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NET NEUTRALITY AND IMPACT OF REGULATION ON OVER THE TOP (OTT) SERVICES AND STUDY OF RESPONSES OF PUBLIC AND TELECOM SERVICE PROVIDER

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Abstract:

The telecommunication industry is evolving at a very fast pace and now a days over the top (OTT) services has captured the market. Many telecom service provider (TSPs) are facing the challenges with the growing customer demands. Customer having smart devices which consumes a lot of bandwidth. In order to meet the demand of customers TSPs are spending heavily to increase the network capabilities. Network quality is a differentiator factor for most of the TSPs. The emergence of OTT has resulted in price and product erosion impacting the revenue system of TSPs. Net neutrality is creating a neutral internet. TSPs are working under stringent rules and regulation and as OTT are competing with the basic Tele services provided by TSPS so there is a need to regulate OTT services, to provide level playing field. There must be a seamless integration between TSPs and OTT players so as to take the internet revolution to a newer height. To provide framework for Over the Top (OTT) service Telecom Regulatory Authority of India (TRAI) has taken initiative as Regulatory framework act more as a catalyst than a barrier. With the increase in the data penetration rate and OTT adoption this is a right time to put in place an appropriate regulatory framework. We have conducted a qualitative analysis of the different operators and the quantitative analysis of the public responses to study many aspect of regulating OTT services and revenue sharing.

Keywords:*OTT Services, Net neutrality, Regulatory framework for OTT*

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1. Introduction:

In the present day internet has become one of the most powerful medium for communication act as an engine which can drive economy, politics, people and business. Internet defines itself over a period and develop its way from normal information/infrastructure sharing (1960) to 19 Trillion Dollar[1] Internet of thing industry which is approx. 9 times of India GDP. Internet can be used in multiple domain like Banking, IT, education, social networking, News, research, multimedia services, Business transaction and many more.

Majority of the revenue is earn by Over the top (OTT)which is refers to applicationand services which are accessible over the internet and ride on operators' networks offering internet access services [2]e.g. social networks(Facebook, Twitter, WhatsAap), search engines (Google, Yahoo), video aggregation(YouTube, Netflix) e-commerce(Flipkart, Amazon), Cab aggregator(Uber,OLA), Online video games etc. These OTT players have large number of market share and mobile traffic only YouTube can account for 24 percent of global mobile traffic where Facebook chat consume 22 percent of all instant message-related mobile bandwidth having the net worth of $200 billion dollar and 128 times its profit margin, WhatsApp carries 5 percent of global message traffic which is now acquire by Facebook in 19 billion[3]. Majority of them are listed in their national stock exchange.

These all OTT players send their packet of data over telecom service provider (TSP) infrastructure and generate high amount revenue and profit margin as and due to it traffic over Telecom service provider (TSPs) network increases which create an demand of high speed internet and lead to huge infrastructure and network investment in up-gradation of tradition TSPs network. On the other hand TSPs Has to pay a very huge for buying the spectrum and licenses from the government whereas same is not the case with OTT.As all these OTT providers relay on global internet infra.

Telecom Service Provider (TSP) network act as a platform for Over the Top (OTT) players for business development. Growing Disruptive OTT services (Similar services like online calling, messaging) utilised TSPs infrastructure and compete with similar TSPs own services. Obviously with growth of OTT application data usage increases and increase revenue to TSPs

Now a days over the top (OTT) services has captured the market and this has evolved to establish some regulation and frame work for the level playing in the field which provides same set of services. To provide framework for Over the Top (OTT) service Telecom Regulatory Authority of India (TRAI) hastaken initiative as Regulatory framework act more as a catalyst than a barrier. With the increase in the data penetration rate and OTT adoption this is a right time to put in place an appropriate regulatory framework. All the operators feel that regulatory framework must be adopted for providing a level playing field.

1.1. A Brief History:

27 March 2015: On 27 march 2015 Telecom Regulatory Authority of India(TRAI) has published 118 pages consultation paper on "Regulatory Framework for Over the top (OTT) services" contain basic definition, concept of over the top services, framework and 19 consultation question which contain fine mix of regulatory framework, Telecom infrastructure, Security concern, need of regulation, licensing regime, revenue model and customer point of view that could be answered before 23 April 2015.

28 April 2015:TRAI has received over 10 lakh responses to its paper and on 28 April 2015 TRAI, has now made all the responses to its paper available for the public which includes comment by service provider, associations and stake holder. All of them written their finding and responses to that 19 consultation quotations based on their need and perception.

May 2015: A Committee on **Net Neutrality** has submitted its report to the Department of Telecom(DOT) termed as "NET NEUTRALITY DOT Committee report" through MyGov.in .Its recommendations broadly contain technical, regulatory and public policy related measures required

with respect to Net Neutrality issue. Where first time the term Net Neutrality coined in India through DOT.Department of Telecom (DOT) also invite valuable comments and suggestions on the report and recommendations

20 Aug 2015: Over 73326 comment received from public on myGov.in where majority of them in favour of net neutrality.

1.2. About Net Neutrality:

There has not been the prescribed definition of net neutrality in our Indian telecom regime, but as far as our understanding it is defined as:**"Net neutrality is basically defined as" equal treatment of all the data packets that moves across the IP network .There must be no any discrimination on the basis of content, application or the service."**

1.3. **Definition of Net Neutrality**:

1.3.1. As per Department of Telecom(DOT):

"Network neutrality is best defined as a network design principle. The idea is that a maximally useful public information network aspires to treat all content, sites and platforms equally. This allows the network to carry every form of information and support every kind of application"[4]

