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Next generation communications & the level playing field – what should be done?

June 2016

COMMUNICATIONS CHAMBERS

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About the Author

Brian Williamson is a Partner at Communication Chambers and has extensive policy and strategy experience in relation to applications, networks and radio spectrum. He has worked on the benefits of, and policy in relation to, mobile apps and the internet.

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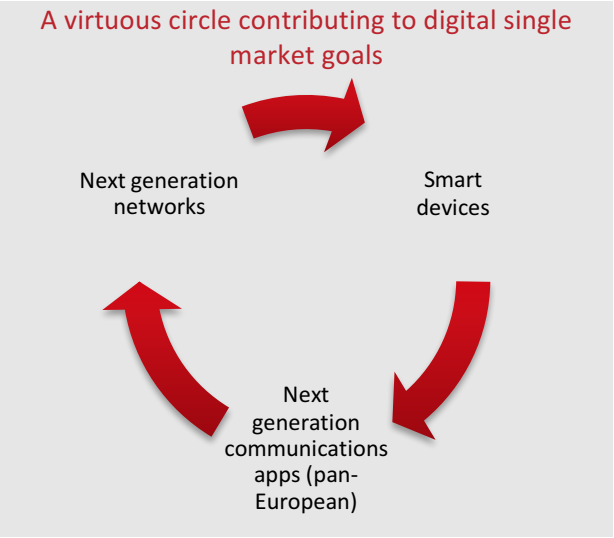
1. Executive Summary

This paper argues that the focus of sector specific *ex ante telecoms* regulation should be narrowed to access bottlenecks with freedom to innovate and compete for all in the communications apps market, that the term the 'level playing field' has no practical application and that next generation communications apps are evolving rapidly.

Some have argued that next generation communications apps (including voice, messaging, video and other forms of communication) free ride on networks and benefit from regulatory asymmetries. We address these questions, concluding that next generation communications apps do not free ride, in general do not benefit from regulatory asymmetries and suffer some competitive disadvantages due to a lack of vertical integration.

Next generation communications, far from free riding, stimulates willingness to pay for next generation networks. The user benefits are substantial, and it is not a zero-sum game, with network operators who adapt seeing revenue growth.



Apps including Skype, WhatsApp, iMessage, Google Hangouts and Facebook Messenger include features such as no cross-border charges, interoperability across networks including Wi-Fi, presence, group chat, video calling and photo sharing.

Next generation communications apps also help those with disabilities to communicate using sign language and text to speech. They help to break down language barriers with live voice translation in Skype and a "Tap to translate" feature in Android; and are seeing adoption by enterprise, particularly SMEs.

Regarding the level playing field, legacy communications enjoy advantages over next generation communications apps including access to managed network capacity and 2G coverage, integration with the default calling "app", numbering based interoperability, emergency calling and bundling under contracts. These advantages stem from vertical integration and standards. We are, however, neither proposing that these advantages be removed nor extended to others.

On the other hand, a range of sector-specific regulation applies to legacy services which does not apply to next generation communications. However, such regulation is not in general applicable to next generation communications for the following reasons.

An obligation may be neutral but next generation communications may not fall within its scope. Fees for licenced spectrum apply to anyone holding licenced spectrum, which next generation communication app providers in general do not. Other examples include provisions relating to contracts and number portability.

The rationale for a given regulatory obligation may not apply to next generation communications. Obligations that apply to access and not apps fall within this category, including aspects of universal service.

Problems in relation to market power may be unique to legacy services. These include call termination and roaming, neither of which arise in relation to next generation communications. However, to the extent that next generation communications apps compete with legacy services, the rationale for some regulation may fall away.

The balance of costs and benefits of an obligation may differ. Emergency calling is an example. Whilst in principle it might seem logical to extend this obligation to all communication services the costs of doing so, and the risk of consumer confusion and therefore harm, raise serious doubts regarding extension.

Considering the above, *a level playing field in terms of regulation is not a helpful general guiding principle for policy*. As NERA noted in a paper for GSMA, a functionality-based approach to regulation should recognise that "differences in technology may require different regulatory treatment to achieve a common objective."

There are no clean lines between apps in general and communications apps. Communications has been incorporated into a wide range of apps such as games, social networks including LinkedIn and e-commerce including e-Bay. Communications apps, for example WeChat, are also becoming platforms for other apps.

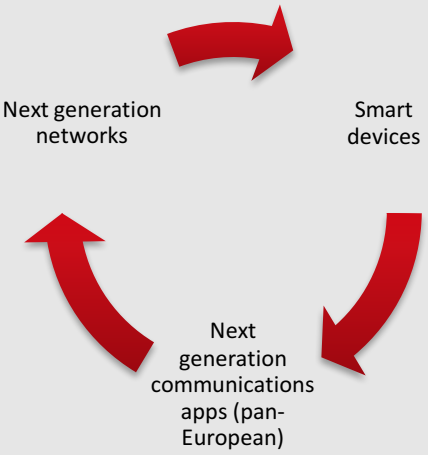
The vibrancy of next generation communications is down to freedom to innovate. Extension of regulation to next generation communications would chill European innovation in the development and use of rapidly evolving apps. Instead, an objective and problem driven approach to regulation should be adopted. Rather than extending *ex ante* regulation to the broader messaging environment, and by extension apps in general, the focus of *ex ante* regulation should be narrowed to network access bottlenecks.

2. Towards a next generation communications market

Four broad shifts are underway in the communications market:

- A shift to broadband, which is almost complete
- Smart device adoption which is mainstreaming mobile broadband and promises to lift internet adoption
- Apps (including communications apps) have taken-off - driven by innovative features, smart devices, app stores and wireless networks
- A transition to next generation access - 4G, 5G, improved Wi-Fi and more fibre - driven by apps including messaging.

Figure 1: A virtuous circle contributing to digital single market goals



Broadband goes mainstream

Broadband access and the internet opened up the potential for next generation communications applications. During the decade to 2014, fixed broadband adoption rose from 15% to just over 70% of households in Europe. By 2015 individual smartphone adoption exceeded household broadband adoption, and a number of households were smartphone only.

