

3G to Web 2.0?

Can Mobile Telephony Become an Architecture of Participation?

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Abstract / Telecommunications companies (telcos) paid too much for European 3G licences on the basis that they would be able to reach mobile consumers directly with web content. The subsequent reluctance of consumers to pay for commercial content and the debts and devaluations afflicting the post-tech-boom telcos has had several consequences. Besides an undercapitalized 3G infrastructure, there has been increasing consternation about the absence of a must-have service 'killer app' that would lead to the uptake of 3G products, and determined efforts to find one, as evidenced at events like 'Mobile Content World', an industry conference and trade fair held in London in October 2005. But the efforts to sell 3G spectrum (and the entire 3G experiment) may be based on a misapprehension of the nature of users' relationships with ICTs and web content. This article presents an overview and commentary on the progress of the 3G mobile content industry. In part it is based on a review of presentations at 'Mobile Content World', and in part on a review and synthesis of the most recent literature covering 3G and mobile content from the fields of media studies, cultural studies, economics and business.

Key Words / 3G mobiles / mobile content / mobile telephones / user-generated content / web 2.0

Introduction and Background

In 2000, at the height of the 'dotcom' boom, telecommunications companies (telcos) in European markets paid too much for third generation mobile telephony (3G) spectrum licences. 3G describes a range of telephone protocols (UMTS, cdma2000 and more) that transmit and receive data at speeds over the threshold at which certain kinds of mobile internet experiences become possible, such as audio, image and video downloads, streaming data, online gaming and so on:

Third generation (3G) wireless networks . . . offer faster data transfer rates than current networks. The first generation of wireless (1G) was analog cellular. The second generation (2G) is digital cellular, featuring integrated voice and data communications. So-called 2.5G networks offer incremental

speed increases. 3G networks . . . offer dramatically improved data transfer rates, enabling new wireless applications such as streaming media. (SCMAD, 2005)

But also 3G phone technologies instantiate multimedia convergence, whereby, along with the voice and text capabilities that second generation (2G) mobiles offered, users can produce, send and receive digital photographs, video, audio and more. The promise of this broad functionality was enough to get telcos and governments excited in the late 1990s about new revenue streams from new kinds of content, and enough in 2000 for them to be led to pay well over the odds for the rights to a segment of the spectrum required to run 3G services.

The clearest example of miscalculation over 3G was seen in the UK's auction, held over March and April 2000, just after the NASDAQ index hit its all-time peak of 5048 on 10 March 2000. It was the first in a series of such sales in European territories. It remains the largest auction in history, raising £22.5 billion, and valuing UK spectrum at US\$107.2 per person, that is, roughly three times more than Italian spectrum, more than four times more than Dutch spectrum, and around 50 times more than Swiss spectrum, all of which were auctioned in the same year (Cramton, 2001. Altogether, the European auctions raised £60 billion). Tellingly, the sale also raised more per head than sales of US spectrum, not only because these happened outside the peak of the technology boom, but because European spectrum was perceived as being more valuable at the time due to the more advanced development of its markets and infrastructure.

There is now a significant academic economic literature devoted to explaining how the telcos were induced to pay so much¹ – was it the cleverly designed auctions, miscalculation over the value of the asset or simply irrational behaviour? The most convincing explanation is that ambitious telcos in 2000 could simply not afford *not* to win licences:

Trouble was . . . a loss in the auction was seen as a death sentence . . . [I]nvestors were all too willing to bid up the stocks of the bidding companies – and punish them if they bailed. 'If we dropped out, our market cap would fall by far more than the price of the license', said an exec at Spain's Telefonica at the time . . . 'I went to Chris Gent [CEO of Vodafone] and told him it was madness', says an executive at Nokia. 'He shrugged and said, "What can you do?"' (Baker and Clifford, 2002)

Damned if they didn't acquire spectrum in 2000 – whatever the cost – telcos have had time to rue their willingness to part with the necessary billions.

