliance in mobile commerce is comparatively less when compared to the existing models. Mobile commerce sites can operate internationally, so national boundaries are becoming less of a barrier. Taxation laws for doing business within national boundaries tend to get blurred when business is conducted internationally through the web.

- In India the digital advertisement revenues grew from Rs 28.3 billion in 2013 to Rs 41.2 billion in 2014. But new models like in-app purchases of selling virtual goods like stickers, mobile games, apps are growing: 85% of the \$1.1 billion revenue of WeChat in 2014 was from online gaming, Line's gaming revenue was 60% of its \$338 million revenue in 2013, 20% from stickers, rest from business services.

3.3 Video / audio content: like Youtube, Dailymotion, Vimeo, Netflix, Hotstar, Spuul, BoxTV. Not in direct competition for a telecom operator. Lead to a loss of audience (hence advertising) for traditional TV services. This is different from IPTV, where the operator controls and manages the content, which is hosted. Once internet access is widespread, content owners will not have to negotiate with telecom or television operators and can directly reach consumers.

Media apps clearly seem to be one of the few services that are earning large revenues for the Internet companies, revenues coming mainly from advertising. In India, with 4% broadband penetration, the challenges to be faced by the broadcasting industry are yet to materialise. The India's active Internet video subscribers (on mobile) in 2014 were 12 million, expected: 15 million by 2015.

Hundreds of thousands of apps have emerged due to the low cost base. WhatsApp Messenger can run at an operating cost of ten cents per subscriber per year.

Internet companies use telecom operator infrastructure to reach their customers and also compete with the traditional telecom services and brick and mortar rivals e.g. ecommerce sites, banking etc.

4. Telecom operators: Earlier, networks used to be built around specific applications, say voice, internet or Pay TV. Voice, message and video content have now been reduced to mere bytes. Major sources of traffic are Google, Yahoo, MySpace, YouTube, Facebook, Wikipedia.org etc, which are not owned by telecom operators. Telecom operators:

4.1 Have no control over content: no rights, no responsibilities, no claim for content on these apps. They are not involved in planning, selling, or enabling Internet apps. They make money only from data usage.

4.2 Have no control over billing: The computerisation of the banking system also allows Internet businesses to bill separately from the telecom wallet, with Internet banking. Earlier, if a consumer bought an app/ content, the Telecom operators did the billing and the content provider had to depend on the telecom operator for its revenue share from the amount collected by the telecom operator.

(Editor's notes:

- Airtel, Idea, Jio and Vodafone have Mobile Wallet licenses. [Click here for the RBI list](#) (scroll down to Prepaid Payment Instruments)
- Telecom operators have applied for Payment Banks licenses. [Click here for the list of applicants](#) (scroll down to Annex II)
- Purchase of goods using telecom operator billing has been increasing. Read this interview. India [has highest transactions for carrier billing company Fortumo](#))

4.3 Are seeing their traditional model declining: subscriptions, metered services (mainly voice and messaging) are declining.

5. Incentives for telecom operators: Some argue that Telecom Operators should focus exclusively on their role as pipes instead of remaining integrated companies that provide services and infrastructure. With Internet growth, networks will have to be constantly built and upgraded, the cost of which will have to be borne exclusively by telecom operators.

- Telecom operators earn less money from data: they earn 50p per minute for a phone call and 4p for a VoIP call. Revenue per MB is 25p, and a 1 minute call is 150 KB). Lower cost means longer calls: VoIP calls are often more than 12 minutes, while traditional calls are 2 minutes. Average revenue earned by a telecom operator for an SMS is around 16p, when compared to 1p of data usage charges (average size of message is 30 KB)

- Earlier, Telecom Operators had an incentive to invest in the network as content and carriage went together and they could generate revenues through the provision of content. Traditionally, Indian telecom operators kept the bulk of the VAS revenues from their subscribers, retaining on average 60-70% revenue from VAS, while the remaining revenues accrued to VAS companies. Now, a telecom operator earns revenue only from wholesale data usage.

- Data has increased: Airtel's data revenues were 16.2% of total for Q3 FY 2015, compared with 6.5% in Q4 FY 2013, data revenue growing 74.3% Year-on-Year in Q3 2015. Data usage has increased from 49645 TB in Oct 2013 to 90267 TB in December 2014, up 65.2%.

(Editors note: More information [on telecom operator growth here](#))

6. Telecom versus Internet: based on a seminar conducted by TRAI on August 5th 2015.

6.1 Telecom Point of View

- **Apps/OTTs are unlicensed:** Internet/OTT circumvent Indian licensing and provide services that are otherwise permitted only under a telecom license. The scope of the Internet Services Licence was historically restricted, without connectivity for Volp from India to mobile number and landline.

- **Apps/OTTs don't pay government:** Telecom operators pay Entry Fee, License Fee and Spectrum Usage Charges, and have regulations regarding quality of service, tariff and consumer protection regulations. (Internet/App companies don't)

- **Apps/OTTs can't be monitored by government:** Telecom operators provide emergency services, confidentiality of customer information, privacy of communication, undergo regular audits and ensure proper lawful monitoring and interception. However, 'unlicensed' Internet companies are not bound by these conditions.

- **Apps/OTTs take away telecom revenue, are “Free Riding”:** they will "unfairly" garner a substantial chunk of voice service usage, as they have done in the case of messages. The Internet model, with low or zero tariffs, results in usage shifting from telecom to Internet telephony. Internet companies compete with telecom operators without any investment in building networks.

- **Apps/OTTs don't pay government revenue share:** Government gets a revenue share from telecom operators. Apps deprive licensed operators and the Government are deprived of their legitimate revenues.

- **This will disrupt mobile and broadband growth:** Use of VoIP/Internet Telephony on such a massive scale, without a licensing regime, would result in a significant disruption of telecom business, derail investment capability. Such a situation would jeopardize the national objective of affordable and ubiquitous telephone and broadband access across the country.