1.3.2. As per Federal Communication Commission (FCC):

"No Blocking
No Throttling
No Paid Prioritization" [5]

1.3.3. As per Indian stream research journal:

"It is the principle that all internet traffic should be treated equally. It means that internet service Providers should treat all data on the internet equally, not discriminating or charging differently by user, content, site, platform, application, and type of attached equipment or mode of communication so they should allow access to all content and applications regardless of the source and no websites or pages should be blocked, as long as they aren't illegal."[6]

1.3.4. As per net neutrality and consumer access to content:

"Net neutrality has no widely accepted precise definition, but usually means that broadband service providers charge consumers only once for Internet access, don't favour one content provider over another, and don't charge content providers for sending Information over broadband lines to end users".[7]

2. Business Model Of OTT Players:

Over the Top(OTT) services have large number of market share of mobile internet itself Youtube consume 24% of global mobile traffic and Facebook 22%. Approx. 1% of mobile users actually consume 50% of operators' bandwidth[8] but generate large amount of revenue as Facebook itself $200billion.
Business model of OTT player depends upon there user as it can be used for Messaging Services, Social Networking, Voip calls, Online gaming, Ecommerce, education, Research and many more. Basically Generate revenue from:

2.1. Internet calling:

Internet calling deal with Voice over Internet Protocol (VoIP) call especially in case of international calls.Includes voice or video call over a network.It'sfree of cost in case of PC to PC but organization can earn money by showing advertisement and it is done for retaining the customers. But in case of

interconnection i.e. PC to PSTN or mobile network an OTT player can charge money and making margin based on interconnection rates. In such case OTT can charge money. Even OTT players can charge money for subscription fee in such case

2.2. Subscription:

Many of the OTT player charger subscription Fee from their customer based on the service provided by them this can help them to retaining the customer and provide services. Subscription charges based upon service offered and duration of it. For example WhatsApp charges $1 per year after the end of first year.

2.3. Advertisement:

Over the Top (OTT) players offering advertising in conjunction with their communication services like messaging , social networking , internet calling ,etc. on and off throughout the years. It generate maximum amount of profit by OTT services as it it's the most innovative way to target the customer. It can be done in many ways like Digital marketing includes content marking, Social media marketing, and mobile marketing.
It based upon many factor:
Click Through Rate = Clicks / Impressions %
Cost per Acquisition (CPA) =It is the cost the advertiser pays only when a desired action is achieved.
Cost per Click (CPC) =It refers to the amount the advertiser pays when his Ad is clicked on, giving him a visitor to his website
Cost per Mille (CPM) =It is the amount paid for every 1000 impressions of an advertisement.

2.4. Big Data:

The revenue generation by many of OTT player by analysing Big data of the customer to targeted for marketing. As our activity reflect our interests, likes, dislikes and majorly depicts our preferences. This information is invaluable to big firms where relevant tailor made products can be offered after data sorting.
For Example: You might notice if you have search Ball pen over Flipkart then you have start receiving advertisement on email, Google search, social networking and other Ecommerce site because it has been analysis that you are going to buy a ball pen so company trying to sell you that and OTT player can charge commission from Seller.
Big data also include revenue from bidding keyword which deal with search engine optimization. Bidding keyword are words or a group of words that most people search for. As we begin typing something in Google's search box, you'd see that there are a few suggestions that appear in form of keyword. This keyword can be sold to seller in form of search engine optimization and seller or advertiser pay for it.

2.5. Service Aggregator:

Many of the Over the Top (OTT) player act as service aggregator like Ecommerce (eg. Amazon, FlipKart, Snapdeal), Cab Aggregator (eg.Uber, Ola, Taxi for Sure), Travel Aggregator (eg. Yatra.com, Redbus, paytm) work on Commission Travel agency and also from advertisement.

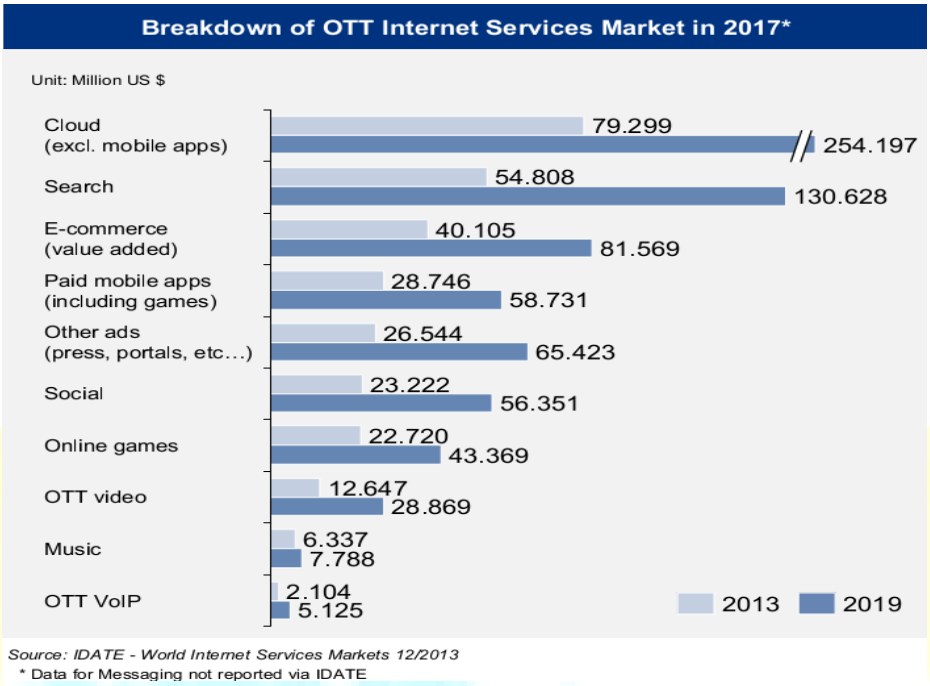
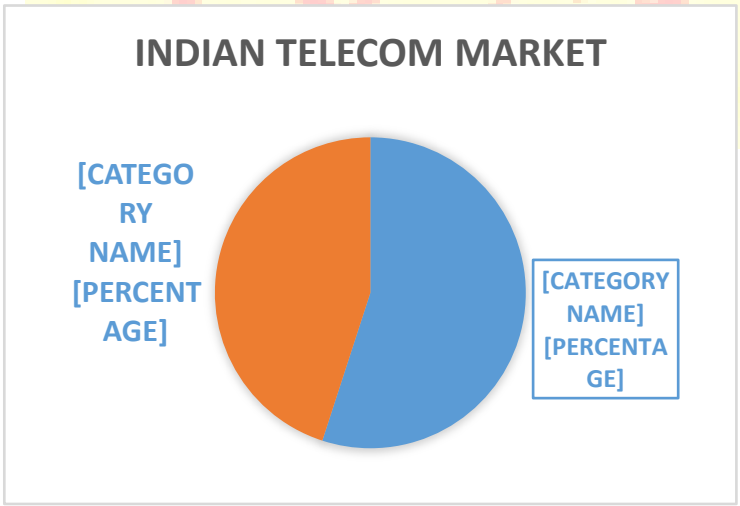


