## 2004 – 2005

## Response to the

## Australian Senate's

# Inquiry into the Proposed Australian Communications and Media Authority

# (ACMA)

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## ACMA Bill Response

The course of this Bill Response originated from an earlier paper based in the knowledge that the economic competitive model for Australia's telecommunications industry has failed. The reference for this proof of failure is Optus, as is Telstra, are both encumbered by internal pricing structure conflicts between their wholesale and retail sectors and it is this nexus that is the continually failing link that proves that in anything larger than small the business model – competition simply does not work.

Telecommunications Industry leaders are now making representations to the Australian Government to make structural changes to Australia's telecommunications industry, and Telstra is in the process of making internal structural changes to isolate the wholesale and retail (reselling) parts of its business. With the amicable joining of Telstra's Wholesale and Infrastructure business units, this then provides the migration path for Australia's telecommunications industry to structurally change for the better – making the retail (reselling) component the competitive sales arm and the Infrastructure component into a non-competitive infrastructure provision.

With this agreed structural change, the role of the ACA moves back from being regulatory to advisory in the case of the infrastructure management, and well forward into regulatory in the area of competitive retail reselling. The ACA is already well positioned, but needs some of the functions of the ABA to be truly effective, and this then leaves the ABA remnants, in effect as a lame duck, and these remains need to be repositioned nearer the ACCC and merged with the Australian Censorship Board.

It is therefore timely that the future role of the ACA and ABA be reviewed and this response addresses parts of the issues provided to me by Dr Jacquie Dewar:

*"As discussed, a submission from you to the Committee's current inquiry into the new Australian Communications and Media Authority would be most welcome. The inquiry's terms of reference are:*

*(a) The provisions of the Australian Communications and Media Authority Bill 2004 and the Australian Communications and Media Authority (Consequential and Transitional Provisions) Bill 2004 and related bills;*

*(b) Whether the powers of the proposed Australian Communications and Media Authority and the Australian Competition and Consumer Commission will be sufficient to deal with emerging market and technical issues in the telecommunications, media and broadcasting sectors; and*

*(c) Whether the powers of Australia's competition and communications regulators meet world best practice, with particular reference to the United Kingdom regulator Ofcom and regulators in the United States of America and Europe.*

*The Committee is to report to the Senate on 10 March 2005, and submissions to the inquiry are asked to be lodged by 31 January 2005.*
*I look forward to hearing from you.*
*Kind regards*

*Jacqui*
*Dr Jacqueline Dewar*
*Secretary (A/g)*
*Senate Environment, Communications, Information Technology and the Arts Committee*
*Parliament House*
*CANBERRA ACT 2600*

## Bill Response

As my background covers more than 35 years in telecommunications in areas including telephony, transmission, signalling, metering and billing, internet, network performance, customer service, service standards, television and radio broadcasting, mobile phone technologies and management at all levels; I feel that my experience, knowledge and wisdom has a lot to offer to this response.

Before responding to the actual paragraphs in question, I have drafted out a brief synopsis of the interaction of some of the various bodies involved with regulation of the broadcasting and telecommunications industries, and this then sets a clear path to respond to the paragraphs in question.

## Introduction

The Australian Communications and Media Authority Bill (the ACMA Bill) addresses two existing authorities; the Australian Communications Authority (ACA) and the Australian Broadcasting Authority (ABA), with the direction to merge these two and form one authority called the Australian Communications and Media Authority (ACMA) by 1 July 2005.

It appears that the given reason for this merge is to better manage commercial business initiatives that would otherwise fall between these two existing authorities – rendering both regulatory authorities ineffective and/or irrelevant.

In the past 25 or so years, major engineering technology developments have been introduced and include at the least; optical fibre transmission, digital transmission standards, digital switching for telephony, common channel signalling (CCS7), the transmission control protocol/Internet protocol (TCP/IP) signalling suite, and massive advances in semiconductor production techniques. This area was well covered in my response to the Australian Telecommunications Network Inquiry regarding Broadband Competition, dated 27-Sep-2003 and the details are in [Ref 1], and it shows that as a consequence, technical engineering developments in telecommunications have converged the physical medium (bearer) aspects.

With this digitally based switching, signalling and transmission convergence process; more recent techniques have greatly simplified and expanded the interconnection capabilities between a very wide range of human interface devices including and not limited to; telephones, mobile telephones, personal interface devices, personal and laptop computers, computer mainframes, televisions, set-tops, radios, digital cameras and projectors, printers, geographic positions systems, visual surveillance and remote monitoring equipment.

It has become very apparent that Australia's network telecommunications sector has in no way lived up to the incredible predictions ***that prices would have been driven down by competitive efficiencies***, postulated by those that rode (and still keep riding, whipping and feeding) the dead horse called 'Full Competition'. Several points of view were provided in the document 'Maximising Australia's Telecommunications Efficiencies', which is referenced [Ref 2] and appended to this document as Appendix A. The Government of the day is still blindly pushing ahead with the same seriously flawed agenda, and the dead horse is beginning to smell rather badly.

The failed experiment that was Optus as an agile competitive force has now shown that Optus has also moved into the same lethargic mould as Telstra, as it too has internal conflicts of (infrastructure / resales) interests! (And that is the nexus of this failed experiment!) In establishing this supposedly competitive model, the fair competition rules were relaxed (bent) to give Optus considerable market share, including the gift of Aussat to Optus Ref [18], for

 

about $180 Million (including the ABC distribution network to 'make' it profitable – at the expense of Telstra), restrictions on Telstra mobile services to give Optus more than a good fair share of the then growing mobile market Ref [19], and in several cases interconnect expenses loaded onto Telstra – for example providing Gateway exchanges, space in Telstra buildings and artificial . This is yet another glaring example that clearly demonstrates that full and open infrastructure based competition simply does not work and it is high time that this dead horse was removed and buried.

It is now more than obvious that Australia's telecommunications industry needs leadership with wisdom (which only comes from experience) to get it out of this malaise, and the consensus between several eminent people in this field is that the full sell-off of Telstra will perpetuate the catastrophe and that an entirely different approach is required (and that comes from within Australia). A document titled 'Steering Australia's Telecommunications Future' [Ref 3] and attached as Annex B, was produced by me and emailed to Senators Helen Coonan, and Stephen Conroy on 07-Nov-2004. An Advisor to Senator Coonan (Mr Matthew Stafford) replied on 20-Dec-2004 that; "*...the Government does not support the break-up and transfer of Telstra's infrastructure into Government ownership. The Government does not believe that the forced structural separation of Telstra would outweigh the significant costs and risks. While keeping the structurally separated company in public control would preclude the benefits of private ownership. ... To this end, the Government is seeking to realise its long-held policy to fully privatise Telstra. ...*

*In a speech presented to the Australian Financial Review Telecommunications Summit on 15 November 2004, the Government outlined its intention to review the current regulatory regime in light of the recent changes within the market, development of future next generation networks, and possible sale of Telstra. The issues raised in your submission may be considered as part of this review*"

The WTO also has a long-held Global policy to privatise all Government held infrastructures and have these privatised infrastructures placed on stock markets, so that the long-term ownership of these infrastructures will ultimately become North American. As the USCIB and the WTO work closely together, it is now plain to see why Australian Governments and Oppositions both have a 'long-held' policy to "privatise or perish"! The WTO has runs on its board with Optus – now overseas controlled, and has Telstra in its sights. Cynically, I see the "*significant costs and risks*" actually do not refer to Telstra's infrastructure, but to the Liberal Party keeping in power. So much for the Australian Government working for Australians! A review and new course cannot be set fast enough before we lose all infrastructures to Global privatisation and become a truly third world country (i.e. banana republic).

There has been no response from The Opposition – and that screams volumes in silence.

Hot on the trail behind these convergent telecommunication interconnect technology developments, a wide range of predominantly interactive business initiatives have now surfaced as the next generation of business generated from the information revolution. Some of these business initiatives include; remote (international) and/or distributed call centres providing services including customer assistance, sexual arousal, product purchasing and customer referral. Website hosting, providing services including product information, stocks and share prices and advice, track and field pricing and gambling, online gambling (gaming) facilities, sexual arousal facilities, real estate / vehicles / second hand goods - sales support/product purchasing, and these are available through a wide range of personal interface devices, which is ever increasing with technology developments.

These more recent business initiatives that have been developed from applying the information revolution fly in the face of traditional over/under the counter business transactions and there is a natural resistance to change from traditional businesses and the people associated with these more traditional businesses. This is the nexus of the real issue!

## *The Role of the ACA and ABA*

As a follow-on from this now wide range of interconnectivity of human interface devices, an ever widening array of business products are being developed and take full advantage to maximise returns on investments (read profits). Whereas the ACA takes its role in regulating the technologies for interconnectivity, the ABA would like to see its role in regulating the content of what is carried between various interconnecting technologies. By combining the two, the idea therefore is that a single body (the ACMA) is there to regulate the technologies for interconnectivity and also regulate what content is allowed!

Although I believe the intention of the ACA/ABA is seen as honourable in a small portion of the more conservative Australian society, it also appears that this body has been placed to be the 'Police' in an internationally competitive environment, where the rules/laws are highly inconsistent. A clearer picture can be taken from the ACA Website [Ref 4]:

***"What is the role of the ACA and the Australian Broadcasting Authority?***

*The ACA has responsibility for ensuring industry compliance with the restricted access arrangements contained in the Consumer Act. It can use its powers to request a view from the Australian Broadcasting Authority (ABA) about whether a particular service is a telephone sex service and can institute legal proceedings against a telephone company or telephone sex service provider which supplies a telephone sex service in breach of the requirements.*

*The ABA is responsible for issues relating to the content of broadcasting services and internet sites. It has a role under the Consumer Act to assess whether a service is a telephone sex service and issue an evidentiary certificate to the ACA, if requested. Where the ABA issues a certificate, it will state that a particular service is, or was a telephone sex service. Further information about the ABA's role is available from the ABA's website at www.aba.gov.au or by contacting the ABA on freecall number 1800 226 667*

*The restricted access arrangements only apply to telephone sex services that are voice calls made from a standard telephone service. They do not apply to visual images or content accessed via premium rate services through the Internet. Information about Internet dumping is provided below."*

You don't have to look too hard into the Website's own wording to realise that the role of the ABA is in effect a sexual censorship regulator for (potential) Australian based business – in an environment that globally has virtually no censorship. With this in mind I believe that the ABA may have had some relevance in Australia in some bygone era, but with global interactive telecommunications well entrenched for several years, that era has long gone.

The ACA is also like a duck out of water, as it has focussed on customer impacting telephony based telecommunications service performance standards and safety for telecommunications premises equipment, while in the last decade global interactive telecommunications businesses have moved to actively track and target potential customers by their user habits. Global telecommunication service standards, equipment safety standards and connectivity have allowed customers to vote with their feet (fingers). While in more recent years the ACA

has moved to regulate the ISP and Website hosting industries – more for (sexual) content than performance standards, their role as seen globally is becoming irrelevant.

In a competitive environment, any regulatory body is effectively irrelevant, as their rulings only apply to honest criminals/business people, and those that cannot dispute the resolutions. That leaves a much higher proportion of 'colourful characters' or 'business people' that will not comply with rulings, or will change their business structures to avoid the rulings. The farcical rulings for the "Phone Sex Industry" in Australia were a classic example.

## *The Phone Sex Industry*

Apart from struggling to survive in a life-ending situation, sexual arousal/gratification is without doubt the strongest mental force that guides and shapes our lives. It is everywhere in our lives from the (fashion) clothes we buy, make-up, language that we speak, cars, houses, holidays, career positions, families and other relationships, and right through all forms of entertainment. Everybody pays for sex/love in some form or another, either informally (by holding a relationship, career, family, etc.) or formally (paid sex/love, women's and men's magazines, books, songs, films, telecommunications, special clothing, holidays, devices etc.).

Talking and/or listening on a telephone or other remote form of conversation highly sexually can arouse many people and naturally they are quite willing to pay for this service, which then usually solves the problem of their sexual urges. Business minded people took the opportunity to develop this service into a well paying arrangement where by calling a particular number range, the call costs could be split between the telephony service provider (TSP) and the sexual service provider (SSP), and the call costs raised to make the deal highly profitable.

Consequently, Australia developed a thriving "190" business, where thousands of otherwise unemployed predominantly female housebound women could receive these calls and make a good living doing what they excel in (talking sexy on the phone). This solved several problems concurrently. Those that desired sexually suggestive calls for their gratification were able to pay for these and their needs were met. Those that answered these calls and 'talked sexy' were paid for their timed services, relieving their burden on social security services – through being paid for their time. Those that wanted to track both ends of the conversations had technology at their fingertips through Common Channel Signalling (CCS7) so they could identify the calling and called parties as desired. So what was the problem?

From the book **Brain Sex** [Ref 5], it is very obvious that the male and female brains are 'wired' very differently from before birth. Females naturally take on the nurturing role in a family situation, and because their sexual gratification is basically built on relationships and not career moves as generally in males, any form of relationship intrusion is very harshly dealt with from females in general. At school dances the girls are usually consumed on who is with whom, and the boys in general don't have a clue (or care too much) till the last few days – or hours! Women's magazines are filled with relationship news, stories and clips about a huge range of various human (and also pet) based relationships, and social 'climbing' pictures. In one sense it could be construed that 'Womens Magazines' are in effect pornography, as there is no doubt that in general females are sexually stimulated from viewing and reading these.

Conversely, in general, the male brain is focussed on hunting, killing and providing food and a safe environment for the female; hence in general the male brain is dominated with sporting and team activities (which are training grounds for hunting and killing) career, domination and strategic business deals, company takeovers (which are again hunting and providing a

 

safe environment for a female – family). Men's magazines are filled with trophies of various sorts including cars, women, businesses, sport, trucks/bikes, corporations, sport equipment, finance, and women (again). In general these magazines leave little to the imagination and spell it as it is, as in general men deal in facts, and not fiction. Some women take offence to see other women seen explicitly as "trophies" as these do not fit their 'relationship' moulds.

It is common in Family Court cases for females to fight (beyond male reason) for ownership of everything physical following a marriage/relationship breakdown and then isolate the children to leave their ex-partner destitute. In male terms this is equivalent to having a 'scorched earth' policy when having a company takeover, or war where the losing side is annulated or reduced to slavery till death, and women saved for crossbreeding. So the wiring differences are vast, but the consequences if fighting are almost identical – and final.

Everybody prostitutes himself or herself in whatever job they do, (they get paid in some form for whatever service they provide in that job) it is just that in general, many females in Australia in a family or personal situation have vilified the term (sexual) prostitute as an added sting to prevent intrusion into their personal/family relationships.

So here is the dilemma where a portion of the Australian (and international/global) society requires sexual services from a formal paid arrangement, and a relatively small portion of the Australian society has potently vilified this situation in fear that their own sexual relationships may be compromised. Added to that dilemma; it is predominantly another portion of the same Australian female society that actually provides the paid formal sexually oriented services. The standoff on physical sexual prostitution has been in the human races from before history was recorded, and with this variation in service delivery where it is communicated via telecommunications of some form or another instead of physical contact, the spite factor is like a firestorm attached to a time-bomb, and it is very difficult to extinguish the fury of these uneducated, unenlightened and/or misguided females, as it is in their "brain wiring"! Reasoning in these situations is often totally irrational and can be detrimental, causing trigger situations from seemingly safe points in discussions.

To compound matters even further, most females in the Australian workforce are very fashion conscious and dress provocatively in many work occasions, and the unwitting message being sent out by these same females is a big "I am available (for sex)" when in fact they are not. Over the past 30 or so years there has been a very strong push to tell males that responding to female generated sexual signals is not acceptable in the workplace – but is OK elsewhere!

Over the past 30 years there has also been a major cultural change in Australian society where women in the workforce - in management positions is now reasonably commonplace, and this has directly impinged on the career paths of males in their traditional roles as (career) hunters. One of the key factors that females find attractive about males is their healthy financial standing as it solves a key issue in providing for a future family. In reverse, one of the prizes 'trophies' for males in having a high profile and well paying position is a much wider choice of females as future partners.

Business is war, and in war, territory, maiming, killing, trophy stealing and restructure is the order of the day. Property forcibly changes hands, people are retrenched, dismissed or otherwise is a natural course of events where workers are 'killed off' and this extends to all levels – except the top – where these people do not have to work to exist. Some years ago the Australian Defence Force did a study to critically analyse the option of having females in the front lines. The results were a resounding 'NO' because of several reasons that I believe included; females over time fail to use/wear camouflage and compromising everybody, when

in groups of more than 30 they tend to form sub-groups of 4 to 6 and develop in-fighting between these sub-groups, again compromising everybody, when shot/injured, everybody immediately comes to the female's assistance instead of firstly securing the area, then coming to assistance – again compromising everybody. In business (as in war), these findings must not be ignored, and it explains why females should not expect to be in high profile business positions unless that business can expect to consistently take a high casualty rate.

The next set of dilemmas comes from politics; where the art in politics is to please most people most of the time, and do as little as possible; and in business where the art is to make the hard decisions and implement what provides the best return on investment.

Regarding the 'phone sex' industry in Australia, this industry had grown into several multi-million dollar businesses, was providing continuous employment for several thousands of people (particularly middle aged women working from their own homes), and the services were being provided internationally, making a strong positive BOP for the Australian Government. Having several thousands of people with ongoing income that they would never have otherwise was another very strong point for the Government to support this industry and this meant that these people then did not lean on the social services budget for their support, and because they had something gainful to do, their mental health would be substantially better, so their strain on medical services would also be substantially reduced.

On the receiving end, the clients would have 'controlled sexual stimulus' (gratification as per the phone connection) and have their anxieties resolved. This would then 'keep them off the streets' but it would cost them (as expected) – nothing is free – not even the air that we breathe! The cost was in the form of a laundered phone bill, where the high cost for timed '190' calls paid the SSP and TSP respectively.

In business terms this makes a whole lot of sense, but politically the emotive fury of potentially scorned women have obviously taken their toll and the result is a complete back down from a very promising industry to one that is costing Australia dearly and the ACA Website spells out the prohibitive terms and conditions that cause the industry to pack up and move offshore. From the ACA Website it reads:

***"What is a telephone sex service?***
*A telephone sex service is a voice service supplied using a standard telephone service (i.e. a fixed line or mobile telephone service). It is a service where, taking into account any advertisement or promotion of the service and the content of the service, it is likely that the majority of persons who call the service would do so with the sole or principal object of obtaining sexual gratification.*

*Other adult information services, such as introductory or dating services and chat services, do not fall within the definition of a telephone sex service.*

***What are premium rates for telephone sex services?***
*Telephone sex services and most other information* ***services****, are generally supplied on premium rate numbers that begin with the prefix 190X. These services are known as premium rate services because they are charged for at a premium rate for the content of the call.*

*Premium rate services (including telephone sex services) are subject to an industry code of practice that contains rules about how such services are to be advertised and supplied. The code of practice was set up by the Telephone Information Services Standards Council*

*(TISSC), which is an independent regulatory body that sets standards for the message content and advertising of any Australian telecommunication service with the prefix 190. Consumers can make an enquiry or lodge a complaint about the message content and/or advertising of any 190 service by contacting TISSC on 1300 139 955 or visiting its website at www.tissc.com.au.*

***How do I control access to my telephone with call barring?***

*Consumers can restrict access to a range of services on their telephones through call barring. Bars can be placed on almost all kinds of outgoing calls.*

*There are two types of call barring that provide different levels of security. They are:*

- *barring access to a class of numbers from your phone, such as 190X numbers. This is called an exchange bar as it is activated and controlled by your telephone company at the exchange; and*
- *barring access to the handset via a PIN. Handset bars can be installed and removed as needed by the telephone account holder (on a call-by-call basis), so they are especially useful for temporary call control. However, you must remember to reactivate the bar once you have removed it to make a call.*

*The difficulty with barring access at the exchange to a class of numbers is that the bar will only work on the network of your telephone company for those numbers-services may still be accessed via another telephone company using an override code. For example, you may bar access to 190X numbers with your telephone company but it is still possible for someone to use your phone to access 190X services provided by another telephone company on its network by dialling an override code. As a result, the best way of preventing access to particular services is to restrict access at your handset. A handset bar will not affect your ability to make emergency calls.*

*When considering barring, consumers need to carefully assess their information needs as barring access to 190X services will mean that access to any other useful information services, such as the weather, sports news etc. will not be available. If you are considering barring, you should contact your telephone company to discuss your barring options. Consumers should keep in mind that it is not possible to bar incoming calls. Also, consumers should note that it is not possible to bar access to individual services."*

The problem was seen to be solved by a political solution of placing prohibitive business restrictions on it so that everybody that called an Australian-based phone sex number/business would openly give their anonymity away. Politically this solved the problem of squeaky wheels arguing against the phone-sex industry being profitable (or even existing) in Australia. What this (inept) legislation did was merely pick up the industry and move it off shore. So now, instead of people in Australia (and Internationally) calling and paying to Australian-based phone-sex workers, they are now calling beyond Australia and getting the equivalent service, but at an expense to our BOP instead of an asset to our BOP. The following wording shows this from the ACA Website [Ref 4].

