

MA MAJOR RESEARCH PAPER

**THE TRANSITION TO HIGH DEFINITION IN ENGLISH CANADIAN  
BROADCASTING:  
CHALLENGES AND OPPORTUNITIES IN A CHANGING MEDIA ENVIRONMENT**

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## TABLE OF CONTENTS

<b>TABLE OF CONTENTS.....</b>	<b>1</b>
<b>CHAPTER 1- INTRODUCTION .....</b>	<b>3</b>
<b>CHAPTER 2- LITERATURE REVIEW .....</b>	<b>6</b>
HISTORICAL PERSPECTIVE.....	6
POLICY PERSPECTIVE .....	8
TECHNOLOGY PERSPECTIVE .....	11
SOCIOLOGICAL PERSPECTIVE .....	11
<b>CHAPTER 3- METHODOLOGY .....</b>	<b>14</b>
INTERPRETIVE PARADIGM .....	14
ETHNOGRAPHIC METHODS .....	15
POLICY RESEARCH.....	15
PURPOSIVE SAMPLING .....	16
INTERVIEW SUBJECTS.....	18
SAMPLING DISADVANTAGES .....	20
<b>CHAPTER 4 - WHAT IS HDTV? .....</b>	<b>21</b>
HD IN THE HOME.....	22
COMPRESSION TECHNOLOGIES .....	22
IMAGE RESOLUTION .....	24
ASPECT RATIO .....	26
DOLBY DIGITAL AUDIO .....	26
<b>CHAPTER 5- DEVELOPMENT HISTORY OF HDTV .....</b>	<b>28</b>
JAPAN.....	28
EUROPE.....	30
UNITED STATES .....	32
<b>CHAPTER 6- COMPARISON OF THE POLICY REGULATIONS IN THE.....</b>	<b>35</b>
<b>UNITED STATES AND CANADA .....</b>	<b>35</b>
FCC POLICY.....	35
CRTC POLICY.....	37
<b>CHAPTER 7- THE ENGLISH CANADIAN TELEVISION INDUSTRY .....</b>	<b>40</b>
ENGLISH LANGUAGE PRIVATE TELEVISION SECTOR.....	40
ADVANCES IN NEW TECHNOLOGIES.....	42
CHANGING BUSINESS MODELS.....	43
<b>CHAPTER 8 - CONVENTIONAL ENGLISH LANGUAGE BROADCASTERS .....</b>	<b>46</b>
CBC TELEVISION .....	47
CTV INC. ....	48
CHUM LIMITED.....	50
CANWEST GLOBAL .....	51
CHALLENGES FACED BY CANADIAN CONVENTIONAL NETWORKS.....	53
OPPORTUNITIES FOR CANADIAN CONVENTIONAL NETWORKS .....	60
<b>CHAPTER 9- SPECIALTY HD BROADCASTERS AND CONTENT PRODUCERS.....</b>	<b>63</b>
DISCOVERY HD THEATRE.....	63
HIGH FIDELITY HDTV .....	64
CONTENT PRODUCERS .....	64
CHALLENGES AND OPPORTUNITIES FOR SPECIALTY HD BROADCASTERS AND CONTENT PRODUCERS .....	65

<b>CHAPTER 10 – SPORTS BROADCASTERS .....</b>	<b>70</b>
TSN .....	70
ROGERS SPORTSNET.....	71
CBC SPORTS .....	72
CHALLENGES AND OPPORTUNITIES FOR SPORTS BROADCASTERS.....	73
<b>CHAPTER 11 – BROADCAST DISTRIBUTION UNDERTAKINGS.....</b>	<b>79</b>
ROGERS CABLE.....	79
BELL EXPRESSVU.....	80
<b>CHAPTER 12 – CONCLUSION .....</b>	<b>84</b>
<b>REFERENCES.....</b>	<b>88</b>
<b>LIST OF ABBREVIATIONS.....</b>	<b>94</b>
<b>APPENDIX.....</b>	<b>95</b>
APPENDIX 1- CONVENTIONAL NETWORKS INTERVIEWED WITH SIGNIFICANT OWNERSHIP INTEREST IN SPECIALTY, PAY, PPV AND VOD SERVICES AS OF 31 DECEMBER 2006.....	95
APPENDIX 2 – COMPARISON OF APPROXIMATE COSTS FOR VARIOUS PROFESSIONAL BROADCAST EQUIPMENT AS OF FEBRUARY 2007.....	98
APPENDIX 3- TSN PROGRAMMING IN HD, 2007 .....	99
APPENDIX 4- TOP CANADIAN DISTRIBUTORS AND THE NUMBER OF SUBSCRIBERS .....	100

## **CHAPTER 1- INTRODUCTION**

This Major Research Paper sets out to provide an overview of the transition to High Definition television broadcasting from a Canadian perspective using a variety of research methods including interviews with executives from Canada's top media companies, policy research and case studies. This paper will illustrate how the transition to digital television and High Definition (HDTV) technology will fundamentally change the way a television program is produced, broadcast, distributed, and viewed by the audience. It is anticipated that this changeover will significantly alter the economic business models of broadcasters, producers, and broadcast distribution undertakings. It will also affect programming services, while completely restructuring the technical infrastructure of the industry. Therefore, the significance of this changeover has been compared by many as being similar to the switch from black and white to colour television in the 1950s (Brace, 2007; Brinkley, 1997; Galperin, 2004; Hart, 2004; Heidendahl, 2007).

The development of digital television and HDTV was originally spurred by a nationalistic competition between different countries, but more importantly out of a necessity to utilize the broadcast spectrum more efficiently. Digital television addressed this issue since digital signals require less bandwidth than analog signals. The most obvious difference between HDTV and standard definition is that High Definition offers a significantly higher quality picture and sound in a wide screen 16x9 aspect ratio (Hart, 2004).

As will be noted in the literature review, the research in this area generally concentrates on the changeover in the United States, Asia and European countries. There has not been a lot of scholarly attention devoted to the adoption of high definition technologies in Canada, as Canadian challenges and opportunities are often combined with the U.S. discussions on HD. Therefore, it is clear that there is a need to extend the analytical scope of qualitative research and concentrate on

the transition to HDTV from a Canadian perspective using examples of Canadian conventional television networks, specialty and sports broadcasters, content producers and broadcast distribution undertakings. As well as studying the Canadian audience and consumer adoption trends in order to better predict the changeover to HD.

It is also important to differentiate the English Canadian broadcast industry from the United States, because while we share a common language, we have different regulatory policies, programming initiatives and economic models. From an academic perspective, it is crucial to study the historical developments of a new technology because once it has become the norm in society; others will want to try to understand its beginnings. Therefore, the research can complement the investigation of high definition technology in Canada, and provide further information to academics interested in this topic area.

The paper will study the historical development of HDTV across different countries. It will compare how the regulatory policies set by the Federal Communications Commission (FCC) and the Canadian Radio-television Telecommunications Commission (CRTC) have affected the broadcast industry's transition in each country, as well as examine the current state of the English Canadian television industry. Furthermore, it will set out the challenges and opportunities faced by the conventional English Canadian networks, specialty HD broadcasters, content producers, sports broadcasters and broadcast distribution undertakings and study their impact on the media environment as a whole.

Over the past few years, the adoption of HDTV in the Canadian media industry has varied with each sector. Manufacturers and the consumer electronics market accepted it quickly because wide screen HD sets could be sold at a premium price (Keeble, 2006). Conventional broadcasters have been slower to adopt the new technology since increases in production costs and technical restructuring are substantial and no new revenue will be attained from the conversion. The

economic business models do not work in favour of the broadcasters since audiences are still relatively low when compared to standard television. Thus advertising revenues are decreasing and as a result, conventional broadcasters are not encouraged to change over.

By comparison, networks in the United States were given little choice in the matter since the FCC demanded that broadcasters switch to digital transmission and HDTV. As a result of the strict policy mandates set by the FCC, the U.S. networks produce many more hours of HD programming compared to the Canadian industry and therefore could overwhelm the English Canadian system if broadcasters and content producers continue to lag behind.

However, some specialty channel providers recognized the niche markets in HDTV and started up general interest, sports, movies and natural science documentary channels to satisfy the sophisticated HD viewer. This is a promising step for the Canadian industry, since HD content production has increased to 15% (Dillon, 2007). Broadcast distribution undertakings initially opposed High Definition due to its large capacity demands, but have embraced it once they recognized the selling point of HDTV, which translates to an increase in subscription revenues.

While there are many challenges to overcome, HD offers early adopters an opportunity to reach out to a new segment of the population and should be viewed as a welcome addition to the Canadian television industry. Finally, the paper will attempt to answer the question “Who really benefits from the transition to HD? Is it the broadcasters, the content producers, the broadcast distribution undertakings, the manufacturing industry or the Canadian audience?”

## CHAPTER 2- LITERATURE REVIEW

The transition to High Definition technologies in Canada has faced many of the same obstacles as other countries around the world, however the Canadian academic community has largely ignored it. Most of the central themes in the literature have been concerned with situating High Definition in a historical context and comparing the status of the transition in various countries (Brinkley, 1997; Dupagne & Seel, 1998). However, some more recent books have placed increased attention on the economics of the business and the policy initiatives which impede or aide the situation in North America and overseas (Forrester, 2000; Galperin, 2004; Griffiths, 2003; Hart, 2004)

Generally, the journal articles have taken a sociological point of view conducting studies about audience adoption factors and their enhanced viewing experience with HDTV (Bracken, 2005; Chan-Olmsted & Chang, 2006) Furthermore, other researchers have adopted a technological perspective, which try to explain the new and emergent technology (Dupagne & Seel, 2007; Lundstrom, 2006). However, one consistent factor in all the reviewed literature is that they primarily concentrate on the transition to High Definition in the United States, Europe and Japan. Therefore it is important for this Major Research Paper to focus on Canadian policy issues, the economic and business perspective of Canadian broadcasters and the social and cultural implications that HDTV can have on the Canadian audience.

### Historical perspective

Brinkley's *Defining Vision: How Broadcasters Lured the Government into Inciting a Revolution in Television* (1997) and Dupagne & Seel's *High Definition Television: A Global Perspective* (1998) are seminal pieces of literature in this area. Brinkley (1997) took a historical

approach in studying the birth of high definition technology in the United States and Japan, while Dupagne & Seel (1998) focused on the European market as well.

Brinkley (1997) conducted interpretive research by interviewing the key players in the manufacturing industry including Zenith, RCA, Philips, Sarnoff Research Group, General Instruments and AT&T; policy personnel from the FCC and the Advisory Committee and lobbying organizations such as the National Association of Broadcasters (NAB) in order to examine the complex boardroom deals, the bureaucracy and the technocracy involved in the development of HDTV. Many Americans believed that not competing in the HDTV market would be synonymous to abandoning the U.S.'s position as a leader in the manufacturing and military industries (Brinkley, 1997).

His methodology is comparable to my own since I am also conducting face-to-face interviews with media executives. However, our research differs in that Brinkley (1997) described each person involved and gave his interviewees a sense of character and personality whereas this paper seeks to provide an overview of the transition to HD through a collection of individual experiences by each company.

Furthermore, Dupagne and Seel (1998) agreed with Brinkley's arguments that the Japanese manufacturing industry encountered many problems from the international community in their efforts to promote their analog High Definition system, called Hi-Vision/MUSE as a world standard. However, Dupagne & Seel's (1998) main contribution is that they also looked at the global marketplace. The purpose of their book was to make sense of the technological and political changes that were occurring during that time by using the development of HDTV as a case study (Dupagne & Seel, 1998).



## Policy Perspective

A number of more recent books and academic studies examined the HDTV transition from a policy perspective (Castaneda, 2007; Forrester, 2000; Galperin, 2004; Griffiths, 2003; Hart, 2004). The literature was generally situated within a political and economic context that had set out to discover the vested economic and political interests of the various regulatory bodies and the high tech industries that drive the technology adoption process.

Hart's (2004) *Technology, Television and Competition: The Politics of Digital TV* studied the regulatory environment within which HDTV was introduced in the United States and compared it with situations in Britain, Germany, France, Italy and Japan. Hart (2004) argued that except for the United States, the other countries each have state-owned or state dominated public broadcasters, which were highly influential in driving the digital transition forward (p. 57). However, private broadcasters dominated the U.S. regulatory system, and as a result the transition has been slower (Hart, 2004, p. 57). Hart (2004) also situated his research within the convergence of digital technologies and argued that there is currently an amalgamation of different platforms and technologies such as computer, consumer electronics and entertainment industries, which was not possible before the transition to digital technologies (p. 2). This is also the case in the Canadian industry, as the changing media environment has added to the challenges of the transition.

On the other hand, British author, Hernan Galperin (2004) provided readers with a comparative analysis of the transition in the United States and the United Kingdom. The book *New Television, Old Politics: The Transition to Digital TV in the United States and Britain*, set out to tackle a number of different issues regarding the impact of political factors on markets and the impact of technological change on regulatory regimes. Galperin (2004) and Hart (2004) both

agreed that the transition to High Definition was part of a long process of technological innovations and industrial restructuring that went as far back as the 1960s, when broadcasters first started looking at improving the picture quality. There is also no doubt that the decline of the U.S. and European market share in the electronics industry contributed to a push towards regaining lost ground by taking up a significant role in High Definition.

Galperin's comparison showed the massive pressure exerted by the transition on both governments to revise their aging regulatory systems. According to Galperin (2004), the transition to digital had gone smoother in Britain because the policy regulators took an aggressive approach in promoting competition between television services while defending the public service broadcaster (p. 23). Meanwhile, in the United States, there was a reinforcement of existing oligopolies and minor broadcast regime changes, which resulted in policy gridlocks (Galperin, 2004, p. 23).

Forrester (2000) and Griffiths (2003) covered the business case for digital television. Forrester (2000) also conducted interviews as his methodology and offered several examples of broadcaster's capital expenditures on equipment and network build-outs. In his book, Forrester (2000) argued that some smaller market stations would fall into bankruptcy while trying to fulfill the mandate set by the government to transition to digital technologies. Forrester (2000) also makes the case that auctioning off of the analog spectrum is the true economic driver behind the push for digital technology in the United States since the U.S. government stands to gain new revenue opportunities after the spectrum is reused by non-broadcast technologies (p. 53).

The main contribution of the research is the final chapter, which offered future predictions as to the road ahead for this new technology. Forrester (2000) maintained that until the prices dropped for the equipment, consumers will be reluctant to adopt the new technology, and therefore, it would be consumers, and not the technology that will determine the future of the

entertainment environment (p. 241). The author's position is against the technological deterministic view, which states that technology directly affects social change (Williams, 2003).

Meanwhile, Griffiths (2003) took a broader approach and analyzed the current media environment taking into consideration the Internet, DVDs, PVRs, text messaging and music downloading all of which offer alternatives to traditional television viewing time. Therefore, Griffiths (2003) argued that television as we know it, is dead and the future will be moving towards companies who are able to specialize in branded electronic content (p. 20).

The challenges and opportunities of digital technologies have a significant impact on how money is made and lost in the television industry. As a result, Griffiths (2003) examined the advertising industry, one of the cornerstones of the traditional business model for television. However, Griffiths (2003) found that advertisers were losing money due to a paradigm shift in how people consumed media products. In particular, young people are promiscuous in their television viewing habits, because they do not stick to program schedules, use several media at the same time and are attracted to content that they can participate in (Griffiths, 2003, p. 34). As a result, a new model must be taken into consideration for the advertising and television industries alike in order to stay profitable.

Finally, Castaneda (2007) disagreed with Brinkley's assumption that digital television emerged from the industry's desire to enhance the picture quality (p. 93). Instead, she stated that digital technologies were highly influenced by military strategy and that at the height of the Cold War, the U.S. Department of Defense was seeking out better resolution systems for its bombers and training facilities (Castaneda, 2007, p. 93).

Castaneda (2007) compared the transition to digital with the changeover from black and white to colour television. She argued that colour television had similar problems as the digital transition, because the global market expansion of consumer electronics was at stake after World

War II (Castaneda, 2007, p. 92). While European countries and the U.S. each wanted to control the export market for televisions in the 1950s, the longstanding divisions, along with industrial and political interests made it impossible for them to agree on a single colour television standard, thus the NTSC, PAL and SECAM standards were born. Similarly, the innovation of digital television and HDTV had caused strained relationships in the global marketplace, as each country would like to create new commercial opportunities for their economies. Therefore, according to Castaneda (2007), the transition has not been successful because the government and the industry are failing to recognize digital television as an entirely new system (p. 102).

### **Technology perspective**

Changes in technology certainly offer broadcasters, distributors and content producers many different challenges when a new product is introduced. HDTV has not been an exception to this rule and the earliest books on High Definition technology were seminal works, which provided significant insight into the new technology. Evans' *Understanding Digital Television: The Route to HDTV* (1995) and Prentiss' *HDTV: High Definition Television* (1994) were generally written for the engineering and broadcast community who needed to learn the basics of High Definition technology. However, more recently, *Understanding Digital Television* by Lundstrom (2006) tackled some of the basic technical differences between High Definition and standard definition technology. This book applied a case study model by providing a comparison between Nordic countries and the United States and is useful for explaining many of the key terms regarding the technology (Lundstrom, 2006).

### **Sociological perspective**

While subsequent research studies traced the roots of HDTV and its economic implications, it is also important to study the sociological changes that HDTV can have on the

audience. A number of quantitative research studies have focused their attention on the social, cultural and psychological implications that HDTV has on the audience (Atkin et. al, 2003; Bracken; 2005; Chan-Olmsted & Chang, 2006; Dupagne, 1999).