Rapid adoption of next generation communications

Skype, a European start-up founded in 2003, started as a PC and fixed broadband application. By 2013 Skype had international voice minutes equal to almost 40% of the entire conventional international telecom market.[1] Skype subsequently offered video calling and other services.

Coupled with the advent of apps stores from 2008, the smartphone phenomenon has propelled innovation and growth in the app market and in next generation communications.[2] For example, WhatsApp passed the 500 million and 1 billion user milestones in April 2014 and February 2016 respectively[3]; whilst by 2016 Facebook Messenger

[1] WSJ, *Skype's Incredible Rise*, in One Image, January 2015.
[2] Williamson, Chan and Wood, *A policy toolkit for the app economy - where online meets offline*, March 2016.
[3] WhatsApp, *One billion*, February 2016.

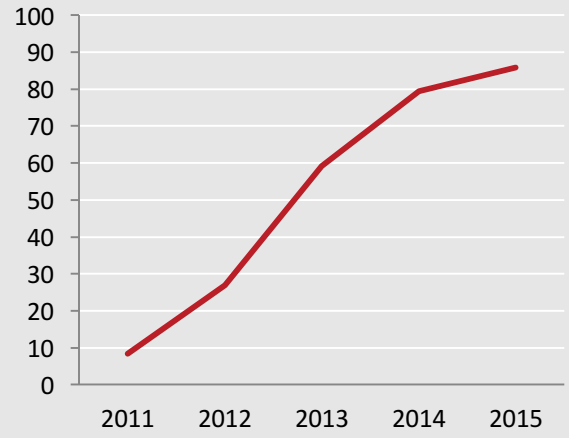
and WhatsApp carried 60 billion messages a day, three times more than SMS.[4]

Smartphone adoption continues to grow and is expected to converge with mobile adoption by 2020.[5] Coupled with ongoing innovation in relation to next generation communications apps, and improvements in the performance and availability of 4G and Wi-Fi, this will continue to propel growth in messaging apps.

Transition to next generation broadband

Fixed networks are undergoing a progressive upgrade with fibre closer to, or to, the premise (or mobile site) and higher speed technologies over copper including VDSL, G.Fast and cable DOCSIS 3/3.1.

Figure 2: Mobile 4G availability (% households)[6]



Mobile networks are undergoing a progressive upgrade as well with improved coverage, higher capacity and more efficient and capable technologies including 4G (Figure 2) and the prospect of 5G.

Innovation and investment in next generation access networks is driven by consumer use of rich applications including next generation communications applications (legacy voice and text do not require such investment since they operate over basic fixed access and 2G mobile networks). Improved 4G coverage will stimulate further adoption and use of next generation communications.

Price competition & tariff rebalancing

Some have argued that growth in next generation communications has been driven largely by arbitrage, the opportunity to undercut existing telecoms service tariff structures. For example, the OECD:[7]

> "VoIP largely exists because it exploits arbitrage opportunities. If it were a cheaper way to deliver calls we would expect mobile networks to have adopted it themselves."

[4] The Verge, *Messenger and WhatsApp process 60 billion messages a day, three times more than SMS*, April 2016.
[5] Asymco, *When will the European Union Five reach smartphone saturation?*, 2013.
[6] European Commission, *Digital Agenda Scoreboard* [accessed 17 April 2016]
[7] OECD, *Working Party No. 2 on Competition and Regulation*, June 2011.

Networks are, of course, adopting internet protocol with telecoms undergoing a transition to "All-IP"[8]. VoIP is also about more than arbitrage, and next generation communications is about much more than VoIP.

At least initially, the price differential between next generation communications and legacy telecoms services contributed to the growth of the former. The differential was most pronounced in relation to cross border communication and roaming.

In these areas next generation communications introduced competition where it was weakest, helped align messaging prices with incremental costs (close to zero) and contributed to the completion of the digital single market in Europe.

Telecoms operators have, over time, rebalanced their tariff structures towards access and data and away from voice and SMS (with a number of mobile plans including unlimited voice and SMS).

Innovation and new features

Rapid innovation continues in relation to next generation communications apps. Conventional standards based voice and SMS have failed to keep pace (the mobile industry is, however, promoting rich communication services (RCS) and Google have announced support for RCS in Android[9]).

Examples of innovation and features provided by next generation communications apps include:

- New messaging features including group calling and chat, presence, video calling, video and photo sharing.
- Extensions beyond communication including location sharing and sending and receiving money.
- The use of forms of identity other than a telephone number can be convenient and preserve privacy, for example, when messaging within a platform such as eBay.
- The ability to communicate over a range of devices including PCs, tablets, games consoles and music players without access to voice and SMS services; and over a variety of forms of connectivity including fixed, cellular and Wi-Fi.
- Accessibility features including Apple 'Voice Over' (an OS level feature) which describes what is on the screen,

[8] LightReading, *DT Completes All-IP Move in Croatia*, 2015. http://www.lightreading.com/ethernet-ip/new-ip/dt-completes-all-ip-move-in-croatia/d/d-id/719616

[9] GSMA, *Global operators, Google and the GSMA align behind adoption of rich communications services*, February 2016.

Facebook 'automatic alternative text'[10] which uses artificial intelligence to provide a basic description of what is in an image, and Google Hangouts Captions which provides live voice transcription. Video also facilitates sign language.[11]

- Language translation of text and voice with live voice translation in Skype Translator and a cross-app "Tap to translate" feature in Android.[12]
- Development of features, including collaboration, financial service data compliance exports and security, tailored to enterprise use.[13]
- FireChat utilises mesh networking to support messaging in the absence of Wi-Fi or cellular coverage. 'FireChat alerts' allows emergency services to send alerts even if cellular service is not available.[14]

The above developments have required R&D and investment by next generation communications providers. The consumer and enterprise benefits are substantial.

Unbundling of networks, apps & devices

The rise of network independent applications including next generation communications is a form of "unbundling", though as a rule next generation communications apps have co-existed alongside legacy voice and SMS (with the exception of use on devices other than mobile phones such as tablets, music players etc).

