JPPI Vol 10 No 2 (2020) 85 - 101

Jurnal Penelitian Pos dan Informatika
32a/E/KPT/2017

e-ISSN 2476-9266
p-ISSN: 2088-9402

Doi:10.17933/jppi.2020.100201

Synergy of Over the Top Services Operation and Telecommunication Operators in Indonesia

Sinergisitas Penyelenggaraan Layanan Over The Top Dengan Penyelenggara Telekomunikasi di Indonesia

Amry Daulat Gultom

Pusat Penelitian dan Pengembangan Sumber Daya, Perangkat, dan Penyelenggaraan Pos dan Informatika
Jl. Medan Merdeka Barat No.9 Jakarta 10110, Indonesia
amry002@kominfo.go.id

Received: 29 December 2019 ; Received in revised from: 20 November 2020; Accepted: 21 December 2020

Abstract

In order to improve the business climate, the Indonesian government focuses on carrying out a fundamental reform program. One part of the program is issuing online business licenses. As a form of compliance, the Ministry of Trade (MoT) needs to implement the Integrated Trade Licensing System (ITLS), where the system's values will be made possible through a collaboration between government agencies. This condition illustrates a self-organizing network of organizations where each agency will be able to contribute its values and result in a new set of values. This concept is aligned with the extended organization. This paper aims to examine how ITLS can successfully work through government agencies' collaboration in an extended organization. The research methodology used a qualitative approach by collecting data through documentation study, observation, and interviews. The study found that trade licenses can only be issued if the value given by the extended organization is sent to ITLS with the assistance of information technology (IT). This research is expected to be a lesson learned of extended organization concept in government agencies.

Keywords: extended organization, trade licensing system, ministry of trade, integration

.

INTRODUCTION

Over the top (OTT) service refers to the delivery of multimedia services, namely audio, video and messaging services via the internet. Today, digital behavior in various parts of the world is leading to convergence in mobile devices. This phenomenon is marked by the increasing use of messaging and social media applications, such as Whatsapp, Telegram, WeChat, Facebook Messenger, and others. Social messaging platforms are receiving more and more attention from mobile device users, and they are often the main reason people purchase or use smartphones. On the other hand, none of these features are standard services on mobile devices, because these features are developed and managed by many different companies and run on the infrastructure owned by telecommunications operators.

The fact that such services are used to replace telephone services and Short Message Service (SMS) has become a concern of the telecommunications industry. When the internet data was not highly used as it is today, the existence of OTT companies with their services became an opportunity for telecommunication operators to increase data traffic, as well as educate customers about the new services. However, with the increasing access to data services, more financial benefits in this relatively new field have been reaped by OTT companies compared to telecommunications operators.

Telecommunications operators are required to develop infrastructure with a large investment capital. On the other hand, OTT is free to operate anytime and anywhere, with increasing profits, without being required to pay to local telecommunications operators or companies. Figure 1 illustrates that throughout the Europe, the presence of OTT has an impact on decreasing revenue and increasing investment costs for telecommunications operators (Blanco, 2014). The existence of these services causes a significant increase in data traffic, requiring operators to deploy new infrastructure to accommodate the increase in traffic and maintain service quality and increase revenue from the new services, namely data services.

The enormous cost of infrastructure deployment is not worth the income earned. Operators' revenues are decreasing from year to year. Customers use more data services than voice and SMS services, so that revenues from voice and SMS are decreasing. OTTs which offer similar services or substitute services of cellular operators, such as basic telephony services, are not subject to the same regulations as cellular operators (same service same rule).

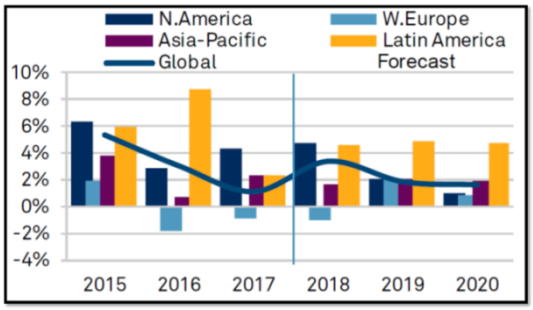

Figure 1. Telecommunications Industry Revenue Growth– Fixed dan Wireless
(Mooney et al., 2018)

According to ETNO, all operators in the European market are affected by the highly competitive market that has been created by the introduction of OTT services. Figure 2 shows that in

the ETNO perimeter, more than 70% of mobile phone users are also OTT messaging services users. The effect has been suffered, along with dramatic drop in SMS revenue. In 2020, most mobile users will also be users of OTT voice services, putting further competitive pressure on operators' voice services.

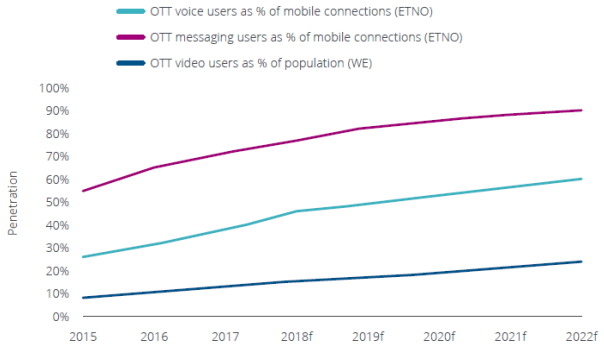

Figure 2. OTT service penetration in Western Europe
(European Telecommunications Network Operators' Association, 2019)

The government plays a role in regulating the operation of telecommunications and informatics through establishment of regulations and policies. This is to protect domestic industry and consumers. The government needs to first obtain the latest data, information, and analysis on the OTT services in Indonesia from various sources and perspectives before establishing appropriate regulations related to OTT services and the telecommunications industry.

