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CHAPTER SEVEN

The Mobile Internet and Net Neutrality

Let us be quite frank: the growth of Mobile Internet so far has been disappointing in Europe ... The costs are too high ... For the vast majority of consumers, the horror of getting a terribly expensive bill acts as a powerful deterrent to enter the Mobile Internet ... Users expect the mobile web to be as open and easy to use as the fixed line internet ... The only question is for the European industry, how quickly will you make this transition?¹

Commissioner Reding (2008)

‘Abandon hope all ye who enter here’ is a phrase from Dante’s *Divine Comedy*, representing the warning at the entrance to Hell. It was also reputedly written on the Traitors’ Gate at the Tower of London,² for those condemned to death as traitors by the king.³ I hope that this chapter on mobile is the augury of a happier outcome. However, I use the phrase to warn you that this chapter is in part the climax of the previous lengthy discussion on the Internet and its environment, which means you should not start here even if mobile is your main preoccupation. Mobile is a rapidly growing and potentially major element of the future Internet, and its environment cannot be sensibly considered in isolation from fixed networks. I do not in this chapter or other works,⁴ and nor should you.

(A note on terminology: Europe uses the term ‘mobile’ while the United States uses ‘wireless’. I will use the terms interchangeably, and when I refer to WiFi or WiMAX alternatives to mobile or wireless networks, I will make that specifically clear. Europeans often state ‘wireless’ when they mean ‘non-mobile’ – i.e. WiFi and WiMAX. Also note that this chapter focuses on the mobile ‘walled garden’ model as deployed in Europe, following to some extent the Japanese pioneers. ‘Wireless’ is more open in the United States, reflecting a regulatory regime that does not generally make mobile a special case. In Europe, mobile has always made special pleading for ‘unregulation’ or rather for forms of self-regulation, as we will see.)

Mobile network operators (MNOs) in Europe have limited competition, with between three and five networks in major markets. The costs of terminating calls on mobile networks, previously unregulated, have recently been examined and regulated particularly vigorously in the United Kingdom, even though regulated termination costs are now lower elsewhere.⁵ The European Commission states:

Mobile termination rates are also typically 10 times higher than fixed termination rates ... [this] cannot be justified by differences in underlying costs, networks or national characteristics. They are an indirect subsidy that benefits mobile operators with a large market share to the detriment of smaller and fixed-line operators. They also direct funds away from critical investments like upgrades to high-speed internet networks, and hinder innovative services like converged fixed-mobile products and competitively-priced bundles of calls.⁶

We will see later in the chapter that these termination charges represent a hidden subsidy paid by fixed ISPs to their mobile cousins. The chapter proceeds from introducing the value chain in the mobile ‘walled garden’ and its development. We then analyse the pre-existing content controls on mobile applied through law. The third section considers the MNO’s own self-regulation of content via contract and classification to avoid inappropriate content, and why this became particularly important as an unsupervised ‘tween’ (young teen) regulation issue in Europe. The fourth section considers the mobile broadband self-regulatory schema, before the fifth section considers the degree of price control regulation exerted on mobiles and the MNOs’ vigorous rear-guard anti-regulation defence. Finally, I look at the effects of this regulatory asymmetry and whether MNO calls for mobile to be treated differently from other ISPs can be justified. I conclude by examining what the effect of price and content control on mobile is likely to be for incentives for fixed ISPs, and produce a result that I describe as the ‘fixed’ strategy.

Mobile Self-Regulation: Content and Control

Mobile services have been used to serve web pages to European users since approximately 2000. The first generation of mobile Internet devices used Wireless Application Protocol (WAP) to deliver specially programmed,

normally simplistic and graphic-poor pages over narrowband networks, in Europe dominated by the standard Global System for Mobile (GSM). The screen is typically very small, and the pixilation (granularity) of the screen means that photographic images are cartoonlike. Text services (SMS) have developed as 160-character text messages, rather than WAP-enabled chat or listserv. In fact, sending a text in the twenty-first century is rather reminiscent of sending a telegraph message in the nineteenth century – and in terms of cost per bit, further reminiscent (a 160 a bit of character message costs up to 30 euro cents).

These 2G networks delivered data at about 65 percent of the speed of the modems used for fixed-line computers circa 1994/5. The simple 2G phone offered 64k colour screens, access at up to 27 kbps to ‘2.5G’ networks and larger screen size.⁷ The third generation – especially SmartPhones – and the data-card connected personal digital assistants and laptop computers are all enabled to receive web pages without re-coding for WAP. These are therefore the first portable Internet devices. Accessing the Internet over mobile networks at perhaps 0.1–0.3 Mbps, and with WiFi up to several Mbps, they can approximate the wired Internet use experience. With larger full-colour screens, they are fully specified Internet devices for image, sound and video. Note that in late 2008, only 13 percent of phones shipped to suppliers were SmartPhones, so 87 percent have inferior browsing experiences even if technically able to support 3G.⁸

The first European commercial 3G broadband networks for mobile were those of Hutchison Whampoa’s 3 service in the United Kingdom and Italy.⁹ By end of 2004, most EU member territories had metropolitan broadband wireless services – by 3G and WiFi ‘hotspots’ – which means that customers with handsets have had a real Internet experience for 4 years. Mobile phones can now be used to access the public Internet and download graphic files, sound and video clips. They can be used for adult services and premium services, such as the 3 ‘G’s: girls, video gaming and gambling, which were supposed to be the revenue streams for 3G mobile in Europe when it launched. As we will see, the ‘walled garden’ for users came with strong content filters that have restricted mobile operators’ access to that revenue.

From the consumer’s point of view, the main differences between old and new generation mobiles are characterized by the different applications they facilitate, which can be summed up as follows:

- 2G allows WAP and SMS applications;
- 2.5G allows multimedia messaging service including low-resolution video games;
- 3G allows rich media, streaming, full-motion high-resolution video.

This means that the policies associated with material accessed via PCs might also be raised by mobile access to the Internet, not just net neutrality but also harmful content, spam, viruses and criminal use of networks. Such technological advances have also led to the development of new business models for network operators, which focus largely on collecting revenue from online content. The models include:

- Vertical Integration: network operators offering their own content (e.g. Vodafone Live!)
- Intermediation: network operators allowing third parties to provide content (payment authorized by the network operator)
- Transit only: providing open access to the Internet (with payment, if any authorized by third parties such as Bango.net)

In the United Kingdom, mobile operator '3' is currently the only operator offering open access to the Internet for adult subscribers, whereas the other operators employ walled gardens.¹⁰ It is important to recognize the existence of these different models, as the possibilities for co- and self-regulation associated with the content delivery model will clearly vary according to the sources of content.

