

Appendix 1

The Evolving State of Audio-Visual Technology and Implications for Business and Policy Models in Canada

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Canadian Association of Broadcasters
L'Association canadienne des radiodiffuseurs

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and
Implications for
Business and Policy Models in Canada

**A report commissioned by the
Canadian Association of Broadcasters**

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Introduction

The Canadian broadcasting system is a complex ecosystem in which the players are part of “value chains” that create, import and deliver content to audiences, then derive revenue from that process. The existence of these media value chains depends on fundamental technologies which enable the process, and whose particular characteristics shape the roles and economic relationships of the players.

From the beginnings of broadcasting, there has been policy and regulatory intervention in the media value chains, principally to ensure that attractive Canadian content in both languages would be created, and that Canadians would have the opportunity to experience it. The interventions have been of many kinds - direct funding and subsidy for programming; protection of markets so that private broadcasters could generate the profits required to cross-subsidize programming; and even investment in broadcasting infrastructure.

The traditional Canadian national strategy has been to make use of the characteristics of media technology to further our economic and cultural goals. In the first days of broadcasting, bi-lateral negotiations with the United States ensured that frequencies would be available for Canadian over-the-air stations. The territory-limited nature of over-the-air broadcasting was then used to provide a Canadian delivery system for Canadian content. Even today, that territorial limitation provides a continuing, though much diminished, protection around parts of the broadcasting value chain.

As technology has changed the nature of media, we have adjusted – sometimes we have encouraged and even led the change, as in the case of communications satellites, where Canada both led the world in their development and ensured capacity for the carriage of Canadian signals. Without that early investment and the creation of Telesat Canada, our current system of successful television networks, both conventional and pay/specialty, would not have been possible.

Over the past ten years, however, media technology has changed in dramatic and disruptive ways. Equipped with new digital tools, the consumer electronics industry has created a wide variety of new “media appliances” that will fundamentally alter the value chains of broadcasting in Canada and around the world. Underlying these new “receivers” is a wide variety of new platforms for content delivery, ranging from the wired broadband Internet, with its revolutionary characteristics, to wireless Internet connectors, to the more traditionally structured new digital wireless transmission infrastructures for mobile and stationary reception.

In addition, new content creation tools have allowed consumers of media to become “voluntary” producers, distributing their works across the Internet to other consumers of similar interests around the world.

These developments have led to predictions that the new content, delivered by the new platforms, will drive out the old, and that the new platforms cannot be regulated.

What this paper attempts to do is examine the developments and the predictions, to try to shed some light on whether the Canadian system can react effectively to these developments, that is, whether Canadian players in the media value chain can, with or

without intervention, continue to prosper economically and provide Canadian content of high quality.

It will look at the traditional drivers of consumer adoption of new media: the desire for greater choice, convenience, higher quality, wider availability of content and greater interaction with content.

It will look at the inhibitors of rapid adoption: principally the efforts of players in the value chain to prevent “bypass” so they can maintain and develop their roles.

It will spend some time looking at the phenomenon of the “long tail”, an interesting window into a larger question, that is, whether the increasing fragmentation of audience may lead us to a place where high quality content cannot generate sufficient revenue to justify its production – and the impact of that change on the production and distribution of Canadian content.

Parenthetically, the paper will note some of the policy reaction to these changes, at this point a mixture of “regulation as usual” in some sectors and a new “hands-off” approach in others.

Finally, the paper will suggest what approaches are needed to foster an effective response to technology change:

- A more thorough understanding of technology
- Understanding its impact on fair competition
- A new approach to the flow of rights and revenues in the value chain
- A vision of the whole

With reference to this last point, above all this paper attempts to place the evolving nature of technology in context, so that we can understand its role in the creation of program content, the changing nature of program rights, its impact on competition – all of the elements that can be used to describe the complex ecosystem of electronic media.

If we do not understand the relationships in the system, we cannot have a vision of the whole. Clearly, technology change is progressively breaking down the barriers between what have been treated as separate and distinct “silos” of media activity. If we continue to structure policy interventions as if the elements of the system do not relate and do not compete, then we risk tolerating or even fostering imbalances in the system that will prevent many valuable players in the chain from continuing to make the contributions we have come to rely on as the strength of the Canadian system.

Section 1 – Technology Change and Electronic Media

New Receivers and network technology drive change in media

The 1999 Consumer Electronics Show (CES) in Las Vegas marked a new era in broadcasting¹. At that show, major advances in technology, and a large number of new consumer electronics “categories” were first introduced to the industry: personal video recorders from TiVo and Replay, CD recorders, “Internet appliances” and dedicated email devices, wireless home networks, LCD screens for the car, GPS navigation and security systems, flash memory devices, a variety of personal music players, and of course, many new HDTV sets.

Even though satellite radio and “smart phones” were not to be introduced until the following year, it was clear even in 1999 that there was a strong movement afoot in the CE industry to create devices that would disperse the functionality of electronic media into mobile spaces: the car and the street, and around the home in a seamless way. There was much discussion of “webcasting”, interactive television, ecommerce, and who would own the media “gateway” into the home – the PC or the TV.

In short, the new locus of change in broadcasting had become the burgeoning inventiveness of the consumer electronics industry. Media appliances were now “strategic” in that the new “receivers” had new capabilities which would alter the value chain of media (broadcasting) delivery. Consumer needs were being facilitated in so many new ways that the older model of a single appliance – radio or television – basically controlled by content distributors (broadcasters and BDUs) would be outmoded sooner or later – the implication was that the consumer had to be considered first, and business models that met consumer needs in new ways were needed.

Looking back from the distance of seven years, it is clear that the developments of that inventiveness have now become commercial reality. Though many of the specific devices failed even to reach the market, others, some even more revolutionary, have taken their place. Some technologies have been slow to realize their potential – for reasons which this study will attempt to explore. Others have penetrated the marketplace even faster than expected.

The lessons to be drawn from the past seven years are many, but they begin with one basic and simple observation, easily forgotten in times of stability, but brought to the fore in times of change:

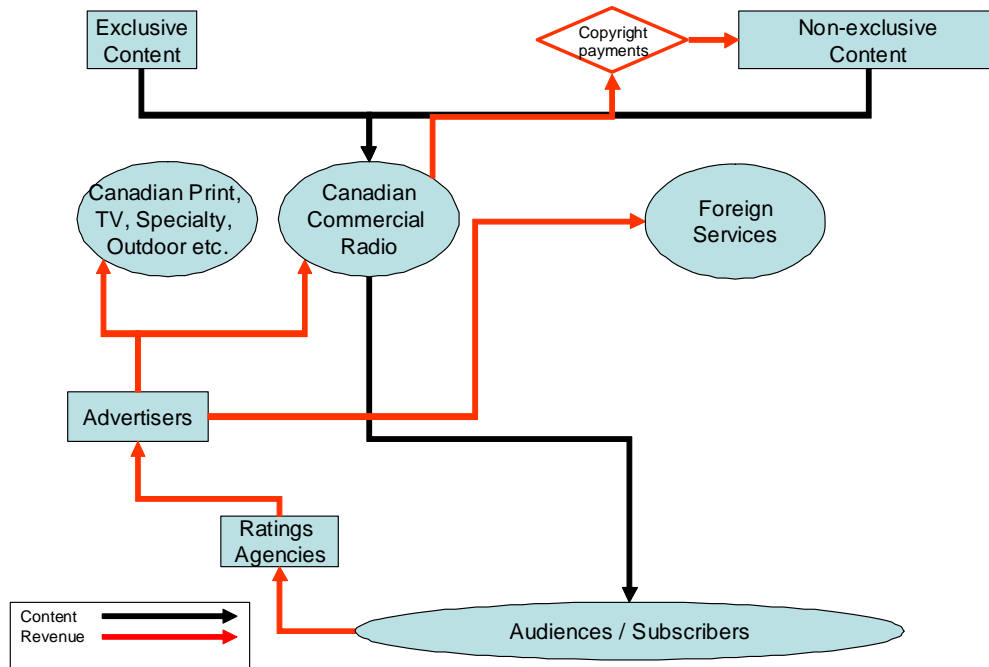
- i) Technology enables the value chains of broadcasting to exist – for content to be delivered to listeners and viewers, and for revenue to flow back from that viewing or listening, up the chain to primary creators.
- ii) The specific character of the technologies employed shapes the value chain and the roles of the players in it.
- iii) As new technologies are introduced, new value chains are created, and old ones change their shape. In some cases, they atrophy, and specific media,

¹ For more detail, see “Strategic Appliances: the Impact of the Digital Home on the Communications Industry”, 1999, by David Keeble

created by a specific technology can be displaced or forced to adapt by changing their functionality.

To illustrate this point, here is a graphic of a simplified value chain for radio.

Radio Value Chain



The radio value chain, in its essence, begins with very few players. The station acquires audio content of two kinds:

- content for which the station exclusively owns the rights in its market. This is usually talk and usually produced by its own staff, but is sometimes syndicated for its market from a national or foreign source.
- Non-exclusive content, usually music, which is available under compulsory licence and for which copyright payments must be made.

The station provides this content to the listeners in its market area (limited by its technology to the range of its transmitter), who do not pay for it. Instead, ratings agencies measure the audience and provide the data to advertisers, who then pay to place advertisements on the radio station based on the ratings.

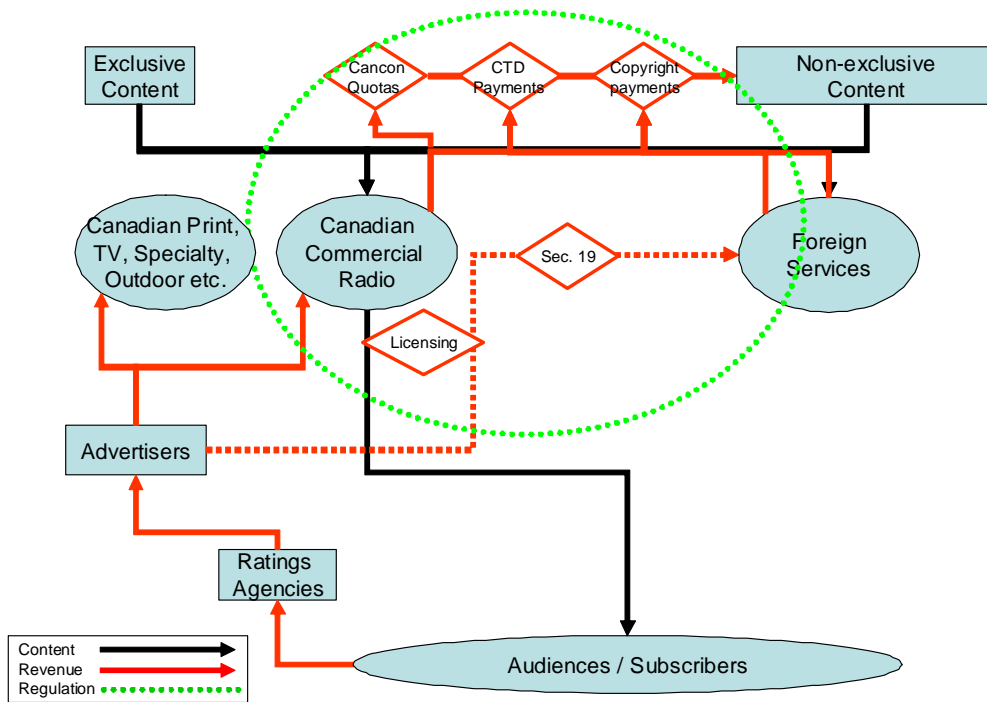
In this early, traditional version of the radio value chain, radio has competitors who must be considered in the chain: other radio stations and television broadcasters, print and

outdoor media, and foreign radio broadcasters. These also go after ad revenues in the same marketplace as commercial radio.

This is very a simple, and market-based value chain. But even in this simple depiction, there are already policy-oriented players who influence the value chain, the first of whom, in Canada, is the Copyright Board, since they, not the market, determine the value of the non-exclusive musical content.

In fact, when one looks at how regulation intervenes in the value chain, it becomes considerably more complex.