The justification for all this in 2000 was that the range of multimedia services 3G promised would significantly expand mobile revenues. The promise of 3G (though vague in its details) was that customers would be able to download video, watch TV and surf the internet on mobile hand-held devices and, moreover, that they would happily pay for the privilege. Where the commercial success of first generation (1G) mobile telephony had been built on voice, and second generation (2G) technologies had built on this with text, games, ringtones and other services, 3G, it was promised, would allow companies to offer full internet connectivity on hand-held mobile devices. The underlying big idea – the one that had European governments cheerleading the 3G race – was that through the development of mobile internet hardware and services, European firms would finally be able to contend with the USA (and Microsoft) in the field of high technology (Baker and Clifford, 2002). This was premised on Europe's undeniable edge in mobile technologies, infrastructure and consumer uptake throughout the late 1990s.

Since then Europe's telcos have declined in value and sunk into debt, and their huge expenditures on 3G spectrum have stymied the capital investments required to implement the services that the spectrum was supposed to allow. Almost all observers have agreed that the events of 2000 were catastrophic. Ure comments that 'It is hard to credit the telecommunications industry with getting things so wrong as the third generation mobile licence fiasco in Europe' (2003: 187), and goes on to quote Sir Peter Bonfield, former chair of BT, as saying 'We spent £10 billion too much' (Ure, 2003: 188): Jeremy Warner calls it 'the biggest misallocation of capital in the modern corporate age' (2005). The problems arising from the sale have been such that many argue that Europe has managed to squander its advantages as a centre for the development of mobile technologies, and that Asia and the USA have begun to pull alongside and even ahead (Baker and Clifford, 2002; Zhang and Prybutok, 2005).

The price telcos paid for spectrum was especially problematic given that even then, but increasingly since, 3G networks have looked anachronistic. Like the old analogue networks, 3G is premised on exclusive rights to scarce spectrum for service providers, and on top-down, vertically integrated delivery of wireless services: the consumer must sign up to one provider and is then reliant on their network. As it has been implemented, 3G offers the consumer relatively low bandwidth for a relatively high cost – Lehr and McKnight remark that '3G is a technology for service providers' (2003: 353). With the prospect of wireless technologies and protocols using unlicensed spectrum – such as WiMax – which might viably offer broadband data *and* Voice-over-Internet (VOIP) telephony via bottom-up mesh networks, in the immediate future the remaining advantage 3G will have over competing technologies is geographical coverage, with that likely to erode over time. After profiting from the initial auctions, European governments have begun cheaply selling off other parts of the radio spectrum that allow the provision of 3G services. All of these are among the reasons for firms writing down their 3G spectrum assets in the years since the auctions – in May 2003 MMO2 (spun off from BT (formerly British Telecom) wrote £6 billion off its German and British 3G spectrum assets; elsewhere in Europe Sonera took a €4.3 billion write-down on its investment in German 3G spectrum in 2002.

Though telcos are always claiming that things will soon get better regarding 3G, recently handsets and hardware have proved increasingly difficult to sell (Judge, 2006), and many of the services that were the rationale for the massive initial investments, and through which telcos hoped to recoup at least part of their massive investment, have been determinedly resisted by European consumers. No killer application – or 'killer app' – has done enough to stimulate the widespread replacement of 2G handsets in a saturated European mobile market, let alone a large-scale uptake of the kind of subscription-based services that telcos require to break even on 3G. While applications based on one-off downloads – like ringtones and wallpaper – continue to sell reasonably well, these alone cannot cover the telcos investments in 3G.

Mobile Dis-content: Mobile Content World (Europe) 2005 as a Snapshot of the Mobile Content Industry

Given the history sketched in the foregoing section, it is unsurprising that the development of new forms of mobile content and new strategies for selling it is taking place

with a sense of urgency that goes beyond the normal hustle and hype of the 'creative industries'. Despite, or perhaps because of the lack of a must-have service – a 'killer app' – stimulating the large-scale uptake of subscription-based multimedia services in Europe, a swarm of enterprises are competing for a place in the mobile content value chain, attempting to come up with models and forms of mobile content that will encourage consumers to engage with these pocket-sized multimedia platforms in a way that is profitable for the industry, whose hopes for 3G were so high.

