Contribution to the ITU CWG-Internet Open Consultation:
Public Policy Considerations for OTTs

Google appreciates the opportunity to provide input into the ITU open consultation on Internet-based services. We believe that these services are critical enablers of global economic growth and opportunity, but that questions regarding them ultimately fall outside the scope of the ITU's mandate. We encourage the ITU to remain focused on its vitally important work relating to radio spectrum allocation, telecommunications network standards, and appropriate capacity-building activities, rather than seek to address issues already being capably addressed by other organizations.

The Internet has been transformative to humanity. Regarded by the World Bank as a "general purpose technology"[1] as transformative as the steam engine, the services provided by Content and Application Providers (CAPs) have democratized knowledge, transformed the ability of people and communities to communicate with one another, accelerated global business, and contributed to worldwide economic growth.[2]

As cross-cutting enablers, Internet access and CAPs play crucial roles helping communities around the world make progress towards the Sustainable Development Goals by, for example, lowering the cost of access to educational and health resources; facilitating simpler and more efficient communication tools; creating new platforms and forums for trade and jobs, allowing small and medium enterprises from any part of the world to sell to anyone, anywhere; and ultimately promoting economic growth.

CAPs as drivers of economic growth in communities around the world

Greater usage of the Internet and digitization of the economy drives economic growth. This applies both to fixed and mobile broadband services, and to the content and applications that users access over these access mechanisms. For example:

- The World Bank "Digital Dividends" report included a background paper that found that a 10 percent increase in fixed broadband penetration was estimated to grow GDP per capita between 0.9 and 3.2 percent, and found that across all studies across both developing and developed countries, increased broadband penetration had a positive impact on economic growth.[3]

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[1] Clarke, George R.G., Christine Zhenwei Qiang & Lixin Colin Xu, "The internet as a general-purpose technology: firm-level evidence from around the world," World Bank, February 2015: http://documents.worldbank.org/curated/en/630411468338366817/pdf/WPS7192.pdf.

[2] Given widely varying definitions of "OTT," including the fact that in some cases telecommunications providers offer "OTT" services themselves, we do not think it appropriate to attempt to precisely define the term. Rapid developments in technology, innovation in business models, and evolving consumer preferences would make it difficult to create a durable definition in any case. For this reason, we have used in this submission the term "Content and Application Providers" which we believe more accurately accounts for the types of services this open consultation is intended to discuss, and which is widely used within industry.

[3] Minges, Michael, "Exploring the Relationship between Broadband and Economic Growth," 2016: http://pubdocs.worldbank.org/en/391452529895999/WDR16-BP-Exploring-the-Relationship-between-Broadband-and-Economic-Growth-Minges.pdf.

- A study of 33 OECD countries found that doubling broadband speeds for an economy increased GDP by 0.3 percent.[4]
- GSMA, Cisco, and Deloitte showed that mobile data drives economic growth. More specifically, doubling mobile data use leads to an increase of GDP per capita growth rate of 0.5 percentage points.[5]

Furthermore, content and application providers themselves generate significant economic activity and value. For example, a recent study found that rich interaction applications on the Internet generate a significant component of the socioeconomic impact of digitization and utilization of the Internet itself.[6] Each 10 percent increase in usage of these applications has added on average US $5.6 trillion in global GDP (0.33 percent of GDP).

New opportunities in the Internet sector are also creating jobs and driving economic growth: for example, a recent study found that in addition to creating direct and indirect employment opportunities, Internet-based applications contributed a minimum of US $20.4 billion to India's GDP during 2015-2016 - a number that was expected to grow to US $270.9 billion by 2020, or nearly 8 percent of India's GDP.[7] Separately, research by PPI found that Europe had an estimated 1.64 million "App Economy" jobs as of January 2016,[8] and that Brazil was home to 312,000 jobs.[9] For the latter, the IT sector was predicted to grow by 5.6 percent in 2017, against overall predicted economic growth of 0.2 percent.