Various literature related to the development of OTT services over the last few decades discusses the possibility of the best and most appropriate regulatory approach that must be taken as discussed by Nandhiasa and Haryadi in an article entitled Indonesian Regulation Management Recommendation for Over the Top Services. This study provides recommendations in order to protect telecommunication operators against the threat of OTT services that can replace conventional telecommunications services. The recommendations include: (1) Blocking of OTT is highly not recommended. (2) OTT service providers shall must pay compensation to telecommunications operators in exchange for the use of telecommunications infrastructure. (3) Creating a paid and unpaid mechanism for the use of OTT services where paid OTT offers significantly better quality of service than non-paid ones. (4) Operators provide a choice of bandwidth usage levels for users where the bandwidth that can be accessed by users is adjusted to the service purchased (Nandhiasa & Haryadi, 2015).

An article entitled Impact of Over the Top (OTT) Services on Telecom Service Providers also analyzes trends that have led users to adopt OTT services. In addition, this study also identifies cost, convenience, features, social environment, content availability, smartphone and mobile internet penetration, user experience and net neutrality that are effectively utilized by OTT players to offer substitute services for services offered by telecommunication operators. Furthermore, this study examines the impact of these factors on telecommunication operators' voice, messaging, and data services. Recommendations offered to telecommunication operators to overcome the threat of OTT services include blocking of OTT services; Bundling with OTT; Collaboration with OTT or developing their own OTT services (Sujata et al., 2015).

Based on such background, a study is required to further examine the impact of the current growth of OTT services in Indonesia by looking at policies in other countries, as a consideration for policy recommendations for implementation in Indonesia.

METHODOLOGY

This research employs a qualitative data approach which is supported by quantitative data. Data collection was carried out through Focus Group Discussions (FGD) and in-depth interviews with Indonesian Telecommunication Regulatory Authority (BRTI) as regulators, telecommunications operators and academics. In addition, a literature study is carried out on the implementation of ecosystems, OTT standards and regulations in other countries. The data is then studied and analyzed to answer the questions formulated in this study.

This study uses descriptive analysis and Benchmark Analysis to identify problems that become the foundation for government's action and regulatory options related to the problems defined.

RESULTS AND DISCUSSION

Internet in Indonesia

Based on data from We Are Social and Hootsuite, internet users in the world are 57%, namely 4.388 billion users out of a total population of 7.676 billion people. With an increase in penetration of more than 9.1% (more than 367 million) from the previous year.

The Indonesian Internet Service Providers Association (APJII) stated that by the end of 2017, 143.26 million people in Indonesia used the internet, an increase from 132.7 million in 2016. This shows 54.68% of Indonesia's population of 262 million people is using the internet.

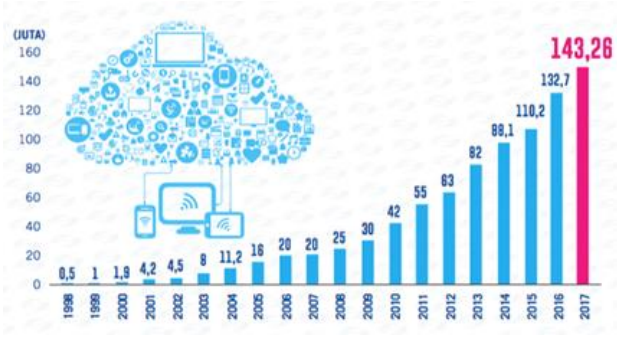

Figure 3. Internet User growth (APJII 2018)

Internet users are concentrated in urban areas with a percentage of 72.41%, rural urban (49.49%), and rural (48.25%). High penetration in urban areas is due to high fiber optic access and other supporting infrastructure for internet access. Smartphones are the devices most used by users when using the internet compared to computers/laptops. In urban areas, smartphone ownership reaches 70.96%, rural urban (45.42%), and rural (42.06%) (Asosiasi Penyelenggara Jasa Internet Indonesia, 2018).

Figure 4. Internet Users in Indonesia
(Hootsuite & We Are Social, 2019)

In the early 2019, penetration of internet users in Indonesia had reached 150 million (56% of the total population), of which 130 million (48%) were

accessed by mobile. The use of mobile phones reaches 355.5 million devices, larger than the total population in Indonesia.

Figure 5. Digital growth in Indonesia
(Hootsuite & We Are Social, 2019)

Indonesia's internet users increased by 13% from the previous year, accompanied by an 8.3% increase in the number of social media users on mobile phones. However, cellular subscribers in general decreased by 19%, which assumes that many 2G mobile phone users are switching to smartphones.

Mobile device user Indonesian citizen are very active in using the internet, especially social media. 56% of all internet users in Indonesia actively use social media, and around 48% access it via mobile devices.

