

# Decentralisation and “Web 2.0” Weaken NGN/IMS Proposals (V5 DRAFT)

Lee S Dryburgh  
University College London

**Abstract:** Next-Generation Network (NGN) and associated IP Multimedia Subsystem (IMS) proposals are hailed as the future by the telecommunications industry. This paper outlines advances in Internet technology and usage which undermine such vision. Instead it infers that the future is a synthesis of media and telephony annexed by a more sociable Internet.

## 1. Introduction.

Operator controlled NGN and associated IMS proposals should be reevaluated due to technical advances and corresponding shifts in Internet usage. Decentralisation enabled by the Internet has given birth to free telephony that has superior sound quality to that of the PSTN. The same process of decentralisation is also impacting the media industry. The likely outcome is that telephony will be annexed by the Internet and merged with media. The process is being accompanied by a shift towards a more sociable WWW, often dubbed “Web 2.0”. This paper briefly outlines these three factors.

## 2. Annexing of Telephony

Technical advances over the past few years call into question the long term viability of telecom operators to charge directly for each call based on time and distance metrics. Services have been touted by operators as the silver bullet to combat the diminishing call revenues. The primary goal of NGN/IMS is to build a converged network based on IP and then to leverage it to offer those silver bullet services.

The underlying assumption was that operators would maintain a “walled garden” with calls graduating smoothly over time onto their NGN IP infrastructure. Underlying this assumption was the opinion that free calls over the Internet would always be a firm second class in terms of call quality<sup>1</sup>, resulting in consumer willingness to pay for NGN based calling (albeit with more pricing pressure to help ward off second class Internet calling). This root assumption was not without it’s’ merit at the time since Internet based telephony had been poor quality.

But the root assumption has been proven to have been fairly wrong and may yet be proven to have been entirely wrong. The entrance of Skype (representing P2P VoIP) into the telecom operator landscape should have caused reconsideration of the validity of the NGN/IMS proposals [1,2]. Assertions that multi-media operator based services will be the key to stemming call revenue loss can be considered a moot point. Once calls fall outside of operator control (to the Internet) users are no longer captive to the operator for the provision of services.

NGN/IMS based services are unlikely to give Internet based services stiff competition since so far no exciting services have been proposed; at least not any which can not be offered over the Internet. Nor have any killer applications have been put forward. Offering content is also questionable, particularly when taking into account the trend towards increased P2P content sharing and homemade content detailed later in this paper.

For a quick insight into operator thinking it is interesting to briefly describe the first dual mode handsets and their associated services. The first is produced by the UK incumbent operator British Telecom (BT) and is branded BT Fusion. It has been heralded as a turning point for the industry. The second is produced by the small manufacturer Olympia and is branded Dual Phone. Both are single devices that can switch seamlessly between networks. Each can be considered iconic of operator and

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<sup>1</sup> Additionally it was assumed that Internet calling would be thwarted due to technical hurdles to be overcome by the end users.

Internet spheres respectively. Such an iconic representation should arm the reader with supplemental material for self-extrapolation of the topic presented.

The BT Fusion [3] is claimed to work like a regular mobile phone when outdoors but when in range of a user's home broadband connection it switches<sup>2</sup> to act like a fixed line phone with fixed line call prices for outgoing calls and fixed line quality. Incoming calls are charged at mobile rates regardless of whether it is attached to the PLMN or to the user's home wireless broadband connection. The broadband connection must be Broadband from BT and the landline must be a BT landline. In addition a monthly BT Mobile subscription must be paid.

The Olympia Dual Phone [4] is claimed to be an ordinary DECT cordless fixed line phone with support for Skype VoIP. It is not constrained in anyway to a specific broadband or fixed line provider. Skype-to-Skype calls can be initiated to "buddies" marked as online (hence presence support). Since such calls are Skype based they are free of charge regardless of call duration or where in the world the called party is currently connected. Skype-Skype calls have higher fidelity voice quality than ordinary PSTN calls due to Skype's usage of a wideband CODEC<sup>3</sup> [5] although call reliability is not (yet?) as robust<sup>4</sup>. For calling those that are not online, the phone can simply be used as an ordinary cordless PSTN phone.

