



**COMMONWEALTH TELECOMMUNICATIONS ORGANISATION**

**UNDERSTANDING THE DYNAMICS  
OF Over-The-Top (OTT) SERVICES**

CTO Research Study

**OCTOBER 2016**

## Summary

Following a mandate issued by Commonwealth ICT Ministers at the Commonwealth ICT Ministers Forum in London in June 2016, The Commonwealth Telecommunications Organisation (CTO) is conducting a research study to understand the market dynamics and policy and regulatory issues of Over-The-Top (OTT) services, both in the context of their impact on traditional business models and of opportunities for innovation and stimulating economic growth.

The main objective of this study is to develop, based on consultations with relevant stakeholders in a sample of representative jurisdictions, a better understanding of the dynamics of OTT by all stakeholders including service providers, policy makers, regulators and operators on OTTs. It is expected that the output of the study will enable future deployment of OTT services to be conducted in a manner that addresses the concerns of all stakeholders including consumers.

This paper is a precursor to a questionnaire-based study that the CTO intends to conduct across the commonwealth and beyond. It aims to solicit from a selected sample of stakeholders, the key questions that should be addressed by the questionnaire-based study in order to understand better how OTT services can equitably be deployed in various jurisdictions.

This paper recognises that the emergence of OTT services and the potential impact of limited or lack of relevant policy and regulatory frameworks is a challenge for traditional telecom operators. And already some jurisdictions are taking steps to regulate parts of OTT services.

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## 1. Introduction

Over the last decade, the communications industry has seen massive changes in terms of customer growth, infrastructure deployment and especially the growth of mobile broadband. The increasing use of smartphones and strong growth of mobile broadband have caused significant changes in the way users communicate and conduct their daily lives. It is estimated that at the end of 2015 more than 2 billion connected smartphones were in use globally and this figure is set to more than treble by 2020.

The increased number of smartphone users downloading and using Over-The-Top (OTT) communications applications (such as WhatsApp, Skype etc) has exacerbated this exponential increase. While there is no single, generally agreed definition for over-the-top (OTT) services, for this study, we regard over-the-top (OTT) services as online services which can potentially substitute traditional telecommunications services such as voice telephony and SMS. For the purpose of this study, we regard OTT services as a subset of general online services.

According to a recent study, it is estimated that among the top OTT messaging applications, WhatsApp is the leading with 700 million users, followed by Skype which has 300 million active users and third is Viber which has 209 million users<sup>1</sup>. The increase use of OTT messaging applications combined with the growing use of VoIP over mobile and the steady increase in consumer video calling services, has had a big impact on many telecommunications operators communications revenues. This has led to declining SMS and Voice revenues for many operators. Many operators are experiencing a decline in mobile voice revenues despite the fact that they have had an increase in new mobile connections.

OTT players are not just enabling users to access their services at much lower cost and encouraging more users to opt for IP-based free or low cost services, they are increasingly introducing more innovative services in the communications market and as a result creating increasing loyal user base. With the increased use of mobile smartphones for payment to gaming, these OTT players are evolving beyond traditional messaging and voice, which are still the mainstream revenue streams for most operators.

On the flip side, this continued trend by OTT players increasing both revenues and customer base globally has raised regulatory concerns in a number of jurisdictions. In recent years, there have been numerous complaints, including from telecommunications network operators and owners, that they face unfair competition from OTT players and providers who are not subject to the same regulatory obligations as network operators. Similar sentiments have been raised in the context of new online service providers who might challenge other traditional services offered by network operators.

At the centre of this debate and the concerns of many stakeholders is the 'lack of a level playing field', which has been attributed to concerns about perceived unfair competition posed by OTT players (who can operate globally), and the lack of clear OTT policies and regulatory frameworks. It's been claimed this has led to the impact OTTs (and other online competing services) have had on traditional telecommunications operators business models.

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<sup>1</sup> Growth Market Mobile Operators Must Tackle the OTT Challenge Now | Ovum Report 2015

At the same time, others have pointed out that the “level playing field” argument and related possible imposition of parallel rules may not be justified when the traditional telecommunications network operators control the broadband infrastructure, with few market players and high barriers to entry, while OTT players do not control the underlying broadband access points and where consumers can easily switch from one OTT service provider to another.

It is this background and concerns that have motivated the decision to conduct this research study.

### **1.1 Objectives of study**

The main objective of this study is to develop, based on consultations with relevant stakeholders in a sample of representative jurisdictions, a better understanding of the dynamics of OTT by all stakeholders including service providers, policy makers, regulators and operators on OTTs. It is expected that the output of the study will enable future deployment of OTT services to be conducted in a manner that addresses the concerns of all stakeholders including consumers.