Radio: regulatory intervention

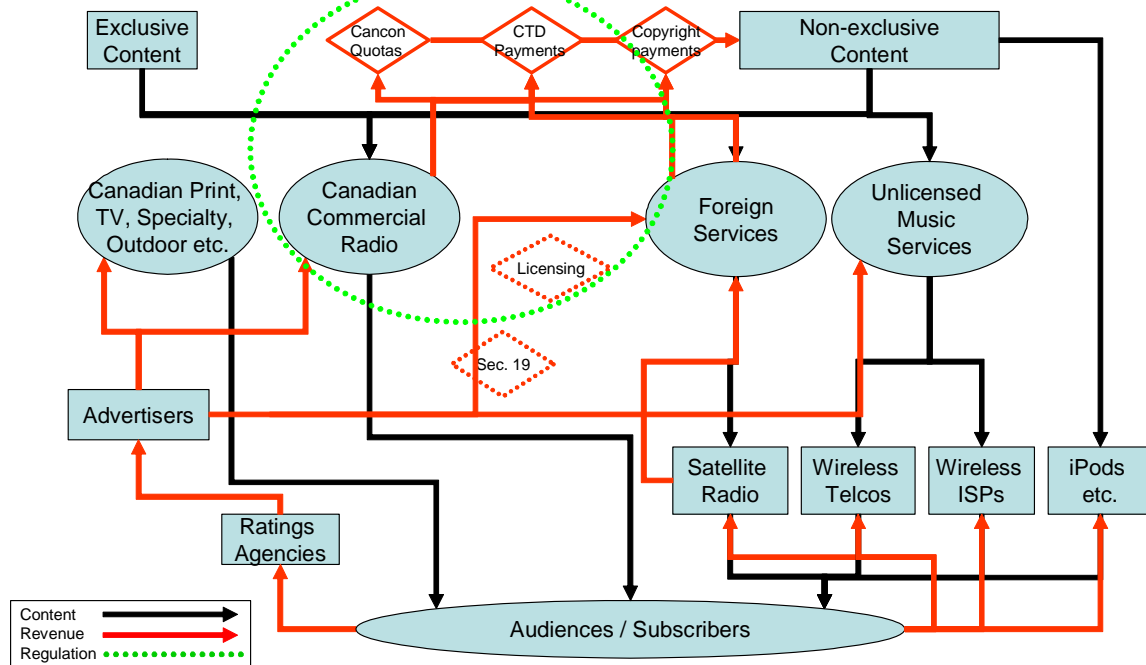


In a simplified form, there are five major interventions in the value chain. Two are protective: licensing prevents interference and controls market entry, while the Income Tax Act helps keep advertising revenues in Canada.

Three are obligations: quotas for Canadian and French vocal music, money for talent development, and copyright payments at non-market levels, in order to further subsidize the music industry. Many players in the value chain are outside the scope of regulation in terms of their own activities, as shown by the dotted green line.

A complete value chain for the present day is too complex to depict graphically, but the following simplified version shows several features:

Radio: more competition outside regulation



First, new competitors have arrived in the value chain. This is the impact of the new consumer technologies: satellite radio, Internet radio, and music download services to portable devices – all of them now available to the mobile audience in ways that other competitors are not, and all of them making extensive use of music – the same non-exclusive content which most commercial radio depends on. There are also players whose delivery is not usually mobile, like web sites, who compete for ad revenue and attention.

Second, most of these players are completely unregulated. Those new players who are regulated have very different obligations, in some ways lighter than existing players, e.g. lower Canadian content requirements.

Third, subscription revenue is now flowing – but not to Canadian commercial radio operators. The market protections afforded by the Income Tax Act and licensing are no longer as powerful as they were before.

What this illustrates is, first of all, the dramatic change brought about by new technologies in a value chain, and secondly, the impact of the asymmetrical application of regulation.

Section 2 – Displacement or Replacement?

Commentators on new technology often forecast dramatic change, but rarely in a very differentiated way. The term, “the end of x”, tends to appear frequently.

Historically, however, it is rare for communications media to be completely replaced by new technologies – perhaps the best “exceptional” examples are the telegram and the telex machine; these have been completely replaced by email.

Some would not even use the term “media” for the telegram or email. But in fact it is helpful to understand all “mediated communications” – that is, something that uses an artifact to carry a communication that is not face-to-face – as media.

Distinctions of Scope

Not all are mass media, however. Some are one-to-one, person to person, like the postal system or the telephone, or now, email. Still others are “interest group” communications, with an audience of a few hundred – like a neighbourhood circular, a parish magazine, an association’s internal website, a stamp-collectors’ newsletter or, again, email. Most of these are largely voluntary activities on the part of the creators, that is, they are not created in return for economic compensation – an interesting point that will arise again later.

Mass media are intended for a general public, and usually their economics only make sense if the audience is large enough to support professional communicators in the creation of the content. Writers, usually – but also photographers, cinematographers, actors, musicians, engineers, and all of the crafts that support the various technologies involved in the particular medium. Most examples of mass media are obvious: television, radio, film, newspapers, most books and music – and then, oddly, we get email again – in the form of spam.

The Internet (merely a distribution network) and the main media it carries (web pages and email) do tend to blur the definitions of scope somewhat. A web page may be meant for a small group, and an email for a single person, but the nature of the technology is such that, while most objects will stay within the scope for which they are intended, any object can become the subject – sometimes the unfortunate or even illegal subject – of mass consumption.

Distinctions of Function

While media can be distinguished by scope, one must also consider what function they perform for their users. Media have different functions, even when they look the same, and new media may assume one function of an old medium without replacing it completely. Television, for example, did not replace radio, but it completely replaced the story-telling element of radio. All commercial radio abandoned drama and comedy serials as the performers migrated immediately to television – a much better medium for their purpose.

Radio and the movies, however, effectively killed the vaudeville theatre. The theatre, as a medium, became the home of movies and more elaborate drama and musicals when the economics could support professional creators. The economics of vaudeville no longer made sense for professionals; the best acts moved to radio, if they could.

Radio did not die when television came along, however, but it changed its function. It became a home for information – news, weather, etc.; it provided entertainment, but only recorded music, since that’s what the economics would support; and finally it provided something more subtle in communications terms – a sense of connection. The voices on the radio provide company to many people, and a sense that, while physically alone, they are part of the life of a larger community.

Displacement and/or Replacement

Thus, even though Internet-distributed media may blur these distinctions, the scope and function of media are important considerations. For when we talk of the “end of x” it may be that x stands for a personal or interest group communication, not a mass medium. A personal web page or blog may well replace the family Christmas newsletter completely, just as email has replaced personal letters for its users - but it is not necessarily going to replace TV news. Both provide information, but not the same kind, so the impact will be limited to the fragmentation of the user’s time among more new activities.

At the same time, while this analysis may lead to a comforting sense of stability in some cases, in others the analysis confirms that a new medium can be a direct replacement for the functions of another. In such cases – and the radio value chain reveals a few – there is direct competition among media, and the competition for audiences and resources can be expected to be severe. And even when there is no direct replacement, the impact of new media on existing media can be severe, since all are competing for the time and attention of the media consumer.

The “Long Tail” Concept

The long tail concept has several forms. In the minds of some commentators, it is that user-generated content will replace professionally-created content in the new value chains. Predictions of “the Death of Hollywood” are based on this assumption.

A more moderate form is simply that the huge mass of content generated by aspiring professionals – like most CDs produced in the world – now freed by the Internet from the gate-keeping of commercial labels, will form the basis of a new media economy, which will displace much of the function of the old economy, which depends on the profits of a few highly-promoted and highly-produced hits.

Aggregators of content in the value chain who are hit-dependent (TV studios and recording labels) are thus vulnerable to new players who learn to aggregate and monetize the content in the “long tail”.

Both versions of this idea need to be seen through the lens of media scope and function.

Most user-created content replaces the phone call and the letter. It is a personal creation – often video – which is the result of voluntary activity, not an economic model. It may

well be quite creative. For example, Scarborough, Ont, resident Tara Winney uploaded her video, "Packing Up the Dreams", which showed her stowing abandoned relationship memorabilia into a box, to the Internet. Afterward, she called it, "a personal journal entry – with flair. The days of hand-written Dear Diary are, in my opinion, long gone."²

There are already professional aggregators of such content – like News Corp, in an interesting contradiction – who make ad revenue based on the fact that it attracts viewers in some numbers. This may well be a sustainable model, but its function is not the same as mass market television, and while it, like other media, will continue to reduce the audiences for the mass media, it is not likely to replace them.

Music and the Long Tail

Music is an interesting and special case. The traditional economic structure of the music industry is already built on the fact that many people want to be musicians – some astonishingly skilled and talented – and will provide their services without economic reward. Economic reward has been concentrated at a different level of the value chain, the labels, who do indeed have an interest in limiting the number of creators they work with, and the luxury of selecting from a huge pool of volunteers.

While many musicians may dream of commercial success, and a tiny percentage achieve it, the willingness of the musical audience to pay for music has never come close to what's needed to sustain the overall volume of musical activity on an economic basis. Even the major labels, according to most industry observers, fail to achieve profits on a very high percentage of their product.

In that sense, the value chain analysis shows that when musicians self-produce and distribute on the Internet, many of them are simply moving their voluntary activity to a more widely-distributed level: 'free' is no threat to most of them since they have always given away their services. In the new model, they can produce at a higher quality level, and achieve distribution to a much wider audience, which is satisfying to both sides – they get value.

So, while Internet-based aggregators of their content are finding ways to monetize the audience to this wave of content through advertising, whereas labels monetize through sales of recorded product and royalties for music use.

Replacement or Bypass of Players in the Chain

So the question usually posed is – will the new Internet-based aggregators replace the labels (and their close allies in commercial radio) if they fail to access the long tail?

Essentially no one can know, but an analysis based on media scope and function would suggest that these factors must be considered:

- The Internet-distributed music model can fragment its audiences into such tiny slivers that they now defy even "micro-format" categorization. Even distinctions

² Shannon Proudfoot, CanWest News Service, from Ottawa Citizen, August 8, 2006

as specific as the difference between neo-billy and psycho-billy (within rockabilly, already a micro-format) may be important to the new music consumer.

- And yet, commercial radio's audiences continue to demonstrate, in weekly surveys and in their listening behaviour, that they are intolerant of the unfamiliar, and that only a small number of major formats can achieve success on an ad-supported basis.
- Even pay audio and satellite radio, with a much greater ability to be specific, cannot sustain the micro-niches and variety that is demanded of the consumer filling an iPod from the Internet.

Perhaps the explanation is that these audiences are using different media for different purposes; and that they are different audiences.

Perhaps commercial radio, a linear service that accompanies other activities, provides companionship, a sense of local community identification, and timely information. Its audiences therefore demand that variety be provided within the context of the familiar. It cannot afford to have audiences tune away, and must remain predictable as it used during the audience's daily round.

Perhaps the Internet audience, by contrast, is leaning forward, engaged, more like a browser in a record store than a driver seeking distraction during rush hour. Community is part of the experience, but a community defined by common interest; if the unfamiliar isn't what the user wants, she clicks away, but stays within the site. Variety becomes more important than quality of experience.

This analysis of media displacement would suggest that, as the two models address different consumer needs, one will not replace the other. Both, however, will compete for time and attention, meaning growth for the new model, shrinking audiences for the old model – and the shrinking of audience can have serious consequences, especially for players whose margins are modest in the current situation.

Value Chain thinking, however, would suggest that an equal; or greater threat to labels, obviously, is the erosion of their ability to extract revenue for value due to piracy; while the threat to the place of radio is the emergence of more direct replacements in Internet radio, satellite radio, and cell phone streaming applications – platforms which can replace the experience provided by commercial radio.

Interaction of Old and New Models

Beyond that, the value chain analysis would note that there can be interaction between the two models as well.

In some cases, musicians' new independence, and ability to record and self-promote labels using the Internet and computerized tools, has essentially re-created the economics of vaudeville, in which performers make a living without labels through constant touring. The sale of their recorded product is one of the sources of revenue that allow them to continue – but in essence theirs is a cottage industry, in which the performers may be self-supporting but do not generate sufficient margin to support major

record companies. Again, this may well prove to be a sustainable model – as long as their business is not disrupted by further innovation – but is not likely to replace the commercial record industry, whose challenges are of a different nature.

But other musicians move a step beyond this stage, using self-production, self-promotion, and self-management to establish their popularity and build a basis of content which the musicians themselves control. Once established, they then make use of major labels as distributors of product, collectors of royalties, and the providers of the next step in promotion.

So, seen through this analysis, the long tail may have legs, to mix metaphors, but the extreme version – the idea that user-generated content will replace professionally created mass media as the economic driver – has been around since the 1970s and is no more likely now than it was then.

To be less metaphorical and more explicit: there is no turning back the wave of user-produced content enabled by the new creation and distribution technologies. For some creators, this model will provide a living, while for the great majority it will remain a voluntary activity. In terms of the value chain, however, this activity will not replace the hit-dependent players who provide professional production, management and promotion. Rather, both will exist side by side, and to a degree support one another. To the extent that listener time and attention is drawn into the long tail, the hit-dependent players will suffer losses.