Note in the value chain in Figure 7.1 several innovations are compared with the familiar fixed-line Internet value chain. First, for services in the mobile portal, there is a strong contractual sanction for content providers failing to fulfil their self-regulatory duties, which in the fixed environment is true only for the largest integrated portals (the famed AOL walled garden). Second, the pre-pay user has no regulatory sanction from the MNO, with no contract and no billing relationship, though the MNO could discover the identity and block service to the SIM card of users if unacceptable use is discovered. Third, the type of network control at the institution of work/research/education that the public access layer establishes is not relevant in the mobile environment except in the case of group contracts for mobiles given to employees.

Even before the start of the value chain there is a fourth critical difference: the MNO owns the network and can control the content flow onto networks

Figure 7.1 Value Chain for Mobile Network Operators

in a manner unfamiliar to fixed ISPs before DPI. Therefore the lack of control over end-users is replaced by a control over the network. This is a critical change from end-to-end where control must be exercised close to or at the end-device, in that mobile networks can institute control in the network itself, are required so to do for law enforcement purposes, and choose so to do to stop spam overwhelming the network. That is not to suggest that as a policy choice such a radical departure from fixed Internet regulation is to be recommended, not least on speech grounds, but it does represent a different architecture of the ISP–network provider relationship.

The primary types of mobile data service fall into four functional categories:¹¹

1. content-enabled services, e.g. addition of location-enabled application with maps and search function, to form a navigational service that navigates to destinations;
2. e-commerce services, including financial transactions;
3. content-based data services, including music, TV and entertainment-based educational content ('edutainment'), games, health, video, news, transport information and adult entertainment; and
4. communications-based data services, primarily involving P2P communications such as voice, messaging (SMS and multimedia messaging service) and email.

Generally, the provision of content to consumers is organized in one of three major approaches, which also may be mixed:

1. 'walled garden' –MNO creates a users' space for wholly controlled content and services, some of which may be bought in from third-party content providers; the 'walls' around the 'garden' keep consumers tied to these offerings;

2. open access – any website or services over any mobile operator that allows Internet access and has a suitably fast mobile network for multimedia services;
3. semi-open access or web-access approach – as in NTT DoCoMo's i-mode service. This is more open than a 'walled garden' and uses connection to any web-enabled site via its proprietary software, but has two tiers of accessible sites and business partners, where open Internet access is available but 'walled garden' content is accessed more easily.

A simplified view of the basic operational value chain or mesh for multimedia mobile is based on extensions from narrowband 2G digital mobile. Whether the model is a 'walled garden' or open access, MNOs play a fundamental 'gatekeeper' role in the mobile multimedia content value chain. The handset supplier (e.g. Apple, Nokia and Sony Ericsson) may preload some limited multimedia content on the handset to provide resident applications for off-air as well as on-air usage. The role of the MNO is critical to the decision whether to allow open access or to vertically integrate operations 'in-house'. This changes the risk-reward in the value chain and the type of regulatory arrangement that is likely to be effective.

The multimedia content provided by mobile service providers is similar to that on the Internet. However, while Internet content is often free at the point-of-use (albeit usually supported by advertising), often mobile entertainment is charged for by the mobile service provider. MacInnes et al.¹² argue that this reflects their 'gateway' role. This is reflected in the indicative revenue shares reported by mGain.¹³ The other 'hub' firm in this value chain is usually the content provider, which also collects a significant share of the revenue. It is worth noting that there are many prospective business models for the provision of mobile content from the perspective of wireless network providers, and the above case studies may describe only one.¹⁴ McInnes et al. classify them according to four models:

1. pipe – the wireless network provider simply provides transport services;
2. pipe-sales – the wireless network provider interacts more directly with content providers and provides billing services;
3. portal – the wireless network provider delivers the content via a portal, and so exerts bargaining power over the content providers;
4. full portal – the wireless network provider takes control of all aspects of branding, marketing and delivery, and the content provider simply supplies content wholesale.

The different models have obvious implications for the power of the operator within the value chain, with the last offering full functionality and the ability to create a vertically integrated ‘walled garden’. However, different actors, such as device manufacturers or publishers, also can act to provide portal services and act as aggregators (e.g. Nokia’s *Club Nokia*).¹⁵ The ‘fitness’ of one business model over another will be determined by its ability to adapt to changes (technological, regulatory, etc.) and the ability to access finance (reliant upon the business model producing an adequate business case).

Walled Gardens: Filtering Content for Child Safety

MNOs have eliminated many of the end-to-end options in Internet design by closing off a walled garden for public safety and their private profit. In a position paper presented in November 2003, Ahlert, Alexander and Tambini explain that:

Major concerns for the self-regulatory framework include adult content (porn), interactive services, unsolicited messages, commercial transactions, location based dating, gambling, and P2P. The major necessary strategies for dealing with these concerns are content rating, filtering and blocking, NTD procedures, public awareness, cooperation with the government.¹⁶

They identify scale economies and entry barriers which make effective and sustainable regulation of the mobile Internet possible:

The emerging market for 3G services in the European Union will be dominated by a few major MNOs, which in theory should make self-regulation a realistic and viable alternative to state regulation. Uncertainty of actual consumer uptake despite projected high popularity of 3G, media convergence, and the evolving EU regulatory framework all offer incentives for 3G mobile operators to invest in self-regulation.¹⁷

Mobile networks already have three examples of self- or co-regulation in place. These are:

- an ombudsman service for customer complaints over pricing and service, and
- a premium rate regulator (for instance, RegTel in Ireland or ICSTIS in the United Kingdom);
- codes of conduct for classification of adult content.

Ombudsman scheme for consumer disputes: In the United Kingdom, Vodafone was instrumental in establishing OTelO, and T-Mobile and Orange in establishing the Communications and Internet Services Adjudication Scheme (CISAS), an ombudsman for ISPs and phone companies. OTelO charges all members a fee, CISAS is free – an interesting example of regulatory competition.¹⁸

Premium services: European broadcasters, fixed and mobile operators increasingly use premium services to fund interactive television ‘reality’ and quiz programmes, such as Gross Bruder/Big Brother/Gran Hermano. Premium rate co-regulators are members of the International Audiotex Regulators Network, the network for premium service regulators. Operating since 1995, there have been two meetings a year.

Other regulatory requirements on telephony content include:

- Intercept, integrity and surveillance: Networks must comply with network integrity and security measures to ensure surveillance is possible, that the European emergency number 112 is accessible.
- Mobile handset theft: Mobile networks also have systems to deactivate the SIM card of phones reported as stolen.
- Number portability: Further measures to monitor phone use include a Home Location Register (HLR) in each member state, to permit mobile numbers to be ported by subscribers from one network to a new subscription on a different network.
- Spam blocking: In several Member States, unsolicited commercial messages (spam) are regulated by, for instance, the UK Telephone Preference Service (www.tpsonline.org.uk/) and E-Mail Preference Service, again in common with fixed telephony. Mobile networks also undertake unilateral action.