Audience adoption studies include looking at problems of consumer awareness, perception and knowledge of High Definition (Atkin et. al., 2003; Chan-Olmsted & Chang, 2006; Dupagne, 1999). Generally, the research was consistent with Rogers' diffusion theory, which states that adoption of new services is a function of one's innovativeness and willingness to try new things (Rogers, 1995). Dupagne (1999) and Atkin et. al. (2003) both found that adoption of digital television was positively related to education, income, the male gender, newspaper usage and the importance of picture sharpness, yet negatively related to age.

Dupagne's (1999) study on the characteristics of HDTV adopters was the first of its kind and found that 98% of those surveyed felt that HDTV was superior to NTSC. It also discovered that sports viewers had significantly higher adoption rates, therefore proving that content was an important buying decision. He stated that consumer demand will be influenced by price, programming availability, consumer expectations, availability of related video products and consumer income, and is consistent with the microeconomic theory, which posits that market demand for a product depends on many factors (Dupagne, 1999, p. 37). Meanwhile, Atkin et. al. (2003) also reported findings that adopters tended to be more adventurous as consumers, less rigid and more likely to take risks in order to satisfy their intrinsic needs (p. 170).

However, more recently, researchers found that there is still a lot of confusion in the education of HDTV. Chan-Olmsted & Chang (2006) found that consumers still had many misconceptions about digital television and HDTV. For those that were aware of the technology it was often correlated to personality traits set out by Ostlund (as cited in Chan-Olmsted & Chang, 2006) such as 'venturesome ness', 'innovativeness', 'social integration' and 'privileged ness' and

Internet usage. The authors also found some inconsistencies with Dupagne (1999), regarding what makes the best predictors of the intention to adopt DTV. According to Chan-Olmsted & Chang (2006), while the desire for larger screen sizes and picture quality linked with a higher income are still present, broadband access and knowledge of the digital television environment were the best predictors in the intention to adopt digital television.

The final research study conducted by Bracken (2005) was situated within a psychological point of view, which followed how HDTV changed the way people viewed television. This qualitative study consisted of people watching programming in either High Definition or standard definition and then rating their viewing experiences on a questionnaire. The results showed that HDTV provided the audience with a greater sense of presence and feeling of 'being there' (Bracken, 2005, p. 202). This study has important implications in the marketing and advertising arena since advertisers have been the slowest to change their commercials over to high definition, even though most are produced on 35mm film and it would be an easy transition. However, they should recognize the psychological implications of viewing commercials in High Definition versus standard definition.

## **CHAPTER 3- METHODOLOGY**

The Major Research Paper utilizes original interdisciplinary research, which can add to the investigation of High Definition broadcasting in Canada. This paper will be appealing for media industry personnel, and useful for students in the communications field, as well as people who are interested in the transition to HD technology in Canada. The paper is situated as historically current until September 2007.

The methodology will rely on a combination of different qualitative methods, such as interviews and policy research. Qualitative methods will be used, instead of quantitative ones because I am interested in finding out people's opinions and experiences in various topics relating to HDTV. Researchers in this method seek to protect the form and content of human behaviour while analyzing its qualities, rather than mathematical statistics (Lindlof, 1995).

### **Interpretive paradigm**

Situating the research within critical theory and more specifically within the interpretive research paradigm is important because it sets out to explain the "the world as it is" (Burrell & Morgan, 1979, p. 28). According to Neuman (2003), interpretive research is

A systematic analysis of socially meaningful action through the direct detailed observation of people in natural settings in order to arrive at an understanding and interpretation of how people create and maintain their social worlds. (p. 76)

The goal of the research is to contextualize and make sense of the relationships between people, technologies and organizations (Klein & Myers, 1999). The interpretive paradigm's epistemological approach to social science research tends to be nominalist, anti-positivist, voluntary and ideographic, which states that it is concerned with the distinctiveness of each particular situation (Burrell & Morgan, 1979).

Interpretivists tend to see organizations, people and technology as constantly changing and thus are studying a moving target (Klein & Myers, 1999). This is important for this research because new technologies are constantly changing and with that so are the meanings social beings create and how they are sustained in society. However, one of the weaknesses to critical theory and interpretivism is that it is very hard to generalize unless all the cultural, economic, social and gender values are the same across different settings (Guba & Lincoln, 1994).

### **Ethnographic methods**

Semi-structured, open-ended interviews will be used in order to gather primary research. Face-to-face interviews provide information on the experiences and opinions of the interview subjects and can pick up on subtle body movements, tone changes and facial reactions to questions, but are not infallible (Hall & Rist, 1999). The main criticism against interview research is that the researcher's presence may contribute to inaccurate results, because people act differently when others are around (Berger, 2000).

### **Policy Research**

Policy research specifically communication policy analysis focuses on finding out the way policies in the communication industry are implemented as well as their implications for the discipline (Hansen et al., 1998). I am interested in finding out the past and present concerns that have arisen regarding the organization and structure of broadcast policies for the transition to HDTV. In this case, policy research will be used to compare different countries and their respective policy issues by studying government reports, newspaper articles, media focused magazines and journal articles.



## **Purposive sampling**

Purpose sampling was used in order to collect a sample of interviewees. I chose the experts in the media industry, who have first hand experience with the HDTV transition through the organizations they work with. The process of finding the interview subjects consisted of Internet research and word of mouth within the media industry. Furthermore, a content analysis of broadcast related publications such as *Playback magazine*, *Dialogue Magazine* and *Broadcaster Magazine* was conducted in 2006. This content analysis looked at key terms and names of media industry executives who were mentioned in the articles collected during a five year time period from 2001 to 2006 and many of those executives are the interview subjects in this paper.

I am aware that purposive sampling excludes a large number of people from the general population, however for this type of research study it would be ineffective to try to get a generalized sample, because the public may not be aware of the topic area. Instead, I decided to interview all the private sector, English language conventional television networks, CTV Inc., CHUM Limited (City TV) and Canwest Global (Global TV) because of their significant impact in the Canadian media industry. They also have similar business plans, based on advertising revenues. Furthermore, their corporation's holdings own and control a variety of other media assets such as pay and specialty channels. At the time of writing, CTV Inc. and CTVglobemedia received CRTC approval for buying CHUM Limited. In the paper, I will refer to them as separate companies with independent problems, even if they now share the same ownership.

As Canada's public broadcaster, the CBC has also joined the HD transition. As a result, they have become strong competitors to the private sector. While this paper concentrates mostly on the private English Canadian broadcast industry, it is important to accentuate the influence that the public broadcaster has on these networks, in part because the CBC receives both parliamentary grants and competes for advertising revenues with the private sector. On the other hand, I decided

to exclude the French Canadian broadcast industry due to the different challenges and opportunities they have among the French speaking population. For example, while the viewing share of Canadian programs on English language television has remained static for over forty years, due to an overabundance of U.S. shows; French Canadians view a lot of original Canadian programs because of the common language (CBC Canadian Television for Canadian Audiences, 2007).

In the HD specialty-broadcasting area, the newly founded High Fidelity HDTV and Discovery Channel HD Canada were interviewed because both broadcast high definition content 24/7 in Canada. Sport broadcasting has been a consistent driver of HD productions and it is crucial to include Canada's top sports broadcasters TSN and Rogers Sportsnet in discussions about High Definition.

Broadcast Distribution Undertakings (BDUs) are cable and satellite distributors, such as Bell ExpressVU and Rogers Cable who have had to work together with broadcasters in order to get the high definition signals into the homes of the audience. Content producers have been to a certain degree pushed by the broadcasters to start making high definition productions. Therefore it was important to speak with Exploration Production Inc., one of Canada's top HD production houses, as well as Barna-Alper Productions, who still has some standard definition programming, as well as making the change over to High Definition.

Broadcast facilities providers such as Dome Productions Inc. and technical facilities providers like TV2GO Inc. have also been an important part of the cycle of HD television production and transmissions. Meanwhile, suppliers such as BSE have had to deal with both the manufacturers and the end-users. Finally, Sony HD Canada is one of Canada's top manufacturers of High Definition products, and it is important to study the broadcast manufacturing industry as

well, because it has been criticized by many as being the only industry that is able to turn a profit from the transition.

## **Interview subjects**

### **Conventional Broadcasters**

- CTV Inc. – Rick Brace, President of CTV Inc. since 2002 and oversees CTV's interest in 14 specialty channels, 21 conventional television stations, music publishing and production houses, as well as sales and programming (CTVglobemedia, 2007)
- Canwest Global - Eric Heidendahl, Director of Engineering for Eastern Operations since 2006. Oversees 85 people in his department, budget planning and new equipment acquisitions.
- CHUM Limited - Peter Palframan, Senior Vice President of Operations for CHUM Television responsible for CHUM's 33 television stations and related business units.
- CHUM Limited - Bruce Cowan, the Director of Broadcast Technology, oversees all technical aspects of City TV, Much Music, Bravo, Space and other interests.

### **Specialty HD Broadcasters**

- High Fidelity HDTV- Ken Murphy, CEO and co-founder. Launched in 2003, the independent Category 2 specialty network is dedicated to smart, refreshing, interesting programming in HD. It also recently received seven more license approvals from the CRTC for HD channels.
- Discovery Channel HD - Paul Lewis, President and General Manager since 2003, and oversees every aspect of programming, finances, sales and marketing and production. Interviewed in 2005.

## Sports Broadcasters

- ❑ Rogers Sportsnet - Rick Briggs-Jude, Vice President of Production since 2003 and is responsible for all live events coverage and presentation, including development, budget planning and production plan.
- ❑ TSN – Rick Chisholm, Vice President of Programming and Production, in a management role since 1997.

## Broadcast Distribution Undertakings

- ❑ Bell ExpressVU – Wayne Scrivens, Director of Broadcast Engineering since 2004 provided a technical point of view for Bell ExpressVU's venture into HD distribution.
- ❑ Rogers Communication Group - Mike Lee, Chief Strategy Officer for Rogers Cable, Rogers Wireless, and Rogers Hi-Speed Internet. Responsible for business development, strategy and new product initiatives.

## Content Producers

- ❑ Exploration Production Inc. - Tony Leadman, Head of Worldwide Sales and Distribution since 2002 and is responsible for selling EPI's HD content domestically and internationally.
- ❑ Barna- Alper Productions - Pim van der Toorn, the Head of Documentary Production since 2001 is in charge of production and post-production.

## Broadcast and Technical Facility Providers

- ❑ Dome Productions Inc. - Mary Ellen Carlyle, the Senior Vice President and General Manager is responsible for the overall business plan in both fiber and satellite distribution, as well as the mobile production business.
- ❑ TV2GO Inc. - Adrian Hepes, Technical Manager since 2001 is responsible for intercontinental satellite transmissions.

## Suppliers/Manufacturers

- Broadcast Systems and Equipment - Joe Scrivo, Sales manager since 2004, is in the unique position of seeing the manufacturers perspective as well as the end user.
- Sony HD Canada – Jeff Ibbotson, Vice President Sales and Marketing, worked with Sony for over 16 years.

## Sampling Disadvantages

One of the sampling disadvantages in the methodology is that it is geographically limited to the Greater Toronto Area. However, it must be noted that Toronto is one of Canada's top media centers. Each of the conventional networks and other interviewees, except for Canwest Global has national head offices in the Toronto area.

In addition, a further disadvantage to the Major Research Paper is the fact that I am not able to speak with the HDTV audience due to the fact that it is beyond my means to survey all the HD population. It would be financially costly and time-consuming to interview or use survey methods in order to gain information from people who already have HDTV sets or the ones who are thinking about getting the new technology. Therefore, I will rely on previous studies conducted by the CRTC and the Canadian Association of Broadcasters (CAB) in order to gather this pertinent information.

## CHAPTER 4 - WHAT IS HDTV?

Digital television (DTV) refers to technologies that use digital techniques to provide television services to its viewers including high definition television (HDTV), multiple standard definition television (SDTV) and other services (Dupagne & Seel, 2006). Digital broadcast signals can be delivered to your television using eighteen different formats in the ATSC and DVB standards, with the two most popular being SDTV and HDTV (Dupagne & Seel, 2004). Digital television's most important advantage over traditional analog signals is its efficient use of the broadcast spectrum since it requires significantly less bandwidth (Dupagne & Seel, 2004).

North Americans have adopted the High Definition system, which provides a significantly higher quality television picture and sound than standard television in a wide screen aspect ratio (Hart, 2004). High Definition also provides greater clarity, richer and more natural colours on the screen, digital 5.1 surround sound capabilities, and the ability to interact with a number of input devices (Hart, 2004). High Definition television broadcasting signals differ from the current NTSC, PAL and SECAM standards because they more than double the horizontal and vertical resolution (Hart, 1994).

The basic concept behind HDTV is to increase the percentage of the visual field contained by the image. According to a report by a subgroup of the International Telecommunications Union a HDTV system is,

“... Designed to allow viewing at about three times picture height such that the transmission system is virtually or nearly transparent to the level of detail that would have been perceived in the original scene by a viewer with average visual acuity.” (Hart, 2004, p. 5)

These specifications allow HDTV viewing to become similar to looking out a window.

## **HD in the home**

From a consumer perspective, viewers can receive High Definition in their homes through digital cable and satellite, using an HD set top box, connected to an HDTV television set. It is also possible to receive HD signals over the air for free, although not a lot of people take advantage of this technology. According to the President of the CBC, over the air delivery has dropped dramatically in the last 30 years, from over 60% penetration, to just over 10% recently (Rabinovich, 2006 as cited in Review of the Over the air TV Policy). In order to obtain over the air reception of HD, consumers need to buy a UHF antenna, and a HDTV set with a built in ATSC tuner. The picture quality for over the air HD reception is said to be as good or better than cable or satellite delivery because of its uncompressed signal (CBC HD Times, 2005).

## **Compression technologies**

An important caveat to note with HD technology is the use of bits per second (bits/sec) also known as Bit rate, which are used to measure the quality of the signal. It refers to the number of bits of information required in one second of moving video in digital television. The bandwidth is the spectrum size, which is needed for a certain size of bit rate. A standard definition digital television signal uncompressed at the best quality will require 270,000,000 bits/sec (or 270 Megabits/sec or 0.27 Gigabits/sec). At the same time, an uncompressed HD television signal will require 1,860,000,000 bits/sec (or 1860 Megabits/sec or 1.86 Gigabits) (Gaggioni, 2007). As a result, an HD signal needs 6.8 times ( $1.86 \text{ Gigabits per second} / 0.27 \text{ Gigabits per second}$ ) more bit rate and takes up close to seven times more capacity in the bandwidth.

Due to this seven fold increase, compression technologies have become even more important in the High Definition world than previously used in SD. Compression technologies are used to compress the data to a level capable of being processed, transported, decoded and finally

recreating the picture elements of the original source. Over the years, the manufacturing industries have developed several compression technologies, based on two main structural differences; the Intra-picture compression and the Inter-picture compression. The Intra-picture compression (JPEGs, HDCAM, MPEG-2, MPEG-4 and AVC) technology uses the common elements in the same frame, while the Inter-picture compression (MPEG-1, MPEG-2, MPEG-4 and AVC) uses the common elements in between several frames (Gaggioni, 2007).

MPEG-2 technology, the most popular compression technology works by reducing repetitive image signals, or eliminating some picture elements (La Maestra, n.d). Its main principle is the encoding of only the active (or moving) video in the image. MPEG- 2 video compression encoding and decoding methods are currently used in DVD, Direct Broadcast Satellites, Digital Television and HD.

MPEG-4 compression technology was developed in the early 2000s and consists of two parts. The first part is used to compress video over mobile telephony, known as MPEG-4, and the second part, known as AVC (Advanced Video Coding) is used in broadcast distribution of HD at high efficiencies (Gaggioni, 2007). The difference between the two is that AVC looks at the past video signal for common frames, in order to be able to predict the future video frames.

Currently, MPEG-4 and AVC is being tested by some BDUs in Canada and countries around the world in order to be able to pack even more data information into the current bandwidth and eventually hopes to catch on in the home distribution of television signals (Scrivens, 2007). The comparison chart below shows the different minimum Megabits/sec required in order to have an accepted quality signal established by SMPTE.



	<b>HD</b>	<b>SD</b>
MPEG 2 (Min. bit rate)	15 Mb/s	3.0 Mb/s
MPEG 4 (Min. bit rate)	12 Mb/s	2 Mb/s
AVC (Min. bit rate)	9 Mb/s	1.5 Mb/s

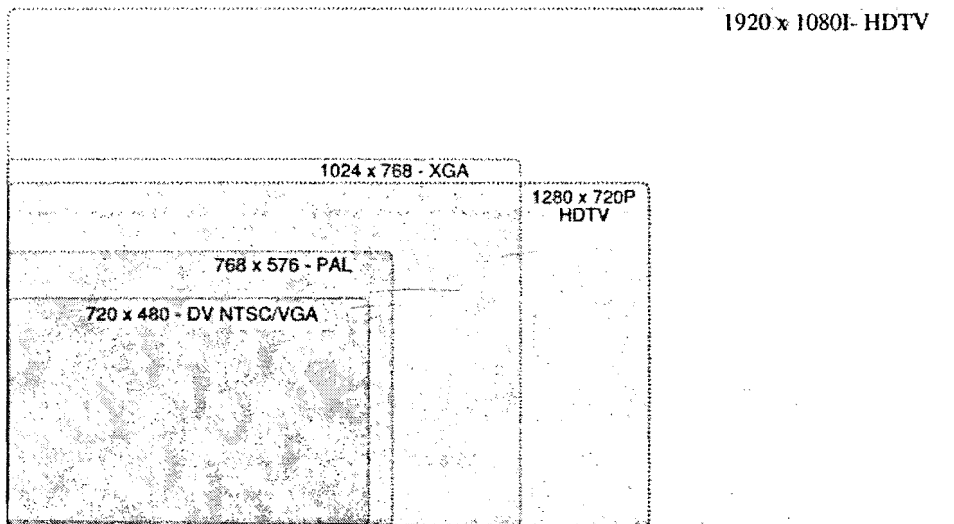
Source: Broadcast and Production Systems Division – Sony Electronics Inc.