The rest of this paper is organised as follows—in the next Section 2.0, the paper outlines some of the challenges in regulating OTT services; Section 3.0 outlines the potential impact of lack of policies and regulatory frameworks of OTT services. This section also considers other related challenges including the risk to consumers and businesses. This paper recognises that already some jurisdictions have taken steps to regulate parts of OTT services, which is addressed in Section 4.0; while in Section 5.0, we outline some of the key debate issues that need to be considered in order to understand the dynamics of OTTs in a given jurisdiction. Finally, in Section 6.0, the paper provides a summary of the workplan for the study.

## 2. Challenges of OTT Services

In this Section, the paper outlines some of the challenges posed by OTT services and provides an avid reader with background information to better understand some of the challenges in developing policies or regulation of OTT services in order to create a fair playing field, as referred in Section 1.0

### 2.1 *Licencing, Pricing, Taxes, Fees*

#### **Licensing**

As it is often the case telecom operators and network owners are required to purchase a licence in order to operate and offer services. This does not apply to most OTT application providers. Some jurisdictions such as India and Pakistan have been reviewing their licencing frameworks and plan to issue licences to OTT service providers before operating in their jurisdiction. The challenge is how effective such frameworks can be in regulating a technology that transcends jurisdictions borders.

#### **Pricing**

In a fully competitive environment, it is left for the market forces, which are more effective than regulations in providing consumers with a wide choice of services at reasonable prices. Price regulation is imposed, especially on dominant operators that have the potential to abuse their market power and engage in anti-competitive practices. However, this form of regulation does not apply to OTT service providers who may possess similar market power which is equally subject to abuse.

Today dominant operators/service providers must file the price of any telecommunication service they intend to offer with local regulator and obtain prior approval before offering the service/price to end-users. While non-dominant operators need not file tariffs with operators for prior approval, they must however publish the prices, terms and conditions for their standard telecommunication services for end-users' information, which does not apply to OTT service providers. However, others argue that it may not be appropriate to apply this type of pricing application and publication requirement for OTT service providers, particularly when they do not charge consumers for using their services, and where consumers are already paying telecom service providers/owners a fee for using the broadband services over which they operate.

#### **Taxes**

Today telecom service providers/owners bear the additional burden of various tax provisions by local, regional and national authorities. In a number of countries, for example in India, the taxes applied to telecommunication services are discriminatory as in addition to the corporate taxes they are also liable to pay Spectrum Usage Charge (SUC), License Fee (LF) and Universal Service Obligation Fund (USOF) on their Adjusted Gross Revenue (AGR)<sup>2</sup>.

The lack of regulations allows OTT players to adopt innovative, flexible and agile business model, which are far more optimized. While many telecom operators/network owners are liable to pay taxes in every country they are operating in, such an obligation is not

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<sup>2</sup> Impact of Over the Top (OTT) Services on Telecom Service Providers | Indian Journal of Science and Technology, Vol 8(S4), 145–160, February 2015

applicable to OTT service providers as they are, mainly required to pay taxes to the country where their main headquarters is located. Similar to what obtains with a few large multinational traditional MNOs, some of these OTT service providers are known to take advantage of different tax regimes by establishing themselves in low tax countries while also serving users in high tax countries, thus making huge amounts of profits. A few OTTs that have offices in certain jurisdictions have recently been under scrutiny in a number of jurisdictions that are considered to be tax-haven countries .

### **Fees**

Many telecom operators use customers' fees to support the costs incurred in service provision, especially in maintaining the network. For example, licensed mobile operators are fighting a losing battle against unlicensed substitutable services like voice, messaging and video messaging services from the OTT players. Unlike OTT service providers, a licensed operator in a number of jurisdictions has to pay a host of charges, including spectrum usage charges, licence fees, service tax to the government, which adds to a Telco's cost. But an OTT can provide the same voice - Voice over Internet (VoIP) and messaging services for less or no fee payment, since OTTs are unlicensed.

## **2.2 QoS, Operating Area, Interconnection & Number Portability**

### **Quality of service**

Most Telco operators have to comply with stringent rules regarding complying with Quality of Service (QoS) obligations for their service offering. In some jurisdictions, it's mandatory for telcos to also provide customer care services and put mechanisms in place to address customer complaints. In contrast, OTT service providers do not have to provide any QoS guarantees, instead QoS issues are blamed on network providers. Others however argue that OTT players also make efforts to improve user experience such as questionnaires at the end of VoIP calls which ask about the quality of user experience as well as their investments in data compression and quality of service.