There will inevitably be disagreement between states as to the extent of the risk posed to openness and innovation by mobile phones and Internet access. What is deemed to be inappropriate or even harmful in one country may be regarded as completely unproblematic in other European states. To this extent, a co-regulatory approach is an appropriate one, allowing public and governmental input to ensure a degree of variation between mobile net neutrality applied in different countries. In signalling support for self- and co-regulation, the mobile multimedia sector may appear more credible and legitimate in the public’s eyes. The classic mobile ‘walled garden’ provides

its own policing for the most part, and is therefore least affected by state regulation. Such regulation reinforces this status quo and raises entry costs to what is already a market with extremely high entry barriers: it is inimical to net neutrality.

The European Commission reported in 2003 on mobile content:

Germany, France and Finland indicated that transmission via mobiles, in particular through UMTS [3G], is covered by regulation. Sweden considers that its legislation on illegal content is in principle applicable to mobile phone transmissions, but mentioned that this had not been tested in the courts. The Netherlands argued that the self-regulatory provisions had been drafted in a technologically neutral way, but were limited to 'hosted information'.¹⁹

Commissioner Reding has made clear her commitment to co-regulation in the mobile communications market,²⁰ although this is not necessarily supported at the level of all European states. To be workable, co-regulation must first and foremost be the result of genuine dialogue between government and industry with room for meaningful (rather than merely trivial) periods of consultation with non-governmental groups such as civil rights groups and the general public. Second, the establishment of such co-regulation must be clearly understood both by those who are limited by its principles and those who seek its protection. Finally, it is essential that such co-regulation be backed up by the creation of clear lines of accountability and monitoring. Given the importance of the rights and privileges that are protected and limited by these principles, it is essential that these are treated with respect.

In addition to 'blanket' regulations of fixed content extended to mobile, the United Kingdom and Norway responded by pointing to codes of conduct being developed to learn from fixed ISP self-regulation. The UK Code was drafted by a committee including all six UK network operators and virtual operators (3, Vodafone, Orange, T-Mobile, Virgin Mobile, O2). Informal consultation with content providers, infrastructure and handset suppliers and government at national and European Commission levels took place. The Code itself was written in the 'regulatory vacuum' of 2003 as the new super-regulator Ofcom was being established, against a background of discrete coordinated lobbying by mobile networks, and pressure for self-regulation

from Parliament during the Communications Bill debates of 2002–3. There was therefore a combination of:

1. Regulatory commitment (fostered by cooperation in 2002–3),
2. Regulatory resource freed within the companies by the handover period from existing regulators to Ofcom (second half 2003), and
3. Political pressure to establish a workable regime prior to the broad 3G launch in 2004.

The six operators include all four of the largest pan-European operators.²¹ A draft was presented for public consultation prior to the full publication of the Code in January 2004. Details of the Code's implementation (see below) were announced on 7 February 2005 with the launch of the Independent Mobile Classification Body (IMCB).²² The Code itself is unremarkable, but its *ex ante* adoption, prior to many adult services being known to the general public, is exceptional and reflects high awareness in the sector both of potential harms and of the value of self-regulation. In part, this can be attributed to the market size and regulatory resources of the four giant companies behind the drafting. The main points of the code are:

- All commercial content unsuitable for under-18s will be classified as '18', and will only be made available to customers when the networks are satisfied that the customer is 18 or over.
- The classification framework will be comparable to those applied to other media, and will be created by a body independent of the mobile operators.
- Chat rooms available to under-18s will be moderated.
- Parents and carers will be able to apply filters to network operators' Internet access service to restrict the content available via a particular phone.
- Mobile operators will work to combat bulk and nuisance communications.

In addition, the Code observes the same NTD requirements with regard to illegal material as those applying to fixed-line ISPs. There are, however, several limitations on what the Code covers. The UK Code explains that: 'The Code covers new types of content, including visual content, online gambling, mobile gaming, chat rooms and Internet access. It does not cover traditional premium rate voice or premium rate SMS (texting) services, which will continue to be regulated under the ICSTIS Code of Practice.'²³ Nor does it cover wider Internet content not directly supplied by third parties to

the mobile operator. Responsibilities here mirror those of fixed-line ISPs. However, the Mobile Entertainment Forum (MEF), a trans-Atlantic grouping of over 70 content providers, has issued its own Mobile Code of Conduct, dealing with premium content. This may prove a precedent for a code dealing with adult content.²⁴ The Code also fails to cover issues which have already stimulated media concern such as the use of camera phones and Bluetooth technologies for content creation and distribution that does not require downloading from a website, or other forms of P2P file-sharing. The extent of likely Internet filtering by mobile operators is somewhat unclear. Under Section 4, operators pledge to 'continue' to take action against spam – they already have prevented much content arriving on-net. To at least this extent, then, Internet content is to be filtered. Further, although the Code committed each operator to introducing an adult content filter only Vodafone fulfilled its commitment, with the UK's other operators missing their agreed end of 2004 deadline.

The UK Code is an opt-in self-classificatory scheme overseen by an independent classification body.²⁵ Content is classified as '18', adult content, or not – with optional interim ratings for younger children. Enforcement of the Code is formally dependent on individual operators: 'Each mobile operator will enforce the terms of the Code through its agreements with commercial content providers.' It remains to be seen how this relationship will pan out but such a contractually required labelling system for 'commercial' content coming from third parties should work, because inappropriate content is to be filtered out at the 'gateway' between the network operator and the provider. Content on the open Internet will pose larger problems. Therefore, it is likely that the most effective approach will be to combine the utilization of filtering software, content labels and URL block lists (see Chapter 2 for descriptions).²⁶ The easiest way to block harmful content will be to block the Internet entirely, or make access difficult by throttling, and issuing warnings that the content 'out there' is unregulated.

Will MNO discrimination become the model for all ISP discrimination? The adoption of content controls by the mobile industry is both different to narrowband ISPs and potentially a forewarning of broadband fixed ISPs' role. There are several features of mobile phones which make such concerns more pressing. For example, control might be increased in the sense that it is easier for network operators to adopt content controls, such as filters, as they are the only gatekeeper to the Internet for individual users of their services.