***"Introduction***

*Information services are generally supplied on premium rate numbers that begin with the prefix 190X. The range of information available is diverse-from weather reports to clairvoyant readings, sports results and quiz show competitions-with many of these services playing a valuable role in servicing the community.*

*Telephone sex services are a type of information service that has historically been available on the 190X number range and which are now subject to tighter government controls under Part 9A of the Telecommunications (Consumer Protection and Service Standards) Act 1999 (the Consumer Act). These controls were introduced in February 2000 because of concerns about unauthorised access to telephone sex services.*

*Under the restricted access arrangements, a telephone company can only bill calls for a telephone sex service if the:*

- *customer has agreed in writing to the supply of telephone sex services;*
- *customer has been issued with a Personal Identification Number (PIN) by the telephone company for accessing the service; and*
- *telephone sex service is supplied on a number with an approved prefix, (which is **1901**).*

*These arrangements do not apply if the telephone sex services are not charged for on a telephone bill (for example, if the services are charged for on a credit card). You should also note that the controls only apply to services provided in Australia and will not include overseas services provided on 0011 (international numbers)."*

As I see it these rulings are very reactionary and as far from a proactive approach as could be possible and in that light it gives me no pleasure to consider what other draconian rulings will; in future come from this body – no matter what form it is in. Not only have these rulings closed down a thriving Australian industry that had substantial export earnings, they have now created a failed Australian industry with substantial import costs.

These rulings have swept the apparent problem away by effectively closing down one side of the industry in Australia, but in its total inept and arrogant attitude, has done nothing to resolve the problem for the clients, other than they now will be calling to overseas phone sex numbers and in this process be paying funds internationally instead of internally, the consequences of higher social services costs and higher medical costs has obviously not been considered and that reeks of a political failure at a very high level.

In business circles, (comparative to political appointments as head of a Department) the President of that business division would be sacked for dereliction of duty, inept arrogance and gross incompetence. But this is politics and not business, and the transfer of this head to another part of the world – the UK for example – could be a prudent management decision before forced retirement!

## *Last Things First – Paragraph C*

I have chosen to answer this paragraph first as to me it is carries the most importance – that of 'best practice'.

*(c) Whether the powers of Australia's competition and communications regulators meet world best practice, with particular reference to the United Kingdom regulator Ofcom and regulators in the United States of America and Europe.*

### World's Best Practice

The cliché "World's Best Practice" was originated in North America in the 1970's with the view of comparing like practices in business and 'cherry picking' what was considered to be the most appropriate to minimise the workload (labour expense) and minimise the adverse

impact on management. In other words by studying business opposition work practices, then identify the process to re-engineer your own business existing work practices to make your own business once again competitive.

Apart from North Americans in general not looking beyond North America and calling that the World – World Series Baseball, World Series Basketball, World Best Practice etc. The concept of 'World' in these situations was a misnomer. *(When engineering analogue modems in the 1980s I used a USA engineered "World Modem" silicon chip that worked to North American telecommunications standards and there was no associated documentation referring to the ITU-T (World) standards as used in Australia. It took some ingenuity to change the chips operating conditions to make it work an ITU-T recommendation.)* North American businesses still refer to the World – meaning North America to them (but nobody else), and they commonly refer 'Global' to the world where North America is not their mindset limit!

*(When working in Nortel (a North American based multinational company), many of their products referred 'World' as inferring North American standards, and 'International' as anything beyond North America. When engineering the interfacing between their Telephony on CATV system through their Meridian PABX into the Australian telephony network, I utilised the standard Meridian 'World' cards were North American 800 ohms resistive standard – totally incompatible with the Australian / ITU-T complex impedance structure. The solution that I chose was to import 'International' cards that were complex impedance, to match the ITU-T (Australian) standard!)*

That aside, to 'meet best practice' is an arbitrary goal where the natural assumption that the terms of telecommunications and broadcasting business in all other parts of the world up for comparison are identical, and that is a fundamental business simplistic flaw.

## Regulation in a Competitive Market

As I understand it, the UK business model is one where the business structure is in full competition, and the regulator (Ofcom) is in the process (December 2004) of a strategic review and possible re-engineering and the link given in Ref [6] refers to this.

With this in mind, and now realising that many other regulators are re-inventing themselves to remain relevant, the term 'World Best Practice' pales to insignificance, and it is time to ask the purpose of a regulator in a competitive market.

In the same way that within an infrastructure environment, competition is the damaging element that must be removed, so too in a competitive environment a regulatory element is also damaging and must also be removed.

It appears to me that the Australian Government's initiative to merge the ACA and ABA into the ACMA is such an effort to re-invent the relevance of both regulatory organisations and minimise their overheads inasmuch as technical engineering standards, bearer content and capitalise on the commercial demand for electromagnetic spectrum demand and supply.

## Historical Ties

On 27 October 1997 the Australian Telecommunications Authority (AUSTEL) closed its doors and became the Australian Communications Authority (ACA), merging the Spectrum Management Agency (SMA) into it as from 1 July 1997. Ref [7] carries this information.

The SMA was borne out of Telecom's Radio Branch, the Post Master General's (PMG) Department and the Department of Communications (DOC) to manage the usage of unbound

media (radio transmission) in Australia. Strategically the SMA is a sub-Government body that is not biased by commercial (competitive) interests, and therefore was intended as an independent Authority.

Since the development of mobile phone technology, management in the SMA have become aware that carriers need spectrum and geographic space to operate their services and this is the critical imperative to their mobile network operations. Because of limited bandwidth supply, and more than one prospective network provider, an artificial demand had been created causing a monopoly sale situation and the Government of the day crippled the competitive nature of telecommunications in Australia by setting unrealistic prices for spectrum usage by carriers – which they of course had to pass back onto their customers. Ref [8] relating the Radiocommunications Amendment Bill 1996 outlines this seriously flawed legislative action that ultimately caused mobile service costs to be substantially inflated.

Had these spectrum allocations been provided free on a needs basis and not an auction to the highest bidder basis then mobile telephony would have been very considerably cheaper, driving down costs of line based telephony. (*The spectrum bidding costs approached 50% of the total network equipment costs.*) This is an example of 'world's **worst** practice' where those in authority have openly preyed on their end customers in a feast of greed for money through abysmal management of scarce resources.

AUSTEL was borne out of the Telecom Australia HQ Regulatory Branch, and the DOC to also be an independent regulatory sub-Government body. In this move, all customer premises equipment had to be passed for safety via AUSTEL, removing the problem with conflicts of interest for Telecom and its new competitors. Although Telecom Australia had managed the national numbering scheme and virtually finalised the current 10-digit plan in about 1985, AUSTEL took on this role, and gave the numbering plan a degree of independency not possible under Telecom Australia/Telstra. As a further block to driving down costs the Telecommunications (Numbering Fees) Amendment Bill 1996 Ref [8] was presented by Mr Warwick Smith in Parliament to charge carriers for the incidental usage of 'blocks' of telephony numbers.

Because full competition was in place and Technical Training was primarily carried out through Telecom Australia, AUSTEL then took on the role of specifying the course content for technical training and this provided another degree of competitive freedom for both Telecom Australia and competitive carriers and premises installation staff. This is now a TAFE course having no Telstra involvement, and Ref [9] is an example.

In about 1996/7, Telstra's Network Management Unit was cut and an area involved with network performance and service standards was moved into AUSTEL, while AUSTEL changed its name into the Australian Communications Authority (ACA). As I understand it, the purpose was that all carriers would then be under the same common scrutiny standards for network performance and customer satisfaction ratings, with the ACA as the independent arbiter.

## *Reactive or Proactive – Paragraph B*

The paragraph below is fascinating for several reasons as it blueprints a certain mindset that is totally irrelevant in today's society.

*(b) Whether the powers of the proposed Australian Communications and Media Authority and the Australian Competition and Consumer Commission will be*

 

*sufficient to deal with emerging market and technical issues in the telecommunications, media and broadcasting sectors.*

The above quoted paragraph (b) is at the least alarming as it speaks of 'powers of proposed ... authorities' and 'deal with' as these are disturbing as they bleat of reactive (draconian) control as opposed to proactive (recommendation) guidance, and that tells me that those in power are not in touch with what has happened, what is happening and what is proposed.

If the positioning of the laws are correct, then the powers required will be minimal, as the authority will be recommending industry approaches as opposed to oppressing industry movements in the existing and emerging markets.

## Existing and Emerging Markets

The following sub-topics give a little background knowledge and wisdom that will then address several aspects of existing and emerging markets, and maybe through this enough light may be shed on the topics so that a proactive approach may be invoked involving a complete restructure of the telecommunications industry in Australia, so that Australia can efficiently and effectively manage the telecommunications infrastructure, and leave competitive retail resellers to listed ASX based 'private' companies – in most cases!

### Telecommunications

As briefly described in the Introduction of this response paper, developments in the last 35 years or so in the field of telecommunications have converged a wide range of transmission, switching and signalling technologies and provided a divergent range of personal interface devices, making it possible to communicate interactively like never before.

#### Basic Carriage Service

This is a well-established standard that is now taken for granted in that nationally; dial tone access, network switching, network congestion, voice quality, network termination, metering and billing, meet and exceed specifications now held by the ACA. These specifications were developed by Telstra from recommendations to date, referenced from the International Telecommunication Union – Telecommunications Standardisation Sector (ITU-T) and over handed to AUSTEL, which publicly aired these through the Australian Communications Interface Forum (ACIF) to become public Australian telecommunications minimum industry standards, (ACIF C519:2004 refers to that current document) and Ref [11] holds the internet address / reference.

*On a side issue; it is interesting to note that the documentation that now is under the ACIF on their Website, is almost entirely drawn from Telstra's now extinct Network Management Unit (where I worked for several years in this area). Since then (about 1996) telecommunications network usage has dramatically changed to include data (Internet based) transport as a major factor. In my professional opinion, the ACIF has seriously lagged the industry, this continues, telling us all that the ACIF is reactive and therefore poorly positioned in the industry, but as Australia has almost privatised its telecommunications infrastructure, the ACIF really has no place to be useful (and be proactive).*

To date, the ACA has had a virtually passive role and as far as I am aware, done virtually nothing to develop an ongoing Basic Carriage Service Standard, which should now (January 2005) include minimum Internet bidirectional access speeds of at least 24,000 bits/sec for dial up modem technologies, and bi-directional 500 kbits/sec for Broadband Internet for all customers – irrespective of physical premises location within Australia.

 

The basic carriage service standard is an infrastructure issue, not a regulation issue, and the Government should own the infrastructure, and lease the usage out to retail resellers, and it is those resellers that should be on the ASX, not the infrastructure provider. If this was the case, then the basic carriage standard would have been proactively developed, and at least align with the paragraph above. Refs [2, 3] already cover this area.

### *Mobile Phone Networks*

Just like the competitive duplicated installations of HFC access networks for CATV and Broadband Internet services, Australia's mobile phone networks are multi-duplicated, over-servicing all major capital cities, and to a much lesser degree in non-major urban (country urban) areas, where these areas are typically under-serviced.

When Telstra introduced its first mobile phone network using analogue handsets, the strategy was to position high power antennas at the highest vantage points to provide the largest footprint coverage per mobile base station. Although this technology worked, because of the electromagnetic spectrum set aside for this service was in the super high radio frequency range, transmission and reception was somewhat intermittent due to 'black areas'. This strategy was mitigated by placing several smaller radio base stations near these 'black areas' to minimise drop out on call connections.

It was also realised that digitally encoded Global System for Mobiles (GSM) offers a large degree of isolation between customers so that privacy issues between customers was effectively resolved. Telstra then introduced a second (GSM based) mobile network of base stations to provide this service and these were limited to the major cities.

With 'competition' Optus, then Hutchison (Orange) and others have since set up GSM based mobile base station networks to fully duplicate the mobile base station footprints of each other, and Telstra was then charged to provide new 'Gateway' exchanges so that calls between the various carriers could be connected and metered for usage.

With yet another technology advance, it was then realised that because of the narrow radio channel bandwidths in GSM, this resulted in very low unencoded bit rates. The first implementation of Code Excited Linear Predictive (CELP) encoding caused considerable distortion to the voice such that with mobile to mobile, many connections were nearly unintelligible, and a modification to CELP (to Vector Sum Excited Linear Prediction VSELP?) Ref [12] was recommended by the ITU-T which somewhat clarified the speech intelligibility. This was initially (partially) implemented by altering the encoders at the radio base stations for clearer speech intelligibility.

Soon virtually every major capital city had at least four (4) infrastructure duplicated GSM radio base station networks, all with relatively thin footprint coverages (so call dropouts were common), and all networks connected through Gateway exchanges to resolve network connection and metering issues. The retail billing cost of calls via mobiles was far more expensive than comparative landlines, (primarily because of the massive network setup costs including the extortion to utilise spectrum bandwidth) and it took several massively expensive advertising and marketing campaigns to initially move people into using mobile phones and then to churn their preferences from competing mobile network carriers. The reality is the stupidity of competition, and competitive policies, and again the Australian public are the losers, as all this telecommunications equipment is imported and is therefore a direct negative impact to the Australian BOP through the import-purchasing of very expensive telecoms equipment to be installed in making these competitive infrastructure networks.

So then, not only did Australia have at least four different mobile carriers, each with duplicated mobile networks, each infighting for a larger share of limited resources; but because their finances are very limited, the footprint coverage was at the best thin, resulting in an unacceptably high number of call dropouts. One uncomfortable (and very expensive) solution was that each carrier bolstered their network coverage to manage black spots – and this is what happened. The network structures changed so that the mobile cell sizes in urban areas were dramatically reduced, and mobile base station towers/antennas placed in the valleys so the geographic horizons were much closer, greatly reducing inter-cell spillover.

As if that was not stupid enough, the whole procedure was again repeated! The next wave of competitive mobile networks surfaced with the advent of Code Division Multiple Access (CDMA) technology, where the bandwidths are considerably wider and the speech signal is distributed over several channels. This technology has the advantage that because the channel is in effect a spread spectrum – where with GSM it is a narrow spectrum, signal cancellation by diverse route paths (as is common in GSM) causing connection dropout, is to a very large degree avoided with CDMA transmissions. So in about 2000, CDMA networks replaced Analogue networks and competitive carriers also introduced CDMA based mobile network. So now we had another technology of multiple duplicated mobile base stations, with all the same problems and an ever-increasing BOP issue due to import-purchasing.

In 2003/4 broadband CDMA (G3) was introduced along with a range of internet/data service not possible with earlier CDMA and GSM (which were particularly poor for data transmission). This was pioneered by Orange (Hutchison) and at least Telstra had the sense not to build yet another competitive mobile network. So as I understand it, Telstra has signed a treaty of co-operation with Orange in that they both share the G3 broadband radio mobile access network, and this is the second sign of sanity in this multiple duplicated network of mobile base station access networks debacle.

The first sign of competitive sanity was that Vodafone signed a mobile network access share agreement with Telstra so that Vodafone users beyond the main capital cities would switch to the Telstra base station network for their access. Reading between the lines, it made no financial sense for Vodafone executives to layout a massive mobile network footprint that would have a very limited usage for their limited number of customers. This option made a huge amount of sense as the network was not duplicated, but outsourced to a major network infrastructure provider, (Telstra in this case) and with that, it set the sensible path for all future network infrastructures in Australia – and probably the World/Globe!

To date the ACA and ABA have had a passive interest in mobile phone usage – until it was shown that some mobiles could carry video of unsuspecting and unsolicited subjects, and show images that could be considered to be sexually explicit. Ref [13] gives a simple example of how easy this can be done and the consequences. In line with the disaster of the handling of "Phone Sex" by the ABA/ACA, it appears to me that the recalcitrant 'elephant's foot' is again about to slam down on an irrelevant area.

Again this is simple management of circumstances and a Local Court ruling in Sydney in December 2004 Ref [13] has already covered this area, and in my opinion the ABA had no relevance here – if at all!

### *Network Numbering*

Although Telecom Australia had managed the national numbering scheme and virtually finalised the current 10-digit plan in about 1985, AUSTEL took on this role, and gave the numbering plan a degree of independency not possible under Telecom Australia/Telstra. This is now with the ACA – which was AUSTEL!

Australia's national numbering scheme is part of the infrastructure, so when the infrastructure part is removed from Telstra (*I know – I was working on the National Numbering Project in Telstra in about 1984*) and positioned correctly back as a sub-Government Commission (or Authority) for Telecommunications, the numbering scheme and the people involved should be moved from the ACA to the ATA (Australian Telecommunications Authority).

Concurrently, the Internet in Australia should have its network and server infrastructure moved into this same infrastructure body, and then the management of the DNS (Domain Name Server) component would be an infrastructure issue – free from the meddling of business and other cheating concerns.

### *Network Reference*

Another of the ills of competition is that alternative carriers duplicate networks to provide competitive services, and as these networks are expensive to engineer, install, commission and maintain. These duplicated infrastructures do nothing to drive down user costs – in fact they do the opposite, as they introduce 'diminishing returns' and that is economic proof alone that competition of infrastructure is an unhealthy policy that must be avoided.

One way to minimise this expensive economic madness is to introduce a common network registry of all network components so that a single regulatory body has a solid knowledge of the overall telecommunications network in Australia. This is a proactive management initiative that is an imperative if the overall infrastructure is to be utilised to its most effective potential, and the savings through this amount to several $ Billion every year in funds that would otherwise become negative balance of payments (BOP).

The reasoning for this is simple to understand but hard to palate. If a duplicate network is engineered installed and commissioned that network cannot run at full capacity unless the original network was so badly under-dimensioned that a second network could put the available services out of network congestion and into full service. In any case, if the networks are competitive, then there is even less chance of either becoming fully utilised in the short term (less than a few years), and the return of investment (ROI) for both networks is then compromised – leading to compromised profits and less funding for ongoing maintenance and associated customer services. Compounding the issue is that the second network has very significant establishment and much lower operational costs, and as Australia has now virtually no telecommunications manufacturing facilities then virtually all the equipment is imported and that means money is exported in the form of BOP – deepening Australia's financial debit position.

It is the realisation that Australia has virtually no telecommunication manufacturing facilities, and that virtually all telecommunication manufacture done in Australia is in fact component assembly using imported components and this is a lose-lose financial situation for Australia and that is hard to palate primarily because present and previous Governments have not and do not know how to actively support the **development** part of R&D, so in general Australian research sells out to overseas interests to maintain (mainly university based) research.

### *Narrowband Internet*

Practical narrowband Internet services became possible through a number of technology-based improvements in telecommunications in Australia, where the analogue based Inter-Exchange Network (IEN) was replaced by the digitally based IEN resulting in very consistent switched connection performance standards.

The engineering programme for this started in 1980 with the introduction of Ericsson AXE digital exchanges, and was completed in about 1994 with the last analogue based transmission links retired from service. Virtually all inter-exchange transmission links longer than a few hundred metres are now optical fibre or radio bearers utilising digital transmission based on industry standard ITU-T and ITU-R recommendations respectively.

Concurrent with this massive re-engineering programme, the Customer Access Network (CAN) went through a rationalisation process. In 1988 Telecom Australia had a massive internal change in structure where the Engineering and Administration (Sales) areas that then were State based were joined and repositioned as Districts under Regions and the State boundaries/managements eliminated. A single Headquarters was also firmly established in Melbourne. One of the follow-ons from that restructure was that one standard was adopted for a common set of CAN electrical / transmission specifications, Telstra's physical CAN wiring was rationalised into passive and active structures, and because of cost cutting competitive pressures, Pair Gain Systems (PGS) were widely adopted into urban situations on a national basis.

As the Basic Carriage Standard was (and apparently still is) to provide basic voice frequency telephony services, PGSs met these criteria, and in a large amount of cases the active circuitry involved additional pairs of analogue/digital conversions in the voiceband frequency range. These extra analogue/digital conversions in the PGS equipment have virtually no effect on voice, but severely impact on data modem training and data transfer rates.

V.34 modem pairs on a passive CAN lines and via a digital IEN can expect to train and run at 28.8 kbits/sec. A V.34 modem connected to a passive CAN and via a digital IEN connecting to a V.130 (2 Mbit/s interface) modem can expect to train and operate above 32 kbits/sec and possibly up to 56 kbits/sec if the customer line is positioned on less than (say) 1500 metres of 0.40 mm copper pair with no PGS. By adding an active PGS in either instance the maximum data speed is usually crippled to less than 24 kbits/sec and can be crippled down to 1.2 kbits/sec in bad PGS cases.

