



# Innovations

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## Managing the transition from analog

### Abstract

Broadcasters, manufacturers, and consumers are already facing the challenge of converting from analog to digital technology. Transitions that have taken place to date have not demanded that consumers change to retain services. They have accepted the change as beneficial. The challenge in mainstream and new and other broadcasting services changing to digital delivery is multifaceted. Industry and services providers must work together to provide products and services attractive to consumers and develop open systems that will not inhibit market growth possibilities and consumer choice, while Government should restrict its role to that of facilitating rather than driving the process.

### Introduction

Consumers and service providers have an enormous investment in analog transmission systems; therefore, the transition from analog to digital cannot be taken lightly. It will have major social and economic implications. Looking back on similar transitions in the past there appear to be three main ingredients for success. It must be investor and service provider driven against a clear consumer demand; transition is facilitated by open, industry developed and agreed standards (including relevant cross licensing arrangements); and Government intervention, if at all, should be that of a facilitator of the above two processes.

There are a number of clear examples of industry developed standards for digital technology. It is a process that has worked very successfully in the professional telecommunications market over a number of years. It has been successful in the transition of consumer sound recordings from analog to digital compact disc.

The Advanced Television Systems Committee and Grand Alliance arrangements in the USA seem to be verging on a successful, litigation free standards setting process for digital terrestrial Television in the USA (with no Government involvement or funding), and the Europeans through their Digital Video Broadcasting Initiative are well on the way to achieving similar results in Europe.

Open standards facilitate open competition for hardware delivery and service provision. The mobile telephone market in Australia gives us daily examples of the consumer benefits of competition in equipment and service supply. The consumer is not tied to a particular supplier by the hardware, the decisions of service supply depend on a match of price performance between the customer expectations and the service delivered by the service provider. In the area of broadcasting which impacts on all consumers, and involves hundreds of service providers there is even more incentive for open standards. Where would the compact disc market be today if each recording company had its own format?

History is littered with examples of failures where suppliers have endeavoured to tie the consumer by the use of dedicated hardware; there are few examples of glaring failures where open standards have been adopted. In the main, open competition has increased returns for all. As in all things, there are exceptions, an industry that captures a new concept and is able to market it efficiently can have its idea so accepted that it is the industry standard, Microsoft Corporation's Windows® product would be an example.

External imposition of standards by Government may have assisted the early development of broadcasting where there were few industry players. That is no longer true. The experience of Europe and Japan in their analog HDTV developments are indicative of the problem of Government and manufacturers pursuing a goal that does not have adequate service provider and consumer support. Notwithstanding, the investments made in the pursuit of analog HDTV objectives have been valuable stepping stones



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towards digital television. Many of the display and signal processing techniques will be directly transferable to the digital world. If anything, the lack of success in the market has been due to the

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fact that solving the analog HDTV problem has pushed the edge of technological possibility so far that the development has been overtaken by the parallel developments of digital technology, fuelled by the far greater resources of telecommunications and computing.

### Market factors

The Australian digital broadcasting market is different to those in other parts of the world. There are few if any technologically advanced countries which have such small populations scattered over such a large area. Neither do they have the multi-sector approach to broadcasting that has developed in this country with its national, commercial, community, subscription and narrowcast sectors. Network ownership and affiliation also has unique aspects. Even our largest capital cities fall far short of the aggregate population and population density of European, North American, or Asian cities. These factors result in much higher costs of delivery for service providers.

Despite the relatively sparse distribution of people in regional Australia, there are expectations of reasonable equality of access to the full range of services available in the more densely settled areas. While market economics and cost structures make true equality an impossible dream, in the long term the potential reduction in the per channel cost of delivery using digital technology may open the way for a wider range of services to be made available. Some of these are likely to be available only on subscription others may be free.

While equality of access is a desirable goal, most Australians living in regional areas also want access to material relevant to their region, news views, information, as well as the standard fare available from the networks. Satellite services while ideal for wide coverage delivery, are not easily able to meet these local requirements. Furthermore, high efficiency in satellite delivery (high performance beams and small receiving dishes) is difficult to achieve and of necessity

must be limited by economic considerations to the more densely settled areas.