In relation to the BT Fusion the BT Retail CEO stated 'The service will transform the communications landscape [3]'. The author's opinion is that the Dual Phone represents such a transformation.

BT's former Chief Technologist Peter Cochrane stated [5] after a personal trial of Skype this year that:

my mobile phone bill has plummeted from \$500 a month to less than \$10 a month...The number of times I have had to use my mobile phone in the...past two weeks can be counted on the fingers of one hand...I've purchased headsets for all of my children and colleagues and asked them to move to VoIP...Because VoIP calls cost nothing, or almost nothing, they become a connection and not a call...because of the voice quality, there is great intimacy and connection. It seems to re-enable those emotional bits normally thrown away by the restricted bandwidth of the old telephone...It is unfortunate indeed that they [telephone companies] have long been aware that their 200-year-old model was going to collapse but took limited or no action...value for fixed and mobile operators is now in services. Unfortunately neither has seen fit to invest in sufficient numbers of services that interest users

This section concludes that what is currently known as 'telephony' is likely to be annexed<sup>5</sup> as an Internet application in much the same way as email. Operators will find it difficult to stem the losses with NGN/IMS services because increasingly subscribers will have broken away from the operator for call provision. Furthermore no exciting services have yet been proposed and the speed of innovation on the Internet is much faster.

### **3. Decentralisation**

Skype is representative of a much broader movement than "free" Internet based telephony. It represents decentralisation of industry enabled by the Internet and driven by its users. Armed with such a power shift they are reinventing what media and telephony mean and are starting to fuse them together.

Skype is the first VoIP client based on P2P technology [6]. Apart from a login server that is used to store usernames and passwords [6], Skype has no infrastructure. Everything else from user search queries, user profiles to call routing is decentralised making use of user's machines and their broadband connections [6]. Thus Skype is not even a service provider let alone a network operator.

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<sup>2</sup> The handset is a GSM Motorola V560 with VoIP over Bluetooth support. It transmits over Bluetooth to the wireless hub which in turn connects to a BT VoIP gateway.

<sup>3</sup> The PSTN uses a narrowband CODEC often restricted to 300-3400 Hz. Skype's CODEC [6] permits 50-8000 Hz to pass thru.

<sup>4</sup> Based on the author's experience, setup failures and call drops occur far more frequently than PSTN placed calls.

<sup>5</sup> It is the author's opinion that it be subsequently morphed beyond present-day recognition.

This is in sharp contrast to the large centralised infrastructure employed in the PSTN and bloated to form the Intelligent Network (IN).

The music industry faced a parallel situation to the arrival of Skype in the form of the MP3 format and the subsequent sharing of audio tracks amongst users using P2P networks such as Napster and KaZaA<sup>6</sup>. The film industry also has its own parallel situation with movie sharing on P2P networks such as BitTorrent and KaZaA. Such P2P networks represent more than just a way to obtain movies free and before cinema or DVD release; they provide a new P2P distributed distribution model allowing users to distribute their own home movies, independent films and video blogs (“vlogs”) at no cost.

Broadcast radio programs also face competition from a decentralised distribution method known as “podcasting”. Podcasts utilise a subscription model which uses RSS 2.0 XML (or RDF XML) format to deliver a file. Listeners subscribe to feeds using “podcatching” software which acts as an aggregator, checks periodically for and downloads new content, which it may finally synchronise to a portable MP3 player for listening to on the move.

The news industry is also facing the effects of decentralisation. The recent transit attacks in London served to highlight this. Within hours of the event citizens had created galleries of images on photo sharing sites such as Flickr ([www.flickr.com](http://www.flickr.com)) often using images they had taken first hand using their camera phone. Blogs<sup>7</sup> at the time provided faster coverage and with more detailed personal accounts. But the real appeal of the blogs were the fact that anyone anywhere could comment on the articles and provide associated web links providing a greater wealth of interconnected information. Besides blogs wiki<sup>8</sup> based news sites are emerging such as Wikinews ([www.wikinews.org](http://www.wikinews.org)).