This was clearly the context informing Mobile Content World, held from 13 to 15 September 2005 at the Kensington Olympia conference centre, London. Mobile Content World was a three-day conference and trade show including exhibits and presentations from the European mobile content industry, which has mirror events in Asia and Australia. It showcased the range of services and products being offered to consumers and businesses, as well as canvassing business models and offering predictions and recommendations for making mobile content pay. Mobile Content World is distinguished from other trade shows in the mobile telephony industry by its focus on content as opposed to hardware. While the speakers at Mobile Content World were gamely assertive as to the quality of their 3G products, and confident in their ability to sell them, not far from the surface was an anxiety that European mobile users will not be persuaded to pay for the array of extant and emerging forms of 3G content.

Judging from this event, the industry forming around content provision for mobiles has identified two areas where their difficulties can be reversed: their understanding of the audience and the content itself. The first area of interest gives rise to a set of questions. Why is the (potential) audience so resistant to subscription services? How do people understand their mobiles as media? Which audience segment is most likely to break first and start subscribing? How do they want their content delivered? The second area gives rise to debate between those who think that mobile phones as a medium require the evolution of medium-specific forms of content, and those who think that existing media – broadcasting, cinema, games – can be successfully adapted to phones given a better understanding of the circumstances of mobile media consumption.

Valerie Accary, the managing director of advertising agency BBDO, talked in her keynote lecture at Mobile Content World about her firm's research efforts at understanding the mobile market for advertisers. Her framework for analysing mobile technologies is a familiar variant of postmodern media theory. For Accary, mobile technologies have led to (a) an acceleration of time, with an accompanying decline in attention spans and forward planning; (b) an expansion and proliferation of new forms of social networks; and (c) a change in consumption patterns and the rise of an 'empowered consumer' with whom brands and content providers must connect. There are opportunities and dangers here. Companies can target market segments with precision, and text-message-based marketing is very economical compared with other promotional strategies. But temporal compression, new social networks and more critical consumers mean that a brand can be made or tarnished in record time, in ways that are difficult to predict or control.

BBDO's research found that the mobile, as distinct from email or the home telephone, is seen as a distinctly intimate and private technology ('my mobile is my right hand', Accary's focus groups said), so traditional direct marketing to the phone is often resented as intrusive.² This leaves content providers and especially advertisers in the difficult position of having to be *invited* to advertise on a medium whose very intimacy is what

makes it so attractive. Accary suggested remedies: leveraging opinion-making communities (as in Tylenol's creation of a community of extreme sports aficionados); piggy-backing on virtual communities' production of and desire for specific kinds of content (as in Snickers' delivery of Euro 2004 results to teenage boys' mobiles); building creative campaigns (as in, allegedly, Burger King's www.subservientchicken.com); and utilizing connectivity (as in Nike's take on mixed reality gaming concepts in Recon).³

The most striking aspects of this presentation, which was very well received by the corporate audience, were (a) the straightforward and obvious nature of much of its content (people don't like being spammed on their mobiles; some people will accept sponsorship of information they find useful); (b) the extent to which 'creativity' in this form of advertising is essentially parasitic upon the spontaneous networking of users – companies were advised to sponsor or co-opt consumer-led activities; and (c) how perturbed the industry is by the dilemmas posed by what Accary herself described as the 'intimacy' of this new medium for advertising and the resentment their brand might encounter if they actually use it. The derivative nature of much of what was forwarded as innovative mobile campaigns underscores the structural problem the advertising industry is still encountering vis-à-vis media which don't allow them simply to pump advertising through to the audience.