### **Operating Area**

Network providers are also subject to requirements such as local sourcing obligations, data protection rules, lawful interception laws, and non-discrimination pacts. Furthermore, the operators are also constrained by the geographical boundaries of their networks they are serving in. However, OTT players are not constrained to any geographical region and can practically serve consumers wherever they are on the globe.

### **Net neutrality**

The issue of Network neutrality (Net neutrality) has been the subject of a number of legislative initiatives not only in Europe, but also in the United States and other jurisdictions such as Latin Americas (e.g. Brazil) over the recent past year. The focus of these debates has centred on providing guarantees that consumers can freely access services and content of their choice provided by OTT providers via the public Internet.

The underlying competitive concern, exhibited in some jurisdictions, has forced legislators to debate the issue subsequently enabling both fixed and mobile telecom operators which provide the broadband connectivity over which the OTT services are provided, to have the

incentive and the ability to throttle or block OTT services which posed a commercial threat to their own tied services (e.g. messaging or VoIP).

### **Interconnection**

There are multiple dimensions to the issue of IP interconnection challenge. Firstly, many operators have raised concerns about the market share and power of major OTT service providers to be gatekeepers to attract content, instead of the operators themselves. Operators have claimed that by generating demand for bandwidth, OTT service providers generate expenses in (next generation) infrastructure investment, but have not made a fair contribution to these expenses through the 'interconnection' arrangements they make with telecom operators.

Secondly, the regulatory treatment of traditional voice services using national numbering plans so as to ensure interconnection and interoperability differs considerably from that of OTTs (such as online voice services). The termination (completion) of voice calls to fixed or mobile networks is highly regulated in nearly all developed countries as a result of perceived network operator market power over the telephone number. There are, no obligations for communications applications running on the Internet such as VoIP and messaging applications to be interoperable, and in practice most online-only applications are not. However, some argue that requiring OTT players to convert to a standardized process using telephone numbers will stifle innovation, reduce existing product features, and result in additional costs being passed on to consumers.

### **Number Portability**

There is an obligation to operators to offer number portability between themselves while operating in different jurisdictions. The OTT service providers are independent from mobile numbers, and therefore have no obligation to implement number portability. (Relevance of this section, this is not a standard feature/service as not all jurisdictions have mobile number portability) Recommend we expunge this section.

## **2.3 Infrastructure/Network, Data Protection & Privacy**

### **Infrastructure/ Network**

Most operators and network owners invest in their networks infrastructure to deliver services to end-users. This involves investing in appropriate technologies in order to use resources efficiently & effectively. OTT services on the other hand, do not invest in these networks built by operators to enable end-user access to services.

In a number of countries that emphasise on net neutrality, telcos are compelled to deliver competitors traffic and services regardless of the impact to its networks. Although OTT players provide unmanaged services (no control over access networks), they are increasingly starting to take measures to enhance the performance of their own services by investing in content distribution infrastructure. This enhances the overall performance of the Internet as experienced by end-users, but still to the expense of operators who provide network access.

### **Data Protection & Privacy**



The ability for operators to offer data protection and security as well as the means to enable interception of data (such as browsing histories, online purchases, e-mail or messaging communications) for law enforcement purposes are regulatory requirements imposed in most jurisdictions.

While regulators strictly monitor data protection and privacy requirements for users by operators, OTTs regulation is practiced on a rather limited and generally voluntary basis. OTT service providers face minimal regulatory constraints. The limits put on their business usually exist only to the extent of addressing the security and privacy concerns associated with user data.

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### **3. Potential Impact of Unregulated OTT Services**

#### **3.1 Security Issues**

A number of OTT communication solutions do not support encryption. This implies that attackers can easily eavesdrop into an OTT service (such as VoIP conversation and IM services). In addition to the obvious problem of confidential information being accessed, the use of unencrypted VoIP and IM communication channels also facilitates identity theft or fraud. The other security threat concerns traffic analysis, which involves determining who is talking to whom. Such information can be beneficial to cyber criminals preparing an attack, e.g. for committing corporate espionage.

#### **3.2 Privacy Issues**

As addressed briefly in Section 4.3, user privacy is paramount in any service offering by both the telcos and OTTs. Some OTT services collect users' private information for commercial gains without making the customer fully aware of the exact details. There is also lack of thorough check on risk assessment and vulnerability levels of applications developed for the OTT market. There are other vulnerability vectors such as use of application with tracking option on, which may pose a threat to national governments.