Regional television broadcasters are still paying for the expansion of their markets under the Government's television equalisation policy. They will face enormous expense in moving to digital transmission technology and as a consequence we might see a phased expansion much like that of initial television development. Digital sound broadcasting likewise involves new transmission arrangements and conversion to digital for both radio and television will require all consumers to acquire new receivers. This factor alone will impose a degree of inertia on conversion, but will present perhaps an even greater brake on eventual termination of analog services.

### Standards

The *Broadcasting Services Act 1992* was introduced by the Government with the clear intent that Government involvement in standards setting be minimal. The only reference to system standards within the Broadcasting Services Act is related to subscription television where the licensees were required to agree on a system standard and then the Minister would approve it. I am sure the participants in this process would agree that it has encountered difficulties. In respect of all other standards processes the Government has strongly encouraged the participants to use the forum of Standards Australia to develop consumer equipment and related standards so that the standards enjoy the widest possible industry and community support.

As mentioned earlier, United States and European Governments have adopted a similar strategy of allowing development of standards through consensus decision processes involving wide participation and consultation. The Europeans have already agreed on standards for cable and satellite digital services and are progressing with digital terrestrial standards for television. Digital Sound Broadcasting standards for Europe have also been established although there is still ongoing debate about what spectrum will be used in which countries. There is unlikely to be a common band so this will marginally complicate the receiver design.

Standards Australia has recently taken up the question of standards for the final distribution of digital video services and digital video receiving apparatus in establishing a special task force within its Electrotechnology Group. These issues are not simply limited to broadcasting but traverse the full range of video service distribution to the consumer including involvement of the compu- ▷



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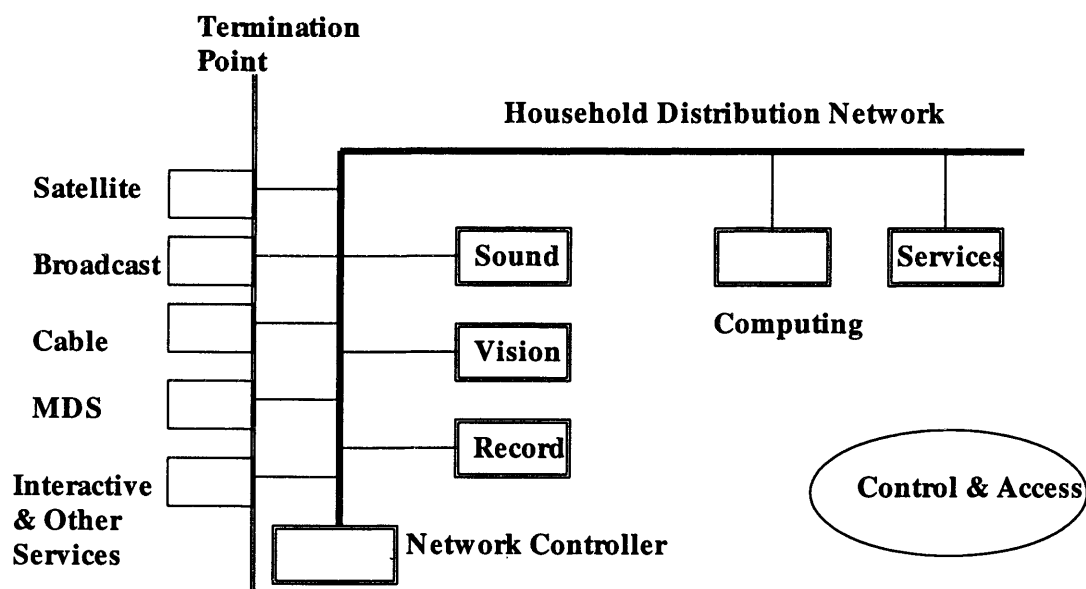
ter industry. A sensible standards approach will ensure this technology can continue to be enhanced over time and is likely to be one of the keys to unlock the gates to the future information super highway.

While the ideal would be world-wide standards, this is may not prove completely possible for a variety of reasons. There are some perceived and some real constraints imposed by the historical choice of television systems in various countries. There are sometimes perceived political advantages in establishing a unique standard to 'protect' domestic markets, despite the fact that history shows such 'Maginot Lines' are usually easier to go around than hurdle and hence are often of higher economic cost than benefit. Nevertheless, some of these artificial barriers may remain, particularly where domestic markets are substantial enough to support a unique standard. This is certainly not the case in Australia.