- **Apps/OTTs don't have mandatory quality of service norms:** unlike telecom operators, for whom it is mandatory.

(Editors note: Responses to some of these arguments [here](#) and [here](#))

6.2 Internet Point of View: Internet companies are growing because of: High speed broadband networks, the fact that Internet/OTT services are free or low priced, propensity to be used by social groups, the strength of the platform (for example, Android), scalability of services. Their response to points made by telecom operators:

- Telecom operators make money from Internet access charges: Telecom operators and the Government are paid for the internet services consumed by an end-user.

- Increased data usage means telecom operators make more money.

- It is in the Internet companies' interest to provide Quality of service else they will lose customers.

(Editors Note: This is not a faithful depiction from the TRAI of what was said at the seminar. Reports from sessions at the seminar [are here](#))

6.3. Telecom operators can do the following things to meet the challenge of the Internet

- **Fair usage policies for limiting speeds and data caps:** Data caps: monitor traffic volume and throttle data or charge for extra volume for a data cap is reached.

- **Toll boothing, Zero-rating and traffic management:** Zero-rating ("toll-free data" or "Sponsored data") is their way of not charging for restricted internet access through prior agreements with specific content providers. Traffic management involves: deep packet inspection, layered segmentation, and traffic differentiation. In Toll boothing, different services offered to the users are priced differently. The recent introduction of differential pricing for VoIP calls and normal internet usage by Airtel in India is one such example of toll boothing. The vast majority of telecom operators employ more than one strategy, or plan to employ more than one strategy in the future (70 percent).

(Editors Note:

- Issues of Zero Rating [here](#) and [here](#).
- [Twitter](#), [Facebook](#) and [Google](#) do Zero Rating in India)

- **Proprietary services and service add ons:** such as unlimited video streaming or speed boosts or toll-boothing- are expected to see the most growth in adoption rates over the next 12 months.

(Editors Note: Airtel did this with Google. [Read about it here](#))

7. Policy Issues

7.1 Regulatory Imbalances:

7.1.1 Telecom has regulatory obligations, Internet does not: Both telecom operators and Internet companies (OTTs) are capable of providing the same service to customers. Telecom operators bear the cost of infrastructure, and face the following government obligations while Internet companies don't:

- Spectrum allotment and use: Need to bear costs and adhere to rules
- Licensing: different licenses and their associated costs including licensing fee
- Spectrum related charges: Need to bear the costs
- Space related charges: Need to bear the costs
- Bank Guarantees to the government: Yes
- Proper record keeping including methodology: Required
- Interconnection: Yes, required as part of regulatory regime. Requirement to interconnect entails costs.
- Quality of Service Parameters: Required as part of regulatory regime
- Obligations under various Telegraph Acts: Need to adhere to rules
- Infrastructure sharing: Need to bear the costs
- Security conditions: Need to adhere to rules
- Emergency and Public utility services: Need to adhere to rules
- Monitoring services i.e. Lawful interception and monitoring: Required as a license condition

Internet companies don't have these costs.

7.1.2 Internet companies/apps are bypassing local regulations: For example, Uber and Ola bypass taxi regulations. Acting as a platform, these taxi services connect private taxi players directly with users. It could also pose certain unanticipated risks. The major challenge remains: in a non-level playing field, how can such App providers be brought within the ambit of the prevailing regulatory regime of the country to ensure public safety and security of users.

7.1.3 Online Media services face Copyright issues and there is a regulatory imbalance regarding ownership of content.

7.1.4 Ecommerce (Flipkart, Snapdeal, Amazon) has issues of protection of consumer information. To participate in online commerce, individuals have to submit personal data online, which can be of great value to criminal elements. These sites can be hacked and denial of service attacks can adversely impact the economy. This can be addressed with legal surveillance.

It may even become necessary to establish a Nodal Authority which is entrusted with the responsibility of ensuring compliance with the laws of the land e.g. Consumer Protection Laws for e-commerce.

(Editors Note:

- [There are challenges](#)
- Until last year, Consumer Courts could not handle telecom consumer complaints and disputes. [More here](#))

7.1.5 Cloud services: exposes users to risks since they don't have physical control of their data, and data protection is an issue. Cloud services can also be offered by people in another country. This may raise sovereignty issues.

7.1.6 Social Media: sites have also been the target of sophisticated hacking. Users are voluntarily disclosing information, and this data is being mined for targeted advertising. There are issues of privacy, ownership of data and longevity of data among others.

7.1.7 Users can access entertainment, information and commerce, mostly not subject to regulation. Where there are regulatory concerns, service providers simply host the site in "friendly" nations. VPN's and international credit cards allow access to these website of his/ her choice, irrespective of local laws.

7.1.8 Internet companies are not mandated to adhere to Quality of Services obligations

7.2 Impact on the economy

7.2.1 Competing with offline: It is becoming difficult for traditional and localized companies to compete with the new global market players. In ecommerce, Internet/OTT players take over the market share of offline/local entities. YouTube, because of its global presence, benefits from lower costs of content storage and hosting, and is able to negotiate better content deals. This renders small specialized local players, irrelevant.

7.2.2 Internet/OTT helps business creation, employment and output, and create employment for new small and medium size enterprises. Specialized manufacturing or cottage industries could expand their footprint throughout the country and also globally through online sites.

7.2.3 The economic benefit of Internet/OTT: reduction in entry costs, fixed costs, and production costs. There is no need of physical showrooms, displays etc, allowing new SMEs to enter.

7.2.4 Tax losses because of global nature: Many Internet companies can also capitalise on savings in tax revenues of millions of rupees. Being location-agnostic, they can take advantage of the variable tax rates across states in the country or globally. Real macroeconomic benefits accrue only to the country in which they are located. National governments stand to lose tax revenues since users purchase goods and services from global players rather than local entities. Moreover, there are limited employment benefits in the country where the services are delivered

(Editors Note: This is a global issue with Apple ([read](#)), Google ([read](#)) and others)

7.2.5 Data centers in India: The emergence of an Indian version of Facebook, like renren.com of China, will facilitate content to be located in servers within the country. Only 30% of the data centers in the country are currently utilised.