#### **3.3 National Economy**

Economically, losing tax to OTT players can have a lasting impact on the country's economy. While telecom operators (i.e. local players) are subjected to local taxes, OTTs pay variable taxes (usually lower) to countries where the HQ is located. Consumers purchase goods and services from global OTT players rather than local entities. It is increasingly difficult for local companies to compete with OTTs that have customers globally. Less government revenues due to lower telecom revenues might imply less investment in infrastructure from Telcos. However, some argue that OTT players too can have a significant positive impact on the local and national economy and promote government objectives, through, for example, e-commerce, social media, banking, e-government, telemedicine, and online education.

#### **3.4 Other Challenges**

##### **Social engineering**

Psychological manipulation of people into performing actions or divulging confidential information (especially via OTTs such social networks) needs to be address. (Section not clear: the information this section aims to communicate is not clear as it relates to OTTs. Scam calls or emails too can be used to get people to divulge confidential information so it is not just an OTT problem)

##### **Copyright violation**

Omnipresence of pirated contents (books, movies, videos) presents a challenge and might require regulation to address the imbalance regarding content ownership. (This may be more of an issue with online content and not OTT players specifically)

**No regulatory framework for Health Apps**

Medical applications and other private data collecting application might result to loss of data, due to a security breach [especially in jurisdictions without strong privacy laws/regulations](#).

**3.5 Some benefits of the provision of OTT Services**

**Increased demand for data services/bundles**

The deployment and use of OTT services in various jurisdictions have undoubtedly led to an increase in consumer demand for data services/bundles provided by mobile network operators which in turn should result in revenue opportunities generated for telecom operators.

**Uptake of Smartphone devices**

Similarly, the increase in the uptake of Smartphone devices as well as the development and usage of Apps are what is driving the increase in uptake of Smartphone devices as there is considerable consumer utility/surplus derived from the use of such apps.

**Technology Deployed**

The provision of OTT services over IP and the possible move to IP by MNOs also means that MNOs can move to 4G/LTE services which in turn would lower their costs of providing voice calls and messaging services to their consumers.

## 4. OTT Regulation Debate

### 4.1 *Policy on OTT Regulation*

In this section, the concept paper outlines issues that the study will aim to address. While the competition provided by the OTT application providers does lead to disruption, this study believes that a functional stable market should be able to adapt to the new situation. It is expected that all stakeholders may have to change their strategies and align their interests with that demanded by the market.

It is expected that the study results will be used to:-

- Implement a review of regulations faced by network operators and OTT players to ensure that these reflect the changed market situation and rebalance obligations as found to be necessary
- Determine whether the provision of “free” OTT services represents unfair competition and whether or not it is detrimental to the development of the market, and if so in what ways, and take action as required
- Consider including a study result that looks at how to address Market definition, market competition rules, market power with regards to OTT players
- Update the license/operating conditions of existing operators and service providers in relation with net neutrality and growing data protection and security requirements as well as define a framework for net neutrality regulations to enable commercial service offers and cost-oriented market pricing (Bullet points 3 & 4 merged as they both talk about net neutrality)
- Establish coordination procedures between financial service regulation, data privacy and protection regulation, broadcasting/publishing regulation and communications regulation to ensure that measures are consistent and coherent. At a maximum, consider the integration of broadcasting, communications (and publishing) regulation

### 4.2 *Queries raised by CTO stakeholders*

This sub-section captures queries or questions raised by a selected number of CTO stakeholders who attended a CTO Regulating ICTs workshop. The delegates were from Bangladesh, Botswana, Mauritius, Rwanda, South Africa, Sierra Leone and Trinidad & Tobago.

- 1) What is the flexible definition of OTTs that takes into account future trends?
- 2) There is a need to examine revenue trends for data and voice; and the overall economic impact of OTTs to local and local and national economy, government and consumers; to understand the potential impact.

- 3) Need to understand how OTTs can contribute more to the required investments for network rollout.
- 4) Re-consider whether the current business models of operators are appropriate or sustainable.
- 5) Consider the costs, benefits and effects of regulating or not regulating. Based on which option is preferred, decide what to and how to go about it.
- 6) Consider public interest issues i such as the protection of vulnerable consumers amongst other things.
- 7) Should provide robust Legal and regulatory frameworks
- 8) Most major OTT players recognise the primacy of US jurisdiction. What is the remedy for other jurisdictions?
- 9) Consider applicability of taxes
- 10) The proposed framework should facilitate regional responses, possibly leading to a global approach
- 11) The proposed framework should address a penalty scheme for misuse
- 12) The need for accurate and verifiable data in the area of OTT usage and its impact should be addressed to facilitate better decision making.

## 5. OTT Study Workplan