In addition, network operators also have influence over which online services will be available to consumers as they currently have a degree of control over the user interface on their handset due to their role in providing the software and operating systems in conjunction with the handset manufacturers.²⁷ A policy risk is that children's use of mobile phones is much less open to supervision by parents and educators and might therefore pose a greater risk than PC-based access to the Internet. These nuances can be summarized as follows:

1. **Ubiquity:** Given the increasing pervasiveness of colour screen technology in even standard mobile phone models, many secondary and even primary school students are likely to have phones with colour screens at the birth of the wireless Internet, whilst most children have only gained access to the Internet via PCs at a later stage in that technology's development. This means the need for protective measures is pressing.
2. **Supervision:** Unlike PC-based access to the Internet, mobile use is more likely to be private and by its nature is mainly unsupervised. This may be tempered to some extent by the possibility of parental monitoring of itemized phone bills, although in the United Kingdom as elsewhere in Europe, large numbers of mobile users have Pay-as-you-go accounts, with under-16s especially likely to have such accounts.
3. **Control:** With PCs, access to the Internet is provided and controlled by an ISP and users can choose which ISP they contract with after buying their PC. Such choice and competition amongst ISPs mean that individuals could easily opt in or out of various filtering options by shopping around amongst ISPs. In the case of mobile-accessed Internet, however, a handset is usually bought as part of a contract with a particular operator. Even if it is practically possible to change network, this is not something which many customers would do on a regular basis. So long as this remains the case it is easier for network operators to adopt content controls, such as filters, as at any point in time they are the only gatekeeper to the Internet for individual users of their services. This feature, combined with the different models for content delivery described above means that MNOs can and do provide so-called 'walled gardens', which effectively limits Internet access to content approved by (and financially benefiting) the network operator.
4. **Filtering defaults:** It was widely expected that on mobile phones, filtering defaults when available would largely be opt-in, unlike opt-out Internet Explorer, AOL and Google, meaning that 2.5/3G mobile phone users

would by default have access to adult content. In the United Kingdom, this position has been reversed, in large part due to lobbying by child protection groups, meaning that those purchasing new mobile phones will now usually need to opt out of filtering applications, which will only be possible after age verification.

5. Convergence of capture and distribution in one device: Most devices now offer digital image capture capabilities and also enable distribution of these images – picture messaging is an example of this. This means that, in principle, the distribution of inappropriate pictures, or even pornography is only ‘One Click Away’ from digital image capturing, but in a way that cannot be controlled by filters at the network level. This is a potential loophole in the widely acclaimed filtering strategies currently used by network operators, although it remains to be seen whether this will be a significant concern in practice.
6. P2P file-sharing: Given that 3G bandwidth is still much slower than standard broadband connections, P2P file-sharing of photos, movies or music is still unlikely as it is time consuming and costly. However, as operators are now starting to offer seamless roaming packages whereby mobile phones can be used at home with standard wireless broadband connections and on the move with wireless hotspots, P2P may further drive usage of mobile-accessed Internet by children.

A ‘walled garden’ of online services may restrict uptake but does effectively eliminate networked P2P problems of illegal file-sharing via the Internet (though not by MMS, such as the picture messaging used in an infamous Irish schoolgirl pornography case of 2003/4²⁸) even though this is perhaps an over-reaction to existing and emerging problems. Similarly, filters may prove overly effective. Filtering technologies in use are much more effective in mobile phones – if the measurement for effectiveness is that some adult sites are simply fully blocked – than in the traditional fixed-line environment. Anecdotal evidence also suggests that sometimes over-blocking occurs and perfectly legitimate services are sometimes not reachable. Technically, mobile Internet on-net can exclude off-net and really ‘wall in’ mobile Internet users. That would eliminate P2P including pornographic images by banishing mobile users from the wider Internet, which appears an over-reaction to existing and emerging problems, which creates restrictions on speech freedoms. It is the approach which was initially taken by all UK operators

except ‘3’, which in September 2005 finally permitted 3G broadband mobile users to access the open Internet. New browsers such as Opera Mini, and new types of SmartPhones allow access to normal web pages, and of course 3G ‘dongles’ on laptops allow real web surfing.

There may be still significant hurdles for workable codes of conduct to overcome: it remains to be seen whether there is any preferable alternative. Certainly it is hard to imagine the mobile or content industries welcoming a more direct regulatory solution. Self- or co-regulation is also likely to be the most appropriate response in the context of rapid technological advance; it will almost inevitably be easier for industry groups to assess the implications of such change and to revise their codes of practice accordingly. Self-regulation would have the benefit of being a more moderate response to the problem, but co-regulation would provide more transparency, accountability and room for public and governmental engagement.

Regulatory rules can be imposed on ‘walled garden’ operators (e.g. mobile, cable and broadcast entities) regardless of whether they are content originators. Thus they may be less able to compete with operators who can take refuge behind the ECD combination of protection from liability and ‘cost-based’ pricing, but it is an obvious prediction that liability and charging are affiliated. In other words, a fairly clear choice exists between (being) one of two types of ISP. One is a ‘blind’ ISP, which neither asks nor tells about content, exercises no control and makes no charge on the basis of content. The other is the ‘walled garden’ model of the ‘sighted’ ISP, which shoulders – and charges for – regulatory and therefore network liability. The former is like the traditional fixed ISP, the latter more like cable or mobile operators.

Mobile Network Neutrality

It is stating the obvious to note that any net neutrality ruling that did not affect wireless carriers would immediately create asymmetrical incentives that would divide the public Internet into mobile ‘walled gardens’ and fixed open Internet customers. That would most probably increase the mobile Internet’s differentiation from fixed service (assuming technological changes at the same pace for both mobile and fixed). In such an asymmetrical world, there would be two classes of Internet access: the true Internet on fixed and the ‘walled garden’ plus whatever open Internet was permitted on mobile. Revealingly, at the first Open Mobile Summit, the only European incumbent

to speak argued for walled garden revenue models,²⁹ though acknowledging that surfers would increasingly browse 'off-portal' (outside the garden).