(Editors Note: BJP IT Cell co-convener Vinit Goenka wants [all Internet companies to set up servers in India](#))

7.2.6 Lower government revenues due to lowering of telecom revenues: The revenue losses of the telecom operators will lower Government revenues, lower contribution to the USO Fund (which the government uses to fund mobile infrastructure and network rollout), lead to less investment in infrastructure from telecom operators.

7.3 Security Issues:

7.3.1 App/OTT based messaging bypasses the regulatory regime enforced on conventional voice and messaging services provided by Telecom Operators. This has implications for telephone number management, public safety, emergency number access and national security. **Without secure connections through telecom operators, they present a cyber security threat.**

7.3.2 Surveillance: Legally approved surveillance of a telecom network is important for investigating and prosecuting criminal (cyber) activities and terrorism. Telecom operators are obligated to grant Law Enforcement Agencies access to their network/services. No such provision exists for Internet/OTTs, and India had a protracted negotiation with Blackberry access Blackberry Messenger Services, in spite of Blackberry having both physical presence and economic interests in India. Blackberry agreed after prolonged discussions. It is also extremely difficult to trace the source of internet calls, for example, during a terrorist attack. Calls appear to have originated from other countries from virtual numbers. Certain apps have special encryption.

Apps like Snapchat, in which data is made available only for a limited time-span, pose a new security challenge, because all Messages (text, audio/ video or graphics) for Snapchat are automatically deleted from the server after delivery.

7.3.3 Cultural Sensitivity: Internet players mostly located outside the country may not be sensitive to the diverse cultural spread of India. There is also the possibility of deliberate misuse of messaging and calling apps, to sow disharmony and discord. The recent inflammatory text messages and depictions through videos/ photos circulated in Bangalore using various apps/ SMS, targeting students from the North East is one example. Most of the content for such Internet/OTT apps are however not housed within India Another issue is the circulation of obscene or pornographic videos through these apps.

Editors Note: The IT Act addresses this. [Read it here](#))

Yet another potentially problematic area is that users of the social media websites express opinions freely without the usual social restraint.

(Editors Note: The Supreme Court of India in its 66A judgment ([pg 14 here](#)) had defined the approach to free speech: discussion and advocacy are fine, incitement is not. So lack of social restraint is not illegal, and not a TRAI issue)

7.3.4 Privacy: The transfer of personal information is a risk because of the open architecture of the Internet. According to MetaIntell, today more than 92% of such Internet/OTT apps use non-secure communication protocols.

“geo-location details, authentication, personal information, banking information etc. and data analytics can lead to a user’s private information being harnessed for commercial gains, e.g. advertisement targeted to a user. This compromises the user’s free will.”

User information is being extracted for carrying out marketing activities. “It is said that Big Data can even predict an individual’s future actions. Several concerns are being raised and most important is privacy of an individual. **Big Data (not Big Brother) is watching.**”

(Editors Note:

- Big Brother is watching: India has the CMS ([read](#)), NATGRID ([read](#)) and NETRA ([read](#))
- India does not have a Privacy law)

7.3.4 Apps that track location can be used for crime: The 'always online' state of mobile phones exposes users to cybercrime. Most applications can trace the user's location for underlying processes (such as GPS apps finding the nearest restaurants etc). This information may be used to commit a crime, or the location itself may be the target of a crime. Such threats can impact the nation's security and financial health.

7.3.5 App stores don't check for risk assessment: Most of the time users believe that apps downloaded from an official app site can be trusted even though these stores do not guarantee trustworthiness of the products or items on sale or offer. These apps are hosted in such app markets without any risk assessment and can impact the device and a company's internal network.

7.3.6 Malicious Software and movies: Internet apps bring "all manners of nuisance" including viruses, worms, malware, spyware or trojan horses etc. Hacking and theft are common occurrences. Recently even unreleased films from Sony were leaked by hackers.

(Editors Note: the IT Act addresses this. [Read the IT Act here](#))

7.3.7 Reconnaissance: scouting or exploring to gain information about an enemy or potential enemy. This enables the attacker to discover vulnerabilities or weaknesses on the network.

7.3.8 Denial of Service attacks: Internet apps/OTT providers do not have any obligation to ensure availability of service at all times. Using a Denial of Service (DoS) attack, services of Apps/OTT providers can be shut down by exhausting processing resources or network bandwidth.

7.4 Other issues:

7.4.1 Apart from this, these Internet/OTT apps “suffer from developer reputation (?), content vulnerabilities and 20% of the apps have the ability to load external applications without the explicit consent or knowledge of the user.”

7.4.2 Health Apps are not subject to regulatory framework: These apps record details of diet, daily exercise, glucose readings, pregnancy, etc. “which could be shared with various unregulated healthcare sites and unregulated medical advice could be provided to users”.

Editors Note: in the US, [this is an FDA issue, not a telecom issue](#))

7.4.3 Ecommerce issues: Internet companies might not meet the expectations of customers in the real world. Often they don't disclose their contact addresses. Quality of goods can be assessed only by the website. "When consumer protection laws and rules apply to all Brick-and-Mortar sellers, should not such (Internet) OTT services also be properly registered to secure customer interests?"

(Editors Note: the commerce ministry and DIPP looking into issues of Ecommerce – read [this](#) and [this](#))

7.4.4 Social engineering: This involves psychological manipulation of people into performing actions or divulging confidential information. Recently, Facebook manipulated information posted on 689,000 users' home pages and found it could make people feel more positive or negative through a process of "emotional contagion".

7.4.5 Copyright violation: The availability of pirated content, usually books, movies and videos is ubiquitous. Alexa (December 2014) ranks torrentz.eu as 50th in India, vs legitimate Indian site 'zeetv.com' ranked at 2263rd. There have been suggestions to throttle speeds of such websites.