FreedomPop, a mobile "phone" service originating in the US and now available in the UK, operates as an MVNO.[15] FreedomPop take "unbundling" further, offering free data connectivity and a messaging app which operates over a data connection, rather than support for the standard pre-installed calling app.

Next generation communications may therefore pave the way to business models that do not involve vertical integration or bundling of messaging, devices and networks. These developments raise a question over the claim that legacy services are disadvantaged, since they are typically integrated by default into devices and network service offers to the exclusion of other competing services, whereas next generation communications is not.

[10] Facebook, *Using Artificial Intelligence to Help Blind People 'See' Facebook*, April 2016.
[11] Quartz, *A startup from Israel has accidentally created "WhatsApp for the deaf"*, April 2015.
[12] Google blog, *Translate where you need it: in any app, offline, and wherever you see Chinese*, May 2016.
[13] The Economist, *The Slack generation - How workplace messaging could replace other missives*, May 2016.
[14] The Verge, *This app lets rescue workers send offline alerts when disaster strikes*, May 2016.
[15] http://uk.freedompop.com/uk?experience=organic.default

Open messaging initiatives

Next generation communications have developed rapidly via individual apps which compete with another, and seek to identify unmet niches in the market. It is up to developers to decide what platforms they support, so not all apps are available on all platforms.

An open source initiative, OpenWebRTC, is bringing next generation communications support to browsers on a cross platform basis.[16] Chrome and Firefox support WebRTC, and support is in development for WebKit – the open-source web browser engine used by Apple Safari and other browsers.[17]

There is also an Ericsson initiative,[18] in collaboration with Google, that allows mobile operators to 'connect' to multiple internet based players to deliver new services to users. The service strives to bridge the gap between operator networks and internet based applications, potentially including next generation communications services.

Integration of messaging into other applications

Messaging has also expanded well beyond standalone messaging applications and is embedded into many other applications including games, e-commerce platforms, peer-to-peer transportation and accommodation services, business collaboration platforms, social networks including LinkedIn and even baby monitors. Next generation communications have enabled this extension since messaging is just another internet based application that can be added and integrated into other applications.

Messaging as a platform

Not only do other applications come with messaging, but messaging applications are becoming platforms for other applications.

WeChat is an example of a messaging app with a developed ecosystem of additional services.[19] By early 2015, WeChat had 549 million monthly active users. Along with its basic communication features, WeChat users in China can access an array of services via "apps within an app". The lightweight apps on WeChat are called "official accounts" and there are well over 10 million of these on the platform. The cornerstone of this model is payments.

[16] http://www.openwebrtc.org
[17] https://webkit.org/status/#specification-webrtc
[18] Ericsson, *Ericsson launches "OTT Cloud Connect" service for mobile operators*, February 2016.
[19] Jean Paul Simon, *How to catch a unicorn*, 2016.

Facebook have also set out an ambition to turn Messenger into a diverse platform.[20] Messaging is a basic and familiar form of interaction that, coupled with machine intelligence, can provide a new forms of user interface and a platform for apps development and integration. Facebook Messenger is now a platform for other services, including Uber.[21]

What next?

We can observe current innovation, including use of messaging across applications and efforts to turn messaging apps into platforms. Beyond that, we are not sure. As one observer put it:[22]

> "The core issue across all of this, I think, is how much is still totally unsettled. We spent 20 years in which the mainstream internet experience was a web browser, mouse and keyboard, and over a decade in which Google was the way you navigated. Smartphones ended all that, but we haven't settled on a new model, and the idea we'll all revert back to the comfortable, simple model of the web seems increasingly remote. Even within messaging, the model is still in flux. I wrote above about the search for new psychologies, but there are deeper architectural questions than anonymity or filters, which you can see in SnapChat's disappearing messages or Meerkat and Periscope's use of live. What will the next blow-up model be - synchronous or not? One to one or one to many? Feed based or thread-based? Algorithmic filter or endless stream? Rich client or rich message? Runtime or deep links?"

What is clear is that we should let innovation, which has delivered so much already, continue. It is also clear that this is not the environment sector specific *ex ante* telecommunications regulation was designed to address. Rather than extending *ex ante* regulation to the broader messaging environment, and by extension apps in general, we should narrow the focus of *ex ante* regulation to network access bottlenecks.

Conclusion

Next generation communications continue to innovate and grow, even where legacy services are now free as part of a bundle.

[20] Wired, *Facebook Messenger: inside Zuckerberg's app for everything*, October 2015.
[21] Facebook, *Messenger Platform at F8*, April 2016.
[22] Benedict Evans, *Messaging and mobile platforms*, March 2015.

Innovation, rather than arbitrage, is the underlying driver of growth in next generation communications.

Next generation communications are also increasingly integrated into other applications, and is itself becoming a platform for applications. There are no clean lines between apps in general and messaging.

The EU electronic communications framework should be amended to support continued innovation and the complementary development of networks and applications, an issue considered in detail in Section 4.

3. Is there a free-rider problem?

> "Telecom firms complain that they do the expensive grunt work of building towers and other infrastructure, while online companies use those networks to offer services like WhatsApp or Google's Hangouts for free." WSJ, February 2016[23]

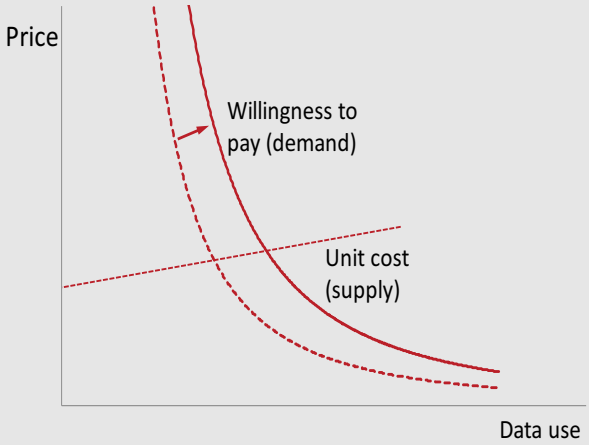
Next generation communications apps do not free ride on network access. Applications and networks are complements.