Figure 1.Breakdown of OTT Internet Services Market in 2017[9]

As shown in Market research majority of the service market captured by cloud services include database management, mobile Apps predicted to be around $254 million in 2019 then then to search engine to $130 million US dollar then then to Ecommerce company to $81 US million. These OTT services capture largest market share

3. Business and Revenue model of Telecom Service Provide (TSPs):

Technology is one of the major aspect for growth of the telecom industry .The telecom service operators are doing well in their fields from the past few years as more and more people are becoming user friendly with the latest technologies as on 30 Jun 2015 there are 980.81 million Wireless subscriber with monthly growth rate of 0.51% and overall Teledensity 77.90 as per TRAI [10]. Also the aim of the Indian government to provide broadband connectivity to all the citizens by 2020. The analytics used by TSPs that identifies the customer willingness to purchase their service and thus obtain a higher share of the customer's wallet.



Indian Telecom Market:

Indian Telecom market for FY 2014-2015 in Rs. 464.721 Cr With growth of 10.2% [11].

Indian Telecom market includes:

1) Telecom Infra Market
2) Telecom Service Market

Figure2. Indian Telecom Market[11]

3.1. Telecom Infra Market:

This Segment cover all the equipment, devices and solution through which services, enable, controlled and finally used.

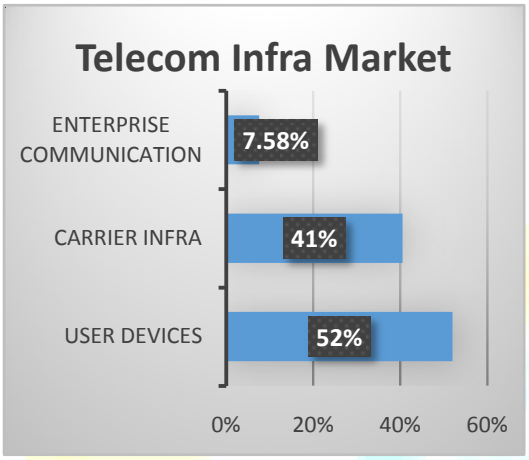


Figure3.Telecom Infra Market[11]

Table 1.Telecom Infra Market[11]

Telecom Equipment Segment	FY 2014-2015 (Revenue in Rs. crores)	FY 2013-2014 (Revenue in Rs. crores)	FY 2014-2015 (YoY % Growth)
Carrier Infra	85,410	79,597	7%
Enterprise Communication	15,956	15,079	6%
User Devices	109,410	93,675	17%
Total Telecom Infra Market	210,806	187,803	12%

Telecom infra market having revenue of Rs.210,86 Cr with growth of 12% which includes:

1.1) Carrier Infra: Carrier Network, passive infra, power solution, Managed services, OSS/BSS, Software, solution and consulting (SCC), Test and measurement

1.2) Enterprise Communication: Enterprise network, Communication Equipment and devices(Desk phone, PBX System, Audio video Conferencing), Software & Application(Enterprise security, conferencing and collaboration)

1.3) User Devices: Mobile phone, Tablet, Data card

3.2. Telecom Services Market:

This segment include all kind of services that are used by individuals as well the enterprises.

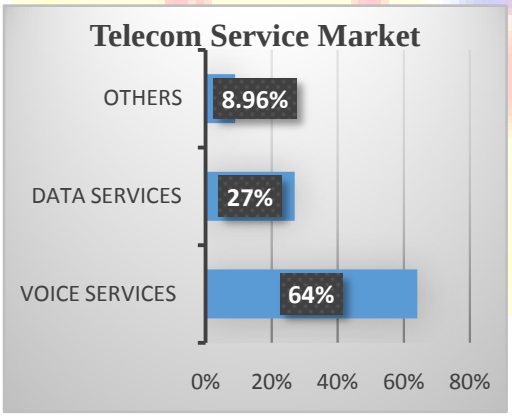


Figure4.Telecom Infra Market[11]

Table 2.Telecom Service Market[11]

Telecom Equipment Segment	FY 2014-2015 (Revenue in Rs. crores)	FY 2013-2014 (Revenue in Rs. crores)	FY 2014-2015 (YoY % Growth)
Voice Services	162,666	153,730	5.8%
Data Services	68,498	57,914	18.3%
Others Services	22,752	22,149	2.72%
Total service Market	253,915	233,793	8.60%

Telecom Service %Share by service type in overall telecom services market of Rs. 253,915 Cr.
In Telecom service market which consist of 23% of Enterprise Services and 77% of consumer services it is observed that fixed services continue to exhibit negative growth due to decline of fixed line subscriber. Although fixed data has shown positive increase.