Mobile is increasingly substituting for fixed Internet access for many consumers.³⁰ Lewin, Williamson and Cave state that 'Competition between suppliers using fixed fibre access networks and those using mobile broadband networks for the spend of those at the margins'³¹ will be a significant feature, with low-cost low-usage customers opting for mobile broadband – as 64 percent of Austrian consumers have done. This is despite Cisco's predictions that mobile broadband will only account for 0.1–0.3 percent of total traffic as far as 2012.³² This limited backhaul demand from fixed networks nevertheless means that they 'expect mobile broadband to offer both a partial substitute for fixed broadband and a complement'.³³ That means it must claim to be a real Internet alternative, not simply a slow and clumsy supplement. If mobile is replacing fixed connections, then consumers will expect to achieve comparable access to their favoured applications, as well as web browsing and email more generally. If mobile will not, or cannot, offer that comparability, the whole enterprise appears designed to persuade consumers to accept third-best. Television over the mobile device, or P2P file-sharing more generally, will appear patchy at best if streamed over the mobile Internet connection, at least using current technologies and with current network quality and speed. There are of course technological and regulatory short cuts such as broadcasting TV over the Digital Video Broadcasting – Mobile frequencies, which would mean a mobile device is both an Internet access terminal and a TV set. However, at face value, the current claim is that mobile Internet access can replace fixed for many consumers. If there are real and tangible differences that can never be bridged (or not until Long-Term Evolution [LTE] is introduced perhaps 5 years hence) due to the technological, economic and social constraints of the mobile device, it would be helpful to make plain to consumers what the offer really is.

There is the same pair of problems with mobile as with the fixed Internet, though the problems are for mobile more profound. First, quite clearly speeds are too low and quality too inconsistent to enjoy all the benefits of Internet applications. Second, the value realized by net users is too low currently to guarantee future investment in a fast open Internet as opposed to a walled garden of preferred content that can be offered at higher quality in return for greater returns to the network provider. Both these problems – speed and revenue – are compounded in the case of mobile by the number of networks.

Where fixed has one or at best two networks to each consumer, mobile offers three, four, five or six (seven in the case of India), depending on national decisions on how many networks to licence. Even with some limited network sharing, it means that mobile networks are taking smaller slices of the mobile pie than fixed operators of their own. It looks like these sums simply will not add up – that the more successful operators might speed up their walled gardens while the less successful operators eke out a living with network sharing and very low data quality.

The issue of wireless net neutrality has created more controversy in the United States, where interconnection charges between mobile and fixed are symmetrical and 3G wireless has rolled out more quickly in terms of data use. In particular, the launch of the iPhone by Apple created a sensation for data users, and became the must-have item of 2007. Its launch was controversial, first because it was not originally a 3G phone, second it did not incorporate WiFi and third it was tethered to a single network (AT&T Wireless), which has led to continued calls for the FCC's 'Four Freedoms' to be applied to wireless.³⁴ The market for 'cracked' iPhones anecdotally appears to have been enormous, with iPhones being exported to other countries prior to their introduction there. The tethered nature of the iPhone appears to have concentrated minds on the fact that the fixed ISP rules just don't apply to mobile: devices are blocked from networks, technologies are excluded, content is filtered and overall the environment is a 'walled garden' not an open access platform. That inevitably causes significant policy issues to arise.

Tim Wu in 2007 issued a report on net neutrality for US wireless: 'to examine what carrier practices may be harmful for consumers or society.' The report makes four major recommendations:

1. Cellphone Carterfone – 'The basic and highly successful Carterfone rules in the wired world allow any consumer to attach any safe device to his or her phone line through a standardized jack. The same rule for wireless networks would liberate device innovation in the wireless world, stimulate the development of new applications and free equipment designers to make the best phones possible.'

This is in part a response to the tethering of devices using network rules that caused such a controversy with the Apple iPhone on AT&T's network. Soon thereafter, Google launched an Android open API phone on T-Mobile's network, which suggests that some kind of competition is occurring in the

market without regulation. This innovators' dilemma is of course at the heart of the Microsoft competition litigation.

2. Basic Network Neutrality Rules – 'Wireless carriers should be subject to the same core network neutrality principles under which the cable and DSL industries currently operate. Consumers have the basic right to use the applications of their choice and view the content of their choice. Wireless carriers who offer broadband services should respect the same basic freedoms. Carriers can tier or meter pricing for bandwidth without blocking or degrading consumer choice.'

This is 'net neutrality lite' for wireless.

3. Disclosure – 'Consumer disclosure is a major problem in the wireless world. In addition to the disclosure of areas lacking coverage and rate-plan information, carriers should disclose – fully, prominently and in plain English – any limits placed on devices and bandwidth usage or if devices are locked to a single network.'

Note the new UK mobile broadband code, designed to produce a baseline of transparency.

4. Standardize Application Platforms – 'The industry should re-evaluate its 'walled garden' approach to application development, and work together to create clear and unified standards for developers. Application development for mobile devices is stalled, and it is in the carriers' own interest to try and improve the development environment.'³⁵

This is where an open operating system such as Google's Android can change the nature of mobile development. Rich Miner of Google describes it as:

A Linux-based mobile phone platform including an operating system, middleware, services and applications – everything you need to build a mobile phone! Open source software stack allowing extensive customization and commercialization; Mobile-centric design optimized for always-on, resource constrained embedded platforms; Rich and robust APIs to enable mobile mash-ups.³⁶

He also described the 'walled garden' environment that has been the Internet experience: 'this was the world we found: billions of mobile users

and a mission to connect with them; tools for mobile development that were difficult to use; constrained devices; mobile browsers that delivered a poor experience; complex paths to get our applications to our users.’ These are undoubtedly the experiences of many users.

He describes six drivers of change, a change fostered by the Open Handset Alliance which Google helped to organize:

- Device innovations are reducing hardware constraints
- 3G is now delivering always-on wireless broadband
- Phones have browsers with desktop level capabilities
- People who know software are driving the platforms (i.e. Google)
- Developers can get mobile apps directly to consumers
- Controlled stacks being replaced by long-tail content

As a result of concerted lobbying of the FCC by Google, corporate actors with similar open access strategies and NGOs, the FCC in 2008 introduced special open access rules for the released broadcast 700 MHz space.³⁷ This chapter can only dip into the issues raised, but in any case it remains to be seen whether the commitments secured from the auction winner, Verizon, will prove to be another AOL-style ‘Kingsbury commitment’ – or a one-off sop to net neutrality advocates that is rapidly forgotten as the industry attempts to erect further walled garden barriers. Prior to the auction, Verizon had charged that offering open access conditions would reduce the price of the spectrum to any private bidder that won, and that this interference was both unjustified and unconstitutional.³⁸ However, it tactically withdrew its case prior to winning the auction with a price only 3 percent above Google’s reserve price for the spectrum (\$4.74b to \$4.6b).