Next generation networks & communications are complements

Providers of network access do not as a rule pay next generation communications providers for bringing demand to their platform, and vice versa.

End users pay for access in order to access content and applications, including next generation communications. Richer applications increase end user willingness to pay for network coverage, speed and data capacity. Increased willingness to pay corresponds to an outward shift of the demand curve (Figure 3).[24] This both involves an increase in data use and price (if the supply curve slopes up), thereby increasing revenue.

Figure 3: Outward shift in demand due to OTT



Network demand due to next generation communications should be welcomed, and is central to the business case for investment in ubiquitous high-quality networks.[25]

Poor performance by some operators is not due to next generation communications

The revenues of mobile operators in Europe have declined in recent years, in contrast to operators in other regions where revenues have grown. Globally between 2010 and 2014 operators' revenue grew at an annual average rate of 2.7%, whilst in Western Europe revenue declined by 5.8%.[26]

Next generation communications are a global phenomenon, and therefore does not readily explain regional differences in outcomes.

[23] WSJ, *Telecom Firms Call for Level Playing Field*, February 2016.
[24] Williamson, *Over-the-top – hindering or helping achieve European Digital Agenda goals?*, April 2013.
[25] Ericsson, *App coverage*, August 2015.
[26] Ericsson, *Mobile business trends*, November 2015. Pages 4-5.

Indeed, to the extent that next generation communications has driven smartphone adoption and data growth, it is likely to have contributed to revenue growth for those operators who have adapted. Globally mobile data revenue grew at an annual average rate of 34 percent between 2010 and 2014, driven by demand for access to applications on the move.

Factors depressing revenue growth in Europe may include the delayed release of spectrum and 4G deployment (which offers improved service quality coupled with lower unit costs) and the financial crisis and recession, which has been deep and prolonged in Europe. A study by IDATE for Ericsson and Qualcomm also argued that policy is insufficiently focused on long-term investment in Europe.[27]

Operators' results suggest a turnaround may now be underway in Europe. Vodafone reported for Q4 2015 that eight out of 13 European markets were back to growth.[28] Vodafone noted that the improvement "reflects a combination of our commercial performance and strong data usage".

There has not been a value transfer from networks to applications

In addition to the argument that next generation communications free rides on networks it has been argued that the value chain is 'broken', that value has been transferred from networks to applications providers and that a fundamental change is required to return the telecommunications industry to health.

The regional differences in outcomes for network operators raise an immediate question regarding this hypothesis, namely if it were true surely it would be true globally? Yet network operators in other markets have weathered the transition to next generation communications.

We have witnessed value creation in relation to messaging, measured in terms of market valuations and consumer use and benefits. But this does not imply a transfer of value from network operators to applications providers.[29] Rather, overall value has grown.

[27] Whitepaper based on IDATE study, *Mobile operators' investments - Europe needs a pro-investment mobile regulatory framework*, November 2015.
[28] Vodafone, *Trading update for the three months ended 31 December 2015*, February 2016.
[29] Feasey, *Confusion, denial and anger: the telecoms industry and the internet*, 2013.

A more convincing explanation is that the internet is not a zero sum game, rather innovation in relation to communications has created value for providers and consumers; and for network operators who have adapted to the changing market. Ericsson, in collaboration with EY, analysed the performance of market leading network operators and concluded that:[30]

> "With voice revenues under pressure and mobile data use soaring, operators have been forced to evolve both their networks and their business models. Some have been more successful than others – we call these operators Frontrunners. Between 2010 and 2014, Frontrunners enjoyed a 9.6% CAGR while competitors in their markets achieved only 2.7%."

Ericsson noted that frontrunners "…do not regard OTT players as threats, but instead generally leverage their offerings." Another study by IDATE considered the impact of VoIP and instant messaging on traditional service providers and concluded that, overall:[31]

> "…there appears to be a small net benefit: losses to SMS revenues have been balanced by overall increases in revenue from data-tariffs -- driven by demand for services such as VOIP and instant messaging."

A study by AT Kearney for the GSMA found that access revenues had grown globally at a rate of 14% per annum between 2008 and 2015:[32]

> "Connectivity revenue grew from EUR 199 billion in 2008 to EUR 508 billion in 2015, but this represents a smaller share of the of the total internet value chain, declining from 18 per cent to 17 per cent…"

Some operators have expressed similar views. Hiroyasu Asami of NTT DOCOMO noted that:[33]

> "Of course the services that OTT players supply often compete with the services offered by network operators. On the one hand, competition adds user value because services tend to improve as a result of the rivalry between service providers, but it also leads to added value across the board if each competitor pursues areas in which they excel."

[30] Ericsson, *Growth Codes*, May 2015.
[31] IDATE, *VOIP and instant messaging have not harmed EU telcos*, 2015.
[32] GSMA, *New GSMA Study Describes the Changing Economics of the Digital Ecosystem*, May 2016.
[33] Ericsson Business Review, *Driving service evolution in the age of smartphones*, 2013.

Whilst the CEO of UK operator EE noted that:[34]

> "… the growth of mobile-messaging services like WhatsApp wasn't a threat to his business as the sector's growth is driven by data-hungry consumers."

Data growth is sustainable

Metcalfe (co-inventor of Ethernet) predicted in 1996 that the internet would collapse due to traffic growth.[35] It did not. The reason it didn't collapse is that computing and networking technology have seen continued innovation which has kept the cost of accommodating ever higher levels of traffic relatively constant (the price per GB carried has fallen dramatically).[36]

Innovation continues to increase the capacity of fibre links; whilst spectrum, sites including small cells and new standards (5G vs. 4G vs. 3G) increase the capacity of mobile networks. Verizon noted that the transition to 4G offered a 4-5-fold reduction in unit costs and that 5G will deliver a similar reduction, for a relatively modest investment:[37]

> "keep in mind that 5G is not a replacement technology of 4G, so this is not a capital-intensive overlay to the 4G network. It really is all about high-speed video delivery over a wireless network in a very, very efficient way. You should think about 5G, again like we did with LTE, where you see those 4 to 5 incremental cost decreases when delivering that video. That's similar to what we will see in the 5G environment."