A number of the most widely used application platforms today are still dominated by YouTube (video applications), WhatsApp (Voice/Video Call and Messaging applications), Facebook (Social Media), and Instagram (Photos). This shows that multimedia applications are in great demand by internet users today.

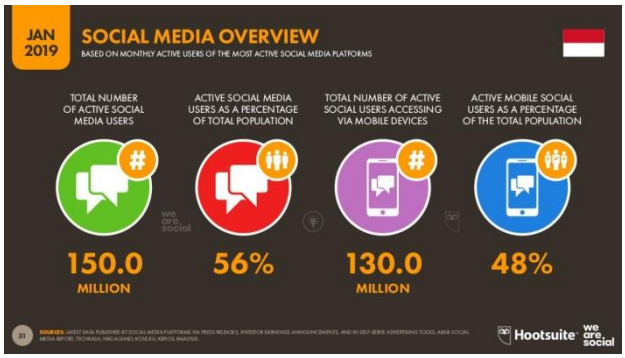

Figure 6. Overview of Social Media user in Indonesia
(Hootsuite & We Are Social, 2019)

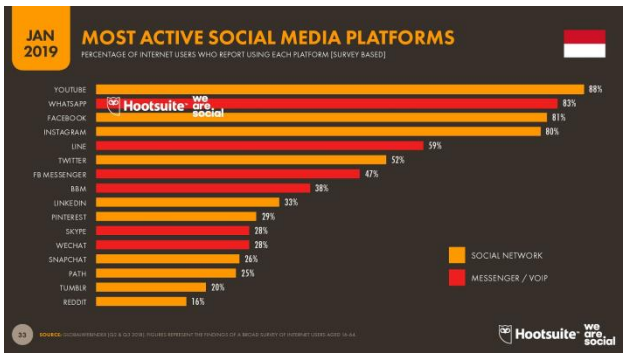

Figure 7. Most Active Social Media
(Hootsuite & We Are Social, 2019)

For mobile internet in particular, internet users mostly use the internet for chat applications (96%), watching videos (95%), map applications (89%), online games (83%), and internet banking (61%).

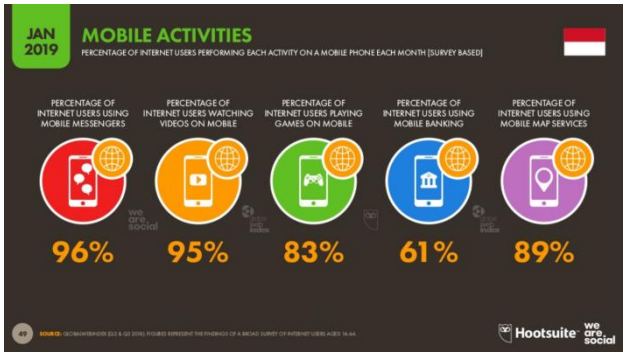

Figure 8. Mobile Activities
(Hootsuite & We Are Social, 2019)

OTT Regulations in Indonesia

Until today, regulations related to OTT in Indonesia are still limited to the Circular of the Minister of Communications and Informatics which defines OTT services as application/content services by utilizing telecommunications services through Internet protocol-based telecommunications networks (Ministry of Communication and Informatics, 2016).

Contribution of foreign OTT actors or service providers currently (starting April 2019) is still limited to tax payment obligations and there is no requirements for foreign OTT actors or service providers to be domiciled in Indonesia (Ministry of Finance, 2019).

Benefits of OTT Service Growth

Some of the benefits of the emergence of OTT in the telecommunications industry are as follows (Bilbil, 2018):

a. High adoption rate of OTT services by end users
b. provides global reach via the internet, in addition to fast speed at use
c. Support broadband connectivity, and drive demand for broadband services
d. publicity revenue which offers a cost-effective way to market users' product/business
e. Increasing demand for data services
f. Increasing data service revenue for operators
g. Increasing consumer interest in online media content accessible from multi platforms

At the end of 2017, 59 percent of internet traffic and 51 percent of internet traffic came from non-PC devices. By 2022, 81 percent of IP traffic and Internet traffic will come from non-PC devices.

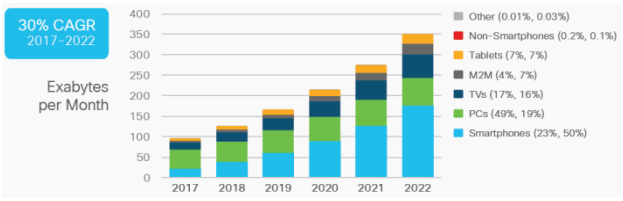

Figure 9. Global internet traffic by device
(Cisco, 2019)

Asia Pacific will have the second highest CAGR of mobile data and internet traffic at 49 percent, after the Middle East and Africa.

Table 1. Mobile data and Internet traffic, 2017–2022

Mobile data and internet traffic, 2017-2022	2017	2018	2019	2020	2021	2022	CAGR (2017-2022)
By Geography (EB per month)							
Asia Pacific	5.88	10.35	15.91	22.81	31.81	43.17	49%
Middle East and Africa	1.22	2.05	3.25	5.01	7.56	11.17	56%
Central and Eastern Europe	1.38	2.15	3.12	4.32	5.83	7.75	41%
North America	1.26	1.80	2.50	3.41	4.48	5.85	36%
Western Europe	1.02	1.47	2.06	2.81	3.80	5.12	38%
Latin America	0.75	1.18	1.72	2.42	3.31	4.44	43%
Total (EB per month)							
Mobile data and Internet	11.51	19.01	28.56	40.77	56.80	77.49	46%

(Cisco, 2019)

Asia Pacific will account for 37.4 percent of global mobile traffic by 2022, the largest share of traffic by any region by a sizeable margin.