Today, using MPEG-2, the contribution television industry that consists of the high end HD production process (recording, editing, transmission and storage technology) uses compressed HD signals at rates starting from 35 Mb/sec to 100 Mb/sec. This is a compression ratio of anywhere between 53:1 and 18:1 of the original uncompressed HD. In comparison, the distribution industry, which is the cable and satellite distribution facilities that bring HD into the homes of audiences, use bit rates from a minimum of 14.5 Mb/sec to 35 Mb/sec. This is a compression ratio of anywhere between 128:1 and 53:1. It is due to this high compression ratio that audiences often complain of the quality of the HD signal in their home, which can have serious degradation problems.

### **Image Resolution**

The image resolution generally refers to the level of detail a device is able to reproduce (La Maestra, n.d). For SD and HD systems the horizontal and vertical resolution are used to explain the number of lines/pixels that can be displayed on the screen. The vertical resolution for television sets is the total number of lines (rows) scanned from left to right across the screen and counted from top to bottom (HDTV Info Port, n.d.). Vertical resolutions are important because they are more noticeable to the human eye. Standard NTSC definition televisions have 525 lines, with only 486 lines visible on the screen. Meanwhile, High Definition television sets have a resolution of either 720 in progressive or 1080 interlaced lines (La Maestra, n.d).

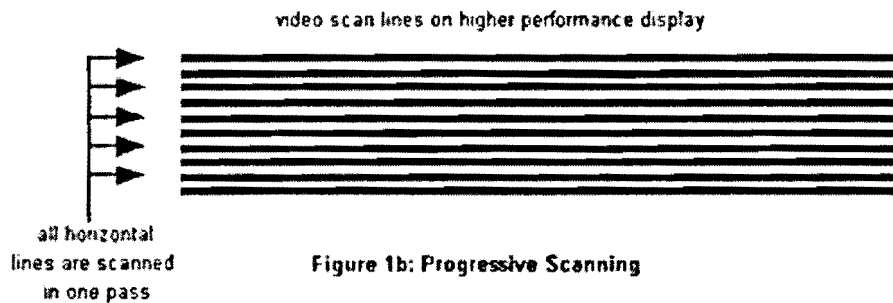
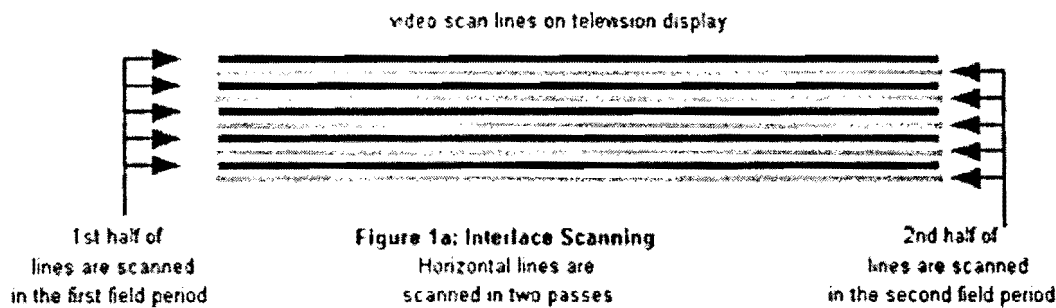
The horizontal resolution is the number of pixels per line, counted from one side of an image to the other. In standard definition the number of pixels is 720 versus High Definition which has 1280 on progressive scanning and 1920 on interlaced scanning (La Maestra, n.d.).



Source: Wikipedia High Definition Television

Another difference between standard definition and High Definition systems is the way the image appears on the screen using either Interlaced or Progressive scanning techniques.

Progressive scanning redraws all the lines (a frame) of a picture in each refresh. Interlaced scanning redraws every second line (odd field) in one refresh and the remaining lines in a second refresh (even field). The two separate fields are then merged into an interlaced picture or one frame (La Maestra, n.d.). Interlaced scanning increases picture resolution while saving bandwidth but at the expense of some flicker or other visual artifacts (Brinkley, 1997). Progressive scanning is mainly used in computer screens and produces a better picture quality (Dupagne & Seel, 2004). It is also more appropriate for fast movement content such as sports because each frame is scanned only once (La Maestra, n.d.).



Source: Projector Central

## Aspect ratio

HDTV systems around the world now use a 16x9 aspect ratio. This means that the viewing area of the screen is significantly altered from the box-like 4x3 aspect ratio of standard television. One of the appealing factors to a lot of new HD viewers is its wide screen, 16x9 aspect ratio, which makes it similar to viewing a movie in a theatre (Hart, 2004). This aspect ratio provides a much more balanced ratio between width and height, which researchers claim is the more appropriate scanning/viewing range of the human eye (Dupagne & Seel, 1998). Furthermore, the 16x9 aspect ratio changes the ideal sitting position, which is brought closer to the television set in order to take advantage of the wider screen (Dupagne & Seel, 1998; 59).

## Dolby Digital Audio

Sound adds a lot to the experience of viewing high definition content and HDTV has the ability to reproduce Dolby Digital 5.1 Surround Sound. This feature offers the audience a full

dynamic range on five discrete main channels; front left and front right, center, rear left and rear right, and a channel for Low Frequency Effects reproduced by a subwoofer (La Maestra, n.d.). This means that watching a television program will sound as if the person is in the middle of the action, which helps accentuate the psychophysical perception of “tele-presence” or a feeling of being there (Dupagne & Seel, 1998; 60).

## **CHAPTER 5- DEVELOPMENT HISTORY OF HDTV**

The development of High Definition technology is different in every country studied. As the literature review states many nations have vested interests in the technology and have tried to control the global marketplace. The following section will provide a brief history of the birth and development of HDTV in Japan, Europe, and the United States and the many debates about television standards.

### **Japan**

Analog High Definition first originated in Japan at the public broadcaster's Nippon Hoso Kyokai (NHK) Television Research and Development laboratories. During the 1964 Tokyo Olympics, NHK engineers were dissatisfied with the quality of the television coverage, and decided to finance further research on advanced television technologies (Hart, 2004). The Japanese engineers understood that the current standard television screen with a 4x3 aspect ratio was not the optimal fit for a person's natural vision range, which is believed to be closer to a 16x9 aspect ratio. This finding prompted the researchers to undertake the development of a higher quality television in 1970 (Hart, 2004). Furthermore, since NHK was a public broadcaster that relied heavily on license fees from consumers, another motivating factor that led to analog HDTV was the fact that NHK officials were worried people would refuse to pay if they believed the service was poor and thus their revenues would stagnate (Dupagne & Seel, 1998, p. 71).

By 1981, after spending over \$500 million on research and development, NHK and Sony revealed the world's first analog HDTV system called Hi-Vision/MUSE (Brinkley, 1997). The public unveiling of a working HDTV system came as a shock to many experts in the industry because the Japanese system seemed to be far more advanced than other technological innovations in the global markets (Hart, 1994).

The Hi-Vision system used a type of signal encoding called MUSE (Multiple Sub-Nyquist Sampling Encoding) that reduced the bandwidth necessary for transmitting the signals (Hart, 1994). The High Definition system also included 1125 horizontal scanning lines per frame, 16x9 aspect ratio, interlaced scanning, 60 fields per second, digital stereo sound and was incompatible with the conventional TV receivers of that time (Brinkley, 1997). This was significantly different from the 525 lines, 4x3 aspect ratio traditional NTSC television sets of that time.

The first major demonstration of the new technology took place at the annual Society of Motion Picture and Television Engineers (SMPTE) convention in San Francisco, where the U.S. first decided to support the Japanese standard (Brinkley, 1997; Dupagne & Seel, 1998). Since American electronic firms were poorly represented in this decision making process, the verdict was left up to the U.S. Department of State, which decided that a worldwide standard would help broadcasters and programmers in reducing non-tariff barriers for trade in programming (Galperin, 2004, p. 74).

However, shortly afterwards in 1986, delegates from around the globe met in Dubrovnik, Yugoslavia for the International Telecommunications Union, XVIth Plenary Assembly and the recommendation was rejected. While the Japanese were surprised by the decision, according to Hart (1994) the rejection should have been expected given Europe's fiercely nationalistic agenda (p. 215). The strong opposition from European countries and the European equipment manufacturers was rooted in the fear that they would loose control of the marketplace to the Japanese, as Europe had previously done with the VCR market (Brinkley, 1997; Dupagne & Seel, 1998). Moreover, they also feared being inundated culturally by non-European films and television programming (Hart, 1994).

The Japanese continued to promote the Hi-Vision/MUSE system domestically where it had strong support. But decided to withdraw from the U.S. race to High Definition during the testing

phase, when it became clear that the FCC would not choose an analog system due to their preference for digital technology (Hart, 2004). However, it was not until 1994 that the Japanese regulatory body acknowledged that the world trend is digital, and that a digital HDTV system would likely replace the analog Hi-Vision/MUSE domestically as well (Dupagne & Seel, 1998, p. 35) As a result, the Japanese government introduced digital broadcasting services in 2003 in major metropolitan centers and will cease analog transmission by 2011 (Hart, 2004).

## **Europe**

The European nations' strategy to HDTV was different from the Japanese and American systems. A key-motivating factor for the European's rejection of the Japanese standard was the fact that they had also started developing the HD-MAC system in the early 1980s, which was intentionally incompatible with the Japanese Hi-Vision/MUSE system (Dupagne & Seel, 2006). The Multiplexed Analog Components system was designed for Direct Broadcasting Satellite and cable delivery and was compatible with the existing European PAL and SECAM receivers (Dupagne & Seel, 1998). However, the MAC system was not considered to be High Definition, rather it was regarded as enhanced definition television (EDTV) because it featured 1,250 widescreen scanning lines and 50 fields per second. Still, HD MAC never gained large market penetration; because it became outdated by the time it reached technical maturity (Dupagne & Seel, 1998).

The case for HD MAC is very similar to the development of colour television standardization in the 1960s when the world became divided into three incompatible television formats NTSC, PAL and SECAM. In the XIth Plenary Assembly held in Norway in 1966, the delegates failed to come to a common agreement for a colour television standard because France wanted to support its own television manufacturing industry (Dupagne & Seel, 1998, p. 10). If

France would have adopted the NTSC standard they would have had to pay royalties to the U.S. companies who held the patents and would not have been able to recoup their research and development costs (Dupagne & Seel, 1998, p. 10). Therefore, the same fears swept European nations in the development of HDTV and thus decided to go their own way.

Once it became clear that the analog MAC system was not going to reach widespread acceptance, a new digital system had to be considered. The Europeans established the Digital Video Broadcasting (DVB) standards in the early 1990s, which is a consortium of companies dedicated to finding specifications regarding digital television broadcasting for terrestrial, cable and satellite transmissions. The DVB-S system for digital satellite broadcasting was developed in 1993 using QPSK modulation (Wood, n.d.). The DVB-C system is used for cable carriage of digital signals, while DVB-T, the most challenging of the three is used for terrestrial broadcasting of digital signals (Wood, n.d.). This system transmits a compressed digital audio and video stream, using OFDM coded modulation and MPEG-2 (Wood, n.d.).

Today, there is still limited HDTV broadcasting in Europe. However, Western European countries have a very strong penetration of digital television, with a focus on SDTV transmissions. According to Dupagne & Seel (2006) European broadcasters still perceive HDTV as a resounding market failure, because of its high costs and the lack of a coherent business plan. Additionally, Europeans prefer to use their limited spectrum to provide viewers more options by sending multiple SDTV channels, rather than one single HDTV signal (Dupagne & Seel, 2006, p. 62). On the other hand, some subtle changes are seen in European countries as more broadcasters and producers are starting to look at the future potential of HDTV. The European Broadcasting Union argued that the market demand factors could drive Europe's renewed interest in HD due to more High Definition broadcasting in the U.S., Australia and Japan, the introduction of cheaper and



larger flat panel displays, the fast adoption of DVDs and the availability of HD-DVDs (Dupagne & Seel, 2006).

## **United States**

The road to High Definition in the U.S. had been paved with many powerful economic factors and policy initiatives (Brinkley, 1997). America initially panicked when the Japanese revealed their HDTV system in San Francisco and realized they quickly needed to match their competitors. While they begrudgingly accepted the recommendation to move forward with the Japanese innovation as the world standard, many high-ranking executives and FCC personnel started to fear what this deal would mean for a sluggish American consumer electronics economy (Brinkley, 1997).

Since the late 1960s, the U.S. leadership in the consumer electronics industry had been declining significantly due to pressure from Japanese imports. For example, in 1964, the U.S. produced 94 % of colour television sets sold in America. By 1975, this percentage had dropped to 67% and finally to 43% by 1986. (Dupagne & Seel, 1998, p. 137). This drop in consumer electronics was correlated to the rise of Japanese manufacturers, who had lower production costs, help from the government, aggressive pricing and the ability to adapt to imported technology (Dupagne & Seel, 1998, p. 139). Many Japanese products also had a fast consumer adoption cycle overseas and generally offered cheaper prices (Dupagne & Seel, 1998, p. 139).

Furthermore, broadcasters faced a new threat in 1985 as the FCC initiated proceedings to give away the ultra high frequency (UHF) spectrum that was generally reserved for television applicants, to mobile applicants (Brinkley, 1997, p. 4). It was during this time, that John Abel, Vice President of the National Association of Broadcasters decided that in order to stave off the cellular phone applicants and stall the FCC, a new technology such as HDTV would be needed

that would require the additional spectrum (Brinkley, 1997, p. 5). Therefore, in 1987, the FCC started a number of policy initiatives that led to the creation of the Advisory Committee on Advanced Television Service (ACATS) headed by Washington communications lawyer, Richard Wiley (Brinkley, 1997; Dupagne & Seel, 2006; Hart, 2004). ACATS was made up of a 25 member advisory body including broadcasters, cable operators, manufacturers and government officials which recommended policies for the transition to advanced television in the U.S. (Dupagne & Seel, 1998, p. 22).

One of the first issues ACATS needed to deal with was how to handle the new spectrum for HDTV over the air broadcasts. The Japanese Hi-Vision/MUSE system required more bandwidth (8.1 megahertz) than was available for local terrestrial broadcasters (6 megahertz) and was incompatible with the 160 million NTSC receivers in the U.S. (Hart, 1994). As a result, the FCC ruled that in the transition period, HDTV had to protect the owners of NTSC equipment and simulcast on one 6 megahertz channel the regular NTSC feed while on another 6 megahertz channel transmit the HDTV signal simultaneously (Hart, 1994).

One of the turning points in the HDTV race came in 1991, when General Instruments announced two days before the testing deadline that they found a new way of compression using digital video signals that would fit High Definition into the 6 megahertz spectrum (Hart, 1994). Impressed by the new innovation, FCC Chairman Alfred Sikes, decided that he wanted the American High Definition system to be completely digital because it would give Americans a greater chance to participate in the market than they would under an analog system (Hart, 1994).

As the first round of testing began, ACATS and the FCC found that each of the major systems proposed had some inherent flaws and provided the remaining companies with two choices: merge into one super group in order to solve the technical problems or more time will be given to continue the research and development stage for a second round of tests (Hart, 2004). The

remaining manufacturers consisted of seven American and European entities; General Instruments, MIT, David Sarnoff Research Group, AT&T, Philips, Thomson Consumer Electronics, and Zenith Electronics. Each had a long history of competition and opposing backgrounds, however, they knew well enough that more testing meant more money spent and that a victory by one company would mean the defeat and loss of revenue for all the others (Brinkley, 1997). Therefore, after many discussions and disagreements about patents, royalties and copyrights the groups finally merged in 1993 in what became known as the Grand Alliance (Hart, 1994). This strategic alliance was able to take advantage of their market position and through utilizing their combined expertise created the first all-digital HDTV system.

The new HD system had seven main characteristics including all digital video and audio, dual scanning format (1125 line or 1080 active lines), interlaced scanning (787.5 line or 720 active lines) and progressive scanning, MPEG-2 compression for video and Dolby AC-3 compression for audio, MPEG-2 encoding, vestigial sideband (8-VSB) modulation, multi-channel audio and a 16 x 9 aspect ratio (Dupagne & Seel, 1998, p. 26).

Finally, in 1997, the U.S. Congress approved the development of the Advanced Television Systems Committee (ATSC) transmission standard and the digital television transition that was designed to replace the analog NTSC broadcast system (The Future Environment, 2006). The analog shut-off date was then set for 2006, with a clause that 85% of the population must be able to view a digital signal. Interestingly, while the FCC required the top networks, ABC, NBC, CBS and FOX to broadcast in digital in the top ten markets by 1999, the FCC did not state that it must be in High Definition, rather it could have been in digital standard definition multi-channel (Hundt, 1997). The broadcasters chose HDTV because of its perceived higher quality and greater benefits to the consumers.

## **CHAPTER 6- COMPARISON OF THE POLICY REGULATIONS IN THE UNITED STATES AND CANADA**

Over the past few years, the High Definition transition in the United States has been dramatically fast-tracked as the sale of digital television sets and the amount of High Definition content have increased substantially (Cripps, 2006). However, many scholars argue that the aggressive mandates taken by the FCC have pushed broadcasters, distributors and content producers headfirst into the digital transition (Hart, 2004; Cripps, 2006).