Small and medium sized enterprises in particular are increasingly utilizing the Internet and digital tools to grow and drive economic growth in their communities by overcoming traditional barriers of limited knowledge and expertise and leveraging a plethora of low-cost or free options online to grow their businesses.[10] For example, small and medium enterprises use the Internet to gain direct access to billions of customers instantly and

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[4] "Socioeconomic effects of Broadband Speed," Ericsson, September 2013: https://www.ericsson.com/res/thecompany/docs/corporate-responsibility/2013/ericsson-broadband-final-071013.pdf.

[5] "What is the impact of mobile telephony on economic growth?," GSMA, Deloitte & Cisco, November 2012: https://www.gsma.com/publicpolicy/wp-content/uploads/2012/11/gsma-deloitte-impact-mobile-telephony-economic-growth.pdf.

[6] Rich Interaction Applications are "applications that are used for a wide range of functions, allowing two parties to interact with each other in a long and growing number of ways." Arnold, René, Christian Hildebrant, Peter Kroon, and Serpil Taş. "The Economic and Societal Value of Rich Interaction Applications (RIAs)," Wissenschaftliches Institut für Infrastruktur und Kommunikationsdienste GmbH, May 2017: http://www.wik.org/fileadmin/Studien/2017/CCIA_RIA_Report.pdf.

[7] Kathuria, Rajat, Mansi Kedia, Gangesh Sreekumar Varma & Kaushambi Bagchi, "Estimating the Value of New Generation Internet Based Applications in India," Indian Council for Research on International Economic Relations, July 2017: http://icrier.org/pdf/Estimating_eValue_of_Internet%20Based%20Applications.pdf.

[8] Mandel, Michael, "The App Economy in Europe: Leading Countries and Cities," Progressive Policy Institute, June 2016: http://www.progressivepolicy.org/wp-content/uploads/2016/11/2016.06-Mandel_The-App-Economy-in-Europe_Leading-Countries-and-Cities-final.pdf.

[9] Mandel, Michael & Elliott Long, "Brazil's App Economy," Progressive Policy Institute, February 2017: http://www.progressivepolicy.org/wp-content/uploads/2017/02/PPI_BrazilAppEconomy_EN_V6_AW.pdf.

[10] "Information Economy Report 2015: Unlocking the Potential of E-commerce for Developing Countries," United Nations Conference on Trade and Development, March 2015: http://unctad.org/en/PublicationsLibrary/ier2015_en.pdf.

establish trust and international brand awareness, which allow them to access regional and global markets. In fact, small and medium businesses that are online are almost four times more likely to be exporting.[11]

In addition to clear, established benefits to businesses, online platforms are positioned to address society's biggest challenges: the Internet can provide nimble solutions to address the "last-mile" hurdles that have hampered sustainable development, particularly in regions where efforts are impeded by constrained institutions, regional conflict, or limited infrastructure. With low-cost and scalable solutions, the Internet sector has connected historically vulnerable populations with new payment platforms, market insights, and financing mechanisms, and has provided a valuable boost to human capital, with education and health platforms that can deliver crucial information or train workers remotely.[12]

The virtuous circle between telecoms operators and CAPs

Telecoms operators play a vital role in providing users with access to the Internet and its almost infinite choice of content, knowledge, applications and services. Telecoms operators are transforming their businesses into "data first" companies, with many developed country operators now making more than 50 percent of their revenues from data services.[13] This is a trend that will only continue as revenues from data services continue to increase.

A virtuous circle of content and access exists - greater demand for CAP services leads to greater demand from users for Internet access services, which leads to greater revenues for telecoms operators, funding greater investment in networks, and driving greater usage of CAPs. This virtuous circle applies in both developed and developing countries. For example:

- In sub-Saharan Africa, mobile broadband connections are predicted to increase from 28 percent in 2015 to 60 percent in 2020.[14]
- In Indonesia, online content and applications drove over IDR89 trillion (US $6.6 billion) in economic value for consumers and telecom operators in Indonesia in 2015. Of this, IDR48 trillion were paid to telecom operators for Internet access.[15]

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[11] "Local Business, Global Ambition: How the Internet is Fuelling SME Exports in Asia-Pacific," Oxford Economics, March 2017: http://www.oxfordeconomics.com/google/local_global.