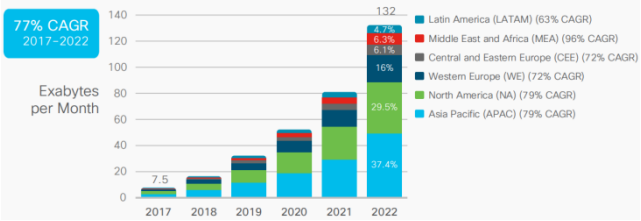

Figure 10. Fixed and mobile Global IPv6 traffic, 2017–2022
(Cisco, 2019)

Impact on Network Operators

The growth of OTT services triggers an increase in data service traffic consumption, which can serve as new source of revenue for telecommunication operators. However, there are several negative impacts experienced by operators due to the presence of the OTT service, which include:

a. Customers "churn" to other operators to receive service promos, only to access the same OTT.

b. There is a decreasing trend of share of revenue from basic services and an increasing share of revenue from data services. Voice and SMS services are starting to be abandoned, users tend to switch to OTT which provides similar and more interactive features.

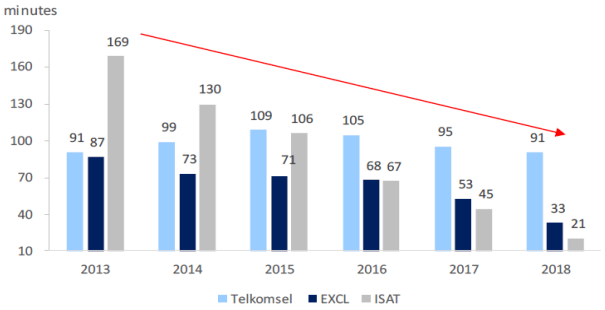

Figure 11. Voice service minutes of use (RHB, 2019)

In Indonesia, OTT services have a very negative impact on telecommunications operators. The trend shows that voice services continue to decline, as they are being replaced by OTT services such as WhatsApp and Line. In 2013, on average, subscribers spent 107 minutes per month on voice calls, measured by minutes of use (MOU). In 2018, the MOU dropped to around 60 minutes due to data service migration. WhatsApp users in Indonesia now comprise 45% of smartphone users.

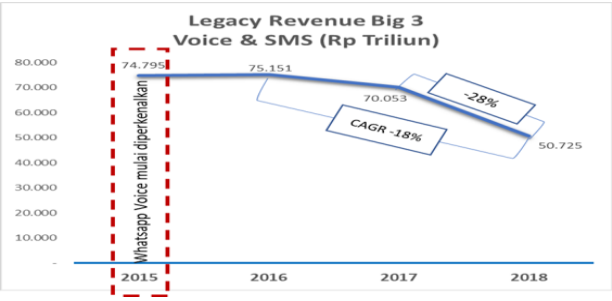

Figure 12. Decreasing trend of voice and sms service revenue (Telkomsel)

Since 2016 until now, the decline in voice and SMS business revenue has reached a CAGR of -18%, while in 2018, it recorded the largest decline by 28%.

Driven by cheap data services, the emergence of video and music OTT services and the growing adoption of smartphones, Indonesia has recorded high data consumption growth, also driven by the growth of cheap Chinese handsets and the increasing operator network expansion.

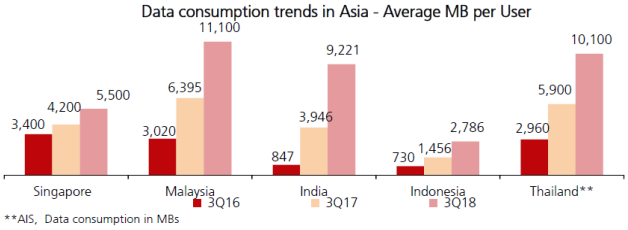

Figure 13. ASEAN data consumption growth (DBS, 2019)

The data service tariff war that occurred to attract customers reached rock bottom. Even though the increase in data service consumption is increasing, data service revenue remain unable to cover the size of the decrease in revenue from voice and SMS services, due to the decreasing data revenue.

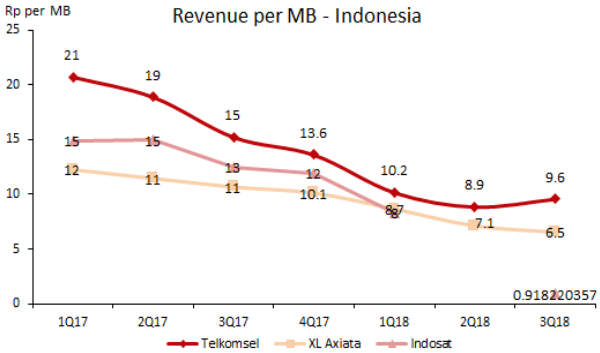

Figure 14. Data service revenue per MB (DBS, 2019)

c. Operators increase capacity which resulted in increasing investment costs to meet increased

customer demand (data services). It is based on a cost-benefit analysis of the business or is enforced to maintain service quality so as not to be abandoned by customers.