On the other hand, in Canada, the Canadian Radio-television and Telecommunications Commission (CRTC) has adopted a voluntary, market driven transition model (Broadcasting Public Notice, CRTC 2002-31). It was just this year that the CRTC decided to establish August 31, 2011, as the date by which television licensees will only broadcast digital signals (Broadcasting Public Notice CRTC 2007-53). By looking at the different policy initiatives in the United States and Canada since the inception of High Definition, one can better understand the regulatory environment Canadian broadcasters have had to deal with and how it has affected the transition in each country.

### **FCC Policy**

After the development of the ATSC transmission standard, the FCC immediately set a firm deadline for the analog shut-off date for over-the-air transmissions (The Future Environment, 2006). However, the FCC soon realized that it was an unrealistic date since audience awareness was minimal and thus decided to educate viewers with consumer bulletins regarding digital television and High Definition broadcasting (Fiske, 1998).

By 2001, in another bold move, the FCC granted “Must Carry” status to digital only television stations. This meant that digital television channels automatically received cable or

satellite carriage from the Broadcast Distribution Undertakings, which made it easier for new digital channels to start up. The FCC believed that guaranteeing cable carriage would encourage other broadcasters to upgrade to digital services in a more rapid manner (Kennard, 2001).

Plug and play regulation followed in 2003, and once again the FCC was trying to relieve the stress and confusion of the changeover for the consumers. This cable compatibility allowed consumers to plug their cable directly into the back of their digital TV, and receive digital basic and premium services (excluding Video-On-Demand) without the need of a set-top box (Powell, 2003). The new regulation was a benchmark in the diffusion of digital television, as it dramatically affected the manufacturing of digital television sets, and the cable television services. According to the FCC, the policy would help ease the transition to digital television by promoting competition among the manufacturers, as well as simplicity and convenience for the consumers (Powell, 2003).

By the end of 2005, the FCC modified digital tuner requirements on all TV receivers regardless of their size in hopes of fast-tracking the transition and moved the shut-off date up by four months (Martin, 2005). This policy initiative assured that consumers buying digital television sets would have the built-in ATSC tuner required to receive over-the-air digital television broadcasts. However, approximately 15% of consumers were left viewing over-the-air services, since the rest of the population in the U.S. was already receiving their television signals via cable or direct-to-home satellite (McEwen, 2006).

It was also at this time that a \$990 million fund was set up for the issuance of coupons for the purchase of digital to analog converter boxes for households without a digital television set (Dupagne & Seel, 2006). The FCC started this program, after many complaints from critics who believed that the lower socioeconomic population with analog television sets would be left behind after the changeover to digital (Cripps, 2006). The \$40 coupons for these boxes, available on a

first-come, first-serve basis, would down-convert digital signals so that homes with analog television would continue to work after the shut-off date (Cripps, 2006).

In 2006, President Bush signed legislation into law making February 17, 2009 the date when U.S. broadcasters must end their transmission of analog television signals (Cripps, 2006). The press have called it the “end of television as we know it” while others see it as a dawning of a new era due to the radical changes to the television broadcast system (Cripps, 2006). Either way, the United States policy regulators have taken clear-cut steps towards transitioning the media industry to digital television and HDTV.

### **CRTC Policy**

It was ten years ago that the Canadian Heritage committee set up the “Task Force on the Implementation of Digital Television” headed by Michael McEwen in order to provide Canadian broadcasters with the necessary information to join the digital revolution (Canadian Heritage, 1997). This task force made a number of recommendations, the most important one being that the government and the CRTC should develop timelines for the introduction of digital television. They strongly believed that a set date for the analog shut-off was needed in order for broadcasters to transition faster and not fall behind the neighbours to the south (Canadian Heritage, 1997).

The CRTC took no action on these recommendations until 2002, when the policy regulators first proposed a licensing policy to oversee the transition from analog to digital over-the-air television broadcasting (Broadcasting Public Notice, CRTC 2002-31). As mentioned, this policy was based on a voluntary, market driven transition model, without mandated deadlines. The CRTC believed that this model would spur competition between broadcasters and that making the changeover behind the U.S. would help alleviate and avoid some of the early adoption costs and technical problems that would occur (McEwen, 2006).

The CRTC also stated that networks holding transitional digital television licenses were allowed to broadcast a maximum of 14 hours per week of HD, that is not duplicated on the analog version of the service and at least 50% of this unduplicated HD content must be Canadian programming (The Future Environment, 2006, p. 22). However, in early 2003, after CHUM received its first DTV license, even 14 hours a week was difficult to achieve, as there was very little HD content available (Cowan, 2007).

The plan also encouraged license holders to switch over most of their schedule to digital by Dec. 31, 2007 (Broadcasting Public Notice, CRTC 2002-31). Currently, there are 22 television stations and four re-broadcasters who are authorized to operate transitional digital television undertakings (The Future Environment, 2006, p. 23).

In 2003, the CRTC adopted a regulatory framework for the distribution of digital television signals. BDUs quickly jumped at the chance to offer their customers new HD packages since they could charge an increased rate. The policy framework, determined that a Broadcast Distribution Undertaking may apply to the CRTC to be relieved of the obligation to distribute analog signals once 85% of its subscribers have the ability to receive digital services by means of DTV receivers or set top boxes (Broadcasting Public Notice CRTC 2003-61). This has not yet been achieved. However, once Broadcast Distribution Undertakings start converting to digital transmission fully, the analog spectrum can be given back to Industry Canada and allocated for other purposes.

Last year the CRTC announced its regulatory framework for the licensing and distribution of High Definition pay and specialty services. It approved license amendments for four specialties, two pay and ten Category 2 specialty services, authorizing their distribution in high definition format (Broadcasting Notice CRTC 2006-74).

Finally on May 17<sup>th</sup>, 2007, after carefully reviewing the Television Policy Hearings from the previous year, the CRTC decided to establish August 31, 2011, as the deadline for the

transition from analog to digital and HD broadcasting (Broadcasting Public Notice CRTC 2007-53). According to the policy regulators, a deadline is now necessary in order to avoid a situation where viewers watch only foreign programming in High Definition because there is not enough Canadian digital programming available (Commission establishes new approach, 2007). A deadline also helps broadcasters plan their future capital needs and develop more Canadian HD programming (Broadcasting Public Notice CRTC 2007-53).

In their explanations, the Commission took into account other countries' deadlines for this transition, particularly the United States, where most of the HD programming is acquired. The CRTC also considered Industry Canada, which stated that effective management of the spectrum is needed in order to prevent serious problems that could arise for over-the-air HD transmissions if the shut down date is not aligned with the North American market (Broadcasting Public Notice CRTC 2007-53). The CRTC will also allow for exceptions after the deadline, in remote regions where there are no digital transmitters. This decision will ensure that those viewers continue to have access to the programs offered by conventional television stations, including the CBC (Commission establishes new approach, 2007).

While the Canadian transition to High Definition has been picking up speed in the past year, according to the McEwen report (2006), the Canadian media industry has suffered a four to five year lag behind the United States. McEwen (2006) argues that this is a direct result of the lack of guidance from the CRTC and a lack of planning on the industry's side. However, the current deadline returns the lag to the original two-year plan behind the United States. Many industry professionals believe that the Canadian media industry has benefited from letting the U.S. electronics and broadcasting industry work out the technical kinks first (Heidendahl, 2007; McEwen, 2006; Scrivens, 2007).



## **CHAPTER 7- THE ENGLISH CANADIAN TELEVISION INDUSTRY**

The Canadian media landscape has undergone a shift from analog to digital technologies and as a result has become crowded by different platforms, new technologies and new means of communication. This in turn takes audiences away from the traditional model of television viewing and changes the advertising supported business model (O'Farrell, 2007). It is within this environment that the transition to High Definition is taking place, and this section will focus on clarifying the additional hurdles that the Canadian television industry is facing, many of which were brought up in the interview process.

### **English language private television sector**

Canada's private television industry is an important part of our sovereignty and an economic driver in many cities and small communities across the country, with total revenues of \$5.1 billion and employing over 22,000 people (Broadcast Policy Monitoring Report, 2007; CAB, n.d.). Television viewing has remained relatively stable over the past few years with an average of 27 hours a week, however changes can be seen in the viewing share of conventional and specialty services (CRTC releases annual report, 2007).

The English private conventional television sector has seen its viewing share slightly slip from previous years to 22.4%, while revenues increased by 16.1% from 2000 to 2005 (The Future Environment, 2006, p. 20). However, a recent study by Statistics Canada, has shown that revenues stayed flat at \$2.2 billion in 2006, unchanged from the year before, while profits fell 62.5% to just over \$90 million, the first time in fifteen years that that particular segment has made less than \$100 million a year (Statistics Canada, 2007). This can be attributed to flat revenue growth and a 10% increase in programming expenses (Broadcast Policy Monitoring Report, 2007). At the same

time, conventional OTA advertising revenues decreased from 84% to 73% over a year (Broadcast Policy Monitoring Report, 2007).

On the other hand, the biggest changes are seen in the specialty sector where viewers are tuning in more with a 26.6% viewing share and revenues rose by 72% between 2000 and 2005 (Broadcast Policy Monitoring Report, 2007; The Future Environment, 2006, p. 21) In 2006, revenue at specialty networks went up another 11.2% to just over \$2 billion (Statistics Canada, 2007). However, analog and digital specialty channels have a revenue stream from both subscriptions and advertising revenues, which increased by 14.7% (Statistics Canada, 2007). This shift toward increased advertising revenues for the specialty sector is consistent with the decline in viewing of conventional television and turning to specialty services.

Pay and pay-per-view services which rely entirely on subscription fees also saw a significant jump with a 78% increase in revenues over a five year span thanks to the growth of pay-per-view and Video-On-Demand services (The Future Environment, 2006, p. 21). Finally, despite the large number of digital services in operation, the revenue gained from these services represents only 5% of the total revenue by the television sector in the past year. Digital services, including HD channels are also lacking the large audiences needed to attract more advertisers and therefore garnered only 1% of the total advertising revenues (Broadcast Policy Monitoring Report, 2007).

In spite of this, it must be noted that while the private conventional television networks seem to be in a delicate state of uncertainty with record low numbers and the specialty and pay sectors seem to have thrived over the past five years; these flourishing specialty channels are actually owned by the floundering conventional networks. By owning and controlling both analog and digital specialty and pay channels, conventional networks can keep their audiences and capitalize on economies of scale (Appendix 1).

## **Advances in new technologies**

Driven by new technological developments, the Canadian television and broadcasting industry has changed and expanded over the past ten years. These changes are due to a combination of new platforms and technologies in both the audio and video side of broadcasting and reception, digital radio and TV, wireless broadcast and telecom services, mobile telephony, the Internet, audio and video streaming, podcasting, downloading, VOD and PVRs (The Future Environment, 2006, p. 101).

The greatest change can be seen in the number of Internet users and owners of personal computers. The Internet is now available in over 70% of households in 2006 (Broadcast Policy Monitoring Reporting Report, 2007). On average, Canadians spend about 17 hours online each week (The Future Environment, 2006, p. 58). Young people ages 15-29 spent the most amount of time on the Internet, and 73% have actively downloaded content in 2006 (The Future Environment, 2006, p. 77).

Young people also spend the least amount of time watching television, as their leisure time is divided by multi platform technologies such as surfing the web, downloading music, sharing files, listening to MP3s and watching videos on their cell phones. Glen O'Farrell, President of the Canadian Association of Broadcasters (CAB), a trade association representing Canada's private broadcasters, describes this trend as "Me Media" where in this new reality "I want what I want, when I want it on whatever device I happen to be using, and I want it wherever I am" (O'Farrell, 2006, para. 26). This trend is significant because it is taking place in an unregulated universe, where government policy is no longer effective and these new mediums are taking away the competitive advantage that the regulated conventional media once had (O'Farrell, 2006). This concern was voiced by CTV President, Rick Brace during our interview as being one of the challenges for running a successful conventional television station.

It also seems to have created a generational gap, where the older, boomer generation still prefers the traditional media, while younger audiences are turning more towards an on-demand consumer service expectation. Researchers predict that the two types of media preferences will likely co-exist for another decade, until the younger generation will be able to apply its full influence on a major segment of the Canadian consumer landscape (The Future Environment, 2006, p. 81).

### **Changing business models**

In the past, the broadcast television industry relied on an advertising supported model, where the broadcaster sold audiences to the advertisers since audiences spent most of their leisure time in front of the television set. This is changing, since in 2006, advertising on the Internet almost doubled in one year, increasing from \$560 million to \$1 billion (Broadcast Policy Monitoring Report, 2007). Today, there are also more channels than ever before, more means of delivering content and newer technologies that take away from the television viewing time (O'Farrell, 2006). While this abundance of content offers greater opportunities to tell Canadian stories, the increase in choices also causes a fragmentation of the audience. Therefore, in order to adapt to a loss in the number of viewers, advertisers are increasingly connecting with the consumer through various new technologies including the Internet and mobile telephony and therefore bypassing the broadcaster as the middleman. Advertisers have also found that they can better target their desired market through other media, not necessarily only television.

As a result, broadcasters have seen a shift in traditional business models and have had to adapt in order to remain competitive. Most affected are the conventional television networks as their revenue base is heavily reliant on an advertising supported model. As well, audience fragmentation for the conventional networks means that it becomes riskier and more costly to

produce high quality Canadian dramas and local programming, because they will not have the assurance of mass audiences (The Future Environment, 2006, p. 104).

However, the conventional networks have taken steps to resolve this problem and to maintain their financial stability in the new environment. Many broadcasters have already adopted or are in the process of adopting some new technologies including making the switch to digital technologies and High Definition broadcasting. Broadcasters are also merging platforms with broadband and Internet services and aggressively looking for new sources of revenue from existing content, while developing content for these new services (O'Farrell, 2006). Broadcasters are starting to make their content available for Video-On-Demand (VOD), playing it on their own websites or on mobile telephones in order to address the audience fragmentation taking place (The Future Environment, 2006, p. 103). For example, CTV started the CTV Broadband Network offering full-length television shows and live streaming news video clips from CTV Newsnet. Furthermore, CanWest MediaWorks and Rogers Wireless have launched the first media player to deliver content to the BlackBerry, offering customers clips from Global News, Global National and the Financial Post and daily sports scores from Rogers Sportsnet (O'Farrell, 2006).

Content producers also used to depend heavily on broadcasters, but new channels of content distribution means that producers can have access to a wide range of consumers through other media. This 'erosion of traditional borders' refers not only to the geographic borders but also the breakdown of barriers between different types of media (The Future Environment, 2006, p. 104). Since it is becoming increasingly easier to transfer content between different mediums, copyright challenges arise as program rights cannot be protected (The Future Environment, 2006, p. 105). For example, the overwhelming success of YouTube, a website dedicated to posting personal videos, and other materials proves that the unregulated environment of the Internet can

significantly threaten the Canadian rights market, because content is sent directly to the consumer (The Future Environment, 2006, p. 105).

Since the Canadian television landscape is packed with new technologies, new platforms and new distribution systems for content, the audience is increasingly moving to other ways of entertainment. Meanwhile broadcasters are losing advertising revenue because of decreased viewer ship and increased costs. It is estimated that industry wide HD related expenses could be as high as over \$400 million (CAB, 2007). However, HD is also seen as a way to win back audiences and to return to television viewing (Brace, 2007). Except audiences must first be convinced of its intrinsic value and when there are so many choices available, this can get increasingly difficult.

## CHAPTER 8 - CONVENTIONAL ENGLISH LANGUAGE BROADCASTERS

Despite all the challenges the Canadian broadcast industry is facing, there have been many positive changes in advancing the High Definition transition. Consumer adoption has been steadily rising, as the price of HD television sets continues to decline. Projected growth trends indicate that by 2011 about 50% of Canadian households should have HD ready displays (The Future Environment, 2006, p. 23). In addition to the growing adoption rate, the CRTC has established a date for the analog to digital switch, which should also help move the transition along and manufacturers claim costs for the professional equipment are diminishing each year (Scrivo, 2007). However, the greatest challenge facing the Canadian broadcast industry, seems to be the lack of a coherent business plan for High Definition, since productions costs are higher, while revenues have stayed the same due to stagnant advertisers and subscribers. As Fred Mattocks, the Executive Director of Regional Programming and Production at the CBC stated,

“We know consumers want it, we know they have an expectation of quality. We know they enjoy the experiences and we believe it actually changes their viewing habits. But at the end of the day, there’s not a dime more revenue that comes to a broadcaster, BDU or a producer for HD.” (as cited in Robinson, 2007).

As part of the primary research, interviews were conducted with a number of television executives in the Canadian media industry. The findings show that many broadcasters and media personnel had conflicting feelings about the High Definition transition. While many voiced their concern about the higher costs and the realities of running a competitive business, they also all wanted to be at the forefront of this new technology and be leaders in the industry. High Definition raised questions about the various responsibilities that broadcasters, distributors and content producers have. While there is a responsibility to their shareholders for increasing profits, they also have a responsibility to the audience by providing them with worthwhile, high quality programming.

## CBC Television

The CBC has been a staple in Canadian television for over sixty years. As Canada's public broadcaster, the CBC owns and operates two national network services, in English and French, as well as providing eight Aboriginal language services in Northern Canada. A number of privately owned stations affiliated with the CBC/SRC across the country allow more Canadians to view the stations (Broadcast Policy Monitoring Report, 2007). The CBC also owns some specialty services amongst others, CBC Newsworld and Le Réseau de l'Information, a national English-language and a French language news service respectively.