Unless we arrive at sensible open standards or as a compromise a family of related standards, consumers face the prospect of separate set-top

different delivery systems (satellite, terrestrial, cable) might require television delivery to be undertaken in a different way than at present. It might be possible to produce a universal display device which would connect to an in home distribution network. The proprietary or system specific electronics could be relegated to a black box located at the point of entry to the premises. This black box would control the number of simultaneous viewing points for subscription services, by interacting directly with the display devices over the in home distribution network. The network could also be used to allow other devices such as VCRs to be used with several display devices in different rooms, etc. Clearly this requires a rethink of the whole system but would be somewhat consistent with the now common Local Area Networks used in most medium to large business offices for personal computers. The clear objective is to simplify the technology for the user.

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boxes for each service provider. This may not be a major difficulty if all of the program material of interest is available through any single provider. That would not seem a likely outcome in the present competitive climate for program supply because content and service are perhaps the only distinguishing elements that will be left to service providers in the future competitive world of video service delivery.

It may be that the technological requirements of

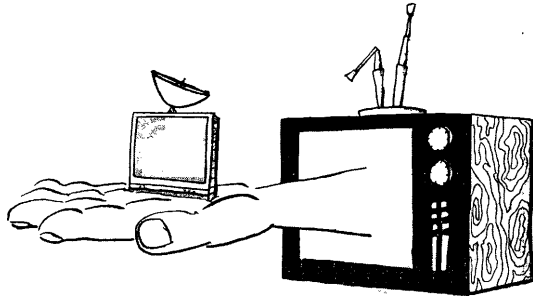
### Consumer perspectives

There seem to be no reliable guides to what might drive consumer take-up of digital broadcasting technology. Even major consumer product manufacturers, despite years of consumer research, and many successful products report they have yet to find the key to what guarantees success. As a consequence, most launch many



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different products that never go beyond the test market stage. Even some that are given world-wide launch become commercial failures. A recent example is the Apple Newton Personal Digital Assistant with its handwriting recognition capability. Despite its technological advancement and relief of the user from keyboard entry etc., it does not seem to have struck a chord with users. Many broadcasters worry that the same may be true of digital television.



The Broadband Services Expert Group in its Interim Report of last year identified 'content' as being the crucial element for

success of the information super highway. The same is equally true for other services including digital radio and television. If there are no real or perceived benefits for the consumer in terms of quality, program choice, or extra features at a reasonable price then take-up will be slow. How many consumers trade up their existing youthful television receiver simply to obtain stereo sound or teletext? They may however choose to spend a little more to obtain these features when replacement becomes a necessity,

Subject to regulatory decisions, digital television is expected to offer options of high definition or multi-program options to the broadcaster. In short better quality or more services. Will consumers notice the improvement in quality on receivers of small screen size? Will they be sufficiently excited by quality to pay the premium for a large screen where the differences will become apparent? Will multi-program offer anything they don't already have available on cable or satellite delivered services?

If digital television is treated simply as a replacement technology, then it risks limited consumer acceptance. However, if the new possibilities opened up by digital technology are fully explored then future video services, and other related digital services may open up a totally new range of market possibilities. Possibilities which will not only excite current consumers, but open up new sources of business and service. It may also help offset the enormous cost of setting up these new digital services as a consumer product.

## **New market opportunities**

At the Digital Sound Broadcasting Conference

held in Sydney in July last year, I suggested that the future automobile would contain a global position satellite (GPS) system to pinpoint its location, and that the future digital broadcasting system might broadcast a wide range of traffic information. The vehicle positioning system knowing where it was located would extract from this stream of information traffic reports relating to its present position and proposed location. The drive would then be presented only with relevant and up-to-date information concerning the journey. We are already closer to this possibility than you might think. GPS is an option on a number of up-market vehicles in Japan.

Pioneer of Japan has recently announced it will start marketing in Japan where Sony already has a foot-hold for this technology having launched its product in November last. Sales in Japan last year alone were estimated at more than 300 000 units and in excess of 500 000 are expected to be sold in Japan this year. The product is at present limited to map displays.

Sales are likely to expand rapidly once added value services like integrated traffic information becomes available. This is but one example of a possible new use for digital transmission. It is not likely to replace the demand for sound programming but may be an adjunct that encourages consumers to purchase receivers, and one which might enable sharing of the cost of the transmission infrastructure between more service providers.