[12] One recent study concluded that "[o]nline platforms have now reached such a level of adoption and influence that they are serving as powerful new tools in the fight to end poverty and promote social inclusion throughout Asia." "Six Stories, Six Paths to Development: Online Platforms as Drivers of Inclusive Growth," The Asia Foundation, 2017: http://asiafoundation.org/publication/six-stories-six-paths-to-development. In its annual report on Internet affordability, the Alliance for Affordable Internet was even more direct, concluding that "Internet access is not only a catalyst for economic growth, it is also increasingly a precondition for people to participate in government and society." "2017 Affordability Report," Alliance for Affordable Internet, 2017: http://a4ai.org/affordability-report/report/2017.

[13] Abecassis, David and Andrew Kloeden, "Broadband in Asia-Pacific: how investment, partnerships and policy are driving a global success story," Analysys Mason, October 2015: http://www.analysysmason.com/Research/Content/Reports/Broadband-in-Asia-Pacific-investment-partnerships-policy/

[14] "The Mobile Economy in Africa 2016," GSMA, 2016: https://www.gsma.com/mobileeconomy/africa/

[15] Abecassis, David, Andrew Kloeden, Alex Skouby & Vina Limanto, "Online content and applications drove over IDR89 trillion in economic value for consumers and telecom operators in Indonesia in 2015," Analysys Mason, May 2016: https://www.aicasia.org/wp-content/uploads/2016/06/A-View-of-the-Economic-Value-of-the-Internet-in-Indonesia-May-25-2016.pdf.

- In Thailand, greater use of online video services increased consumers' willingness to upgrade to fiber-to-the-home (FTTH) broadband services.[16]
- In Western Europe, there is a strong correlation between usage of CAP audio-visual services and the take-up rates of high-end broadband for both fixed and mobile.[17]
- In the United States, the majority of users of SVOD (subscription video on demand) services would be willing to spend more on their broadband services.[18]

CAPs driving demand for users to get online

Capability and relevance, the "demand side" of Internet access, is as important as availability and affordability of Internet access. Locally relevant content, and users having sufficient digital skills, are a critical part of the equation to getting more people online, to help bridge the digital divide and meet the Sustainable Development Goals.

A recent study by GSMA identified "lack of awareness and locally relevant content" as the biggest barrier overall to internet adoption in Africa, for example cited by 58% of respondents in North Africa.[19] Lack of digital skills was the second largest barrier cited. Again, competition-based market solutions are often the most appropriate way of addressing these obstacles to Internet adoption and use. Lowering legal and regulatory barriers to produce, host, and share locally relevant content and launch innovative Internet services help to provide relevance to users that encourages users to get online and use telecoms operators' data services.

CAPs and Internet traffic growth

With user demand for Internet services increasing as a result of new content and applications, technological advances have enabled telecoms operators to continue to build and expand networks to successfully provide service to an ever-increasing number of users who are demanding greater volumes of data.

Internet traffic has grown by around 8 orders of magnitude in the past 20 years, yet telecoms operator capital expenditure has stayed relatively constant as a percentage of revenues (known as "capital intensity"). This trend is forecast to continue in the future, according to the GSMA.[20] Developed country capital intensity for telecoms operators is around 15 percent today, and up to 30 percent in developing countries depending on the stage of network build-out. The GSMA forecasts that capital intensity for telecoms operators for both developed and developing countries will fall in the years to 2020, and that the gap between developed and developing country capital intensity will narrow.

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[16] Sudtasan, Tatcha and Hitoshi Mitomo, "Effects of OTT services on consumers willingness to pay for optical fiber broadband connection in Thailand," September 2016: https://www.econstor.eu/bitstream/10419/148709/1/Sudtasan-Mitomo.pdf.
[17] Kloeden, Andrew, Gentiana Shiko, Yuliya Guitard, and David Abecassis. "Operators' Digital Transformation: Unlocking EUR15 Billion Through Partnerships with OSPs," Analysys Mason, April 2017: http://www.analysysmason.com/digital-transformation-through-partnerships.
[18] "Paid OTT Video Services: Research and Insights Into Growth Opportunities and Consumer Behaviours," IBB Consulting, 2017: https://ibbconsulting.com/insights/Paid-OTT-Video-Services.
[19] Lucini, Barbara Arese, "Consumer Barriers to Mobile Internet Adoption in Africa," GSMA, 2016: https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2016/07/Consumer-Barriers-to-mobile-internet-adoption-in-Africa.pdf.
[20] GSMA (2017) "GSMA Intelligence: Capex outlook: coverage, capacity and competitive edge"

