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Conference Paper

Net neutrality in the Netherlands: Dutch solution or Dutch disease?

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Net Neutrality in the Netherlands: Dutch Solution or Dutch Disease?

The law of net neutrality has been in effect in the Netherlands since January 1, 2013, after having been passed on June 5, 2011 by the Lower House of the Dutch Parliament and then ratified by the Upper House a year later. This paper investigates the policy, its process, and its impact. It offers a review of the background of the problem; the design and conceptualization of the policy response, the implementation of the policy, the impact of the policy and an assessment of the policy. It also provides a discussion of the market for over the top (OTT) technology services and its role in the market. Interviews with key stakeholders were conducted to provide further insight. A financial analysis is also offered to help inform the issue. As net neutrality is on the agenda of regulators worldwide, such an analysis can be helpful to policymakers. Other countries looking to implement such a rule might learn from the Dutch example.

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Background

The Netherlands, population 16.7 million, has a competitive broadband market. The OECD notes that it has 6,652,000 wireline and 10,249,000 wireless internet subscribers.¹ Further the OECD ranks it #1 for competition between types of networks.² Cable deployment came early to the country (after there was already a copper network), and there are two next generation access (NGA) lines to almost every home. These copper lines were unbundled, so in practice a household could purchase access from a number of DSL providers as well as the local cable provider. There are three existing mobile networks: KPN, Vodafone, T-Mobile. A fourth, Tele2, recently acquired spectrum. Additionally some 80 virtual mobile operators purchase wholesale access to incumbents infrastructure and offer services to the public.³

Network neutrality, which has been defined differently from country to country, is essentially the idea that all data should move at the same speed across the internet. This was less of an issue in the narrowband era when it mattered little if an email arrived with a few seconds delay. In the broadband era where latency may degrade voice over internet protocol (VoIP) communications or make video gaming unworkable, network neutrality has been the subject of intense debate and has risen on the telecom regulatory agenda.

The topic has been the subject of academic inquiry in law, economics and engineering for 10 years since the publishing of Tim Wu's paper⁴ naming the issue. Each discipline brings certain assumptions about the motivations and incentives of the actors in the net neutrality debate, typically telecom operators; users, and content and application providers. Within the economics, academic of both the classical liberal and progressive tradition are represented.

¹<http://www.oecd.org/sti/broadband/oecdbroadbandportal.htm> See "Total fixed and wireless broadband subscriptions by country (Dec. 2012)"

² ibid

³ <http://www.kpn-wholesale.com/nl/over-kpn-wholesale/partners.aspx>

⁴ Wu, Tim. "Network Neutrality, Broadband Discrimination". Columbia University Law School, 2003. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=388863

Proponents of net neutrality, frequently of the progressive persuasion, assert that internet service providers (ISP) will discriminate data traffic for financial gain, whether by slowing, blocking or degrading certain content or applications. The solution, they argue, is to ensure many ISPs in the marketplace so that users can switch providers if they find they have a poor experience.⁵ If this is not enough, they argue that strict ex-ante regulation needs to be in place to prevent operators from harming users or content/application providers.⁶

Opponents of net neutrality, frequently of the pro-market persuasion, argue that discriminating traffic ultimately makes an operator's offering less valuable to the public.⁷ Because it is not a profit maximizing to offer less than the full internet, operators have little incentive to behave in this fashion. Further ISPs have incentives to steward the network to maximize the network experience for all subscribers as well as to innovate network management for efficiency, performance, and competitive advantage.⁸ They hold that there is no sustainable business model in offering a partial internet. Not only do shareholders not support it⁹, companies risk the wrath of unhappy customers who broadcast their dissatisfaction on social media.¹⁰ Finally strong ex post anti-trust regimes are well-equipped to handle discriminatory behavior in the event that competition doesn't work.¹¹

That competition is a factor to lessen violations of net neutrality may be the only area on which the opposing sides of net neutrality debate agree. What is interesting, however, is that concerns about net neutrality emerged in the Netherlands--ostensibly the world's most competitive broadband market--and on mobile networks. Mobile networks, though quickly evolving with ever better technologies, still have limitations in the amount of bandwidth and throughput they can accommodate. It is for this reason that America's Open Internet Order from the Federal Communications Commission (FCC), the US version of the net neutrality rule, is less strict about how operators can manage traffic mobile networks.¹²

An additional background to the discussion is the rise of over the top (OTT) technology competition. Free voice and message services such as Skype and WhatsApp have arisen on broadband networks and threaten the revenue streams of operators, the parties that make the investment in networks themselves. OTT has proved a potent competitive force, driving down prices and emboldening consumers. Meanwhile Dutch operators, still oriented to business models based on voice and message, were forced to adjust to the new paradigm of data and likely made some public relations missteps in the process.

⁵ Tim Wu Testimony for House of Representatives Task Force on Telecom and Antitrust, April 2006.

http://commdocs.house.gov/committees/judiciary/hju27225.000/hju27225_0.HTM

⁶ Lemley, Mark A. and Lawrence Lessig. "The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era" 2000 http://papers.ssrn.com/sol3/papers.cfm?abstract_id=247737

⁷ Faulhaber, Gerald. "Economics of Net Neutrality: A Review." *Communications & Convergence Review*, Vol. 3, No. 1, pp. 53-64, 2011

⁸ Yoo, Christopher and Daniel Spulber. *Networks in Telecommunications: Law and Economics*, Cambridge University Press, 2009.

⁹ Faulhaber, Gerald, Robert Hahn and Hal Singer. "Assessing Competition in U.S. Wireless Markets: Review of the FCC's Competition Reports". *Federal Communications Law Journal*, Vol. 64. July 2011

¹⁰ Federal Trade Commission. *Broadband Connectivity Competition Report*, 2007.

<http://www.ftc.gov/reports/broadband/v070000report.pdf>

¹¹ FCC Commissioner Robert McDowell, Dissent to Open Internet Order. 23 December 2010.

http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-201A4.pdf

¹² See p. 93 of FCC Open Internet Order http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-201A4.pdf

The Case for Net Neutrality Legislation

The following two sections present some of the arguments for and against net neutrality, given the situation in the Netherlands. As the term is defined differently in different countries, there are other arguments that may be used for or against the rule in other places. So these thumbnail discussions are simply meant to highlight, not exhaust, the topic.

The reasons given for mounting a campaign for net neutrality legislation in the Netherlands were to eliminate **copyright**, to protect **freedom of speech**, to protect **privacy**, and to encourage **innovation** in internet applications.

Bruno Braakhuis, then a member of Dutch parliament representing the GreenLinks party but now a member of the Party of the Animals (PvdD), sponsored the legislation explained his motives given his background in the ebusiness and interactive media industry, which is “totally dependent” on the internet. He said that the current censorship law in the Netherlands was not sufficient to protect against censorship, specifically the kind that operators were practicing against their users.¹³ Braakhuis to the *New York Times*¹⁴ declared, “For us, this is really a basic right. We consider network neutrality to be as important as freedom of the press, freedom of speech.”

The evidence he cited in support of the proposed legislation was that Vodafone offered a tariff with a higher price for WhatsApp, a popular and competing messaging service to the SMS packages offered by operators. He explained that KPN was using deep packet inspection (DPI) to determine which users were accessing competing messaging applications. He cited the tariff mobile services with surcharges to access certain services as evidence for the censorship.¹⁵

Bits of Freedom, the Dutch net neutrality lobby¹⁶ which was instrumental in advancing the rule, advocated on the issue beginning 2009. It published a position paper¹⁷ on net neutrality on January 5, 2010 which made the following observations.

- BoF holds that the internet was built on the end-to-end principle and that traffic is delivered on a best efforts basis.
- BoF defines net neutrality as an ISP not discriminating on source, content or destination of internet traffic.
- Net neutrality guarantees a free and open internet and promotes freedom of choice. Everyone should have access to the same internet. If an ISP blocks a certain application, then the user’s choice is limited.

¹³ Braakhuis, Bruno, personal interview, 29 July 2013.

¹⁴ http://www.nytimes.com/2011/06/23/technology/23neutral.html?_r=3&pagewanted=all&

¹⁵ Braakhuis, Ibid

¹⁶ A lobby is a group focused to influence decisions of the government. Bits of Freedom’s 2012 budget was €435,000, comprised mainly of donations from the Internet4All Foundation (related to Dutch ISP XS4ALL), Adessium Foundation, and SIDN, the domain name register which advocates to internet issues. Individuals gave €110,000. Corporate support included 4 “gigabit providers”, which are probably fiber companies. <https://www.bof.nl/live/wp-content/uploads/JaarverslagBitsofFreedom2012-defweb.pdf>

¹⁷ <https://www.bof.nl/live/wp-content/uploads/2010/01/netwerkneutraliteit-def.pdf>

- Net neutrality ensures innovation because if application developers have to ask ISPs for permission, they will likely not get it.
- Because of the increasing vertical nature of ISPs, they are pressured to discriminate or will be asked to discriminate. Providers will spontaneously discriminate traffic to favor their own services. The report notes that Dutch cable operator UPC also offers internet and telephony. KPN, a traditional telephony provider, also offers internet and television. XS4ALL, an ISP, was acquired by a telephony operator. It notes that VoIP is replacing traditional telephony and that YouTube is replacing television. ISPs are also under pressure from the music industry to police copyright violations and to stop piracy.
- Market forces and existing laws are not enough to stop ISPs from discriminating. Transparency is not enough because switching costs are too high, and if all providers discriminate, net neutrality proves pointless. Therefore net neutrality legislation is needed.
- Deep packet inspection violates users' privacy.
- BoF asserts that the academic literature shows that ISPs, to save on expenditure, will choose discrimination over investment in network. The paper cites an article¹⁸ by Robin Lee and Tim Wu, the only academic citation in the paper.

Further discussion is provided on the Open Internet on BoF's website.¹⁹ It notes that the open internet is

a fundamental building block for technological innovation and our democracy... Companies and the government want to block the internet... The companies that give you access to internet, internet service providers (ISPs), did until recently without interfering.

Bits of Freedom states, "Internet Service Providers will increasingly take measures to hinder or slow down Internet traffic, either at their own initiative or under pressure from third parties, unless this is prohibited". BoF blames the vertical nature of telecommunications companies as the reason they want to block content and applications.²⁰

For Bits of Freedom, however, the evidence was KPN's admission that it was using deep packet inspection (DPI) to determine the destination of the traffic on its network. Naturally a network provider can see where the traffic went once it arrived, but DPI has the ability to see the destination noted on the data packet before it reaches its destination. "We are the very first operator that has built the capability to identify where the traffic is going," noted Marco Visser, Head of Mobile, at KPN's Strategy Day²¹ for its investors on May 10, 2011.

Janneke Slöetjes is an attorney for Bits of Freedom. She recounts how the net neutrality rule evolved and BoF's role.

We were pushing net neutrality since 2009, but no one was listening. But that changed when KPN showed that they were using DPI, deep packet inspection. That's when BoF jumped on it. DPI is a violation of communications confidentiality. We told people to report crimes to the police, and they did. We had a draft law ready. It was short. The government was reviewing telecommunications law at the

¹⁸ Lee, Robin and Tim Wu. "Subsidizing Creativity Through Network Design: The Zero Price Rule and Net Neutrality". *Journal of Economic Perspectives*, Summer 2009. <http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.23.3.61>

¹⁹ <https://www.bof.nl/ons-erk/open-internet/>

²⁰ Ibid BoF position paper on net neutrality

²¹ http://pulse.companywebcast.nl/player/v1_0/default.aspx?id=12193&bb=true&swf=true Scroll to 3 hours, 32 min.