(Editors Note: Copyright [is an HRD ministry issue](#). Indian courts [issue John Doe orders on copyright violation](#))

Consultation Questions

Question 1: Is it too early to establish a regulatory framework for Internet/OTT services, since internet penetration is still evolving, access speeds are generally low and there is limited coverage of high-speed broadband in the country? Or, should some beginning be made now with a regulatory framework that could be adapted to changes in the future? Please comment with justifications.

Question 2: Should the Internet/OTT players offering communication services (voice, messaging and video call services through applications (resident either in the country or outside) be brought under the licensing regime? Please comment with justifications.

Question 3: Is the growth of Internet/OTT impacting the traditional revenue stream of Telecom operators/Telecom operators? If so, is the increase in data revenues of the Telecom Operators sufficient to compensate for this impact? Please comment with reasons.

Question 4: Should the Internet/OTT players pay for use of the Telecom Operators network over and above data charges paid by consumers? If yes, what pricing options can be adopted? Could such options include prices based on bandwidth consumption? Can prices be used as a means of product/service differentiation? Please comment with justifications.

Question 5: Do you agree that imbalances exist in the regulatory environment in the operation of Internet/OTT players? If so, what should be the framework to address these issues? How can the prevailing laws and regulations be applied to Internet/OTT players (who operate in the virtual world) and compliance enforced? What could be the impact on the economy? Please comment with justifications.

Question 6: How should the security concerns be addressed with regard to Internet/OTT players providing communication services? What security conditions such as maintaining data records, logs etc. need to be mandated for such Internet/OTT players? And, how can compliance with these conditions be ensured if the applications of such Internet/OTT players reside outside the country? Please comment with justifications.

Question 7: How should the Internet/OTT players offering app services ensure security, safety and privacy of the consumer? How should they ensure protection of consumer interest? Please comment with justifications

2: Net Neutrality

8.1 Telecom operators are concerned primarily because of the excessive use of internet leading to congestion and bandwidth difficulties. 10% of mobile users actually consume 90% of operators'

bandwidth. Internet companies are not in favour of regulation that could tilt the balance in favour of telecom operators, but are advocating legislation to keep the internet open.

8.2 What is Net Neutrality (NN)? Net Neutrality means that telecom operators must treat all internet traffic on an equal basis. It has been suggested that to ensure a thriving and neutral Internet, the following issues need to be addressed:

i. The Internet must be kept open and neutral. Reachability between all endpoints connected to the Internet, without any form of restriction, must be maintained.

ii. All data traffic should be treated on an equitable basis no matter its sender, recipient, type, or content. All forms of discriminatory traffic management, such as blocking or throttling should be prohibited.

iii. Network service providers should refrain from any interference with internet users' freedom to access content (including applications of their choice)

iv. There should be restricted use of packet inspection software (including storage and re-use of associated data) to control traffic.

v. Complete information on reasonable traffic management practices and justifications for the same must be accessible and available to the public. Telecom operators should be transparent and accountable to any changes in practices.

vi. Non-neutral treatment of traffic for "voluntary" law enforcement purposes must be prohibited unless there is a legal basis for it.

(Editors Note: A simplified definition of Net Neutrality is [here](#))

8.3 The debate:

8.3.1 Antitrust and innovation: There are concerns that telecom operators will discriminate against certain types of content and political opinions. This will hurt consumers and diminish innovation in apps and content spaces. Discriminatory pricing proposals can raise anti-competitive concerns. Access networks, if left unrestrained by non-discrimination rules, have incentives to favour their own services, applications, and content and to kill competing services. One concern is that a cartel of telecom operators will degrade traditional internet access to force apps and content providers to use the telecom operators new "premium" service (without the degrading of access).

8.3.2 Slicing the Internet: Allowing telecom operators to charge fees from content producers can result in operators "competing" for content, by charging different fees for different content providers. This could lead to a fragmentation—where certain content would only be available on certain telecom operators, —and hence multiple "internets".

(Editors Note: Airtel and Uninor have both spoken about this. [More here](#). How the Internet reacted to it: [here](#))

8.3.2 Freedom of expression: At one level, it is being linked to the right to freedom of expression and the right to information. The underlying idea of an open internet is that all internet resources and the

means to operate on it are easily accessible to all. It effectively renders the telecom operator a dumb pipe.

8.3.3 Impact on startups: The ability of smaller and start-up Apps to compete with established Apps may be affected if they are unable to secure access to specific telecom operators or afford access-tiering charges, particularly if a Telecom Operator with market power reaches an exclusive arrangement with an established App or where smaller Apps are unable to secure affordable access. This may deter start-ups from joining the market.

However, majority economists argue that price discrimination is legitimate especially in view of externalities i.e if a video service hogs bandwidth it ought to pay more.

8.3.4 Impact on networks: Some experts believe that mandating Net Neutrality would be inconsistent with sound economic management of the internet. Innovations in application services can be better achieved if innovators, for example, take into account potential congestion costs of bandwidth-intensive applications.

8.3.5 Some services need prioritisation: A Japanese study noted that poor quality images limited the medical use of the internet, but that a very high-speed dedicated link can make real-time surgical collaboration possible.

8.3.6 Internet access will become costlier: Due to rise in data traffic, telecom operators will be forced to increase the cost of access for consumers and consumers would be worse off. Instead, Apps that earn by advertising and other business models should be charged by the Telecom Operators.

8.3.7 Alternate market mechanisms exist: The market is already dealing with the issue by virtue of a range of new mechanisms, including:

- i. Tiered pricing structures, so that data hungry users are charged more for more usage
- ii. The use of content delivery networks (CDNs) by Apps to improve the quality of service for their customers.

8.3.8 Traffic Management would not be allowed under Net Neutrality: Traffic management involves techniques a telecom operator uses to allocate bandwidth for optimum network performance. This is done to ensure that a small number of users don't use up available bandwidth and clogging access for others. A strict adherence to Net Neutrality would not allow this.