The problems of advertisers are similar to the problems of broadcasters who want a part of the mobile content market. As TV viewing declines (at least in relative terms), broadcasters whose whole business revolves around producing long-form broadcast content are more than a little concerned to keep their brands and services viable by tailoring them to the 'mobile lifestyle'. In her presentation to the conference, Tanya Price, Head of Business Development at BBC Broadcast, formerly part of the venerable Corporation but now sold off to the Macquarie Bank, did her best to be upbeat about offering tailored and adapted broadcast news and entertainment content to mobile users. BBCB provides BBC-derived, specifically crafted editorial material to Hutchinson 3's network users in the UK, and their view is that mobiles are a unique medium, with a unique set of viewing habits and contexts attached to them. She thinks that people will want to watch three main types of content:

- *They'll want to be entertained on the move, they'll want short, punchy and funny stuff to fill in those moments of boredom . . .*
- *They'll want to see the 'money-shot,' pictures that just can't wait until they get home . . . England winning the Ashes . . .*
- *Or they want to have timely and relevant content which fills an immediate need that won't be relevant by the time they get home . . . in a supermarket they might want to screen a quick cookery vid to give them inspiration before buying the ingredients for that night's supper. (Price, 2005)*

Whether or not we can picture ourselves using our mobiles in this way, these suggestions seem to be the fruit of clear analysis, as was Price's outline of the problems with using broadcast material to meet these needs. The first is that the standard toolkit of contemporary news broadcasting – including tricky editing, headline tickers, fancy camera work, busy sets – all become visual mush on a one-inch screen. Price's answer to this is to subtract from the televisual image and flow in order to adapt it to mobile broadcasting: head and shoulders shots, tight camerawork, a minimum of visual extras and very short news grabs and packages. There is a useful insight here, but at the same time it is

slightly bemusing that the brave new world of mobile content is envisioned as a remediation of the 'talking heads' aesthetic of early television.

It's not entirely clear that this effort at repackaging the televisual for the 'unmoored screens' (Pace, 2005) of 3G mobiles is succeeding in the important sense of attracting paying subscribers. When questioned and then pressed by an audience member about the break-even points in terms of subscribers, Price claimed that the complexity of the service options offered meant that she could give no answer, nor even match an exemplary bundle with a break-even point. To one listener at least, this seemed frankly implausible. Either BBCB has not done its projections, which seems highly unlikely, or they have and the numbers are so large relative to the current market for this kind of mobile content that revealing them would scare off potential partners, clients and investors. One suspects that if these crucial figures were good, or if break-even points were likely to be reached any time soon, the question would not have needed to be asked; when a company's numbers *are* good, as was seen in the few presentations where they were, companies are inclined to publicize it.

Unsurprisingly, pornography, or 'erotica' as the industry prefers it, is being forwarded as a way of breaking the 3G subscriptions market, and those providing it seem to be doing an increasingly healthy trade, at least by comparison with other sectors. Porn has all the advantages as content that news broadcasts and advertising do not: people in a key demographic seem to want it – 'primarily 18–35 adult male, highly educated and with a high income' (Penev, 2005), it is a flexible commodity which can be delivered and priced in numerous ways (from one-off still downloads to MP3s to voice services to video), it fits with the notions of intimacy that seem to cluster around mobiles, it is open to all market players, and people are accustomed to using new technologies to access it (we could even say, along with games, that porn is a major educator in the use of new technologies since it draws audiences to those technologies: '38% of mobile searches are for adult content' (Penev, 2005). Even here, though, Victor Penev of Playboy Online expressed a concern that the 'wild west environment' of 10 years ago would return, when millions of online porn downloads happened without anyone making a cent. One question is whether or not all that mid-1990s free content acted in effect as a kind of loss leader, not only for the porn industry, which has since stabilized somewhat, but for internet use in general and then e-commerce and commercial online content provision as a whole. Another is whether the 'wild west' is already returning in the form of user-generated mobile erotica (see later in the article).

Gaming is an area where some companies have made some gains, particularly in Asian territories and particularly if they are involved with providing content for Nokia's NGage phone/hand-held hybrid. Scott Foe, who developed Sega's *Pocket Kingdom* (a mobile MMOG) for the NGage and then moved over to Nokia Games to work as a senior producer, has something to be happy about, since his is one of the leading titles in a \$2.6 billion market (which puts mobile gaming, as he pointed out, practically neck and neck with PC gaming). He spent a lot of his presentation outlining the clear differences between designing for the PC platform and designing for mobiles (Foe, 2005).

