White Papers From IML

Convergence; Myth or New Legend?

Convergence of fixed and mobile services has been discussed and heralded for many years. Is it happening or is convergence happening in other ways?

Presented by Intercai Consultant

Chris Angell

INTERCAI
MONDIALE LIMITED

1. Introduction

For several years convergence has promised the tantalizing goal of bringing together the functions and utility of the mobile phone, with the low cost and bandwidth capability of the fixed line. Products have come and gone (remember “OnePhone”?) and still most of us either have just a mobile phone, or we have both mobile and fixed; 3G gives us games and video clips but the promised convergence seems, up to now, to have eluded us. BT has launched its Fusion product which seems to offer a convergent service, but more about that later.

There’s a new convergent kid on the block; or more accurately a whole gang of them. Services used to define where convergence was coming from, now applications seem to be finally making some headway in the convergence stakes.

A number of technological advances have occurred in a relatively short period of time which has enabled the coming together of some rather unlikely bedfellows. The idea of putting a low resolution digital camera into a phone seemed a little odd at first, but it has certainly caught on with one (quite large) group of phone users (the youth market, perhaps inevitably) – so much so that buying a new phone without a camera is a bit of a challenge! Portable music has been with us since Philips invented the Compact Cassette recorder in 1965 and it has evolved through the Walkman, Discman, the Minidisk and finally the solid state MP3 player and iPod. This final innovation has required the development of compact flash memory devices and has only really become acceptable since the size of memory available at a reasonable cost has reached into the Giga Bytes (see box).

The increasing density, and plummeting price, of solid-state memory devices has been driven by the photographic world at least as much as the music world. Digital cameras are very memory hungry devices and it’s only now that we can store a few hundred high resolution pictures on the camera without returning to a laptop to offload them, that digital photography has released us and allowed our creative juices to flow unhindered.

While these hardware advances have been marching forward, software development hasn’t been idle either. The digital mobile phone was only made possible by the development of sophisticated speech encoding and decoding algorithms enabling the transport of good quality speech over a restricted bandwidth. The real-time coding for this, which at one time would have been the domain of the hardware engineer, has for some time been carried out in software permitting upgrades and improvements to functionality and speech quality without recourse to expensive hardware upgrades. Of course for this to happen has required large increases in computing power within the handset too. These advances in computing power have benefited the music reproduction equipment, and convergence of these three technology areas (memory, computing power and software algorithms) has been driven by these separate applications (mobile telephony, digital photography and personal music reproduction).

2. The New Convergence

The latest convergent step is the Personal Video Recorder. A device capable of recording from an analogue video source (composite video or S-Video),

accepting video files such as M-PEG 4 or DivX from an external source such as a PC, accepting still picture files (JPEG) and audio files (MP3, WMA, WAV and iTunes), capable of holding data files (an external USB drive), and then displaying or reproducing the movies, still pictures and audio files away from any fixed power source and without requiring a PC.

From a technology perspective these features fit together very well; they all need memory, computing power and sophisticated software and much of this technology can be easily shared in a small handheld device. Clearly convergence is happening, but where is the telephone in this?

Some mobile handsets include MP3 players and, as already mentioned, most include a still camera and many can take short low quality movies, so a low level convergence of these technologies is occurring here too, but will it continue this way and what about the original convergent idea – the coming together of fixed and mobile telecommunications services?

3. Telecoms Convergence

DECT and Bluetooth have promised the realisation of convergence in telecommunications. They both have the potential to allow a single handset to provide the benefits of both fixed and mobile services and yet neither has really done so until now. DECT has been adopted as a high quality, medium feature cordless system providing wireless fixed communications for up to 100m around the fixed line portal. Bluetooth, with its much lower range of 10m, has given us the wireless hands free headset for mobiles. These features are tantalizingly close to providing the means for convergence, so what's happening?

While a mobile operator could possibly provide all the services required by a customer at a variable price depending upon location and bandwidth requirements, this would not really be convergence because nothing has converged. Telecoms convergence requires the coming together of fixed and mobile technologies to deliver a seamless service to the customer at the best (ie lowest) price available at the customer's current location. BT's Fusion product finally appears to provide this through the use of yet another technology, Voice over IP (VoIP). Fusion utilises GSM, Bluetooth and VoIP (via ADSL or cable modem) to give the customer a mobile service while away from home (or chosen base) and when within range of the home base unit calls are handed over to the ADSL fixed line via a Bluetooth link (with the possibility of 802.11 when that technology becomes available in mobile handsets). An important point in this service is its ability to handover an existing call between technologies, without this ability convergence would be less seamless and therefore less acceptable.

BT has achieved this convergent step in its "BT Fusion" product, with the cooperation of Vodafone which provides the mobile element, but bearing in mind that a call to a handset which is in range of the home base unit will be delivered by BT's infrastructure alone, what does Vodafone get out of this arrangement? It

would surely be better for a mobile operator to encourage customers to use their mobile phones at home while remaining on the mobile network? There is only one reason why Vodafone would enter into this agreement and that is to gain access to BT's customer base. Without this the economics of convergence don't stack up; a mobile operator will always benefit from keeping its customers on-net and, while all the services imaginable can be delivered via the mobile network, convergence it is not.

4. The (not too distant) Future

Perhaps true convergence will come from a different direction. Music, pictures and video have converged, now they just need a broadband link so that the source data can be stored elsewhere and remain accessible wherever the user is. Then the same broadband link can offer VoIP calls wherever the user is.