.In addition, it is also expected to increase the growth of new customers. With the increase in the number of subscribers and data traffic, it is expected that there will be an increase in revenue from the data service itself.

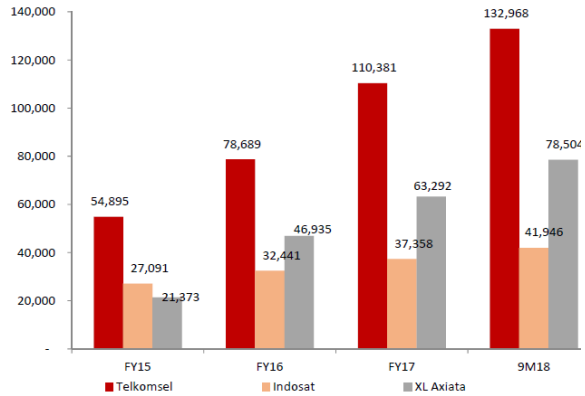

Figure 15. Number of BTS 3G/4G stations (DBS, 2018)

Currently there are 62,291 4G BTS built by telecommunications operators. The 4G service has reached 45,811 villages/urban villages in 4,088 subdistricts and 331 regencies/municipalities. 4G services have reached 55.55% of all villages in Indonesia. The operator speed in building BTS, if averaged, is around 80 BTS are built everyday by the operator.s Issues that remains a homework for operators in deploying 4G services are the frequency availability, availability of backbone infrastructure and transmission (Association of Indonesian Internet Service Providers, 2018).

GSMA projects that in the future, revenue sharing will be dominated by Service Providers, where the first three technologies (1G, 2G, and 3G) are fully dominated by operators. In the 4G generation technology, OTT services that are innovative and cheap when compared to the services offered by operators have experienced very rapid growth. (Hootsuite & We Are Social, 2019)

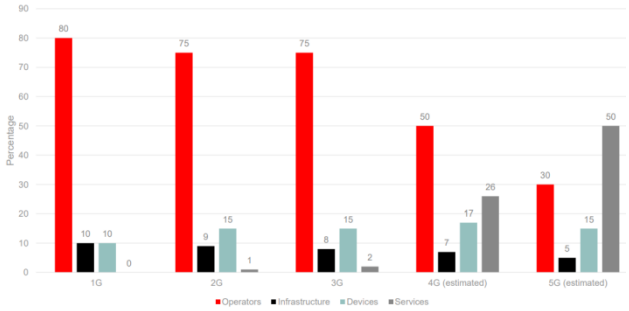

Figure 16. Share revenue of various cellular technology generations (GSMA, 2019)

Operators as network providers for OTT services have experienced a decline in voice and SMS service revenues which are starting to be replaced by OTT services.

Figure 17. OTT service replacing operators' voice and SMS services

Level Playing Field

In the trade sector, the level playing field is a concept of justice, not only that every business actor has the same opportunity to succeed, but also the same set of rules. The level playing field comprises of equality, namely; (1) Equal opportunity, which means equal business opportunity for business actors without discrimination. (2) Equal accessibility, no

business actor is prohibited from entering the market, for example, no business actor is prohibited from obtaining bank credit. Every business actor who has the opportunity has gone through a healthy business competition process. (3) Equal treatment, namely the government treats every business actor equally.

Table 2. Telecommunication Operators vs OTT

Regulatory Imbalance	Operator	OTT
Voice & Messaging services	Yes	Yes
Market segment includes all Indonesian citizens	Yes	Yes
Obligation as Indonesian juristic person	Yes	No
Obligation to obtain operation license	Yes	No
Obligation of deployment commitment	Yes	No
Contribution to the state (frequency usage rights fee/BHP, telecommunication service rights fee and Universal Service Obligation, tax)	Yes	No
Obligation of Quality of Service (QoS)	Yes	No
Obligation of lawful Interception	Yes	No
Obligation to protect subscribers' data	Yes	No

As network operators, Indonesia's telecommunication operators view the current conditions unfair. OTT services that run on a telecommunications operator network without having to build a network are not subject to the same fees as obliged to telecommunications operators.

Operators' Strategy in Facing OTT

In responding the challenges posed by OTT players, telecommunications operators may adopt one of the following strategies:

a. OTT Service Block. This strategy can be employed by blocking certain services, especially those that replace the main service operators, such as voice and SMS. Operators can adopt a short-term strategy where they can decide to deny users access to OTT services. If applied, will stop the SMS service substitution. However, this is a short-term strategy and has a high dependence on a country's net neutrality policy, moreover, it is detrimental to businesses as it will limit the operator's possible revenue through increased data usage. This condition works if all operators adopt the same strategy simultaneously.

   Example:

   In South Korea, after being pressured by CSPs KT, SK Telecom and LG U + -, national regulators approved the blocking of Talk Kakao services. Telecommunications companies in many countries have blocked Skype or slowed down Skype traffic. However, users can gain access to blocked content using a VPN.