The Middle Ground

What is of great interest to Canadian cultural policy is this question, “What happens to the content between the long tail and the fat head?”

This is a serious question for Canadian public policy. Already faced with the difficulty of competing head-on with our neighbour, the largest content producer in the world, the challenges raised by new platforms and new media only exacerbate the problem.

The Canadian cultural production sector consequently lies in an uncomfortable and middle ground. A good deal of Canadian cultural product is not commercially self-sustaining, especially television drama. There are few “hits”, in some genres, and yet the product is not user generated or voluntary – it is professional production and is often costly. One way or another, much of it is driven by regulation, not the market, and requires subsidy from private and public sources, if it is to be made and promoted.

So while the “Hollywood hits” will continue to generate sufficient margin to overcome the Hollywood failures, and while the content in the long tail will continue to be produced in the voluntary sector of the economy, what happens to professionally-created product that has low margins or no margins, and which is most vulnerable, if not to replacement, to the further weakening effects of audience fragmentation from new media?

There is no ready answer to this question, but it would seem that re-aggregating audiences through multi-platform exposure and re-purposing in different media would be an essential part of any solution. Since the need for “seamless availability” across

platforms is also one of the drivers for the adoption of the new technologies, that part of the discussion will be resumed in the next section.

Section 3 - What drives consumer adoption of technology?

Many technological advances are possible in media, and many are hyped as the next revolution in media. However, only some of these become real: those that successfully answer primary consumer needs in a better way than existing technologies.

What are these needs? Historically, every successful new media technology has delivered benefits to the consumer in the areas of convenience, choice of content, cost, and availability (that is, expanding the space in which media can be used over a greater space and time). In other words, it performs a media function better than the existing technology and at a price that looks like value to the mass of consumers.

Sometimes, a richer, higher quality experience is also a driver – but, historically, this is not an adoption driver with the same force as the others. Successful technologies will deliver on most or all of these drivers.

In the current situation, these drivers have produced a range of new successful media technologies that can be best categorized under the four themes noted above:

1. The drive to greater choice of content
2. The drive toward a richer content experience (e.g. as provided by HDTV)
3. The drive toward seamless availability of the content experience
4. The drive toward greater interaction

This last is, in a sense, a variant of the drive to availability in that a variety of social communications, including transactions and personal or parochial messages, are moving into the realm of electronic media where once they occurred only in physical space.

At the same time that appliances and applications are created to meet these drives, there is a counter-theme: the limitations of content distribution networks, which have tended to slow adoption. These limitations are not primarily technical, but economic. That is, any technology can be implemented, but only those which make economic sense to the key players in the value chain (those who cannot be bypassed) will be implemented.

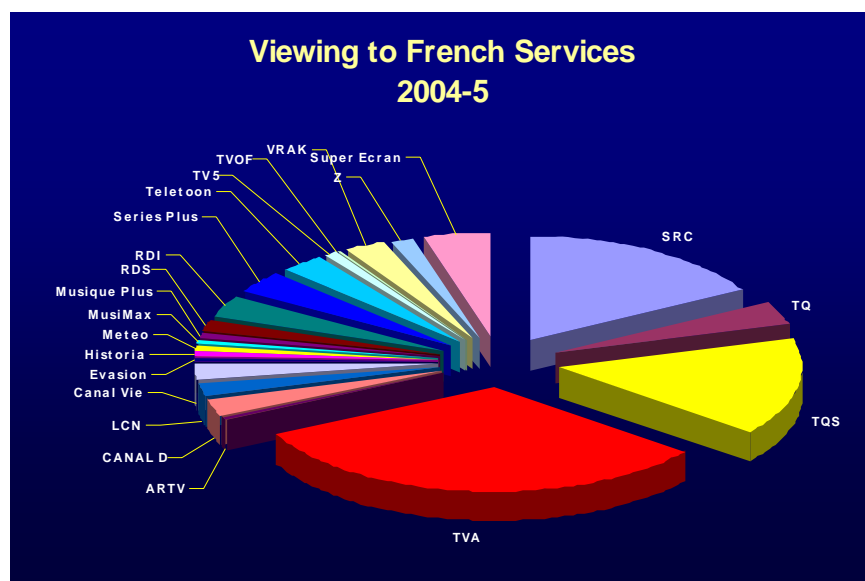
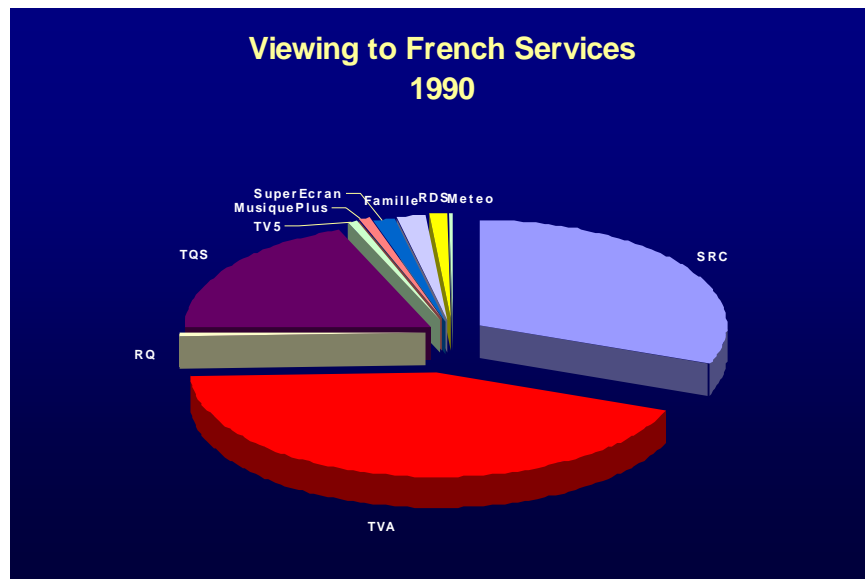
The Drive to Greater Choice

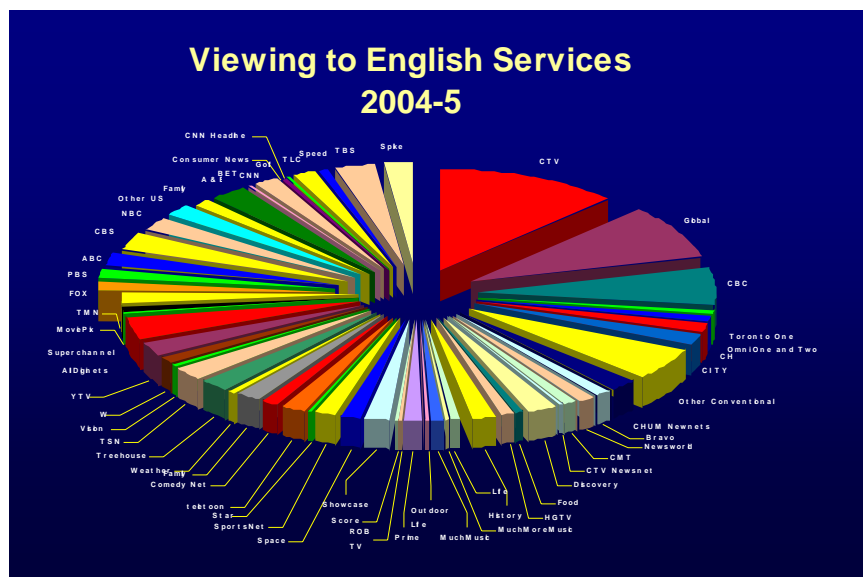
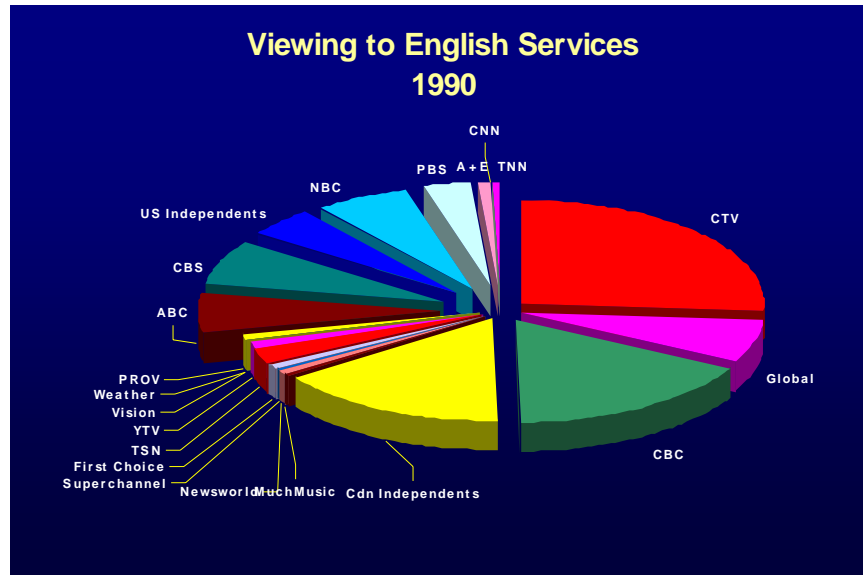
While most technologies are supported by a number of advantages offered to the consumer, some rely almost entirely on one, specifically the drive toward a greater choice of media content.

The first stage of the digital *evolution* in media has been characterized by a huge expansion in choice. In both television and radio, the ability to expand the channel capacity of distribution networks has been realized, not in higher-bitrate, higher-quality signals, but in increased numbers of lower-bitrate, lower-quality signals. The reason is obvious – subscribers will pay more for new channels promising new content, or a more convenient choice of times to view that content.

Eventually, of course, diminishing returns set in. The audience for television has not grown; therefore more channels simply fragment the audience more and more. While the subscriber revenue stream will continue to rise, advertising rates will fall as the audience for any given commercial becomes smaller. The combined sources of revenue ultimately will reach a point where they cannot support attractive, competitive new programming to fill the channels available.

The graphs below, based on Nielsen ratings data, illustrate the effects of fragmentation on both English and French television audiences from before the introduction of digital to 2004-05.





In the extreme case, one can see in the Canadian English market in 2004-5, that over 50 digital specialty services, taken together, achieved only a small sliver of audience.

Nor is this the final state. Even now in 2006, less than half of the Canadian TV audience has made a digital choice³. Analog cable and over-the-air viewers are still a majority of Canadians at 54%, especially among francophones, where viewers dependent on over-the-air transmission still comprise 17% - almost one in five – of the population. One can speculate about whether we have reached the limits of the drive to greater choice on TV as a compelling value proposition; but most likely a variety of factors will continue to drive digital penetration and consequently greater fragmentation.

³ Appendix 3, *CAB Technology Adoption Analysis*

Radio's fragmentation has not yet reached this stage. But while subscription radio is still new to the Canadian market, and still acquiring market share, it is arriving on more and more platforms. It is now delivered by satellite, Internet and cell phones via telephony channels, and is seeking delivery on DTH and cable at this time.

The response of the Canadian commercial radio industry to fragmentation of its audience is not yet clear. Digital radio options are available, but it is unknown whether these delivery platforms will be competitive with consumers. They have been, in the UK, where new content is offered on free over-the-air DAB, but whether the same dynamics would apply if Canada were to offer new content is not clear.

In the United States, most of the commercial radio industry is fighting back with a home-grown digital delivery technology (HD-Radio™ – also called IBOC (in-band, on-channel), a proprietary technology developed by iBiquity Digital Corporation) . HD-Radio radio stations to offer additional program channels overlaid digitally on their FM signal. In July, 2006, Clear Channel Communications announced that it is offering HD-Radio on 300 of its stations and plans to be on 95% of its stations in the top 100 markets by the end of 2007. In April, Clear Channel announced that it had developed 75 new radio channels through its Format Lab initiative, which it would make available to other companies offering HD-Radio multicasts in the HD Radio Alliance.

There is thus a clear push to match choice with choice on competing platforms. The fragmentation of radio is thus proceeding rapidly in international markets, driven by the demand for greater choice.

Of course, the Internet is the greatest delivery platform for choice yet seen. And with 56% of Canadians connected to Broadband Internet⁴, it has surpassed the growth of digital television. But since Internet-based media offer other advantages as well, they will be discussed below.

The Drive Toward a Richer Content Experience

Historically, the use of digital for higher quality became available at the same time as the use of digital for greater choice. The digital compression and modulation technologies that led to the choice explosion are also fundamental to providing high-definition video with multi-channel digital sound.

However, HDTV has rolled out at a much slower pace than the “expanded choice” options, which reflects the position of quality as a driver of new technology adoption. “Content is King”, and Quality is a nice-to-have. CDs and DVDs offer superior quality, and they have enjoyed rapid adoption – but they also offer a very large convenience factor over LPs, cassettes, and videocassettes.