This departs from the principles of non-discrimination and fair competition (including the abuse of market power). There is a fine line between correctly applying traffic management to ensure a high quality of service and wrongly interfering with internet traffic to limit applications that threaten the telecom operators own lines of business.

There are two broad forms of Internet traffic management:

i. **"Best-efforts" internet access**, under which telecom operators attempt to convey all traffic on more or less equal terms. This results in an 'open internet' with no specific services being hindered or blocked, although some may need to be managed during times of congestion.

Criticism: Critics say 'Best Efforts' internet favors real time communications traffic over other non-time sensitive traffic. It cannot be seen as 'neutral' since different types of data and applications

have different requirements for network quality. Historically, ISPs have blocked port 25 or port 80 disallowing certain types of services.

ii. **Managed Services**, under which telecom operators prioritise certain traffic according to the value they ascribe to it. For example, prioritisation of a high quality IPTV service over other traffic. This amounts to a form of discrimination, but one that is normally efficiency enhancing.

8.3.9 Telecom Operators can discriminate: Network discrimination can take place in the following ways:

- **Blocking of apps and services**, including VoIP, to maximise profits for telecom operator owned apps and services.

- **Throttling:** Slowing internet speeds for specific services and apps or asking users to pay extra. For example, Comcast throttled Netflix before Netflix agreed to pay for a "fast lane" access.

- **Blocking websites:** Telecom operators can block websites for a number of reasons – to secure their network, avoid competition, and sometimes for social, public relations or political reasons.

- **Preferential treatment:** they can impose data limits on internet access while allowing exception for their own proprietary streaming or service (Ed: Example, Airtel giving data free with Wynk)

Editors Note: Throttling is not new to India. More [here](#))

8.4 Need for investments and charging content owners for access to users:

8.4.1 Increasing demand for infrastructure capacity is being demanded by new data-intensive apps. Shortage in spectrum has put telecom operators under pressure to make investments in network, which will need to be upgraded regularly.

8.4.2 The telecom operators could generate extra revenue from online Content and Service Providers, who are in part causing the necessity for infrastructure investments. Charging content companies and apps would be unlikely to provide sufficient sums to drive network up-grades given the scale of the revenues for these providers versus the cost of the network upgrades required.

8.4.3 Proponents of Net Neutrality argue that this would violate Net Neutrality. The pricing structure of the internet can be viewed as a means of subsidizing creativity and promoting innovation. Historically there is a bar telecom operators from charging an additional fee from a content provider to reach users. This allows more content creators to join and prevents Internet fragmentation: even content providers who don't have a deal with telecom operators can reach users.

8.5 Fault with all or nothing approach to Net Neutrality:

8.5.1 The adoption of the strict Net Neutrality rule would require Telecom Operators to treat each packet the same. This would make it impossible to offer and deliver Quality of Service.

8.5.2 Telecom operators may use this as a tool to distort competition among competing applications by making quality access for one app versus another. Telecom operators might also slow down the regular access so that content providers and apps are forced to pay for faster access to their services.

8.5.3 Therefore, the two extremes- strict Net Neutrality and no regulation - are inherently flawed. Banning all discrimination is over-inclusive and restricts the evolution of the network. Allowing all discrimination can lead to exclusion and, effectively, make the rule against blocking meaningless.

Hence, a few standards or principles such as 'No Blocking' and fixed QoS standards ought to be specified to respond to concerns.

9. Internet business models:

9.1 Existing business models:

- Telecom operators charge users for Internet Access. Telecom operators international operators for traffic, or do peering.
- Internet companies pay telecom operators for hosting and connectivity. They monetize with advertising or charge end users for their services.

9.2 New Business models

- Prioritization for higher prices (including of a telecom operators own service, like IPTV)
- Charging Internet companies for prioritization for delay-sensitive services
- Providing guaranteed network capacity for end users.

9.2.1 Telecom operators partner with Content and application companies and give them access to their user base, high quality network services.

9.2.1 Instead of blocking access to those apps that do not pay a termination fee (which is a common practice in telecom market), they can offer faster access lanes in return for an additional fee.

9.2.2 Yet, given a fixed amount of bandwidth, speeding up some App traffic will inevitably lead to a slowing down of those that do not pay the priority fee.

Quality of service techniques (traffic management) may be used to provide tiered internet access to end users: Light users could be offered limited access to the internet in return for a discount, **with access to some websites or services not included**. At the same time, the cost for an unlimited internet access is likely to increase, because it is no longer cross subsidized by the light users. Proponents of Net Neutrality fear that such practice may lead to a fragmentation of the internet.

9.2.3 Telecom Operators can also try to have players located higher up the value chain help cover their costs: especially other operators and Internet services/Apps

9.3 Principles of Net Neutrality legislation: The following principles need to be ensured under any regime, since user choice, innovation without permission, and low costs of application innovation are essential to maintain and preserve the factors that have allowed the internet to serve as a platform for application innovation, free speech and decentralized economic, social, cultural and political interaction:

1. Effective competition amongst telecom operators and user choice which can be ensured by:

- Sufficient information available to enable consumers to make the right purchasing decisions; and
- Consumers should be able to act on this information by switching telecom operators where appropriate.

2. Transparency: Network Providers need to declare all their practices on traffic management. Ofcom has published six principles for the publication of consumer information on traffic management:

- Appropriate: Telecom Operators should disclose all information, and only such information, that a

consumer needs to make an informed decision.

- Accessible: basic information should be available at the point of purchase, and more detailed technical information should be readily available online or on request.
- Understandable: information should be simple enough for consumers to be able to understand the practical impact of traffic management policies on the way they may use the internet service.
- Verifiable: consumers or third parties should be able to verify any information provided.
- Comparable: consumers should be able to compare information provided by different providers.
- Current: the information available to consumers should be up-to-date, both at the point of sale and subsequently.