Problems with ‘walled garden’ mobile are not confined to Europe and the United States, of course. Michael Geist provides an excellent analysis of the ongoing accusations from content owner The Weather Network (you need good forecasts in Canada, and that is its content!) against wireless carriers blocking content. The basic problem is that content sites that do not make a ‘walled garden’ deal with the wireless carrier find their web pages ‘rendered’ into a different format by the carrier, with different advertisements substituted. This is a whole different level of discrimination than fixed ISPs are known to have engaged in. They claim:

1. Wireless resellers blocking advertisements from a mobile site
2. Wireless carriers stripping out tracking codes embedded in web pages, thereby limiting ability to deliver advertisements
3. Wireless carriers establishing ‘walled gardens’ that provide preferential access that reduces data charges for sites within the walled garden

4. Forcing users through the wireless carrier homepage when accessing the Internet on feature phones
5. Prior approval of applications for use on smart phones
6. Extra fees for text messages that include ads
7. Wireless carriers limiting to whom ads in text messages may be sold³⁹

It appears surprising, therefore, that mobile operators claim everything in the garden is rosy, that their new 3G 'dongles' (plug-in USB connected wireless modems) can offer a genuine substitute for fixed-line access, and that speeds can be 'up to 14.4 Mbps', which would be genuinely as fast as the theoretical maximums of fixed access. The cap on monthly usage would not suggest quite the confidence that mobile networks claim, with 3 GB or 5 GB quite common high-usage caps, and 1 GB even more frequent for the casual user, based on current advertised rates in the United Kingdom.⁴⁰

3G Networks: Roll-Out and Code of Conduct

The roll-out of 3G networks has been slowed by overspending on licences, limiting the funds available for solving technical problems to bring a new and difficult technology to market.⁴¹ Higher data rate services than these are available in some countries, notably South Korea and Japan, but Europe is still behind. The data rate – and its pricing, which goes with network capacity for high bandwidth – is essential in setting the expectations of customers and sales. The data rate sets not just the volume of sales but also the type of content that will sell. Simpler content with lower bandwidth demands such as ringtones and music have been the leaders. In Europe, 3G is being enhanced with next generation (3.5G) enhancement High Speed Downlink Packet Analysis (HSDPA).⁴² HSDPA became more widely available to the mass market in 2008–9. The high costs of 3G networks means that alternatives for lower cost high-bandwidth WiFi and WiMAX are being sought by alternative providers to the incumbent telcos and MNOs.

One major trend concerning data rates which has delayed multimedia take-up is the price of data transfers over mobile, as measured against disposable income. Price has been used by MNOs as a way of limiting demand, to protect network capacity in the hope that faster high-capacity networks can be rolled out soon. Mobile data transfer costs for use of the network to download content or for streaming remain high, so users tend to minimize the amount of data transferred. Moreover, the markets targeted initially for much mobile content are teens and twenty-somethings,⁴³ with

limited income, rather than business. This has acted as a major brake on content sales.

The development of mobile broadband has been much slower than anticipated since the 3G auctions were conducted in summer 2000, with mobile broadband 'taking off' in the period since 2007. In June 2009, benchmarking tests by Eptiro showed UK broadband running at about 0.9 Mbps in evening peak time, a rate below that which would permit video streaming of the BBC iPlayer. The delays to the network also make it unreliable for video gaming or VOIP.⁴⁴

Testing by broadband benchmarking company Eptiro shows that the average mobile broadband speed clocks in at 0.9 Mbps. Of these, users received on average 24 percent of the maximum 'up to' headline speeds advertised. The fastest 20 test agents recorded an average speed of 1.8 Mbps ... During peak hours (6 pm to midnight) speeds dipped by approximately 20 percent ... web browsing which appeared to be 34 percent slower than on fixed ADSL connections. Ping times, an important metric for online game playing came in at around 150 ms which is too high for acceptable gaming performance. Another metric that affects real-time applications such as gaming and Voice over IP is packet loss, a measure of data loss. One unnamed provider suffered 2.1 percent whilst the average was 0.67 percent, with the lowest at 0.1 percent.

The slow speed and unreliability of mobile broadband has led Ofcom to pursue with the mobiles a formally self-regulatory scheme to prevent misleading consumer advertising and marketing of their limited broadband offer. The European Commission recently noted:⁴⁵

Regarding broadband, in July [2008] Ofcom published a new voluntary code on broadband speeds. Some 43 ISPs, covering over 90 percent of broadband customers, had signed up to it by December 2008 ... This Code, however, applies only to fixed broadband and not to mobile broadband, where QoS issues are also highly relevant in particular because of the instability of transmission speeds depending on traffic.

On 1 June 2009, Ofcom released the Code of Conduct, including information on coverage, as well as the factors that impact download speeds, and pricing.⁴⁶

In a section marked ‘Monitoring’ – somewhat incongruously for self-regulation but in line with its fixed ISP co-regulation ‘lite’ announced a year previously – it states:

Ofcom has been fully consulted throughout the process and our Director of Consumer Policy, Claudio Pollack, said: ‘Ofcom welcomes the mobile operators’ commitment to give their customers better information about mobile broadband services. We will be undertaking further research and monitoring of mobile broadband to check that consumers’ needs are being met.’

This suggests MNOs are on notice to improve their service and make their customer advertising more truthful and less misleading. The Code of Conduct itself is remarkable for its brevity. It states – the entire Code! – in full:⁴⁷

Principles of Good Practice for selling and promoting Mobile Broadband

Uptake of mobile broadband services is increasing rapidly. Customers appreciate the widespread coverage and convenience of being able to connect wireless devices to a 3G mobile network.

As the market is in a relatively new phase and in order to promote consumer awareness of the potential of mobile broadband, the UK’s mobile operators have agreed some good practice principles that underpin the way in which they and their customer service staff communicate information that is relevant when purchasing and using mobile broadband services. The principles cover:

- Coverage
- Factors that determine download speeds
- Pricing transparency

Coverage

1. Make coverage information available via a website (e.g. a map or a post code checker).

Promotion of factors that determine download speeds

2. Download and upload speeds that are given in advertising and promotional material must be achievable by end-users and should be accompanied by an explanation that speeds are variable. An indicative

range of download and upload speeds under normal conditions can be given.

3. The factors that determine download speeds should be explained (e.g. distance from mast, surrounding environment, number of other users, network connection).
4. A glossary should be made available describing technical mobile broadband terms used in customer literature and on on-screen indicators (e.g. 3G, HSDPA).
5. Translate raw data speeds into some real life examples such as: 2 megabits per second delivers a 5 minute music track in approximately 20 seconds.

Pricing transparency

6. Pricing information should set out the relevant tariff options, including a description of any fair usage limits. There must an explanation of the consequences of the usage limit or fair usage allowance being exceeded.
7. Where operators make references to megabits, megabytes and gigabytes in close proximity, they should give an explanation of the differences. A description of what, for example, a megabyte of data usage allows should be provided.
8. Pricing information should include either the roaming charges or a hyperlink to where the roaming charges are set out (which should also set out explanations of what a megabyte of usage allows and provide description of fair usage limits and any other relevant information).