Lest we forget, the most popular show on Canadian television during much of the adoption period of CDs and DVDs was “America’s Funniest Home Videos” – most of which was shot on very low-quality VHS videotape. The current phenomenon of the moment is YouTube on the Internet, which also provides low picture quality comparable

⁴ Appendix 3, *CAB Technology Adoption Analysis*

to early VHS, but unique content. And even video distributors frequently compress their standard-definition video signals to the point where some serious degradation is visible on some channels to the critical viewer – but most of the public accepts the quality they receive. So it is not surprising that growth in the adoption of HDTV has been slower than some of the other media technologies discussed here.

In this respect one must also note that, while the adoption of HD screens is increasing rapidly and analog is declining, many analog, narrow-screen television sets are still being sold. Moreover, less than half of Canadian consumers who own an HD set have connected them to any source of actual HD programming. According to the data,⁵ 13% of Canadians say they own a high-definition screen, but only 5% say they have connected it to a set-top box. HD sets appear to be largely used for standard definition television, usually wide-screen DVDs. Perhaps wide-screen is the value proposition for most consumers, not high resolution.

The history of the industry adoption of HDTV has varied with the sector. Manufacturers embraced it relatively quickly, since wide-screen HD sets could be sold at a premium and were attractive even to consumers who wanted simply to watch DVD movies in good quality and at a better screen aspect ratio. Moreover, the mandatory nature of the rollout of digital over-the-air television (and by association, HDTV) in the United States promised a market.

After initially opposing HDTV because of its capacity demands, distributors embraced it when it became clear that growth in subscription revenues required something other than choice of more and more channels; the HDTV experience was becoming a selling point.

Broadcasters have been slow to adopt since most will experience no new revenue from the conversion. Networks in the United States were given little choice in the matter: the FCC was clearly insistent that broadcasters switch to digital transmission, and accompany it with some HDTV programming. (The FCC was probably motivated less by a desire for higher quality than by the efficiency of DTV, which permits the recovery of VHF and UHF spectrum for auction to other users.) Some providers of specialty services saw a niche in HDTV, with their first entries being omnibus channels combining a broad range of content, as long as it was HDTV – movies, sports, science and general interest channels mixing all three have been launched.

Conventional networks and specialty channels have been gradually increasing their amounts of HD content beginning with drama, sports and movies, and we are beginning to see more adoptions of HD for local news and studio productions. CITY-TV has announced it will be converting its morning show; "Breakfast Television," "CityLine" and "CityNews."

Canada is still behind the US in HD programming terms, though more content is produced in the format each year. But the conversion of the entire television system to HD would depend on the adoption of new technologies to overcome a distribution capacity bottleneck. Even then, these measures may be insufficient. Specifically,

- new satellite modulation technologies are required to generate space segment capacity;

⁵ Data from CBC/Radio Canada Research analyzed in the CAB Technology Adoption Analysis (Appendix 3),

- new satellites, operating in new bands, must be launched and new equipment developed if there is to be sufficient capacity to accommodate Canadian HD services; and
- new compression technologies – e.g. MPEG-4, H.264 – must be deployed on all platforms to increase capacity. This will require the replacement of all current MPEG-2 set-top boxes, which cannot receive MPEG-4 encoded signals.

Some of these steps are underway. In January, the US Dish Network announced at CES 2006 that they have added new HD channels in MPEG-4, which only MPEG-4 capable HD-STBs would be able to tune, such as local HD channels in the markets of New York, Los Angeles, Chicago and Boston. ExpressVu, Dish network's technology partner, has also indicated they will be making a move to MPEG-4 and new modulation techniques to expand capacity. In Europe, MPEG-4 is assumed by most to be a precondition for the deployment of HDTV on most platforms.

Beyond the question of developing the capacity is the question of affording the capacity. It is not clear yet, since only 4% of Canadians have HD receivers (as opposed to displays) that demand for the higher quality is strong enough that subscribers and advertisers will absorb the increased cost of a system-wide transformation.

While the industry attempts to absorb the impact of HDTV, it is worth a note of caution: HDTV is not likely to be the last word in quality. Digital cinema (theatrical) implementations already look for much higher resolution than normal HDTV, and in recent years there have been several experimental attempts at 3-D.

For example, at the Consumer Electronics Show (CES) in 2006, "Philips announced that the company plans to introduce in two years an HDTV that can play 3D content. The technology is in the lab at this time and has not been shown to the public yet. ... LG made a demonstration of a pair of 3-D LG LCD 42" panels." (State of HDTV Technology 2006)

It is likely that the future will bring, not a single conversion of the whole system to a new "standard", but a variety of picture quality standards, each appropriate to the content, the receiver, and the platform it is to be delivered on. Policies built on the assumption that there will be a single transition – rather than a state of continuous innovation or evolution– may find themselves superseded by events before they are even fully implemented.

The Drive to Seamless Availability

The drive to seamless mobility is really the drive to availability – the consumer's desire for easy access to all media content at any time and in any place. Many analysts have noted this as a feature of a younger demographic with a mobile lifestyle and the expectation that technology will make all content available to them at any time.

What technologies respond to this drive?

- Video and audio over the Internet
 - Including public hotspots

- Video and audio on the mobile phone,
 - via one-to-one channels like EVDO or Edge, or
 - via digital broadcast technologies like DVB-H, DMB, or ISDB-T
- “transfer” technologies
 - like the Slingbox, or Sony’s “location-free TV”
 - or the mini-FM transmitters (a.k.a. FM modulators) to play an iPod or satellite receiver through a car radio
 - or even flash memory cards to move media from player to player

To be sure, the “seamless” aspect of this phenomenon is not yet realized. All of these content delivery platforms are separate, and require the user to implement connections one at a time. If subscriptions are needed, they typically are separate for each platform.

The easiest way to understand seamless mobility is to use a telephone analogy – appropriate too, since expectations of media are often encouraged by developments in other areas.

Telephone companies are working now on a technology called “SIP” (Session Initiation Protocol). The idea of SIP is that a user’s communication will cease to be device dependent – e.g. on entering the home, the user terminates a cell phone call and dials back on the land line. Instead, communications will follow the user. As the user enters the home, the cell phone will be aware that there is a land line available and will switch the call automatically to the appropriate device via the most efficient network.

For example, wireless mobility provider Trapeze Networks recently announced a partnership with DaVitas Networks, a new provider of mobility software and appliances, to deliver the ability for handset users to roam freely between Wi-Fi and cellular networks without interrupting a call.

Likewise, Microsoft is set to unveil a plan to integrate voice technologies with the communications software it already provides. A unified inbox for text and image communications of all kinds will be combined with a SIP-based “soft phone” over VOIP for the enterprise – that is, company employees’ phone calls and communications will follow them wherever they happen to be.

SIP is not limited to telephony; in fact it was conceived in the Internet world. In the electronic media world, it might work like this.

- Working late one night, an office worker has a game broadcast on, in a window on his PC.
- As he leaves work, he doesn’t want to miss anything, but that’s okay – his smart-phone is aware he has left the vicinity of the PC (the devices perhaps communicating via Bluetooth) and it seeks out the play-by-play on a local TV station, which is broadcasting via DVB-H.
- Once he gets in his car, the phone becomes aware of the car radio and turns it on to the same broadcast, audio only, via digital radio.
- He stops at a coffee shop and goes in, still carrying his smart phone, which now picks up the same play by play on the coffee shop’s wireless Internet hotspot.
- Entering his apartment, the smart-phone becomes aware that there is a TV set, and switches it on to the same game in HDTV.

One could work many variants of this scenario, using different platforms. The point of it is not the particular platforms or which one will be dominant, but the seamlessness of the user experience. Serving a mobile lifestyle implies that the content will follow the consumer, not that the consumer must continually seek out the content.

Of course, different architectures are possible: the user could simply use one receiver, getting everything from a DVB-H or DMB transmitter. That is a version of the vision; but it sacrifices both network efficiency and adaptability of quality levels. No one wants to feed HDTV to a cell phone over a one-to-one network; that's a waste of bandwidth. But when the user is near the big screen, HDTV will be required. Can we not manage the transition seamlessly for the user, and ensure that only one subscription needs to be paid for this content?

And before one gets to this "seamless" operation, there must be an intermediate stage, where content becomes available on many delivery platforms, with little or no coordination. That is the stage we are embarked on now.

What technologies are currently working toward this vision?

Three kinds:

- The Internet, and the software and sites that support downloading and streaming material from the Internet.
- "Bridge" devices that take the user's content and make it available in a different space or time.
- Technologies to broadcast video, audio and data to mobile devices.

A. Internet and PCs

ComScore recently reported that 18% of consumers are now viewing video on line, and have increased this activity from 85 minutes/month (October 2005) to 100 minutes/month (March 2006).

The number of search engines, producers and even broadcasters who are now involved in supporting the Internet as a platform for video distribution is too great for all of them to be mentioned here.

Google, Yahoo, MSN and others now index video throughout the Web, so that a user can easily find videos on all subjects.

- Yahoo's service also permits the user to search for movie showtimes through Yahoo! Movies, and use their PC as a personal video recorder. Yahoo! Go TV can be controlled through a simple television remote.
- Amazon.com announced a digital video download service to commence in July 2006.
- The Google Video Store at <http://video.google.com>, allows users to buy or rent videos, including new CBS content--CSI, Survivor--as well as video from cable nets, various independent filmmakers. In addition to new CBS series and NBA

match-ups, the archive will contain some classic boomer fare, like a couple of the Star Trek spin-offs (Deep Space Nine and Voyager), I Love Lucy, Brady Bunch, Twilight Zone, MacGyver, Mannix and My Three Sons.

- According to programming partner CBS, the content will also include shows from top noncom producer WGBH, Trinity Broadcasting, Blue Highways TV, CareTALK, Fashion TV, Here! TV, HDNet, Hilarious Picks, Image Entertainment, iWatchNow.com, Kantola Productions, MediaZone, Plum TV, Porchlight Entertainment, SOFA Entertainment, Teen Kids and Wheels TV.
- Recent announcements have added more and more content to the site.
- In Canada, MoboVivo of Calgary offers a library of downloadable content at \$1.99 each. Most comes from CHUM, CBC, or Reel Girls Media. Their content will work with 130 media players.
- JumpTV offers 200 streaming channels over the Internet, "For monthly fees that start at \$5.95 US a station, customers watch TV channels on their computers. Catering mainly to foreign nationals in the United States, it offers channels from Africa, the Middle East, Europe, Latin America, and Asia.

Broadcasters showed their interest in using the Internet as a new platform during the "upfront" television sales market in Spring of 2006, where virtually all broadcasters offered advertising inventory within their Internet and mobile television offerings. In Canada:

- Before the upfronts, CTV had also foreshadowed its own launch of the CTV Broadband Network, featuring four broadband channels that live on ctv.ca. Its MTV Overdrive features full-length MTV shows and music videos. In: Depth, which focuses on musicians, "will be one of the first shows made for broadband, with the secondary goal of migrating to TV."⁶
- Six CTV Canadian shows are or will soon be available via the broadband service: Whistler, Canadian Idol, Instant Star, Corner Gas, and Degrassi are there now, while Robson Arms will arrive in August.
- CBC promised to plan for multi-platform distribution of all commissioned production,
- Corus Kids television announced, "many of our series' will be available on a number of platforms. Whether it's on-air, online, on mobile or on-demand, we are committed to being everywhere our audience is."
- CHUM has partnered with yahoo.ca to offer on-demand access to such programs as VJ Search, Canada's Next Top Model and others shows on MuchMusic, plus headlines on Citytv.
- To all this on-demand product, CHUM adds Mobisodes, cut downs of 12 shows, including FashionTelevision, MovieTelevision, Ed the Sock, MuchMusic Video Award performances and others, video snacks for downloaders on the go.
- MTV Canada has already obtained, thanks to its relationship with MTV International, the rights to stream full episodes of foreign programs on mtv.ca. Shows include Laguna Beach, Real World and Pimp My Ride.
- Rogers and CanWest announced that the new service bbTV will offer CanWest content to Rogers Wireless customers using their Blackberries – reports from Global News, Global National and the Financial Post. All content will begin and

⁶ A number of examples excerpted from CARTT, July 27, 2006

end with 5 second ads, with advertisers GM, the Royal Bank, and Labatt already signed up.

- Alliance Atlantis has begun offering broadband video content, from full episodes on demand (Season III Finale of Naked Josh to unique webisodes (Rescue Me).
- The newscasts and public affairs programming of TVA, LCN and LCN Argent are now available on the Internet.