Clearly the Basic Carriage Standard needs to be dramatically changed from a voice based clarity issue into a voice clarity and data speed issue. Alternatively, the Basic Carriage Standards needs to be radically reviewed and include Broadband Internet as an essential part.

This Basic Carriage Service Standard is a pivotal role of the ACA to proactively develop, document, administer, measure and enforce. If the ACA has any difficulty in this role then it is symptomatic that the ACA should not have any part of this role – as the ACA would be ill positioned. It seems to me that the ACA is traumatised by the Government in power to do nothing proactive and apply severely outdated standards as the normal and by this, assist the Government of the day to sell off Australia's telecommunications infrastructures.

### *Broadband Internet – HFC Access*

It appears to me that the Australian telecommunications industry has been brought into Broadband Internet like a reluctant child – wailing, complaining, and generally retarding from the obvious direction. The cause of the problem is not the Industry players, but the playing condition of the Industry – and that comes down to very poor Government management.

The endemic problem here is that 'free market forces' and 'open competition' do not provide anything like an ideal environment for 'market development' and/or 'industry re-engineering' and included with 'rational economic growth'. Commonly, those that cite military advances and/or developments especially during wars as prize examples do so totally excluding the financial burden (of extreme competition) thus cavitating their argument.

Broadband Internet had its first introduction in about 1997 as CATV channel space and the backward channel within this hybrid fibre/coax (HFC) form of customer access network. In relative terms, this was not a difficult technology to introduce – if the CATV coax cable existed to the premises, and the signal level was sufficient. All that was then required was a passive signal splitter at the customers premises to attach a premises cable modem, and a Cable Modem Termination System (CMTS) / router at the head end to talk through the hybrid fibre/coax (HFC) access network to the cable modems.

Consequent to the endemic 'open competition' policy, major capital cities were largely double infrastructured with HFC access in many suburbs to provide CATV services, and more than $2 Billion was wasted (as negative Balance of Payments (BOP)) in competitively installing an unnecessary geographically duplicated CATV network infrastructure.

A direct quote from the Senate Committee on Broadband Competition 2004, Ref [14] is; *"[251] While the Committee did not receive any detailed evidence on the cost of rolling out fixed line networks the cost per home passed can be estimated from the evidence received. In its submission Optus stated that its HFC network had cost over $4 billion to install since 1994 (Optus, Submission 36, p 7) and that the network passes 1.4 million addressable homes (Optus, Submission 36, p 6). On this basis the cost of rolling out the network can be estimated to be over $2800 per home. The cost obviously depends on the type of network being rolled out and the availability of access to existing infrastructure."*

If this figure of $4 billion were doubled (at least to cover the Telstra rollout), then my estimation of $2 billion as wasted BOP funds through competition is very conservative.

So much for 'free market forces' being economic, and this is enormous infrastructure cost one of the reasons that Broadband Internet was and still is so expensive! Unfortunately, because of the competitive environment, the engineering was so poorly (cheaply) executed that most customer premises set back from the nominal street-front building alignment were in general not able to be connected without incurring massive connection fees to provide extra amplification then required.

### *Broadband Internet – ADSL on Copper Pair Access*

In a bid to reduce complaints of slow Internet via dial-up modems, utilising ADSL over existing copper pair access lines was the next minimal technology incremental evolutionary step. This is again a cheap technology and the results are less than exciting. As copper pair is not an ideal medium for frequencies above (say) 0.2 MHz, and ADSL usually works up to just beyond 1.1 MHz, virtually every physical constraint is pushed to its limit and performance beyond 3.5 km distance is questionable at best. Transmit power levels have to be extremely high because of the huge attenuation of the copper pairs and this in turn raises the overall noise floor – compromising other ADSL pairs and voice circuits in the same customer access cables. This is a very ugly technology – a misfit cancerous growth!

These customer access cables were never engineered for use above voice frequencies and it should be very obvious that this is a very ill fitting technology. However Telstra is now run on full commercial business lines with about 49% officially sold off – as 'privatised' – into the stocks and share market, and consequently the Telstra's Board is critically aware of shareholder return, with the result that doing nothing gives the best return and doing as little as possible prevents Telstra form going bankrupt, so the move to ADSL on existing copper pairs in the existing CAN was pitiful – but expected.

More information on how PGSs are incompatible with ADSL, and how ADSL should be considered at the best as a very short-term stopgap knee-jerk solution to an endemic situation. Ref [15] (Senate Hearing on Broadband Competition, Submission 19) provided some insight to this problem and the associated submission (19a) did not have a linked Internet reference, and so it is included here as Appendix C, and it provides the insight to a long-term technology/engineering solution and a long-term political solution. This Appendix spells out the problems of ADSL on voice grade copper pair technology, and compounding with that, competitive factors have combined to make this a far more expensive technology to roll out because of the political constraints included with competition, and the fact that ADSL on copper pair will not work in regional or remote situations.

Some serious consideration (beyond Telstra, Optus etc) has been given to providing ADSL over radio (point to point) CAN access, but because the major infrastructure providers already have ADSL via copper pair (<3.5 km only) and Satellite as retail sales options, ADSL via point- to-point Radio has been actively suppressed (by Telstra etc) from infrastructure development (as it has a line of sight limit of about 30 km) and this technology would directly conflict with the existing and limited access options available. This is a blatant example of internal conflict of interests caused when the same body manages both infrastructure and retail sales and marketing.

As a follow-on from the National Broadband Strategy (Ref [16]) The Higher Bandwidth Incentive Scheme (HBIS) unwittingly unearthed this and the majority of new funds were then channelled back into Telstra (at the expense of the initiators) to do what Telstra was not willing to do in the first case. I have a very strong doubt that ADSL via point-to-point Radio will ever materialise from Telstra and it is no wonder that I despair at the inept handling of our telecommunications infrastructure funding in Australia!

### *Broadband Internet – PON*

This is the way of the future of Australia and all the focus should be moved to here, as this is where the next big move will be – but again its progress is bound by competition resulting in bodies that have substantial infrastructure unwilling to introduce a new product that will internally conflict with retail sales products that they already have on the market. This is a dramatic change and it heralds the inclusion of; telephony, Broadband Internet and CATV together as the new basic carriage service standard.

Appendix C gives a simple overview of the proposed technologies and the services that are capable of being provided. It does not take too much intelligence to realise that copper pair access will become virtual ancient history in a very short time and all services including digital CATV, true Broadband Internet, multi-channel telephony and datacasting will be the services that will grow and develop on this access network.

As distance is not really a problem, rural and remote services will also use Passive Optical Network (PON) technology, and this will wipe out earlier access technologies including copper pair, satellite, PGS, ADSL, HFC and in most cases point-to-point Radio.

With this in mind ACIF and the ACA need wake-up calls to rewrite their code specifications, and the ABA really should start to rethink its relevance – in any case. The ABA should have close (sexual) ties with the Australian Censorship Board and merging these two should be a far more rational approach than bedding down the ACA with the ABA.

### *Website Industry*

In line with the move to very common use of the Internet in Australia (2004), every business must have a website as a part of their advertising, contact, point of sales, and marketing strategies.

Websites grew out of Intranet data banks, where larger corporations moved their documentation from paper onto computer files, and then made these data files available internally on their corporate LANs. The common process was to use File Transfer Protocol (FTP) and load the files onto a local computer, then open and read the files as required.

With developments in presentation through the development of Hyper Text Media Language (HTML) documents could be immediately displayed and include graphics, and through the use of Hyper Text Transmission Protocol (HTTP) related documents could be virtually immediately displayed. The problem was that graphics (pictures) are memory intensive (they are very large data files in comparison to simple text data files) and because of that, wider bandwidths are required so that a communication system can have a similar response times when pictures are transmitted – hence one reason for Broadband Internet.

To secure transactions so that point of sales (POS) could exist on the Internet, encryption and extended mark-up language (XML) was developed, along with encapsulated point-to-point protocols (PPP) to and other security measures. These all combined to make financial based transactions safe via the Internet – much safer than street banking!

In line with every business needing a Website as an essential part of their business strategies, the growth in Websites was phenomenal, and with it came an army of new careers in Website management including and not limited to – building, hosting, mastering, editing, logging, tracking and hijacking.

In the telecommunications field, this has meant a complete rethink of the network structure away from telephone based communications and towards Website based hosting, the deployment of Website mirrors (regionalised Website virtual hosts that store and forward recent data, and update themselves automatically) and radically changed global traffic patterns to match Internet requirements. The beauty of Website mirrors is that only the latest data is updated from the parent website and no more – so the parent website is not bombarded with high traffic requirements – which inevitably slows the traffic flow to a crawl as it is in server and/or network congestion mode. So when the prospective user calls for that website address, they are re-directed to the local mirror and the download is much faster (at least 10 times faster) than to the parent website, and the long distance network is not congested. This is a win-win situation for the user, the website owner, and the service provider, so it makes compelling sense to mirror websites regionally wherever possible.

Websites are managed by addresses under the Domain Numbering System (DNS) which is a distributed library database that links website names to Internet based addresses. These addresses come in several forms and usually have the acronym 'com' or 'org' or other to designate their business grouping, and then often have a country of origin designator like 'uk' or 'au' etc to identify their geographic basis. Interestingly enough, the USA seems not to have a country identifier – but their conception of the 'world' is the USA in any case!

One of the biggest volume traffic Website topics is sexually implicit and/or explicit material which in some more prudent minds is considered to be abhorrent and therefore is to be restricted at any cost – and this is termed by others as censorship.

In line with this the Australian Government of the day has placed restrictive (draconian) laws on the use of Web hosting in Australia, stipulating that explicit 'sex sites' must not use the country identifier 'au' and through this ruling, inept is it is, the Australian Government has 'washed its hands' of sex sites in Australia – as if they are not here! In almost the same stupidity as the 'Phone Sex' laws the 'Web Sex' laws have crippled an otherwise thriving market that – surprise, surprise – is thriving in Australia, but Australians are exporting funds when they could be importing funds at a far greater scale.

The workaround is almost too simple! The Sex Sites operators simply do not include the '.au' as part of the DNS and the operators simply use overseas sites – at the expense of the Australian Government. The Internet is a global market – not an Australian bounded market, and having draconian laws like these in place to 'deal with' emerging markets is akin to cutting off you nose to spite your face. The ACA/ABA should be working with this Web industry to see how it can foster telecommunications businesses of any sort, not restrict it.

Dating Services are apparently not restricted as Sex Sites apparently are, yet the line is so fine, and the sexual arousal factors are intermingled, depending on sexual orientations and these are highly interactive between prospective users. I know of clients that have used these dating sites and their dates have been persistent 'no-shows' which loudly tells me that a high percentage of these respondents have sexual fantasies but remain anonymous – and this is virtually no different in sexual arousal factors that explicit sex sites for others. Again the draconian laws for 'Sex Sites' need revisiting, and it appears to me that the ABA is involved in an area that is part of self-censorship – and that again makes the role of the ABA totally irrelevant in today's global culture.

In another draconian move, the push to 'deal with' (eliminate) on-line gambling from Australian based Internet sites is nothing short of laughable, (where overseas interests are laughing at the Australian laws) and overseas sites have already capitalised on this stupidity of law making. Those Australians that are inclined to waste their earnings on gambling – without attending a registered (State-based) club with 'poker' machines simply log onto a foreign-owned Website and do so. The smack in the face (from the Australian Government) is at Australian poker machine manufacturers who employ Australian programmers to develop the gambling programs. Australia is, I am sure, because of its innovative nature of people, are the best programmers in this industry on a global scale.

In the case of horse or dog based gambling, the rules are virtually the same with as I understand it, a Darwin based company in a commanding position and from that all bets become overseas based – and the bookie always wins – because it is a numbers game.

The Australian Government needs to look again on a global scale and realise that its draconian law approach is actually crippling Australia from capitalising in on a global market that is simply worth $ Billions every year as a positive BOP into Australia. The Australian Government should be fostering this on-line business at the expense of every other somewhat developed country on the globe. The flow-on effect is that international telecommunications costs would be far cheaper because far more people would be calling into Australia than those calling out of Australia, as the centre for global on-line gambling would be Australian based.

## Media

Community Access Television (CATV) has already heralded its footprint into the interactive world (like Internet), and I believe that it is in its juvenile state with pay for view on particular programs, gaming (gambling), and 'voting' as the first round of developments to directly compete with the 'entertainment' available from the Internet - which already has pay to view sites, on-line gambling, and 'voting' on topics along with on-line forums.

People choose what they want to view and interact with, and with minimum Government interference. I have no doubt that in the next phase of interaction level the set top box will include a mouse pointer and keyboard top provide the next level of interaction and this will directly compete with Internet for forums and menu selections, including a wider range of pay for view options.

The big problem for CATV is the access medium, which is HFC (hybrid fibre- coax), and coax is the killer because of its poor transmission characteristics compared to optical fibre. Some of the limitations of HFC are described in Appendix A and C and it seems fairly obvious to me that with the inevitable change to FTTP (Fibre to the Premises) that the distribution of both Broadband Internet and CATV will extend to almost every Australian premises before 2008, and the Australian Government has to realise that repressive laws to deal with emerging technologies is the wrong way to manage technology and social change.

In a recent conversation I have it on good authority that in 'green fields' applications (installing cabling into new sub-divisions) the break even on return on investment (BEROI) is currently about 2.5 years and in 'brown fields' applications (installing cabling into existing suburban areas) the break even on return on investment (BEROI) is currently about 4.5 years. In other words the green fields situation has about a 40% payback per year, making it very difficult to explain why to continue with copper. In brown fields situations have about a 22% payback per year placing copper as a par – but why install obsolete technology?

The only answer that I can think of is that Telstra is under intense shareholder pressure to keep doing what it has been doing so that the share price will not fall any further, and by moving to optical fibre (FTTP) this could be seen as a change in direction and that could drop the share price, and that could make it much harder for Telstra to be sold with a falling share price. But why would a Government even contemplate selling off the finance and control of its main infrastructure for the future – that is ludicrous.

## Broadcasting

### *News Broadcasting*

In the last decade news broadcasting has changed from general news to 'advertisement news' – where virtually every item for news has a price tag attached to it and those with the biggest price tags get the biggest spaces. The reason for this is simple economics in that the value of the news timeslot was not fully recognised – until corporate forces offered to pay top dollar for advertising space, and then went over that untouchable edge, and manufactured stories for the news complete with their corporate twist (spin) on the stories to get the extra advertising.

News is usually split into a few segments – International (overseas politics), National (politics), "Accidents" (corporate and personal failures), Business (always positive), Sport (professional business), and Weather (including spot advertising). Sometimes the segments cross over with business appearing as political decisions, and sport advertising as international news. In short it is very difficult to get a level news report, that is; a news report that has a sporting chance of not being part of a paid advertorial!

Once in tune with the advertorial segments – it is far easier to spot the rot and discard content en masse and that alone makes news into entertainment – but not the way that the sponsors and station management would wish it to be viewed!

News reporting like oil, is a slick business, and with competition in commercial channels this process is destined to be more covert, making a Government independent body (the

Australian Broadcasting Commission (ABC)) a vitally essential part of the Australian broadcasting industry to stop the rot and set the minimum standard that most commercially based broadcasting organisations find difficult to attain.

### *DataCasting*

Free to air analogue based TV transmission signals have a large proportion of synchronisation signals in them that are repetitive and constant in value. Data casters have realised this potential and have raised the technology to insert data into the vertical synchronising lines that are not seen in a TV transmission. Consequently data can be broadcast via TV transmissions and this data can be used for a variety of purposes on a commercial basis – and hence the fight to have it outlawed by those that can do the same by other means in bounded media – i.e. CATV HFC, and Internet service providers and infrastructure service providers – operating at a commercial / retail level – not a wholesale level.

The two that I am aware of include the TELETEXT screens that come in on the back of particular free to air TV channels and stock exchange data by a similar method.

Through my personal experience I have found that both Narrowband and Broadband Internet suffer from network breakdowns – commonly during the business day and these breakdowns can be at times for hours – to residential sites. On commercial levels the duration of these breakdowns is much tighter controlled – in the knowledge that lost time is lost contracts. All equipment has a mean time to failure (MTTF) figure or rating that can be both engineered and calculated and it is known and that is the basis for setting service contracts – plus human error! In line with that, data casting comparatively does not have a very complex structure, meaning that there are far less components that can fail within a specified time, but usually there is very little backup / diverse routing to compliment the low equipment-based MTTF figure, so in reality all network based distribution systems commonly suffer from network connection and equipment failures, all of which come back to suitable reliability engineering, network outage planning and commissioning processes.

### *Mobiles and Palm Pilots for News Broadcasting*

With the spread of interconnecting personal interface devices the concept of these devices receiving TV data casts, Internet and cellular mobile transmissions as required is in political terms a definite probability, and business censoring of news already happens meaning that media companies make it their business to inform their clientele, so that their clientele maximise the future use of their products – like TV shows, and sports programs.

Akin to this will be the distribution of news headlines to mobiles, with the follow up on request, and palm pilots and Internet will and do have these same 'services'. In the same way Web hosts that insisted on including adverting found that they lost their clientele in droves, so too the public will vote with their feet on other information based products. So the need to bring in laws to 'deal with' the businesses is totally irrational and out of synch with the information revolution, but 'control' was the way of the law during the industrial revolution some 150 years ago!

## *First Last - Provisions*

*(a) The provisions of the Australian Communications and Media Authority Bill 2004 and the Australian Communications and Media Authority (Consequential and Transitional Provisions) Bill 2004 and related bills;*

The term 'provisions' in this clause (a) as I understand it, means to 'provide changes in naming titles' so that the existing laws in being slightly altered such that the changes in names in effect reflects the name of the new authority, or body.

 

From what I have comprehended in reading through the explanatory memorandums associated with this ABA / ACA >> ABCMA structural change, my understanding is that the ABA and ACA are two di-separate bodies both under the one Ministerial heading, and the plan to combine these two bodies appears to be more about resolving issues the could otherwise fall between the two areas – and by having them as one body – it apparently leaves that new body delegated to come up with the resolution. It therefore in effect sweeps the problems that the Minister (and advisors) is/are inept in resolution, and passes the problems onto a broad range committee that will then procrastinate and also give no result.

It seems to me that this Bill actually is intending to close a whole lot of little gaps that were not tidied up when the Spectrum Management Authority (SMA) was established and since then various licensing fees and other pieces that were attributed (incorrectly) to the ABA.

*With this in mind, my thoughts tend to go along the lines of keeping the ACA as the established communications authority, and moving the technical and licence gathering parts out of the ABA into the ACA, and* ***not renaming*** *the ACA to the ACMA. This leaves the content part of the ABA out by itself and I believe that this part should be merged with the Australian Censorship Board (ACB).*

This then clearly defines the role of the ACB as the body for media content recommendations, and if people, associations, incorporations, businesses, companies, and/or corporations do not abide by these recommendations, then the ACB can 'recommend' to the ACA that the licenses by immediately revoked – and it will happen!

Not only does this greatly simplify the changes in structure and changes to the existing laws, but the bodies have clear and directly associated delegations – leaving virtually nothing to fall between the cracks, leaving two bodies that are in no way irrelevant in today's society.

## Conclusions

After reading through the paragraphs in question and reading the associated documentation pertaining to the ACMA Bill, and through the knowledge and experience that I have it telecommunications and in my life, it strikes me that the joining of these two authorities (the ACA and ABA into the ABMA) is yet another reactive attempt to keep on top of regulating telecommunication technology advances and the broadcasted sexual content to the Australian public, in isolation of the global interconnectivity advancements in telecommunications technologies, the role of the Australian Censorship Board, and the far more liberated attitudes that is prevalent in the Australian society.

It appears to me that the previous Minister (Senator Richard Alston) was an unfortunate qualifier of the (Laurence) 'Peter Principle', which is a reasonably well-known situation but often unrecognised till too late. *The Peter Principle* Ref [17] *can be paraphrased as 'people tend to get promoted into a position where they are incompetent'*. In that light I believe that Senator Alston may have been driven into this proposed legislation for purposes that I believe are out of step with large majority consensus of the Australian populations wishes and business directions. By merging these two di-separate authorities (the ABA and the ACA into the ABMA), this would appear to bring common control and regulation in the form of extended censorship across the broadcasting and telecommunications arenas (inside Australia), but why is the Australian Censorship board is separate?