Indeed, continued technical progress coupled with slower traffic growth, would see network costs and revenues decline:[38]

> "… in the absence of demand growth induced by lower prices and an outward shift in the data demand curve – declining unit costs would result in a revenue contraction for the mobile industry. The demand stimulus from growth in the use of applications offsets the impact of declining unit costs due to spectrum efficiency, utilisation and increased spectrum availability." Page 7

[34] Wall Street Journal, *WhatsApp Is Killing SMS, but That's OK, EE's CEO Says*, February 2014.
[35] John MacMullen, *Bob gets his just desserts....*, April 1997.
[36] Kenny, *Are traffic charges needed to avert a coming capex catastrophe? A review of the AT Kearney paper A Viable Future Model for the Internet*, August 2011.
[37] Verizon, *1Q 2016 Quarter Earnings – Transcript*, April 2016.
[38] Williamson and Wood, *The Spectrum Crunch is Dead, Long Live Spectrum Demand*, 2015

Network operators have faced challenges, but these relate primarily to the 2007 recession and regulation, rather than traffic growth. As WIK noted:[39]

> "Overall, we feel that the current data continue to demonstrate that traffic growth is not a root cause of the challenges that network operators face." Page 1

Data growth, driven by user willingness to pay to access apps and by falling network unit costs driven by innovation, is sustainable.

Messaging app providers have invested in connectivity

Next generation communications providers have made targeted investments in infrastructure including servers and network infrastructure.[40] The aim is not to do what others are doing efficiently, but to lower costs and extend access where the market may not fully meet demand.

A gap, which next generation communications providers are seeking to fill by developing and sharing new technologies, is to extend access to those who currently do not have access. Whilst the focus is primarily on developing country markets, the innovation and investment efforts illustrate that next generation communications providers are not averse to investing in relation to access.

Microsoft have invested in affordable access[41], Google have invested in fibre to the premise in the US and developed balloon based access (Google Project Loon[42]), whilst Facebook have announced a collaboration with Eutelsat to launch a satellite,[43] are experimenting with providing access via solar powered drones,[44] are developing open source networking standards[45] and have announced initiatives to extend mobile wireless access and develop a high speed wireless last mile fibre substitute.[46] Microsoft and Facebook have also announced an investment in a 160 Tbps transatlantic fibre link.[47] In Q1 2016 Facebook invested $1,343 bn in R&D, 25% of revenue, with hundreds of millions planned for R&D on connectivity.[48]

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[39] WIK, *The economic impact of Internet traffic growth on network operators*, October 2014.
[40] Analysys Mason, *Investment in networks, facilities and equipment by content and application providers*, September 2014.
[41] https://www.microsoft.com/en-us/affordable-access-initiative/home
[42] http://www.google.com/loon/
[43] https://www.facebook.com/zuck/posts/10102407675865061
[44] https://info.internet.org/en/story/connectivity-lab/
[45] LightReading, *DT: Telcos Must Escape Vendor Prison*, May 2016.
[46] https://code.facebook.com/posts/1072680049445290/introducing-facebook-s-new-terrestrial-connectivity-systems-terragraph-and-project-aries/
[47] *Microsoft and Facebook to build subsea cable across Atlantic*, May 2016.
[48] https://www.facebook.com/zuck/posts/10102777889538891

Conclusion

Next generation communications do not free-ride on access; just as network access providers do not free-ride on next generation communications. Access and applications are complements. Richer applications drive demand and willingness to pay for enhanced network access, whilst improved access coverage and quality enables greater use messaging and other applications. There is no free rider problem.

4. A level playing field – but which field & what level?

> "Stagecoach companies were unhappy in the late 19th century, just as disrupted taxi companies are today. Legacy players will claim they are facing unfair competition from players that are not abiding by the same rules." Jean Paul Simon, 2016, Page 60[49]

The policy analysis in this section does not start from the idea that regulation should necessarily be the same for 'equivalent' services, or that a level playing field (with various possible interpretations) is a desirable *per se* goal. Rather, it tackles the underlying question of what specific policy and regulation, if any, of communications services is appropriate.

In the following a framework for analysis is set out, specific areas of regulation are considered and general conclusions are drawn.

Framework for analysis

Tennenhouse and Gillett (2014) discuss making innovation the primary policy goal.[50] They discuss how, towards the end of the 20th century competition supplanted universal voice as the primary goal of communications policy. The paper argues that policy makers should now pursue an innovation-first approach and undertake a 'back to basics' process of:

- "Identifying rules that are barriers to innovation
- Clarifying the original public interest values served by legacy policies, and determining which values remain relevant today
- Leveraging technology to help address today's concerns."

This basic approach appears well suited to addressing the policy questions raised by next generation communications.

NERA (2016), in a paper on behalf of the GSMA, develop the idea of functionality-based regulation.[51] The paper starts with four premises summarised below:

> "I: While markets are generally the most effective way to foster innovation and consumer welfare, they do not always deliver optimal outcomes. If market conduct is harming

[49] Jean Paul Simon, *How to Catch a Unicorn*, 2016.
[50] Tennenhouse and Gillett, What about innovation?, InterMEDIA, Volume 42(1), Spring 2014.
[51] NERA, *A new regulatory framework for the digital ecosystem*, 2016. Pages 8-9.

consumer welfare and regulatory intervention would create a net benefit, then regulations should be designed to achieve the greatest possible benefit at the lowest possible cost.

II: Policy should be functionality-based, rather than structure- or technology-based. By this we mean that regulatory policy should be designed to achieve the desired objective (e.g., protecting privacy, promoting universal adoption, providing incentive for investment and innovation) in the most efficient way, regardless of the technology, industry structure, or legacy regulatory regime.

III: Information technology markets are characterised by dynamic competition, meaning that companies largely compete through innovation, rather than price. This competition leads to rapid changes in markets and technologies, so regulation must be flexible enough to accommodate these changes while creating the regulatory certainty and predictability that companies need to take risks.