On the “bypass” side, the CFL, PGA.com, and Major League Baseball are among those who stream video of sports, for a fee or for free, on the Internet. The NHL is reportedly contemplating such a move.

Earlier, American media reported that advertisers were making commitments to new media advertisers in advance of television’s spring offering of its new schedules. Consequently, US networks were going online:

- NBC was offering a broadband comedy channel (dotcomedy.com), offering computer users archives of shows like “Leave It to Beaver” and a chance to create their own content to podcasts; and an animated digital comic book based on characters and plot lines from “Heroes,” a drama series being scheduled for Monday nights.
- Warner Brothers announced⁷ it will make hundreds of television shows and movies available for purchase over the Internet using BitTorrent software, which is widely used to download movies and other copyrighted material illegally.
- Vince Roberts⁸, VP worldwide technology for the Walt Disney Corp., told the audience that during the month and a half trial of streaming some of the company’s most popular content for free on abc.com, over 11 million streams of shows like Desperate Housewives and Lost had been downloaded. The company’s research showed viewers had an 87% retention rate on the ads shown - “twice the usual retention on TV,” said Roberts. Viewers were not able to skip the ads but could click on them to interact with the advertiser.
- Roberts also said they were working with Comcast on technology so that every time a Comcast high speed customer were to click on myabc.com to watch one of these shows, the customer would be given the feed from their local ABC affiliate – complete with the local ads.
- In August, Anne Sweeney, Walt Disney co-chair of media networks and president of Disney-ABC TV, said⁹ the experiment was a success for advertisers, given that research showed users had 87 percent recall of the advertisers involved. The average recall of advertising on TV is about 24 percent. A single advertiser supported each program that streamed.

In the UK, the BBC announced that online developments would cause it to make wholesale revisions to its Web presence, offering more content for viewing. Meanwhile, Channel 4 promised to “make Channel 4’s public service programming available across all meaningful platforms and to be the first UK broadcaster to begin simulcasting our content on broadband is a significant step towards delivering on this objective”. The channel already offers a pay-per-view video on demand service for US dramas Lost and Desperate Housewives.

⁷ May 19, 2006 8:00 AM, Strategic Content Management e-newsletter

⁸ CARTT report from Cable-Tec 2006, June 2006

⁹ Broadcast Engineering, Aug 4, 2006 8:00 AM

Amid all this activity, there was still skepticism about the wisdom of these moves from an economic point of view.

“I find it amazing there is so much of a rush toward video on the Internet without a clear business model,” said Cynthia Brumfeld, president with Emerging Media Dynamics Inc., an Internet consultancy. “A lot of these ventures, they want to get their toes in the water but they don’t really know how they will make money off it”. Ms. Brumfeld said the major US broadcasters are leading the charge because they are putting a lot of content online that may or may not generate much revenue.¹⁰

Whether or not there is a business case for video distribution on the Internet, the involvement of producers and broadcasters is understandable. Any technology that fragments or threatens to fragment their existing audience will be met by attempts to re-integrate that audience – especially if the migration of viewers is accompanied by a migration of advertising dollars.

This case is complicated by the fact that the rights for Internet distribution are separated from the rights for television distribution, so the entire schedule cannot be migrated – only those programs for which the broadcaster holds the rights. As the audience moves more toward seamless availability – accessing programming on whatever platform is convenient, this separation of rights will make less and less sense.

B. “Bridge” devices: take recorded or streaming media from one consumer environment and move it in space or time to make it more generally available to that user.

Clearly the iPod is the standard bearer for mobility of audio and video downloads. But it simply leads the charge of hundreds of music/photo/video players now commercially available and as ubiquitous as the Walkman once was. While the initial offerings in this category – such as the Diamond Rio – were met with critical admiration and a lukewarm consumer response, the category is now huge, perhaps because

- Cheaper storage makes the units much more powerful for their price. The video iPod can carry 150 hours of video.
- They are perfectly adapted to taking music from a computer
- The iPod popularized the category enormously, spinning off benefits for others.

Such devices take computer-resident media and make it portable. But there are devices that extend this yet further. On the simple end, there are mini-FM transmitters to move sound from any device with a headphone jack to a nearby FM radio. These permit listening in cars without headphones that might block sound that the driver needs.

¹⁰ National Post, July 27, 2006

A recent study (Harris Interactive's AutoTechcast) indicated that two thirds of iPod owners use them in cars, using adapters of some kind – younger drivers (younger than 45) are most likely to do this. (To accommodate this audience, Ford, GM and Mazda have announced that they will provide direct plug-ins in their 2007 models to accommodate iPods.)

The "Kensington Pico FM transmitter" for iPod is one of many re-transmission devices available. The user simply selects a clear FM space on the dial and selects the same frequency on the iPod. This is not a totally personal process - field and lab testing in the US by the NAB and NPR has determined that many such "modulators" are over-powered, and reach well outside the vehicle to produce interference to regular FM broadcast reception in adjacent vehicles. (When Howard Stern is re-broadcast in this way, people tend to complain.)

One category that has been around since 1999 but has never succeeded is the wireless media player for the home. (See D-Link DSM-120 Wireless Music Player at right.) The idea makes sense in terms of the drive for availability – make the music that's on the PC, and streaming Internet radio stations, available throughout the home wirelessly – but it has never taken off. Most likely it has never passed the convenience test, since most such devices rely on to transmit – so that each device that is to receive the media needs its own receiver. This category will succeed when a generally available simple and inexpensive receiver becomes available – if for example, commercial digital radios could also receive these signals. Early attempts to create consumer electronics standards, using Firewire and other digital connectors, to permit easy interconnection of home media devices have not been successful.



Others are also attempting to solve the simplicity problem. For example, PC chipmakers Intel and AMD have launched platforms to certify and co-ordinate home entertainment devices that work with PCs, in an effort to simplify the experience of using the PC as a home entertainment centre. Microsoft's Media Center operating system is another effort to simplify. But attempting to make the PC experience as easy as a game console, TV set, or even a set-top box will be a big challenge on an inherently multi-function device. On the plus side, however, clearly many Internet users do not find it too difficult to download and play audio and video.

This year's biggest buzz has been about the impact of another "bridge" device, the Slingbox. Sony's "location-free TV" has similar functionality and has been around longer but has never been heavily promoted.

The Slingbox uses a hardware "transmitter" in the home, attached on one side to a source of television, such as a set-top box, and on the other to a high-speed Internet connection. The user can then load software onto a computer anywhere in the world, and view and control whatever is available on the home device over the Internet. If a playoff hockey game is broadcast only in Montreal, a user equipped with a Slingbox (in

Montreal) and a laptop computer (in Paris – or just across town) can watch the game as if in his or her own living room.

The PVR (personal video recorder) is another device which responds to the need for availability, though in this case it is concerned not with overcoming distance but time. Like many of these other devices, PVRs have been around for some time, and are only now seeming to come into their own as mainstream devices. Briefly, since these are now familiar, their function is that of a VCR that is genuinely easy to use. Using an electronic program guide, they record programming for later viewing, and permit the user to pause live TV and to fast-forward through parts of a show or commercials.

While it is now an old technology, the greatest increase in the availability of broadcast media in our time resulted from the development of DTH platforms that fed television to small dishes across Canada. In 2006, it is fair to say that the availability of television in Canada is no longer an issue; any consumer can get access to it one way or another.

At the same time, satellites have made the availability of conventional television programming out of its market a commonplace – creating as many problems as it solves, since a great part of the television value chain is dependent on the ability of terrestrial television to divide the country into territories and provide advertising opportunities on that basis. Satellite crosses those boundaries, and because of Canada's many time zones, has the unintended consequence of making that programming available many times a day ("time-shifting") thereby increasing its availability and further devaluing the program rights purchased for local territories. Moreover, the spread of parallel practices to cable has exacerbated the situation.

The extent of the disruption caused by these "availability" impacts was not anticipated at the time of DTH licensing and is currently a difficult policy issue and a source of much strain between players in the television value chain, since some appear to be benefiting at the expense of others.

C. Broadcasting television to mobile devices

The space which can be served by traditional broadcasting has also been opened up by digital technology to the point where the delivery of television to small mobile receivers – frequently embedded in cell phones – is now a reality.

Technically, the development came from three directions. When the digital transmission scheme called OFDM was first developed, it was intended for radio – to provide a reliable signal to moving automobiles – and it became part of the DAB standard. Its uses for television were immediately obvious, however, and while DVB-T – the European terrestrial television standard – was designed for higher capacity to stationary receivers, the adaptability of the technology to mobile television receivers was always inherent, and DVB-H (the "H" stands for handheld) was the result.

At the same time, DAB, with some modifications, spawned DMB (Digital Multimedia Broadcasting), also capable of delivering video to moving handheld devices, while a third offshoot, ISDB-T, was based on the same original technology concepts to provide the terrestrial television standard for Japan.

Interest in all of these possibilities lay dormant while broadcasters concentrated on building out “normal” digital radio and television networks. But now all the mobile technologies are moving at an accelerated pace, fuelled by improvements on the receiver side: advances in chipsets, displays, and battery life that finally permit practical use of television in handheld devices.

Now we are at the stage where:

- Brazil, a country which has delayed choosing a digital terrestrial television standard, finally announced it had chosen ISDB-T, largely because of its ability to support both stationary and mobile devices, such as cell phones. (AP, June 24, 2006)
- Debitel, Germany’s 3rd largest mobile telecom company, with 10 million subscribers, began broadcasting 4 TV channels and 2 audio channels to its subscribers in May, 2006, using the Korean T-DMB system. It uses phones from Samsung and LG, equipped with a program guide.
- The UK regulator, Ofcom, plans to auction 40 MHz of spectrum in the L-band before March, 2007. Some expected bidders are planning to offer DMB services, others satellite radio. UK proponents of DVB-H for mobile television would prefer spectrum to be made available in the UHF band.
- Qualcomm has obtained the rights to UHF channel 55 (716-722 MHz) in much of the United States, in order to offer its MediaFLo service. It has deals with large network operators including Verizon. Modeo, previously Crown Castle Mobile Media, is planning a DVB-H mobile service in the US using 1670-1675 MHz.
- In Canada, Look-TV is planning to offer a broadcast mobile television service under its current BDU licence. Mobile telephone companies here are already offering video, but using the MobiTV technology, which operates over one-to-one connections in the same spectrum used for telephony.
- In Finland, the government has licensed UHF TV spectrum for use in broadcasting to mobile phones.

Interest in mobile television worldwide is intense. At Digital Hollywood, in March, 2006, Peg Jackson, NeoCarta Ventures, noted that she was expecting 250 million video phone users worldwide by 2010, with the price of video phones closing on the magic \$50 mark.

Overall, there a high level of interest in mobile TV, when one considers that little is known about the commercial prospects or even how users will make use of the service. The received wisdom is that it will be “snack tv”, consumed quickly while moving, but some Nokia trials indicated that users may make as much use of the appliance at home as they do out of the home.

Why these high expectations?

Clearly many analysts see mobile TV as a technology ripe for rapid adoption, reasoning, perhaps, that the drivers bundled into its adoption – convenience, cost, and availability – have proven to be the most compelling. The explosive growth in the adoption of mobile telephony – putting a potential receiver in many pockets – is also compelling. When The President of the United States demands, as he did on June 26, the Emergency Alert System cover cell phones and wireless PDAs as well as radios and television sets, it is clear that the “mobile phone as receiver” concept has sunk in.

There is a “supply push” element to the excitement as well, in that mobile telephone companies are in a very large and profitable, but very competitive business. They have built capacity at a great pace; and must find services that will profitably use that capacity. Media is one possibility.

Finally, the addition of mobility to television can be seen, in one way, as the first really new thing to happen to television since its inception.

- Colour TV and HDTV simply improved the quality, without changing the nature of the experience.
- Cable vastly increased the amount of choice in television, and more significantly, introduced a new subscription revenue stream.
- Satellite extended the reach of multi-channel into remote locations.

But the result of those changes was simply to fragment an already existing audience. The usage of television did not change – the audience accepted TV as their medium of choice when it was “black and white and two channels”. Very early on, the audience adopted TV for 21-23 hours a week, and has never really changed that level. Until the arrival of the Internet, which has siphoned away viewing hours, the average weekly usage of television has been one of the most constant numbers in the media business, year over year.

But mobility adds something new: by expanding the space in which television is available, it may also expand the time of its use. For once, a development in television may be more than simple fragmentation of an already existing audience: an opportunity to grow, not simply to keep pace.