*time, and there was room to add extra provisions. We're going just one step further. The government was not enthusiastic at first, but then they saw the advantages of it. It all happened because of the hype. It was a combination of being ready, KPN's announcement, and the telecom legislation on the table. We managed to blast the opportunity. We demonstrated the problem, showed what we wanted, and how to make it happen. I'm not sure net neutrality got Bits of Freedom more supporters; net neutrality is not very sexy. An issue like PRISM gets us more support.*²²

An additional argument made for the net neutrality law is **innovation**. Many net neutrality supporters claim net neutrality is necessary to ensure innovation by application and content developers. Net neutrality supporters note that if applications developers have to “ask permission” to put their creations on the internet, then operators will deny their requests. Their reasoning comes from the notion that the internet was neutral by design, owing to the end-to-end principle, a seminal article²³ written by internet legal scholars Lessig and Lemley who referred to a then obscure paper by Saltzer, Reed and Clark, “End-to-End Arguments in System Design”.²⁴ Though not mentioned in the Bits of Freedom paper, the argument that internet architecture is the reason for innovation, also called the modularity thesis, has been promoted by Yochai Benkler²⁵, Jonathan Zittrain²⁶, and Barbara van Schewick.²⁷

The Case Against Net Neutrality Legislation

There was not a long debate period leading up to the net neutrality law, and the following arguments were not made in the Parliament, but the relevant responses to the criticisms of net neutrality supporters are that competition in the market allows users to switch operators; regulators may make the wrong diagnosis and legislation in a fast changing market (regulatory errors and unintended consequences), the problem of regulatory capture in that specific groups exploit the political process for a singular, self-serving end, the false assumptions of the rule (net neutrality is predicated on a beautiful, however unproven, theory of the end-to-end principle), and that networks also need the ability to innovate.

While net neutrality was introduced as a concept in the US in 2003, it did not take hold in Europe until 2007. A number of European legislators believed network neutrality to be an “American problem” and desired a “wait-and-see” approach. One EU commission observed, “[t]he competitive markets together with the current provisions on access and interconnection, should [...] be sufficient to protect ‘net freedoms’ and to offer a suitably open environment for both European consumers and service providers.”²⁸ Part and parcel of the European approach with its focus on **competition** as evidenced by the number of players, for example, even a small nation such as the Netherlands should have 80 or more providers, is that consumers have many choices for internet and telephony providers, and that realization by operators, holds their behavior in check.

Dutchman Jasper Sluijs who was working on his doctorate on net neutrality from 2009 and 2012 reflects,

²² The full text of the interview with Bits of Freedom is included in Appendix A.

²³ http://papers.ssrn.com/sol3/papers.cfm?abstract_id=247737

²⁴ <http://web.mit.edu/Saltzer/www/publications/endtoend/endtoend.pdf>

²⁵ *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, 2006.

²⁶ *The Future of the Internet and How to Stop It*, 2008.

²⁷ *The Internet Architecture and Innovation*, 2010.

²⁸ European Commission, ‘Commission Staff working Document: Impact Assessment SEC(2007) 1472’, 2007 9

By the end of 2008 mobile broadband adoption was still relatively insignificant, but by the middle of 2011 it had become the main competitive battleground for ISPs and moved to the forefront of the network neutrality debate in countries such as the Netherlands. . . Moreover, the often rapid developments in policymaking have been premised on even faster technological progress in broadband markets. . . The speed with which innovation in broadband takes place requires continuous investment by the private sector, and is hard to keep up with for regulators.²⁹

One of the topics that Sluijs covers in his doctoral thesis is **regulatory errors**, the problems and associated cost of misdiagnosing an anticompetitive situation and applying a draconian remedy that may be not be warranted.³⁰ The cost of the wrong legislation is even higher in emerging industries. “Because broadband, as an emerging market, is subject to above average-uncertainty, prone to network effects and dependent on investment, but not necessarily to the same extent at all times, antitrust law and regulation should be applied flexibly and on a case by case basis.”³¹

Sluijs calls on the work of Pietro Crocioni, the principal economist of Ofcom who has made exhaustive studies of competition and market power. Crocioni notes,

. . . in markets where innovation and investment are particularly important, consumers may place a higher value on receiving new or better services than on the price of these services. In these markets, most of the value to consumers is created by maintaining the firm’s incentives to innovate and invest. These benefits may not be immediate, but may only unfold and be realized in the longer run. When leveraging takes place in such markets, intervention by a regulator often means imposing remedies that may, at best, alter, distort, or reduce, and at worst, eliminate the incentives to invest and innovate. In these cases, the risks and costs of intervening, when the authority should not, could be more serious than in other cases. The key message is, therefore, that by their own nature, in emerging markets the probability of committing errors is greater. Furthermore, the risks or costs of getting a decision wrong in markets where there are network effects and/or innovation and investment are particularly important could be more serious than in cases where these features are not present.³²

Indeed economists have noted that some firms can leverage market power to their benefit, but whether they have the incentive to do it, and furthermore, whether it harms customers, are larger questions. Indeed it may happen less than expected. Crocioni clarifies that it is not the market power itself that is the problem, but a firm’s behavior that creates consumer harm.

To be sure, Dutch operators are subject to many pre-emptory or ex ante regulations. However in an emerging and fast moving industry, that ex post regulation is more appropriate. As *The 10th Anniversary Edition of*

²⁹ Sluijs, Jasper. “Net Neutrality and European Law”, introduction to doctoral thesis, University of Tilburg 2012. http://jaspersluijs.org/jaspersluijs.org/Home/Entries/2012/11/28_Dissertation_online_to_download_for_free_files/NetworkNeutralityandEuropeanLaw.pdf p. 21

³⁰ Ibid. See generally Sluijs “Chapter One: Network Neutrality between False Positives and False Negatives: Introducing a European Approach to American Broadband Markets”

³¹ Ibid. Sluijs p. 58-59

³² Crocioni, Pietro. “Leveraging of Market Power in Emerging Markets: A Review of Cases, Literature and Suggested Framework.” <http://www.utexas.edu/law/journals/tlr/sources/Issue%2087.4/Lemley/fn159.crocioni.pdf>

*Telecom Regulations Handbook*³³ suggests ex poste regulation is less costly, requires evidences, and allows the market to determine the winners, not the regulators.

Another danger with net neutrality is regulatory capture, the concept in which powerful interest groups shape public policy. There is a vast literature³⁴ in the school of public choice which seeks to understand how certain groups or individuals focus their efforts to achieve their own outcomes, while members of the public, each with only a small stake in the outcome, may ignore the issue.³⁵ One of the key findings of the school is that when regulatory agencies are created for specific industries, for example national regulatory authorities for telecommunications, the parties which are regulated are incentivized to please the regulators rather than to serve their customers.

It may be true that the end-to-end creates innovation on the internet, but this has never been proven empirically.³⁶ The academic literature on innovation including thousands of scholars and many leading lights such as Schumpeter, Rogers, Christiansen, and Teece. It may be far-fetched to build a regulatory regime on background paper that notes only a single academic article, as was the case in the Netherlands.

Perhaps the most telling reason not to support the end-to-end notion is that one of the authors of the actual end-to-end paper, David Clark, has claimed that the article has been used as a “religious tract”, which was not his intention. Clark states, “I believe I verified that the paper does not contain word ‘open’. That paper was about correctness, which is a narrow objective. It’s not even about performance.”³⁷ Clark, an engineer of the ARPANET (the forerunner of the internet), has been an active supporter of network innovation, writing articles on the topic³⁸, and now serving as the Vice-Chair of the Federal Communication Committee’s Open Internet Advisory Committee, where he also leads the Specialized Services Working Group which investigates the issue of managed or specialized services, how to classify operators’ provision of services on their own network. To be sure, Clark is sensitive to the needs of civil society (He has a political science graduate student studying internet abuses in China³⁹), but there are consequences of design choices that need to be recognized.⁴⁰

³³ <http://www.infodev.org/articles/10th-anniversary-telecommunications-regulation-handbook>

³⁴ See Bernstein (1955), Huntington (1952), Laffont & Tirole (1991), and Levine & Forrence (1990) and generally Nobel Prize winner George Stigler.

³⁵ http://www.nytimes.com/2006/08/03/opinion/03lee.html?_r=0

³⁶ Yoo, Christopher “Modularity Theory and Internet Policy”.

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2032221 (2013), Faulhaber (2011), Bennett, Richard. “Designed for Change: End to End Arguments, Internet Innovation and the Net Neutrality Debate”. Information Technology & Innovation Forum, 2009. <http://www.itif.org/files/2009-designed-for-change.pdf>.

³⁷ See David Clark’s comments during the FCC’s commencement of the Open Internet Advisory Committee. Scroll 65 minutes into the video to hear the specific comments. <http://www.fcc.gov/events/open-internet-advisory-committee-meeting>,

³⁸ “Interconnection and the Internet: The Policy Challenge.”

[http://groups.csail.mit.edu/ana/Publications/Assessing%20Broadband Reliability-Measurement and Policy Challenges tprc-2011-bm-3.pdf](http://groups.csail.mit.edu/ana/Publications/Assessing%20Broadband%20Reliability-Measurement%20and%20Policy%20Challenges%20tprc-2011-bm-3.pdf) For presentation, see http://people.csail.mit.edu/wlehr/Lehr-Papers_files/Clark%20Lehr%20Bauer%20TPRC2011%20Interconnection.pdf

³⁹ See prior video of Clark where he talks about the end to end principle and his discussion of the internet in China.

⁴⁰ Should Specific Values Be Embedded in the Internet Architecture?”

http://groups.csail.mit.edu/ana/ANA%20PUBLICATIONS/Should_Specific_Values_Be_Embedded-In-The_Internet_Architecture.pdf

In the arguments for net neutrality, the innovation thesis is often presented as networks need to be neutral so that the application and content providers can innovate. This notion is predicated on the idea of “the edge” where content and applications resides versus “the core”, the operators’ “network. This characterization while helpful in the abstract creates an unnecessary false dichotomy, as if innovation can only happen in one part of the network and necessarily at the expense of the other. Indeed modern networks may require co-innovation.⁴¹ For example video was not a reality until the broadband era. The evolution to a 3G mobile network has enabled YouTube and Netflix where it was not known on smartphones before.

Policy Implementation

Since 2009, Dutch lobby Bits of Freedom had been developing the text for a law on net neutrality, but the actual passage of the law from introduction to vote was less than two months. This was touched off by an announcement by the CEO of KPN on April 21, 2011.

The uptake of the free SMS applications in lieu of KPN’s proprietary services materially affected revenue, and KPN was not prepared for the shift. For the first time in many quarters, the company issued a profit warning. In its quarterly announcement, it noted a large drop in SMS revenue in Q1 of 2011 and lowered EBITA projections by €200 million euros from the prior year.

KPN announced on national television that it would investigate ways to recover revenue, possibly by adding a surcharge to users who wanted to access WhatsApp and other free messaging services. The company did not block or throttle the applications as such. It only stated that it wanted to explore charging fees to access them. KPN also noted that to lower costs, it would lay off 25% of its Dutch workforce about 4000-5000 FTE and replace them through outsourcing and offshoring.⁴² While the telecom industry has already outsourced many of its functions, the trend will likely continue as revenues from traditional sources decline.

The Dutch telecom regulator OPTA⁴³ approved KPN’s offer. Spokeswoman Harriet Garvelink noted "This means more choice for consumers, which allows subscriptions can take better suited to use. We therefore welcome such a development, on condition that the provider is transparent about the cost."⁴⁴

Within hours of the CEO’s announcement, Dutch Labour Party representative Martijn van Dam tweeted *KPN starts blocking services. Time for Parliament to block KPN and guarantee net neutrality in the Telecoms Act.*

⁴¹ Kovacs, Anna-Maria. *FCC’s Open Internet Order--A Financial Translation*. Dec. 31, 2010.