   In the UAE, Etisalat (legacy operator) has rightly blocked Skype and other VoIP services from using their networks, such blocking of OTT voices is possible because the UAE is a highly regulated market and Etisalat has telecommunications regulatory support.

b. Bundling with OTT, is another strategy that can be adopted. Many operators use this strategy where they combine offers in such a way creating image that financial savings using OTT services becomes less attractive. For example, in the case of SMS services, operators try to extract basic

revenue from users in the form of free SMS packages. So, by combining data or voice packages with SMS packages, operators can maximize their revenue and at the same time reducing the threat of OTT services while offering affordable prices. However, this will only help operators maintain multiple levels of customer loyalty for a short period of time. Content bundling is another innovative way for operators to combine OTT such as a video app (Netflix) with voice subscriptions to encourage subscribers to use the app thus driving increased data usage.

Example:

After an unsuccessful attempt to block Skype, TeliaSonera, now offers Skype on a certain data plan. Many Indian telecommunications companies such as Tata Docomo, RCom, Airtel, among others, have special data packages for whatsapp, Facebook, saavn services.

Vodafone in the UK has started incorporating a choice of either Spotify Premium, Sky Sports or Netflix access for 6 months, as part of their Vodafone 4G Red plan.

c. Collaboration with OTT. Many telecommunications operators have used a strategy where they partner with OTT players and benefit from their traffic.

DiGi telecommunications, a Malaysian mobile service provider, has partnered with a WhatsApp provider so that DiGi subscribers can receive unlimited access to the WhatsApp service for a flat fee. The same strategy has also been adopted by 3 Hong Kong, the mobile network operator and broadband service provider in Hong Kong and by Reliance Communications in India.

This strategy has enabled operators to maintain traffic and earn a share of revenue. However, operators have limited or almost no control over the direction and quality of services offered through this partnership agreement. This can affect their relationship with their customers.

Table 3. Operator and OTT Service Partnership

Country	Operator	OTT	Description
A number of African Countries	A number of Operators	Facebook	Facebook can be accessed free by subscribers Facebook invests on satellites
Australia	Optus	iHeartRadio, Spotify, GooglePlayMusic, Netflix	On package options, subscribers may access certain OTT without using monthly quota
Singapore	Starhub	LINE	Offers subscribers access without, with daily or monthly “LINE data package”
Malaysia	Digi	whatsapp	Offers limites access to subscribers to Whatsapp flat fee

(International Telecommunication Union, 2018)

d. Develop their own OTT service. Another long-term strategy that telecommunications operators can adopt is to introduce their own OTT services. This will allow them to have complete control over the service. While this is not the fastest way to market but it allows operators to reach a much wider customer base. They can also leverage their core assets (control over networks, customer data, and distribution channels) to differentiate their OTT services from other services on the market. However, the investment required for such an approach is quite high and it is risky for operators because they do not have the skills necessary to launch the service.

Example:

T-Mobile USA has launched Bobsled, Telefonica Digital has introduced the Tu Me service which both offers free voice and text services. Orange has also launched their own brand of OTT communication service Libon. Likewise, Comcast has started providing web access to movies and TV shows to compete with Netflix.

The GSM Association (GSMA) is actively promoting Joyn, its IP-based communication. Member companies are encouraged to use it as a standard approach to developing and introducing new services such as chat, image sharing, and file transfer that can compete with third-party OTT services.

Other challenges

Several other challenges relating to OTT service which currently has become important issue include:

a. Competition
b. OTT Provider License
c. Interconnection
d. Consumer Privacy
e. Quality of Service
f. Content Regulation
g. Cybersecurity

OTT Policy Aproaches in Other States

Policy approaches adopted or proposed are varied and cover various dimentions. These are different between one state and another, even among states within the same region.

Policy approaches adopted by other states are categorized into three, namely:

a. Neutrality, no discrimination or interference in the treatment of content, including blocking, throttling, zero-rating internet data or speed settings.
b. Regulating licensing for OTT, certain types of OTT can be subject to a operation license, such as a VOIP license.
c. Cooperation, where the regulator directs cooperation between OTT service providers and operators as network operators. With this, operators are given the right to apply certain business models to OTT service providers, such as implementing premium services, bandwidth management and even blocking them completely.

Policy approaches adopted by other states are categorized into three, namely:

d. Neutrality, no discrimination or interference in the treatment of content, including blocking, throttling, zero-rating internet data or speed settings.
e. Regulating licensing for OTT, certain types of OTT can be subject to a operation license, such as a VOIP license.
f. Cooperation, where the regulator directs cooperation between OTT service providers and operators as network operators. With this, operators are given the right to apply certain business models to OTT service providers, such as implementing premium services, bandwidth management and even blocking them completely.

Table 4. OTT policy in various states

State	Policy	Description
Belanda	Neutrality	Introduced the principles of neutrality into the Law in 2011.
United Kingdom	cooperation	OFCOM allows operators to apply certain traffic management for new business model
Germany	VOIP Licensing	Same obligation with telecommunications operators
France	VOIP Licensing	Same obligation with telecommunications operators
USA	Neutrality (2015), But repealed in 2018	In March 2015, FCC released new internet regulation which strengthen the neutrality concept of network in the In 20018, FCC repealed the neutrality policy. FCC claimed such policy is not required because it hinder operators' and small scale operators do not have selling power to offer OTT service providers.
Chili	Neutrality	In July 2010 introduced network neutrality principle to its Telecommunication Law. In May 2004, prohibited "*zero-rating*"
Singapore		Special license is required to connect Voice-over-IP (VoIP) to Public Switched Telephone Network (PSTN).
South Korea	Premium Service VOIP	Operators have the rights to induce VoIP as paid premium service or entirely block the service
United Arab Emirates	Blocking Obligation to cooperate with operators	International OTT must cooperate with licenced telecommunication companies. TRA protects the market by blocking foreign OTT players except they have partnership agreement with local companies.
India	Status Quo	TRAI decided in August 2014 not to regulate the OTT. TRAI argued is that cellular operators recovered their lossess from the increasing data revenue.