And of course, mobile TV may recapture some of the younger demographic that prefers the Internet to the passive viewing of television. But to do that, it must develop further to meet all of the expectations – not merely be mobile, but be seamlessly available.

It may also need to do more, and provide some of what the Internet provides – interactivity.

The Drive to Greater Interaction

- Youtube is streaming 100 million videos per day for free over the Internet.
National Post, July 27, 2006
- On MySpace, users keep personal pages with journals, communicate with friends and play games. It's a formula that has attracted more than 54 million users and the attention of media conglomerate News Corp., which bought the site last year for \$580 million.
Associated Press, Feb. 16, 2006
- Americans conducted 6.4 billion searches in June, a 6 percent decline from May (a seasonal effect), but a 29-percent increase over June 2005, according to comScore. Google sites led in search query volume with 2.9 billion searches conducted in June, followed by Yahoo sites (1.8 billion) and MSN-Microsoft sites (818 million).
MarketingVox, July 19, 2006

Less than ten years after the launch of the World Wide Web, there can be little doubt that it has become one of the main distribution mechanisms for news and information in North American society, and the dominant tool for those seeking information on any subject.

In terms of displacement of existing media, there can be no doubt that the Internet has had an impact on the information-seeking function for the 74% of Canadians who use the Internet monthly. But what medium is it displacing? Broadcast news, or the encyclopedia?

One must ask the same question of the story-telling and community functions of media.

A huge part of the “video on the Internet” explosion has been user-contributed material – the mainstay of sites like YouTube and MySpace¹¹. User-contributed video has been touted as the replacement for commercial television viewing at least since the early 1970s, when the first portable camcorders became available – in Canada this idea was connected with community television channels as the distribution medium.

It may not be a replacement for broadcast, but user-generated video has taken off since then because of three technical developments:

- much cheaper consumer handheld digital recorders;
- the computer software to permit editing of the product at home (even user-generated videos need post-production); and
- social interaction sites on the Internet, combined with search abilities to permit easy distribution and promotion to a user community.

Quality is not an issue – Sony recently announced two new HD consumer camcorders, one with hard disc recording, the other to 3 inch DVDs. But any camcorder can exceed the quality expectations of video compressed for Internet distribution.

What these technologies do is give the consumer the opportunity to interact as a video producer, just as weblog technology permits the user to easily publish text and still images. The fact that the quality of these contributions does not approach professional standards is irrelevant to the expectations of the users. That is, what users are looking for is creativity; raw, quirky, full of attitude and accident, but sufficiently different to become the real “water cooler” video for that community, whose popularity can, very occasionally, spread to near mass-market proportions.

The phenomenon raises several questions: first, will it continue and grow larger or fade as a fad? Second, if it continues, will it to some extent replace the viewing of commercially produced videos?

On the first question, the fact that a drive for interactivity clearly exists would argue that video of this kind will continue. But probably not in this form, because “Internet-and-computer”-delivered media cannot help but be in a continual state of change and invention.

11 Although these sites also carry professionally produced material, such as the recent “rejected pilots” phenomenon, raising questions for rights owners when it is illegally uploaded.

More generally, the fundamental technologies which have built the Internet – the personal computer, and packet switched networks that can intelligently route content – are so malleable that predicting the progress of the Net technically is impossible. The fundamental difference between the Net and all other electronic media is that **the receiver is in the software**. New media “receivers” are invented and improved continuously. They can be downloaded and installed in minutes. Content can be created or adapted for them in weeks – not years.

To take an example, the conversion from the codec (compression-decompression technology) MPEG-2 to MPEG-4 which is needed in broadcast networks will require a complete swap out of millions of set top boxes and cost hundreds of millions of dollars. To make this conversion on a cable or satellite or broadcast network is a serious financial decision to be taken by a major distribution company.

The download of a new codec to a computer can be done in minutes – and can even be done without the consumer’s awareness – triggered by the needs of a new content object.

For the second question, “will it replace commercial media?”, we need to return to the earlier analysis of why people use media. User-produced video does not replace the dramatic storytelling experience of television. Those who are seeking a compelling experience of this kind are not looking for interactivity and will not regard these productions as a replacement.

In a sense, user-generated productions replace non mass-media uses; the person-to-person or interest-group communications of the earlier media analysis.

In another sense, however, time is time. Every viewer has one set of eyes and ears and if they are engaged in watching user-generated material they will not be engaged in watching commercial video entertainment of any kind, whether VoD or linear streams.

What the “drive for interaction” tells us is that younger members of society have not formed a 22-hour a week habit of passive viewing, and they may never form such a habit. Before the television and radio age, we are told, people in North America engaged in a good deal more social interaction. The current tools for social interaction with media are very powerful and they are improving, permitting all kinds of mobility and the forming and reforming of groups. It is certainly not impossible that they will improve to the point where the current users are able to maintain that habit throughout their lives.

Transactions and other interactions

The development of interactive tools has not progressed in North America in the same way as it has in Europe. The interactive television remote control, with its four coloured buttons permitting users to make choices in interactive programming on their TV sets, is a common tool there, whereas in North America interactivity is a feature of the Web and telephony.

Some European developments in interactive technology include:

- The Berlin Mobile Convergence project (BMCO)¹², a joint activity of Nokia, Philips, Universal Studios and Vodafone, which combines digital terrestrial television (DVB-T/H) and mobile communications technologies to provide interactive and TV-like services on the go and at home. In other words, it uses broadcast TV to deliver the content and the cellphone bandwidth to interact with applications in the broadcast, permitting transactions, “tell me more” requests on commercials etc., all in an environment that could be mobile or at home.
- One of the barriers to interactive tools is the multiplicity of platforms outside the computer. This forces developers to rewrite their applications for each hardware platform. UK broadcasters have invested in semi-automatic translation techniques to minimize this cost. At the same time the DVB undertook to develop a standard authoring language, the so called portable content format (PCF)¹³ as a part of the DVB-MHP (Multimedia Home Platform) interactive television standard.
- ITV and “emuse absolutely” ran the first interactive advertising campaign on the terrestrial digital platform, Freeview, on behalf of T-Mobile. An unprecedented 9-10 per cent of viewers pressed the “red button” during the ad to find out more. The interactive campaign was also seen by over a quarter of the available Freeview audience.
- In the UK, “The red button also provided a new way of giving, attracting more than 1 million pounds in donations through efforts co-ordinated by the Community Channel” for tsunami relief.¹⁴

All of this is evidence that a drive to greater interaction is a real need among media consumers. It is not clear that it needs to be a part of every device, or that every device will need the kind of computing power that will make interactivity possible.

It does appear, however, that media appliances that incorporate the possibility of interactivity – such as smartphones with some computing power, and running a standardized operating system, will have a real advantage. Media that can exploit that advantage will not only benefit from increased attention but also potential new revenue opportunities in enhanced advertising and transactions.

12 Dr. Claus Sattler, Sept 2004, DVB-Scene

13 Digital News, Feb. 2005

14 Hugo Martin, digital news, Feb 2005

Section 4 – The Barriers to New Technology Adoption

This section deals with the reasons why new technologies are not adopted. And there are many – “technological determinism” is an easy trap to fall into, but in fact the availability of technology is only the first step toward its adoption. To be adopted, a technology must satisfy both the consumer/user drivers discussed in the last section and the interests of key players in the value chain whose cooperation is needed to ensure adoption – when they cannot be bypassed, that is.

Once the needs that drive the consumer adoption of new technology are recognized, it becomes easier to recognize the inhibitors: they are simply any factors that act contrary to the drivers. Which is not to denigrate them – while it is fundamental to understand new media technology from the consumer point of view, it does not follow that it is always desirable or even feasible to meet those needs, for either economic or policy reasons or both.

The consumer’s desire for low cost content, for example, is often a desire for free content, obtained often at the expense of the rights holder and acting to totally disrupt all business models, since all value chains are essentially a trade of the right to use media for revenue.

Likewise the consumer’s drive for content choice and quality would logically lead to the building of more extensive delivery networks than the economics of broadcasting can support, given the consumer’s perception of the value proposition.

Canadian public policy has also consciously restricted the choice of consumers under the explicit direction of the *Broadcasting Act*, in order to ensure, through various mechanisms, that Canadian content choices will be available.

On the other hand, the argument is frequently made that the new technologies cannot, by their nature, be restricted or inhibited. This is rarely if ever the case; usually it is simply that intervention is unpalatable. Likewise the assertion that something is technically impossible to do; while of course this can be true, usually the translation is simply that it is economically unattractive.

In short, most of the reasons for non-adoption can fall into one of three types:

1. The technology is simply not good enough, in terms of the drivers for adoption, to look like good value to the mass of consumers.
2. The economics of adoption do not work in favour of one or more players in the value chain, and these players cannot be bypassed by others.
3. The adoption does not work in favour of interventions in the policy chain, and the political will exists to inhibit deployment of the new technology.

This last point needs the additional note that public policy is not necessarily an inhibitor: it has historically encouraged new technology for the public good. In one way or another, governments have invested in the infrastructure of television, radio, and satellite to ensure that Canada would have the ability to carry its own media product across the

country. In recent years this practice has waned – there was therefore no satellite radio infrastructure, and the investment in broadband, while important to ensure access, has not created a distribution infrastructure that favours Canadian content.

Not Good Enough

The list of failed inventions is long and not particularly instructive, but there are some interesting examples. One is the e-book. Many devices to act in place of books have been designed; up to now they have typically used LCD screens and the ability to read some form of Adobe Acrobat or other standard document format.

However, the expense and fragility of an LCD screen has always made such devices a losing proposition compared to the existing technology – paper. Paper books are simply more convenient, less costly, an equally rich experience and much more widely available.

Doesn't Work for Some Players, who can't be bypassed

Advertisers

The case of HD is equally interesting when one looks at the interests of advertisers. Advertisers have been remarkably slow in adopting HD, even though many commercials are shot on 35mm film, which is readily adaptable. Evidently they have determined to be followers in this regard, but it is certainly true that as long as they are unwilling to pay a premium for HD – as consumers must – their presence will not encourage other players in the value chain who depend entirely on their revenue, i.e. conventional broadcasters – to adopt HD. They certainly cannot be bypassed when they act with the degree of consensus they have shown in this case.

Advertisers, of course, are agnostic as to platform. While different media have different uses, they will put their ad spend into anything they believe will work. In that sense, they are promoters of new technologies. In fact, according to recent reports, “Internet advertising is the fastest-growing segment of the Canadian ad industry and, for the first time, Web-based commercials are raking in more dollars than billboards. The out-of-home advertising category, which includes everything from billboards and bus-stop signs to video screens in food courts and elevators, was surpassed last year by on-line ads, which are now a \$347-million (U.S.) industry in Canada.¹⁵”

According to the Internet Advertising Bureau, Internet advertising is expected to account for nearly 7% of all ad revenue in Canada in 2006. “We are bound to see slowdowns in sectors such as radio and TV’, as Internet ad spending approaches \$1 Billion, said Carl Bayard, an analyst at Desjardins Securities in Montreal who tracks companies that rely on advertising.” However, the IAB also noted that only \$27 is spent for every online user in Canada, compared with \$71 in the US¹⁶.

Consequently, ratings agencies are now operating on a multi-platform basis as well. In July, Nielsen Media Research (US) announced it will, “abandon media viewing measurement by handwritten diaries and expand its tracking to new platforms, including computers, iPods, video game players and mobile phones. Through a range of new

¹⁵ Globe and Mail Friday, June 23, 2006

¹⁶ National Post, July 27, 2006

electronic monitoring methods, Nielsen will begin to track content regardless of platform. Digital technology is driving changes in the way people watch television and is enabling Nielsen to follow them, Gary Holmes, a Nielsen spokesman, told ABC News.¹⁷

Receiver Manufacturers

Another group whose interests sometimes run counter to those of conventional radio and television broadcasters are the receiver manufacturers.

Take digital radio as an example. Both of the rollouts of digital technology to convert conventional radio to digital have stalled in North America because of a lack of manufacturer support. Both DAB in Canada, and HD-Radio in the United States have been implemented by broadcasters, but receivers have not entered the marketplace in sufficient numbers to raise consumer awareness.

“HD radios¹⁸, manufactured by such companies as Boston Acoustics and Yamaha, have price tags in the \$300 range. (US) The only cars that come equipped with HD radios are high-end BMWs. Not surprisingly, the cost has stunted HD radio's growth. A recent Arbitron/Edison Media Research study found that more than one-third of Americans are interested in HD radio, but nearly half said they would only purchase an HD radio if it cost \$100 or less.”

New receivers are typically supported by subsidies to the manufacturer from the service provider, based on an anticipated subscription revenue stream. That's the model manufacturers have come to expect, and in its absence, they lose interest.