Whereas, Foe claimed, the more immersive PC experience demands games that are 'easy to learn and impossible to master', the more distracted nature of mobile play means that there must be a more gentle ascent in the difficulty of gameplay. Very quickly, designers like Foe have concretized vague concepts like 'connectivity' and 'community' in

design, realizing that a satisfying multiplayer game cuts down on development costs and boosts a service's longevity by relying on peer-to-peer (P2P) interaction as a source of pleasure. Asynchronous play has been accounted for in the design of games like *Pocket Kingdom* – if a player's device is switched off the structure of the game means that this will not alter the result, and Nokia's NGage Arena server will replay the sequence of play. Technical problems for designers around the bewildering range of mobile telephony providers have been eased by a range of tools that Nokia offers for NGage developers. Having said this, we can also say that content success stories like *Pocket Kingdom* are vanishingly rare, and that the 'worldwide' statistics that Foe used to illustrate Nokia's successes are unevenly distributed across the major content markets. Also, to be fair to others attempting to sell mobile content, it may be much easier to rationalize success than to explain failure.

Apart from the presentations already summarized, there was a widespread, evident industry concern at Mobile Content World that mobile content is not 'sticky' enough to garner an audience, or that the audience is too mysterious and ornery to be encouraged to take it up. Papers had such titles as 'Developing the killer application for mobile content' (Weiner, 2005), 'Innovating to create desire for music content', 'Making mobile music pay' (McBride, 2005), 'Content acquisition – finding the right content' (Laury, 2005), 'Is 3G for the Playground or the Office?' (Bill, 2005), and 'The Asian Experience of Mobile Content: Why it has Been so Successful' (Yeh, 2005). They revealed in their broader themes and detail the concern that the content industry – and the telcos with which it is hand-in-glove – has not hit upon any kind of content or business model in European territories that can make the kind of money they may have been led to expect would flow from the consumer adoption of these technologies, and which they need in order to justify and realize the massive outlays of 2000. Then there is the mysterious, younger audience: part of one afternoon was taken up with a panel session, 'How to exploit the massive youth market through mobile channels', followed by a faintly bizarre 'Live youth focus group', where some teenagers, tagged as 'representative youth', were led on stage and asked questions about their self-definition by moderators and audience.

The overall impression, then, was of an industry (or industries) which is a little at sea. There is expensive content available or in the pipeline, but few customers are volunteering to pay for it (outside certain kinds of content in certain markets). Meanwhile the clock is running down on this particular phase in the development of mobile technologies, with wireless protocols incorporating VOIP and even 4G looming as the new standards for mobile telephony. The industry cannot be blamed for attempting to make up for misjudging the value of 3G spectrum, and investing in the production of new kinds of content is understandable as an effort to crack consumers' resistance. But is it throwing good money after bad, and does it fundamentally misunderstand consumers' relationships with mobile technologies and online content alike?

There is a lesson here, perhaps.

Mobile Content: New Ways Forward?

A clarifying definition and segmentation of the mobile entertainment is offered by Wong and Hiew (2005), which may allow us to conceptualize ways for service providers to find new ways to bring about the adoption of 3G technologies by building on the ways in

which consumers already employ their technologies. In ‘Mobile Entertainment: Review and Redefine’, the authors’ aim is to ‘present a framework to examine mobile entertainment from multiple points of views [sic] concerning the service, network and device related sectors’, so as to distinguish ‘mobile entertainment of different domains’. Instead of relying on top-down definitions according to technology (as previous definitions or segmentations of mobile entertainment have done) or value-chain analysis, Wong and Hiew think about what the end-user does with mobile technologies, and segment mobile entertainment with the understanding that ‘increasing revenue from mobile entertainment services in the future [depends] ultimately on the successful development of an end-user market rather than technical development’. They offer a segmentation of mobile entertainment along the following lines:

Segment 1 consists of intersection between mobile commerce and mobile entertainment . . . which involves exchanges of monetary value and interaction with service providers. Segment 2 covers mobile entertainment services which utilize wireless telecommunication networks, but do not incur a cost upon usage and do not interact with service providers . . . Segment 3 involves mobile entertainment which does not require wireless connection and transaction of economic value.