The Impact of OTT Growth in Indonesia

Based on the results of data collection, it is imperative to assess all the costs and benefits of increasing OTT service growth from the perspective of each of the key stakeholders, namely customers, OTT service providers, telecommunications operators and the government.

Table 5. the Impact of OTT growth in Indonesia

Group	Benefit	Cost	Desc.
Subscribers	A host of interactive and innovative service options which are inexpensive or even free.	Security Privacy	Possitive on the Consumers' side
OTT service providers	Gain a large number of subscribers, large amount of revenue, collect subscribers' data	Increase of service provision cost bottlenect investment	Positive on the OTTs' side
Operators	Increased data demand and revenue	Decreased voice nad sms revenue Larger investment	Currently negative, however, data increase can be positive. Partnership can be possitive
Government	Telecommunication and ICT eficiency Increasing broadband penetration Increasing smartphone growth Revenue potential	Increased imports Potential revenue loss (if not regulated)	Positive for the state.

Stakeholders can gain positive results from the growth of OTT service, especially by implementing optimal policies. Operators can also have a positive impact given the growth in demand for data services during regulation allows operators to adopt the most effective and efficient technological innovations such as licensing and spectrum fees which are priced fairly. In order to ensure a level playing field, it is imperative that fees and taxation are imposed for both groups especially for those players providing substitute services.

Policy Benchmark Analysis

a. Status Quo, which means that there are no regulations governing OTT services established, either those allowing or prohibiting. OTT service providers have the freedom to innovate and offer users without having to consider operating licenses in Indonesia. There is no guarantee of rights, safety, quality of service for users. The issue of injustice will continue to be raised because OTT services running on operator networks are not subject to fees which are imposed to operators as service and telecommunications networks operators.

However, operators also still have the opportunity to offer various business models for cooperation with OTT service providers. Thus, it is hoped that the growth in traffic and consumption of data services will continue to increase so as to provide new revenue to cover the decline in revenue from voice and SMS services. In addition, it is expected to accelerate

broadband penetration and digital transformation in Indonesia. However, this must be accompanied by an increase in network capacity to maintain the quality of service, which of course costs more.

b. Neutrality, where internet service providers including network operators must allow consumers access to all internet content and applications regardless of the source, and without endorsing or blocking certain products or websites. The neutrality policy is very beneficial for both users and OTT service providers. Without any concerns about restrictions on access and bandwidth management, enabling the growth of the number of OTT service providers. The issue of privacy and security from the customers' side will be very important, if no regulations governing this are in place.

   The neutrality approach needs to consider local conditions, especially the level of retail competition to access the market. Telecommunication operators will not have the selling power to enter into partnerships with OTT service providers. It is possible that operators tend to become "dump pipes" for OTT services to pass.

c. Operations License. The regulation requires OTT service providers to have a service operations license for all types of OTT services or only certain OTT services, such as OTT services that can replace traditional services. In this case, the government can enforce rules and sanctions directly and firmly to OTT service providers who fail to comply with the applicable rules. This also promotes new revenue potential for the State. This regulation has the potential to collide with Finance Minister Regulation No. 35 of 2019 on the Determination of a Permanent Establishment (BUT) which does not require foreign OTT service providers to be domiciled in Indonesia. In addition, this could potentially increase the price of customer access due to increased permit fees.

   There is a tendency that such policy will be difficult to implement because of the government's bargaining position on OTT service providers, especially large foreign OTT services. However, the state's large market can become an attraction to OTT players to recalculate potential revenue.

d. Cooperation. The government issues a policy requiring the establishment of cooperation between OTT service providers and operators as network operators. Such policy gives the right to apply certain business models to OTT service providers such as the imposement of premium services, bandwidth management, service bundles, zero data rate, and even complete blocking. With the cooperation, it is expected that all parties would be benefited. Thus, generating new revenues for operators to cover the decline in revenue from voice and SMS services, thus helping to invest in better network quality improvement. This may also help reduce "churn" and attract customers with attractive service offers.

   However, this collaboration could potentially charge subscribers more fees for

special subscription to access certain OTT services.

Indonesia's OTT policy direction

Indonesia needs regulations which regulate OTT services in terms of:

a. Fair business competition between OTT service providers and operators

Currently, several services provided by OTT service providers are in direct competition and replace voice and SMS services provided by operators. From business competition astpect, this is unfair for operators because OTT service providers do not hold any licence nor obligations to comply with to the government and customers, while they can use the entire ecosystem and resources owned by the operators.