That traffic can continue to grow while costs stay relatively flat is due to the effect of Moore's Law, explored in research that demonstrated that fixed network investment can keep pace with Internet traffic growth.[21] It was also found that there was no linear relationship between traffic growth and network costs.

Furthermore, and critically, Cisco's "Visual Networking Index" reports that Internet traffic growth rates, for both fixed and mobile networks, are declining year-on-year; there is no "exponential" growth in Internet traffic, and therefore there is no exponential growth in telecoms operator costs. Part of this is due to content and application providers investing in infrastructure, which helps to deliver traffic more efficiently and more locally, reducing costs for operators and improving performance for users.

CAPs investing in infrastructure

CAPs pay telecoms providers for "transit" access to the Internet, or they invest in their own telecoms infrastructure, which can help to reduce the cost of delivery of Internet services; they do not "free-ride" on operators' networks. An Analysys Mason report published in 2014 estimated that CAPs were directly or indirectly responsible for around $100bn of capital expenditure on infrastructure in the years 2011-2014.[22]

The same study found that the capital investments of the largest CAPs were greater as a proportion of revenue than that of many telecoms operators.[23] This is because CAPs make significant capital investments in a number of areas: they invest in data centers to store and process content and services, networks to bring that content and services closer to users and reduce costs for operators in serving demand from their subscribers, and content delivery networks (CDNs) to improve performance for users together with telecoms operators.

Google, along with other content providers and international network operators, invests in its own network infrastructure to carry its traffic, and to bring our services close to users. This reduces costs for telecoms operators to whom we deliver traffic, and improves performance for users. We carry Google traffic up to 99% of the way to users, by building our own network (often in partnership with other telecommunication providers), and also provide Google Global Cache servers to telecoms operators and Internet Exchanges in over 100 countries worldwide.[24]

Innovation in telecoms by CAPs

Content and application providers are also innovating in telecommunications technologies, to help reduce the cost of building and expanding telecoms networks for the whole industry. For example, the Open Networking Foundation (ONF) was founded by a group of companies from across the Internet ecosystem - Deutsche Telekom, Facebook, Google, Microsoft, Verizon and Yahoo! - and brings operators, vendors, and integrators together to promote

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[21] Marcus, J. Scott, "The economic impact of Internet traffic growth on network operators," Wissenschaftliches Institut für Infrastruktur und Kommunikationsdienste GmbH, October 2014: http://www.wik.org/uploads/media/Google_Two-Sided_Mkts.pdf.

[22] Abecassis, David and Andrew Kloeden, "Investment in Networks, Facilities and Equipment by Content and Application Providers," Analysys Mason, September 2014: http://www.analysysmason.com/CAP-Internet-Sept2014.

[23] Id.

[24] https://peering.google.com/#/

and develop software defined networking (SDN) approaches to networks.[25] OpenCORD ("Central Office Re-architected as a Datacenter") is another pan-industry collaboration to "bring datacenter economies and cloud agility to service providers for their residential, enterprise and mobile customers."[26]

The value of partnership between telecoms operators and CAPs

As has been explained above, CAP services combined with the Internet access services provided by telecoms operators are creating a virtuous cycle of value creation and economic growth. CAP services are accelerating demand for fixed and mobile broadband, helping to stimulate the growth of traditional telecommunications markets.

Telecommunications operators are looking to the Internet and digital services to fuel a new period of growth. This process of "digital transformation" is well underway. The telecoms industry and content and application providers are able to drive more value for consumers and the economy when they work in close partnership with one another.