Globally overall revenues in the telecom/ICT sector is rising because of growth in users, traffic and applications. Even though there may be a loss of up to 6.9 per cent in cumulative voice revenues

(representing $479 billion) because of OTT services, the total revenue for TSPs is likely to grow to $2.4 trillion in 2019 from $2.1 trillion in 2014 [2]

Earlier the revenue model of the operators, depend on subscriptions and metered services, majorly voice and messaging but now with the growing OTT communication services which uses TSPs' existing infrastructure and provide very similar services. But with increase in OTT application which demand very high data usage and these data can be charged by TSPs and generate revenue. In such case OTT players like Google and Facebook also find a way generate revenue with the data usage as they have planning to provide its own network infrastructure so that they cannot be dependent on TSPs infra and can charge customer for data usage and diversify their business. Initially they have started their services for free or at very lower rate than traditional TSPs for primarily advertising purposes.

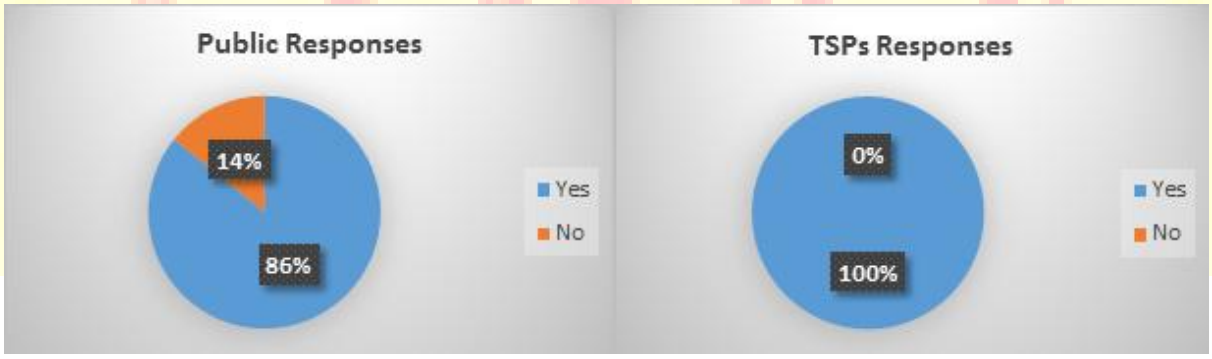
4. Analysis Of Public And Telecom Service Provider Review:

We have conducted the survey at various technological and management institution who have a great knowledge on Telecom and Information technology. Sample size of pulblic survey is 108 all are belog to age group of 20 to 26 Years, Post Graduate student and Industry expert having wide area of experence in Telecom and ICT industry. They given their neutral responses and thus we have analysis the responses about their views on the question that were published in the consultation paper of TRAI.

Secondly in case of TSPs we have conducted the qualitative survey on the 17 operators and analyse the responses who have given their responses about those similar questions.

Thirdly, we have shortlisted the top 5 companies on the basis of their market share , customer data base , customer satisfaction and retention level and have also analysis their responses. And at last we do the comparative the analysis of each question based on the public and TSPs responses pie chart.

4.1. Favour of Net Neutrality:



COMPANY	RESPONSE ANALYSIS
AIRTEL[12]	There must be a level playing field as both the players are providing the same services and therefore they must obey the same set of rules, hence Airtel fully support the concept of Net Neutrality.
RELIANCE JIO [13]	RJIL strongly supports Net Neutrality, in order to make sure that an

	increasingly essential need of people, internet, is made available to all without any discrimination or distortion.
BSNL[14]	India has entered into a competitive market scenario and thus it becomes difficult for an organization to set their own prices, hence Net Neutrality must be adopted.
IDEA[15]	Yes, Idea supports Net Neutrality. All the consumer should be **free to choose** and have access to all possible solutions, and make internet affordable such as Toll Free/Sponsored Data Plans etc.
VODAFONE[16]	The service provider should not distinguish between the data and voice packet and must not set the priority whether voice is sensitive to delay or data. Thus Vodafone believes to offer all the choices to the customers without any discrimination of any services.

Figure5.Are you in favour of net neutrality?

Table 3.TSPs Responses

ANALYSIS: Competition in the age of ecosystem is shaped by the interaction of a diverse number of players. Net Neutrality means all the data that move across the IP network must be treated equallyandthereshould be no any discrimination irrespective of the services offered. All the sites must be equally accessible, with same access speed and the same data cost to access each site[17]. Internet must remain a dumb pipe that transmit bits from user to user treating all the bits equally [18].There are numerous definition of net neutrality and varies from person to person, organization to organization. Almost all the general public (86%) wants net neutrality also all the Tsps.' are in favour of net neutrality.