It therefore appears to me that this proposed legislation has not yet been dropped with the change in Ministers, but the new minister (Senator Helen Coonan) may see yet the light and realise that this proposed and inept legislation was probably championed by a small (possibly religious) minority of highly financial people with powerful business ties, who are living in a bygone era that has long left the general Australian community. In dropping this repeated attempt to repress peoples choices; an alternate approach that is provided in this response is in step with the large majority of Australian culture, and will lead the Australian Government out of an increasing negative downward spiralling of Australia's BOP, caused by the implementation of full competition in the Australian telecommunications sector some two decades before.

If there is to be any convergence of bodies then it seems to me that the Australian Censorship Board and the ABA have a lot in common, and a merge here would and should be a complete and comfortable fit, except that naming it the Australian Broadcasting Censorship Authority (ABCA) could be seen as too precise as that is exactly their apparent involvement! In any case this naming would cause direct confusion with the Australian Broadcasting Commission (ABC). As this newly proposed combined body would be focussed on providing recommendations of acceptable public display content for all forms of public entertainment at a Federal level, then the ABA could rightly be absorbed into the Australian Censorship Board, (ACB) and the Board's role slightly re-defined to include media content.

In the case of the ACA; it is isolated but has the technical standards / recommendations and licensing as its backbone. The ACA needs to have its technical standards updated in several areas including the basic carriage standard to include bi-directional Broadband Internet and CATV, Websites and Email service standards. Currently the service quality standards seem to have stagnated at about 1995, and a decade of information revolution has happened since.

The ACA needs to be tied into a Government Commission to be effective through being truly independent, and proactive – not reactive. Australia's telecommunication's sector has been largely privatised and it has proven to be a dismal failure, (with the failed experiment of

Optus Singtel already overseas owned) but nobody in Government is prepared to accept that there is a major problem, not blame any earlier political situation and move on to fix the mess.

In Appendix B of this reply, I have provided a skeleton blueprint of how to move forward and fix this mess and it involves the amicable restructuring of Telstra to become two separate bodies. The first is Telstra 'sales, financial and marketing arms' as the fully privatised services resellers, and a sub-Government Commission that is fully Government owned, incorporates the infrastructure part of Australia's Telstra as a start, and in the ensuing years as other carriers 'unbundle' themselves of infrastructure, the Australian telecommunications sector.

This proposal has industry support from highly eminent people that obviously share my views, so this proposal should not be taken lightly and discarded. It provides an out for several companies in full competition and gives them a chance to divest their infrastructure to the Commission, which frees them up to be resellers that can run with their own retail products, all based from common wholesale pricing of the base infrastructure.

What is probably not understood is that wholesale infrastructure service pricing has a different 'bottom line equation' to it than a commercial retail service – which has ROI (return On Investment) and PAT&E (profit after taxes and expenses). For wholesale infrastructure services, the bottom line is measured in terms of the increases in productivity made by the businesses that use infrastructure services to generate their monetary profits – not the monetary profits made to provide infrastructure services to those businesses!

With this in mind, it then becomes blatantly obvious that charging obscenely high auction prices for mobile cellular spectrum bandwidth (infrastructure service) flies in the face of increasing productivity as this directly cuts into the monetary profits obtainable by the 'competitive ' carrier companies, and this in turn increases the amount of unnecessary advertising and both combine to substantially increase the retail usage costs, which in turn does nothing to increase productivity.

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# Appendix A

# Maximising Australia's Telecommunications Efficiencies


## *Abstract*

Profit margins in the telecommunications sector in Australia are continually falling, and we are witnessing the slow death of what was once touted by world trading pressures to be a good for Australian business. Technically, shares usually follow a trading channel, and Telstra, Optus and others in this sector are all in a downward trend, have been for some years, or have already become 'penny dreadfuls'.

With an ageing copper-based access network engineered for voice telephony, CATV access soon due for major maintenance, ADSL technology providing urban-only minimum Broadband Internet services as a stopgap measure, mobile phone networks multi-duplicated, and marketing in the Australian communications industry in full flight; something has to give.

Competition appeared to work in the mid-1980s due to digital replacing analogue technologies, but the multi-access networks for CATV and mobiles in the 1990s proved to everyone that duplicated networks is the worst-case cost scenario, and this type of competitive farce must never be repeated.

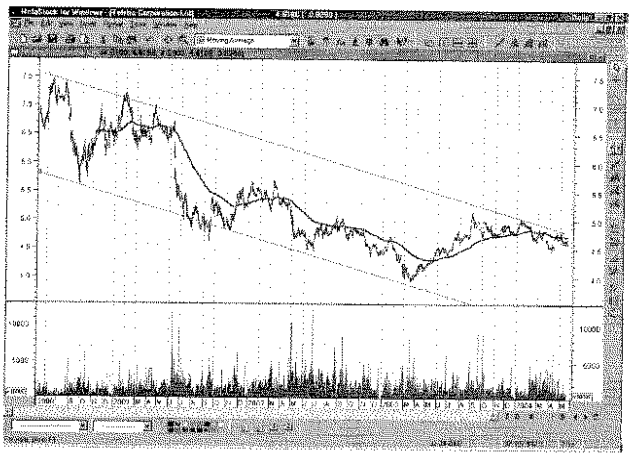
The whole telecommunications industry in Australia requires radical restructuring to make it again efficient, and one radical approach would be to reposition all public telecommunications as infrastructure under a sub-Government commission, with all resellers placed away from engineering. Only when this is done will the prices be really driven down.

The spin-offs for Australia, with its expertise in optical fibre technologies, can then flow on as developments and not just research. PON technology has the potential to resolve all urban, rural and remote service quality issues – including the engineering problems of distance, and provide all Australians with the Broadband access network for the future.


## AN ECONOMIC VIEW

### Stock Market Truths

Fundamentally, a share price is valued on the estimated total worth of a company, divided by the number of shares allocated; the rest is perception, promulgated by news in several varieties and flavours.



Share prices often follow a trading channel. The associated chart of Telstra shows a negative channel, and spelling 'poor long-term investment'. The 109-day long-term exponential moving average for the vast majority of time has been above the share prices, and is coming back over the average, again saying 'poor long-term investment'.

Either way the share price of any company does reflect how the public view the purpose of the company, the Board of Directors, the executive management, the products that the company sells, and how well these products/services are received.

When large companies are providing infrastructure items, a general consensus is that the prices for these products and services should be inexpensive. This is a fair call considering that economies of scale and the sheer bulk of products and services mandate that manufacturing processes are streamlined to such a degree that these products and services should be inexpensive, and consistently getting cheaper.

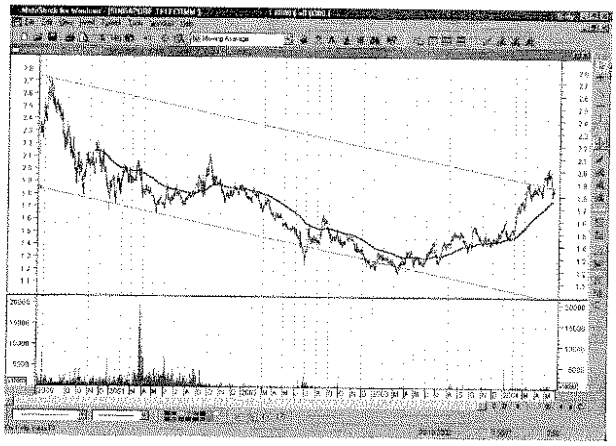
With this data translated into information as a stock chart in time, then looking at the historic share price of Telstra, Optus and other telecommunications companies in Australia tells us some frightening realities!

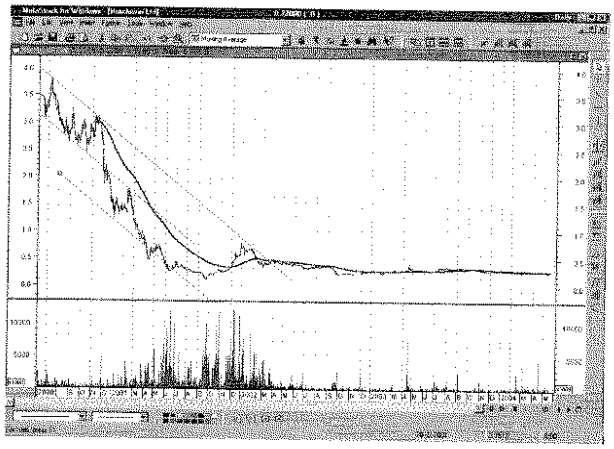
## AUSTRALIAN BOARD COMPETENCIES

The value of Telstra, as perceived by the stock market, is falling. The longer-term trend lines help to get a perspective on this. This is embarrassing, as nobody in their right mind would invest in a stock with a general long-term loss (or medium-tem loss), but nonetheless the volume of trades shown at the bottom of the chart is enormous.

The role of all Directors is to mentor and provide wisdom to the long-term running and steering of their company. However these charts speak volumes for the perception of the competence of Board members. In the case of telecommunications industries, the Board members of these companies should have expert long-term wide-ranging experience – but the stock graphs seem to be able to see through the verbiage.

For some decades now the mantra of 'outsource everything' is coming home to haunt most businesses, as the real costs of outsourcing are far more than the money saved – it is knowledge. Many Directors do not have the relevant company floor experience, knowledge and/or expertise, and consequently many Boards call in "Consultants" to do what they should have done. Further, most Consultants are not in-company experienced so their recommendations are often questionable at the best. There is a lot of wisdom in corporate memory and that is extremely valuable.





## Crunch Time

The two graphs above are showing that Singapore Telecom (SGT) is in a downward trend, just like Telstra, and that Hutchison/Orange (HTA) on the right, is nowhere.

The Telstra chart is shouting out that the profit margins in the Australian telecommunications industry are continuing to fall, and that at this rate by about 2007 the Telstra will be insolvent. Telstra has a legacy of older infrastructure to continue to manage. Telstra has the rural and remote services (which are not profitable); the lion's share of land based customers (who are not profitable); and some Business and Government services (which are profitable). Internet is a major profit area, but the access arrangements are broadly unacceptable, with ADSL as the apparent Broadband standard (and in my opinion this must be a stopgap technology).

Mobiles are a profit area, but it has taken several years to get the land coverage to acceptable levels and because the land area is limited, and the population stable, this market is now in a shakeout mode where there are already too many mobile service providers, which means that the returns on investment have been severely curtailed because of competition.

In the case of Optus (Singapore Telecom – SGT), this market was never profitable till it finally had a sizable share of the Australian mobile phone market, and until then the share price continued to fall. The price is now encountering a resistance line at about $2.04 and as no new technology is coming in, and as Optus has effectively eliminated its legacy in HFC CATV, the price should flatten out then fall again in line with Telstra. It should be no surprise that both Telstra and Optus should be looking to acquire synergetic companies to improve their core and diverse businesses – in that order.

If these two graphs were added to each other (note the volumes) then the net result would be a continually falling share price for the infrastructure and that agrees with the hypothesis about the share price of businesses due to go broke or about to become infrastructures.

(My hypotheses is that when certain technologies become commonplace, they have everyday use and with several private companies competing for sales, all these companies become unprofitable, because competition causes them to spend on non-core overheads. There is then a shakeout, but as the margins are so low, the few surviving companies are barely lions and their survival is tenuous and unpleasant, and then the choice is that the Government provides 'support funds' or simply takes the failing large scale business over and those technologies then become everyday infrastructure.)

Australian political management is now in the embarrassing position where a very large amount of its telecommunications infrastructure is owned offshore and the Government's (and Opposition's) hands have been compromised because of this.

Something radical has to be done to stop this trend, or the telecommunications industry has to become infrastructure as it was before. This is not palatable, and I propose a radical restructuring that provides for the network to be managed like an infrastructure and the sales and marketing arms to operate competitively, and both areas to operate 'efficiently'!

## Australia's Economic Balance

An article "***Electronics as an Economic Catalyst***" by Professor Trevor Cole, in Electronics News August 2003, is clearly embarrassing to the Australian economic forecasters in that this article does not focus on the traditional "mining industry and primary produce" as the future backbone for the ongoing strength in Australia – but points out that the balance of payments is now worse than it has ever been – primarily because of our immense imports of technology. This is so even though we are nationally flush with IT expertise; but we don't use it to our advantage, and have no manufacturing and software development to speak of to export.

In the area of Information Communications and Technology (ICT), according to Professor Cole, we are not even on the map with an almost invisible 0.5% of our Gross Domestic Product (GDP), where the more developed countries have in the order of 8.0% as their GDP. In other words we have to increase our ICT by a factor of at least 16 times (1600%) to normalise our GDP. Only a radical change can assist here.

The answer is plain –it will solve both the balance of payments (BOP) problem, and our Gross Domestic Product (GDP) problem. It is staring us in the face, and when (and if) the Government / Opposition parties wake up to it then it will also solve our lacklustre business in the Information Communications and Technology (ICT) sector, and provide us with a world-class telecommunications infrastructure again.

One of the answers is to engineer and manufacture all our requirements for the National Broadband Customer Access Network using Passive Optical Fibre Network (PON) technology in Australia – with Australian-based companies, utilising Australian labour. This is not a tall order – just a change in mind shift from looking for the cheapest worldwide manufacturer. The simple fact is if we have this (or any) equipment manufactured offshore, then we effectively un-employ people in Australia and that is a poor national business policy for Australia.

This means that Australia would manufacture the optoelectronic interface chips, cable, and other components in Australia, and not import them – even if they cost more to manufacture here. These chips will have a global customer base and they should be required worldwide – not just Australia. Compare that as a commercial possibility to the farcical episode of an Australian company that manufactured a short run of special Fast Fourier Transform (FFT) chips for a radio telescope in Australia.

Professor Cole shows us in his article that our ratio of ICT exports to imports is about 31%, when it should be greater than 100%, and this is a golden opportunity. This situation exemplifies the fact that Australian ICT business needs to manufacture and export more than 300% of what it does now, and to do that we need a radical change in the tendering and manufacturing policies to remove this impediment.

### Multinational Trade Forces

The problem is that there are world trade forces with a mind set of 'liberating' infrastructures from Government control, and in this process privatise various infrastructures so that their intrinsic values can be traded on stock exchanges, and/or taken over by multinational corporations (primarily based in the USA). In Australia, there is strong evidence to show that Australian Governments (and Oppositions) over recent decades have been heavily pressured to sell off many infrastructures that the taxpayers have already paid for.

I am sure that both major Australian political powers are concerned that if they nationalise this industry, then those who control the organising of world trade will place such embargos and unfair trade agreements, that Australia will very quickly slip into being a third-world country. Adding this threat that the Government (and Opposition) are under external pressure to sell Telstra to offshore interests, and it is no wonder that the price continues to fall.

For light bedtime reading, there is an excellent book that shows how the USA power industry for more than a century has manipulated US governments, and many governments elsewhere, including Australia. Needless to say, their tentacles extend far into the world trade of energy and other resources – including telecommunications! The book is "Power Play – the fight for world domination of energy resources" by Professor Sharon Beder. It is interesting to note that energy companies organising the sale of options based on future performance initiated the depression about 1930, and that Enron (another 'energy' company based in the USA), almost initiated the same catastrophe in 2001, doing the same reprehensible and fraudulent activity.

### Economic Conclusion

There is a fundamental business conflict of interest here in that non-Government (privatised) businesses focus on marketing the target Government business for investors to 'steal by law' what is already paid for by the people's taxes. When stolen, long term planning and preventative maintenance programmes are minimised in favour of extensive advertising, and the creation of 'shelved' or 'holding' companies, which are commonly structured to conceal cash flows away from the original core business to the new 'owners'.

The stable market size, huge overheads and forced competition, in an environment of diminishing returns along with virtually no Australian manufacturing, have combined to almost asphyxiate the life of this essential service to support all other businesses and community lives, and destabilise the Australian economy. The expensive lessons of inappropriate competition seem yet to be learned by our political leaders. Competitive strategies in Australian telecommunications are substantially forcing operating costs, and user charges, up rather than down. The whistles have been blowing, but Government and Oppositions are not listening.

## *A Competitive View*

### Competitive Benefits

There is no doubt that competition in its most simple form works. The classic fairy-tale example is when two corner stores are both selling the same lines of goods. However, in practice, as margins are cut, so are maintenance and planning – so too for the Australian-based telecommunications companies. The customer base is finite, so the base cannot be indefinitely increased. Advertising comes off the profit margin. Outsourcing services merely moves the listed workers from the company books to contractor books. Contractors, like brokers, are commission driven, not responsibility driven.

### Competitive Example

In Professor Beder's book "Power Play" there is a comparative reference to the cost of lighting a half the Niagara bridge from two electrical power companies – each providing equal power to half the bridge. These comparative rates show that the price from the Canadian Government monopoly electricity provider is about one quarter of that from the USA electricity company. As the analogy between the USA based electricity power companies' business models and the current Australian telecommunications companies' business models is far too close to ignore, then it stands to reason

that with a well run Government enterprise – free from the politically meddling hands of multinationals, Australia's telecommunications service costs would be much less than 50% of what they are now.

By direct comparison, a phone call that currently costs say 20 c, would without competition, cost about 5 c. This cost blowout is due to the comparative inefficiencies of the 'competitive' model that bleed the core industry of its internal funding, compared to a sub-Government commission.

## Overhead Expenses

To further compound the issue, each competitive network business will have their own management overheads that naturally raise the operational costs (read: service user costs) and there is the very real cost of competitive advertising, management, shareholders and sponsorship that further voids the competition argument, as these have to be paid by the end user. An efficient sub-Government enterprise has these expenses, but nowhere near the size of a competitive business does.

The current telecommunication competitive model in Australia provides a very wide range of services at both the wholesale and retail market arrangements, but because the current Broadband Access Network does not exist outside some major urban areas, where CATV, ADSL and telephone services are simultaneously available, this exposes further flaws in the actual existence of a current and prospective broadband access network and/or service.

We have all witnessed the 'more competitive' Internet Service Providers, which to make a financial profit of these trading/business models must be running in a state of heavy congestion and have an absolute minimum of face-to-face (telephone call centre) customer response service, and/or else also be providing pop-up advertising.

## Government Initiatives

I have no doubt that the Government (and Opposition) have seen the flaws in the competitive model but are too terrified to kill it, in fear that the international backlash will ensure they will no longer be a political power. The current Government has come up with some highly questionable initiatives through what was the National Office of the Information Economy (NOIE), now the Australian Government Information Management Office (AGIMO).

As part of the response to the Regional Telecommunications Inquiry, the so-called National Broadband Strategy was invoked. The first notable advertised program was a 'Demand Aggregation Broker Program' to bring in Brokers to perform the role formerly done by professional Network Planning Engineers. The second notable program was the 'Coordinated Communications Infrastructure Fund' to throw money at geographic areas to encourage their further investment in Broadband initiatives (without the essential engineering knowledge of available infrastructure). The third notable program was the 'Higher Bandwidth Incentive Scheme' to throw money at businesses touting to use high bandwidth Internet outside the major urban cities. None of these initiatives address nationally industry coordinated engineering.

Having read the report of the Inquiry, and seeing that it was thin on engineering know-how, it is of concern because of an earlier attempt with the 'Networking the Nation' project to distribute the problem instead of focussing it. This has resulted in an immense waste of otherwise useful resources that could have gone directly into building and maintaining the network. In all cases each interested group had to provide a bid submission (with their very limited knowledge) and in that, produce a business case to 'justify' their immediate service requirement.

The reports have shown that a portion of successful bids have gone to social clubs and entities that included the almost key word 'communication' but omitted the actual key words 'network' linked with 'telecommunications' so I really doubt the credibility of the judging panel. Further the processes of advertising, lobbying, extensive meetings, document production and presentation, all combine to drain the resources from the essential core; that of providing a highly functional telecommunications network in Australia. Thus ***'Networking the Nation'*** was in my opinion a farcical waste of resources and manpower that maybe was well-intentioned but actually ill-directed – and I believe poorly managed because there seemed to be no industry-wide national engineering plan to co-ordinate and standardise the overall program.

## Competitive Plunder

Competitive models are easy pickings for multinationals to plunder, and history has shown that fact for more than 100 years, though the writings are scarce. The scarcity of these writings is no real surprise as multinationals have actively lobbied, sponsored and supported many areas to make sure that their

'spin' on history is always favourable – so that makes the 'facts' much harder to find. Professor Beder's book "*Power Play*" on the Electricity Industry in the USA and now globally has a litany of evidence showing how these multinationals operate to compromise governments, oppositions, courts, executives, Universities and how they have removed and/or significantly altered text books and other documentation to favour their causes.

It should now be obvious that behind the front of 'competition' is the tactical separation of once powerful and well-structured Government-managed service organisations into much smaller sales-focussed businesses lacking engineering processes and spending heavily on advertising, which then become easy prey for internationally-based corporations to plunder at the Australian public's expense.