Since that model is very difficult for advertiser-supported media, the rollouts of DAB, HD-radio, and even DTV have been slow. In the United States, the government has agreed to a subsidy program for DTV receivers – a portion of the revenues it expects to make from spectrum auctions when the broadcasters drop their analog transmissions in 2009. Only in the UK have the new receivers taken off – backed by a wholesale offering of new free-to-air content choices and a local manufacturing industry. Even there, a form of subsidy is needed - the BBC's key contribution to the television offering, Freeview.

In part to address these issues, Ibiquity has been working on developing a conditional access system for HD-Radio, which would permit the addition of subscription revenue to the business model. Actual implementation in Ibiquity-licensed OEM hardware is not expected, however, until after 2006.

At the same time, Clear Channel is addressing the “choice” driver by producing programming for 75 new channels, “which will be made available to alternate media services that some broadcasters view as a threat to terrestrial radio. The original audio, video and text programming will provide a foundation for Internet channels, station websites, Ipods, satellite broadcasts, in-vehicle navigation systems and HD-Radio multicasts. Specifically, radio broadcasters can use the programming as-is for subscription services or can choose to supplement the elements, which include continually refreshed playlists, imaging and spoken-word vignettes, with their own locally customized content to create fully localized radio channels.”¹⁹

¹⁷ Strategic Content Management e-newsletter Jul 7, 2006

¹⁸ Boston Herald, 07/04/06

¹⁹ May 3rd, Radio Online

The HD-Radio Alliance will also be spending \$200 million this year to promote the benefits of HD-Radio to the public.

On the television side, the resistance of receiver manufacturers to the rollout of over-the-air digital has been interesting to observe. The FCC, in an effort to speed the transition and recover spectrum for auctioning, has insisted that DTV tuners be included in every set with an analog tuner. This was to proceed through the product line by size of set, but recently, noting the slow progress in getting OTA receivers to the public (as noted above, less than half of HDTV owners have any HD receiver, and fewer still have OTA DTV tuners) the FCC accelerated the requirement, so that all sets are required to have DTV tuners by March of 2007.

In another example of asymmetrical regulation, the mandate does not apply to other small screen video capable devices that do not receive analog broadcasting, even when they might be used to watch TV shows, such as PDAs, mobile phones iPods, etc.

In response to what they saw as a draconian measure – which added costs to their product line without increasing sales, the CEA president Gary Shapiro threatened, “Some manufacturers could opt to market monitor-only models that remove both digital and analog tuners, or stop manufacturing certain sets altogether”²⁰

Distributors

The rollout of interactive television, the “Cablecard” technology and even digital cable all show examples of inter-sectoral conflicts over new technology introductions involving television distributors.

Interactive TV and Cablecard

Interactive TV has been a problematic technology around the world. Embraced by the BBC and by Sky Digital in the UK, it has produced some results and spawned a significant amount of interactive programming of various kinds. In North America, however, it has not taken off, though most distributors have an offering of some kind. Its prospects, at least on the TV set, depend on a cross-sectoral solution being found – some kind of standard that will lower the cost of application development for producers and broadcasters. “OCAP” is the proposed standard for cable, but it has been very slow to deploy.

At least part of the problem with the standardized solution is that programmers want interactive applications to have secure control of the appliance (the set-top box) in a transparent way, but cable operators are most reluctant to lose control. The second issue is that, for consumer electronics manufacturers to be able to produce retail set-top boxes, the “interactive Cablecard” must be created. This is a device that would permit cable operators to control the services available to customers, including channel packages, PPV, VOD, etc., on Set-Top Boxes they do not distribute themselves. It would consist of a smart card inserted in a slot in an STB purchased at retail.

²⁰ “State of HDTV technology, 2006”

Brian Smith, of Philips, has represented the CE industry in the ongoing "Interactive Cable Ready" standard negotiations. He was interviewed in HDTV Magazine²¹ and noted that the negotiations have been, "Slow going. There are fundamental business issues on each side which conflict with each other and have not yet yielded to mutually satisfactory compromises even after almost 2 ½ years.

"Cable's fundamental business position is that their service is the entire collection of individual services, presented in the way they want them presented with little or no room for CE products to provide any value-added or differentiation. In effect, Cable wants a set-top box buried within the TV. CE manufacturers need the freedom to innovate and differentiate their products in order to compete with each other in the retail environment. This includes wanting a uniformity of user operation whether the viewer is watching cable, terrestrial broadcast or any other internal source."

..."Cable does not want to unduly delay commercial introduction of new applications to enable extended testing, but CE manufacturers are concerned about product robustness - which can be summed up as "TVs should not crash". Finding a middleground is a tough task. ...So far, Cable has not even implemented CableCARD for its own use and has consistently requested implementation delays from the FCC."

This interview is quoted at length because it illustrates how the devils in the details, encouraged by differing interests, can delay indefinitely the deployment of new media technologies and stifle innovation in new services – at least in situations where one of the conflicting parties cannot easily be bypassed.

Even partial success - the creation of the unidirectional cablecard, (which can only permit the authorization of packages, but not PPV, VoD, or anything requiring two-way communication) has actually turned out to be a disappointment.

- "Ironically, when many could tend to think that the cable companies were behind this (CableCARD) actually the unidirectional CableCARD approach was soon noticed by cable companies as a loss of revenue. Subscribers stopped buying bidirectional STBs, and with it gone was the opportunity of the cable company to make a profit with impulse PPV and VOD as friendly as clicking the remote control, because CableCARD did not allow it."²²
- Quoting the New York Times, the Strategic Content Management webletter reported, "While 6 million CableCard-ready digital TVs have been sold to consumers, only 170,000 sets — less than 3 percent — are actually using a CableCard device. The rest are receiving digital cable and HDTV programming the more familiar way, through the cable company's rented set-top box, the newspaper reported."

"Frustrated by the lack of consumer interest, many television manufacturers have sharply cut the number of CableCard-ready models. According to market research firm the Envisioneering Group, 80 percent fewer television models with CableCard are available this year than in 2005."

²¹ Wednesday, August 11, 2004

²² "State of HDTV technology, 2006"

“The Times said one factor may be a lack of incentives for cable companies to encourage CableCard use, since the companies collect monthly rental fees for set-top boxes and can also count each box as an asset on their balance sheets.”²³

Analog to Digital Conversion

Ironically, even the creation of new cable capacity from the conversion of subscribers to digital cable raises economic questions – for all sectors. Some broadcasters do not look kindly on a headlong rush into digital migration of their services, disrupting subscribers, marketing and current packaging arrangements, and causing a loss of subscriber revenue. But other broadcasters want new digital capacity for new services and HDTV.

Capacity is certainly an issue. Platforms like satellite DTH will have greater difficulty accommodating a full conversion to HDTV – if that is the future – particularly in Canada, where Ku-band capacity is already at a premium. Only the opening of a new satellite frequency band, with all of the delays and cost inherent in that move, can create enough orbital slots to manage all Canadian services. And even then, it is not clear that such a move would be economic. Ultimately, some services may never have a business model that justifies the additional cost of producing and distributing high definition content on all platforms.

In this context it was very strange to see one cable operator thoroughly rooted in the analog age. Outgoing Comcast CTO David Fellows, from the largest MSO in North America, said Comcast will still offer anywhere from 20 to 40 analog channels in five years – after all broadcast over the air has converted to digital.

“MSOs here see it as a competitive advantage. 'There's a saying that 'old TVs never die, they just move to the bedroom,' said Fellows. In the U.S. there are 2.5 to 3.5 TVs in the home but just 1.5 set top boxes, meaning there could be up to two televisions in the home without a set top box. To provide an STB to all customers like that would mean Comcast would have to buy 40 million set tops and 'if I can avoid buying 40 million set tops by keeping 40 analog channels, I'll do that,' he said.”²⁴

Cable companies may be able to add capacity in other ways, of course, such as the technology of “switched broadcast via IP”, in which channels that are not being watched are not carried on the network until requested by a viewer. This can save up to 60% of a cable company’s capacity, according to proponents.

ISPs

The new stance of ISPs raises the thorny question of “network neutrality”. After some years of general belief that, “the Internet cannot be regulated”, the public has come to realize what engineers already knew, namely that Internet Service Providers have access to traffic management tools that permit them to close down access to sites, sources of video and audio, or even “choke” capacity, so that a user may have limited, low-quality access to some sources and good access to others.

²³ Strategic Content Management e-newsletter, Jul 7, 2006

²⁴ CARTT Jun 22 2006

These tools permit the ISP to charge for higher bandwidth use – not simply to consumers, but, as recently debated in the US, also to the providers of content being carried on their service. That is, a provider like Google or a broadcaster or YouTube could be told that they must pay for sufficient capacity to allow their users to download video.

This has been the source of heated debate in the United States Congress and some comment in Canada, since it would fundamentally alter the nature of the Internet value chain, introducing a gatekeeper of content where previously content flowed freely. To some, failing to respect network neutrality on the Internet is a “freedom of speech” issue; and at a minimum, is seen by many observers as a real inhibition to innovation and technology adoption.

Under this scenario, ISPS begin to resemble cable companies, in that they would limit consumer access to services with which they have affiliation agreements. Since many high-speed ISPs are affiliated with BDUs, this is not too surprising. As the technologies come to resemble one another over time, the definition of “broadcasting over the Internet” may need to be redefined to distinguish not a certain form of technical delivery, but rather to exclude certain kinds of behaviour, such as this kind of gatekeeping for commercial purposes.

In other respects, however, ISPs act as classic new entrants, bypassing the value chains established by other players, even to the extent of using their “neutral network” status to permit the illegal downloading of rights-protected content on their networks – a very sore point for the music and now the video industries.

A form of bypass of particular concern to radio operators is the widespread provision of wireless networks, which make Internet radio stations available in many new places, bypassing the radio value chain and all regulation. For example, a subsidiary of Toronto Hydro will shortly provide access to six square kilometers of Toronto’s downtown core, an initiative similar to other cities that see access as a public utility. Like some other similar developments,

“The initiative is being driven by external considerations: the availability of a massively underused fibre network (at 2% capacity, according to Toronto Hydro Telecom president Dave Dobbin) and Hydro’s need for a wireless network to monitor “smart electricity meters” mandated for all homes in Ontario by 2010²⁵.”

Network architectures

There is a limiting factor in the use of ISPs as video and audio delivery vehicles, however, and that is that the network architecture appropriate to most Internet uses is very inefficient – probably totally uneconomic – when it comes to serving mass audiences with broadcast-type content.

Almost all internet connections are one-to-one, while broadcast connections, as the name suggests, are one-to-many. Adding television viewers to the audience for a program does not strain a cable, satellite, or over-the-air network – but ISP service

25 Backbone, May/June 2006

would collapse if millions of viewers tried to connect to the same video at the same time, because millions of connections, requiring millions of times the bandwidth, would be needed²⁶.

Thus, even though we are impressed by announcements that 250,000 viewers streamed the rejected TV Pilot, “The Adventures of Big Handsome Guy and his Little Friend” from break.com, 250,000 viewers is actually quite a small number compared to a top-rated show’s audience of 20 million or more simultaneous viewers (US numbers). Even while ISPs can increase the speed to the home for individual users – Rogers has announced it will make 18 Mbps available – there are significant bottlenecks in the Internet as a whole for this kind of use, because of its inherent architecture.

Does it make sense to change the Internet fundamentally to accommodate mass use of high-bandwidth content? Probably not – not when broadcast networks are available and do a better job. That’s why mobile phone companies are expected to adopt mobile broadcast technologies – DVB-H and DMB – to get broadcast content to their subscriber, and move this traffic away from the spectrum used for data and voice²⁷.

Broadcasters

Broadcasters are among the players in the value chain who can be bypassed by the creation of new technology “paths” to the consumer. Moreover, the smaller the broadcaster, the more vulnerable they are to these developments. At one time, the territorial limitations of spectrum gave even small independent broadcasters clear protection in their markets, but the arrival of satellite and then the Internet have created new paths to the consumer that go “around” broadcasters, and reduce the value of the rights they have purchased from other players in the chain. Newer technologies exacerbate these problems for small and large broadcasters alike.