FIGURE 1

Segment 1	Segment 2	Segment 3
Watch a streaming video on mobile device. Send MMS to a friend's mobile device. Download music to a mobile device.	Share downloaded video clip with friends via Bluetooth transfer. Transfer pictures to a friend's mobile device via infrared. Transfer music files to a friend's mobile device via infrared.	Record video clip on mobile devices equipped with a camera. Snap pictures with mobile devices equipped with a camera. Listen to music files transferred from PC to Apple iPod.

From Wong and Hiew (2005).

We can take Wong and Hiew’s segmentation a little further when we notice that Segment 1 includes (a) pre-existing content, including that produced by service providers (e.g. streaming video; downloaded music; downloaded video), downloaded at a cost and (b) any content exchanged between end-users, at a cost, via mobile service providers (e.g. SMS, MMS). The difference here is important: though both attract revenue for telcos, only (a) involves the uptake of content produced by or for the telcos for sale to consumers. As Wong and Hiew point out, Segment 1 as a whole necessarily ‘contributes as the main source of data revenue for telcos’: Segment 3 is content produced by and for end users using the multimedia capabilities of 3G mobile devices; and Segment 2 involves the free exchange of content between users, whether this is material sourced from commercial content providers or elsewhere. Given this segmentation, we can see that most of the plans laid for 3G – as, for example, in the presentations made at Mobile Content World – are focused on Segment 1(a) alone, the effort to grow that part of it that depends on top-down content production and distribution has stalled. But if this approach is not

working in Europe (and is seeming increasingly unlikely to), what would be lost by concentrating on facilitating and encouraging the production and exchange of end users' content, and growing Segment 1 revenues by putting users in charge of content provision?

Very little, some would argue. Andrew Odlyzko has been one of the most consistent critics of the telcos' ability (and suitability) as content providers. Following on from a range of his published research on communications networks (e.g. 2001), Odlyzko (2004) argues for a spectrum reallocation on the basis that current spectrum policy is based on dogmatic 'myths' about telecoms, four of which are of pressing interest in this context. The first is that 'carriers can develop innovative new services', for which Odlyzko thinks there is no serious evidence, and much evidence to the contrary:

ATM, QoS, RSVP, multicasting, congestion pricing, active networks, WAP and 3G have all been duds, not because they failed to work, but because they failed to satisfy user demands. The real 'killer apps' . . . have all come from users . . . If anything, we should expect an even greater fraction of innovations to come from users at the edge of the network. (Odlyzko, 2004: 7)

The second myth, 'content is king' – that prosperity in the future will come from the development of content, is critiqued by means of a simple comparison of the revenues from content and content industries as against the 'pipes' provided by telcos, which demonstrates that 'providing pipes for connectivity has always brought more revenue than content distribution' (Odlyzko, 2004: 8). The third and fourth, 'voice is irrelevant' and 'streaming real-time multimedia traffic will dominate', are premised on a misunderstanding of the continuing importance of voice in mobile telephony (still providing 70% of telecom revenues, despite its development being neglected during 3G) and the fact that faster than real time multimedia file transfers are increasingly displacing streaming, since they are more convenient and fit better with consumption behaviour. He concludes that the way forward for the industry is in 'expanding the spectrum that is available for connectivity, as opposed to broadcast' (Odlyzko, 2004: 13)

Odlyzko's is trenchant criticism of the approach of telcos, and appears to argue that designing phones with multimedia capacities and a network able to facilitate transmission of such material is a misplaced effort given that voice has been the major generator of revenues. We might say that this in part neglects the fact that users do use and appreciate mobiles' multimedia capabilities, even if, at present, they are producing and exchanging material outside the revenue-generating segments of the entertainment market. And it also misses the possibility that telcos could profitably turn away from multimedia content provision towards multimedia connectivity. The broader point, though, about the proper (and profitable) role of telcos as facilitators of connectivity rather than as producers of content is well made, and finds support among other commentators.