In order to create fair business competition, a number of balancing efforts need to be taken, which include:

- OTT service providers are required to have an operating license, so that they are subject to all provisions of the laws and regulations such as regulations on pornography, etc.
- OTT service providers are required to pay taxes and non-tax government revenue (PNBP).
- OTT service providers are required to meet and maintain quality of service standards.
- OTT service providers are required to protect customer personal data.
- other obligations the government imposed to and relevant to operators.

b. Obligation for OTT to build cooperation with Operators

In order for operators to benefit from providing OTT services, it is necessary to impose obligation for OTT service providers to cooperate with Indonesian operators to be able to operate in the State. This will also help the government in monitoring the implementation of OTT services in Indonesia, especially in order to provide protection to subscribers and operators' continuity of services replaced by OTT services and ensure the contribution of OTT service providers to the government in terms of taxes and non-tax government revenue (PNBP).

Recommendation of policies that can be implemented are as follows:

- Designing whitelist regulations to attract OTT service providers to build mutual cooperation with operators and maximize State Revenue, impose obligation to OTT service providers to comply with Indonesia's laws and regulations, regulate Customer Data Protection and Intercept Activity and having customer data server in Indonesia as standard obligations, and allows content developers to cooperate directly with operators.
- Regulate OTT subscription fees through operator systems to increase the government's role of control to protect the public and the state against the negative impacts of OTT while at the same time creating a sustainable telecommunications industry in Indonesia and maximizing Government Revenue.

c. Increasing local OTT service competitiveness

Currently, OTT services in Indonesia are dominated by foreign OTT services, so that the growth of OTT services will only benefit providers' country of origin of the OTT service provider. It is necessary that the government issue policies that can

promote or increase local OTTs' competitiveness, so that local players can also benefit from the development of the OTT service industry.

Followings are the recommended policy to be implemented:

- Imposing limits on domestic investment obligations for foreign OTT service providers to operate in Indonesia.
- Government supports the developmemt of local OTT services through cooperation in supporting government programs.
- Provide education for and outreach to the community to use local OTT services.
- Provide a distribution channel between local OTT service providers and end users.
- Facilitating local OTT service research through research institutes and universities.
- Providing OTT service development incubator.
- OTT-service related human capital development

CONCLUSION

The study concluded that the growth of OTT services greatly affects telecommunciations operators' revenue, especially in voice and SMS services. The largest decrease in CAGR occurred in 2018, which was by 28%. The trend shows that voice services continue to decline. In 2018, operator voice service usage fell to around 60 minutes/month from its previous 107 minutes/month in 2013 due to migration to OTT services such as WhatsApp and Line. Revenue from data services has not been able to replace the loss even though data service traffic has shown an increase. In facing the growth of OTT services, several countries have implemented policies that support network neutrality, which require licenses to operate OTT services and encourage cooperation between operators and OTT.

Indonesia has not have strong regulations in place to regulate OTT service. Therefore, it is necessary to have policies related to the implementation of OTT services that regulate fair business competition between OTT service providers and operators, the obligation to collaborate between OTT and operators, and increase the competitiveness of local OTT services.

ACKNOWLEDGEMENT

The author would like to thank the SDPPPI Research and Development Center for funding this research.

REFFERENCES

Asosiasi Penyelenggara Jasa Internet Indonesia. (2018, April). *Buletin APJII*.

Bilbil, E. T. (2018). Methodology for the Regulation of Over the top (OTT) Services: The Need of A Multi-dimensional Perspective. *International Journal of Economics and Financial Issues, 8*(1), 101–110. https://doi.org/https://doi.org/10.32479/ijefi.5809

Blanco, C. L. (2014). *Rethinking the Telcos Business models in the age of 5G*.

Cisco. (2019). *Cisco Visual Networking Index: Forecast and Trends, 2017–2022*.

DBS. (2018). *Indonesia Industry Focus - Telecom Sector*.

DBS. (2019). *ASEAN Telecom Sector*.

European Telecommunications Network Operators' Association. (2019). *Annual Economic Report: The State of Digital Communications 2019*.

GSMA. (2019). *5G: The Path to the Next Generation*.

Hootsuite, & We Are Social. (2019). *Digital 2019 Indonesia*.

International Telecommunication Union. (2018). *Regulatory Challenges and Opportunities in the New ICT Ecosystem*.

Kementerian Keuangan. *Penentuan Bentuk Usaha Tetap*. , Pub. L. No. PMK No 35/PMK.03/2019 (2019).

Kementerian Komunikasi dan Informatika. *Penyediaaan Layanan Aplikasi dan/atau Konten Melalui Internet (Over The Top)*. , Pub. L. No. SE MENKOMINFO No. 3 Tahun 2016 (2016).

Mooney, C., Hari, M., Arden, A., Habib, M., Park, J., & Martinez, L. M. (2018). *Industry Top Trends 2019 Telecommunications*.

Nandhiasa, A., & Haryadi, S. (2015). Indonesian Regulation Management Recommendation for Over the top Services. *2015 1st International Conference on Wireless and Telematics (ICWT)*. Manado: IEEE.

RHB. (2019). *Indonesia Telecommunication*.

Sujata, J., Sohag, S., Tanu, D., Chintan, D., Shubham, P., & Sumit, G. (2015). Impact of Over the Top (OTT) Services on Telecom Service Providers. *Indian Journal of Science and Technology*, *8*(4), 145–160.