4.2. Establishing a framework for OTT services:

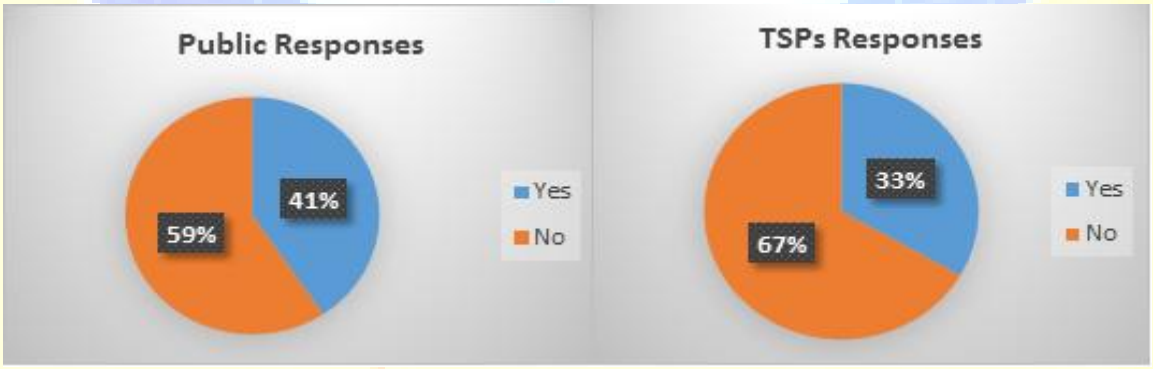


Figure6. Is it too early to establish a framework for OTT services?

Table 4.TSPs Responses

Company	Responses Analysis
AIRTEL[12]	There is a need to establish a framework for OTT players because it will have a direct impact on network investments. And in order to achieve the vision of "Broadband for All" it is necessary to establish a framework for OTT services.
RELIANCE JIO [13]	In India the broadband penetration is increasing at a fast pace. OTT landscape is still taking shape to ensure greater good to the common public, so this is the right time to establish an appropriate regulatory framework.
BSNL[14]	OTT services are directly competing with the basic tele services (Voice, SMS and Video Call) being offered by Tsps. Thus this is the right time that a

	regulatory mechanism for the OTT services must be established.
IDEA[15]	The OTT services are dominating the market at a massive scale, leading to a significant disruption in the existing revenue model of Tsps. Thus in order to meet the national objectives of bringing affordable and ubiquitous broadband and telephony access across the nation framework must be established.
VODAFONE[16]	In order to succeed the digital India program of the government it is necessary to find a solution and to establish a fair regulatory mechanism especially for VOIP telephony services, and if would left unaddressed it could directly hamper the entire Digital India program.

ANALYSIS: Over thepast few years communication industry has evolved at a very past pace.Worldwide popularity of OTT content and service has been steadily increased. Connectivity, usage, access and services offered to customers are increasing at a rapid rate so to avoid high level of uncertainty, different planning method must be adopted. As it is a disruptive model (free, freemium , ad based)we believe that before the OTT adoption inIndia explodes, it is a right time to address various new issues to implement the framework to address national and consumer security. Also 67% of the TSPs and 59% general public agreed that there must be a framework for OTT services. It may not be necessarily through licensing but through registration or authorization requirement with a nominal entry fee and minimal license fee. [19]

4.3. Licensing OTT players Offering Communication through Application:

uld the OTT players offering communication through application be brought under the licensing regime?

Table 5.TSPs Responses

Company	Responses Analysis
AIRTEL[12]	TSPs has to buy spectrum worth thousands of crores ,pays Licence Fee, and other Central/State Taxes and thus contribute to national development .As both the players are offering the same set of services so OTT must also be brought under the licensing regime.
RELIANCE JIO [13]	In order to address national security concerns and consumer's security, safety and privacy, we support an appropriate licensing scheme for OTT communication services.
BSNL[14]	Indian telecom market is one of the most competitive market in the world, on the other hand the tariffs rates are extremely cheap also tsps. Are subjected to a stringent set of rules and regulations, licensing and other fees .Hence OTT players must be brought under the licensing regime.
IDEA[15]	If the OTT players will not bring under the licensing regime then it will

	pose a huge social andeconomic risks and have adverse effect on the development of the nation. Also it is an unfair means of completion and have an unlevelled playing field.
VODAFONE[16]	The OTT communication players must be brought under licensing regime for the national development and security and also to encourage motivation and competition.

ANALYSIS: In orderto protect the profitability of business model of both the players there must be a transparent system. 100% TSPs are in favour of bringing OTT players under the licensing regime. OTT have great flexibility in business model. OTTs must not see TSPs' as their competitor but rather as their complement to their business[20]. Service providers are already prepared as the OTT services increases, vast majority have already upgraded their network to accommodate increased band with form OTT players. As both the players offers same set of services licensing is required for consumer protection, legal interception and taxation[21].