Even in the publishing industry the 237 year old Encyclopaedia Britannica has become a victim of decentralisation due to a wiki based encyclopaedia Wikipedia ([www.wikipedia.org](http://www.wikipedia.org)). Wikipedia is a collaborative, internet-based encyclopaedia. Anyone can create an entry and anyone can edit existing entries. So far it has 1.5 million entries in 200 languages. In contrast the online edition of Encyclopaedia Britannica has 120,000.

#### **4. Second Generation World Wide Web**

Web usage is orienting towards interaction and rudimentary social network modelling exploiting the power of the Internet's to bring people together [7,8,9]. This new era of participation is evident in the rise of social networking services; Amazon user product reviews, ratings, recommendation engine and user product lists; and exponential growth in sites based on content management systems (CMSs) which provide functionality for ratings, user feedback, user editing, user uploading, discussion forums Etc. A limited number of social centric sites are outlined in this section including a shift towards social centric search.

Delicious ([www.del.icio.us](http://www.del.icio.us)) is a social bookmarking tool. It uses RSS subscriptions to allow users to subscribe to the links their friends save and annotate as they voyage around the Web. It allows users to discover links from others. They can subscribe to the links of people whose lists they find interesting. When they bookmark a site it shows who else has bookmarked a specific site; if wished they can then subscribe to their lists. The tool is also used to recommend media to others. For example video bloggers (“vloggers”) use Delicious to recommend interesting videos to one another.

Photo sharing sites such as Flickr have become more popular in parallel with the rise in blogging. Users can share what they have been doing in life, places visited Etc. with others in static picture format. Users can subscribe to RSS feeds of friends and family to automatically receive latest image feeds.

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<sup>6</sup> Last year KaZaA integrated Skype into the software.

<sup>7</sup> A blog is a web-based publication consisting of periodic articles written by a single individuals, although group blogs also exist. Readers can comment on the articles.

<sup>8</sup> A wiki is a publicly editable website which allows its visitors to collaborate by editing its pages.

A number of popular social networking sites have appeared in the past two years. They act as human search engines, helping people to make connections with other people. Examples include MySpace ([www.myspace.com](http://www.myspace.com)) and LinkedIn ([www.linkedin.com](http://www.linkedin.com)). They allow users to find new friends (or add in existing ones if they are also registered), and importantly to communicate with friends of friends, who may then evolve become new friends and so on. Such sites facilitate the process of finding like-minded individuals regardless of time zone or geography. Found people can then be leveraged into helping achieve ones aims and ambitions; from spreading an ideology, refining a specification, to developing a business plan. Normally users include their Skype contact details to expedite contact.

Yahoo! recently introduced a new version of its search engine dubbed “My Web 2.0” [8] ([www.myweb2.search.yahoo.com](http://www.myweb2.search.yahoo.com)). It aims to gain an advantage over the PageRank™ technology pioneered by Google. Instead of relying on the number of in-bound links (IBLs)<sup>9</sup> as a primary input to determine the ranking of a given page, it harnesses the collective power of users thru technology dubbed MyRank. MyRank orders pages based on how close search users are related to one another in their social network and on their reputation at finding useful information. This is significant since people value content differently according to the person and the context under which the search was performed.

#### 4. Conclusions

It is highly unlikely that telephone companies can continue charging for each demarcated thin audio stream labelled as a “call”. Since calls are the primary service and revenue source of the industry, it faces a dilemma on par with the railroads and the introduction of the automobile; or the mainframe and the arrival of the personal computer. Bucket pricing plans or flat rate residential calling plans may thwart off any impending doom for the more immediate future. But in the longer term the very concept of a “call” is likely to vanish into the fusion of communication streams and media rendering the concept meaningless. At the same time Internet based offerings are likely to be a very strong rival for any planned NGN/IMS based offerings, particularly due to the open and decentralised nature of development which leads to fast innovation on the Internet. With the loss of call revenue and planned IP based “multi-media” services questionable, telephone companies face an uncertain future. Both these factors should be strongly considered in determining the likely success of NGN/IMS proposals and any planned future telecom offerings.

The future of telecommunications appears to be a decentralised social-centric fusion of media and communications empowered by the Internet and its users.

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<sup>9</sup> IBLs can be considered as “votes” enabled by the democratic nature of the Internet as to which pages should rank higher than others.