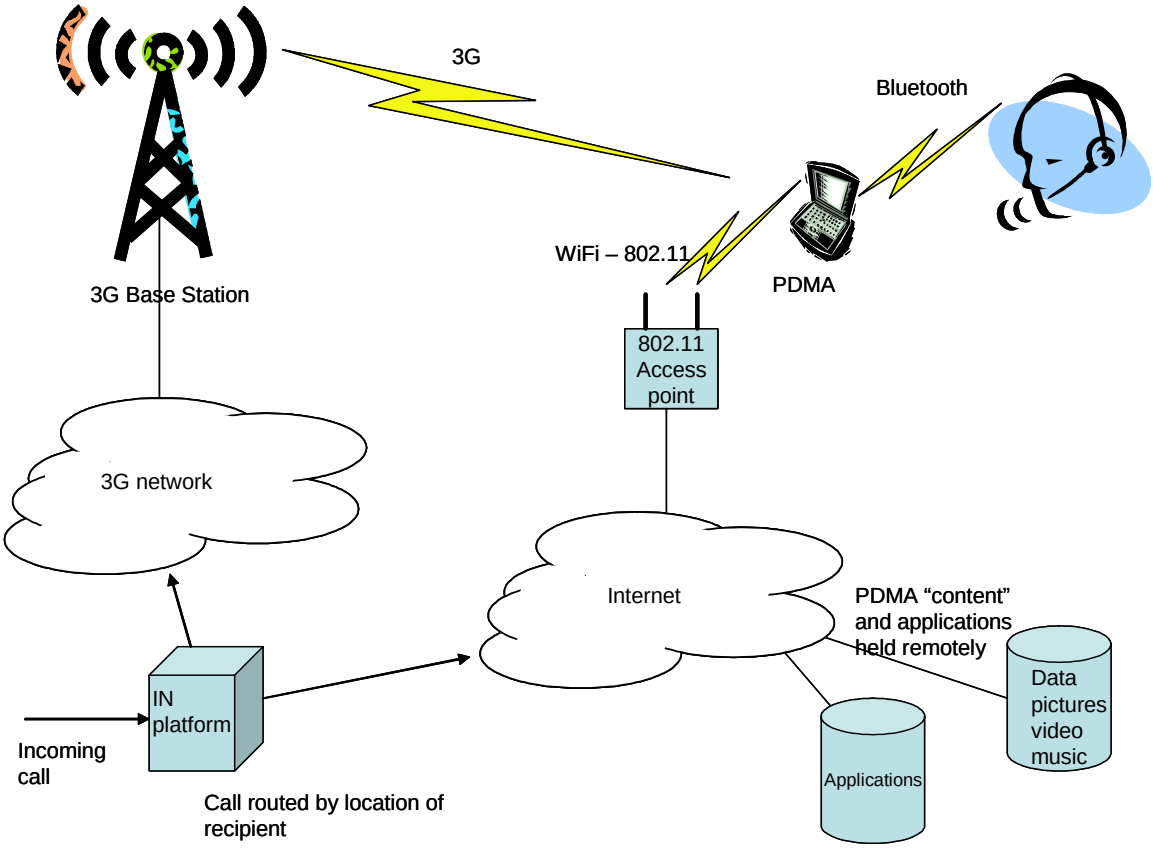
Imagine a new device, the Personal Digital Media Assistant (PDMA). This is an upgradeable, flexible portable device which provides processing, memory and interfaces:

- Wireless,
  - 802.11
  - Bluetooth
  - WiMAX
  - GSM
  - 3G
- Optical
  - Camera for still and moving images
- Display,
  - Flexible so that it can fold away when not in use
- Minimal keyboard, and
- Microphone
  - For speech and verbal commands

A "thin client" device, it would be able to support applications downloaded as required too, for example a Voice over IP (VoIP) codec, and would be consequently somewhat future-proofed. Now while listening to your favourite tunes an incoming call (VoIP delivered by the internet via WiFi or a mobile call delivered directly via the GSM or 3G network) is directed via Bluetooth to your PDMA headset, where the current rock classic is paused until you complete the call.

If Mr. Bell was still inventing; "Mr. Watson, come here. I want you." would be replaced with “Mr Watson, review these files, look at my holiday snaps and movies, let me share your music and, oh yes, when you’ve done that come here, I want you (by the way I’m in France)”.

All this hands free and if the price is right and the bandwidth available, then convergence on a grand scale has occurred.



A further advance, and well within the realm of foreseeable technology, will be the virtual replacement of the keyboard by voice command. Voice commands would be complemented by voice responses (improving the hands free experience) and the profile of the voice responses will be configurable and, like ring tones, will be downloadable – your PDMA will speak to you in a chosen Voice (like a Media Player “skin”) and well known actors voices will appear from PDMAs everywhere.

5. Convergence is happening…

It is becoming clear that most people require as much functionality compressed into one unit as possible. If this single unit takes photographs and movies, plays music, handles telephone calls and is built to be upgradeable, it will fulfil many of the needs of the modern consumer. With some of these functions already

combined into one unit convergence is already happening, the rest is just a matter of time – now all we need is the voice response function to make our favourite toy into our best friend!

References

1. Previous IML papers on Bluetooth and WLAN applications and related subjects which can be found at www.intercai.co.uk

2. Information about BT Fusion can be found at www.btfusion.bt.com

The material contained in this White Paper is based on Intercai's wide experience of wireless and mobile networks. Training courses tailored to your specific requirements can be provided on request.