Further, these competitive businesses drive marketing sales packages that are implicitly confusing to their customers, and considerably more expensive than a simple non-marketed product. It is this reasoning that makes non-Government business the wrong management team for any national infrastructure and the Broadband access infrastructure in particular.

## Competition Conclusion

No competitive telecommunications network structure can provide a maximised network usage, and the peripheral costs – advertising, multi-management, legal/lawyers, outsourcing, differing engineering standards and differing technical practices – actually decrease the overall productivity by increasing the total overheads, and inherently limit the networks' capacities.

We already now know that the real reason for introducing competition is to set up business structures that will divert funds from reinvestment in the core product and place these funds with shareholders and foreign owned multinationals. If you still doubt this then read again the stated reference "Power Play" by Professor Sharon Beder.

It has now been proven through the last 20 or so years of experience, that a direct competitive model is only good for those businesses selling the manufactured equipment and not those using and paying for the telecommunication services. Considering that we in Australia effectively now do not manufacture any equipment in major volume – so we import technology – not a 'clever' country policy.

The multiple mobile networks and the dual HFC-CATV are two of several financial disasters for Australian telecommunications, and still the politicians can't seem to come to terms that these extremely expensive capital blowouts could have been relatively easily avoided. No doubt the spectre of competitive Web hosting and multiple parallel optical fibre systems will show similar financial disasters in the near future – all thanks to 'competition' – all in the wrong places.

This competitive case is a very simple application of the law of diminishing returns in that, by maintaining more than one telecommunications network in a common geographic area as a competitive model is self defeating, as each additional competitive network is in effect a redundant network (and each competitive network costs are roughly equivalent to the existing network before competition).

If competition policies had not so acutely interfered with the national telecommunications network plan then the existing broadband structure would be working at, or near its maximum capacity. It therefore stands to reason that if we want the opportunity to maximise the use of the existing broadband, then the governing competition policy has to be totally revised and structurally changed so that a national sub-Government enterprise body must manage the wholesale broadband network – it is that simple! Politically it is almost impossible.

# *An Engineering View*

## Physical Network Convergence

In relation to the Senate Hearing into the *Australian Telecommunications Network Inquiry regarding Broadband Competition* about July 2003, I wrote a response covering their five major points as per the Terms of Reference. In this response, I pointed out that the CAN transmission technologies have followed the IEN/IPN transmission technologies and that the lag time is getting much shorter. This phenomenon was also detailed in "Australia's Converging Broadband Networks", which is a sister paper to this one. I am predicting that although currently we have the voiceband engineered copper-based CAN, it will be replaced by a passive optical fibre access network (PON) in the very near future and it will be the infrastructure to provide long distance Broadband in the full sense for all Australians.

## Network Development Stages

It was the digital revolution of the mid 1980's that set the foundation for these technology advances, and these advances come in stages or steps:

In this first stage of digital networks, voice channels and their associated signalling shared the same digital streams under the ITU-T G-series recommendations. Video (TV) was also sent on 'virtual containers' in digital streams utilising Plesiochronous Digital Hierarchy (PDH). Digital exchanges switch digital streams at 64 kbit/s and these were multiplexed into nominally 2 Mbit/s and 8 Mbit/s Plesiochronous Digital Hierarchy (PDH) based streams and then connected into digital transmission systems that connect to other exchanges. With this digitally based technology, the ongoing fault rate fell so dramatically that maintenance soon became almost non-existent. It was these digitally based technologies that drove down the operating costs to new stable lows, not competition, not deregulation or 'liberation'.

In the second stage of networks, PDH was transformed into the Synchronous Digital Hierarchy (SDH) along with Common Channel Signalling (CCS7) and integrated Network Management facilities, to remotely report on the health of the network, and remotely restructure the physical networks. Asynchronous Transfer Mode (ATM) was also used with SDH to encapsulate data streams, and soon the manual side of network management became almost non-existent. With this phase of technology introduction, the use of SDH on optical fibres set in physically large (several hundred km) network rings provided self-healing transmission structures. The costs were already minimised and this just made the transmission networks more reliable and to a large degree automated network management functions.

In the third stage of networks, PDH and ATM were largely transferred to the Internet Protocol Suite (TCP/IP); IP switches replaced most of the previous telephony based digital switches. In this 'Data Mode' the network is largely self-repairing and telephony use is rivalled by Internet and other data forms usage. It is now that the Optical Fibre based (and some SDH radio) transmission network is virtually a combination of IP (and some PDH) feeding into ATM or SDH, which is then carrying most of the traffic for voice, Internet, data, vision, and programme in data packets. With the introduction of Voice on Internet Protocol (VoIP), this technology substantially reduces the bearer load for equivalent transmission bearers, causing a few years' halt in the need to increase bearers for voice – but Internet traffic density had dramatically increased, virtually cancelling this temporary halt. IP technology should have heralded a major decrease in telephony usage costs – but the added costs of competition have voided these potential consumer gains.

## Wholesale Network

It is my understanding in here that the wholesale network including the IPN/IEN and CAN is in effect the major broadband network, including the following:

- ***Telephony***: switches and multiplexers, high capacity optical fibre digital networks, terminal exchange equipment, and the current customer access networks, including all mobile base stations.
- ***Data/Internet***: IP data switches, routers, digital multiplex equipment, high capacity optical fibre digital networks, and customer data multiplex access networks.
- ***Broadband/Television***: transmission multiplexer and coding equipment, high capacity optical fibre digital networks, cable television distribution networks and terminating equipment.
- ***Network Management***: Metering, Supervision and Monitoring equipment, high capacity optical fibre digital networks, and management/system databases.

## Access Engineering

Since the 1940's, almost nothing has changed with the customer access network (CAN) as it has basically continued to be provided by unit twin insulated copper wire. The cable that was manufactured as paper insulated is now manufactured as polyethylene insulated cable. Remote Integrated Multiplexers (RIMs) now replace small rural exchanges and/or extend into the metropolitan customer area, to reduce the average cable length, but still the equipment and cable is engineered for analogue telephony technology.

Customer Access Cable was never engineered for working much above voice frequencies and consequently it is not balanced nearly as well as carrier cable was – so using ADSL is literally asking for extremely difficult engineering problems to surface as the uptake of ADSL increases.

High frequency crosstalk may be a very expensive issue, where situations like the Casualties of Telstra (COT) cases may again resurface, but this time in the Broadband Internet area. Considering the sensitivity of Telstra and their share price, that has never regained value from the $7.40 days, another round of 'COT cases' involving Internet this time could be catastrophic for both Telstra and the prevailing Government (and also the Opposition parties) and multi-national competitive practices in general.

Cable Internet, Coax (CATV) has a short life before it moves into the high maintenance part of its life span and ADSL on twisted copper pairs must be viewed as a stop-gap measure only before Optical Fibre replaces all other CAN technologies en-masse, as soon as financially and technically possible.

As pointed out in the sister paper, I do not see mobile and/or radio as a component of the Broadband CAN, but G3 and G4 mobile radio have a wide band usage and to be effective, the mobile networks need to be aggregated and managed by a sub-government Commission to avoid multiple mobile networks congesting the very limited available bandwidths.

## Broadband Access Re-Engineering

It should be profoundly obvious to all but those who have committed to copper-based CAN for broadband that the common technologies used for providing access for telephony are not at all suitable for bi-directional Broadband distribution throughout Australia. This is spelt out in 'Australia's Converging Broadband Networks'. An entirely different customer access network infrastructure is an imperative that must be implemented as a priority, and this is the first and biggest impediment to be overcome: with or without competition.

This same reference has already discussed the process where the inter-exchange bearer / transmission network technologies lead the customer access bearer / transmission technologies by several years, but this time gap is decreasing and the two networks are becoming convergent in bearer / transmission technologies. As shown there, copper twisted pair technology is not suitable for Broadband transmission in the customer access network, just as it became impracticable in the mid 1980s for the inter-exchange networks, when that transmission technology was then replaced en-masse by optical fibres and some radio point-to-point systems. It therefore stands to reason that the Broadband customer access network must also be replaced by Optical Fibre technology as an immediate imperative, if Australia is to become and remain 'clever'.

*As Australia follows the ITU-T for industry-based communication standards, and not the USA based company standards, it is essential that we in Australia continue to be actively involved in the initiation and development of these standards within the ITU-T framework, and actively negotiate standards to implement an industry standard Fully Broadband Access network based on Passive Optical Fibre Network (PON) as the national standard.*

My guestimation is that in using a PON for urban conditions a single fibre will feed out and be passively split to feed up to 32 premises within a 4.5 km range of the headend/exchange. In rural and remote areas, using a PON with fewer passive splits, the length could be extended up to about 70 km and that totally resolves most remote and rural situations for full Broadband services. Most current telephone metropolitan exchanges handle groups of about 10,000 lines, and PON technology fits very comfortably with this customer grouping, and the footprint should be substantially smaller.

Rural and remote Broadband PON services could be either fed from a centralised headend in major regional centres, or small flat loops from regional centres could provide the bandwidth to small exchange sites, and long feeds could start from there. Non-CBD, urban, rural and remote infrastructure (IEN/IPN) will be the major restriction that will require a national collaborative engineering approach to maximise Broadband facilities.

Competitive proof of concept trial and other pilots have been going on in Australia for some years. The time for full-scale optical fibre customer access network implementation is already overdue, and our telecommunications industry needs a 'shot in the arm' to get it out of its competitive malaise, and back into engineering excellence.

## Opportunities to Maximise Broadband

The telecommunications industry is one that can make considerable opportunities to minimise its overheads by near full network utilisation (without network or switch congestion), and that only comes

about by effectively planning and long-term (>5 years) managing the whole national network. Not apparently competitive parts of it, as is the case at present!

Before any opportunities to maximise the capacity can be approached and realised, it is imperative that the whole telecommunications network needs to be managed/engineered by one Government-based body in a non-competitive environment so that the communications infrastructure can be fully utilised at will, and only through that will the economies of scale that are required be effective. This is, after-all, one of our main infrastructure assets that private and/or multinational businesses have proven they are incapable of maintaining for more than a few years, for the people, and for all business without unbiased regulation.

## Existing Infrastructure Limitations

Beyond our immediate major urban cities, the IEN/IPN transmission infrastructure is essentially 'flat rings' and/or rings based on SDH/ATM with PDH spurs designed primarily for telephony and not for Internet and/or CATV, so even if there was a large uptake in Broadband Internet, the only areas that would immediately benefit would be the greater urban cities.

It is therefore critical that the existing combined competitive IEN/IPN structures be analysed on a national basis and together with the existing switching/routing equipment the combined network be restructured in a combinational manner so that the over-supplied equipment is better positioned to provide a much greater grade of service with minimum effort.

Current technologies allow for interconnected rings of very large bandwidth – for example up to 10 Gbit/s with Dense Wavelength Division Multiplexing (DWDM) for most inter-nodal networks. As most of the non-urban IEN/IPN is basically tiered star networks, there is a huge amount of network infrastructure to be repositioned to give non-urban areas the same (or similar connection bandwidths to that in major urban areas.

Further, to provide minimum delay and speed downloading, a network of mirrored web caches may be required to hold the most recent web information and minimise the long traffic paths that would otherwise drag down the overall networks response times. This facility is near a reality as computers with massive Hard Disk Drives are now relatively inexpensive.

Considering that a Passive Optical Fibre Customers Access Network (PON) will provide the infrastructure for virtually every house in the Australian mainland and surrounding islands to have and use Broadband facilities including Internet, CATV and telephony, the possibilities of a vastly different network structure may be required and with it, facilities to make the response times much faster than they would be if the uptake was virtually 100%.

### *Engineering Savings*

As an example, in the mid 1980s a particularly brilliant Australian theoretician, Dr. John Galloway developed an incredibly smart relational (associational) computer program called Netmap and it was in this case utilised in one application to 'groom' the Telstra network and better utilise existing network structures. I believe that about $1 Bn was saved in a year through this effort, and considering the hefty multiple duplications that exist in our so-called competitive networks today, savings should be in the order of more than $5 Bn per year through minimising unnecessary link / path duplication and utilising links / paths far more effectively.

The economies of scale that would be applicable will virtually stop ongoing purchases of overseas purchased telecommunications equipment for at least a year, and this could save the Australian Government / people about $7 Bn. The heavily duplicated mobile networks that exist could be much better repositioned to properly cover the major city and suburban geographies. Already economies of scale have meant structural changes to Community Access Television (CATV) holdings such that the content is effectively single sourced, and it should follow that the engineering management of this network be brought under one management to minimise overheads, reduce and eventually eliminate duplicated routes, and minimise the overall operating costs.

## Engineering Conclusion

We currently have multiple broadband structures that have been outlined here and it is clearly shown that with the exception of Optical Fibre, all other Broadband customer access network technologies should be either severely limited or stopped in the immediate future as these other technologies will not provide an ongoing low maintenance, interoperability and long life that Optical Fibre can provide.

That is: any development in the Customer Access Network that is not totally Optical Fibre is a very poor investment.

The Australian Government (and all Opposition parties) need to realise that Optical Fibre is the only suitable transmission medium for the future Broadband Access Network. This means that the Government and Opposition need to make some hard decisions and actually take ownership of the Access Network through a set Government Commission, and through that manage the implementation of the Optical Fibre Broadband Access Network as a high priority.
For several years many of our Universities have excelled in Optical Fibre technologies, but few have been able to transfer this research into business development. This means that the Federal Government and Opposition have to move on local manufacturing Optical Fibre technologies and have the research developed and implemented into this new Broadband Access Network, again as a high priority.

# *A Future View*

## Core Business

The core business of Australia's telecommunications infrastructure is to provide an ongoing basic telecommunications service to the public (communities and businesses alike), available to be connected to any premises so that any person or business in Australia can efficiently connect and communicate with any other person or business and conduct communications in a most cost-effective manner. The range and service standards of these products for these telecommunications services should rival the best available in the world.

## Defining Efficiency

In competitive / commercial terms, business efficiency is usually based on realised profit divided by effort (investment) expended. What this more brutally means is that if the investment can be minimised and the profit taken out of the business maximised, then those talking the majority of the profit for themselves would see this as an efficient business, and they will do everything to make it happen that way. Most humans are very greedy – it's our human nature.

In competitive / commercial terms, the best way to make an infrastructure look efficient is to minimise the apparent number of people in that infrastructure, and the most common way to do that is to subtly change the accounting laws so that permanent staff are replaced by contractors or part-time people (and in either case they are not counted), remove maintenance and planning functions so that these overheads are eliminated – or contracted out and also not counted. The third subtle move is to import or hire all equipment, so those people and equipment overheads appear to be excluded. The last step in the mirage is to radically increase marketing, advertising, sponsoring and product lines. Again, most of these people and the associated revenues for this last step are also outsourced, so they don't 'appear' on the company books. The wide range of bundled product lines serve to further confuse the customers and that provides the foil to raise the costs.

In infrastructure terms an efficient infrastructure is one that is near fully utilised, well future planned and funded from its use such that it nominally does not run at a profit or loss, as the funds are totally re-invested to replace legacy infrastructure and create more new infrastructure as required.

In infrastructure terms, the best way to make an infrastructure efficient is to engineer the future planning in long term (10-20 years) medium term (5 years) and short term (1 year) such that the growth and replacement phases are highly coordinated. This automatically manages and readily introduces new product lines, and minimises the overhead and infrastructure purchase costs. Because the product lines are essentially simple, marketing, advertising, sponsoring is almost eliminated. People working in infrastructures generally are not contractors with a narrow field of expertise, but usually full-time staff members with a broad range of working skills gained from moving around many associated areas. These people by their experience, have the data, information, knowledge, and wisdom to mentor and most effectively manage the life cycles in the infrastructures.

It should be very obvious from the above paragraphs that commercial and infrastructure derived terminology must never be inferred, compared, or interchanged as the focus and direction of the two groups is entirely separate.

## Centres of Excellence

Commercial businesses excel in selling, and they do this through selective advertising and marketing, aiming their products to target audiences. This is their strength and they do it very well. Currently

there is a large amount of 'competitive' marketing, advertising, sponsoring and target seeking in many phases of the telecommunications industry and these efforts are in an enclosed market, meaning that a law of diminishing returns comes into place and directly forces the prices of calls and other services up, not down.

Sub-Government Enterprises excel in excellent engineering planing, long-term engineering project management, life cycle management and high maintenance standards. These roles far outweigh a sales drive, a sponsorship deal, and a Government term and in many cases a human lifetime. Currently much of the engineering planning is outsourced to businesses that work on fragmented parts of a network, national engineering coordination has been lost, and to a large degree much of the maintenance work has been outsourced to satisfy an ill directed accountants' dream that it looks much better on the books that way.

## National Restructuring

Australia's telecommunication infrastructure is currently fragmented into a few large corporations and a flotilla of small businesses. The whole telecommunications industry needs to be restructured in Australia, so that there will be a strong competitive sales arena, but that arena must not be involved in the engineering and everyday running of the network infrastructure. The infrastructure must not be placed in a competitive mode, but in a collaborative mode, and that is a major turn-around from the current strategies.

I am not aware of any national Australian body that coordinates the installation, use and life cycle of all major telecommunications equipment, as this part of the industry is in a competitive mode and therefore multiple duplicated. The lack of this active body also effectively pushes up call costs, as equipment and network duplication are not being avoided. This body should be a Sub-Government enterprise, and in that, making a profit or loss is not the issue, rather that the equipment is wisely engineered and well maintenanced.

The compromise proposed is that:

- All existing and new customers access networks, and telecommunications infrastructures have the option to become the property of an Australian Commission.
- This Commission would manage the national network's growth, development, maintenance and structure, and provide these services to all retail Telecommunications Service Providers (TSPs) at a wholesale level.
- With this managed by one non-competitive body, the business efficiencies will be much higher than for a competitive situation.
- The Retail Telecommunications Service Providers would package the wholesale services as retail services to their customers, depending on the contracts negotiated at the wholesale level.
- Major Federal and State Governments would form their own wholesale reselling service supply arrangements. Their C&IT departments would manage their communications at the wholesale level, and have full security of their networks.
- Major businesses would form their own wholesale and retail service supply arrangements. This way they would not have to go through a third party to have their services provided at a wholesale level.
- Retail reselling should be through ASX based companies to the general public and businesses
- Government reselling should be through focussed State and Federal Government Departments to their associated Offices, Councils etc.

Initially this body would restructure the total network to utilise all existing equipment in a collaborative manner instead of a competitive manner, and the savings for the Federal Government by doing this should be in the order of $5 Bln per year, possibly much more.

Competition needs to be in place for several reasons, and the first one is political. Australian world trade will be seriously impacted if the telecommunications industry in Australia was to be nationalised. It is sales and marketing that is the competitive area, so it should be that retail (or reselling) area that needs to the cauldron of competition.

In light of the immense costs for installing a new infrastructure in Australia, we have to avoid the serious failures of the simplistic competitive models used in the past and negotiate an economic model that provides the services to everyone that needs them at a very low cost, includes competition for service packages, and eliminates the unnecessary multiple duplication of services that happened with our telephony, CATV, ISPs and mobile networks.

## Future Direction

The extremely expensive experiences in having both CATV and mobile phone networks installed, operated and managed under a competitive environment has very clearly shown that competitive management of infrastructure is a worst-case financial scenario for Australia, and it does nothing to drive down operating costs. The lessons of bad national economics through having competition in essential infrastructure have been taught, but have gone unheeded.

The only way to secure a well engineered Broadband Customer Access Network that uses consistent and low maintenance infrastructure for all Australia, is to create this infrastructure through a Federally backed Commission, and engineer, manage and maintain this infrastructure as that, and not as a commercial entity.

With this Commission in place, it would then be in the right place to selectively purchase existing telecommunications network infrastructures and through that the cost-effective approach of managing and developing the whole Australian telecommunications network in a non-competitive environment can then again be realised, with very significant savings to our currently out of control Balance of Payments debits.

It is imperative that this Federally backed Commission be engineering based to team specify and manage to programme a range of projects to create a nationally coordinated Passive Optical Fibre Customer Access Network (PON) for transporting Broadband to all Australian households as a matter of urgency, and provide the telecommunications infrastructure at a wholesale level including ongoing maintenance.