PVRs

Ever since their introduction, broadcasters have seen personal video recorders as a potential threat to the advertising revenue. The experience of their use, now that they are deployed more widely, has led to less catastrophic predictions. Nielsen Research in the United States began ratings including DVR usage in late 2005, (with a sample working toward the 7% of US population with the device – in Canada the current measurement is 4% among anglophones, 2% among francophones²⁸) and reported that usage tended to boost top network shows. Network executives more recently have been bullish on the lack of impact on the value of commercials. However, analyst Tom Wolzien of Bernstein Research, notes “Ad-skipping is expected to lead to losses of 6 per cent in US TV annual advertising revenues in 2009.”²⁹ A recent McKinsey study advises

26 Technology exists to alleviate the problem to some extent on IP-based networks. Known as “multicast”, this message transfer technology would permit, for example, a single stream of video to flow from Los Angeles to Toronto, where it would branch into several streams for different parts of the city, yet more streams to reach the neighbourhood, and finally, branch into a single stream to reach each of the viewers of the program. However, because this technology has a number of problems and would require much upgrading of the Internet’s core routers, it has not been deployed for public use to any extent.

27 In the “MobiTV technology used now for mobile TV, all traffic is carried in the spectrum used by telephony.

28 See Appendix 3, data supplied by CBC/Radio-Canada Research,

29 Quoted in ‘The end of TV as we know it’, a 2006 study from IBM

advertisers that TV advertising will be significantly less effective by 2010, due to several factors including PVRs – but also citing ad saturation due to multiple choices and decreased attention due to multitasking by viewers.³⁰

For distributors, however, a PVR and its accompanying EPG service is a source of new revenue, and most took them up with enthusiasm, in spite of the lawsuits launched against the technology by program rights holders in the United States. The use of PVRs puts a kind of Video-on-Demand functionality in the hands of consumers, and is workable for satellite television distributors in a way that networked VoD is not. Since a fee can be obtained for the PVR service – the guide and the hardware – there is some value-added in this for the distributor. Recognizing that this is a losing battle, some broadcasters have also begun to try to exploit the technology to offer video on demand.

All the major Canadian BDUs sell or rent PVRs, in standard or high definition, while abroad:

- “Few can now doubt that James Murdoch’s forecast that some 25% of Sky subscribers will own a Sky+ device [ed. PVR] by 2010 is probably an understatement. They are selling like hotcakes.”³¹
- Microsoft is hooking up with TiVo to deliver recorded television to a variety of devices dunning the mobile variant of Windows Media Player 10, and allying with a number of US broadcasters to provide a video downloads services to mobile devices.
- Thomson also supplies a FreeView PVR with Top-up TV, and a version incorporating a recordable DVD drive in 2006.
- The DirecTV Home Media Centre includes a PVR, but is also a home media gateway, capable of networking all kinds of media among television receivers in the home. It supports high definition (HD) and standard definition signals. Through software and a broadband connection, the unit supports personal computer connectivity, scheduling DVR recordings from the Internet, photos from wireless phones and video-on-demand. It is also MPEG-4 compatible.

Over-the-air digital

The history of the PVR shows that broadcasters, and producers as well, are the parts of the value chain that are most easily bypassed. Their ability to impede technical innovations is not strong – though they have resisted HD in some cases because of the absence of a business model, it is generally accepted as inevitable for regulatory reasons.

Over-the-air digital is another case – analog works quite well for broadcasters, and so far no one has made economically advantageous use of digital over-the-air transmission outside of the UK. USDTV, which was attempting to market a subscription television service using DTV, recently filed for bankruptcy, mirroring OnDigital, which did the same in the UK before the BBC started Freeview.

30 AdAge, August, 2006

31 Chris Forrester, Digital News, Feb. 2005

The legacy of analog TV sets and viewers is, in this sense, both a burden and an opportunity. There is no obvious winning solution for converting the 12% of Canadians who rely totally on over-the-air television to digital reception. Yet these viewers represent a kind of advantage for conventional TV, though it is not generally regarded as economically important. If they could be converted to digital, they might represent a greater advantage, but it is clear that broadcasters would not have the assistance of any other members of the value chain in doing that, and will encounter resistance from others – notably distributors (who would like them as customers).

Producers

The main issue for producers is the protection and exploitation of rights. However, they have been even more vulnerable to bypass than broadcasters.

The perceived need to exploit new rights across a variety of platforms as they develop has, in general, led content owners to try to delay the deployment of new technologies until they can settle all the issues and get negotiated or mandated solutions.

For music producers, the delay was disastrous, as the technology moved ahead without them and led to a massive movement toward downloading of music and video with no payment. A new model based on digital rights management and copy protection, leading to legal download, shows some promise – but the amount of illegal downloading does not seem to have abated significantly.

All of the above consumer drivers show that the demand for content across platforms, perhaps seamlessly in the future, makes the whole question of separate rights for different platforms moot. The exploitation of content across different platforms for the re-aggregation of audiences seems to be a necessity, moving forward, and it is likely that a simpler regime of rights, permitting multi-platform exploitation, is also going to be necessary.

Doesn't Work for Public Policy

In Canada, there do not appear to have been any examples of new media technologies having their adoption inhibited by public policy, though some have had “managed” development for policy reasons.

Traditionally, public policy has operated to ensure that it could work through new technologies. There were significant public investments in radio, television, and communications satellites, and early intervention in those technologies to ensure that Canadians could receive Canadian content on each of those platforms. In addition, both cable and satellite were regulated from their inception to ensure that the gate-keeping (i.e. the deliberate selection of services to be offered to the public) potential of those platforms would be used for public interest purposes as well as purely commercial interests.

More recently, the trend has been to encourage new technologies without the same degree of intervention to ensure provision of Canadian services and programming. Measures to encourage investment in broadband Internet infrastructure, combined with

the “hands-off” approach of the CRTC’s New Media Exemption Order, have been a step away from an approach in which the distribution of Canadian services is a paramount objective to be protected.

The Commission’s decision to license satellite subscription radio with different conditions from terrestrial subscription radio was, of course, coloured by the fact that Canada had not made any investment, nor secured appropriate spectrum, for the delivery of a domestic service on this platform – unlike DTH, which benefited from the earlier investment in communications satellites.

And most recently, the decision and further proposal to exempt television delivered to the cell phone from licensing, and hence any public policy obligations has been widely seen as a seismic shift in regulatory policy – in which, at least for some new platforms and players, the goals and strictures of the *Broadcasting Act* are not applicable.

This approach is not universal, however. The Commission’s recent decision on a framework for high-definition specialty services contained a number of measures designed to encourage the provision of more high-definition programming – including Canadian programming – by, in effect, removing protective interventions (access to BDU carriage and protection from competitive licensing in their genres) from services that did not reach certain thresholds in the HD world.

Many jurisdictions around the world have taken a different approach. In Europe, mobile television services are to be subject to the same licensing regime as other broadcast services. There has been significant public investment in, and encouragement for the new terrestrial digital radio and television platforms to try to ensure the success of domestic broadcasters in those difficult areas.

High-definition has not, until very recently, been a significant part of the European approach to new services, and even now, with growing interest in the technology, it is largely a matter to be left to the marketplace, rather than to interventionist measures.

There has, however, been intervention of another kind in government’s involvement in the creation of technical standards for the new platforms.. The motivation for government’s involvement has been various – from an industrial strategy to encourage European industry, to protection of the consumer, to providing a basis to ensure fair competition in the media marketplace. Nor has it been heavy-handed: by and large government has insisted that standards be put in place, but has left the development of those standards to industry.

Section 5 –Policy intervention and technology

Summary to this Point

The principal themes of this analysis of the evolution of audio-visual technology are these:

- Technology has always shaped the value chains of electronic media delivery. While this is not always obvious, the current period of rapid change is introducing disruptive changes in the broadcasting system which require rapid adaptation by all players.
- The consumer drivers for change continue to be strong. Combined with the powerful digital tools for new invention available to the consumer electronics industry, the industry must anticipate, not a simple transition to a new period of stability, but an extended period of continuous change.
- In particular, the drives for greater choice, for seamless availability of content, and for increasing interaction with content must be respected.
 - Choice: All media compete with each other for the consumer's attention, and the proliferation of choice will, at a minimum, fragment and reduce the audience for existing services delivered on traditional platforms. In cases where the new media provide a clear direct replacement for existing media, the impact will be much greater.
 - Availability: The technologies being created to meet these consumer needs will drive the increasing use of new mobile delivery platforms – and ultimately demand for integration of the media experience across those platforms.
- Technology changes will not automatically result in an open and competitive marketplace. Barriers to change also exist. In particular, players in the system who exert “gate-keeping” power over the distribution of services will naturally seek to retain this position, and many have the tools to do so.
 - When technology adaptation is very complex, as in the case of interactivity combined with television, for example, the technical standards needed to move the whole system forward have been very difficult to achieve.
- Intervention in the media value chain in Canada has traditionally made use of the particular characteristics of media technology to further public policy goals.
 - Through encouragement of and investment in distribution infrastructure (radio, television, satellite);
 - Through investment in programming;
 - And through regulation to protect markets so that Canadian services could support Canadian programming.
- In recent years, public policy intervention has become increasingly asymmetrical
 - Regulating traditional players but not new platforms, so that market protections are eroded but obligations remain.

Innovation in Policy Intervention

The purpose of this paper is not to prescribe new regulatory or policy measures, but to describe the elements of technology change that need consideration in the development of a new framework.

In that limited sense, it is prescriptive, since it is clear that current approaches will not address the demands of a continuously evolving set of value chains, and therefore the first conclusion is that new approaches are needed.

Elements Needing Consideration

- **A more thorough understanding of technology.** In the past, successful interventions have been based on the particular characteristics of the technologies deployed. This is still true – but when technologies are new, it is easy for simple, but misleading, conclusions about them to be accepted.
 - “The Internet cannot be regulated”, seemed to be true, but it later became evident that ISPs have tools to control service delivery and are prepared to use them in their commercial interests. Whether or not broadcasting on the Internet should be regulated – if only to ensure network neutrality – is still a good question, however.
 - Equally, other providers of broadcast services have claimed that they are providing services over the “Internet”, and should therefore be exempt from licensing and obligations. Clearly, to determine the correct approach to such services demands a clearer understanding of what we mean by “the Internet”, at least in this context, and why different means of distribution should be regulated differently.
 - “Spectrum scarcity has ceased to exist, so regulation is unnecessary”, is another common statement. Why then, are governments concerned to convert over-the-air television to digital, if not to solve a problem of spectrum scarcity? Why are new players such as telephone companies pressing for rapid access to the spectrum, if it isn’t scarce? Why are we concerned about capacity for high-definition? Spectrum scarcity was never the justification for most broadcast regulation in Canada in any case, but was and may remain both a limiting factor and one of the tools by which market protection can be managed.

Tools for regulatory intervention are still available, in spite of glib assertions about new technology. Whether one is in favour of maintaining regulation and obligations, or in favour of gradual deregulation of the system, understanding the technologies, and what regulatory tools may be applied, is essential.

- **Understanding the impact of technology on fair competition**
 - A marketplace with no intervention may be a fair and competitive marketplace, or it may be a marketplace that tends toward monopoly or oligopoly. New technology may create an open value chain, with many players able to reach the public, or it may give certain players the ability to control the marketplace.

- A hands-off approach may even stifle innovation, preventing technical advances and new services, just as surely as over-eager intervention in the marketplace.
- Again, an understanding of the effect of technology change on the value chain is needed.
- **A new approach to the flow of rights and revenues in the value chain**
 - Traditionally, rights have been segmented and dealt with separately according to territory, delivery platform, and an orderly succession of time “windows”.
 - The proliferation of platforms and the drive to greater choice has created a level of fragmentation so profound that, unless it becomes possible to re-integrate audiences across platforms, it will be impossible to afford quality professional content, certainly for the Canadian domestic market.
 - The drive toward seamless availability from the consumer also suggests that a new approach to the segmentation of rights across platforms should be considered.
 - Meanwhile, the ability of existing and new technologies to disrupt the territorial segmentation of rights demands a new approach to revenue models.
 - One example is the severely reduced ability of local television broadcasters to monetize the program rights they have acquired for their markets when out-of-market signals abrogate those rights. Such situations demand that we consider the business model for affected players and how it may be improved, if they are to continue to provide valuable service to their local territories.
- **A vision of the whole**
 - Perfect symmetry in policy interventions is not required or possible. However, a degree of consistency, predictability, and the avoidance of disparities that can develop through the arrival of disruptive technologies, is needed to reduce strains between players in the value chain for the delivery of Canadian content.
 - Policy interventions need to be guided by a common understanding of what the system of electronic media delivery in Canada – including but not limited to traditional broadcasting – is expected to accomplish.
 - This is true whether or not one accepts the continued validity of the goals of the *Broadcasting Act*, and is looking for new means to fulfill them; or whether one rejects the need for a distinctly Canadian culture and is simply seeking fair economic regulation. Policy intervention will be required in either case, and can only be consistent and fair if it is guided by agreed goals and operating principles.

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