The CBC's conventional networks have seen small increases in its viewing share and advertising revenues over the past three years (Broadcast Policy Monitoring Report, 2007). In March 2005, CBC joined the transition to High Definition, by receiving over the air transitional digital television licenses, launching in Toronto and Montreal. By January 2006, the CBC/SRC added Quebec City and Vancouver with Ottawa changing over later in the year, therefore covering most of the major markets (Broadcast Policy Monitoring Report, 2007). With these steps, the CBC, in spite of being a cash-strapped public broadcaster or possibly because of it, took a lead in over the air HD broadcasting in Canada and pushed some private sector networks into making the chance to over the air television for High Definition (Careless, 2006). As with most conventional networks, CBC-HD is a simulcast of the Toronto feed across the nation.

In terms of content, CBC is producing many of their new dramas series in HD, including the upcoming *Hockey: A People's History*, the comedy series *Little Mosque on the Prairie*, and the David Suzuki series, *The Nature of Things* (CBC.ca/HDTV). The network has also returned its focus to national sports and is therefore producing *Hockey Night in Canada* and CFL Football in High Definition. Furthermore, the CBC will begin broadcasting *The National* in HD starting in the fall of 2007 (Robinson, 2007). Mattocks agreed that HD gives broadcasters the platform and the



ability to deliver an immersive product. "It's all about the quality and experience for the audience," (Strauss, 2007).

## **CTV Inc.**

CTV, Canada's dominant commercial network is very interested in the growth of High Definition and currently owns two HD channels, CTV HD East and West, which were launched in 2003 and 2004 respectively. CTV also installed over-the-air HD transmitters in Toronto and Vancouver in 2005 (CTV Position Statement, 2007). Its parent company CTVglobemedia Inc., has a variety of assets in 21 conventional networks across the country, with 15 Category 1 and 2 specialty channels, radio stations, the Globe and Mail newspaper, and other investments across various media. It's revenues increased in 2006 up to \$776 million (Broadcast Policy Monitoring Report, 2007).

In June 2007, the CRTC approved the sale of CHUM Limited to CTVglobemedia, which provided the company with several well established brands including the Much Music, Bravo and Space specialty channels (Powers, 2007). However, as per CRTC policy, companies can only have one conventional network in one language, in a particular market, and therefore CTVglobemedia has to divest its interests in the five CityTV conventional networks to a third party (CTV gets most of CHUM, 2007) Nevertheless, this deal has made CTV a larger and more stable company with a variety of specialty channels available. Meanwhile by blocking the purchase of the CityTV networks the CRTC protected the diversity of voices in the media, and promoted healthy competition for advertisers at the local level (CTV gets most of CHUM, 2007).

CTV Inc. President Rick Brace is a great believer that HD content will bring audiences back to conventional television viewing due to its superior picture and sound (Brace, 2007). Therefore, CTV has taken an aggressive stance to convert its stations to HD. The self-proclaimed

leader in HD content, CTV is currently airing all their U.S. primetime programming in High Definition (Brace, 2007). These include Top 20 hits such as *CSI*, *Grey's Anatomy*, *Law and Order*, *Lost* and some Canadian programs like *Corner Gas* and *Degrassi: The Next Generation*. In addition, for the coming year, CTV has vowed to produce only HD programming for their new slate of Canadian scripted dramas, including *Whistler*, *Instant Star* and *Movies of the Week* (CTV Position Statement, 2007).

One segment where CTV lags behind the competition is in the production of HD news with no set plans to change their national or local newscasts over to HD. Brace (2007) explains that the company must first decide which newscast to transition to HD, and weigh in the extra costs needed for the new equipment and master control. News production is unique and has special requirements in High Definition due to the amount of file footage used, which is in standard definition. The change from one to the other can often cause jarring transitions, especially if changing aspect ratios come into play as well. In the meantime, CTV is in the process of upgrading many of their stations across the country and building new transmitters for High Definition broadcasting.

CTV's long-term goals are to continue to be leaders in the industry by changing over RDS, the French version of TSN to High Definition by the fall of 2007 (Brace, 2007). As well, having the rights to the 2010 Vancouver Olympics, which will be an all HD production together with TSN and Rogers Sportsnet, provides another motivating factor to upgrade quicker (Brace, 2007). According to Brace, the network wants to be fully functioning in High Definition by the time the Olympics come around because it is an opportunity to show the international community what the broadcaster can achieve. In addition, CTV hopes to continue to provide access to those early adopters who are migrating to HD.

## CHUM Limited

CHUM Limited assets have been recently released from the Voting Trust Agreement, and have been split up after its sale to CTVglobemedia (CTVglobemedia Inc. Announces, 2007). The five CityTV stations will remain in trust pending regulatory approval of their sale to Rogers Broadcasting Limited (CTVglobemedia Inc. Announces, 2007). However, it is important to state some of the findings from the interview process, which took place in April 2007, as CHUM Limited has taken great strides in changing over to High Definition.

CityTV had decided that High Definition was the “direction the world was moving into” and became the first Canadian broadcaster to receive a transitional over-the-air digital license in 2003 (The Future Environment, 2006, p. 23; Palframan, 2007). They were also the first Canadian broadcaster to change their news and talk/entertainment programming, *Breakfast Television* to High Definition in September 2006 (Palframan, 2007). As Senior Vice President of Operations, Peter Palframan (2007) noted, that it was important for CityTV to move their news to HD because of their focus on local programming. This change also provided a competitive advantage over other broadcasters because CityTV HD was able to produce 6 hours of daily original Canadian HD content, more than any other broadcaster in Canada (Cowan, 2007; Palframan, 2007). While CityTV has no current plans to produce Canadian dramas in HD, they have informed all their independent producers that CityTV prefers to have programming in HD.

High Definition broadcasting has also pushed the network to upgrade their old technical equipment, redesign studios and build new master control operations for transmitting HD. However, they argue that this was all part of their normal investment in infrastructure (Cowan, 2007). In the future, CityTV is looking to convert their production area to HD, by adding new cameras and editing facilities compatible with the High Definition format. As well, CHUM Limited had applied for transitional DTV licenses for their specialty channels Space and Bravo

because of the available HD content for these channels (Cowan, 2007). However, with the recent sale of the company, Space and Bravo are now in the hands of CTVglobemedia Inc. and it will be up to their new owners to decide their fate.

## **CanWest Global**

CanWest Global Communications, owned by the Asper family, has interests in television, radio, and publishing. Its revenues have been decreasing since 2004, to \$594 million last year (Broadcast Policy Monitoring Report, 2007). Global Television, took a different approach to the High Definition changeover in comparison to their competition. When Eric Heidendahl, the Director of Engineering for Eastern Operations joined Global TV in 2006, the company was in a time of renewal and change. It was still using old analog technology and made the switch directly to network based productions. However, their next challenge was converting that system to High Definition and they have taken steps towards that goal by buying a new three-gigabyte routing switcher that is capable of accommodating the highest form of HD 1080p/60 fields (Heidendahl, 2007). Global TV sees the changeover to HD broadcasting as a motivator for replacing the old technology at the station (Heidendahl, 2007).

Global TV joined the HD race in 2004 purely based on industry pressure, and simulcasts many of their top U.S. hits in High Definition. However, Global TV lags behind the competition in their production of Canadian HD content. Heidendahl (2007) states that there are active plans to change *ET Canada* and the news over to High Definition once the production area has been upgraded.

Global TV also does not have any over-the-air transmitters set up for HD broadcasting, which has become problematic for them, but have an HD service carried on Bell ExpressVU and Rogers Cable (Heidendahl, 2007). They believe it does not make economic sense to transform

their over-the-air transmission to High Definition since only about 10 to 13% of the population views HD content over the air with an antenna, while the rest of Canadians rely on cable and satellite carriage (Heidendahl, 2007).

CTV also agrees with this decision, although they do have HD transmitters in major cities. Ivan Fecan, President and CEO of CTVglobemedia adamantly stated at the Television Policy Review hearings that it would be inefficient and very expensive to put up new HD transmitters in such remote places such as Dawson's Creek, Yukon (Fecan, 2006). Still, the problem remains that once analog transmission ceases, remote areas will have to rely on other means to receive television signals in their homes. Furthermore, CBC President, Robert Rabinovitch called for a hybrid model, where only 44 digital over the air transmitters would be installed across Canada in the major markets, instead of the 500 to 600 analog ones currently running (Rabinovitch, 2006). Therefore, the public and private broadcasters are hoping that rural Canadians will switch to cable, satellite or IPTV delivery, instead of over-the-air conventional television. However, this puts the burden of further expenses in the hands of the consumer, whereas this service was free before the changeover to HD.

For Global TV, not having transmitters has also caused some problems with simultaneous substitution guidelines since the CRTC does not require cable and satellite distributors to substitute commercials if there are no over-the-air transmitters set up for HD viewing. For a few months, Bell ExpressVU and Rogers Cable both did simultaneous substitution for Global TV as a favour, but have since stopped due to the extra time and expenses incurred by the BDUs (Heidendahl, 2007). Simultaneous substitution regulations are very important because they protect the rights and revenue streams of Canadian broadcasters. Therefore, Global TV's advertising revenues have been at a disadvantage since audiences now see the American commercials, while watching a program in simultaneous substitution.

## **Challenges faced by Canadian conventional networks**

While there were some differences in all the interviews, generally it was found that English language Canadian conventional networks faced most of the same challenges and opportunities. The CBC, CTV Inc., CHUM Limited and Global TV were all confronted with increased financial expenditures, changing business plans, low consumer adoption numbers, a learning curve for production and technical problems, and rigid regulatory policies regarding over-the-air HD transmission. Meanwhile, High Definition broadcasting did present some tempting opportunities for being leaders in a changing media environment, increasing audience migration for early adopters, as well as protecting and maintaining the existing business and Canadian programming content.

### *Technical restructuring*

In order to function in the HD environment, Canadian broadcasters have had to change their camera gear, the VTR recorders, switchers, routers, editing facilities, master control rooms including waveform and vector scopes. As well, adding new 16x9 monitors and upgrading their transmission and distribution systems from new satellite receivers all the way down to new cabling. For example, when CityTV was upgrading to HD, they realized that all the old copper cables in the building had to be replaced with fiber optic cables due to the higher amounts of data coming through from an HD camera versus a standard definition camera (Cowan, 2007). This was but one of the unexpected technical challenges that arose with the High Definition transition.

After all these changes are made, the staff and production crews have to learn the ins and outs of HD technology. Bruce Cowan, the Director of Broadcast Technology at CHUM Limited noted that his staff are still learning and that it is probably a three to six month adjustment period for all the new equipment and workflow changes. But it does not end there, as broadcasters still have to transmit two separate feeds or signals at one time, one in High Definition and one in

Standard Definition to provide programming for the 90% of the audience who do not have HD capabilities (Cowan, 2007). Therefore, the beautiful new High Definition signal, which was created with all the new equipment, now has to be down converted to Standard Definition for the larger part of the audience.

Conversion problems are also significant at Global TV, where they receive most of their programs in 1080i, but one of their distributors, Bell ExpressVU are zealots for 720p. Therefore, before sending a program over to Bell ExpressVU, Global has to pass it through a converter box, which takes the signal from 1080i to 720p. It can be argued that quality is also lost with this conversion (Heidendahl, 2007).

However, Heidendahl (2007) argues that the greatest technical problem comes from the change in aspect ratios, because it significantly alters how the picture looks. Cowan (2007) confirms that his ENG news crews are all trained to shoot in 16x9 with the new HDV cameras, but they protect 4x3. This means that all the pertinent information in a composed shot has to be clearly visible in a 4x3 box, because many people still do not have wide screen televisions at home.

Finally, all the broadcasters agreed that audio is one of most important yet often overlooked parts of the HD transition that also seems to cause the most problems. Digital 5.1 Surround sound is great for a live sporting events or a concert, however, most agree that in a “talking head” show, it is an unnecessary feature. For example, CityTV HD has decided to leave the audio for *Breakfast Television* and the local news in Stereo because of the costly new equipment needed and their belief that it would not add to the viewing experience (Cowan, 2007). In addition, Global TV found that the audio coming from acquired U.S. programming never seems to be encoded properly and needs to be adjusted before it can be aired (Heidendahl, 2007). Therefore, technical problems often creep up on engineers and impact the quality of the program.

### *Production changes*

Production changes are not as significant for conventional broadcasters as they are for content producers. Then again, they cannot be discounted, as even small changes are noticeable on the High Definition screen. Palframan (2007) states that when CityTV HD first went on the air, they realized they had to completely redesign their studio in order to fit the HD frame. Since CityTV has a young, urban feel, the on-air personalities do not sit behind anchor desks, nor do they wear the traditional suit and tie. It was important for CityTV to retain this look and feel with the High Definition service since it is a vital part of their brand. Therefore, they had to readjust some of the backgrounds, organize desks and clear people away from the camera view since everything was visible otherwise (Palframan, 2007).

Make-up and costume design was another subtle yet important change for the High Definition transition. Since HD cameras have higher resolutions, every pore and wrinkle on a person's face can also suddenly become visible. A make-up artist with experience in HD productions was brought in, but needless to say, the on-air personalities were a bit reluctant with the changeover to HD, since they thought it would not be flattering to them (Palframan, 2007).

### *Financing the business plans*

All three conventional networks declared that their business plans for the future undoubtedly included High Definition broadcasting. Ironically, as a public broadcaster, the CBC was most concerned with the lack of a coherent business plan for HD. Mattocks pointed out that without gaining additional advertising revenues, it makes it difficult to justify changing over the smaller CBC markets to HD (Careless, 2007). On the other hand, Brace (2007) argued that HD is just the evolution of the business and it is no different than going from black and white to colour television. However, each of the broadcasters complained about the extra financial expenditures for the transition to High Definition. In general, they agree that the price increases for producing



and transmitting HD content is about 20 to 30 percent more than a standard definition show (Brace, 2007; Heidendahl, 2007; Palframan, 2007). However, they all claim that prices are diminishing from a couple years ago, when the High Definition transition started (Appendix 2). For example, a professional HD broadcast camera used to be priced around \$250,000 a few years ago, which at the time was anywhere between 30 percent and 100 percent more expensive than SD cameras (Luff, 2007).

A study conducted for the CAB in 2005, supports these claims, and estimates that HD related capital costs range from \$2 to \$4 million, while technical operating costs would be expected to increase by up to \$2.25 million annually (Wall Communications Inc., 2005). CTV stated that it would cost them approximately \$160 million to build out transmitters, (at \$250,000 per transmitter), \$40 million to convert master controls and \$200 million to upgrade all their stations to HD across the country (Brace, 2006). Brace also argued that programming costs and license fees increased due to the higher expenses incurred by the producers of the shows. He stated that at first, these costs were initially concerning, but have since become standard practice (Brace, 2007). The study by Wall Communications (2005) confirms the incremental programming costs and states that increases of 5 to 15% can be expected.

On the other hand, executives at CHUM believe they received a lot of good deals from broadcast manufacturers because they were the first to change their network to HD. Cowan (2007) warns that while they were able to offer early adopters some excellent opportunities, there was more risk involved in the transition because of unseen problems. As well, Cowan (2007) remarks that there were many associated items and unexpected costs, which increased the overall premiums paid for the HD equipment. Yet, he explains that one of the significant differences between CHUM and the competition was that they accept what is considered low quality High

Definition technology such as HDV cameras which are cheaper and have helped them transition their news to HD because of the lower costs (Cowan, 2007).

According to Heidendahl (2007), Global TV has spent approximately \$3 million on upgrades to HD, but has not changed the studio and production areas yet. He estimates that it will cost another \$4 million to switch *ET Canada* over to High Definition broadcasting (Heidendahl, 2007). These figures are generally higher than the Wall Communications (2005) study, which found that broadcast center facilities will cost in the range of \$1 to 2 million and High Definition production studio upgrades will be costing about \$2 million.

Since broadcast manufacturers have not yet recovered research and development costs, prices are still generally high for HD equipment, but this is expected to slowly drop in the coming years (Scrivo, 2007). In the meantime, the Wall Communications (2005, p. 31) study found that the impact of the digital migration and the transition to HD results in a significant decline in revenues for the existing analog services. On the other hand, Category 1 and 2 digital specialty services will be seeing an increase in revenues but most significantly, pay and specialty services will see substantial increases in revenues because these services generally offer programming for niche audiences.

Meanwhile, advertisers have been reluctant to embrace HD technology and do not pay any extra premiums for their ads. Therefore, while broadcasters are spending millions in a market driven transition, they are receiving nothing back in return. Advertisers also do not produce their own ads in High Definition, which means when an ad appears in a HD show, it suddenly cuts the screen with black bars all around the picture due to the changing aspect ratios, and the quality is noticeably worse. Many of the broadcasters understand that advertisers do not want to produce their ads in HD, due to the extra costs, but are frustrated that since the conventional networks are facing increased revenues, they are not receiving any returns on those expenditures (Brace, 20007;

Palframan, 2007). Meanwhile, advertisers have no motivation to pay extra for the HD content since broadcasters cannot yet present them with the mass audiences that standard definition programming is used to.

It is therefore up to the broadcasters to devise a new business model, which fits High Definition broadcasting into their revenue stream. Broadcasters proposed a fee for carriage argument, asking the CRTC to introduce new regulation which would allow conventional broadcasters to charge satellite and cable distributors fees for carrying their signal, in hopes of recouping some of the costs for the HD transition (Review of the Over the Air TV Policy, 2006). However, the CRTC has rejected the fee for carriage argument stating that it has not been effectively proven as a necessity for conventional networks current financial situations (Broadcasting Public Notice CRTC 2007-53). As well, the imposition of a fee would also raise cable and satellite bills for consumers, which could have a negative effect in the long term (Broadcasting Public Notice CRTC 2007-53). At the time of writing, while broadcasters in the industry believe that HD is here to stay, they are still looking for new ways to capitalize on the transition to High Definition.