4.4. Growth of OTT Impacting the Traditional Revenue Stream of TSP:

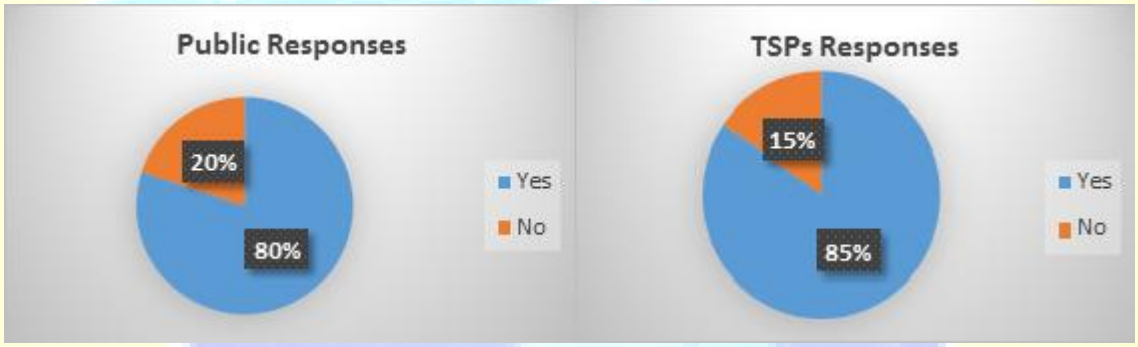
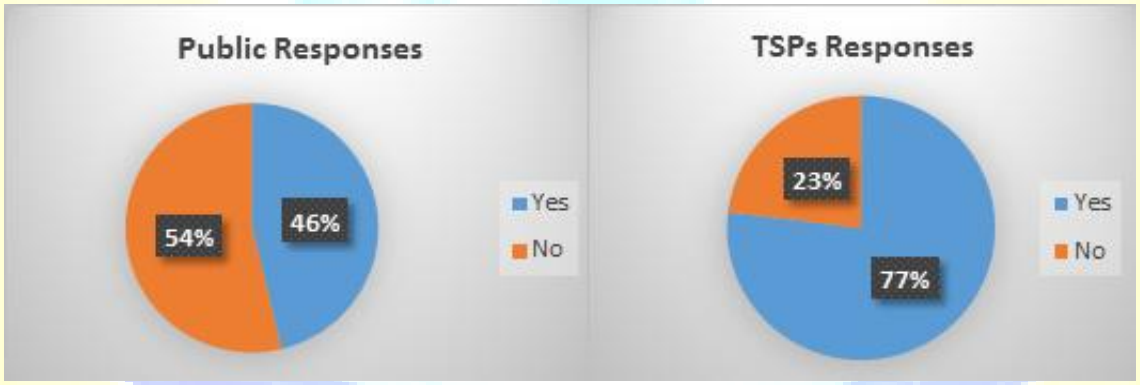


Figure 8.Is the growth of OTT impacting the traditional revenue stream of TSP?

Table 6.TSPs Responses

Company	Responses Analysis
AIRTEL[12]	Yes, because if the data prices increases or if there is a slowdown in investment, either of them will set back the vision of Digital India.
RELIANCE JIO[13]	Revenue of TSPs from SMS has decreased as the OTT players have fully captured the market. Also there is a continuous increase in demand for data services and thus affecting the TSP traditional revenue stream. Although subscription from data services has increased correspondingly for tsps. but it is not sufficient to meet all the challenges
BSNL[14]	Growth of OTT services has impacted the traditional revenue model of Tsps. The SMS and voice calls have severely impacted which is one of the main source of revenue for TSPS.
IDEA[15]	If all voice would convert to data, then significant new investments will have to be made in new data networks, but the existing networks built mainly for voice systems by spending huge amount of money and thus this money would be wasted to a large extent and thus impact the revenue model.
VODAFONE[16]	Messaging revenues have declined nearly from10% to 3%. Although there has been an increase in the data revenues of the TSPs, but this increase is not sufficient to compensate the decline in the traditional revenue streams.

ANALYSIS: Despite globally increasing dependence on communication, there is a steep decline in telecom business it may be due to following two reasons: 1.Users expect quality of service and reliability from service and in turn does not want to pay more .2.Also Tsps.' not able to cater thousands of users needs in one box which makes them less and less competitive with new business model of communication that have more choice and flexibility. Also OTT does not bear the burden of providing mobile internet services[22]. TSPs connectivity complements OTT business, means the product that is consumed together with another product. Affordable broadband and data services which means more and more number of smartphones and software's will be sold, people will use more e-commerce site and more apps will be developed and installed[23]. Also high quality content and traffic push a heavy load on Tsps.' existing infrastructure and thus forces Tsps.' to upgrade their network which requires huge investment to support Quality of service for OTT players (MTS, 2015). Moreover 85% of the TSPs and 80% of the general public has gave their consent about the impact OTT will pose on traditional revenue model of Tsps.'



4.5. Need of OTT Players to Pay for Use of the TSPs Network for Over and Above Data Charges Paid by Consumers:

Figure 9. Should OTT players pay for use of the TSPs network for over and above data charges paid by consumers?

Table 7.TSPs Responses

Company	Responses Analysis
AIRTEL[12]	TSPs spend a substantial proportion of their revenue on infrastructure development such as spectrum bidding, maintenance of towers, rolling fibre optic, etc. As both the players provides same services, OTT communication service providers also need to have the same responsibility.
RELIANCE JIO [13]	Yes, It cost a large amount of money to build the network and OTT players sell their wares using these telecom networks without any direct payment to the TSPs.
BSNL[14]	Yes they must pay as they are directly competing with the basic tele services of Tsps.
IDEA[15]	The cost of Internet service provider to reach the servers of OTT players is being carried by the TSP. Those OTT players which provides communication services must pay to the TSPs for creating the value.
VODAFONE[16]	In the present scenario internet emerges as a two sided market that involves the consumer and the content /app provider. TSP provides the platform for bringing these two sides of market together. As far as payment is consider it can come from either side of the market and a two-side payment approach is a win-win solution – for a content/app provider also it will ensure a quality experience for its end user.

ANALYSIS: OTT business model is developing at a fast pace and has change the traditional revenue split.77% TSPs provider wants OTT players to pay at least the nominal usage charges and thus contribute them to take both the business at a greater height. However 54% of the general public are in favour that OTT will pay TSPs as they are more concerned about the end to end delivery mechanism rather than understanding the backend operation system. Availability of APP is a primary consideration, now a days people are demanding for more and more data with good speed and connectivity[24]. So the TSPs' continues to invest in building wireless capacity and for this TSP incurs a huge expenditure which is necessary to provide value to the customers. OTT players putting increasing pressure on traditional TSPs profit centre to upgrade existing infrastructure [25].In order to compete in the present competitive scenario telecom service provider has to deliver a perfect voice quality with universal coverage and with minimum level of dropped calls, voice and also ensuring high speed data connectivity. OTT communication and service provider uses the TSPs' pipe to deliver their own services and TSPs need to maintain the quality[26]. So as to speed up the growth of business of both the players, OTT must pay to TSPs and thus deliver quality of service and customer satisfaction.