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## *Glossary*

| | |
|---|---|
| 100BaseT | 100 Mbit/s based on twisted pair wires |
| 3U | 3 * 44.45 mm = 133.35 mm |
| ADSL | Asymmetrical Digital Subscribers Line |
| AGIMO | Australian Government Information Management Office |
| AMPS | Advanced Mobile Phone System |
| ASX | Australian Stock Exchange |
| ATM | Asynchronous Transfer Mode |
| B | 64 kbit/s channel |
| BOP | Balance of Payments |
| BRI | Basic Rate Interface |
| C&IT | Communications and IT |
| CAN | Customer Access Network |
| CATV | Community Access Television |
| CBD | Central Business District |
| CCS7 | Common Channel Signalling Number 7 |
| CDMA | Code Division Multiplex Assignment |
| CEO | Chief Executive Officer |
| COT | Casualties of Telstra |
| CPE | Customer Premises Equipment |
| CWDM | Coarse Wavelength Division Multiplexing |
| D | 16 kbit/s channel |
| DRCS | Digital Radio Concentrator Systems |
| DWDM | Dense Wavelength Division Multiplexing |
| E1 | 32 time slots at 2.048 Mbit/s |
| FDM | Frequency Division Multiplex |
| FFT | Fast Fourier Transform |
| FTTH | Fibre to the Home |
| FTTP | Fibre to the Premises |
| G3 | Third Generation Mobile Phones |
| G4 | Fourth Generation Mobile Phones |
| GDP | Gross Domestic Product |
| GSM | Groupe Spéciale Mobile |
| HFC | Hybrid Fibre Coax |
| IEN | Inter-Exchange Network |
| IPN | Internet Protocol Network |
| ISDN | Integrated Digital Service Network |
| ISP | Internet Service Provider |
| IT | Information Technology |
| ITU-T | International Telecommunications Union - Telecommunications |
| LAN | Local Area Network |
| LAP-D | Local Area Protocol – Digital |
| NIU | Network Interface Unit |
| NOIE | National Office of the Information Economy |
| NTC | National Telecommunications Commission |
| PABX | Private Automatic Branch Exchanges |
| PCN | Premises Customer Network |
| PDH | Plesiochronous Digital Hierarchy |
| PGS | Pair Gain System |
| PON | Passive Optical Network |
| PRI | Primary Rate Interface |
| QAM | Quadrature Amplitude Modulation |
| RCM | Remote Combinational Multiplexer |
| RIM | Remote Integrated Multiplexer |
| SDH | Synchronous Digital Hierarchy |
| SHF | Super High Frequency |
| SPN | Service Provision Network |
| TCP/IP | Transmission Control Protocol (through to the) Internet Protocol (suite) |
| TDM | Time Division Multiplex |
| TSP | Telecommunications Service Provider |
| TV | Television |
| UMTS | Universal Mobile Telephony System |
| USA | United States of America |
| VOIP | Voice in Internet Protocol |
| WiFi | Wireless Local Area Network |

# Appendix B

## Steering Australia's Telecommunications Future

*Malcolm Moore BE(Elect)*

Abstract: In the last 40 years most people behind telecommunications restructuring have done so with a hidden agenda of international corporate greed, not an Australian community need, resulting in clumsy structures that have major internal conflicting issues, inherently preventing technology advances and/or good competitive practices.

This paper recommends a dramatic shift from the previous 'all or nothing' approaches and splits Telstra into two bodies; infrastructure/wholesale and reseller/retail, paving the way for a Federal Government Commission to efficiently manage the infrastructure area and the floated Telstra/Bigpond to operate as a competitive reseller/retailer. This approach removes most internal conflicts and the ensuing larger 'economies of scale' paves the way for other carriers to also reposition their inefficient competitive infrastructures into a fully cooperative infrastructure networks, also freeing these carriers to reposition themselves and be fully competitive in the reseller/retail market, not tied by infrastructure constraints.

With consolidation of the telecommunications infrastructure, timely technology advances like PON FTTP for the CAN to introduce FSN including proper Broadband Internet and CATV to all Australian residences, become highly probable in the very near future. Multi-duplicated urban Mobile Base Station access networks could be rationalised and their footprints substantially improved. Existing CATV access infrastructures could also be removed and replaced by PON in an ongoing engineering based capital works program that is not hindered by competing carrier infrastructures and their internal marketing/reselling conflicts.

The win-win argument here liberates the reselling/retail areas from infrastructure so they can proactively market products in a virtually even competitive terrain. Meanwhile the economies of scale created by the unfractured and cooperative infrastructure drives down wholesale prices, without continuing to compromise on engineering standards.

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# Steering Australia's Telecommunications Future

## *Current Status*

Australia has a very awkward telecommunications industrial current strategy in place, and this has gradually happened through a series of structural changes implemented through a succession of Federal Governments by law changes over the last 30 or so years. Very powerful multi-national business corporations are the driving forces and have agendas not in common with the Australian Governments, the Australian people, and/or Australian businesses at large. These multi-national business corporations are the instigators of these initiatives for structural changes for their own purposes. [1]

Telstra is the only full national telecommunications network, apparently half owned by the Government, and the other half apparently owned by the Australian public, and foreign investors. Optus is now foreign controlled, with substantial major urban network infrastructures. Australia now also has a range of alternate carriers of Australian and/or foreign ownership, all vying for a piece of the financial action in Australian telecommunications. To further complicate the issue, there are also service resellers having no network infrastructure, for example Crazy Johns; a range of State Government bodies with their own network infrastructures, for example Queensland Rail; some large corporations with their own network infrastructures, for example News Corp; and a base of Federal Government bureaucracies for example the Australian Government Department of Communications, Information Technology and the Arts to interface a wide range of Government, business and customer issues.

It takes some considerable experience and in-house knowledge to get a clear picture of all the stakeholders and their values. Even with this wisdom, the approaches to resolve structural simplifications so that the industry will not have bodies with internal conflicts of interests, be in the main part Australian owned, service all areas with equitable Broadband services, be fully competitive and highly responsive to all customer requirements is difficult, but not an impossible call. This brief identifies many of the main stakeholders and in that it identifies where and what the industrial problems are and how they can be avoided in the future.

Multi-national forces to introduce competition have inevitably resulted in foreign ownership of a sizable proportion of the Federal Australian Government's telecommunications infrastructure. This is exactly what the multi-national corporations intent was and still is. As various parts of the telecommunications infrastructure are 'opened to competition' they naturally become prize isolated acquisition targets and are swallowed up with the inevitable result that entire infrastructure revenues will be offshore owned, and permanently bleeding the Australian balance of payments (BOP), unless competition is politically removed from the engineering management of Australian telecommunications infrastructures.

### Internal Conflicts of Interests

Most Australian based major telecommunications based bodies have several internal conflicts of interests, and these heavily impede the industry as a whole to be highly responsive to customer requirements, as providing a new service of one special type will inevitably impinge on another product or service also being marketed by that same entity. The obvious solution for these bodies to be conservative and keep the status quo and through that smokescreen, suppress their internal conflicts of interests from being exposed.

On a worldwide basis, the telecommunications infrastructure is going through a dramatic change where the copper wire based customer access network (CAN) that has really not changed much in the last 150 or so years, is quickly being replaced by optical fibre to the

premises (FTTP) [2] as the choice bearer for future Broadband services as part of the full services access network (FSAN) [3]. Over the past decade several engineering structures have been trialled with the result that passive optical network (PON) technology is the proven cost-effective structure of choice.

Australian telecommunications infrastructure providers have conservatively avoided PON as they have already introduced the far less effective and much slower Asymmetric (directional data) Speed Digital Line (ADSL) technology running on existing copper pair CAN. With the immediate needs of Broadband customers requiring higher speeds and symmetrical data rates, ADSL technology barely fits into the lowest Broadband rung in the ladder of needs.

According to Mr Paul Budde at the Telecommunications Society Australia lecture in Sydney on 29-Oct-2004, the current minimum worldwide standard for Broadband is 1 Mbit/sec and the typical standard for ADSL in Australia is 0.256 Mbit/sec. This technology situation in Australia is clearly far from satisfactory, as in the next decade this minimum required access speed would move towards 10 Mbit/sec and stabilise there.

To compound the issue, ADSL is limited in its service footprints because of line length limitations keeping it generally less than 3.5 km from the Digital Service Line Access Module (DSLAM). Also, in complying with competitive forces to minimise costs through introducing Remote Integrated Multiplexer (RIM) this technology is incompatible with ADSL resulting in about 20% of current urban customer unable to have ADSL in any case [4]. The unfortunate option for the remaining customers in urban, rural and remote locations currently is to use satellite /analogue phone line as another poor solution for Broadband access.

## Government Bodies

More recently several alternate operators have been introducing another band-aid solution of local radio "Broadband" Internet, sponsored through another sub-Government body culminating from the Higher Bandwidth Incentive Scheme (HBIS), the Coordinated Communications Infrastructure Fund (CCIF), and the Demand Aggregation Broker Program (DABP) – all of which I feel have their place as a consolidated infrastructure, and not piece-meal partial solutions as they are now.

There have been several other earlier Government based attempts to identify and act on customer initiated telecommunications infrastructure requirements, including the Networking the Nation (NTN) 'initiative', which ultimately lead to a large number of people without telco engineering knowledge working in isolated committees to produce a huge number of business cases related to small telecommunications projects. These business cases were then sorted by another committee and then had to be coordinated into an overall engineering program that was ultimately in the mainstream managed by Telstra to engineer and implement as their Telstra engineers would have done without this serial of committee interventions.

In my professional opinion and experience, the enormous time and effort put in by the public in general may well have 'appeased the Indians' but because the public in general, lack the necessary engineering telecommunications wisdom and expertise, this would have resulted in at least a triplication of workload compared to leaving an infrastructure based body such as Telstra's Network Construction and Design (NDC) to do what they do best, and that is to install and commission telecommunications networks under a well organised and structured capital works engineering programme.

These projects would also have upset years of forward planning and diverted many engineers from their normal work of identifying forward network growth and implementing appropriate engineering specifications to be programmed into an ongoing telecommunications capital

works program. Instead, these same engineers would then have to interpret the content of these business cases and formally reply on how the planned capital works programme would be meeting these prioritised cases, and if not, then seek to change the programmed works to partially suit these requests, and respond on those lines.

Most State Governments have initiated business based telecommunications projects to introduce Internet and computer/office based services into selected country towns with the intent that these businesses will run along the same profit lines as CBD based businesses. An example is the New South Wales base Community Technology Centres (CTC). The flaw in this project is that the requirement is community based and not business based, and his raises a whole spectre of money poorly invested into Local Government Areas (LGAs) for geographically isolated community facilities. These facilities would be far more synergetic through co-locating community facilities in the same concept as a shopping mall – in other words as a community mall, and not separately housed facilities. That is separate issue.

Again, most State Governments have substantial internal telecommunications and information technology (C&IT) networks in their infrastructures, separate to (and therefore effectively financially opposing) the efficiencies of the national telecommunications infrastructure network. These C&IT networks inevitably interface and utilise major telecommunications infrastructure providers at several points.

One example is the Queensland Railroads Commission that has a substantial optical fibre telecommunications network because of extensive high voltage alternating current (AC) electrification of their immense rail network. This is a leading technology rail network in Australia and the electromagnetic interference (EMI) caused by this mode of high voltage AC powering would have made copper based transmission bearers alongside rail lines unworkable. No doubt Telstra and other telco infrastructure providers/resellers also have fibre optic networks base in Queensland too, and these networks could be collectively much cheaper to finance with the existing fibre being shared between entities and through that being much fuller utilised. This is economic rationale, not competitive stupidity.

Most large businesses have substantial communications and information technology (C&IT) based networks that in the main connect to, and through, the major telecommunications infrastructure providers, usually at more than one point. The comparative wholesale usage costs of the Australian telco infrastructure should be a large fraction of the operating costs of networks used for large businesses, as this is simply an economy of scale issue. Large businesses would have their own wholesale user requirements, making them effective purchasers of telco wholesale services, not retail level. In this situation these businesses would have to include within their C&IT structure, the complete reseller function to handle their (internal) client service and fault handling, metering and payments and engineering forecasting.

## Customer Interface Bodies

There are several Government bodies that interface customer concerns from a statutory point of view. Most of these bodies grew from the need to report on the status of the telco industry from an independent and unbiased position and as such these bodies are funded by Government revenue. Unless a vigilant check is / audit is held on these bodies, they have the opportunity to grow well beyond their 'use by' date and/or find new but useless work to do to keep in existence, and/or overlap in work reporting and functionality boundaries.

### *Australian Telecommunications Authority (AUSTEL & ACA)*

AUSTEL (Australian Telecommunications Authority) was created in about 1988, primarily out of Telstra's HQ Regulatory Branch, and became the independent regulatory authority,

voiding Telstra from a strong conflict of interest in setting safety standards for and licensing alternative brands of customer equipment. In about 1990 its role was expanded to promote competition, report on the quality of service of all carriers. At about this time the name was changed to the Australian Communications Authority (ACA), and it took on national numbering management that was till then done by Telstra.

### *Spectrum Management Authority (SMA)*

The Spectrum Management Authority (SMA) was created largely out of Telstra's HQ Radio Branch to independently manage the electromagnetic spectrum used for unbounded media (radio) communications. The auctioning of various mobile radio spectrums in distributed geographic areas was a major financial bonanza for this authority and it crippled mobile telco competition, significantly drove up mobile call costs and forced incumbent infrastructure providers to reconsider extended geographic network coverage because of the immense spectrum licensing costs. In about June 1997 the SMA was merged into the ACA, as these functions were then effectively concurrent.

### *Australian Competition and Consumer Commission (ACCC)*

According the their Website http://www.accc.gov.au the "*ACCC was formed in 1995 to administer the Trade Practices Act 1974 and the Prices Surveillance Act 1983. The ACCC promotes competition and fair trade in the market place to benefit consumers, business and the community. It also regulates national infrastructure services. Its primary responsibility is to ensure that individuals and businesses comply with the Commonwealth competition, fair-trading and consumer protection laws. The ACCC is the only national agency dealing generally with competition matters and the only agency with responsibility for enforcing the Trade Practices Act and the state/territory application legislation.*

*The Trade Practices Act (TPA) purpose is to enhance the welfare of Australians through the promotion of competition and fair-trading and provision for consumer protection. The TPA deals with almost all aspects of the marketplace: the relationships between suppliers, wholesalers, retailers, competitors and customers. In broad terms the TPA covers unfair market practices, industry codes, mergers and acquisitions of companies, product safety, product labelling, price monitoring, and the regulation of industries such as telecommunications, gas, electricity and airports.*"

Within the TPA, parts XIA and XIB are telecommunications specific, and obviously take up a large percentage of the ACCCs' activities as shown by the ACCC website content included in the above paragraphs. It seems that because telecommunications companies that have substantial infrastructure and a reselling function these company business have an internal conflict of interest and this results in pricing being irregularly 'distorted' in attempts to minimise competitive resellers from undercutting their own reselling operations wherever and whenever possible. By having the telecommunications infrastructure stripped from the resellers and having this infrastructure made commonly available to all resellers, then this action should very substantially reduce the role of the ACCC in this industry, as telecommunications product and service reselling would by from a common and stable infrastructure platform, void from internal business conflicts of interests.

## Non-Government Bodies

### *Australian Consumers Industry Forum (ACIF)*

From its own Website http://www.acif.org.au/home "*ACIF is an industry owned, operated and resourced company established in 1997 by the telecommunications industry to implement and manage communications self-regulation within Australia. Its primary role is to develop and administer technical Standards and Industry Codes and provide Industry Facilitation services that promote both the long-term interests of end-users and the efficiency and international competitiveness of the Australian communications industry.*"

This forum followed on the normal work of Telstra's "Network Performance" Branch and incorporated competing telcos to work in harmony with 'service quality' specifications previously drawn up from within Telstra. These documents set the technical standards and industry (fault reporting) codes for all telcos to agree to across the industry. I expect that with the advent of VoIP and Internet new technical standards and industry (fault reporting) codes will be drawn from sources in and beyond Telstra and be applied as industry standards. In my opinion the work done in the ACIF (apart from drawing on people from several sectors of the community) draws a very close parallel to work done in the ACA and in that case it should be part of the ACA if it is not already there.

### *Service Providers Industry Association (SPAN)*

This is an interesting body, which was called the Service Providers Action Network. As I remember, it originated with AUSTEL opening the Australian telecommunications market to a wide range of alternate operators, in about 1996 and this body formed out of the entrepreneurs that stepped in expecting to make a financial killing, based on Telstra's' annual accounting profit disclosures. My opinionated aspect of this organisation then was that very few if any of these people had any conception of the enormity in costs and engineering involved in establishing a network, interfacing it, managing it, and developing future products and services, beyond what was existing.

The Website address for SPAN is http://www.span.net.au/ and the following is directly quoted the below *italic* paragraphs:

"***Mission Statement***

- *To foster open, effective and ethical competition in Australian telecommunications markets.*
- *To ensure all service providers obtain access to networks and facilities in a manner suitable for the provision of sustainable competition in services to end users.*
- *To ensure that members are committed to delivering the highest standards in customer service, innovative products and services and prices, which represent excellent value.*

***Objectives***

- *Provide an effective forum for all industry participants, including access providers and access seekers, to work co-operatively together to develop the overall market to their mutual benefit.*
- *Contribute constructively to the ongoing development of industry and regulatory policy; particularly through representation of members on self-regulatory industry bodies.*
- *Promote the highest standards of business ethics and behaviour.*
- *Provide information and other services valued by the membership."*

The Mission Statement and Objectives are interesting to me because it seems that this group as come a long way in the learning curve from its inception, and yet these statements thinly veil self-regulatory problems with ethical business behaviour issues, and this smacks of conflict of issue problems impinging on resellers. This body has a long way to go on its learning curve. The terms "mutual benefit" and "self-regulatory" are in contradictory.

A classic example in the early 1990s, the development of CCS7 to transfer a customer full national number (FNN) to a database and through that, the customer could then be 'Gateway' switched through to their carrier of choice. It took several years of innovation; network development and implementation to further grow the CCS7 signalling protocol so that customer numbers could be first group related and then transported between network infrastructure carriers. This then lead to full number portability where in particular – mobile phone numbers (originally grouped by network infrastructure owners/carriers) could then be individually moved between carriers – at a cost to the customer, so that the customer could then have the infrastructure carrier of choice.

SPAN jumped on this bandwagon and rattled the sabre (to remove customers from Telstra) but SPAN members (basically other than Optus) didn't have the infrastructure in place to handle mobile customers, and didn't understand that this was a developing technology that had not matured, and Telstra was not in a hurry to mature this technology as their mobile market share would be under serious threat.

The conflict of interest in Telstra was painfully obvious and the technology 'matured' as Internet became to the fore. I have no doubt that the SPAN raised the profile of mobile full number portability, but in so doing, they openly demonstrated to me their collective amateur and superficial knowledge of telecommunications infrastructure and this industry as a whole. (A little knowledge is dangerous!)

### *Australian Telecommunications User Group (ATUG)*

This is another interesting body that seems to have its agenda fully occupied with disputing the spirit of the law in order to release the hold that Telstra has on the competitiveness of the telco market in Australia. It is worth reading the Vision/Mission/Strategic direction as provided directly from the ATUG Website www.atug.com.au , so it is here in *italics* below:

***"ATUG's Vision***
*All Australian telecommunications users should have competitively priced, innovative, quality services benchmarked at world's best practice, as measured by the OECD.*

***Competition***
*ATUG supports strong competition between telecommunications service providers. Regulation, policies and funding programs should be designed to foster innovation and deliver pro-competitive outcomes for end users.*

***Innovation***
*ATUG encourages the development and deployment of new technology and services as a way of fostering competition e.g., IP based services, WiMAX, WiFi. Policy, standards and regulation should assist the deployment of such services, eg, USO contributions should be directed to an industry infrastructure fund.*

***Access***
*Any to any connectivity is critical to effective competition and, consequently, to end users. Access to competitors' networks should be provided on cost-based and non-discriminatory price and non-price, terms and conditions.*

***Anti-competitive behaviour***
*Market power should not be allowed to stifle competition. Regulatory authorities should try to prevent abuses of market power by using information gathering and reporting powers to keep markets informed. Where necessary, regulatory authorities should have the powers and resources to respond quickly to instances of abuse of market power.*

***Broadband connectivity***
*All Australian users should have broadband access at speeds of 2Mbps or more. To maintain competitiveness, Australian users should have broadband availability, speed, data download and prices at world's best practice. Government policy and funding programs should foster innovation and deliver pro-competitive outcomes for end-users.*

***Mobiles***
*Mobile termination rates (domestic and international) are too high and should be reduced by regulatory intervention, including by international co-operation between regulators. Mandated price reductions must be passed through to end-users using regulatory tools if necessary.*
*National roaming between networks should be automatically mandated where network expansion has been supported by Government funds. If commercial negotiations on national roaming are not concluded by June 2005, regulation should be introduced to require roaming.*

***Informed Choice***
*Suppliers should not be able to unilaterally change the prices, terms and conditions of customised or fixed-term contracts within the life of a contract. Customised contracts should be exempt from Part 23 of the Telecommunications Act.*

***Regional Communications***
*Users of communications services in regional Australia should have access to the same range of services, at the same prices and same levels of service as metropolitan users.*

***International***
*ATUG supports international regulatory and trade cooperation in the telecommunications sector. ATUG supports international agreements on any-to-any connectivity, cost based access pricing and transparent regulation for telecommunications services. Such agreements should apply to all connectivity platforms,*

*including IP-based and 3G networks. Co-operation between regulators should be increased, given increased supplier and user activity across borders."*

This 'users wish list' is interesting in that it states what ATUG wants but not how to do it, what for, who would benefit and who would lose. Just like SPAN, ATUG is a self-interest group, and my guess is that both groups have a rather common membership – but two voices!