### *Small Audiences*

Many consumer adoption studies try to pinpoint what exactly drives the adoption of new technologies. Historically, every new and successful technology in the media must first deliver exceptional benefits to the consumer such as convenience, choices in content, cost and availability (Keeble, 2006). As well, in certain cases, a higher quality experience is also a driver of consumer adoption, but not as strong as the ones mentioned above. Therefore, the technology must be able to perform a function better than the current technology, and at a reasonable price for the mass consumer (Keeble, 2006).

The current High Definition audience, those who own an HD set and a set top box for the HD subscriptions is currently at around 850,000 people (Tracking the growth and development, 2007) However, awareness of HDTV has increased by 10% to 83% of the population in the past year alone (HDTV gap exists, 2007). Decima Research states that as of September 2006, there are approximately 1.7 million HD sets (Usage of and Attitudes, 2006). According to Rick Nadeau (2007), the Vice President of Decima Research, this number is currently in the area of 2.2 million. Those who do own HD sets are between the ages of 18 to 34 years old, followed closely by 35 to 54 year olds and earn an average income of more than \$80,000 a year (CAB Technology Adoption Analysis, 2006, p. 14)

The problem arises in the disconnect between the amount of subscriptions to HD services, and the television sets (HDTV gap exists, 2007). Many consumers believe that just by buying the HDTV sets, they have High Definition television services; compound this with the lack of understanding that only some channels are in HD, illustrates the need to better educate the general public on the basics of HD before the technology becomes widely adopted.

Keeble (2006) anticipates that this is partly due to the position that “Content is King and Quality is a nice to have” (p. 17). He states that in previous years, one of the most popular television programs in Canada was *America’s Funniest Home Videos*, which was shot by amateurs on low quality video (Keeble, 2006). Furthermore, YouTube presents audiences with low quality content but unique entertainment. Thus, Keeble (2006) has found that consumers generally buy the HD television sets to use for wide screen DVD viewing and examines that perhaps wide screen is the value for most consumers, not the higher resolution. All the interviewees voiced this concern about a disconnect between HDTV sales and subscriptions and were very disappointed that their conventional networks cannot increase their revenues for HDTV by offering advertisers larger audiences for HD viewing.

In addition a study prepared for the CRTC by Solutions Research Group has found that HDTV growth levels underperformance in Canada are primarily due to a number of reasons. Until recently, there were generally high price points for the HDTV sets, misunderstanding in the consumer education relating to the features and benefits of HD, lack of programming, and a lack of clear and consistent communication by the consumer electronics and television industries (The Future Environment, 2006, p. 27). As well, from a technical perspective, Wayne Scrivens, Director of Broadcast Engineering at Bell ExpressVU states consumers also do not buy the necessary accessories such as HDMI cables. Finally consumers continue to watch their favourite television shows on the standard definition channels, without flipping to the HD channels (Scrivens, 2007).

### **Opportunities for Canadian conventional networks**

HD offers some interesting opportunities to conventional networks in leading the charge in the Canadian media environment. Rick Brace, the President of CTV, stated that being first and asserting their leadership position in the industry is very important for their company's brand and future growth. Often times, he said,

“It's nothing more than bragging rights, because there is no real incentive to be a leader and there is no return, and so you may choose to follow. In this case...we've decided we wanted to take a leadership position and we needed to get there quickly” (Brace, 2007).

Peter Palframan, the Senior Vice President of Operations at CHUM Limited agreed with this notion and mentioned that in such a competitive business as television, “you never want to be a follower” (2007). He argued that CHUM never looked at the HD transition as a matter of meeting their 30% internal rate of return; rather the decision makers at CHUM saw HD as a part of continuing and maintaining the business and most of all making sure that their current audience is protected (Palframan, 2007). He argues that CHUM audiences are aware of the extra upgrades the

network has undertaken and their response has been very positive and supportive (Palframan, 2007). Therefore, it is clear that Canadian broadcasters have to continue to expand and upgrade to High Definition, because their livelihood in the business depends on it.

Furthermore, the early adopters of High Definition technology have an opportunity to provide HD services to the tech-savvy early adopting consumers. Even though the HD population is currently around 10%, the niche audiences currently watching HD content are better educated, have higher incomes and generally influence many other people around them (Dupagne, 1999). For example, CHUM has noticed a shift in their audience demographics, with the news on CityTV HD attracting generally older age groups, while their specialty services, Much Music, Much Vibe and Retro generally draw the hip, young and urban crowd (Palframan, 2007). Due to this, Palframan (2007) argues that High Definition television plays well to both demographics, because while the younger generation is more sensitive to HD awareness and technically savvy, the older generations have more disposable income at their service and are better equipped to afford the HD costs.

Finally, the amount of High Definition programming being made in the United States is significantly higher than what the Canadian industry can produce in a year. In a study for the CAB on the availability of HD programming in the U.S. it was found that 92.7% of the prime-time schedule for non-sports specialty services were in HD, while 37% of the prime-time schedule for the major networks was shown in High Definition (Armstrong Consulting, 2005). As mentioned before, CTV and Global TV rely heavily on U.S. content in High Definition, but they have an opportunity to protect Canadian content by producing original Canadian programming in HD. While CHUM concentrates on news and entertainment style programming, they do not have any Canadian scripted dramas in their lineup in HD. CTV and the CBC lead in the production of

Canadian dramas in HD, while Global TV has no original Canadian programming in HD, as of July 2007.

Therefore, Canadian audiences often tune in to American programming for HD dramas, which are simulcasting on Canadian networks. As a result, University of Calgary professors, Beaty and Sullivan, argue that HDTV is a threat to our cultural sovereignty because the selection of programming is almost exclusively American (HDTV a threat to Canadian culture, 2006). Brace (2007) responded to this criticism by saying that even if the program is in standard definition Canadians still have an affinity for the American programs, and therefore does not understand the root of their argument. The implications of this trend can be detrimental to the Canadian cultural objectives that the CRTC is trying to uphold and it has expressed concern that HD viewers are finding little Canadian programming in HD, and therefore are turning to foreign services. The Commission notes that it might be difficult to repatriate those Canadian audiences currently watching U.S. HD programming once more Canadian shows become available, thus it is very important to continue producing Canadian HD content (Broadcasting Public Notice CRTC 2007-53).

## **CHAPTER 9- SPECIALTY HD BROADCASTERS AND CONTENT PRODUCERS**

For the most part, Canadian specialty broadcasters have been vigilant about the High Definition transition because they have become accustomed to their profitable analog services over the years. The digital landscape is more consumer-driven, and while production and technical costs are increasing, the distribution revenues are declining. In spite of this, a couple of Category 2 specialty channels have taken advantage of the High Definition market, which has proven to be a great driver of natural science documentary programming. These networks rely on independent content producers such as Exploration Productions Inc. and Barna-Alper Productions to provide them with programming to support their niche audiences.

### **Discovery HD Theatre**

Discovery HD Theatre was the first 24-hour, 7-day a week high definition Category 2 specialty service launched in Canada in 2005 (CRTC 2005-519). Discovery HD, owned 80% by CTV Specialty Inc., and 20% in partnership with Discovery Communication Inc. (DCI) represented a landmark for Canadian television because it was the first HD dedicated channel and nothing else like it on the air (Lewis, 2005). The network proposed to offer HD programming devoted to science and technology, nature, the environment, adventure, animal behaviour, pet care, wildlife, travel and world cultures (CRTC 2005-519). Discovery HD currently has 140,000 digital subscribers, with yearly revenues of \$152,000, but has not yet broken even with a Profit Before Interest and Taxes margin of -70.3% (Broadcast Policy Monitoring Report, 2007).

The Canadian content regulations stipulated that the station must air 15% of the Canadian content in the broadcast year and prime time, in the first year and up to 35% in the third year of operation and thereafter (CRTC 2000-171-1). Paul Lewis (2005), President of Discovery Channel believes that Discovery HD is uniquely positioned to lead the way in the Canadian HD arena.



## High Fidelity HDTV

High Fidelity HDTV is Canada's leader in independent HD broadcasting. As a Category 2 specialty broadcaster, dedicated to 24/7 HD programming, it currently has four HD channels, Oasis HD, Equator HD, Rush HD and Treasure HD, with seven more recently licensed by the CRTC (Murphy, 2007). Privately owned by former Discovery channel executives, Ken Murphy, John Panikkar and David Patterson, the small start-up network has some tough odds to face in the Canadian media landscape. Subscription numbers are on par around 120,000 subscribers for Oasis and Treasure HD, with yearly revenues of \$208,000 but Profits before Interest and Taxes are still very much in the red with - \$348,000 for Oasis HD (Broadcast Policy Monitoring Report, 2007).

According to co-founder and CEO, Ken Murphy, the network provides smart and beautiful niche programming to an older, thoughtful and more affluent baby boom generation (Murphy, 2007). He states that when High Fidelity HDTV first started in 2004, HD was not a driver, it was a given; "When we started this enterprise...it seemed inconceivable that one was starting a broadcast enterprise that wasn't 100% HD" (Murphy, 2007).

## Content Producers

Exploration Productions Inc. (EPI), owned by Discovery Channel, is one of Canada's top HD production houses, with over eight years of experience in producing high quality HD programming. Tony Leadman (2007), the Head of Worldwide Sales and Distribution for EPI, remarks that EPI produces all their programming in HD, with the exception of *Daily Planet*. Leadman (2007) argues that HD extends the shelf life of a program and the increases in international sales, more than make up for the extra expenses incurred during production.

Barna-Alper Productions, another Toronto based production house has just recently ventured into the HD market. However, the company has more than 25 years of experience in the

Canadian independent production sector. For Barna-Alper Productions, HD was a necessity after one of their broadcasters; Discovery Channel requested that the new seasons of *Mega Builders* be shot in HD. For an independent producer, the changeover to HD comes with more risk, as they have no financial backing for the investment capital required. Pim van der Toorn, the Head of Documentary Production at Barna-Alper states that the first show in HD was not as difficult as first thought, due to a lot of planning on the part of the production crew. However, increased costs for the equipment rentals and tape stock, as well as editing difficulties were still significant (van der Toorn, 2006).

### **Challenges and opportunities for specialty HD broadcasters and content producers**

Distribution issues such as capacity and bandwidth shortages make it harder for specialty channels to find the right market for their products. As well, broadcasters had to find the niche, underserved markets, which do not compete with the protected incumbents. But once those hurdles are crossed, specialty HD broadcasters have an opportunity to serve a large segment of the population through programming designed especially for their interests. Independent producers have the ability to sell their programming not only to Canadian audiences but internationally as well which more than makes up for the increased costs.

#### *Distribution*

Specialty HD broadcasters generally have a hard time finding the right channel of distribution for their service. While BDUs generally all seek HD channels to add to their lineups, there is a serious problem with capacity since the bandwidth needed for an HD signal is significantly higher than an SD channel, and distributors cannot fit the same amount of channels as before.

High Fidelity HDTV also stated that being a start-up Category 2 service made it even more difficult to obtain carriage. Murphy (2007) complained that the regulatory environment is not friendly to Category 2 license holders. For example, a Category 1 digital service can demand carriage from the BDUs, while High Fidelity had to make a strong argument. (Murphy, 2007). From the BDUs perspective, they were reluctant to carry the signals because High Fidelity HDTV was an unknown, without a strong brand and audiences were not requesting them. Therefore, High Fidelity executives outlined the strengths of their proposition including the fact that all their programming was premiere, and 100% High Definition (Murphy, 2007). Currently, High Fidelity HDTV is carried on Bell ExpressVU, SaskTel and Access Cable, but they are also in discussions with Rogers Cable, Shaw Cable and Cogeco (Murphy, 2007).

The road to distribution was relatively “painless” for Discovery HD Theatre due in part to its well-established Discovery Channel brand (Lewis, 2005). But being the first specialty channel in HD, also meant that in order to make the channel financially viable, Discovery HD had to charge a relatively high rate, approximately \$2 per subscriber, almost triple what they charge for Discovery Channel Canada (Lewis, 2005). Therefore the BDUs needed some convincing that Discovery HD was a quality premium service and the only one of its kind in Canada for the foreseeable future.

#### *The ‘boomer’ market*

High Fidelity HDTV understands that their audience is made up of sophisticated consumers, who have a lot of options in terms of different channels and other media. However, executives at High Fidelity noticed an alarming trend that Canadian broadcasters were not rushing to provide audiences with HD programming, therefore they saw an opportunity to reach out to an often ignored older audience. High Fidelity HDTV found that the aging boomer population is in the process of inheriting a trillion dollars from the World War Two generation (Murphy, 2007).

Thus, this segment of the population is very attractive to High Fidelity, since they have the disposable income and the free time to watch natural science programming in HD (Murphy, 2007).

### *Production and Technical problems*

For independent producers like Barna-Alper Productions one of the biggest challenges was shooting the material differently due to the new aspect ratio. Filling the frame with a close up which has been a staple in television production has become almost intrusive using HD, because of the incredible detail available to the viewers. Shot composition including headroom and nose room for single subjects also had to be reconsidered. While in 4x3, a close up of a person's face fits inside the screen nicely, in 16x9, the screen is left more than half empty, unless the person's face is in the middle, which creates awkward looking shots. Therefore when shooting in HD, the director has to use medium shots or medium close-ups in order to introduce a character. *Mega Builders* has started introducing characters by doing a 360-degree spin around the person using a wide shot, head to toe. This adds a different dimension to the program, making it interesting and also taking away from the traditional close up of the person's face.

In addition, editing tends to take longer in High Definition productions due to the down converts and up converts required (van der Toorn, 2006). These expensive conversions were not required with standard definition; however, they are a necessary part of HD productions for the offline edit. Van der Toorn (2006) explains that Barna-Alper Productions spent more than \$40,000 upgrading their in-house online facility, but even something as simple as tape stock more than doubled in price for HDcam tapes.

Exploration Productions Inc. also found some challenging situations regarding HD productions. Leadman (2007) states that the mobility and size of the professional equipment has at times become a problem and a nuisance. While they strive for the highest quality HD programming and use top of the line cameras, production crews have found them too bulky for the

active shows they shoot. For example, Leadman (2007) comments on a new pilot about the Queen Mary cruise ship, where camera crews were running around the ship, up and down stairways and through boiler rooms and have found that smaller cameras are needed for shooting these types of active programs.

Furthermore, Leadman (2007) is concerned about the amount of stock footage in each of the programs EPI produces. Since the topic of the shows sometimes calls for stock footage, which is not available in High Definition, Leadman (2007) worries that these shows will have a harder time being sold to U.S. HD networks. For example, HDNet in the U.S., one of EPI's international clients has capped stock footage materials at 10%, so that the programs they put on the HD channels, are truly High Definition (Leadman, 2007).

#### *International sales*

Canadian HD productions are slowly increasing, and overall it is estimated that 10% to 15% of television programming are produced in HD (Dillon, 2007). While the numbers are still low, specialty HD broadcasters and content producers have both tuned in to the advantages of selling the programming to an international audience. For example, EPI has garnered a long list of HD programs, which air on Discovery Channel HD, but are also sold to international markets such as China, Singapore, Malaysia, Japan, France, Italy, Germany, the UK, and the United States (Leadman, 2007). Broadcasters around the world are realizing that having an HD component is just better business in the long run. Even Eastern European countries, where HD is not yet available, are starting to buy HD programming, but only pay the equivalent of a standard definition show (Leadman, 2007).

Building a good relationship and giving international broadcasters a good deal is important for EPI because it gives them a leg up on the competition and the ability to have a first run, which is paid nicely by broadcasters. While it may cost about 15% more to produce a show in HD, the

incremental costs pay off since having high quality programming gives EPI an extra window of opportunity, and extends the shelf life of that program (Leadman, 2007). In addition, Leadman (2007) argues that High Definition helps give audiences the two things they want the most, quality and content. Therefore, EPI has learned that building a library in High Definition is just “plain smart” because of the growing demand for HD content (Leadman, 2007).

## CHAPTER 10 – SPORTS BROADCASTERS

The biggest driving force for Canadian High Definition content have been sporting events, such as hockey, baseball and basketball games which naturally fit well with HD's horizontally designed, widescreen television sets. TSN and Rogers Sportsnet have both been leaders in the transition to HDTV, by adopting the technology early on and providing sports fans with many hours of stunning HD content.

### TSN

TSN, "Canada's Sports Leader", is owned by CTVglobemedia and is part of the CTV family. TSN first started broadcasting CFL games in HD in 2004 and since then, Rick Chisholm, Vice President of Programming and Production at TSN, says the HD broadcasts have increased substantially. Chisholm estimates that in 2007, TSN will have close to 4900 hours of HD programming in their lineup (TSN HD Programming, 2007). TSN broadcasts many hours of live Canadian sporting events such as CFL games, Blue Jays, Raptors, and national hockey games (Appendix 3).

Through their partnership with ESPN, TSN has also expanded its schedule to include NFL games, Nascar races, Masters and PGA golf, tennis, and championship boxing events (TSN HD Programming, 2007). However, the biggest impact for the TSN HD service has been the complete restructuring of TSN's daily news show, *SportsCentre* to High Definition in September 2006. *SportsCentre* adds over 920 hours of original HD content to TSN's lineup each year (TSN HD Programming, 2007). The restructuring for High Definition included building a new Master Control, new editing facilities and upgrading the current studio to house both *SportsCentre* and *That's Hockey*.

Chisholm (2007) confirmed that future plans would include producing all CFL

home and road games in High Definition, starting in 2008 when the contract is renewed. He hopes that other leagues including Major League Baseball and the National Basketball Association will follow along and also switch over to HD games for home and away broadcasts (Chisholm, 2007).