⁴² <http://www.kpn.com/corporate/aboutkpn/Press/pressrel/2011-EBITDA-outlook-adjusted-downwards-free-cash-flow-confirmed.htm>. Listen to CEO Elco Blok <http://nos.nl/audio/234661-ontwikkelingen-hebben-negatieve-invloed-op-omzet.html>

⁴³ OPTA is the Dutch Post and Telecommunications Authority, the now closed Dutch telecom regulator. It was subsumed into ACM (Consumer and Market Authority) in early 2013

⁴⁴ <http://tweakers.net/nieuws/74017/kpn-chatheffing-voor-mobiel-internet-komt-deze-zomer.html>



Dutch politician tweets to the effect that if KPN will block telecom services, the Parliament will block KPN and guarantee net neutrality. (Source: Twitter.com)

The Dutch Parliament had been revising its Telecommunication Act during this period, and Bits of Freedom found support from Deputy Prime Minister Maxime Verhagen (CDA) and Parliamentarians Kees Verhoeven (D66), Van Dam (PvdA), Gesthuizen (SP), Van Bommel (PVV) and the aforementioned Braakhuis (GroenLinks). Only the liberal VVD (liberal) and the conservative SGP opposed it. KPN's announcement was a catalyst to push the proposed legislation into law. Supporters used events from the Arab Spring to heighten the urgency of the open internet.⁴⁵ It seemed a no-brainer for Dutch politicians to support the "free internet".

There were but two opposing op-eds in the press. Jasper Sluijs wrote an article in the *Nederlands Juristenblad*, the largest Dutch Legal weekly declaring "Although the idea of the an 'open internet for all' appeals to the imagination, the House is wrong to restrict how ISPs can manage their traffic. The intrinsic motivation of the Court on the basis of fundamental rights is misguided. Net neutrality has unforeseen consequences for the European single market and the Netherlands' role in it."⁴⁶

Bart Schermer, assistant professor in internet law at the University of Leiden, wrote an editorial "Net neutrality is not about human rights".⁴⁷ He noted that the rule only applies to operators, not to the government, so the government could filter or discriminate. Further, he noted that the Dutch constitution and the European Charter of Fundamental Rights already protect human rights, so net-neutrality law is superfluous.

For the discussion in and beyond the Netherlands it is important to understand what Dutch net neutrality is really about: it is about regulating the telecoms market and the behaviour of internet

⁴⁵ Source forthcoming

⁴⁶ Sluijs, Jasper. "Nederland netneutraal?" *Nederlands Juristenblad*. 2011.

<http://www.recht.nl/vakliteratuur/staatsrecht/artikel/300687/nederland-netneutraal-de-zin-en-onzin-van-netneutraliteit-in-nederlands-telecommunicatierecht/>

⁴⁷ <http://www.europeanvoice.com/CWS/Index.aspx?PageID=181&articleID=71632>)

service providers, not about the protection of human rights. Mixing human rights in the net neutrality debate not only clouds our judgment on the best way to regulate the telecommunications market, it might also provide a false sense of security when it comes to the ability of governments to control the internet.

The net neutrality law, an amendment to the Act implementing the European Regulatory Framework 2009 was passed by Dutch by Parliament enshrining net neutrality under Article 7.4a of the Dutch Telecommunications Act. Penalties of up to 10% of an operators annual sales can be levied for violations.⁴⁸

Policy Design

The Dutch net neutrality law⁴⁹ has the following five provisions

Article 7.4a [Enters into force on 1 January 2013]

1. Providers of public electronic communications networks via which Internet access services are delivered and providers of Internet access services shall not hinder or slow down applications or services on the Internet, unless and to the extent that the measure in question with which applications or services are being hindered or slowed down is necessary:
 - a. to minimise the effects of congestion, whereby equal types of traffic must be treated equally;
 - b. to preserve the integrity and security of the network and service of the provider in question or the end-user's terminal;
 - c. to restrict the transmission to an end-user of unsolicited communication within the meaning of Article 11.7(1), provided that the end-user has given its prior consent for this to be done;
 - d. to implement a legislative provision or court order; or
 - e. to comply with an express request by the subscriber to obstruct services or applications due to ideological reasons specified by the subscriber if the provider does not offer the subscriber a monetary or other advantage for this request and the provider already offered the option of complying with such a request prior to 1 June 2011.
2. If an infraction of the integrity or security of the network or the service or a terminal of an end-user, as referred to in (b) of the first paragraph, is being caused by traffic coming from the terminal of an end-user, the provider, prior to taking the measure which hinders or slows down the traffic, must notify the end-user in question, in order to allow the end-user to terminate the infraction. Where the required urgency means that this is not possible prior to the measure being taken, the provider must give notice of the measure as soon as possible. The first sentence shall not apply where this concerns an end-user of a different provider.
3. Providers of Internet access services shall not make their charges for Internet access services dependent on the services and applications which are offered or used via said services.
4. Specific rules with regard to the provisions in paragraphs 1 to 3 may be provided by way of a general administrative order. The proposal for a general administrative order as provided for under this paragraph shall not be made earlier than four weeks after the draft has been submitted to both Houses of the States General.
5. In order to prevent the degradation of service delivery and the hindering or slowing down of traffic via public electronic communications networks, minimum requirements regarding the quality of service of publicly available electronic communications services may be imposed by or pursuant to a general administrative order on providers of public electronic communications networks.

⁴⁸ Further information is forthcoming from Dutch Market and Consumer Authority.

⁴⁹ See Article 7.4a in the translation of the Dutch Telecommunications Law <http://www.government.nl/files/documents-and-publications/notes/2012/06/07/dutch-telecommunications-act/tel-com-act-en-versie-nieuw.pdf> and Dutch Telecommunications Act (Telecommunicatiewet) <http://www.government.nl/documents-and-publications/notes/2012/06/07/dutch-telecommunications-act.html>

In summary operators cannot hinder or slow traffic unless (1) to minimize the effects of congestion, whereby equal types of traffic should be treated equally; (2) to preserve the integrity and security of the network, service, or end user terminal; (3) to restrict unsolicited communication (e.g. spam), only if end user has given prior consent; (4) to fulfill a court order, and (5) to comply with a subscriber's request to block a service or application for ideological reasons. If an end user is endangering the integrity or security of the network with an application or website, the network provider must notify the end user before taking action to block or slow the user's traffic. Providers of internet access services cannot price their offerings based upon the services and applications that users select on the network. Quality of service requirements may be imposed by the government to ensure minimum standards on public electronic communication networks.

The brevity of the statute was part of the strategy to its being passed, according to Bits of Freedom.⁵⁰ A closer reading of the law may bring some questions. For example "providers of public electronic communication networks which deliver internet access services and providers of internet access services", does this apply to virtual operators as well as network operators? Are virtual operators liable for actions of the network owner from whom they wholesale?

What is "internet access"? Are operators' "managed services" such as IPTV are considered outside the scope? If so, what is the boundary? What are "public electronic communication networks"? Are they the networks that are offered to the public, both retail and enterprise? Does this apply to WiFi networks at hotels etc? Or are they the government funded networks, if such things exist, in the Netherlands? This same question about general and specialized internet services has arisen on the FCC's Open Internet Advisory Committee with David Clark has head of the Specialized Services Working Group to investigate this issue. Their annual report to the FCC notes the potential problems of lack of adequate definition.⁵¹

Another question is how the user is to give consent for certain traffic management practices. For example spam blocking, malware management and other security activities, are performed at a higher level in the network. That is, they cannot be performed for some network users and not others. It seems that it would be difficult to collect the users permission to perform these tasks. Does the operator provide a waiver at the time of contract signup? Does it send a letter or email to all subscribers requesting permission? Does the operator cease security efforts while it waits for the response from subscribers? At what level of subscribers agreeing is it possible to move forward? If one subscriber disagrees to the action, but the rest agrees, what happens then?

Policy Impact

The policy impact reviews the outcomes for the reasons given for the law: censorship, freedom of speech, privacy, and innovation.

⁵⁰ Slotjes.

⁵¹ See p. 66 <http://transition.fcc.gov/cgb/oia/oia-2013-annual-report.pdf>

Censorship

Braakhuis suggests that the law is now working to eliminate censorship because operators have changed their tariff.⁵⁶ It is not clear from the law how this may be tested, or whether it is just accepted because there are no complaints.

Freedom of Speech

The freedom of speech argument is problematic because it may backfire against the goals of net neutrality advocates. Dutch freedom of speech laws protect companies as well as citizens. European freedom of speech rules, as American, cover both the speech and its transmission. So operators coerced into net neutrality rules may counter that their own rights to speech are being violated.

Sluijs observes, “This may come as a striking finding for those civil society organizations advocating a strict human rights approach to network neutrality: firms (including ISPs) enjoy fundamental rights as well under the ECHR, and could invoke such fundamental rights when being regulated. Notwithstanding the facts that network management concerns mere transmission of content and not content itself, and that network management is likely to be interpreted as expression with little public value, this will likely not withhold the court from including ISPs’ network management under freedom of expression according to the Convention.”⁵⁷

Nevertheless, there is a danger to equating traffic practices with free speech, as it can be argued both in favor of the ISP or the user. Presently Verizon in the US is using a First Amendment Free Speech argument against the FCC’s open internet rule.

The danger with the net neutrality law is that it confuses digital censorship, the deliberate blocking of content and website for political reasons, with network management. Curtailing an operator’s ability to manage a network may set a dangerous precedent. Will net neutrality lobbies be able to second-guess the management practices of any industry they see fit? Will arguments of free speech be applied opportunistically for trade protection?

Privacy

Analysis forthcoming

Innovation

As for Innovation for content and application providers, it is difficult to benchmark or measure in a comprehensive way. It may necessarily rely on anecdote. Bits of Freedom suggests that this is hard to measure and suggests checking with the regulatory office.⁵⁸

The arguments that net neutrality supports innovation is predicated on the idea that the internet itself makes it easy for any user to connect to any application and for any application to connect to any user. This is theoretically true, but in practice both users and applications face gate keepers such as app stores or search engines where the ranking of applications is not neutral at all. As such, many users fall back to social networks

⁵⁶ Braakhuis interview.

⁵⁷ Sluijs p. 132

⁵⁸ See addendum A

as the way to find applications. However social networks are not neutral either; what a user sees depends on a person's friends and whether Facebook shows the post.

In an article titled "Free Speech and the Myth of the Internet as an Unintermediated Experience"⁵⁹ Christopher Yoo observes,

..intermediation helps end users to protect themselves from unwanted content and allows them to sift through the avalanche of desired content that grows ever larger every day. Intermediation also helps solve a number of classic economic problems associated with the Internet. In short, intermediation of mass media content is inevitable and often beneficial.

More generally an app's success may be better explained by David Teece whose 1986 paper "Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy"⁶⁰ is a touchstone in the innovation literature, being cited 7269 times compared to Lessig and Lemley's end-to-end paper with 464 citations. Teece observed that most innovations are not products themselves. They have to be combined with complementary assets before they can be a marketable product. Such partnerships lower barriers of entry for the innovator and can provide rewards to an innovator upfront. It is therefore ironic that net neutrality by creating embargoes for partnerships/bundling may limiting the ability of application developers to find those complementary assets to make their applications known.