Given that the entire Code is only 365 words, it is presumably a first draft, and details can be added with more ‘close consultation’ with Ofcom. For instance, there is no mention of upload speeds or of peak congestion (except that allusion to ‘number of other users’), which is a huge issue with mobile, as the EC pointed out.

This is thus far the extent of regulation of mobile broadband, and it is a very sparse self-regulatory scheme. The regulation of mobiles in this way is not a surprise to many who have seen the mobile sector declared Europe’s telecoms success story in the past two decades. Given the intransigence of fixed-line incumbents that we saw in Chapter 1 and the Introduction, it is perhaps understandable that the Member States saw mobile oligopoly as a success story, with rapidly increasing penetration and falling prices.

Viewed with hindsight, we can see that social network use of cellular mobile technology was the driver rather than particular European MNO innovation: mobile is a global success story, with vast oligopoly profits and high charges in most countries. It was once said that commercial television was ‘a licence to print money’: self-regulated MNOs appeared to be the new way. In the next section, we will see that mobile termination monopolies permitted exponentially higher charges to fixed operators than they could charge back to mobiles, the European mobile subsidy that drained much of the profitability out of fixed phone companies.

Mobile Call Termination and the Fixed Subsidy to Mobile

We saw in Chapters 1 and 2 that a mobile termination monopoly endures, in that you can only call me by routing that call through my mobile network. Mobiles have been able for many years to maintain very high termination prices even under regulation (and especially where not), in contrast to regulated fixed prices. Small operators of mobile networks have called for the full abolishment of termination charges, because high terminating rates mean largest companies benefit most. 3 has no 2G termination monopoly to exploit with its network, in fact it rents its 2G network and operates as a mobile virtual network operator, making margins only on its 3G network termination. 3 is the rogue operator amongst the UK mobiles, lobbying to remove the termination charges it pays its four incumbent 2G rivals (T-Mobile, FT’s Orange, Telefonica’s O2, and Vodafone). Its UK Chief Executive Kevin Russell launched a ‘Terminate the Rate’ campaign with BT on 20 May 2009, stating that:

The amount of legal authority and PR mobilized by the Big Four is unbelievable ... We get subsidised by BT but we want the subsidy to go.⁴⁸

The reason is that 3 customers call the other bigger networks much more than their customers call it, so it pays more in termination at the above-cost charges they are permitted.

The effect of compulsory subsidy by European fixed-line customers of their mobile friends, through termination rates ten times above fixed-to-fixed rates, is to increase mobile penetration above cost-oriented levels, such that

people who would have chosen to make no call or a fixed-line call, instead used a mobile to either receive a call or send a text: the very cost-conscious have a mobile phone whereas in 'bill-and-keep' countries they may not. Think of it as a form of unexpected universal service for the poor. The model encourages prepaid as well as monthly subscriptions, so that twice as many UK customers have prepaid SIMs as monthly contracts, though this is highly variable by country, so that France has twice as many monthly contractees as prepaid customers. The more prepaid customers, the lower the monthly minutes used (i.e. lower actual phone utility).⁴⁹ Astonishingly, the European average is about 1 minute for every 3 minutes used in the United States.

In the United States, where termination rates are the same as fixed-line rates (which means networks effectively 'bill and keep' – peer to swap traffic), average minutes per month are 700–800, and subscriber penetration is 84 percent, though note that Canada with a less competitive market for mobile has much lower penetration and usage (62 percent and 430 minutes).⁵⁰ It may be that penetration growth in 'bill and keep' countries has been slower than in calling party pays (CPP) systems, though figures are obscured by the propensity of more price-sensitive customers in CPP systems to buy multiple SIMs for different networks, such that penetration exceeds 100 percent by significant levels (otherwise explicable only by many people having own-use and office-use mobile phones, itself a measure of unexpected honesty or insecurity in job tenure).⁵¹ However, overall the statistics appear to indicate that prices lowered faster and earlier in the United States than Europe, by 75 percent in 1996–2001, hence that very high usage rate, and that penetration achieved saturation slightly slower. Summarizing the US experience as compared with Europe, I draw the following six conclusions:

- Fixed networks have not subsidized mobile, as the 'bill-and-keep' interconnection regulation has ensured parity;
- Mobile penetration levels are almost identical at a saturation 82 percent;
- Mobile usage per customer is three times higher than in Europe;
- Networks offer continental coverage at identical prices, while in Europe, the hypothetical Euro-traveller would pay 26 countries' roaming charges while doing business in the Internal Market;
- Universal service is maintained by coverage requirements on licences,⁵² and spectrum licences remain sufficiently attractive that the open access 700 MHz D Block auction was successfully concluded, though critics claim

that it failed to achieve openness via a new market entrant or to garner maximum price for spectrum;⁵³

- The lack of a special pleading regime for economic pricing of mobile termination has contributed to an inclusive discussion of net neutrality for mobile in the United States, in contrast to that in Europe.

In the European Union, the average mobile termination rate is 8.7 euro cent (and as high as 15.09 cent in Bulgaria).⁵⁴ India's telecoms regulator, TRAI, in March 2009 announced a slashing of the mobile termination rates by a third – effective April 2009. That is 0.32 euro cent per minute (or 2 percent of what the Bulgarians pay). Mobile monthly usage in India has increased in 2003–8 from 326 minutes to 464 minutes, almost twice EU levels. Commissioner Reding stated:⁵⁵

High mobile termination rates are thus an indirect subsidy for the larger mobile operators – a subsidy that has to be paid by all fixed operators, by smaller mobile operators and by all consumers. While there may have been a greater tolerance of high mobile termination rates when mobile networks were first being rolled out across Europe, they can no longer be justified today, at this advanced stage of mobile market development.

This explains why US users make much larger volumes of calls, and mobile companies who cannot charge higher termination to fixed operators are therefore not paid the European 'mobile subsidy'. Mobile companies have fought a very long running battle to maintain their high prices, in the case of the United Kingdom for instance it is now over a decade old, but this EC activity indicates that this regulatory episode is drawing to a close.⁵⁶

This led the EC to issue an Article 7 Recommendation on mobile termination rates following consultation, under its responsibilities to coordinate a single market for communications within the terms of the Framework Directive.⁵⁷ The issuing of a recommendation requires NRAs to take 'utmost account' of EC recommendations, in conjunction with the requirements to ensure accurate cost accounting for wholesale and retail markets. In this case the Recommendation requires that 'NRAs should ensure that termination rates are implemented at a cost-efficient, symmetric level by 31 December 2012' (para 12).⁵⁸

The high termination rates direct funds away from critical investments in NGA.