### **Rogers Sportsnet**

Rogers Sportsnet has been a leader in sports production since 2003 when it started broadcasting MLB and NBA games in HD. Currently, Rogers Sportsnet airs about 80 Blue Jays games in HD, 54 Raptors games in HD, in addition to an assortment of HD NHL games and international events like the World Cup of Soccer, and the World Series (Briggs-Jude, 2007).

Doug Beeforth, President of Rogers Sportsnet believes that "High definition is the future of sports broadcasting...many people say watching sports in high-def is actually more compelling than being at a game in person" (Beeforth as cited in Poulton, 2005). Owned by Ted Rogers' Rogers Communications Group, Sportsnet claims to be an early adopter of HD technology. Vice President of Production, Rick Briggs-Jude states that Ted Rogers' entrepreneurial spirit and the fact that he embraces technological change have been significant in moving the channel to High Definition.

Sportsnet became the first sports channel to broadcast Blue Jays games letterboxed, meaning the picture appeared with black bars on the top and bottom of the screen when watching in standard definition (O'Brien, 2004). Briggs-Jude (2007) explains that this approach was introduced in order to present HD to those still watching in standard definition and to give viewers who were unfamiliar with HD a chance to see what the aspect ratio change could do to the viewing experience. However, they did not expect the negativity from the standard definition audiences, as many complained that the channel was significantly altering their viewing screen and cutting their picture by adding black bars on top and bottom (Briggs-Jude, 2007).



Rogers Sportsnet plans to continue expanding and building on their strong brand. The company is moving out of the Agincourt CTV compound to the Rogers headquarters in the fall, and will be building new HD studios and Master Control rooms to accommodate the transition to High Definition. As well, Rogers Sportsnet would like to receive more channels of distribution for their HD services, as they only have one HD channel at the moment. Briggs-Jude (2007) complained that this is in conflict with their brand as a regional broadcaster, since in standard definition; Rogers Sportsnet operates four regional channels, Sportsnet East, West, Ontario and Pacific. However, he understands the capacity issues broadcast distributors are faced with in the HD market (Briggs-Jude, 2007).

### **CBC Sports**

As a conventional public broadcaster, the CBC's sports department has been leaving its mark on the sports industry since *Hockey Night in Canada* was started in 1952 (Houston, 2006). However, after many years of strong commitment to the Olympics, hockey and football, the CBC has faced some tough competition from other conventional networks and specialty sports networks as more and more, sports rights have been spread out among the different incumbents. For example, the CBC lost the Olympics for 2010 and 2012 to the surprising partnership of CTV/TSN and Rogers Media (Houston, 2006). It has also lost its CFL football contracts, which are now broadcast on TSN and TSN-HD.

Fortunately, it was just earlier this year, that the CBC was able to hold on to the hockey rights, which expire after the 2007/08 season (Strauss, 2007). It will be paying more than a \$100 million per year, which is 50% more than the current cost. As a result of the steep sports rights, some production costs could suffer, as generally all Saturday night games are in HD. However,

occasionally half of a hockey double header from different cities has to be produced in standard definition, due to budget cuts (Careless, 2007).

Furthermore, CBC is also back in the baseball business after a five year absence, due to a rebuilding attempt by newly appointed head, Scott Moore (CBC sports rises from the grave, 2007). It picked up the Toronto FC games this summer showing most in HD, and just recently signed a three-year deal with the Toronto Raptors, putting Canada's only NBA team back on conventional television and for the first time on public airwaves (CBC signs Raptors, 2007).

### **Challenges and Opportunities for Sports Broadcasters**

Sports broadcasters face similar challenges and opportunities as conventional and specialty broadcasters including changes in the production of the sporting event, transmission problems, increased costs and an inadequate number of available mobile production trucks due to the high demand for HD productions. At the same time, sports audiences drive the adoption of HD sets and are avid television viewers of sporting events. Therefore, keeping this segment of the audience satisfied with the highest quality programming is very important to each networks survival.

#### *Production changes*

Once again, aspect ratio changes become a key factor in sporting events. Horizontally oriented action sports, such as football, hockey, basketball and baseball are better suited for HD's widescreen picture format, because the lateral movement on the playing field is ideally suited for the larger 16x9 aspect ratio. As well, live events perform much better in Dolby 5.1 Digital Surround Sound and immerse the audience in a game like atmosphere. Other sports such as golf, tennis and hockey, where small objects need to be followed are better visualized on a crystal clear television set in HD. Therefore, as Rick Chisholm (2007) stated, "Sports is live television...and [HD] just plain makes it look better".

Directors and producers of sporting events also have the ability to tell the story differently than before. High Definition provides more detail, more drama, longer wide shots, quicker cutting, or less cutting. For example, according to the Vice President of Production at Sportsnet, Briggs-Jude (2007) argues that more close-ups in a baseball game provide intensity and drama because of the detail of the pictures.

“When you see the pitchers face, scowling and growling and staring in at the catcher. And you see that because it’s the 7<sup>th</sup> inning the stubble on his face from his whiskers that have grown in or the sweat or the chalk on his cap, the detail from all those things is a dramatic piece of art on our canvas, and it’s special.”

As well, Briggs-Jude (2007) mentions that make-up has been more carefully considered for the on-air talent, in order to have a more finished presentation.

### *Technical challenges*

TSN and Rogers Sportsnet both agree that technical issues have been their biggest headaches, since High Definition becomes much more complex during a live event. In order to produce live shows, both networks often contract out Dome Productions Inc., Canada’s leader in HD mobile production trucks. Dome Productions provides the broadcast facilities and crews at sporting events for many broadcasters in Canada and the United States. It currently has 3 HD trucks, starting with Majestic launched in 2004, and will be debuting a new HD mobile in the fall of 2007.

As Senior Vice President and General Manager, Mary Ellen Carlyle (2007) states, that they are fortunate to be owned by both Rogers Communication Group and CTV Specialty, which give them the capital dollars, needed to keep building HD mobiles. Carlyle (2007) explains that if Dome would not build HD trucks, they would no longer be in business and therefore it was crucial to join the transition. She also notes that at the current time demand is slightly outweighing supply and thus it is very important to keep expanding and building HD mobiles (Carlyle, 2007).

An important factor in the engineering of the mobile trucks was the ability for each truck to be multi-format, that is capable to handle both High Definition and standard definition shows. As well, placing encoders and decoders in each successive truck gives Dome Productions a competitive advantage over others. In addition, Carlyle (2007) asserts that with RDS transitioning in the fall, there will be more business opportunities for their HD trucks. More importantly, Carlyle confirmed that the NBA and NHL Leagues would announce in the fall of 2007, that all visiting and home games for the teams must be in HD. This will add considerable business for Dome Productions and others like them in the U.S. and Canada.

Sports broadcasters also stated that transmission problems were difficult due to capacity problems and the increased costs. This is a direct result of the contribution technologies, which are used to send signals between venues and the television stations. These technologies require the best possible quality in video and audio and therefore charge a premium price. TV2GO Inc. is a Canadian satellite transmission company working in the contribution area, with many Canadian broadcasters to send signals around the world. In 2006, TV2GO provided the World Cup of Soccer to Rogers Sportsnet and CTV/TSN from Germany in HD. It was the first time that a Canadian company had taken an HD signal at 1080i/50 frame rates with Dolby E audio at 25 frames, the European standard, and successfully converted it to 1080i/60 frames with Dolby E at 29.97 frames, the North American standard. Since then TV2GO has successfully transmitted many other international events around the world using satellite technology. Implementing the new DVB-S2 modulation algorithm increases the bit rate for the same amount of bandwidth and provides an alternative to fiber usage, via satellite HD contribution.

#### *Cost increases*

There is a well-known statement among industry personnel “HD is all cost and no profits”, which seems to symbolize the disagreeable mood of the industry regarding the High Definition

transition. According to Chisholm (2007) that is not always the case, because while there is no linear measure of increases in revenues for HD productions and no extra revenues from advertisers, there is a huge profit on the brand of the station. Chisholm (2007) states that this cannot be quantified; yet it is very important to the network.

On the flip side, Briggs-Jude (2007) claims that there is probably a 30-35%, which Carlyle (2007) concurs and explains that the higher daily truck rates are affected by many other issues. On the other hand, mobile production truck prices have been declining slowly as the fourth truck is costing \$9 million compared to \$12 million for the first one (Carlyle, 2007). There a number of reasons for this change in price, including the American dollar coming down over the years. She predicts that by the year 2009, prices for standard definition and High Definition productions will be in equilibrium (Carlyle, 2007).

#### *Competition from the public sector*

The new deal between the CBC and Maple Leaf Sports and Entertainment (MLSE), owners of the Raptors and Leafs, is a clear example of how the public broadcasting sector has the ability to influence and impact the private sector. The recent agreement grants the CBC rights to broadcast 10 regular season Raptors games this year, and 20 games in each year afterwards with most of those being produced in High Definition. However, this deal has important implications for the private sector as MLSE has granted exclusivity to the CBC in the Air Canada Center. According to Carlyle (2007), Dome Productions could not compete with the rate that the CBC was able to offer MLSE, and therefore decided that it would be financially irresponsible to keep lowering their own rate further. With a new HD truck about to roll out, it puts added pressure on Dome Productions to find business opportunities elsewhere. On the other hand, the CBC only has two HD mobiles at their disposal, and two digital trucks, out of the 11-truck fleet (CBC Mobiles-Video, n.d.). The limited amount of HD trucks may cause problems, from a capacity perspective,

in the long run if the sports leagues decide to mandate all High Definition broadcasts for home and away games.

In terms of opportunities available to sports broadcasters, as Briggs-Jude (2007) stated there is a marquee aspect to being the first to embrace a new technology. However, that notoriety cannot be enjoyed to the fullest, if very few people see it. TSN's VP agrees and states that being part of the CTV family has helped anchor the stations outlook on High Definition (Chisholm, 2007). Chisholm (2007) gives credit to CTV President Rick Brace for making a smart move where High Definition was concerned since HD protects the properties and the major distributors. Therefore, TSN was able to follow the CTV example and used High Definition broadcasting in their highest rated shows.

Both sports broadcasters agree that sports audiences are more demanding in terms of the quality they seek from their sport viewing experience. Carlyle (2007) argues that a person sitting at home watching Canadian Idol does not care if it is in HD or not, but the sports fan cares if the Superbowl is in HD. Demographics for both stations are sports fans ages 25-49, generally male, and coincidentally this segment of the population has been found to buy the most HDTV sets (CAB Technology Adoption Analysis, 2006, p. 14). TSN and Rogers Sportsnet both agree that this audience is filled generally speaking with "boys who like toys... and HD is certainly a toy" (Briggs-Jude, 2007). Therefore, they have tailored the content using High Definition programming in such a way as to keep their audience happy.

Dome Productions and TV2GO have other opportunities from the High Definition transition. Dome Productions has the ability now to compete with the U.S. market, something that was not possible in the standard definition world, due to the overabundance of mobile SD trucks (Carlyle, 2007). Since HD is still at the onset of the transition, and Dome Productions currently has three High Definition trucks available, more business flows from the United States due to

demand for HD events. It also introduced the company to the entertainment world and has given Dome Productions more opportunities to produce concerts and internationally known events (Carlyle, 2007).

TV2GO Inc. saw an opportunity in the European market for linking transcontinental High Definition between Europe and North America (Hepes, 2007). Since there is very little HD programming currently in European countries, TV2GO became a supplier of American and Canadian sporting events to the European market. The company pioneered this interoperability for the first time during the final two games of the Stanley Cup Playoffs in 2006. This is significant because European networks have not yet become convinced of High Definition's value in the broadcast industry and having the ability to see sporting events in HD can perhaps jump start the transition in Europe as well.

## **CHAPTER 11 – BROADCAST DISTRIBUTION UNDERTAKINGS**

According to the CRTC, Broadcast distribution undertakings had healthy revenue gains in 2006, as total revenues for cable companies increased by 12% in one year to \$6 billion, while combined revenues for Direct-to-Home and Multi point Distribution System companies rose by 17.7 per cent to \$1.7 billion (CRTC releases financial results, 2007).

From a High Definition perspective, BDUs are heavily criticized by the private sector broadcast industry for being profitable during the transition to HD because they have the ability to charge a higher rate to consumers. However, Mike Lee, Chief Strategy Officer at Rogers Communications Group states that the hundreds of millions of dollars that BDUs spend on network build-outs are nowhere near the small amounts that broadcasters need to spend for the transition to HD (Lee, 2007). Rogers Cable and Bell ExpressVU are two of Canada's top BDUs in their respective businesses, which are cable and Direct-to-Home satellite carriage (Appendix 4).

### **Rogers Cable**

Rogers Cable launched the High Definition service in December 2001, with eight channels available on their service, after early adopters demanded a better service. As well, Rogers Cable did not want to fall behind the competition, including the satellite distributors, who were seeing significant gains in subscriptions. Rogers Communications Group understood that as the largest operator, they had a responsibility to be a catalyst in any major shifts in the market (Lee, 2007). Rogers Cable currently offers 40 HD channels on their service and 12% of their digital cable audience subscribes to their HD stations (Lee, 2007). In total, Rogers Cable currently has over 2.2 million subscribers (Broadcast Policy Monitoring Report, 2007).

Lee (2007) who currently overlooks strategy, business development, partnership management for corporate, cable, wireless and internet services understands the gamble some



broadcasters are taking with High Definition and is worried about the future of the industry as a whole. He argues that if the broadcasters are not producing Canadian HD content due to the increased costs, then the unintended consequences of their inaction will hurt them in the long run, as they are inadvertently pushing audiences to turn to U.S. programming (Lee, 2007).

Rogers Cable's future plans include many more HD services, including HD On-Demand, to satisfy all their consumers' needs as they see HD as an investment in the future, rather than a moneymaking scheme in the present. Lee (2007) concludes that in order for HD to be successful, the company investing in the technology needs to have a five to seven year plan instead of an 18 month return, because High Definition will not turn a profit that quickly. However, Lee states that "if you never go you will never have the opportunity to make money" (2007).

### **Bell ExpressVU**

Wayne Scrivens, the Director of Broadcast Engineering at Bell ExpressVU is very optimistic about the future capabilities of the satellite distribution business. Currently, Bell ExpressVU has two satellites in orbit, which provide 52 HD channels and other services. There are generally 32 transponders on a 500 MHZ satellite and usually have either 1 or 2 HD channels per transponder. (Scrivens, 2007). In 2009, the company will launch another satellite, Nimiq 5, which will provide them with the much-needed capacity to expand their capabilities to carry hundreds of HD channels (Scrivens, 2007). Bell ExpressVU has 1.8 million total subscribers, with over 3 million set top boxes since most households usually have more than one box.

In order to be able to fully manage HD channels, Bell ExpressVU underwent a complete upgrade of their facilities, including a new routing system, adding Dolby E decoders and AC-3 encoders and working with manufacturers to improve compression and conversion technologies. However, cable and satellite distributors still have to send both an HD signal and a standard

definition signal out to their customers, since the greater part of the population is still watching in SD. At the same time, Bell ExpressVU is working on testing out a new technology for the future, IPTV in the Toronto and Montreal markets using a higher compression standard, MPEG4 that can fit twice the number of HD channels.

### *Educational challenge*

There remains a significant gap between screen sales and connectivity through digital cable or satellite. This is a direct result of the lack of education provided to the consumer by the distributors, the broadcasters and the consumer electronics industry. Additionally, once consumers do subscribe to an HD service, the audience will soon realize that the HD channels offered by the distributors are actually not all HD all the time, since many of the channels only show High Definition during prime-time hours or during sporting events. Lee (2007) warns that if Canadian broadcasters continue to be disingenuous about HD programming, it will have negative long-term ramifications for the viability of the business. As well, consumers will feel that they are not getting their money's worth and once penetration caps out, the broadcast industry will cap out from a revenue perspective. This in turn affects the revenue stream, and as a result there is not enough money to go back and invest in HD programming, finally becoming a vicious circle.

Furthermore, the educational challenge also extends to media industry personnel because broadcasters are not interested in over-the-air transmissions of HD and are only putting up antennas for simultaneous substitution purposes (Lee, 2007). He claims that this is an oversight on the part of the broadcasters because they are not taking into consideration the effect the transition in the U.S. will have on the Canadian market. The broadcast spectrum needs to be harmonized with the U.S. transition since the country is populated along the U.S. border, and once analog to digital over the air transmission takes place, there will be serious interference coming from the Canadian 700 MHZ signals (Lee, 2007).

### *Technical challenges*

As mentioned in earlier chapters, High Definition takes up more space than standard definition broadcasting. Scrivens (2007) calculates the capacity needed for HD is 5.5 times more than standard definition. Therefore, HD uses MPEG-2 technologies to compress the signal before sending it to the audience, so that more channels can be squeezed into the spectrum. MPEG-4 technology, which can double the amount of HD channels, is also being tested by Bell ExpressVU. However consumers will need to buy new set-top boxes and convincing them to do so might be a tough sell. Jeff Ibbotson (2007), the Vice-President of Sales and Marketing at Sony Canada, notes that the U.S. industry has already introduced MPEG-4 into major markets such as New York, Los Angeles, Chicago and Boston, and has been adamant about changing over to this technology quickly. Compression algorithms used in MPEG-4 technologies have become highly sophisticated and engineers have figured out ways to take away bits from locations on the screen where a person is not looking (Ibbotson, 2007).