Operators, far from blocking applications and services, can actually be some of the key enablers. Operators frequently partner with OTT services. One way that innovative application providers have grown has been by partnering with mobile operators. Carriers have thousands, if not millions, of customers and can offer an attractive distribution channel. These kinds of arrangements are particularly valuable for startups which benefit from an influx of users without bearing marketing cost. Operators in this way are promoters for new applications, quite the opposite of the discriminators that they are painted.

It is worth noting that WhatsApp has also partnered with mobile operators to offer branded mobile data price plans such as Airtel Nigeria, Viva Kuwait, DiGi Malaysia, Reliance Communications (India), 3 Hong Kong, Virgin Mobile Chile, Mobily Saudi Arabia and Movistar Colombia. In some instances, these are virtual operators wanting to differentiate themselves from incumbents, so they make special offers with SMS OTT services.

In spite of paeans to the app economy, there reality for applications on the internet is challenging. The Open Internet Advisory Committee of the Federal Communication Commission has convened a working group on mobile broadband to investigate issues of mobile networks and net neutrality.⁶¹ It is chaired by Jennifer Rexford, professor of computer science at Princeton University. She notes that the average life of an app is only 1 month and generates \$700 in revenue.⁶²

Yet app developers can do more to promote their app than the realize. Christina Moazed is the CEO of ApproStar, a New York marketing agency devoted to app developers. She notes that most app developers fail to consider a marketing strategy when they release their app. "Just putting it on the internet is not enough,"

⁵⁹ http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1475382

⁶⁰ <http://www.sciencedirect.com/science/article/pii/0048733386900272>

⁶¹ <http://www.fcc.gov/encyclopedia/open-internet-advisory-committee>

⁶² <http://transition.fcc.gov/cgb/events/Presentation10-9-12.ppt>

she says. "In order to get your app known in the sea of competitors and gatekeepers such as app stores and Google, you need to do SEO and keyword modification for your app."⁶³ If developers need to market their apps so that they are found, they have left the world of the end-to-end principle.

Indeed one of the challenges of the OTT world is that internet applications succeed to disrupt established industries, but they generally don't create the cash flow to employ the number of people of the industry they disrupted. Skype managed to disrupt the global long distance calling market, but even with 124 million active users, its revenue was less than \$1 billion. Netflix and its OTT video providers account for 2% of the pay TV industry, some \$300 billion annually. Even Spotify with 600 employees is a small fraction compared to the old record label empire. Furthermore, operators invest over \$300 billion⁶⁴ per year in infrastructure more than the combined revenues of all the leading OTT players including Google and Facebook. Without infrastructure, there is no internet. An EU report notes that the telecom industry is facing overall declines of 10% in employment because of falling revenues.⁶⁵ In the U.S. alone, hundreds of thousands are employed in building and managing networks; it is just as labor intensive to manage an internet network as the classic telephone, even though the scale is much greater.⁶⁶

Nevertheless the telecom industry and applications need each other. No one gets an internet subscription without an idea of going to the internet and accessing content and applications. The more content and applications that an operator offers, the more valuable its service become. Telecom consulting firms such as Informa and IDG are doubtful that operators can create the cool applications that will compete with innovative services such as Spotify, Facebook, and Netflix. This makes blocking less likely, for if users can only get a subscription to a an operator's substandard service, they will likely not subscribe at all. The profit maximizing position is for the operator to offer both its own services and the other OTT services, or just the competing service with a competitive offer, as KPN does with Spotify.

With the internet has come the ability to pirate music on a massive, global scale. A few paid music services have emerged to provide legal copyrighted digital music for an attractive price, offering musicians remuneration for their work. Revenues declined steadily in Sweden from 2002 to the 2009. With the introduction of Spotify, however, the industry has managed a 20% gain in the last three years.⁶⁷

The Netherlands has fared even worse with its traditional music industry than Sweden, but Spotify offers some glimmers of positive news. Spotify has reduced piracy in the country, with 29% of the 1.8 million Dutch BitTorrent pirates taking just 1 file in 2012. The top 10% of the pirates account for half of the content obtained illegally, some 16 files each or more.⁶⁸ As with the changed KPN tariff, competitive pricing offers strong incentives to change behavior. Passive pirates don't bother to pirate material when then can get a reliable, quality music experience for a fair price. Such is the Spotify effect.

⁶³ Moazed, Christina, CEO ApproStar, personal email, 26 August 2013.

⁶⁴ Infonetics. Service Provider Capex, Revenue, and Capex by Equipment Type. <http://www.infonetics.com/pr/2012/2H11-Service-Provider-Capex-and-Subscribers-Highlights.asp>

⁶⁵ Kroes, Neelie. "Connected Continent" Report. 9 September 2013.

⁶⁶ U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2012.

<http://www.bls.gov/cew/cewind2012.htm>

⁶⁷ Ibid p. 9

⁶⁸ Ibid p. 1

In Sweden, digital music revenues account for almost 60% of all music industry revenue. In Netherlands the amount is just 27%, but if it could increase to the level of Sweden, ideally with more uptake of services such as Spotify, there would be an additional \$124 million for the music industry and musicians. In any case, digital music sales grew by increased by 66% in the country in 2012, the highest of any country in Western Europe.⁶⁹

While music piracy may be on the wane in some countries, piracy of film and books is going strong. Indeed a Spotify solution for these media would be welcome. In addition to Netflix and a number of over the top video services, HBO has started a program licensing directly with operators, allowing users to get its quality content without buying a cable subscription.

While not exclusively working with mobile operators, Spotify has realized significant growth and revenue by partnering with mobile operators in Europe. In addition to a successful partnership with operator Telia in Sweden, it launched its partnership with KPN in 2011. While some operators have launched their own music services (TDC Play in Denmark or Telenor's Wimp), some operators choose to partner with an industry leader.

It would seem that such partnerships should be encouraged in Europe, especially because both its telecom and the internet sector are in the doldrums. Europeans spend more time on American websites than their local versions. Of the top 25 internet companies, just 1 comes from the EU; 14 come from the US. EU Vice President Nellie Kroes wishes for the next billionaire company to come from the EU, not Silicon Valley.⁷⁰ But with the net neutrality law in the Netherlands and looming EU wide regulation on the topic, operators may be skittish about pursuing such partnerships as KPN did with Spotify for fear of inciting net neutrality, that they unfairly preference some application providers over others.

It is curious why net neutrality is not given as part of this recipe, given the urgency of governments to create legislation.

The net neutrality supporters perspective is that operators still earn revenue on subscriptions, so they can recover their investments. Bit of Freedom notes, "The most effective method to combat the effects of congestion is indeed to avoid congestion. Providers can avoid congestion in the first place by adequate investment in capacity."

Given that service revenue has declined since the imposition of the net neutrality urlle for the leading Dutch operators, the ability for an operator to make the adequate investment in capacity may be increasingly constrained.

Policy Assessment

Given the short nature of the implementation of the policy, it bears mentioning some questions in light of the policy.

(1) How does the policy compare to the ideal type proposed by *Telecom Regulators Handbook*?

⁶⁹ Ibid. P24

⁷⁰ <http://blogs.ec.europa.eu/neelie-kroes/improve-billionaire-company-europe/>

(2) Was competition allowed to work when a problem arose

(3) Has the Netherlands avoided regulatory errors and what did the Netherlands risk in making an *ex ante* rule about a dynamic and quickly developing market such as broadband?

What is good regulation?

The 10th Anniversary Edition of Telecom Regulations Handbook published in 2011 for the world community of telecom regulators, observes "Regulation has potentially high costs. The regulatory process is inherently time consuming to administer and requires considerable expenditure of resources. In addition, regulation can have unintended consequences which may be detrimental to customers and the 'public interest'. No matter how capable and well intentioned regulators are, they will never be able to produce outcomes as efficient as a well-functioning market. . . Where regulation is necessary, regulatory forbearance is the key to good outcomes. . . In other words, the concept of regulatory forbearance rests on the goal of a gradual removal of *ex ante* regulation and an accompanying increase in the use of general *ex post* competition regulation."

The rule itself does not have a definition of "open" nor does it offer metrics of openness, so it leaves an open question of how to determine this.

The haste to make the rule belies some kind of political expediency, which goes against the notion of the *Telecom Regulation Handbook* that the telecom regulator be independent and not subject to regulatory capture. If it is in fact the case that the net neutrality law can be attributed to a captured process, then this is not a desirable outcome. Another difficulty with the situation is that KPN had the regulator's blessing to bring forth the scheme. Was the regulator reprimanded for advising KPN to pursue a strategy that was ultimately found to be illegal?

It does not appear that policy making in this instance was a rational, empirical process in which a methodology was applied (problem definition, evidence-gathering, analysis, testing etc). Rather it seem to be a political process in which stakeholders use the media to promote an agenda.

A law that comes together on a short time frame based upon a company's announcement and media fanning the flames is certainly exciting, but it probably not the best circumstances for reasoned lawmaking. The human rights allegations were made, but were not prosecuted under those statutes. What does that say about the seriousness of human rights law? Are they not strong enough to be tested? What is a bona fide human rights concern then, if the human rights laws cannot be used?

There is no doubt that privacy, freedom of expression and human rights are important today as ever. But urgency is no excuse to avoid an evidenced-based approach to policy making. Indeed if the abuses are so rampant as net neutrality supporters claim, then evidence gathering should be relatively easy and prosecution by using the relevant and existing laws and institutions should prove them right.

Additionally because of the haste, some important provisions have been left out including other players that may discriminate, censor or otherwise inhibit freedoms such as the government or even OTT players themselves. A proposed EU law on net neutrality would include OTT players.

Can competition work?

In an open society with good information and competition, bringing abuse to light should allow the market forces to work. It is unfortunate that this example did not include the market option, so it cannot be known whether the market would work.

Furthermore a competition test for consumer harm would require a three pronged test.

1. Does a firm possess significant market power (SMP)?
2. Does the firm exercise the SMP?
3. How have the consumers been harmed?

Did the Netherlands avoid regulatory errors?

To be sure, the Netherlands made a statement about their position on net neutrality by passing the law, making it the second country in the world to do so. Certainly its action emboldened net neutrality supporters globally and might be consistent with a larger Dutch agenda and reputation of a liberal society and its associations with the legalization of prostitution, marijuana, euthanasia, and so on.

However regulators are not infallible. The downside can be greater in an emerging market because of the foregone innovations, including network innovations, that never occur. It is too soon to tell whether regulatory errors were avoided.

A related issue is how the Dutch decision figures into the larger EU wide question of net neutrality. Sluijs makes a potent case for the importance of harmonization of telecom law across the EU.

The threat of regulatory divergence across Member States in and of itself should be enough to justify harmonizing regulation at the EU level. After all, this research has demonstrated that fragmentation of network management regulation leads to inefficiencies and threatens the internal market. A harmonized European approach to network management, rather, is in the best interest of both ISPs and CSPs. ISPs can benefit from a consistent European network management policy by reaping the benefits from scale economies, which in turn would incentivize them to enter more national markets across the EU. This would then increase competition between ISPs, either on an intermodal level—for instance, more ISPs entering markets by seeking access to the local loop of former telephony incumbents—or intermodal level—market entry by setting up additional mobile network, for instance. Similarly CSPs can operate more smoothly across the EU when the network management conditions under which they operate are uniform from one country to another. CSPs furthermore guarantee a specific level of Quality of Services (QoS) under a homogenous regulatory regime vis-à-vis network management, which is particularly important for an up-and-coming and increasingly important new type of content providers such as cloud computing services.

Mobile networks are standardized products, by with worldwide suppliers. Now to comply with the laws, they have to buy bespoke solutions. Time consuming, burdensome. "full harmonization" no freedom of other countries can deviate.