Whatever approach is adopted the new digital services must excite the consumer. Excite them enough for them to make purchase decisions, and subsequently to use the equipment they purchase. Unless this happens, consumer use of digital services will not become a significant force. If broadcasters are unable to find ways to excite the consumers of their product or decide not to participate in the development of new product, then it is highly likely that niche service providers will. It would be in the interest of consumers and service providers to see niche and mainstream services develop in parallel.

## **Regulatory environment**

The Broadcasting Services Act represented a significant change in the regulation of broadcasting. It separated content and the means of delivery (except for satellite television where Government decided some regulation of transmission standards was needed to allow industry involvement in standards setting but to preserve the competitive position of the three satellite licensees). The Act is concerned with the regula-

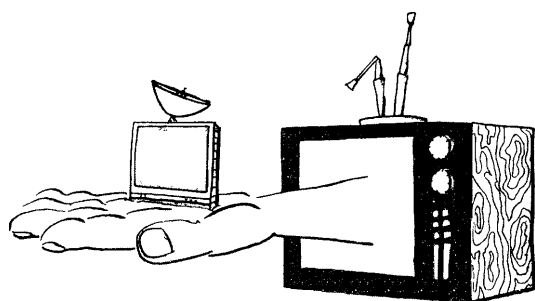


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tion of broadcasting content and broadcasting content providers rather than the carriage of the program material.

The Act preserved certain features of past regulation such as limitations on ownership and control and definitions of service which essentially relate to single program streams in order to provide the degree of regulation Government considered necessary for the present technology. Digital technology will provide a different delivery framework with the prospect of more 'channels' different 'quality' or 'performance' levels of different channels and sub-channels, and transport arrangements which may obliterate the currently relatively clear concept of what constitutes a transmission channel.

The regulatory framework of broadcasting recognizes that different degrees of regulation are needed to respond to the extent of a particular service to dominate or influence. Narrowcast (niche) services which are limited in appeal, coverage, time or some other way are subject to very little regulation, whereas main-stream broadcasters



have higher degrees of regulation. The widespread adoption of digital technology for broadcasting delivery will require reappraisal of some of the current rules so that they assist rather than hinder innovation.

With digital technology the current concept of what constitutes a channel largely disappears. The service is delivered by a digital data stream that may contain one or many services embedded in it. Furthermore, what might be a high definition single video channel at one time (say for live sport) might become four or five lower quality movie channels at another. Do each of these video channels constitute a separate service if they are not in a state of continuous program transmission? How much parallel transmission time would constitute a separate service? Will the present limit of one television service per market continue to be relevant? How should the limits be redefined?

Some changes may be necessary early in the transition process so that new services can commence (for example, if the Government decided to make available digital channels to current broadcasters in addition to their current analog channels, the present rules would constrain

many existing broadcasters who are currently at the limits of station ownership in their markets to direct simulcasting of the current analog programmes because a different digital program could be deemed a separate service. Some capacity to differentiate the digital product from the current analog one may be an essential ingredient to the successful transition from analog to digital

Once digital services have been accepted and become mainstream consumer delivery systems, there may need to be further reconsideration of the regulatory arrangements as the multiplicity of outlets etc. open the way for reduction in the controls necessary to achieve Government policy objects. It will be some time however, before any cable or satellite broadcaster is able to claim anything like the market or access enjoyed by current free to air services. Therefore there may continue to be differences in regulatory impact for some time yet. However, inevitably, the clear distinctions between broadcasting and other services will continue to blur as the transmission technology and delivery systems merge. Australia is at least well advanced in recognizing the need for service regulation to be distinct and separate from carriage, and has a regulatory framework which will be responsive to future change.

## **Conclusion**

The transition from analog to digital will require the backing of industry and consumers, freedom from unnecessary obstacles of regulation or divergent and multiple system standards, and for Government to facilitate rather than drive the process. Despite the fact that each of these prerequisites tend to interact and sometimes the objectives of the participants might be in conflict there is ample evidence to suggest that any other approach is almost doomed to fail before it commences.

Australia has been often considered one of the markets most willing to adopt new technology. This may be true but it has also been in the position of adopting technology that has already been well established in other markets. Australians appreciate value for money and utility and benefits of the product. They received these from colour television, video cassette recorders, and mobile telephones. Will they receive new benefits from the adoption of digital technology in consumer broadcasting delivery? It remains for the industry to respond to this challenge and make digital more than a simple replacement for analog systems. □