IV: These sweeping changes in the digital ecosystem mean that even when the goals for regulatory policies and institutions remain unchanged, it is necessary to rethink how to achieve these goals from the ground up. We therefore propose that policymakers take a bottom-up approach to regulatory reform discussions, which will encourage them to consider entirely new approaches—and be willing, where appropriate, to jettison old ones."

The NERA paper lists (Table 2, page 29) sector-specific regulation of communications providers, and the claimed disparity in treatment, across regulatory issues including economic regulation of prices and entry, consumer protection, competition regulation, privacy and data protection, security and law enforcement, and taxation. However, the NERA paper (page 32) also notes that functionality-based regulation may require different regulatory treatment of services provided via different means:

"Functionality-based regulation is related to policy criteria like technological neutrality or 'same service, same rules', but goes beyond them. First, it is technology-agnostic rather than technology-neutral, since it calls for all technological means for achieving the desired objective to be examined, but does not demand that each technology be regulated identically. Indeed, a functionality-based approach recognises that differences in technology may require

> different regulatory treatment to achieve a common objective."

Both Tennenhouse and Gillett (2014) and NERA (2016) point to the need for an objective and problem driven approach to policy, and to the need to maximize scope for innovation in relation to market outcomes and delivery of public policy goals. In what follows, specific regulatory issues relating to legacy and next generation communications are considered with these principles in mind.

Issue by issue analysis

Interoperability

Legacy voice and SMS messaging apps are interoperable in the sense that anyone with a telephone number can, in principle, contact anyone else with a telephone number (in practice the ability to discover someone's phone number and the cost of calling or texting them may constrain the extent of interoperability). This is possible because the telephone networks, by using a common set of unique identifiers, become one network. So, while interoperable among themselves, they cannot necessarily interoperate with messaging services.

It has been argued that next generation communications services lack interoperability, though what is proposed is unclear. Compelling interoperability with other next generation and legacy services may simply not be practical or desirable. DG Competition considered interoperability in relation to the Facebook acquisition of WhatsApp and concluded that:[52]

> "…technical integration between WhatsApp and Facebook [including Facebook Messenger] is unlikely to be as straightforward from a technical perspective as presented by third parties." Paragraph 139

Within technology markets there is a constant search for the combination of closed versus interoperable elements which maximises innovation and benefits.[53] Open innovation and interoperability may be in tension, after all next generation communications has innovated far faster than legacy standards based services. Viber founder Talmon Marco expressed this tension as follows: [54]

[52] DG Competition, *Case No COMP/M.7217 - FACEBOOK/ WHATSAPP*, October 2014.
[53] Autorité de la concurrence and CMA, *The economics of open and closed systems*, December 2014.
[54] The Verge, *Alone together: will one messaging app rule them all?*, May 2013.

> "You can choose to interoperate or innovate; you cannot do both at the same time."

In addition, legacy services lack interoperability across other dimensions where next generation communications apps are interoperable (Figure 4).

Figure 4: Next generation versus legacy service interoperability

	Voice	SMS	Skype	WhatsApp
Phone number interoperability (by default)	✓	✓	x	x
Device interoperability e.g. PC, tablet, mobile	x	x	✓	✓
Network interoperability (Wi-Fi, cellular & fixed)†	x	x	✓	✓

† Some mobile devices and networks support Wi-Fi based calling

Finally, consumers achieve effective interoperability by having multiple apps on their device (multi-homing), via operating system functionality that aggregates messages (for example, via the notifications screen in iOS) and via access to a common set of contacts information.

Switching and number portability

The transfer of numbers from one service provider to another is regulated to reduce switching barriers for consumers.

Such requirements can be expected to continue, given the uniqueness of numbers, and the fact that consumers cannot associate multiple numbers with a given device/SIM card.

In contrast to legacy services, consumers using next generation communications services do not need to switch provider and port their means of identity, but can adopt multiple services (multi-homing) and use multiple forms of identity.

Some have argued that consumers may nevertheless face barriers in "switching" next generation communications provider. DG Competition considered switching in relation to the Facebook acquisition of WhatsApp and found, in its market investigation, that there are no significant costs preventing consumers from switching between different apps.[55] The Commission gave the following reasons for this conclusion:

> "First, all consumer communications apps are offered for free or at a very low price. Second, all consumer

[55] DG Competition, *Case No COMP/M.7217 - FACEBOOK/ WHATSAPP*, October 2014.

communications apps are easily downloadable on smartphones and can coexist on the same handset without taking much capacity. Third, once consumer communications apps are installed on a device, users can pass from one to another in no-time. Fourth, consumer communications apps are normally characterised by simple user interfaces so that learning costs of switching to a new app are minimal for consumers. Fifth, information about new apps is easily accessible given the ever increasing number of reviews of consumer communications apps on app stores." Paragraph 109

"…the Commission has not found any evidence suggesting that data portability issues would constitute a significant barrier to consumers' switching in the case of consumer communications apps." Paragraph 113

Switching and contracts

Telecoms contracts, applying to both broadband access and voice services, are subject to specific provisions to support competition and protect consumers. Since next generation communications apps are not in general subject to contracts that bind the user to a specific term or spend, sector specific regulation of contacts is unlikely to be applicable.

Spectrum fees and coverage obligations

Spectrum fees and associated obligations are not restricted to telecoms network operators, but apply to anyone acquiring or holding licenced spectrum subject to fees or obligations.

Next generation communication service providers have not, as a rule, sought to purchase or hold licenced spectrum. As such, they do not pay fees. This is not discriminatory. Fees should however only be applied to the extent that they promote optimal spectrum use.[56]

Universal service

Universal service requirements apply to broadband, voice and facsimile. Existing requirements relate to access to underlying infrastructure in order to access services; and to the affordability of access and services.

Next generation communications have contributed greatly to affordability, and access obligations are not relevant to next generation communications. The current approach is not discriminatory.

[56] Williamson, Marks and Yi Shen, *Annual licence fees - you cannot have your cake and eat it*, January 2014.