Given EU Vice President Kroes goal to drive a digital single market across the EU and net neutrality along with it, the Dutch case may or may not support her goal. Indeed, if all nations joined the Netherlands in the rule, then the regime would be harmonized, but if each country opts for its own definition and rule for net neutrality, the creating the digital single market will be difficult. In the case of net neutrality in Europe, should EU nations pursue their own policies, there will be opportunity for regulatory arbitrage, as companies may seek or avoid investment in certain countries depending on the legislation.

Industry Trend: Over the Top VoIP Services

OTT applications and services represents a type of co-opetition. That is simultaneous cooperation and competition. Co-opetition exists in a number of industries, for example the auto industry where competing car manufacturers may share the same input and each markets the car it produces under its respective name.

In the internet, the new technologies reside "over the top" of existing broadband networks. The competitive part is that OTT and broadband providers frequently offer the same end users similar services, for example both Skype and a voice broadband provider offer long distance calling. In addition some OTT services such as Netflix and YouTube compete with broadband providers own offerings for video as well as tax the network with high traffic load. On the cooperative side, the presence of OTT services makes a broadband provider's offering more valuable to the subscriber.

Skype managed to disrupt the global market for long distance, providing free long distance, one a key source of revenue for telephony providers. Revenue was \$860 million for the year ended 2010. There were 668 million users, 18% of which were active users, and 8.8 million paying users. With 124 million active users, Skype made less revenue than the annual operating profit of many mobile operators. It is worth noting that an operator with 124 million subscribers would make many billions of dollars, but Skype made less than \$1 billion. Such is the nature of disruptive technology. Microsoft purchased Skype in May 2011 for \$8.5 billion. The company does not breakout revenues for the service, but it is likely part of the Online Services division which has had a negative performance for the last three years.⁷¹ This division makes up just 4% of Microsoft's revenue and is the smallest division. It is not clear whether Microsoft can transition Skype users to pay \$4/month for enhanced video.

There are OTT applications for voice, messaging, video, music, books and other services. Skype (owned by Microsoft) is a popular voice over internet protocol (VoIP) application. WhatsApp is a messaging platform. Pandora is music service; Netflix is an video on demand provider. Amazon Kindle is a book retailer. All of these services are enabled by broadband networks.

Clinton administration economist Ev Ellich discusses OTT comeptition in his paper "Shaping the Digital Age: A Progressive Broadband Agenda."⁷² He notes that infrastructre, devices, applications and services are not the

⁷¹<http://www.microsoft.com/Investor/EarningsAndFinancials/Earnings/FinancialStatements/FY13/Q4/SegmentRevenues.aspx>

⁷² <http://www.progressivepolicy.org/2013/07/shaping-the-digital-age-a-progressive-broadband-agenda/>

independent markets but “compete against each other to become the focal point of the consumer’s broadband experience”, a dynamic called platform competition. If anything, the broadband providers are the most disadvantaged, because any improvement to the network helps their competitors even more. More bandwidth and better devices means more uptake, for example Siri is an Apple innovation made possible by better signaling in the network.⁷³

Ehrlich continues,

The broadband world is one in which many networks co-exist—there is no central management, protocols can be influenced by any participant, and no-longer do “dumb” devices compete with the network itself in terms of functionality. And the broadband world is one in which companies invest their own funds without guarantees, in which competition exists in every element of the customer value proposition, and in which technological progress, company strategies, and consumer preferences are continually evolving and reshuffling the deck⁷⁴.

To be sure, the improvement and proliferation of smartphones has been a boon to SMS and voice apps, as well as the improvement in networks. For example the iPhone’s Siri, the intelligent personal assistant and knowledge navigator, is an Apple innovation made possible by better signaling in the network. Smartphones feature ever better integration between the app. Additionally there are some 130 individual app marketplaces globally, so apps and app developers, in theory, have additional avenues for distribution.

The Dutch Consumer and Market Authority commissioned a study⁷⁵ of OTT services, which was published in January 2013. It observes that broadband and smart devices are enablers of OTT services and that consumers are increasingly using these services. Specifically it notes, “On sales level we see a shift from KPN to cable and a parallel of shifting market share. Mobile data market is the engine of growth, with WiFi as a substitute for mobile or mobile data. The mobile service revenue and ARPU show a slight downward trend.”

The emergence of these new services demonstrates the dynamism unleashed by broadband networks, value realized by consumers by new and expanding services, and competition for broadband providers, namely that the desire for OTT is driving Dutch consumers toward cable ostensibly because of faster speed on the fixed side and WiFi on the mobile side probably because of lower cost. Thus broadband providers supply an important foundation to the ecosystem so that dynamic competition and innovation can flourish, creating new and novel applications and services. Perhaps most telling is the fact that internet companies whose businesses are built on top of broadband infrastructure (Google, Facebook, Netflix etc) are generally more profitable than the broadband providers themselves.

WhatsApp and the Disruption of Mobile Messaging

WhatsApp Messenger "has done to SMS on mobile phones what Skype did to international calling on landlines," wrote Tim Bradshaw at the *Financial Times*.⁷⁶ By June 12, 2013 WhatsApp was handling 27 billion

⁷³ Ibid

⁷⁴ Ibid

⁷⁵ <https://www.acm.nl/nl/publicaties/publicatie/11717/Overzicht-markt-voor-over-the-top-diensten---Nederland---januari-2013-Telecompaper/>

⁷⁶ <http://www.ft.com/intl/cms/s/2/30fd99a2-0c60-11e1-88c6-00144feabdc0.html>

messages per day⁷⁷. The service is larger than Twitter. WhatsApp is the 6th best-selling app of all time in the Apple AppStore.

WhatsApp messenger is a proprietary platform where users can exchange SMS, images, video and audio messages across the leading smartphones. It was founded in 2009 by two Yahoo! veterans. The service is free for the first year, thereafter \$0.99 annually. As of June 20, 2013, WhatsApp had over 250 million active users, and handles 27 billion messages every day.⁷⁸ Once downloaded on a user's smartphone, the app finds all the user's contacts in the phone's directory, and places a logo next to one's who have WhatsApp. Handset manufacturer Nokia included a WhatsApp hard key on its Asha 210, allowing direct access to the service.

WhatsApp is just one of a class⁷⁹ of messaging apps. Facebook Messenger is a similar instant messaging application available both on Facebook and smartphones. Its key benefits include a built-in phone book, allow users to message instantly with their Facebook friends. There is no need to enter phone numbers unlike traditional mobile phones.

Beginning in 2010-11, WhatsApp and Facebook Messenger became available on smartphones in various European countries. Strand Consult, an independent consultancy, reported that operators saw SMS traffic decrease by 20% for Danish operators.⁸⁰ Other reports show declines as high as 30-40% of SMS traffic, for example the Netherlands.⁸¹ This decline in SMS traffic also results in a revenue, the funds operators need to run their businesses and build networks. It is estimated that 40% of SMS revenues will be lost by 2015.⁸²

WhatsApp clearly marks a shift from operators selling voice and SMS to selling data and value added services. Informa in its report⁸³ "VoIP and IP messaging: Operator strategies to combat the threat of OTT players" estimates that every 10% increase in smartphone penetration could cost Western European operators \$1.19 billion in voice and messaging revenues and \$306 million for Eastern European operators. Consumers choose these services not only because they are free, but frequently because they are better than operators' own services. Finally they observe that "Mobile operators are becoming invisible: As consumers engage with applications, the operators' own services are becoming buried behind the home screens of smartphones which is where most of the customer activities take place as customers 'play' with their apps."⁸⁴ The following slide illustrates Informa's expectation for how OTT messaging will take over traditional operator messaging, what it calls peer to peer (P2P) SMS.

⁷⁷ <https://twitter.com/WhatsApp/status/344966710241161216>

⁷⁸ <http://mashable.com/2013/06/21/whatsapp-250-million-users/>

⁷⁹ Others include Skype, Facebook, BlackBerry, KakaoTalk, Nimbuzz, Tango, Apple, Kik, Line, Tencent, Apple, Kik, Line, and Tencent (China).

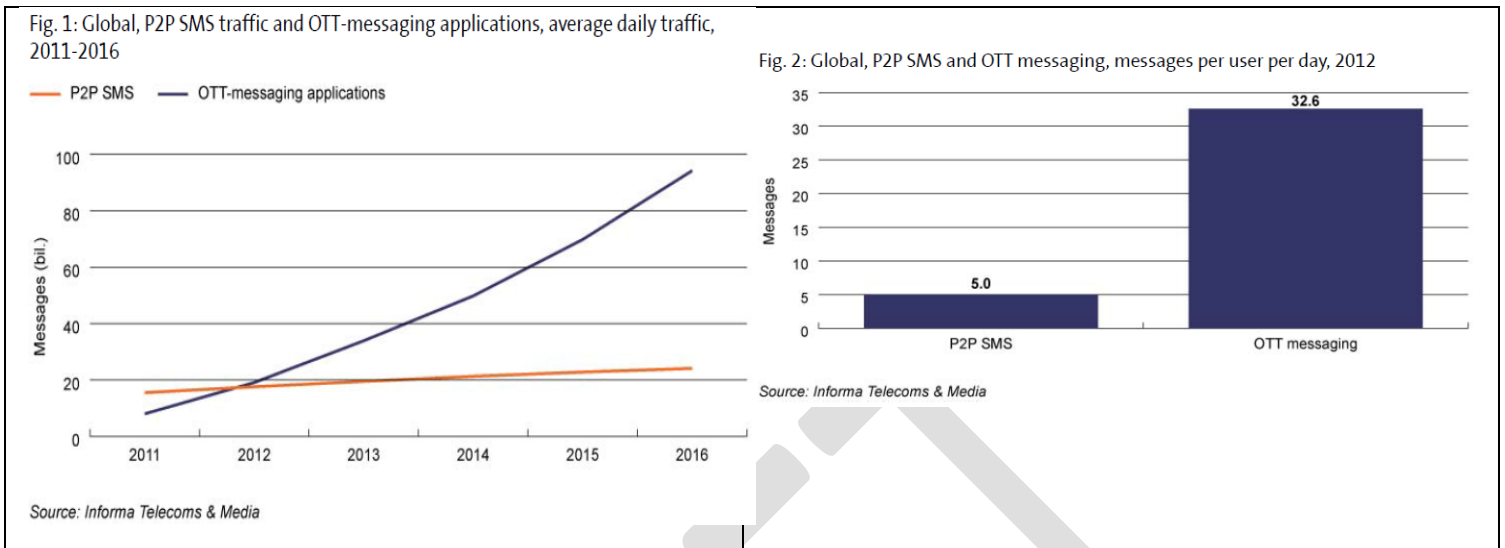
⁸⁰ <http://www.strandreports.com/sw4561.asp>

⁸¹ <http://www.rcrwireless.com/article/20120612/opinion/reality-check-how-mobile-operators-can-beat-ott-upstarts-at-their-own-game/>

⁸² http://www.telco2research.com/articles/AN_text-sms-on-fire-OTT-burn-revenue_summary

⁸³ Clark-Dickson, Pamela and Dario Telesio. "VoIP and IP messaging: Operator strategies to combat the threat of OTT players". Informa Telecoms & Media 2013.

⁸⁴ Ibid p. 1



Financial Impact to Dutch Mobile Operators

The academic literature on the financial impacts of net neutrality, specifically whether operators will invest under net neutrality, suggests conflicting results. Indeed papers by Economides and Tåg (2011) and DeMaagd and Bauer (2012) find situations in which net neutrality both helps as well as harms network operators. It should be mentioned that these papers are theoretical; that there is they are not before and after net neutrality studies. Operators face a number of competitive and regulatory pressures, so it is difficult to isolate and verify the impact of net neutrality alone. Further should an operator be negatively impacted by net neutrality in one way, for example, lowered revenue or less investment, an operator could still maintain its profit margin or EBITDA, at least in the short run, by lowering costs.