According to Lee (2007), Rogers Cable has the most amount of spectrum at its disposal in North America, with 860 megahertz. However, Rogers splits up this spectrum for hi-speed Internet, telephone, analog television, digital cable and data services. Lee (2007) explains that because of the higher amounts of data in an HD signal, Rogers Cable can only fit two channels of HD with MPEG-2 compression, into the six-megahertz of spectrum allocated for each channel. Meanwhile, digital cable, with MPEG-2 compression technologies, is far more efficient and can fit 10-12 standard definition channels in the same spectrum.

### *Economic obstacles*

It costs approximately \$200 to \$400 million to purchase a satellite for Bell ExpressVU, plus the launch fees (Scrivens, 2007). At the same time, Rogers Cable asserts that in 2006, their capital budget was \$600 million, which they spent on network build outs, set top boxes and

developing the business (Lee, 2007). To offset these expenses a little bit, BDUs charge customers a premium for the HD services. For example, Bell ExpressVU charges \$102/month for an HD Extra package versus \$54 for the SD digital only package and claim that they are charging much less than what the actual value is (Scrivens, 2007).

Therefore, the problem that BDUs encounter with HD is the low return on the investment for the capital that they spent on building up the needed capacity for High Definition. As well, Lee (2007) asserts that there is a real challenge with allocating 120 MHZ of spectrum out of the 860 MHZ for 40 HD channels and then putting programming that is not actually HD on it. This provides even more confusion to the already misinformed customers because these HD shows are actually of the same quality as SD. The revenue driven off the 120 MHZ of spectrum is very low and will continue to be low until more hours of programming are produced. However, Rogers feels that it is important from a strategic perspective and a consumer perspective to transition to HD, even if the economics are challenging for the company (Lee, 2007). As well, he warns that if BDUs stop investing in the network, everyone else's revenues will also stop growing. He claims that broadcasters do not understand that their success is intimately linked to the success of the BDUs; "People in the industry tend to think of it as a zero sum game. If you win, I lose; if I win, you lose and as a result you never win, if I have anything to say about it. And it doesn't work that way anymore" (Lee, 2007).

## CHAPTER 12 – CONCLUSION

“The transition to digital television is a lot like getting into heaven. Everyone knows what it takes to get there, but no one wants to do what it takes and sacrifice.” – Florida Congressman, Cliff Stearns. US House of Representatives, 2001  
(As cited in Castaneda, 2007)

Technological advances are constantly being developed as the scientific community continues to make new discoveries every day. We are currently living in the midst of a digital age, where many of the established past times are endangered by new technologies that have cropped up (Hart, 2004). Over the past few years, new media technologies have evolved in dramatic ways, far from the battles between the VCR and Sony’s Betamax. Equipped with new digital tools, the consumer electronics industry has now created a variety of new technologies that will fundamentally alter the broadcasting industry in Canadian media.

Originating in Japan during the late 1960s, the current digital High Definition system has been adopted in the United States, Canada, Japan, Australia and some European and Asian countries. The global transition to HD is picking up momentum as broadcasters and producers are steadily upgrading their equipment to HD, making it a \$12 billion industry (HD Transition Boosts Industry, 2007). Flat panel display sales have grown substantially worldwide and reached more than \$65 billion (Hart, 2007). Nevertheless, a world standard has still not been decided upon, due to many of the same obstacles that arose during the NTSC, PAL and SECAM battle. However, HD may have the ability to become a global standard, albeit with minor variations across different countries, because many industry experts believe that this changeover is as significant as going from black and white to colour television. Furthermore, a global standard would allow for mass production of HDTV sets, which history has shown would drop prices significantly, recoup the research and development costs for the manufacturers and start a consumer adoption frenzy.

This Major Research Paper is a collection of the different experiences Canadian conventional broadcasters, specialty channels, BDUs and content producers are currently undergoing in regards to changing over their stations and services to High Definition. It was hypothesized that the whole cycle starting with the manufacturing industry, to the production, broadcasting and distribution of a television program is affected by the changeover to High Definition. Finally, through different interviews with media executives, this paper set out to answer who really benefits from the transition to High Definition technologies; the broadcaster, the content producer, the BDUs, the manufacturers or the Canadian audience?

While it cannot generalize those who were not included in the study, it does provide a wide variety of interview subjects from many different companies in the various areas involved in the transition. Therefore, the study is able to create an overview of the challenges and opportunities that have arisen from the changing media environment.

The main challenges covered include the large financial investments that are required and the lack of a coherent business model for HD providers. Ultimately, the economic obstacles cannot be denied, as production and technical restructuring costs are generally 20% to 30% higher for High Definition broadcasting. Yet many agree that the higher prices have to be looked at as part of keeping up with emerging technology and growing the business. A strong motivator for many broadcasters has been the added advantages HD provides to the branding of the network.

The next few years will be difficult for the conventional broadcasters since their viewing share is slipping and advertising revenues are stagnant for the HD services. However, conventional OTA broadcasters are some of Canada's richest media companies with a wide variety of assets in specialty channels and other platforms. As a result, they should see the transition as part of maintaining and protecting their business. As many of the networks rely on

U.S. primetime programming in HD, new concerns have been raised about the protection of Canadian content and the urgent need to produce more Canadian HD programming.

Furthermore, conventional OTA broadcasters have a responsibility and a mandate to provide audiences with free over the air television and therefore should not leave audiences in remote locations stranded. Many have expressed hope that the CRTC will continue to regulate OTA broadcasts and not allow conventional networks to wash their hands of 13% of the population. Free over the air HD television protects HD from becoming a niche, premium product that only the wealthy can afford.

On the other hand, specialty HD broadcasters have a chance to greatly benefit from the transition and move ahead of the competition by seizing the audience tuning in to HD programming. Sports, movies and documentary programming have been very successful at capturing the better educated and tech-savvy HD population. At the same time, content producers have an opportunity to sell their programming to an international audience, not just domestically, since the demand for HD productions is currently very high.

The general population and industry professionals have criticized broadcast distribution undertakings because they believe that distributors can capitalize on HD since they charge customers a premium for the service. However, BDUs claim that they are also plagued by extraordinary cost increases for network build-outs, as they try to keep up the capacity demands of High Definition.

The distribution arena will significantly impact the HD transition, especially if the CRTC mandates a 'must carry' status for all HD signals, as in the United States. According to Scrivens (2007), this would be very difficult to support since there is not enough space in the broadcast spectrum. However, the CRTC has recently launched proceedings to study the regulatory

framework for the BDUs and the distribution of HD signals, which will take place in early 2008 (Broadcast Policy Monitoring Report, 2007).

From a consumer perspective, many have criticized distributors for frequently compressing the HD signal to the point of serious degradation (Keeble, 2006). Therefore, new compression technologies such as MPEG-4 need to be adopted by consumers on all platforms, and more satellites must be launched in addition to the new equipment that will need to be developed if there is to be sufficient capacity to accommodate the Canadian HD services. Since the U.S. has already started introducing MPEG-4 set top boxes, Canadians should see this trend established in approximately two years time.

Clearly the manufacturing industry will continue to profit from the transition to HD, because new equipment is still a necessity for the broadcast industry and the sales of HDTV sets keep going up (Ibbotson, 2007). There is also increased competition among new formats and standards, as well as consumer devices such as Blu-Ray and HD-DVD.

But in the end, the audience benefits the most, according to the interview subjects who all agreed that the improvement in picture and sound quality provides audiences with the ability to enjoy a movie-like experience in the home. Still, it can be argued that consumer adoption will not really take off until the price of the sets are well below \$1000, and subscription fees will be on par with standard definition rates. Therefore, while HDTV is here to stay, and many believe will bring audiences back to television viewing, it is still unknown whether the demand for higher quality programming will absorb the increased costs of the whole media industry transformation. High Definition is also not going to be the final word in quality, as manufacturers are already implementing 3D HD, Super HD and HD 4K. In the future, it is more likely that we will see a variety of picture qualities that will vary depending on the content and distribution medium, with HDTV playing the role of the home-theatre leader.



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## **LIST OF ABBREVIATIONS**

ACATS – Advisory Committee on Advanced Television Services

ATSC – Advanced Television Systems Committee

AVC- Advanced Video Coding

BDU – Broadcast Distribution Undertaking

CAB – Canadian Association of Broadcasters

CRTC – Canadian Radio-television and Telecommunications Commission

DTV – Digital Television

DVB – Digital Video Broadcasting

FCC – Federal Communications Commission

HDTV – High Definition Television

HD- MAC – Multiplexed Analog Components HD

MPEG-2 – Motion Pictures Experts Group

NAB – National Association of Broadcasters

NHK – Nippon Hoso Kyokai

NTSC – National Television Standards Committee

PAL – Phase Alternating Line

PVR – Personal Video Recorder

SDTV – Standard Definition Television

SECAM - Séquentiel couleur à mémoire

SMPTE – Society of Motion Picture and Television Engineers

VOD – Video-On-Demand

## APPENDIX

### Appendix 1- Conventional networks interviewed with significant ownership interest in specialty, pay, PPV and VOD services as of 31 December 2006.

CanWest <sup>(1)</sup>	Type of service	Language	Direct/indirect voting interest	31 August 2006 financial results (000)			
				# of subscribers	Revenue (\$)	PBIT (\$)	PBIT Margin
Cool TV	Sp. D2	E	100%	152	627	1,052	167.7%
DejaView	Sp. D2	E	100%	1,022	3,907	-772	-19.8%
Fox Sports World Canada	Sp. D2	E	100%	885	3,485	-477	-13.7%
Lonestar	Sp. D2	E	100%	1,031	4,256	1,164	27.4%
Xtreme Sports	Sp. D2	E	100%	782	2,926	405	13.9%
TVtropolis	Sp. A	E	66.7%	5,754	25,543	4,548	17.8%
Mystery	Sp. D1	E	50%	1,264	5,678	1,148	20.2%
MenTV	Sp. D1	E	49%	872	4,317	1,188	27.5%



Appendix 1 continued- Conventional networks interviewed with significant ownership interest in specialty, pay, PPV and VOD services as of 31 December 2006.

CHUM <sup>(2)</sup>	Type of service	Language	Direct/indirect voting interest	31 August 2006 financial results (000)			
				# of subscribers	Revenue (\$)	PBIT (\$)	PBIT Margin
x BookTelevision	Sp. D1	e	100%	919	3,228	448	13.9%
x Bravo!	Sp. A	e	100%	6,529	40,727	11,948	29.3%
CLT (Canadian Learning Television)	Sp. A	e	100%	4,648	15,377	6,786	44.1%
x CourtTV Canada	Sp. D2	e	100%	1,359	5,543	1,951	35.2%
Drive-In Classics	Sp. D2	e	100%	1,297	3,114	984	31.6%
x FashionTelevisionChannel	Sp. D1	e	100%	882	4,016	687	17.1%
MuchLoud	Sp. D2	e	100%	265	538	-58	10.8%
x MuchMoreMusic	Sp. A	e	100%	6,662	19,215	6,783	35.3%
MuchMoreRetro	Sp. D2	e	100%	271	559	174	31.1%
x MuchMusic	Sp. A	e	100%	7,884	53,254	13,277	24.9%
MuchVibe	Sp. D2	e	100%	581	918	20	2.2%
x Pulse 24 (CP24)	Sp. A	e	100%	3,169	11,365	-18	-0.2%
PunchMuch	Sp. D2	e	100%	526	899	-190	21.1%
x Razer (MTV Channel)	Sp. D1	e	100%	896	4,704	388	8.2%
SexTV: The Channel	Sp. D2	e	100%	1,157	2,272	-116	-5.1%
x SPACE: The Imagination Station	Sp. A	e	100%	5,785	48,756	18,404	37.7%
x Star!	Sp. A	e	100%	4,739	19,304	5,201	26.9%
TV Land	Sp. D2	e	80.1%	1,045	3,944	67	1.7%
x Musimax	Sp. A	f	50%	1,907	9,427	933	9.9%
x MusiquePlus	Sp. A	f	50%	2,332	19,047	2,817	14.8%

Appendix 1 continued- Conventional networks interviewed with significant ownership interest in specialty, pay, PPV and VOD services as of 31 December 2006.

CTVglobemedia <sup>(3)</sup>	Type of service	Language	Direct indirect voting interest	31 August 2006 financial results (000)			
				# of subscribers	Revenues (\$)	PBIT (\$)	PBIT Margin
CTV Newsnet	Sp. A	e	100%	7,962	19,226	1,412	7.3%
MTV Canada (TalkTV)	Sp. A	e	100%	5,107	8,626	-11,579	-134.2%
BNN Business News Network (ROBTV)	Sp. A	E	100%	5,139	20,564	4,104	20.0%
TCN (Comedy Network, The)	Sp. A	E	100%	5,541	45,122	14,201	31.5%
travel + escape (CTV Travel)	Sp. D1	E	100%	763	4,180	-14	-0.3%
ESPN Classic Canada	Sp. D2	E	80%	758	2,296	-144	-6.3%
RDS - Réseau des Sports	Sp. A	F	80%	2,514	86,938	18,368	21.1%
RIS Info Sports	Sp. D1	F	80%	785	4,725	1,587	33.6%
TSN (Sports Network, The)	Sp. A	E	80%	8,438	201,270	48,582	24.1%
Animal Planet	Sp. D2	E	64%	1,222	4,295	532	12.4%
Discovery Channel, The	Sp. A	E	64%	7,405	85,615	33,148	38.7%
Discovery Civilization Channel	Sp. D2	E	64%	977	3,091	196	6.4%
Discovery HD	Sp. D2	E	64%	140	152	-107	-70.3%
OLN (Outdoor Life Network)	Sp. A	E	33.3%	5,571	15,580	5,291	34.0%
Viewer's Choice Canada	PPV	E	19.9%	2,594	24,692	7,435	30.1%
NHL Network, The	Sp. D2	E	17.1%	785	6,007	1,268	21.1%
ARTV	Sp. A	F	16%	1,865	13,096	153	1.2%
Canal Indigo	PPV	F	15.9%	949	4,945	-274	-5.6%
Leaf TV	Sp. D2	E	15.4%	223	3,837	-3,759	-98.0%
Raptors NBA TV	Sp. D2	E	15.4%	531	3,923	-897	-22.9%

Source: Broadcast Policy Monitoring Report, 2007; p. 75

**Appendix 2 – Comparison of approximate costs for various professional broadcast equipment as of February 2007.**

Please note every model type varies in price.

<b>Equipment</b>	<b>Standard Definition</b>	<b>High Definition</b>
Professional Camera	Betacam SP with Lenses \$30,000	HD Cameras with lenses \$50,000- \$150,000
VTR	Digital Betacam \$50,000-60,000	HDCAM recorders \$80,000- \$120,000
Switcher	Grass Valley 100 \$10,000	Ross M100 \$75,000-300,000
Router	16 x16 \$4000	\$25,000
Waveform/vectorscope	\$3000-4000	\$25,000
Monitors	17 inch \$3000	17 inch HD \$5000
Video Distribution Amplifiers (VDA)	\$200	\$1800 (need about 100 to 200 for a television network)
Audio Distribution Amplifiers	\$180	\$1500 (need x # of VDA x 2 or 4)
Frame synchronizer	\$4000	\$25,000
Satellite receivers	\$2000-3000	\$12,000- \$18,000

Source: Sony.ca and TV2GO Inc.

## Appendix 3- TSN Programming in HD, 2007

February 28, 2007

### TSN HD Programming March 2007

#### March Original programming

- 18 episodes of That's Hockey
- 91 episodes of SportsCentre
- 8 NHL games, plus 1 national Leaf game
- NASCAR – 1 Nextel Cup race, 2 Nextel Cup qualifying, 4 Busch Series races, 2 Busch Qualifying races, 1 episode NASCAR Now
- 3 Raptors games
- PGA TOUR – 3<sup>rd</sup> & Final rounds of World Golf CA Championships
- 2 HBO Championship Boxing events, 1 HBO Boxing After Dark event
- 5 episodes Bell Spirit of the Game
- 3 ESPN Friday Night Fights
- Westminster Kennel Club Dog show
- 2 episodes NHRA Drag racing
- 5 episodes of Motorcycle Experience

#### TSN 2007 schedule update, year to date (Jan. 1 – March 31)

No. of HD original hours = 565

No. of HD total hours = 1173

Estimated 2007 annual original HD hours = 2380

Estimated 2007 annual total HD hours = 4900

#### Summary of 2007 HD programming

EVENT	# OF EVENTS	TOTAL ORIGINAL HOURS
<b><i>TSN Produced Programming</i></b>		
CFL - Wendy's Friday Night Football	35	105
NHL on TSN	36	90
World Jr. Hockey Championship	12	30
Blue Jays Baseball	21	63
SPORTSCENTRE	1035	927
That's Hockey	157	83
Raptors	19	47.5
<b>SUBTOTAL</b>	<b>1315</b>	<b>1345.5</b>

#### Appendix 4- Top Canadian distributors and the number of subscribers

	Number of subscribers (000)			
	2004	2005	2006	2007
<b>Corporations</b>				
Rogers Cable Inc. <sup>(1)</sup>	2,266	2,249	2,260	2,278
Shaw Communications Inc. <sup>(2)</sup>	2,074	2,138	2,179	2,220
Bell ExpressVu LLP. <sup>(1)</sup>	1,403	1,532	1,739	1,824
Vidéotron Ltée <sup>(1)</sup>	1,428	1,455	1,520	1,583
Star Choice Television Network Inc. <sup>(2)(3)</sup>	814	830	862	873
Cogeco Cable Inc. <sup>(2)</sup>	829	831	836	955
<b>Total – Top Canadian distributors</b>	<b>8,814</b>	<b>9,035</b>	<b>9,396</b>	<b>9,732</b>

Minor variances are due to rounding

Source: Table 4.3 Broadcast Policy Monitoring Report, 2007.