Universal service should, however, be re-examined in light of a number of developments, in particular:

- The shift from the household (at a fixed location) to the individual (anywhere) as the primary unit of consumption.
- A shift from funding via cross subsidy or industry levy to State Aid funding for non-commercial extension of high speed broadband.
- The growing relative importance of a demand-side rather than supply side-gap. Broadband coverage is near universal, whereas around 100 million adults in Europe do not use the internet.

The outcome of such a re-examination will depend on the policy objectives. Arguably, given market developments and the goals of the Digital Single Market strategy, the focus of policy should be on:

- Broadband access and internet use; rather than telephony, facsimile and services such as call boxes.
- Mobile data availability and use, given shifts in behaviour and in the ecosystem of applications.

Further, future policy initiatives should be technology agnostic and publicly funded. This would increase transparency, reduce inefficiency resulting from sector specific levies or cross subsidy[57], foster innovation and competition in provision.

In conclusion, universal service requirements should be modernised, simplified and publicly funded; and are not applicable to next generation communications.

Voice origination, termination and roaming

Wholesale calls (and in a few cases SMS) are subject to economic regulation of prices where competition is judged insufficient. Such regulation applies to fixed call origination (in some markets), call termination and international roaming.

To the extent that fixed-mobile competition and competition from next generation communications acts as a constraint on pricing (absent regulation), regulation should be removed.[58] Whilst there is a case for reducing or eliminating existing wholesale price regulation

[57] According to the Diamond Mirrlees result taxes of inputs is inefficient compared to general taxation of income and consumption. https://assets.aeaweb.org/assets/production/journals/aer/top20/61.1.8-27.pdf

[58] The removal of voice origination from the list of relevant markets in 2014 was a step in this direction. Others, for example, the Nordic Regulators Group, have questioned whether regulation of call termination will remain relevant "As more and more traffic is made up of data, the need to maintain the traditional regulation on voice termination rates is becoming less relevant, and may even, within a foreseeable future, create market inefficiencies." Nordic Regulators Group, *The Digital Single Market Strategy*, August 2015.

of calls and SMS, it is not discriminatory between next generation and legacy messaging services.

Information gathering

It has also been suggested by BEREC that information gathering powers be extended beyond legacy services. However, if the focus of regulation is access, then information regarding applications is not relevant.

Information regarding consumer use of applications might however be of value, for example, in assessing future bandwidth demand. Such information would need to be based on stated and revealed consumer preferences and bottom-up demand estimates, rather than formal information requests to application providers.

Bundling

Bundling of services, including broadband, messaging and video could potentially make switching more difficult for consumers. Next generation communications tend to counteract the impact of bundling by allowing consumers to pick and mix the applications they want.

Emergency calls and the risk of consumer confusion

Emergency calling requirements relate to the use of telephone numbers, and are linked to requirements in relation to the location of callers.

Whilst the status quo arose for historical reasons, there are sound grounds for maintaining a narrow focus in terms of emergency call requirements:

- It is essential that the public have a clear understanding of how they can contact the emergency services to ensure that help is obtained promptly.
- Not all the devices and networks that support next generation communications would allow location to be determined, for example, an iPod touch does not have cellular service or GPS. In addition, it is the network rather than the app that has access to the location information required by emergency services.
- Emergency calling is provided over dedicated switched capacity, rather than the public internet. A managed service is required which offers a high degree of reliability; something the 'best efforts' model of internet applications does not provide.

- Accommodating a wider range of applications would impose additional costs on the emergency services and on those developing next generation communications apps.

Maintaining a narrow focus in terms of the means of reaching the emergency services, and the universality of emergency number 112, appears sound. Extending the requirement to applications would, in practice, fall short of all forms of communications.

This would likely result in consumer confusion and delays in contacting the emergency services given the ubiquity of communications in applications such as games including Angry birds and Minecraft; e-commerce including eBay; and social networks including LinkedIn. It would likely prove impossible to draw, and communicate, a clear and unambiguous distinction in terms of emergency service support beyond legacy voice (and perhaps SMS).

Data protection and interception

With the adoption of the General Data Protection Regulation overlapping provisions in the e-Privacy Directive should be removed.

In relation to interception, the costs and benefits of legal intercept of stored communications differ from those involved in providing access to encrypted communications.[59]

The question of interception highlights the importance of considering the costs and benefits of regulation in different contexts rather than simply assuming that the same rule should necessarily apply across the board.

From specific to general

The above analysis of specific regulatory requirements applying to telecoms services points to a number of general conclusions, but the idea of a level playing field for regulation does not emerge as an overriding principle.

An obligation may be neutral but next generation communications may not fall within its scope

Fees for licenced spectrum apply to anyone holding licenced spectrum, which next generation communications providers in general do not. Other examples include provisions relating to contracts and number portability.

[59] The Economist, *Internet security - When back doors backfire*, January 2016.
Abelson *et al*, *Keys Under Doormats: Mandating insecurity by requiring government access to all data and communications*, July 2015.

The rationale for a given regulatory obligation may not apply to next generation communications

Obligations that apply to network access and not applications fall within this category, including aspects of universal service obligations.

Problems in relation to market power may be unique to legacy services

These include call termination and roaming, neither of which arise in relation to next generation communications. However, to the extent that next generation communications competes with legacy services, the rationale for economic regulation of legacy services may fall away.

The balance of costs and benefits of an obligation may differ

Emergency calling is an example. Whilst in principle it might seem logical to extend this obligation to all communication services the costs of doing so (for the emergency services and next generation communications providers), and the risk of consumer confusion and therefore harm, raise serious doubts regarding extension.

Policy implications

Defining a general boundary between next generation & legacy services does not appear helpful

The question of how to define electronic communications services (ECS), in light of next generation communications, has received attention (for example, by BEREC, which did not agree a common position[60]).

One proposed approach that has been proposed is to consider whether consumers view next generation communications as substitutes for ECS. Whilst this question is relevant to the question of whether price controls relating to ECS should be removed, it does not help clarify the applicability of other regulation currently applying to ECS.

Another approach suggested by some is to consider whether next generation communications apps can make and/or receive calls to a telephone number. However, whilst this may relate to number portability provisions, it doesn't clarify other questions. Further, if use of numbering is a deciding factor in terms of whether a range of regulatory obligations apply to next generation communications,

[60] BEREC, *Report on OTT services*, January 2016.

next generation communications providers may remove useful functionality.