Both Informa and Telecompaper assert that OTT services have a negative impact on services revenue and ARPU. Additionally Informa considers net neutrality a negative to the financial operating environment of operators.

In any case, this paper offers a review of the key financials for three of the leading mobile operators to see whether anything might be learned. Following are data from Bank of America Merrill Lynch, a leading financial analyst of the mobile telecom industry.

KPN: Don't Shoot the Messenger

KPN is the incumbent telecom operator in the Netherlands. It offers telephone, DSL broadband, IP telephony, and mobile services. It also wholesales to a large numbers of operators (fixed as well as mobile). Traditionally it offered mobile services based on packages of voice and SMS. Data was not strongly demanded by its customers, so KPN charged as little as 2€ per month for it. Even with the smartphone introduction in 2007, KPN had relatively low priced data packages. Even through 2011, it was still pricing mainly for voice and text services. In fact SMS traffic was growing through the greater part of 2010.

Interviews with KPN CEO Eelco Blok appeared in the Telegraph, a leading newspaper in the Netherlands. It noted that Block, himself a WhatsApp user, "was startled when in the third week of March the revenue from

SMS collapsed, because consumers were using the free alternatives massively. In one month 10% of the texting volume volume melted away.”⁸⁵ "It is important that customers clearly know where they stand and what they can do, and we will be very clear about that," said Blok, noting that a price increase should be expected in summer 2011.⁸⁶

At the KPN Investor Day on May 11, 2011⁸⁷, KPN addressed the threat of WhatsApp. They highlighted the following points

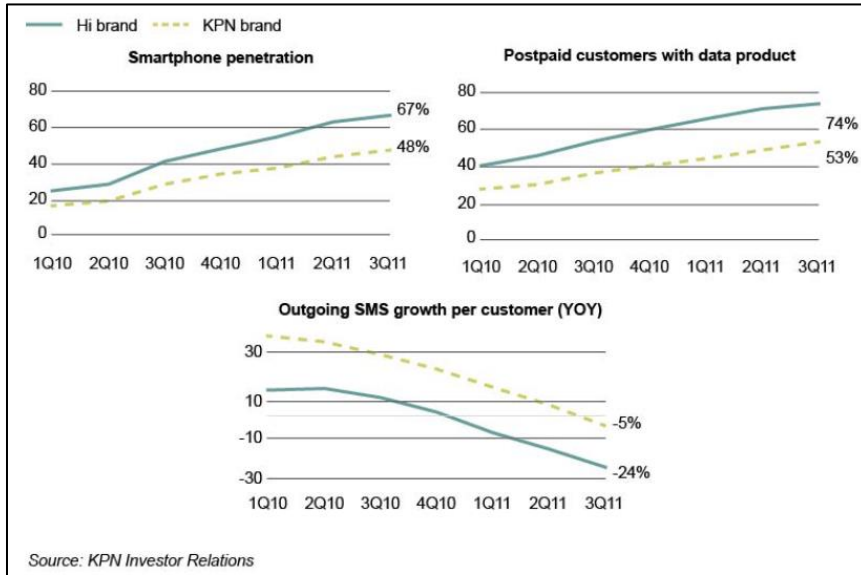
- Advanced smartphone penetration on the user base increased from 6% to 30% from the beginning of the end of 2011. (Adding new devices on a network so quickly can have effects not just for traffic management and congestion, but also revenue).
- This precipitated a stronger than anticipated drop in tradition SMS and mobile use in the youth segment, some one-third of the user base of KPN’s network. Of its “Hi” brand (segment age 18-25), WhatsApp penetration grew quickly on smartphones from 0% in August 2010 to 35% December 2010 to 85% in April 2011. Separately T-Mobile reported 70% WhatsApp penetration in 3 months of the app’s release.
- Small part of the user base adversely impacts the profit and loss statement.
- SMS revenue had been growing year over year to the fourth quarter of 2010, when it took a downturn.
- Flat fee data packages increased from 33% in Q1 2010 to 55% in Q1 2011.
- KPN was caught off guard by the change. It didn’t predict, or at least it didn’t admit. Didn’t expect that impact immediately. KPN sustained 50€ million EBITDA loss in 2011 and expected 60 million -70€ million in 2012.
- KPN explained other changes in addition to the 50€ million decline in EBITDA from SMS revenue decline plus another 50€ million decline from customers leaving KPN for other cheaper brands plus an addition impact of 300€ million in regulation from loss of roaming fees.
- KPN is determined to win market share against cable companies, requires an investment in VDSL and fiber (ostensibly revenues that came from mobile?). 100€ million investment.

⁸⁵ <http://tinyurl.com/m4pwotx>

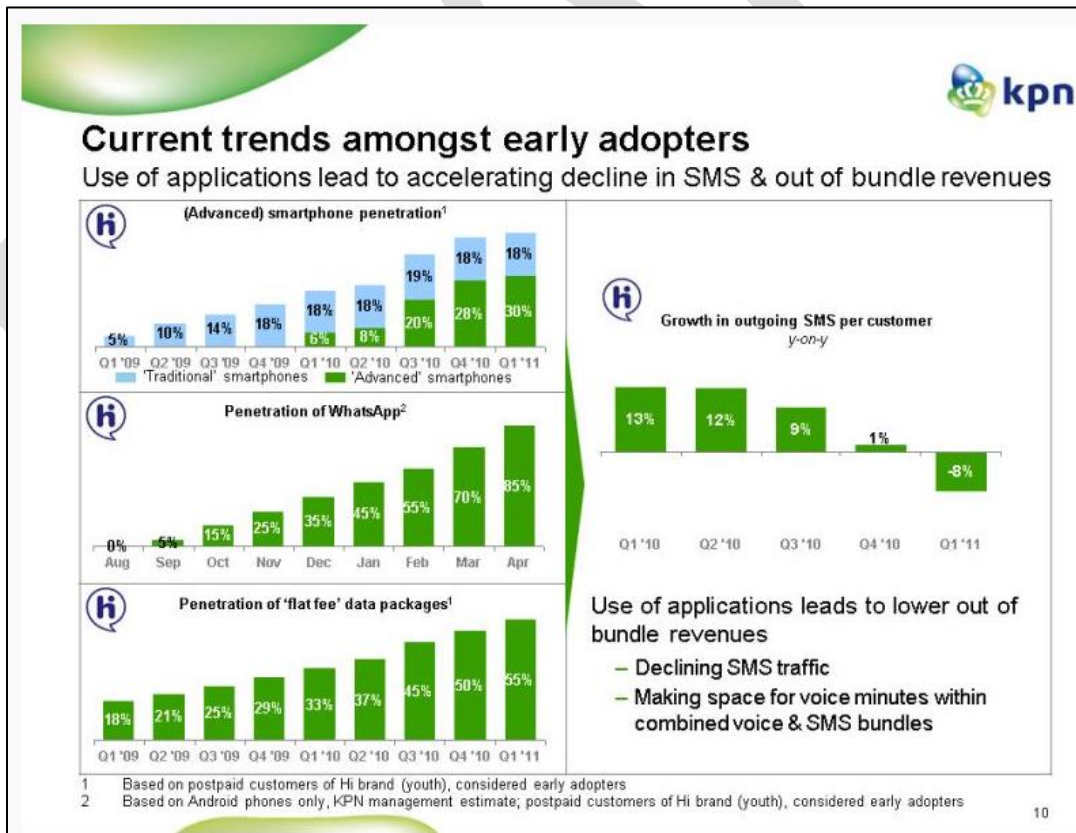
⁸⁶ <http://tinyurl.com/kydt9gg>

⁸⁷ http://pulse.companywebcast.nl/player_v1_0/default.aspx?id=12193&bb=true&swf=true


The following slide shows how users of the Hi brand had a particular impact to KPN's network and financials: they used smartphones more, they were bigger users of data, and they sent fewer SMS using KPN's services.



This slide from KPN's presentation shows the increased in advanced smartphones, the explosion of WhatsApp, the growth of flat fee data packages and the shift in SMS revenue from positive to negative in a single quarter.




This slide was presented as an example of a typical KPN customer during this period. Customer renews agreement with a new advanced smartphone, buys a flat fee data package, uses less voice and SMS by substituting with an OTT service. By substituting the OTT service, the subscriber uses less "out of bundle" minutes and messages, so KPN earns less.




Customer behavior (cont'd)

Example of mobile bill of high value customer, before new initiatives

January 2010



Handset



Nokia N95 8Gb

Usage


200 minutes

200 SMS

37 Mb data

Subscription	Cost
• Hi 30 (225 credits) ²	€ 30.00
• Data bundle	€ 9.95
• Out of bundle	€ 22.50
Total bill	€ 62.45

January 2011



Handset



Samsung galaxy S

Usage

175 minutes

160 SMS

204 Mb data

Subscription	Cost
• Hi 30 (225 credits) ²	€ 30.00
• Data bundle	€ 9.95
• Out of bundle	€ 9.00
Total bill	€ 48.95


Recent contract renewal

¹ Example of high value postpaid Hi customer that renewed contract to advanced smartphone in past months

² One voice minute is one credit; one SMS is 0.5 credits

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Source: KPN Investor Day 2011



① Future proof portfolio

Successful migration to data centric bundles


From



Volume based bundles

➔

To




Integrated data and voice bundles + VAS

First steps

- Integrated bundles
 - Data bundles no longer sold separately
- MB differentiated per bundle
- Speed differentiation
- mVoIP tariffs
- USP per brand

Future steps

- Application based packaging
 - Music, video, internet, social media
- Multi-device propositions around mobile data



1 Value Added Services, e.g. apps
39

KPN's strategy is to repackage how they sell their services by moving away from a package based on SMS and voice, to one based on voice, data with some value added services. SMS is already included. The data is priced in such a way that it does not incentivize the customer to use a competing app.

While it is not a concern for users, operators need to safeguard their ARPU levels and perform closely to investors' expectations. A single statement in the media can cause a stock price to plummet, so in practice companies script their announcements. In retrospect KPN's announcement about how they would manage VoIP was a misstep. Naturally they wanted to reassure investors that the management was on top of the revenue situation in the midst of an ambitious program to invest 100€ million in fixed line upgrades. They did not expect to engender the ire of net neutrality supporters.

The internet has forced a change in all industries. The retail and financial industries are two that have done well with the transition to the internet. But not all industries have been able to cope with change. The newspaper was one that did not succeed. However the music industry has learned to grow with digital models, however after a time. Telecom providers may not be the fastest, but allowing for a few quarters to find sustainable business models is not unheard of.

KPN's New Pricing Plan

Indeed the new plan offers more robust and differentiated pricing. Reviewing the monthly SIM-only tariff from 2011 and 2013, a different conclusion might be drawn than KPN was trying to censor its competitors. Rather it may be observed that KPN did not have proper pricing to reflect customer demand. In the 2011 tariff all bundles offered the same data amount, 1000 MB. The price only varied by the number of phone calls and SMS that customers made. It is clear that for the low call/SMS plan, there is an incentive for consumers to use free SMS applications because the number of calls and SMS are limited while the data allotment is high.

Looking at the new tariff two years hence, KPN offers more competitive pricing. For one, there is a lower entry point, €20 for 100 calls and 100 SMS and 100 MB. In 2011 customers paid €37.50 for 200 calls/SMS and 1000 MB. For the same amount today, customers get unlimited calls/SMS but only half the data. However for just €2.50 more (€40), customers get unlimited calls/SMS and twice the data as before.