3. Switching costs: For competition to affect the traffic management practices used by telecom operators, consumers need to be able to act on their experiences and information by switching providers. If two telecom operators differ only in their traffic management techniques, in a competitive market, consumers should be able to switch the Telecom Operators without undue costs or other barriers.

4. Quality of service assurances: There is a concern that if prioritization by Telecom Operators becomes widespread, then the un-prioritized traffic will be so degraded that the Apps that do not participate in prioritization will suffer competitively. Should there be measures that ensure a certain base level of quality of service?

10. Device and Search Neutrality: Network Neutrality in the internet ecosystem is dependent not only on telecom operators, but device owners and search engines as well.

10.1 The mobile device manufacturers (such as Apple) and owners of mobile operating systems (such as Google) and search engines decide which software is allowed on their devices, both indirectly (e.g., no support of flash media) as well as directly through an approval process for the AppStore. These companies are in a position of a gatekeeper that controls the content and functionality of end-user devices.

(Editors Note: Google violates Net Neutrality in India. [More here](#))

10.2 Advertisement funded search engines like Google have an incentive to bias search results in favor of their paying advertisers. They can personalize search results even more, based on personal preferences, social affiliation and browsing history.

10.3 Social network providers (e.g., Facebook) own the information about the so-called social graph (the aggregate information about all links of each participant of the social network with other participants of the network and the related personal information).

Consultation Questions

Question 9: What are your views on net-neutrality in the Indian context? How should the various principles be dealt with? Please comment with justifications.

Question 10: What forms of discrimination or traffic management practices are reasonable and consistent with a pragmatic approach? What should or can be permitted? Please comment with justifications.

Question 11: Should the Telecom Operators be mandated to publish various traffic management techniques used for different OTT applications? Is this a sufficient condition to ensure transparency and a fair regulatory regime?

Question 12: How should the conducive and balanced environment be created such that Telecom Operators are able to invest in network infrastructure and CAPs are able to innovate and grow? Who should bear the network upgradation costs? Please comment with justifications.

3. International Legislation

11.1 For communication apps/OTT services, US, EU and Japan tend towards net neutrality to promote openness and non-discrimination. But, even in their cases, there is no unanimity. Some governments in the Middle East have blocked Skype. In China, VoIP (PC-to-phone) is classified as a basic voice call service; hence, only major operators with basic telecom service licenses are allowed to provide VoIP services. Details:

11.2 USA: On March 12, 2015, the FCC (US) released the new draft internet rules, which may take a few years to be finalized and have opened the doors to litigation which is bound to ensue. Reasonable network management has been allowed by the agency. The rules:

- No Blocking: broadband providers may not block access to legal content, applications, services, or non-harmful devices.

- No Throttling: broadband providers may not impair or degrade lawful internet traffic on the basis of content, applications, services, or non-harmful devices.

- No Paid Prioritization: broadband providers may not favor some lawful internet traffic over other lawful traffic in exchange for consideration of any kind—in other words, no "fast lanes." This rule also bans ISPs from prioritizing content and services of their affiliates.

11.3 France: French Telecom regulator ARCEP has demanded that Skype register as a Telecom Operator. Skype is not required to obtain administrative approval, but it is obliged to declare itself compliant with the French Postal and Electronic Communications Code (CPCE). ARCEP also says that it must route emergency calls and allow legal interceptions. There is no clear classification for VoIP, Instant Messaging, Cloud and Content Delivery Network. Skype has refused to register as a telecoms operator in France.

11.4 European Parliament: had voted for protection of Net Neutrality in April 2014. The inclusion of the same in French law was fiercely debated. The "Digital Bill" is scheduled for the first quarter of 2015

11.5 South Korea: In 2008, 3G mobile networks had reached 99 percent of Korea's population. Because of the rapid uptake of smartphones and free Internet telephony and messaging, this raised serious concerns about the sustainability of business models of telecom operators. Korea Communications Commission (KCC), the telecom regulator announced Net Neutrality (NN) and Internet Traffic management Guidelines in 2011. The four requirements included in the Guidelines were:

- Transparency: disclose traffic management objectives, practices and management
- No blocking: of lawful content
- No unreasonable discrimination: no discrimination between lawful content
- Reasonable traffic management: network may adopt traffic management for network stability (congestion) and security.

The KCC made it legal for telecom operators to charge their customers extra fees to use VoIP apps – or block their use entirely. Korean telecom operators were planning to develop their own messaging apps

11.6 United Kingdom: decided that allowing ISPs to develop additional revenue streams from preferential traffic would be the best means of incentivizing investments in the broadband infrastructure. They can provide preferential treatment in the form of tiered services or toll-boothing, for example, by giving online companies who are willing to pay for faster flow of data packets than other internet traffic. The incremental revenue from such services could be used to pay for the building of increased broadband access to more consumers.

11.7 Germany: VoIP has the same regulatory framework as telecom, including provision of free emergency calls, surveillance, and retention of traffic data. Federal Network Agency says it will exercise its discretion, in the medium-term. Telecom operator Deutsche Telekom in 2013 attempted to reduce consumers' broadband speeds if they exceeded certain data caps. The court ruled that data caps (price based or otherwise) are perfectly legitimate; there is no legal bar to the use of such caps. However, favouring one's own app over others is a discriminatory practice and, hence, not legally sustainable.

11.8 Taiwan: the National Communication Commission (NCC) is planning to regulate mobile apps. Certain mobile app developers will be required to obtain a license from the NCC.

11.9 China: WeChat threatened China Mobile revenues, and China Mobile argued that the constant signaling of WeChat applications with base stations to communicate online status and position has imposed traffic costs on the mobile networks. China Mobile, with the approval of the Ministry of Information Industry (MII), announced plans to begin charging Internet/OTT communication services for termination of traffic to their customers. The move was immediately criticized by users on social media. On its part, Tencent immediately announced that it had no plans to pass on the charges to users. Under public criticism, the proposed charges were withdrawn.