Focussing electronic communications regulation on access infrastructure appears desirable

An alternative to attempting to finesse the boundary of ECS and next generation communications would be to narrow the definition of electronic communications to network access. This would sharpen the focus of *ex ante* regulators, and leave legacy and next generation communication applications regulation to general competition, consumer protection and data protection law.

CERRE have proposed that electronic communications regulation be focused on access rather than services:[61]

> "Services which consist in the access to, and the conveyance of signals on, electronic communications networks."

WIK made a similar suggestion "Consider reducing the scope of the EU Framework for electronic communications to connectivity."[62]

Other specific obligations could apply independent of this change, for example, in relation to radio spectrum and telephone numbers. Roaming regulation is covered by European regulation with roaming surcharges eliminated by June 2017. Obligations in relation to emergency calling would also need to be maintained.

A level playing field for competition differs from applying the same regulation, and neither may be feasible or desirable

As NERA (2016) note, appropriate regulation may depend on the means of service delivery (even where consumers would not necessarily see the services as distinct). Platforms may also regulate markets, thereby shifting the appropriate balance between self and externally imposed regulation. As Cohen and Sundararajan (2015) noted:[63]

> "…platforms should not be viewed as entities to be regulated but rather as actors that are a key part of the regulatory framework…For non-intermediated peer-to-peer exchange in the past, the primary solution to market failure was intervention by a government agency. But today, the existence of third-party platforms that mediate exchange fundamentally alters what the market is capable of providing on its own, and it creates a new institution capable of

[61] CERRE, *An integrated framework for digital networks and services*, 2016. Page 22.
[62] WIK, *Over-the-Top players (OTTs)*, December 2015.
[63] Mary Cohen and Arun Sundararajan, *Self-Regulation and Innovation in the Peer-to-Peer Sharing Economy*, University of Chicago Law Review, Feb 2015.

> affecting what Michael Foucault referred to as the "conduct of conduct."

The concept of same regulation for same service is therefore not universally applicable, nor desirable, as a guiding principle. A possible variation would be to require the same level of consumer protection, allowing for self-regulation. However, legacy services may not be able to match the level of consumer protection afforded via self-regulation utilising information technology and data. As Joshua Gans (2015) put it:[64]

> "Uber and Airbnb are in fact some of the most regulated ecosystems in the world. They have massive regulations that would make any would-be bureaucrat proud. The problem is essentially that we have a compatibility issue between the public and private regulations…"

Another conception of the level playing field is that it relates to competitive neutrality. Whilst it is desirable not to distort competition, a completely level playing field may not be feasible, in particular given integration of legacy services.

Legacy communication services and next generation communications may have competitive advantages and disadvantages, not all of which can (or perhaps should) be removed. Whilst it has been argued that legacy services are disadvantaged by existing regulation, they also enjoy advantages compared to next generation communications, in particular legacy services:

- Enjoy dedicated network capacity and priority compared to services provided over the public internet.
- Are able to utilise more extensive 2G coverage compared to 3G and 4G data coverage.
- Are integrated with the default "Phone" and "Messaging" apps on smartphones, and cannot be replaced.
- Provide access to anyone with a number and integration to the the emergency services.

Application of the level playing field concept as an overarching principle would therefore require removal of those advantages enjoyed by legacy services. Legacy services might also be required to be supported on a cross network basis including Wi-Fi, to prevent consumer lock-in to cellular service.

[64] FTC, *Workshop Transcript - The "Sharing" Economy: Issues Facing Platforms, Participants, and Regulators*, June 2015. Page 25.

Whilst removing some of the existing regulatory constraints on legacy service providers may be justified, application of the level playing field as an overarching principle might also require new regulation of legacy services to overcome advantages stemming from vertical integration.

Doing so, however, would not necessarily be in consumers' interests as integration can simplify and improve services. To be clear, we are not necessary advocating such action, but simply illustrating *reductio ad absurdum* that a level playing field is neither straightforward, nor necessarily desirable as an overriding policy goal.

Conclusion

A level playing field for competition may be desirable but may not be achievable in practice (for example, legacy messaging has advantages stemming from vertical integration) and would not necessarily involve the same regulation across services.

The scope of the electronic communications framework should ideally be narrowed to network access, with nearly all issues in relation to legacy and next generation communications apps addressed via general competition, consumer protection and data protection law.

An objective and problem driven approach to regulation should be adopted, and would be likely to leave some asymmetries of regulation where the costs of equalisation exceed the benefits. Removing unnecessary restrictions on innovation and competition wherever possible is desirable.

5. Next generation communications - helping complete the single market

The Digital Single Market initiative aims to contribute to growth and jobs, based on three pillars:

1) Access: The Digital Single Market strategy wants to allow better access for consumers and business to online goods and services across Europe. This will remove the key differences between online and offline worlds, to break down barriers to cross-border online activity.
2) Environment: The Digital Single Market aims to create the right environment and conditions for digital networks and services to flourish by providing high-speed, secure and trustworthy infrastructures and services supported by the right regulatory conditions.
3) Economy & Society: The Digital Single Market Strategy will maximise the growth potential of the European Digital Economy and of its society, so that every European can enjoy its full benefit.

Innovation and growth in relation to next generation communications is contributing to the above goals in several ways:

- In contrast to legacy voice and SMS services, which are provided on a national basis, next generation communications services are pan-European by default.
- Next generation communications reduce language barriers by combining speech, video and text; with some apps supporting translation.
- Next generation communications stimulate demand for more ubiquitous data access; whilst video and photo sharing simulate demand for faster higher-capacity networks.

European citizens and enterprises (in particular SMEs) have benefited from next generation communications. Next generation communications focussed on the enterprise market, such as Slack, HipChat, Symphony and Skype for Business, are now also been adopted by enterprises.

These developments will facilitate cross border collaboration and development of the single market. To support the role of next generation communications in breaking down barriers to cross-border communication, it is important that the country of origin principle applies and that innovation is allowed to flourish.