This group is very active in that it does hold seminars and shows involving many manufacturers and service providers, so it has what appears to be considerable power, but their fight is totally frustrated because Telstra (and now Optus and a few others) are internally bound to provide infrastructure, wholesale and retail services, and these businesses, in their present forms, having these self-conflicting products cannot move to suit the needs of ATUG.

## *Understanding the Problem*

It should be clear that the problem needing to be understood is that when the Federal Governments of the days have instituted stages of 'full competition' they did so with blind innocence compared to the multi-national businesses that had more than a century of experience in undermining Governments on a grand scale. Reference 1 provides a very detailed litany of how deceitful and underhanded these multi-national businesses are and just how far these businesses will go to destabilise countries so that they can effectively steal infrastructures on a worldwide scale. For the last decade, Australia has been on the brink of having its telecommunications infrastructure stolen by multi-national corporations.

As stated before the fallacy is in believing that Government Business Enterprises (GBEs) are inherently inefficient, when in fact it has been several times proven that GBEs are far more efficient than private enterprises – especially when it comes to managing infrastructure. Again, Reference 1, details this situation with prominent examples.

Competition has its place in reselling, and that is where it flourishes. Competition has no place at all in infrastructure, as infrastructures are effectively ongoing engineering works programmes, and that is the subtle difference. Infrastructures provide the foundations for a stable and efficient economy, and in this position, infrastructures are in effect wholesale services and not a retail commodities.

If an infrastructure has a reselling / retailing sales and marketing body attached to it, then it has a natural conflict of interest, and that is where the problem lies. The examples below spell the pictures:

Telstra is the major telecommunications infrastructure provider and it is a major retailer, and reseller, and content provider through Foxtel. Optus is that it is also an infrastructure provider (major businesses only), and reseller and content provider – again through Foxtel. The alternate carriers are minor infrastructure providers and retailers. These self-conflicting businesses arms

To correct these problems a major rethink of all these bodies needs to be undertaken and the whole industry needs to be restructured so that existing bodies no longer have conflicting business interests, which are stifling the development of telecommunications in Australia.

## *Proposed Solution*

### Containing Competition

The supposition that competition drives down costs is false and therefore is the core of the problem. Competition has been the calling card from multi-national corporations for several decades, as this calling card splinters infrastructure bodies that are themselves usually highly efficient but also usually lack the marketing arm to effectively interface their services to their clients/customers. A splintered infrastructure body is very easy prey for a multi-national to discredit, further isolate and acquire – in the name of competition.

It has been proven to be true that initial competitive approaches do reduce costs, but the longer-term consequences of competition have strangely been neglected in economics texts and university courses. What really happens is an ordered approach where community good infrastructure is replaced by bottom-line accounting, then consultants are commissioned to direct restructuring, lawyers/solicitors and accountants replace the existing engineering based management with a then much higher performance pay basis, the Government (public) owned infrastructure is then refinanced by investment houses / shareholders, sponsoring and advertising direct funds from the lost infrastructure are directed to covertly support this business, via political intervention from this business. Reference [1] details this.

What was running effectively and costing a moderate amount to the general public initially became cheaper with the first round of competition but from then, the consumer costs will continue to rise significantly, well above that of the previous infrastructure rates, and the quality of service significantly drops as short-term overhead costs are minimised, engineering planning is minimised and reactive maintenance is replaced by preventative maintenance.

### Owning Infrastructures

Competition has no place in infrastructure. The Australian Federal Government needs to be charged to manage the wholesale infrastructure of Australia – if it is not already. In that light, wholesale telecommunications, just like road, rail, electricity, land management and water are all wholesale infrastructure components for business and public to use as a service. These infrastructures are the foundations for a solid and ongoing strong national economy.

Telecommunications as an infrastructure is a wholesale provision, (not a retail service, regulatory body, advisory service or content provider) and that is the key solution to this very awkward strategic position that the Federal Government, Telstra, Optus, and a plethora of alternate operators and service providers are currently in.

To get out of this awkward strategic situation, several structural splits have to take place so that all self-conflicting bodies are initially separated. The immediate and present danger is that these now freshly split entities will be extremely vulnerable to take-over / consolidation by businesses that are not Australian based, and that must be avoided. Simultaneously it will be these freshly split entities that would be the ongoing primary buyers of these wholesale telecommunications supplies, and contractual clauses need to be in place to ensure continuity of business with the new wholesale telecommunications provider.

A national telecommunications infrastructure provider has sole focus on providing a high performance telecommunications infrastructure for now and the future, is not hampered by shareholder payouts, advertising, or sponsoring. It is self funded from the wholesale usage that is paid through resellers, and through that alone it is committed to perform.

This approach in no way cripples any organisation from having and/or operating their own communications and IT network. It does however set the benchmark for wholesale pricing in that because of economies of scale, the comparative user wholesale costs of the national telecommunications infrastructure should be significantly lower than any privately owned network. Dr Peter Gerrand [5] sees a very similar picture in that the fixed network "NetCo" should be the wholesale arm and "ServeCo" as the services arm, and this split would put the infrastructure in the Government / Commission control, and the Services (reselling) area into private (shareholder) ownership.

## Creating Competitive Resellers

Since 1975, Australia has come a long way in telecommunications, and it now has several corporate and smaller business bodies reselling telecommunications to the retail (Business, Commercial, Consumer, Country) and Government Department (Federal, State And Local) markets.

The range of products has dramatically increased well past the standard telephone/line rental and/or Sylvester (manual cord) switchboard that were literally the complete sales range of products in about 1975. Because the range of products are now so wide it is rare to find resellers that have the capability to provide all products, and so product reselling specialisation has further increased the number of retail resellers.

Through introducing the digitally based telephony network switching in 1980, this massive engineering works heralded a wide range of new switch-based products that was fostered by common channel signalling No. 7 (SS7 or SSC7) as it totally replaced the far more primitive channel associated signalling (CAS) used with the earlier analogue / mechanically switched inter-exchange network (IEN). It was not until 1994 that all Telstra's IEN was fully was fully digital that this wide range of switch-based products would then have a direct impact in consumer and commercial markets. Newer technologies for the consumer market have introduced fax, mobiles, CATV and Internet. Similarly newer technologies for the business/Government market include all those in the Consumer market and telex/tress, PABX, data, Call Centres, and Broadband Internet. Currently both Telstra and Optus are in another stage of massive network engineering programme where that are restructuring their inter-exchange networks to become IP protocol based, replacing the previously held connection approach for telephony with the highly cost effective voice over IP (VoIP) protocol. With the development of more innovations, technology will grow and be changed to match these needs and resellers are the first to hear about it from their client bases.

By having all resellers isolated from providing infrastructure, the resellers then have no internal conflict of interests between the equipment that they have in service, and the products and services that they can resell to the general public, businesses and Government bodies, and the infrastructures that they would be providing the services on. Further it gives the resellers the agility to focus in on their customer exacting requirements and matching these requirements with the existing and future infrastructures.

By having the resellers between the customers and the infrastructure providers, the resellers can then interpret customer demands and relay these in engineering terms that the telco infrastructure provider can recognise and provide. The telco infrastructure provider can reflect this back to the resellers as wholesale usage costs and a realistic implementation schedule managed by a now dynamic engineering works programme. This puts the onus onto the resellers to focus on their customers' requirements and their wholesale network product requirements. It also isolates the telco infrastructure provider from conflicting products and services, and frees the telco infrastructure provider to introduce newer technologies far quicker than the current approach.

## Infrastructure Consolidation

By removing the infrastructure component from resellers, this will leave several infrastructure bodies to be amalgamated as a the wholesale telecommunications commission, and this body will then provide telecommunications services with common wholesale methods and rates to commercial service resellers and other government departments. As said before, there is no place for competition in an infrastructure. Informal consolidation is already taking place with Telstra hiring the 3 Access network from Hutchison, Optus hiring some of the Telstra access network and Telstra and Optus sharing their main network transmission grids. Conflict in rival sales competition is also killing these initiatives.

Currently, Telstra is apparently about 50% Government owned placing it in an ideal position so that the nominal 50% that is privately owned is to become the customer interface, sales and marketing Telstra/Bigpond with all its staff. This is a very logical split and it places the new Telstra/Bigpond in a commanding position with a very large client base providing a large ongoing cash flow, so the share price should not be negatively affected. Further as there would now be no conflict of interest in what services to be provided because of existing infrastructure situations, this reselling body can then be fully competitive.

The remaining nominal 50% that is Government owned becomes the base for the new Australian Telecommunications Infrastructure Commission (ATIC) along with the associated staff. This infrastructure is essentially managed as an ongoing engineering capital works program with a very large engineering network to be maintained and developed/grown. The directions for growth would then come from the resellers, engineering forecasts, and lifecycle management of the existing equipment.

Unfortunately with Telstra/Bigpond the infrastructure component is more like 70% and the retail/reselling component is more like 30% meaning that a 20% Government share buyback would align the infrastructure with 70% Government owned shares and the Telstra reselling/retailing component with 30% open market shares – making a the division between the two areas a bloodless issue.

Because of economies of scale, the ongoing operating costs of this (inter-) national network would inherently be very low, making it uneconomical to run telecommunication networks in competition. This would induce other telecommunications bodies to sell their networks to the ATIC, and become truly competitive telecommunications service resellers – without their own internal marketing restrictions.

Bodies that have their telecommunications infrastructure consolidated could alternatively be paid in kind and these funds used to cover the wholesale costs of network infrastructure usage for a specified period, based on the capital value of the consolidated network and the agreed payments for client usage of the network services. Alternatively the funds could be there to offset the agreed payments for client usage of network services providing these resellers with a financial advantage including a sunset clause to level the competition after several years.

There is no conflict of interest with an Australian wholesale Telecommunications Infrastructure Commission providing wholesale telecommunications services, to resellers, and the national savings should amount to well in excess of $ 7 Billion per year, through the removal of duplicated and unnecessary networks, a massive reduction in unnecessary advertising and sponsoring and a solid future focus on building a proper broadband access network based on passive optical fibre network (PON) to all Australian homes.

### Maintenance Processes

The infrastructure provider is responsible for the service levels of the infrastructure and therefore all maintenance is to be managed by the national telecommunications infrastructure provider. In this light, a wholesale service level agreement (SLA) is to be struck between the national telecommunications infrastructure provider and each reseller, and each customer also sets up personal service level agreements with the resellers of their choice.

The wholesale SLA would be based on the combined number of client SLAs and the service levels that each reseller managed.

The fault management process would have a slight change from the current setup as the reseller would log the fault and manage the client, while the national telecommunications infrastructure provider would assign the workforce and equipment and report back to the reseller. This slight change is in accordance with standard practices of engineering management and customer ownership remains with the reseller not the infrastructure provider.

### Billing and Data Processes

This process is actually simplified as a unified billing process would distribute the appropriate wholesale Telephony, Data, Video, Internet, and Other Services to each reseller who would then de-aggregate the wholesale bills, add their percentage charges and bill their customers according to the service plans. The change in process is rather small from present, but it provides an excellent method for selected wholesale data to be used by third parties like Federal Police/ASIO and other criminal/fraud investigation bodies, Sensis/White Pages and other public information bodies, to quickly access customer details at the appropriate security levels and not be in conflict with any reseller as this data is sourced directly from the national telecommunications infrastructure provider as a wholesale service.

### Service Standards

Virtually nothing changes! The ACA is the body that the national telecommunications infrastructure provider and all resellers report to.

### Complaints Handling

Virtually nothing changes! In all cases customer requests are initially managed through the resellers customer interface for initial resolution and if not resolved then escalated to and managed by the national telecommunications infrastructure provider. Only then if the situation cannot be resolved it is then to be passed on to the Telecommunications Industry Ombudsman (TIO). The TIO is the body that the national telecommunications infrastructure provider and all resellers report to in cases that cannot be resolved. 'Ministerials' (customer complaints channelled through Ministers instead of the normal process) would continue to be sent to the infrastructure provider for direction and resolution.

## *Historical Background*

Historically, the incumbent Post Master General's Department (PMG) was initially split into several entities at about 1975 and one of these was Telecom Australia, which after several years later merged with the then Overseas Telecommunications Commission (OTC), then later changed to become Telstra. As Telstra had split from the PMG's Department, it also lost its customer interface in the Post Office, and it took several years for those then managing State offices to realise that the 'Telecom' customer interface was then severely deficient, as the technical staff informally did this role for decades. Also at that time, the range of products was very limited – primarily because of the limitations in available telecommunications technologies in that period were comparatively basic and requests beyond a standard telephone service for home/business or a Sylvester Switchboard for businesses were rare. Private Automatic Branch Exchanges (PABXs) were in their infancy, the Public Switched Telephone Network (PSTN) was phasing out the manually connected

Transit Switched Network and it was not till about 1990 till the PSTN digital switched network was far more digital than analogue. In the early 1980's the Dedicated Data Network (DDN) became the forerunner of virtual (digital) circuits (about 1990) switched through the Integrate Digital Network (IDN) and this was the forerunner of TCP/IP based Internet about (1998). It does not need much imagination to realise that the range and number of retail based communications bases products mushroomed with developments in digital technologies.

*What is not understood is that the range of wholesale products and services has changed very little, and most people incorrectly view wholesale products as the retail range but much cheaper, and nothing could be further from the truth. Wholesale products are based on a particular connectivity protocol for several thousand virtual end users over a specified time and service level agreement, and bulk billing arrangement. Retail products are based on individual billing arrangements providing a grouped set of connectivity protocols, based on individual usage requirements! That is why competitive reselling is the right place for competition and nowhere else!*

Within innocent and honest attempts to introduce true competition into the Australian telecommunications industry, the then Federal Governments have fostered the development of a complete competitive carrier (Optus) to take on Telstra, drive down call costs, speed up the introductions of new technologies and better address customer service standards. This was soon followed by Government rulings to generally open the telecommunications market to a wide range of alternate carriers to further increase competition for the same above reasons.

The competitive carrier (Optus) was virtually given Australia's then satellite network as an appetiser, along with Government enforced network rulings to ensure that there would be positive cash flow, and beyond the float, competitive community access television (CATV) networks were established in suburban areas of major capital cities only, competitive CBD optical fibre access loops were established in major CBDs only, and competitive GSM mobile network base station networks were established in major capital cities.

With the development of digitally based switching and transmission equipment and the introduction of optical fibre to economically replace coax cable, twisted copper pair and radio links, these technologies becoming effective by about 1990. ***It was not competition that dramatically drove down operating costs! It was these optical and digital technologies that drove the prices down***, primarily because scheduled daily maintenance was eliminated, digitally based equipment failure rates also fell be at least an order of magnitude because they were non-mechanical and far more tolerant than analogue based equipment. Mass produced construction techniques of digitally based equipment also drove down comparative capital expenditures. "The most expensive thing about optical fibre is digging the hole to put it in!"

Telecom/Telstra developed customer shopfronts, substantially boosted its sales and marketing workforce, and substantially dropped its engineering and technical workforce to match its new requirements, and restructured its business plan to provide content on its infrastructure. This was a forced issue as competitive forces had severely crippled the Telstra income stream, and Telstra had to replace old infrastructure with new, and provide new infrastructure for a growing mobile and later Internet market.

Optus now has a very substantial portion of the mobile market and has since inception built a solid second 'golden boomerang' (Brisbane – Sydney – Melbourne transmission link), and Optus was in dire straits with CATV overhead costs. Optus had also gone down the content path to boost its revenue stream. But it had also gone down a financial path with various partners including Cable & Wireless and now Singtel (as an foreign controlling interest). So

the multi-national corporations are finally getting their way in stripping the Australian Government of its assets as this saga continues. ***So there is the ugly proof: the fully competitive model has been proven not to drive down prices (it actually forces prices up) and worse still the infrastructure that once belonged to Australia is now foreign owned.***

There are a large number of Alternate Operators, but in general most of their networks are relatively small and there would be a strong initiative for these operators to move to the reselling/retail market and trade their infrastructures into a common operation.

Since Internet has emerged, another level of Alternate Operators (as Internet Service Providers) have again emerged, and these to a large degree already use common infrastructure, but built their added value software is usually on this existing infrastructure.

## Conclusion

The structural changes to the telecommunications industry, as a whole in Australia will provide for a series of competitive resellers that are focussed on customer products, market pricing, customer needs, and product development. These resellers will have specific target markets and because of that; their wholesale network requirements will be substantially different – depending on their clientele, and be substantially similar – in geographic boundaries.

These resellers inherently aggregate their wholesale requirements, and translate their customer base requirements as wholesale product requirements to the national telecommunications infrastructure provider. As a reseller there is no conflict of interest here, as they will resell any service that their customer wants – irrespective of the infrastructure required to provide it.

The Australian national Telecommunications Infrastructure Commission (ATIC) as a national provider inherently focuses on forward planning and well-programmed engineering to provide timely wholesale-based services to all resellers. There is no conflict of interest here, as there is no reason to delay or otherwise be conservative in providing new services – as the national telecommunications infrastructure provider is disinterested in which reseller wants to sell what service.

The ACA has little reason to change its role other than it will be working to the national telecommunications infrastructure provider and a whole range of Service Providers for service quality standards reports. Being independent very little changes in its role, as it appears to be well positioned for the future. The ACIF should be merged into the ACA.

With Internet there is a host of incestuous technology based products including and not limited to: email, web hosting, mobile small message signalling (SMS), call centres, customer relationship management (CRM) databases, home and office networks both now and on the market. As these technologies converge, translating of portions of signalling protocols will manage messaging between several different communications platforms, and this is really an infrastructure issue that can be far quicker engineered without competing product managers strategically delaying products to better suit the product life cycles.

The push is then for the infrastructure engineering works programme to be guided by the resellers' needs, and forward planing engineers. Both of these entities operate in the future mode and as there is little conflict there – other than the timing for decommissioning older equipment. This approach opens the technology gate to put Australia close to the world forefront of telecommunications and information technologies, instead of our very backward and conservative position.

In our current apparently full competitive mode, we now are heading for a situation of complete infrastructure duplication, and much of it foreign owned. As an Australian I see this approach as untenable as it is not fully competitive, nor is it good for the Australian economy.

The Australian share market and other financial industry entities should welcome this structural change as it provides a fully competitive market in resales of telecommunications and that opens up a wealth of other companies to be further floated on the ASX market. At the same time it does not detract from Telstra/Bigpond nor Optus from continuing to be major players and investment holdings on the market, as they would continue to have considerable cash flow just as any nationally established bank.

With the Telstra structural split, the size of the new Telstra/Bigpond (reseller) will be about half the financial size of the ATIC (infrastructure). To compensate; a Government partial share buyback, wholesale cost offset, share handout in splintered businesses (Foxtel and Sensis etc.) or a combination of all are credible business solutions to stabilise the ongoing and growth of the Telstra/Bigpond share price at and beyond the structural split.

## Present and Future

As the technology of Internet has come to the fore, a wide range of Internet Service Providers (ISP) has risen to the surface and are providing a mix of infrastructure in the form of Website hosting servers, and email servers. Some major ISPs are providing Website hosting services (Website management) and are also resellers for their own infrastructures and they strongly prefer their customers to use ISP services bundled with their infrastructures. Consequent allegiances between major ISPs (with infrastructures tied with them) to not charge for traffic between are seriously compromising free competition.

With the imminent future move in common access bearer medium from twin insulated copper pair wire to optical fibre, Australia could again be opened up to full competition at the access level again as it was for CATV and historically that was a financial and engineering disaster for the Australian economy and its telecommunications infrastructure. At tremendous financial and social /aesthetic expense CATV access was rushed in to most major urban cities, and it resulted in duplications of access in most areas. Because of the dominance of bottom line accounting, engineering corners were again cut resulting in most homes passed that were not street aligned were unable to be connected to CATV without exceptional extra expenses – making it totally uneconomic for an unacceptably high percentage of potential customers.

Passive network Optical Network (PON) is the technology access bearer of choice for the future, as it provides a very Broadband service capability and is not distance limited as copper pair is. The engineering in providing optical Fibre To The Premises (FTTP) is mature, and successful trials have happened worldwide – including Australia. If such an access network is to be rolled out, then it will be in direct conflict with the established copper pair and ADSL technologies currently in service and being resold through Telstra / Optus and other infrastructure providers/resellers. With the introduction of PON FTTP the universal services obligation (USO) millstone will also be dissolved as virtually every residence in Australia can then be connected to optical fibre – providing true broadband without the current metropolitan distance boundaries.