In a similar vein to Odlyzko, Nick Foggin (2005) argues that mobile service providers need to return to their original core business of facilitating communication between users. Foggin criticizes the idea that sustainable growth in the mobile industry depends on the commercial provision of new kinds of content. Voice calls are worth \$1,000,000,000 per annum with plenty of room to grow (only one-third of calls are made on mobile as opposed to fixed line phones) and yet there is surprisingly little interest in improving the quality and reducing the cost of voice calling. Text, together with voice calling and

voicemail, still represents 95% of the revenues of telcos, but Foggin laments that no one seems interested in improving the standard of voice telephony on mobiles, and thus differentiating them from emerging wireless and VOIP technologies. He mobilizes a range of research that suggests that

content over mobile phones is unlikely to generate substantial revenues . . . [but] conversations between users – conversations that are powered by content – have the potential to create a multi-billion dollar market . . . The small-talk that has powered the massive growth of mobile voice can be further stimulated and grown . . . by using content as its raw material. Content becomes a means to an end, not an end in itself. (Foggin, 2005: 255)

For Foggin, the telcos need to shift their focus from (in Wong and Hiew's terms) Segment 1(a) – the provision of content – and focus on improving and extending consumers' ability to communicate with one another.

To do so would, among other things, take account of what some see as a profound change in consumers' relationship with ICTs and online content, which has been conceptualized as 'Web 2.0'. Although it is true that mobile phones are a very specific kind of ICT that still need to be distinguished from computers, the fact that they are now part of the spectrum of web-enabled devices means that we can fruitfully think about them in connection with Web 2.0. The most prominent definition of Web 2.0 is probably Tim O'Reilly's:

Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating networks through an 'architecture of participation', and going beyond the page metaphor of Web 1.0 to deliver rich user experiences. (2005, emphasis mine)

Web 2.0, for the audience, is held to be less about *reading* discrete pages offered by service providers than it is about providers facilitating the presence of end-users as active, collaborative co-creators, and affording tools and connectivity that will allow an 'architecture of participation'. One of the other key concepts around Web 2.0 is the notion of 'social software' – the kind that facilitates the building and maintenance of virtual communities, self-expression, participation and dialogue: wikis, weblogs and other participatory forms. We can see that new thinking on the way the internet is developing is heading in the opposite direction to the ring-fenced, essentially receptive model of content delivery that some 3G service providers are adhering to.

There is, though, evidence of an increasing willingness on the part of enterprises – whether media enterprises or telcos – to invite and feature the output of untrained members of the public armed with powerful multimedia 3G recording devices. 'Citizen journalism' describes – among other participatory developments – new kinds of audio-visual reportage by untrained members of the public exploiting the affordances of mobile technologies. The early defining moment in the use of 3G videophones came with the extensive use of citizens' phone footage during the 7 July 2005 bombings in London; figures in the broadcasting industry are making plans out loud to feature the mobile-assisted work of citizen journalists more and more prominently (Clifton, 2005). Although television and newspaper reporters cannot be everywhere that events are happening, a

3G mobile-equipped population can and will supply eyewitness coverage of events such as the London bombings.

On a more prosaic level, web platforms that allow moblogging (blogging from mobile phones), vlogging (video blogging) and other forms of 3G-enabled participation are increasingly popular and show clearly the potential for user-generated 3G content to be integrated in an architecture of participation. Sites such as moblogUK offer users the opportunity to blog with text and pictures directly from their telephones via SMS, MMS or the web browser. Vlogging, though still in relative infancy, takes advantage of the video capabilities of 3G phones in order to allow regular posting of home-made TV. Emerging services such as JuiceCast account for the convergence of digital media formats and offer the ability to post text, video, sound and pictures to a multimedia blog, and from mobile devices. None of these services rely on content production, only on facilitating user participation, and all secure revenue through advertising, which as Odlyzko points out (2001) is one of the few historically reliable methods for making money from content.