4.6. Imbalane Exists in the Regulatory Environment in the Operation of OTT Players:

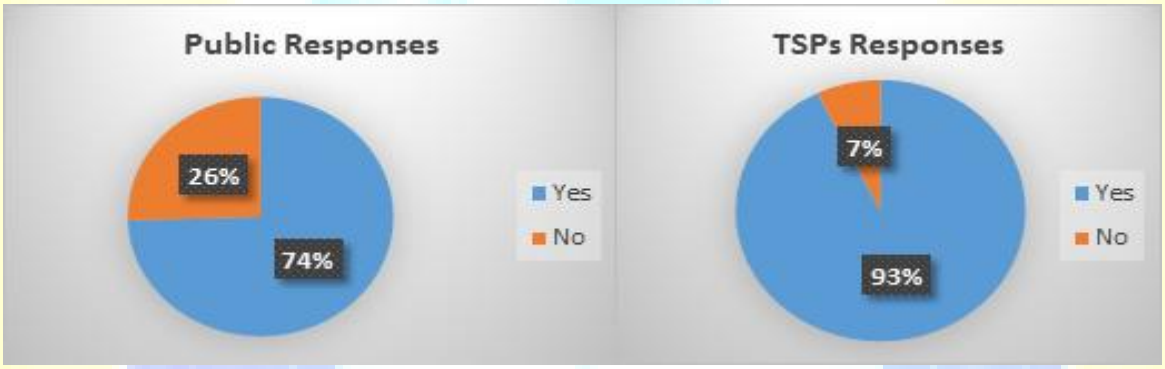


Figure 10.Do you agree that imbalane exists in the regulatory environment in the operation of OTT players ?

Table 7.TSPs Responses

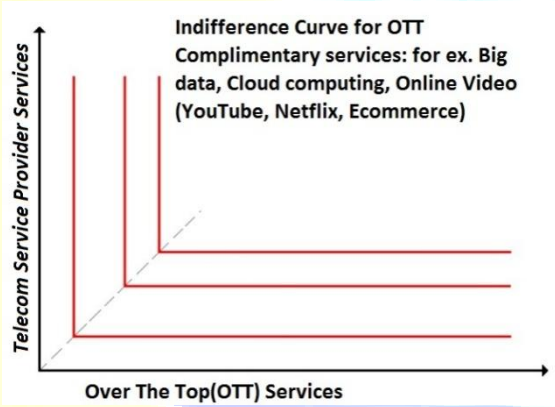
Company	Responses Analysis
AIRTEL[12]	Yes, OTT services are giving direct competition to the TSP services. TSPs in their capacity as data/internet providers are providers of bearer services only. Despite being the nature of services remain same there is a difference between the frameworks for both the services.
RELIANCE JIO [13]	Yes, the national security is one of the, major aspect and thus it is necessary for these OTT players to maintain servers in India and thus help each other to grow.
BSNL[14]	OTT is competing with the basic tele services of TSPs, TSPs invests a huge amount in the up gradation of their network and are also subjected to stringent laws, while OTT doesn't and thus create an imbalance which will affect the Digital India program of Government of India.
IDEA[15]	Firstly OTT services encourages entrepreneurship, on the other hand it violates the existing laws , like national security ,privacy etc. need to be strictly within the domain of Regulatory framework .also it will help in the development of the nation .
VODAFONE[16]	Yes, the growth of the OTT services has exponentially risen due to the increasing number of mobile telephone services, and the proliferation of smartphones. So to support a Digital India for the future a proper regulatory framework is required.

ANALYSIS: 93% telecom service provider agreed that imbalance exists in the environment. In the present scenario in the present competitive scenario Telecom service provider business **environment has changed from reliability and scalability of network to choices and flexibility of services.** OTT communication services should also be subjected to the same security requirements as the

traditional Tsps.' has to adhere to, as the services offered by both of them are similar in nature[27]. So to create a balance in the environment both players must work hand in hand and must adhere to same set of rules and regulation and thus it will help to connect a billion potential broadband netizens Fairly 74% of the general public assures that there exists a imbalance as their data is more secured by using TSPs services while there is always a concern of security of data by using OTT services as most of the servers are installed outside the country and it poses a serious threat of loss of important information.

5. Conclusion:

The growth of over the top (OTT) services and content has increase constantly with Services like Social networking. The success of the company like YouTube, Facebook, WhatsApp, Amazon and many more create new area of innovation and contribute major part in value chain. These over the top services (OTT) impact traditional model of Telecom Service provide (TSP) based on their impact over TSP it can be classified into Complimentary services and Substitute services.