Regulatory Symmetry and the ‘Fixed Strategy’

In mobile markets, the ‘dongle’ has led to a surge of substitution of fixed broadband by mobile, as well as new broadband users, with over 100 million 3G broadband users (both ‘dongles’ and phones). Will mobile broadband users be allowed to exploit their dongles to use the Internet openly as they can on their fixed ISP? The Economist states:

The growth, however, comes with a couple of big drawbacks for the operators. One is loss of control. Subscribers can do what they want: the operator is merely a ‘dumb pipe’ to the internet. Next, rates have been falling quickly ... ‘Network neutrality’, the principle that operators should not discriminate between different forms of traffic, will not succeed on mobile networks, says Holger Knöpke of T-Mobile.⁵⁹

The argument that there are sufficient networks to compete away such a hopeless (from the universal open viewpoint) scenario is based on the success of open wireless platforms offered in particular by the 3G entrants in Europe. While most 3G licensees are extending their 2G networks, we saw that Hutchison 3 began 3G service earlier, and has a more open service, than its rivals, marketing itself as offering Internet service at cheap rates via its ‘dongle’ and also Skype-to-Skype calls for free on its phone network.⁶⁰ I argue that 3 is the exception that proves the rule, as indeed does the United Kingdom. The UK fixed incumbent, BT, sold its mobile network to Telefonica in 2002, under pressure to reduce its debts. As a result, there is not only separation in the United Kingdom between wholesale and retail arms of the incumbent, but between the fixed and mobile incumbents, leading to a much more even regulatory and lobbying battle, even if Russell expresses amazement at the ‘Big Four’ and their legal expenses. Elsewhere in Europe, for instance in the homes of T-Mobile (Germany), Telefonica (Spain) and FT, there is resoundingly less pressure to regulate the termination monopoly of the mobiles. The renegade 3 may put pressure on regulators in the markets it has entered (including Italy), but without an incumbent to make much bigger noises, all it does is show that in very specific, almost freakish, conditions, as in the United Kingdom, there is a real choice of ‘walled garden’ or open

access. More importantly that open access is at a price and coverage that makes it somewhat attractive to low-volume transient users.

The special pleading of mobiles, and the relaxed or incompetent regulation of their termination rates (depending on your viewpoint), is greatly to the detriment of consumers with fixed-line connections. The approximate number €100 billion keeps coming up:

1. It is the minimum number in what ECTA claims has been the cross-subsidy effect of distorted fixed-to-mobile termination rates over the past decade;
2. it is what the mobiles 'lost' on the 3G auction due to its timing at the height of the dot-com bubble (the total cost in Europe was substantially higher but the spectrum was never going to be given away);
3. it would make an enormous hole in the cost of getting every European household onto at least 50 Mbps VDSL broadband lines – even if the backhaul would still be a bottleneck.⁶¹

Should these three numbers be related? The regulatory purists would say no, the realists would say of course they are. The European broadband environment has been enormously distorted by these problems for the past decade, and arguably its one reason why competitive broadband has been patchy at best. The answer to that is to stop deceptive advertising and enforce QoS standards on ISPs including mobile, while Ofcom is still trying to avoid including mobiles in its preferred co-regulation. My position is rather more interventionist than most, based on a lack of belief that NRAs are effective at ensuring that consumers are well informed and competition works effectively, and therefore that minimum quality requirements should be necessary. Consumers are misinformed and misled by most ISPs, and competition works ineffectively in general. Of course many NRAs may ignore net neutrality requirements, and the Commission should be careful what it asks for and enforces in the new regulatory package. Therefore, I see a need to fire a legislative shot across the bows of all ISPs to ensure they conform to minimum QoS 'net neutrality lite'.⁶² If customers get what they pay for, they might be happier with ISPs.

This leads to some lateral thinking and what I term the 'fixed strategy' – a regulatory option for redressing the balance in the fixed-mobile debate while ensuring at least 'net neutrality lite'. How can ISPs make money on their NGNs if they continue to over-promise and under-perform? Four options present themselves:

1. PHORM – behavioural advertising, act as targeted advertisers and extract some of Google's revenue without directly charging them.
2. The 'Mobile' option: Discriminate and offer consumers walled gardens of 'approved' (i.e. prioritized) content – exclusive offers where possible, such as with Disney or the Premier League.
3. Stop spending money on DPI and offer customers what they want, high-class Internet service – that's what Odlyzko believes, as we saw in Chapters 1–3.
4. The Fixed strategy.

The United Kingdom is unique: an incumbent SMP operator, BT, which has no mobile (as opposed to wireless) network, has the OpenReach structural solution. It also has a reasonably strong tradition of regulating mobile networks, over a twenty-year siege laid by the most expensive lawyers in London. Yet still the Competition Commission castigated Ofcom's latest attempts to regulate mobile termination.⁶³

So here's the 'Fixed' plan to invest in higher bandwidth without the need for behavioural advertising, QoS deployment or 'walled garden' portals:

- Reduce mobile prices to cost – check Indian termination rates to see what cost is;
- Then the fixed operators stop losing market share and interconnection charges hand-over-fist and they can invest in higher-speed broadband as their advantage over mobile;
- enforce net neutrality against mobiles too – if their mobile broadband is the advertised 14.4 Mbps, they can afford to give their customers the whole Internet.

What does this radical option do? It enforces a transparent cost-based technology-neutral settlement on the operators, and thus a transparent and open access solution for consumers. Will Ofcom and the European Commission do it? Do oligopolists fly?

As regulation stands, mobile will be a walled garden for the most part, and fixed ISPs will either move towards that walled garden (reversing the historic strategy of AOL) or a gulf will open between the two types of access. It is reminiscent of the story of the little man who dies and goes to heaven, meeting Saint Peter who offers him a guided tour to settle in. He sees the areas settled by the Hindus, Presbyterians, animists, Muslims, Jews, Protestants,

Methodists, Confuscians, in fact all the peoples of the Earth, whatever their beliefs, smiling in endless bliss and tranquillity. Finally, they come to a high wall, behind which they can hear raucous noise and loud music accompanied by squeals of delight. The little man asks Saint Peter who is enjoying the party: 'That's the Catholics, they think they're the only ones here.' European mobile may not be a special type of the Internet heaven, but it is likely to offer a safer and more sanitized experience though with less surprises and innovation.

In the concluding chapter, I sum up the argument in the book, focussing on the prospects for effective co-regulation of 'net neutrality lite'. The last three chapters have pointed out the extreme reluctance with which European regulators have agreed to regulate for net neutrality in any form, with the honourable exception of Norway. US observers may think that 'lite' net neutrality is a long way backwards from their debates, but it is also a long way forwards from the current situation in most EU countries for fixed ISP access, and as we have just seen, for MNOs.

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