Intriguingly, some telcos are beginning to put user-generated content at the heart of their mobile content enterprises. Hutchinson 3G's SeeMeTV, launched in 2006 (Hutchinson 3G UK, 2006), is a service allowing customers with video-enabled telephones to upload their videos via text. Other customers pay 10p per download, and users receive 1p for each download. Initially, they receive credits for SeeMeTV downloads, but after 1000 downloads Hutchinson 3 opens a special PayPal account where they can spend their credit in any way they like. Though a wide variety of content features on SeeMeTV, the slogan for the service – 'it's astonishing where people point their video mobiles' – foregrounds the fact that a certain amount of the content is amateur erotica. The commercial pornography producers who are among the few content providers currently managing to sell 3G content may find themselves increasingly squeezed by the amateur producers sending home-made erotica for distribution through services such as SeeMeTV. In any case, the service and its business model specifically rely on harnessing those segments of the mobile entertainment market that do not involve the production of top-down content by telcos. The service depends on people equipped with 3G mobiles (and a desire for some pocket money!) providing content which Hutchinson sells on to other users, thus eliminating altogether the overheads and infrastructure that go along with content production. This is a clear early example of an attempt at the construction of an 'architecture of participation' by telcos that harnesses the productive capacities of 3G technologies and integrates all segments of the mobile entertainment market, deriving value from the full capacities of 3G phones.

Conclusion

It is easy to be wise in retrospect about the disastrous purchases of 3G spectrum, and we need to be measured in our criticism of the telcos and governments involved, but still resolute in counting the costs. The purchase of spectrum six years ago was premised on mistaken assumptions about telcos' ability to harvest revenues from Segment 1-style content provision. The failure of a market to emerge for top-down content has meant not only that telcos have suffered, but that telecommunications infrastructure has suffered in turn. Leaving aside questions about the wisdom of entrusting the development

of such infrastructure to private investment, the knowledge that 'content is not king', and that the most vital mobile content is that being exchanged between users, ought to inform policy and commercial strategies in the future. 3G saw telcos making huge investments on the basis of a vertically integrated model of content provision derived from broadcasting, tech-boom hype and a certain amount of wishful thinking. Their chances of finding a 'killer app' for content during the 3G era – if Mobile Content World is any guide – seem increasingly remote. If the direction of technological change allows them the opportunity to participate fully as drivers of the next generation of mobile technologies, telcos ought to look towards simply creating the best and most connective communications environment for consumers to produce and exchange content. This, safe in the knowledge that they will, for once, be swimming with the tide of consumer behaviour and expectation.

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Notes

- 1 For example, see Binmore and Klemperer (2002), Cramton (2001), Klemperer (2001), Melody (2001), Plott and Salmon (2004). There is some debate as to whether the auctions were deliberately designed to extract the maximum (unsustainable) price from the telcos, and the macroeconomic rights and wrongs of what happened. On the one hand, some argue that the auctions were designed to draw companies into overpaying and the whole exercise represents an irresponsible transfer of debt from the public sector to the private sector. On the other hand, some argue that the telcos can only blame themselves for paying far more than they could afford.
- 2 This does not stop 3, my mobile service provider, text messaging me every Friday lunchtime with offers I never take advantage of, and rarely read.
- 3 Tylenol (a pain reliever) created the 'Ouch' campaign (including a zine, website and mobile services) targeting extreme sports aficionados. For more details see Pesca (2003). Nike's Recon is summarized by the Mobile Marketing Association:

To generate buzz among hip urban adopters while creating a sense of scarcity for a limited edition high-end athletic shoe, Mobliss helped Nike conceive and execute a mobile scavenger hunt in New York City called 'Recon'. New York-based 'Sneakerheads' were targeted via key circles and invited to join the competition by submitting their mobile numbers for alerts and interactive game play. Recon participants received clues to find posters dispersed throughout the city in the form of SMS 'missions'. Participants were awarded points based on how quickly they texted back a code posted at that location, as well as how thoroughly they found and identified codes over a four-day period. Top finishers were eligible for prizes, with the highest-scoring players qualifying to pre-buy the limited edition Nike Air Force-X Mid. The mobile campaign captured the guerrilla sensibility of both the artist and the shoe, while creating a new and engaging communications' vehicle for Nike and one of its core constituencies. (MMA, 2005)

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