This fact is widely recognised by industry. For example, GSMA noted that "value in the digital economy comes from attracting complementary participants, so it is more important for mobile operators to catalyse the formation of new ecosystems and partnerships as opposed to going it alone."[27] Moreover, a recent study by Analysys Mason estimated that if telecoms operators and content and application providers cooperated more directly and intensely, telecommunication network operators in Europe, the Middle East, and Africa could see an annual positive impact to operating free cash flow of 15 billion Euros in 2021.[28] This would represent a 50 percent increase on today.

These partnerships can take many forms, but fall into three main areas:

- *Core business development*: working with telecoms operators to grow revenues from their core access services; for example by CAPs driving demand for high-speed broadband (as explored earlier in this document); or by bundling content such as subscription video and music on demand services.
- *Enhanced technology and operations*: partnerships on improving network performance and transforming networks through technologies such as SDN, or improving customer interactions across multiple channels, can lead to significant operational and capital expenditure savings for operators.
- *New business opportunities*: telecoms operators are a valuable route to market for services provided by CAPs, for example software-as-a-service packages for enterprise and SMB customers can be sold by telecoms operators; or by using the billing relationship that operators have with their customers as a billing mechanism

[25] https://www.opennetworking.org/news-and-events/press-releases/261-onf-formed-to-speed-network-innovation
[26] http://opencord.org/about/
[27] "GSMA Intelligence: Mobile operators: the digital transformation opportunity," GSMA, June 2016: https://www.gsmaintelligence.com/research/2016/06/mobile-operators-the-digital-transformation-opportunity/564.
[28] Kloeden, Andrew, Gentiana Shiko, Yuliya Guitard, and David Abecassis. "Operators' Digital Transformation: Unlocking EUR15 Billion Through Partnerships with OSPs," Analysys Mason, April 2017: http://www.analysysmason.com/digital-transformation-through-partnerships.

for CAP services, “carrier billing” is another new revenue opportunity, which could be worth US $24.7 billion in 2019 according to Ovum.[29]

As the Internet ecosystem continues to innovate, the number and scope of potential partnerships with telecoms operators will only continue to increase. The future for the Internet ecosystem is increased partnership and greater cooperation, not less.

Recommendations for the ITU

In a rapidly transforming world, the ITU plays an important role within its established core remit of organizing and managing spectrum, setting technical telecommunications network standards, and providing an enabling environment to promote development through telecommunication technologies.

However, Internet-based services do not fall within any part of the ITU’s mission or established remit.[30] Instead, questions regarding these services are already being dealt with in a variety of other multistakeholder institutions, including standards organizations in which ITU member states and entities are encouraged to participate. For this reason, we urge member states interested in maximizing the benefits of Internet-based services, and the Internet more generally, to consult with organizations like the Internet Engineering Task Force (IETF), W3C, ICANN, and to participate in relevant processes like the Internet Governance Forum and the UN Conference Conference on Trade and Development’s eTrade for All initiative, to do so.[31] The ITU’s focus must remain on its core mission of developing standards for telecommunications networks, managing radio spectrum, and appropriate capacity-building activities.

[29] Escofet, Guillermo, “Carrier Billing: Global Market Trends and Forecasts,” Ovum, 2015.
[30] The International Chamber of Commerce has echoed this sentiment, noting recently that it was concerned about “the expansion of the ITU’s work program beyond its original mandate to include virtually any issues related to the Internet infrastructure or the contents, applications, and services that are used on the Internet.” ICC Comments on ITU Strategic Plan for 2020-2023, July 2017: https://www.itu.int/en/Lists/CWGSFPFirstConsultation/Attachments/25//ICC_ITU.SP.07.2017.pdf.
[31] The importance of the ITU coordinating with existing organizations and structures on these issues was reflected in, among other things, the Final Acts of the 2014 Plenipotentiary Conference, with Resolution 102 resolving that the ITU should “explore ways and means for greater collaboration and coordination . . . [with] relevant organizations involved in the development of IP-based networks and the future Internet,” and by the UN General Assembly in its ten-year review of the World Summit on the Information Society, where it reaffirmed “the value and principles of multi-stakeholder cooperation and engagement” among governments, the private sector, civil society, international organizations, the technical and academic communities, and other relevant stakeholders.