By splitting Telstra/Bigpond from ATIC, this also splits the business conflicts of interests, and provides clear paths for the ATIC to far quicker replace the access network nationally, and for Telstra/Bigpond, Optus and others to resell the new Broadband access networks as they are commissioned and fully utilised. As the ATIC would be driven through engineering future planning and not delayed or limited by existing and self conflicting market products, the rollout of PON/FTTP would be considerably accelerated as would the removal of existing

above and below ground CATV access wiring and access copper cabling. The bottom line accounting driven partial engineering solutions of Remote Integrated Multiplexers (RIMs), and ADSL would be replaced by a fully engineered solution of PON/FTTP as a priority.

Mobile access networks would be aggregated, greatly reducing the number of mobile base stations (antennae arrays) in urban areas and concurrent to that, significantly improving the network coverage and footprint sizes nationally. With the aggregation of existing optical fibre and radio based transmission networks, further savings would be forthcoming through the utilisation of existing 'dark fibre' (unused) optical routes through infrastructure sharing of State based infrastructures, for example; rail and electricity routes. The added expenses of having existing telecommunications exchange buildings internally divided to provide limited access to competitive carriers would be eliminated. Competitive switching networks can then be reconfigured to be cooperative switching networks and these national savings are massive.

### The Issue of Annual Profit

There is an accounting issue here in that the term 'Profit' is commonly understood by the general public to be the money left over after expenses and therefore the term 'Annual Profit' would naturally be the money left over after expenses over an annual/yearly period. For a small business wishing to remain small this concept may well hold true. The inconsistency is that with infrastructure, there really is no such thing as profit, as these funds are already factored into the ongoing engineering capital works programme and therefore the term 'Annual Profit' should be the remainder after the term 'Annual Reinvestment Capital', is taken out, leaving the then remaining term 'Annual Profit' as zero.

With the issue of annual profit reduced to a zero value, this takes away the interest of shareholders in infrastructure to seek a reward in terms of dividends or share growth. In any case, this infrastructure has already been paid for through the public and business paying their Federal taxes, and that is why Australian Government based infrastructure is not a sale item.

This accounting initiative removes all shareholders – other than the Federal Government as a Commission from infrastructure, and positions the shareholders in the competitive business of reselling – where they should be! This then would allow the resellers (Telstra, Optus and others) to work in a non-self-conflicting competitive market from a common wholesale telecommunications infrastructure supply, and honour their shareholders with dividends, as their Annual Reinvestments are much lower to that of the infrastructure side of the industry.

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## Biography

Malcolm Moore is an Electrical Engineer with more than 35 years experience in virtually every facet of telecommunications in Australia. Educated at The Kings School, trained as a Technician with the PMG, qualified as a Senior Technician in both Research and in the Radio Transmission domains, and later specialising line transmission equipment engineering and computing, and gaining a solid understanding of the engineering requirements for radio and TV broadcast and network transmission equipment. Concurrently he qualified in through Technical College with the Electronics and Communications Certificate and supervised/managed several technical engineering teams to develop and manufacture a very wide range of telecommunications monitoring and support equipment.

After qualifying as an Electrical Engineer through part time study at the NSW IT (now UTS), he progressed as an engineer in Telecom Australia, with a wealth of technical background. He gained experience in Switching Engineering through managing the augmentation, installation and commissioning of several switching exchanges, then moved to Forward Network Planning and structured part of the future outer Western Sydney network, and then developed an early PC based program that radically reduced the workload for computer data network modelling.

Later, in Network Planning he structured the initial Melbourne-Sydney optical fibre bearer utilisation plan to replace the ageing coax cable and then advanced to Line Transmission Support as a Senior Engineer, managing several project teams. He was integral in the consolidation of the many transmission equipment maintenance areas into a few per State then one Melbourne based entity. After being headhunted by Network Investigations to resolve customer service quality issues in NSW he involved several areas in HQ and all States, culminating in a national workshop affecting the Quality work practices of all technical staff in Telstra, the conformance of customer and network transmission engineering standards and introducing suitable test equipment to properly commission CAN and customer equipment. This resulted in a reliable platform for customer fax/modem equipment, and paved the way for workable dial-up Internet.

*In heading Service Quality Improvement, (a multi-State based engineering section) he authored two detailed Web manuals specifying all interface settings for transmission and switching equipment to minimise echo and stabilise / optimise service performance. In collaboration with OTC Research, he negotiated major changes to their computer-based, network transmission channel monitoring equipment. His engineering cells were developing cutting edge CCS7 monitoring and analysis techniques. He crossed these two technologies to pinpoint and resolve customer-affected network interfacing problems from live traffic. He then wrote and progressed the Business Case for the CCS7 Network Monitoring System and this became the national proactive fault analysis system for Telstra to capture and resolve intractable switching, transmission and metering/fraud problems.*

In Nortel he gained first hand experience of the New Zealand network through being a team engineer commissioning the South Island SDH/PDH/Video optical fibre loop from Wellington to Christchurch, then on the bid team for the Saturn CATV project in Wellington. As a Project Manager, he led the Ballarat based team that installed and commissioned the first working telephony on CATV network in Australia. As a Bid Manager he was involved in a large number of successful sales and marketing bids for a very wide range of alternate operator equipment requirements covering SDH, ATM, VoIP, Data, Call Centres, Mobile Access Networks, Radio, Optical Fibre, Internet; involving international negotiations with all levels of clientele, accounting, engineering and management.

Currently Malcolm is a Telecommunications Industry and Engineering Consultant, with more recent expertise in Web hosting, programming and network structuring.

# Appendix C

# Broadband Supplementary Paper

*Mr. Malcolm Moore BE*
*02-Dec-2003*

## *Introduction*

This supplementary paper has been written in several parts to follow on from the first paper and to tidy up some unfinished answers that came from being a witness in the Senate Hearing Committee in Sydney 13-Nov-2003.

## *RIM and DSLAM Utilisation*

### RIM: Introduction

A RIM (Remote Integrated Multiplexer) is one of many similar devices that connect via a digital stream to a parent exchange, and provide terminal exchange (local loop access with loop disconnect line signalling) for telephone, fax and analogue (dial-up) modem services.

The network beauty of this type of equipment is that the parent exchange can be several kilometres from the remote RIM and this RIM can look like a local telephone exchange, so the copper loop can be that much shorter.

The engineering beauty of these devices is that the connection into and from the parent exchange is entirely digital, and to all intents and purposes, the RIM looks and behaves exactly like a local (terminal) exchange.

### RIM: CAN – IPN/IEN Demarcation

Electrically, for analogue (dial-up/loop disconnect signalling) service connections, the demarcation between the Inter-Exchange Network (IEN/IPN) and the Customer Access Network (CAN) is at the line interface card, where the digital signal is converted into analogue signal and vice versa. This demarcation rule fits very comfortably with all terminal/local exchanges, and it aligns perfectly with RIM technology. Politically this is not comfortable, as many see the RIM as part of the CAN.

The political problem is that some earlier RIMs did not connect digitally to the parent exchange. These RIMs connected with an exchange part RIM located in another terminal exchange at the line loop interface and then a digital connection to the remote RIM and as such these RIMs (both ends) are in-fact entirely part of the CAN, as the demarcation point is in the local exchange and everything beyond the first analogue/digital conversion out of the IEN/IPN is part of the CAN.

### RIM Utilisation

As described above the vast majority of RIMs provide a very simple way of dramatically shortening the copper local loop and replacing old Crossbar and Step by Step switching equipment with an effectively equivalent digital line card that would be in a local terminal exchange.

In many cases the RIM directly replaced the remote exchange equipment in small exchange huts, and the old switching equipment was never removed – just unpowered.

In newer urban areas, cost advantages could be seen by placing RIMS in cabinets on the streets and running the copper to those street cabinets.

In some situations when number ranges run out at particular exchanges, or for special privacy reasons, it is advantageous to connect RIMs to that exchange from a foreign parent exchange and get the customers connected – even though they do not have the same or similar number range.

## DSLAM Connection

A DSLAM (Digital Subscribers Line Access Multiplexer) is a device that converts a digital Internet (TCP/IP) stream to ADSL protocol – usually this is encapsulated in Point to Point protocol on Ethernet (PPOE), and in some cases it is encapsulated in Point to Point protocol on ATM (PPOA), where ATM stands for Asynchronous Transfer Mode.

Either with Ethernet or ATM, both of these digital streams require a wide bandwidth and that means a large amount of infrastructure to carry the Internet, and in many non-urban areas, there simply is not the infrastructure.

Where cost-effective the (optical) transmission infrastructure already exists can take the Internet load, and DSLAMS are then fitted to those local/terminal exchanges. If this optical transmission infrastructure does not exist then there is no way that DSLAMS can be installed.

In the case of RIMs, this equipment is already in remote locations and usually on limited copper or optical digital transmission connections. It does not matter if the RIM is connected to a parent exchange directly or through a local exchange and extended:

I believe that if the optical transmission infrastructure is not there to support a 155 Mb/s ATM stream, then the DSLAM cannot be installed at the RIM location. I believe that this is the reason that Telstra put a blanket 'no' on services provided through a RIM or similar pair-gain system arrangement.

In some instances where DSLAMS are located in a particular exchange for local exchange use, many of the customers there may well be on pair gain systems as RIMs or like RIMs, and there is no reason that I know of (other than the above paragraph) to explain why these customers should be refused Broadband ADSL facility from the DSLAMs in that local exchange.

## Broadband – ADSL Solution

As I recall, every piece of equipment in every exchange (switch) and every transmission link includes an alphanumeric code that identifies the site (building) where the equipment is located. The exceptions to this rule would be some remote regenerator equipment on some transmission links, and some small CAN pair gain equipment.

The building code consists of a 4-alpha code, where the first three alpha specifies the location / building and the fourth letter indicates the switching or transmission system identity. Some large sites have more than one building code identifier – so some knowledge and experience is necessary. Transmission links have two building code identifiers (one for each end).

The solution here is to geographically locate the remote RIM and see if the first three letters of the second location code assigned to that transmission link also can associate with the remote DSLAM. If there is an association and there are spare ADSL ports, then I believe that these customers should be able to be provided with Broadband (ADSL) service.

ADSL is a very poor stopgap Broadband technology measure.

## *Broadband Development Standards*

The International Telecommunications Union (ITU) has long been established as the global reference point for recommended telecommunications practices. Australia has been and actively follows this body and in general most of Australia's major telecommunications engineering structures follow these recommendations.

The ITU has for some years been active in developing recommendations the field of Optical Fibre to the Home / Premises (FTTH / FTTP) technology. As such the ITU already have a set of well-structured industry (not company) based recommendations that effectively are the standard to manufacture, install, commission and maintenance this technology. These ITU recommendations are also the basis that legislation should be built around, and this process stops legislation that favours a particular business or company, and provides an overall cheaper product as the products for installation and application have a true global market.

## *Top Down Broadband Approach*

### Optical Fibre Standards

The optical fibre cable specifications recommended by the ITU-T are in G.652, G.653 and G.655. In all these case they recommend a Single Mode Optical Fibre (SMOF) operation as it has been proven over decades that this mode has the least loss (attenuation) with distance and the production process is very inexpensive. The recommendations specify the physical dimensions and acceptable testing requirements to make a serviceable transport medium.

### CAN Transmission Standards

ITU-T recommendation G.983.3 specifies a download rate of 622 MB/s and an upload speed of 155 MB/s, together with an 880 MHz download band for Community Access Television (CATV).

ITU-T recommendation G.983.4 specifies a download rate of 1.24 GB/s and an upload speed of 622 MB/s, together with an 880 MHz download band for Community Access Television (CATV).

While both of these recommendations sound as though the data rates seem to be very excessive, it is important to look at the proposed access network structure, because this optical structure is radically different than as for copper pairs that were ideal for telephony or coax distributions that was somewhat effective for community access television distribution.

### Network Access Structure

#### *Passive Optical Network*

Single Mode Optical Fibre (SMOF) has a typical loss of about 0.35 dB/km and the maximum loss to be tolerated in an access network situation is be about 24 dB, so in simplistic terms the maximum distance for a single fibre without any splitting or amplification would be about 68 km (almost 70 km).

One of the agreed access plans is to have a passive optical network (PON) that allows typically 32 to 128 customers connect (split) off one cable in metropolitan areas, and lesser (4 to say 16) splits in regional and remote areas. Special optical splitters are capable of cheaply dividing the cable into a large number of individual customer feeds and in the process the power is halved through each splitter.

### *Distance Considerations*

In consideration that the maximum loss tolerated would be about 24 dB and SMOF has an attenuation of about 0.35 dB/km, then for 128 customers off the one bearer would involve a 21 dB loss then these would have to be shorter than 8 km and that covers all the metro and most regional connections.

With 64 customers per bearer the splitting losses would be 18 dB and that would allow up to about 15 km from the terminal end or head end. For a 32 way split, the maximum distance limit would be about 25 km. With a 16 way split, the maximum distance would be about 32 km and for an 8 way split the distance would be about 40 km. A 4 way split would allow a distance of 50 km.

In other words almost all metropolitan, regional and remote situations could be connected to Broadband access with this technology approach. It would solve almost all regional and remote Broadband access network connection issues, as customers as far away as 50 km from an optic fibre head could be serviced with Broadband.

The overall infrastructure to provide Broadband to the fibre heads is another issue, but a large proportion of Australia is already wired with optical fibre infrastructure, providing telephony, mobile and data services. This infrastructure will have to be re-engineered to provide Broadband on the existing optical fibre infrastructure.

### *Bandwidth Considerations*

With this Broadband access structure a download bandwidth of say 622 Mbit/s is effectively reduced to a simple average of about 4 Mb/s per customer on an even usage basis per 128 customers, but we know that data usage is 'bursty' so the real usage is much more like 10 Mb/s as much higher data rates are possible for short times for all customers.

Further it is quite possible to implement multiple 'colours' (wavelengths) on the Broadband network by Coarse Wave Division Multiplexing (CWDM) so that different service standards can be provided to different customers over the same Broadband access network. Major businesses could have a full 622 Mb/s and other customers have typically a 622 Mb/s shared access between say 120 customers – all on the same access fibre!

### *CATV Usage*

The beauty of the PON under the ITU recommendations is that as well as true Broadband Internet access CATV would be available for everyone, and at a high standard too. Currently the competitive engineering design limitations of coax access (CATV) in Australia are so tight that residences on battle-axe (or recessed) blocks can't connect to without extra (off street) amplification. (In a non-competitive environment, the engineering would have allowed for all 'homes passed', to have service, and not simply 'homes passed' – but no available service). With SMOF as the access medium this would not be a problem because distance considerations are considered in km for SMOF and not metres as in the case for coax.

As far as I am aware the IEEE specifications do not provide the inclusion of CATV into the Broadband access where the ITU recommendations do. (Australia in general follows the ITU recommendations.)

### *SMOF Development*

Australian research has for years been at the pinnacle of optical fibre research, and there is no shortage of technology here in this area. Australia also has some of the best silica sands in the world that make the ideal resource material for the manufacture of optical fibre and associated components.

The problem areas may be in technology based patents where although Australians have been doing the research, these technology patents may have not been really appreciated and consequently these may have been sold off or sponsored by foreign interests making Australia in a position to really pay heavily for what we had researched as an art but not developed as Australian based technology patents.

We have the opportunity to develop several SMOF manufacturing plants in many regional areas in Australia.

### *Optical Fibre Component Manufacturing*

Australia's Universities have led the push to research new and innovative ways to develop optical fibre component technology, and this art is in a very fragile situation with the opportunity of patents and manufacturing development not high on the economic priority list.

One of the most important optical components is the optical fibre line termination and light splitter (OLT) that is required in every home. To date the manufacturing yields have been low and few businesses have mechanical methods of manufacture, making these components unreasonably expensive.

Australian Universities working in conjunction with Australian manufacturing development business have the time-limited opportunity to develop mechanical methods of optical fibre component manufacture, and the manufacturing patent spin-offs have the potential as tremendous wealth earners for Australian Universities and businesses in the coming decades.

## Legal Side-Industry (Technology Patents)

In more recent years we have had an internal oversupply of Lawyers/Solicitors, and many of these have moved their attention to litigation as their main means of income. This action I believe has been to the detriment of our society and we now have a very high number of unnecessary personal litigation cases flooding our Court system.

With Australia's development of Intellectual Property, and the sheer number of development patents that Australia should be creating, it makes common sense to me that these litigation specialist Lawyers should be moved away from litigating Australians to litigating people and businesses internationally and in so doing securing Australia's technology future.

## *Privatisation/Competition is the Major Impediment*

The earlier paper that I wrote covered the terms of reference as requested, and these terms were:

*a)* *the current and prospective levels of competition in broadband services, including interconnection and pricing in both the wholesale and retail markets;*

*b)* *any impediments to competition, and to the uptake of broadband technology;*

*c)* *the implications of communications technology convergence on competition and other emerging markets;*

*d)* *the impact and relationship between ownership of content and distribution of content on competition; and*

*e)* *any opportunities to maximise the capacity and use of the existing broadband structure.*

This supplementary paper goes that little bit further to show that the next stage in access network convergence in Australia should be that optical fibre is the preferred way to go and that the engineering recommendations refer to this technology as already mature.

This situation further addresses reference terms b) and c) and shows that the policies of maximising shareholder value have actually stifled network development. In other words, the policy of 'privatising' the telecommunications industry has done several things to stifle network growth and development:

*a)* *The connection / calling costs have not dropped due to competitive pressures (this was only caused by technology improvements).*

*b)* *Development of the access network over the past 10 years has not happened as the focus has been on sustaining existing technologies to return maximum dividends to shareholders. (Not in the public interest).*

*c)* *An internal war has been caused that now sees the Wholesale and Retail arms of most privatised telecommunications businesses vying for a market of diminishing returns. That means that some of these businesses must collapse. (Not in the public interest).*

*d)* *Where regulation was once well controlled and to a high engineering standard, now several legally based activity groups are pushing their own interests and not working together under one management. (Not in the public interest).*

*e)* *Almost all telecommunications companies have had to resort to high level advertising and sponsoring to try to win the hearts and minds of the relatively fixed market and the cost of these expenses are lumped onto the connection and calling plans. (Not in the public interest).*

*f)* *Teams of marketing / sales people have been employed along with lawyers to 'create' products and services that are deliberately packaged (bundled) to be more confusing by increasing the options or choices. These unnecessary overhead costs have to be included into the end product (service and call connection fees). (Not in the public interest).*

g) *Proposals are in place to introduce several Demand (Service) Aggregation Brokers to formulate Business Cases to pull together several businesses telecommunication needs and hopefully arrange a Broadband solution for a region or district as required. From the look of the proposal it is obvious that these people have a very limited knowledge of telecommunications infrastructure and in that sense, their fragmented knowledge will not provide the right engineering specification that is required to build the most cost-effective long term integrated solution from a national perspective. (Again this proposal is not in the public interest).*

It should be very obvious that the act of privatising the telecommunications industry in Australia is the main impediment to the uptake of broadband technology and very little else.

It is because of this that impediment that proposals such as in g) above come out to try to stop gap catastrophic situations caused by multiple telecommunications carriers providing an increasing number of 'services' to a limited market.

As I alluded to in my main paper on Broadband, the only way to address this looming disaster is to leave the retail areas to compete/fight amongst themselves, and save the wholesale area from private and multinational business concerns, who are totally intent on routing Australia's infrastructure for themselves and taking it out of Australian Government hands.

With this proposed solution the telecommunications network is not to be owned by the competing businesses, they merely rent parts of it at wholesale rates and on-sell those services at retail rates to the general public and businesses. That means putting a knife through Optus and Telstra and a few other concerns, and give the Retail parts of those businesses the right to on-sell the wholesale network.

The current wholesale telecommunication network (i.e. the network as it stands), is of a very limited value with Broadband becoming the mainstay, and as such this limited telephony, data and television based infrastructure needs to be taken underwing and totally managed by a national telecommunications authority/commission for the good of the Australian Nation and its people.

As stated before, I am one of a few people in Australia that have a very extensive wealth of knowledge in most facets of the Australian telecommunications industry, including and not limited to network architecture engineering, public and private switching and transmission systems, major transmission systems expertise, customer access network and customer premises equipment expertise, experienced people management skills, seasoned business / tender / bid management skills and I am highly computer literate. I am available in whatever capacity is required to bring the Australian telecommunications infrastructure out of the doldrums and into the future backbone for Australia's emerging information based economy.

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