It is important to note that competition amongst mobile operators and improved technology, such as KPN's 4G network (part of KPN's infrastructure roadmap long before the net neutrality rule), have helped to lower prices in the past two years. Presently T-Mobile Netherlands offers a package of unlimited calls/SMS and 4000 MB for half price for six months, €25 instead of €50. KPN can't match the price cut because of its cost structure, so it takes a loss.

In retrospect, to claim that KPN was censoring applications seems difficult to prove. KPN announced that it had the capability, not that it was already using it.

It is possible that KPN and its customers simply behaved rationally under the pricing regime. However a change in the tariff has changed behavior: customers get the applications they want without hindrance; KPN earns a fair price for its offer. The lesson for policymakers is whether and how to allow companies the flexibility to find market and technology solutions without imposing draconian ex-ante rules. To be sure, operators will likely heed KPN's example and take initiative to avoid the appearance of discrimination and the hammer of regulation.

KPN April 2011

Personal Sim Smart

Bundel	Aantal minuten/sms	Internetbundel	Normale prijs/mnd
Smart 100	100 min/sms	1000 MB	€ 30,00
Smart 150	150 min/sms	1000 MB	€ 32,50
Smart 200	200 min/sms	1000 MB	€ 37,50
Smart 275	275 min/sms	1000 MB	€ 42,50
Smart 350	350 min/sms	1000 MB	€ 47,50
Smart 450	450 min/sms	1000 MB	€ 57,50
Smart 650	650 min/sms	1000 MB	€ 77,50
Smart 1000	1000 min/sms	1000 MB	€ 100,00
Smart 1500	1500 min/sms	1000 MB	€ 150,00

<http://web.archive.org/web/20110413230029/http://www.kpn.com/prive/mobiel/tarieven/abbonementen.htm#tabcontent5>

KPN August 2013

MEEST GEKOZEN

	Basis 100	Basis 200	Alles-in-één Instap	Alles-in-één Standaard	Alles-in-één Premium
Minuten/SMS	100 + 100*	200 + 200*	Onbeperkt	Onbeperkt	Onbeperkt
Internet**	100 MB	200 MB	500 MB	2000 MB	4000 MB
Downloadsnelheid	2 Mb/s	3.6 Mb/s	25 Mb/s	25 Mb/s	50 Mb/s
Uploadsnelheid	0.1 Mb/s	2 Mb/s	5 Mb/s	5 Mb/s	25 Mb/s
Netwerk	3G	3G	4G	4G	4G
Geen buitenbundelkosten internet	✓	✓	✓	✓	✓
Gratis WiFi HotSpots	✓	✓	✓	✓	✓
Gratis ToestelVeilig	✓	✓	✓	✓	✓
250 MB erbij	×	×	€ 5,- per keer	€ 5,- per keer	€ 5,- per keer
Prijs i.c.m. toestel vanaf***	€ 29,- p/mnd	€ 35,- p/mnd	€ 45,- p/mnd	€ 47,50 p/mnd	€ 55,- p/mnd
	Kies toestel	Kies toestel	Kies toestel	Kies toestel	Kies toestel
Prijs Sim Only	€ 20,- p/mnd	€ 30,- p/mnd	€ 37,50 p/mnd	€ 40,- p/mnd	€ 50,- p/mnd
	Sim Only	Sim Only	Sim Only	Sim Only	Sim Only

<http://www.kpn.com/prive/mobiel/abbonementen.htm>

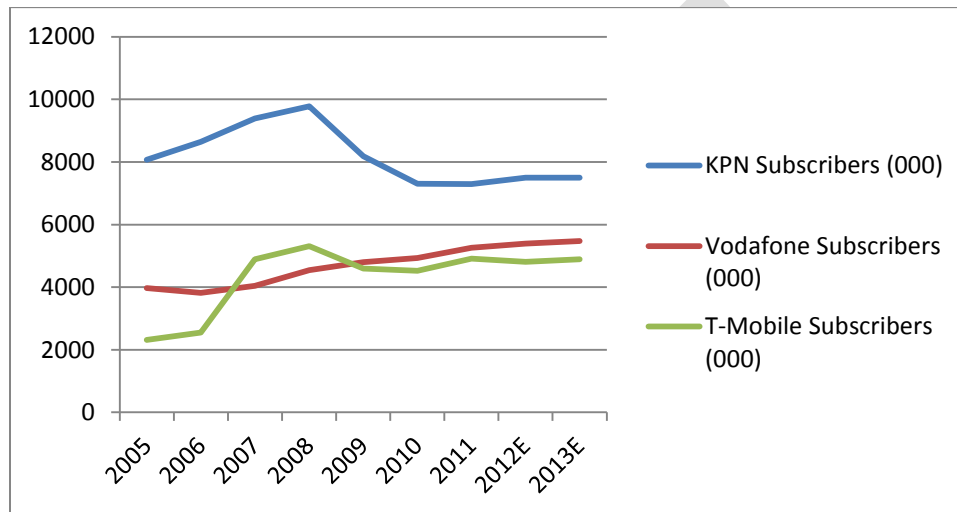
It is assumed that operators can bundle voice, sms and data into a single package and achieve profitability, but it not yet an empirical case. So operators are faring well; others are not. This is an area for more research.

Subscribers

One of the key competitive tests should be whether customers can leave an provider with whom they are unhappy. Therefore we should see customers depart their provider once they learn of an activity of which they don't approve. However given that the law came into effect just two months after allegations were revealed, it is not clear whether there was any effect to subscribers, for example whether they had enough time to switch, whether they stayed because they believed that the law would have an effect, or some other reason. To be sure, contract periods are a way to keep subscribers longer. Perhaps lessening the rules about contract periods may be a way to achieve the desired ex post competitive outcomes rather than ex ante net neutrality rules.

The following data are for blended paid and prepaid mobile subscribers in the Netherlands.

		2005	2006	2007	2008	2009	2010	2011	2012E	2013E
KPN	Subscribers (000)	8072	8642	9392	9779	8185	7305	7295	7497	7502
Vodafone	Subscribers (000)	3976	3817	4038	4543	4800	4936	5261	5393	5478
T-Mobile	Subscribers (000)	2317	2552	4889	5308	4592	4526	4909	4811	4896



Because the subscriber data is blended, the net subscriber data provides a clearer picture. KPN shows an increase leading up to 2008, but then a sharp decrease in 2009. This is the result of writing down the size of the prepaid customer base. It is possible that additional competitive forces drove the change, for example MNVOs with lower prices.

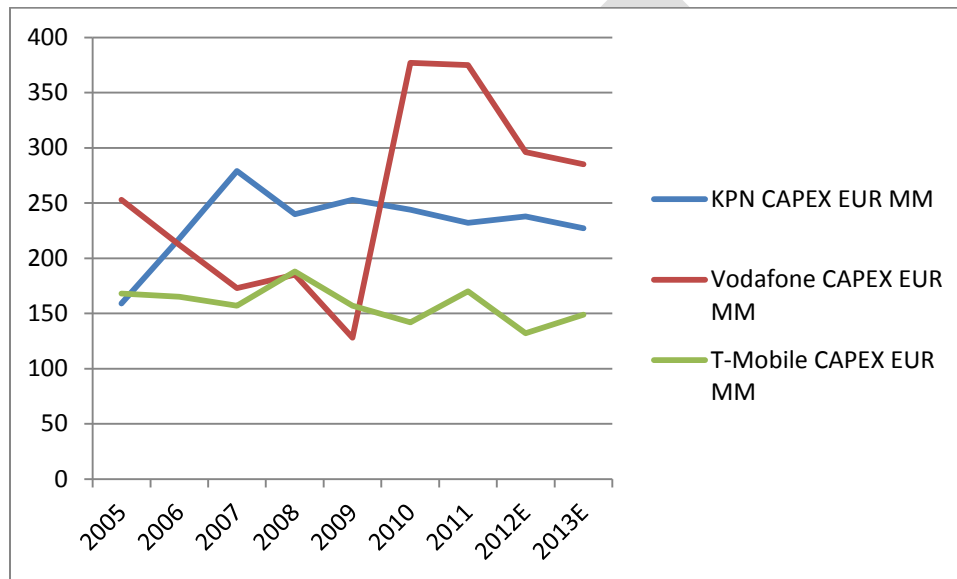
		2005	2006	2007	2008	2009	2010	2011	2012E	2013E
KPN	Net Subscriber Adds (000)	1996	570	750	9779	-1594	-889	-10	202	5
Vodafone	Net Subscriber Adds (000)	305	-159	-221	4543	257	136	325	132	85
T-Mobile	Net Subscriber Adds (000)	56	236	2337	5308	-716	-66	383	-98	85

In 2005 KPN added almost 2 million subscribers from the acquisition of Telfort. T-Mobile burst on the scene in 2007 with over 2 million net additions, and then 5 million in 2008. It should be noted that churn for operators in the Netherlands are in line with the rest of Western Europe, around 2.5% according to Bank of America Merrill Lynch.

Capex

One of the typical areas that is said to be impacted by net neutrality legislation is investment in infrastructure.

		CAPEX								
		2005	2006	2007	2008	2009	2010	2011	2012E	2013E
KPN	CAPEX EUR MM	159	218	279	240	253	244	232	238	227
Vodafone	CAPEX EUR MM	253	212	173	185	128	377	375	296	285
T-Mobile	CAPEX EUR MM	168	165	157	188	157	142	170	132	149

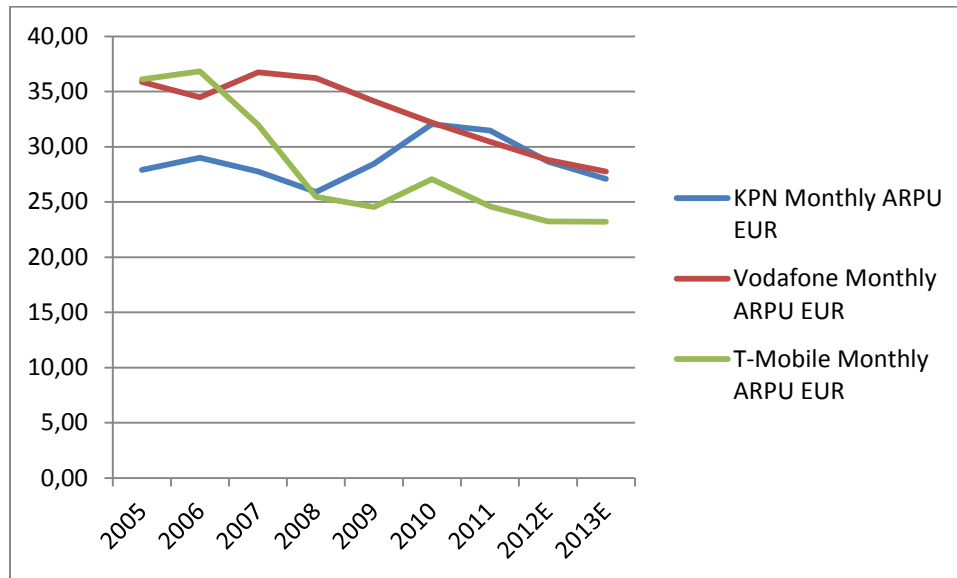


KPN shows a clear increase leading up to 2007, but then a slow decline. Vodafone shows a sharp increase in 2009 followed by a steeper decline. T-Mobile is slowing declining. However as revealed in the KPN investors day meeting, the capital investment decision is one made well in advance. KPN continues to invest in spite of a number of impacts to its business. Because customers are leaving for cable networks, KPN announced its plan to invest in fiber to the home networks. There are other investments such as spectrum licenses and updating of network equipment that continue. It is hard to bring any conclusions to the impact of net neutrality with these data, but it may be revealed in future.