In July 2014, the Chinese Ministry of Science, ICT and Future Planning (MSIP) blocked two Korean owned Internet/OTT services, Line and Kakao Talk.

11.10 Vietnam: regulators are contemplating an outright ban on OTT services

11.11 (Ed: IMPORTANT) European Telecommunications Network Operators' (ETNO): proposed payment for termination of Internet/OTT traffic. ETNO has demanded changes in the regulatory and interconnection pricing regime with OTT/Internet services, so that Internet services pay them to allow to be accessed. It has put forward a pricing proposal that would enable them to negotiate pricing schemes with Internet/OTT providers.

Specifically, ETNO put forward three interrelated demands:

- a) Content providers, Internet/OTT services and apps must pay "fair compensation for carried traffic" to interconnect with network operators (the "sending party network pays principle")
- b) Quality of Service (QoS) delivery for sending parties willing to pay a premium
- c) Governments should allow these carriage fees to be negotiated between telecom operators and Internet services.

The proposal has been strongly opposed by Body of European Regulators of Electronic Communications (BEREC) and others, saying this is antagonistic to the decentralized efficient routing approach to data transmission of the internet, and isn't commercially nor technically realistic. In 2009, the EU announced the guidelines for telecom regulations regarding network neutrality.

11.12 Netherlands: Network operator KPN, in cooperation with the local affiliates of Vodafone and T-Mobile, tried to block or charge for Internet/OTT services. Dutch lawmakers reacted strongly passing a net neutrality law in 2011 prohibiting discriminatory practices, making the Netherlands the first European country to do so.

11.13 European Union: In April 2014, the European Union (EU) approved new rules: first, to ensure equal access of firms and individuals to online services such as video on demand, streaming audio and cloud computing; and second, to harmonize rules across national borders to create a unified European market. But no EU-wide ban on telecoms companies offering online services such as Facebook for free. The so-called "zero-rating", where operators offer unlimited access to certain online services - typically Facebook, music streaming or online television - is seen as good for competition and innovation as well as more choice for consumers, even though some perceive it as a breach of net-neutrality.

Consultation Questions

Question 8: In what manner can the proposals for a regulatory framework for OTTs in India draw from those of ETNO, referred to in para or the best practices? And, what practices should be proscribed by regulatory fiat? Please comment with justifications.

Regulatory Frameworks

12.1 For Internet services/Apps/OTTs: The starting point for a suitable regulatory framework is the need to define the basis for classification of OTT players either as Communications Service Providers (CSPs) or as Application Service Providers (ASPs):

12.1.1 Communications Service Provider(CSP): The classification of an Internet Service/App/OTT as a Communications Service Provider will enable them to have proper interconnection with other service providers and at the same time ensure quality of service to the end customer. All regulatory/ licensing requirements including lawful interception and security of the network will be ensured this way. These apps could position themselves along with the telecom operators in offering adequate quality of service to customers through various traffic management techniques like deep packet inspection, layered segmentation, and traffic differentiation. This will make them liable for payment of license fees and other applicable fees paid by the telecom operators. This therefore, needs careful deliberation.

12.1.2 Application Service Provider (ASP): The alternative is to categorise Internet Services/Apps/OTT communication service providers as ASPs. These are enhanced services, in the nature of noncore services, which either add value to the basic telecom services or can be provided as standalone application services through the telecom network. The TRAI had recommended that ASPs should be covered under licensing through authorisation. This will enable a proper regulatory framework to consider cases of revenue share, open access to application services and prioritised services being offered to customers. However, such an authorisation system should incorporate certain minimum public service utility add-on concerns like emergency access, Lawful interception etc.

12.2 For Telecom Operators: There are no legislations in place that define the dos and don'ts of how a telecom operator can treat the traffic in its network. Until the Government comes up with the rules on Net Neutrality, the Telecom Operators will be tempted to use practices resorted to in other jurisdictions. Public outcry and regulatory restraint will remain the main instruments to prevent blatant misuse of power. Except for regulatory action within the ambit of the law, any other regulatory measure can be called into question as legally non-sustainable.

12.2.1: Traffic management: Telecom operators can and do resort to differential treatment of Internet services on their network. Video streaming services impose large demands on the network in terms of traffic load, bandwidth requirements and congestion. The most popular strategies employed by Telecom Operators include fair usage policies, toll booting, zero-rating, data caps and traffic management. Should they be allowed to differentiate between Internet/App/OTT players based on the services they provide? Or, should restraints be imposed on what can and cannot be done?

12.2.2 Differential treatment is through:

i. Non-price based differential treatment: degrade the quality of service, delay interconnection requests, require customers to go through additional procedures to decrease the application's brand value, or even outright refuse to interconnect.

It may become necessary to **impose a transparency requirement on telecom operators**, mandating them to disclose peering and transiting arrangements and traffic management practices. Some traffic management practices such as those for avoiding network congestion or for security concerns cannot be strictly viewed as nondiscriminatory.

Telecom Operators can provide customised services to Application Service Providers via revenue sharing or payment:

- a toll-booth system where different services are priced differently
- "Zero-rating", where they can provide preferential access to certain defined sites, such as Reliance Communications' relationship with Facebook, and Airtel 'One Touch Internet'.

Telecom operators can do traffic management in other ways:

- **Congestion control**, when a source of traffic is slowing down the network due to packet loss
- **Prioritisation of certain data:** Time sensitive data like VoIP, or emergency services
- **Differential throttling:** this technique is for content that is bandwidth hungry and non-time-critical. This can also ensure differentiated delivery of various OTT services depending on various agreements with the App companies. Also, if the users exceed the data cap, the speeds are throttled.