In case of complimentary services like Big Data, advertisement, Cloud computing, online video games where the demand of Data increases with increase in OTT services. Growth of these OTT services increase the actual data consumption and as the data consumption increases Telecom Service Provider can Charge for the data from the customer. This complimentary will not impact directly as both have different revenue model independent to each other but these services directly dependent over TSPs infra and Consume large amount of bandwidth which required large amount of infra investment by TSPs.Revenue of both TSPs and OTT players are interdependent on each other but not in same proportion

Figure 11.Indifference Curve for OTT Complimentry services

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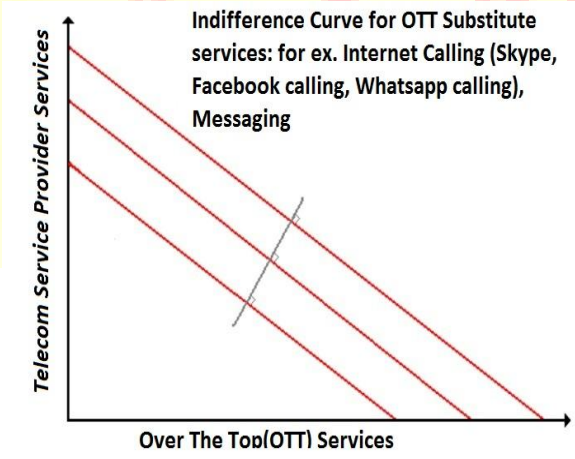
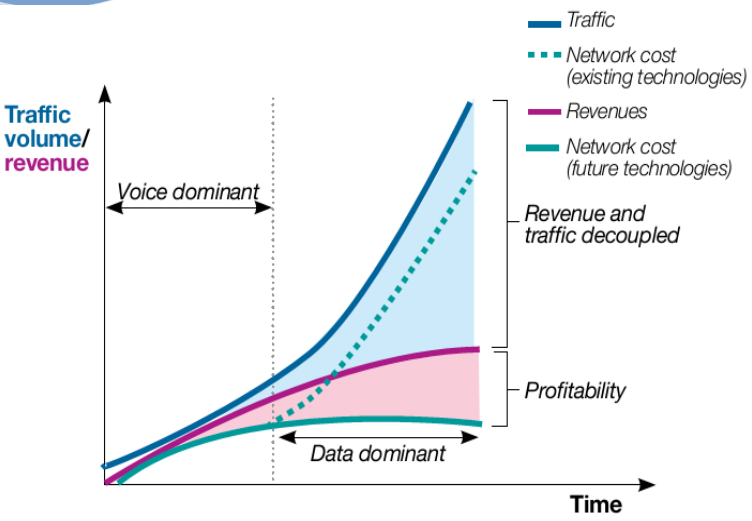


In case of OTT substitute services for ex. Internet calling(Skype, Facebook calling, Voip, WhatsApp), Messaging or other substitute services which have similar revenue model as Traditional TSPs have will directly Impact TSPs by using TSPs infra itself . For Example A person can make message using WhatsApp, Hike or other social messengers which charge just 10-15Kb generate revenue of few paisa which was substitute of SMS services which charges 1 Rupee.

Higher in Indifference curve is always better as it increases satisfaction and reduce difference between predicted and actual revenue generation

Figure 12.Indifference Curve for OTT Suplimentry services

. So that OTT players start increasing pressure on traditional TSPs profitcentres and it's tempting to consider them as direct competitors. They do not compete for profits and revenue, but theycompeteforcontrol over value chain. But the competition is not symmetrical between them,

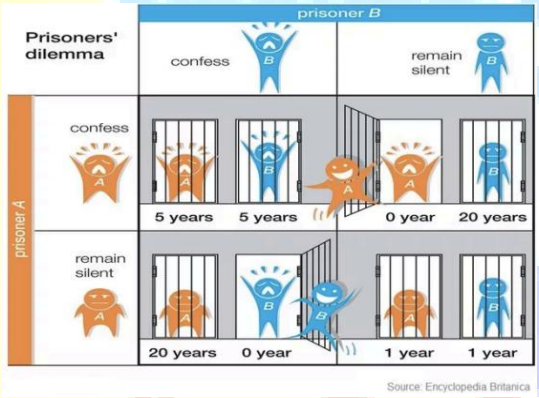


Source: Nokia-Siemens; IBM Institute for Business Value analysis.

AsunlikeTSPs, OTT players do not bear the burden of providing mobile Internet service. TSPs complements OTT business. TSPs are more concerned about managing increased bandwidth. Many TSPs have begun implementing fair usage policies and bandwidth caps but now beginrealize the importance of offering extra value through new services or subscription options.

As Shown Traffic over the internet were constantly increasing (Voice dominate) over a period of time but in case of data dominate Data traffic increases exponentially which required high network or infra investment cost incurred by TSPs so profitability or revenue reduced constantly. As Significant network investment are required to meet future demand.[28]

The needed investment cannot be recovered yet by data revenue and traditional voice revenue continue to shrink in current market.



Prisoners' Dilemma	TSPs (COMPLETE)		TSPs (SHARE)	
OTT (COMPLETE)	**OTT (Small Win)**	**TSP (Small win)**	**OTT (Win all)**	**TSP (Losses all)**
OTT (SHARE)	**OTT (Losses all)**	**TSP (Wins all)**	**OTT (Shared Win)**	**TSP (Shared Win)**

TSPs-OTT Prisoner's Dilemma:

Figure 13.Prisoner's Dilemma

Both TSPs and OTT players had created there revenue model based on their profit without considering other factor which bring regulatory imbalance as shown by Prisoner's Dilemma both revenue and business model and interdependent to each and both are making their profit with considering that his competitor behaviour but the only way to survive in the market to share their revenue and create sustainable environment. As TSPs have to invest in spectrum allocation, Licensing, Space relates issue, Bank guarantees, QOS, Infra Sharing and other Issue which cannot be applicable to OTT services.

As per the survey and analysis done on Public and TSPs, 59% of public and 67% of TSPs had responded that it's the right time to establish regulatory framework over OTT services but 55% of Public had responded that OTT should not be bring under licencing regime so OTT service should be regulated but not bring under licencing regime because it impacting Traditional revenue model. Regulation of OTT services will provide mutual growth of all services and all sector.

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