Annual Revenue Per User (ARPU)

ARPU is a key industry indicator. It is the gold standard on which to judge the success of mobile operators.

		2005	2006	2007	2008	2009	2010	2011	2012E	2013E
KPN	Monthly ARPU EUR	27,90	29,00	27,75	25,90	28,44	32,04	31,47	28,65	27,1
Vodafone	Monthly ARPU EUR	35,88	34,48	36,74	36,22	34,13	32,19	30,44	28,81	27,77
T-Mobile	Monthly ARPU EUR	36,11	36,83	32,00	25,47	24,55	27,07	24,61	23,24	23,20
Country Average		30,62	30,55	30,87	28,12	28,83	30,77	29,27	27,21	26,24
YoY Growth		-6,50%	-0,20%	1,0%	-8,90%	2,5%	6,7%	-4,8%	-7,1%	-3,5%

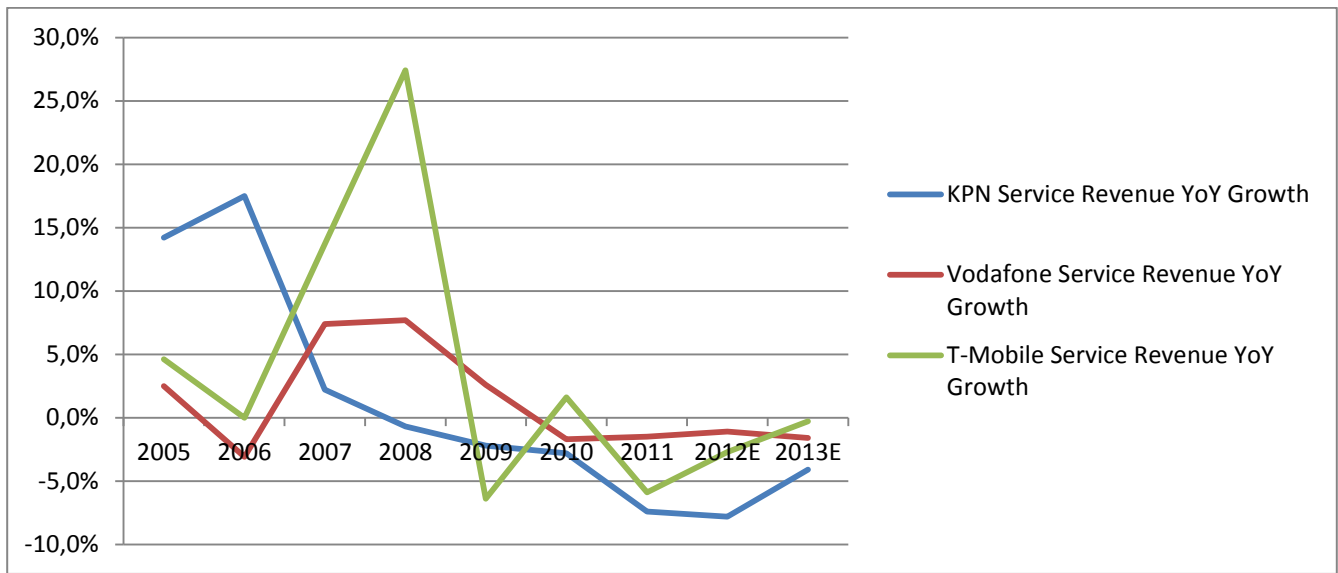


The numbers show that all three operators have sustained continued negative ARPU. KPN shows an increase between 2008 and 2010 and then a decline. This might have something to do with the net neutrality ruling, but that is not certain. T-Mobile also shows a peak when it had an exclusive offer for the iPhone, but then it decline after 2010 as customers migrate to cheaper plans. Vodafone has been declining since 2007, but had an overall higher starting point.

Services Revenue Year over Year Growth

All operators have declines in services revenues growth, though the numbers are close estimates. This might suggest that new plans selling data do not replace the revenue operators previously earned with voice and SMS. Competition in prices, competition from OTT, demand for data plans is growing.

		2005	2006	2007	2008	2009	2010	2011	2012E	2013E
KPN	Service Revenue YoY Growth	14,2%	17,5%	2,2%	-0,7%	-	-	-	-7,8%	-4,1%
Vodafone	Service Revenue YoY Growth	2,5%	-3,1%	7,4%	7,7%	2,6%	1,7%	1,5%	-1,1%	-1,6%
T-Mobile	Service Revenue YoY Growth	4,6%	8,5%	13,7%	27,4%	-	1,6%	5,9%	-2,7%	-0,3%



The winner in this scenario might be cable providers, historically strong in the Netherlands, but as they are wired providers and have higher bandwidth than smartphones, they have not been subject to the charges of restricting services on mobile networks.

It is interesting that the Ministry of the Economy informed Bits of Freedom that KPN has not been harmed financial by net neutrality legislation.⁸⁸ Using data from Merrill Lynch Bank of America, the financial results of three mobile operators is analyzed to review the assertion that there are no negative impacts of net neutrality legislation. Tele2 data was not available.

Conclusion

In many ways, net neutrality in the Netherlands creates more questions than it answers. While it seems that a battle was won for the net neutrality lobby in the short term, it is not clear that unintended consequences will result in future. Further without a solid base of evidence of violation and consumer harm, it is difficult to judge not only how the internet will be measured as open in the future.

The case of human rights violations seems weak, especially because the before and after from the user's experience don't seem very different. An additional concern is that existing laws and statutes for human rights were not exercised, but rather new rules created. Furthermore these rules don't apply to the government or other actors of the internet value chain.

The impact to innovation of content and application providers can only be anecdotally measured.

An alternative to net neutrality rules may be the multi-stakeholder process which is time consuming but fair. One outcome of the FCC ruling was the creation of the Open Internet Advisory Committee, which includes some 30 representatives of all the stakeholders in the net neutrality debate. All of the meetings are recorded

⁸⁸ See Addendum A

and open to the public (held in different locations to provide geographical reach). The videos and proceedings are published on the FCC's website along with a means for public comment.

<http://www.fcc.gov/encyclopedia/open-internet-advisory-committee>. There are four working groups dedicated to investigating issues in mobile broadband, economic impact, transparency and specialized services which have revealed a number of deficiencies in ruling. Most important, their reports highlight that issues of internet traffic management are complex and involve any many actors. Indeed it is not just operators that deliver voice, video and data.

Keeping in mind what is good regulation, countries should not adopt the Dutch approach.

Appendix

Addendum A

Bits of Freedom Interview

Janneke Slöetjes, Attorney and Privacy Advocate

28 August 2013

Question: Is the net neutrality law working today why or why not?

Slöetjes: It's working. In fact there was not much harm going on before the debate started. There was only one scandal around data traffic, privacy violation and offering different packages at different prices. KPN was proud to announce that they used DPI to determine which kind of websites customers visited and then to offer specialized packages. It wasn't the case that they were necessarily doing it, but it was enough evidence for us. KPN's announcement was a slip of the tongue. We would not have known it if they didn't announce it. A smarter company would never tell you what they're doing. They would tell you that they're enhancing your user experience rather than using DPI.

Question: How do see Dutch law in light of the larger EU effort on net neutrality?

Slöetjes: The Netherlands only plays a small role in EU. Even though EU VP Kroes is Dutch, we call her effort a "not neutrality" approach. However Netherlands can be a good example. Other countries can see that Dutch telecom companies are not lagging behind as a result of net neutrality. Other MP are sympathetic to net neutrality. They see net neutrality as a nice thing to throw in for consumers.

Question: When and how did BoF get started on the issue of net neutrality?

Slöetjes: We were pushing net neutrality since 2009, but no one was listening. But that changed when KPN showed that they were using DPI, deep packet inspection. That's when BoF jumped on it. DPI is a violation of communications confidentiality. We told people to report crimes to the police, and they did.

We had a draft law ready. It was short. The government was reviewing telecommunications law at the time, and there was room to add extra provisions. We're going just one step further. The government was first not enthusiastic, but then they saw the advantages of it. It all happened because of the hype. It was a combination of being ready, KPN's announcement, and the telecom legislation on the table. We managed to blast the opportunity. We demonstrated the problem, showed what we wanted, and how to make it happen. I'm not sure net neutrality got Bits of Freedom more supporters; net neutrality is not very sexy. An issue like PRISM gets us more support.

Question: The Dutch rule only focuses on telecom operators, but doesn't protect users from governments, websites, operating systems or devices which may also have discriminatory practices and incentives to discriminate traffic. Why didn't you support a blanket policy for all players in the value chain?

Slöetjes: This was a political issue. The Dutch government was reviewing the telecom law at the time. It was the moment that the law was in the public debate. The larger internet value chain is not covered by the telecom law. For us, it was the telecommunications issue at the right time. As for other players in the internet value chain, there is general data protection regulation in progress in the EU presently.

Question: How is DPI different from behavioral advertising or web analytics, also technologies used to mine user behavior to create competitive offers?

Slöetjes: They are all the same privacy breach. The difference is that consent is required for advertising and web analytics. DPI, on the other hand, breaches confidentiality. A telecom provider only sells you data; they don't have your consent to look at the data in the package you purchase.

Question: What has been the impact of the law on the telecom industry in the Netherlands and innovation in general?

Slöetjes: To date, the Ministry of Economics has informed us that they have not found any negative consequences on the telecom industry as a result of the net neutrality law. Telecom providers have many ways to differentiate their packages. They can sell packages on the amount of data. Telecom can still differentiate without restricting access to the internet. It may be the case that people could buy lower priced packages based upon access to only a few preferred applications, for example a

young person may just want Google, Facebook and Wikipedia and would be happy to pay just for that. But that person is cutting himself off from the rest of the internet, and we can't let that happen.

Lawyers often fail to review financial implications. I admit to this fault. We at Bits of Freedom are not number crunchers.

Question: Innovation was given as a secondary reason for the law. What has been the impact of the law on innovation among content and application providers?

Slöetjes: It's really hard to measure. This research is not something that Bits of Freedom does. We leave this to the regulatory office.

Question: Explain why the competition or antitrust law won't work as a way to resolve questions of net neutrality.

Slöetjes: In competition law, it's difficult to establish a relevant market. Even though you can have sufficient competition, there are still ways to stifle innovation. It's also not so easy to change your provider if you're locked into a two year contract.

It's not that the players are unfair, but that there is so much behind the scenes. The competition authority would likely rule in favor of the telecom providers. Consumers will be confused. That would have an effect on society. Thus the net neutrality rule is geared to end users.

Question: Many net neutrality laws state the "end to end" principle as the foundation of the internet's architecture and the reason for its inherent neutrality. Yet the end to end principle is only theory. It is not a proven law of physics or even an accepted principle among all engineers. David Clark, one of the authors of the paper that introduced the concept said that others have taken the notion out of context and uses as a religious tract. He adds that the word "open" never appeared in his paper. In fact, he is more concerned about government abuses of the internet than of companies. He believes that networks have to be able to innovate and have viable business models.

Slöetjes: As for end to end...it's the thought that counts.

Question: What's next for Bits of Freedom?

Net neutrality is just a small slice of the whole picture of data and privacy. There is a lot of money in big data. There is also a downside; it's called the government. The Dutch government is planning a wholesale tap on Dutch residents under the guise of intelligence services and counter-terrorism. The government is not valuing our privacy. We have a reason to fear government more than companies. The government is just outsourcing their data projects to companies.