- **Blocking:** End users may be prevented from viewing content or accessing a site. Blocking: End-users may be prevented from using or accessing a particular website or a type of content (e.g. the blocking of VoIP traffic on a mobile data network). Blocking may be implemented to:
 - o Inhibit competition, particularly if the access provider offers a service that competes with the service being blocked;
 - o Manage costs, particularly where the cost of carrying a particular service or type of service places a disproportionate burden on the access provider's network;
 - o Block undesirable content such as child abuse, viruses or spam. This may be necessary to comply with government or court orders, or done at the request of the end user.

ii. Price based discrimination: Pricing an Internet service too high can effectively lead to prohibition of the service; equally, pricing services too low may result in entry of inefficient apps into the market. The Telecommunication Tariff Order, 1999 (TTO 1999) laid down the conditions that will regulate telecom operator tariffs. Non-discrimination means that telecom operators shall not, in the matter of applications of tariffs, discriminate between subscribers of the same class and such classification of subscribers shall not be arbitrary. Pricing for access ought not to be used to create monopoly rent or create discriminatory networks. Some of the common ways of price discrimination are:

- Data caps: to monitor traffic and throttle data or charge extra volume once a predefined data cap is reached. This is currently being used in India.

- Access-tiering: A telecom operator may prioritise a specific application or content for a price to be paid by a customer. They can generate revenue to fund network investments this way. "This is similar to pricing in the railways where travellers on passenger trains and express trains are priced differentially."

Consumers (supported by Internet service companies/Apps) say that end-users pay for the data usage as per data tariffs, and hence there is no free ride. They say telecom operators don't incur any extra cost when a customer accesses an Internet service. Simply because telecom operators look at some of these Internet/OTT services as competing with their main offerings is not sufficient reason for forcing them to pay a higher tariff for consumption of these OTT services.

12.3 Viewing Internet companies as Bulk users of telecom services: This involves creating a pricing plan for Internet companies by telecom operators. It has to be ensured that telecom operators don't incentivise their own vertically integrated services, and the pricing mechanism reflects the mobile networks' costs of providing access and network services. Also, telecom operators cannot "double dip" – collect payments for the same traffic from both Internet companies and the consumer. Potentially, only a model based on usage-based pricing, in which there will be two-part tariff: a basic access fee and a usage charge indexed to user's data usage. Internet companies may charge users this access fee. This would ensure fair compensation to telecom operators, while ensuring competitive neutrality between platforms and providers, and thus suggests best practices for Internet regulation.

12.4 Pricing of Apps/Internet/OTT services:

12.4.1 Today most Apps are offered to customers at near "no cost" (or entirely free). Some companies like Whatsapp, Skype, Viber also have a subscription model where users are charged a certain amount every month for use of these apps. The astronomical valuation of some of these Internet/OTT players (like the Twitter's \$11 billion or Facebook's \$104 billion) is forcing these entities to look for alternative business models to generate more revenues, moving to a complete subscription model from the

current free model. This may be at the cost of customer's interest. The larger question is whether there should be any check and balance to ensure adequate consumer protection, and of what kind?

Consultation Questions

Question 13: Should Telecom Operators be allowed to implement non-price based discrimination of services? If so, under what circumstances are such practices acceptable? What restrictions, if any, need to be placed so that such measures are not abused? What measures should be adopted to ensure transparency to consumers? Please comment with justifications.

Question 14: Is there a justification for allowing differential pricing for data access and OTT communication services? If so, what changes need to be brought about in the present tariff and regulatory framework for telecommunication services in the country? Please comment with justifications.

Question 15: Should OTT communication service players be treated as Bulk User of Telecom Services (BuTS)? How should the framework be structured to prevent any discrimination and protect stakeholder interest? Please comment with justification.

Question 16: What framework should be adopted to encourage India specific OTT apps? Please comment with justifications.

Question 17: If the App based/OTT communication service players are to be licensed, should they be categorised as ASP or CSP? If so, what should be the framework? Please comment with justifications.

Question 18: Is there a need to regulate subscription charges for App based/OTT communication services? Please comment with justifications.

Question 19: What steps should be taken by the Government for regulation of non-communication App based/OTT players? Please comment with justifications.

Question 20: Are there any other issues that have a bearing on the subject discussed?

All the Questions

Question 1: Is it too early to establish a regulatory framework for Internet/OTT services, since internet penetration is still evolving, access speeds are generally low and there is limited coverage of high-speed broadband in the country? Or, should some beginning be made now with a regulatory framework that could be adapted to changes in the future? Please comment with justifications.

Question 2: Should the Internet/OTT players offering communication services (voice, messaging and video call services through applications (resident either in the country or outside) be brought under the licensing regime? Please comment with justifications.

Question 3: Is the growth of Internet/OTT impacting the traditional revenue stream of Telecom operators/Telecom operators? If so, is the increase in data revenues of the Telecom Operators sufficient to compensate for this impact? Please comment with reasons.

Question 4: Should the Internet/OTT players pay for use of the Telecom Operators network over and above data charges paid by consumers? If yes, what pricing options can be adopted? Could such options include prices based on bandwidth consumption? Can prices be used as a means of product/service differentiation? Please comment with justifications.

Question 5: Do you agree that imbalances exist in the regulatory environment in the operation of Internet/OTT players? If so, what should be the framework to address these issues? How can the prevailing laws and regulations be applied to Internet/OTT players (who operate in the virtual world) and compliance enforced? What could be the impact on the economy? Please comment with justifications.

Question 6: How should the security concerns be addressed with regard to Internet/OTT players providing communication services? What security conditions such as maintaining data records, logs etc. need to be mandated for such Internet/OTT players? And, how can compliance with these conditions be ensured if the applications of such Internet/OTT players reside outside the country? Please comment with justifications.

Question 7: How should the Internet/OTT players offering app services ensure security, safety and privacy of the consumer? How should they ensure protection of consumer interest? Please comment with justifications

Question 8: In what manner can the proposals for a regulatory framework for OTTs in India draw from those of ETNO, referred to in para or the best practices? And, what practices should be proscribed by regulatory fiat? Please comment with justifications.

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