Today the international broadcasting community is undergoing a revolution in television content creation and transmission, brought about by a range of stunning digital technologies. Digital television, High Definition Television (HDTV), 24p High Definition production, as well as Interactive TV are all technologies that will have far-reaching consequences for the television industry, affecting program producers, broadcasting entities, advertisers, electronics manufacturers, as well as television viewers. The situation is further complicated by differing approaches to digital television implementation in different parts of the world, with Europe and the United States charting their own digital directions, developing their own niches of expertise, while also exposing themselves to a range of unique creative and commercial risks. Surrounded by rapid technological change, untried business models, and uncertain viewer expectations, countries such as Australia attempt to navigate their own course in what is fundamentally uncharted territory.

*Digital Television Broadcasting: Perspectives on the Future*, a Swinburne University of Technology Masters thesis, which I wrote in 2002 and subsequently updated in May 2003, is an attempt to formulate a balanced and comprehensive perspective on this emerging digital television space. In particular, I sought to identify the real drivers of digital television, both current and future, explore competing business models, understand the various technologies and how they intersect with each other, and ultimately cut through the rhetoric and often biased commentary surrounding digital television in Australia, especially with regard to High Definition Television.

Considering that HDTV is potentially the greatest advancement in television since the inception of colour TV, it is curious that so much of the debate about the digital TV directions in Australia has focused on the standard definition European approach, while the emergence of a viable HDTV broadcasting regime in the United States has largely been overlooked. It is for this reason that this summary will focus on HDTV implementation, highlighting the rapidly escalating growth of HDTV in the U.S. market.

**Quality versus Choice**

Compared with Standard Definition Television (SDTV), with its meager 300,000 to 400,000 pixel resolution, HDTV's 2 million pixels offer an astonishing increase in picture quality, enabling large screen displays, 'cinema like' viewing experiences, as well as providing a quality platform for the true convergence of information, interactivity, multimedia and television. The difference between high level HDTV and SDTV is striking, and something that needs to be seen to be appreciated. Much of the opposition to HDTV has stemmed from the fact that few, including in the broadcasting industry, have seen HDTV for themselves. This has been consistently overlooked by those arguing that consumers prefer the multi-channel European model to the increased picture quality of HDTV. While multi-channeling has driven the take up of DTV in the United Kingdom, there is little evidence to suggest that consumers prefer multi-channeling, or choice, to higher quality HDTV. In fact, it is quite possible that UK viewers may prefer HDTV if they were able to see it for themselves. Interestingly, a 2001 study by Nielsen Media Research indicated that viewers want more than simply extra channels, in fact, in cases where viewers had 100 channels at their disposal, they only watched about 16 of them. With rapidly escalating HDTV content, the United States is now shaping up as the first true consumer test of choice versus quality. New research seems to indicate that consumers with access to HDTV in the U.S. are more likely to watch HDTV than SDTV programs. A recent university study by Connie Book investigated the viewing habits of HDTV set owners in Raleigh, North Carolina – the U.S. city with the most HDTV programming – revealing that these viewers were 70% more likely to watch a program if it was in HDTV. Moreover, these viewers

were demanding more HDTV programming, indicating that terrestrial broadcasters must seek to satisfy this growing demand, or face competition from cable, satellite and package media prepared to fill the HDTV void.

**HDTV Displays**

The transition to HDTV will be facilitated by a range of new home theater display technologies, including HDTV plasma and CRT screens, along with DLP/LCD HDTV projection systems. The current 1440 x 1080 display resolution barrier was recently bettered by a new Toshiba 57-inch rear projection TV (the 57HLX82). It employs Liquid Crystal on Silicon (LCOS) technology to display 1920 x 1080p HDTV. Other manufacturers have announced the 2004 release of full resolution 1920 x 1080 LCD HDTVs.

Contrary to popular opinion, HDTV display technology is now moving to the mainstream in the U.S., with the cost of consumer HDTV displays falling approximately 50% per year, reducing the entry point from $1300US in 2002, to $700US by May 2003. Plasma, front and rear projection systems are also falling rapidly in cost, and new manufacturing plants are expected to come online during 2003, further driving costs down. Another promising development is a concept recently announced by HD satellite broadcaster EchoStar, where the company will lease HDTV sets to subscribers unable to afford them. In Australia, HDTV CRT displays have fallen to approximately $3300 Australian dollars, a level comparable to that of standard definition digital televisions. In addition to CRT displays, a number of large rear projection HDTVs have entered the Australian marketplace at prices commensurate with their SDTV counterparts.

In April 2003, the Consumer Electronics Association reported that 5,139,775 DTV sets have been shipped to dealers in the U.S. They predicted that manufacturer to dealer sales of DTV products will reach 5.4 million units by 2004, 8 million by 2005, and 10.5 million by 2006. Independent market analysts are even more confident, with In-Stat/MDR predicting “explosive growth” in the U.S. market, in part due to the FCC’s decision to mandate that HDTV tuners be integrated in televisions larger than 13 inches by 2007.

In October 2002, Strategy Analytics released a report predicting 4.8 million U.S. homes with HDTV sets by the end of 2004, and 29 million homes by 2008. Moreover, half of these homes would have a HDTV programming service, i.e. cable/satellite. Based on these figures, with a total of 100 million TV households in the U.S., HDTV set penetration now stands at 5%, reaching 30% by 2008. While the appeal of HDTV is likely to rise dramatically as cable, satellite, broadcast and package HDTV content rises, even the worst case scenario represents 15% of all TV households watching HDTV content by 2008. The advent of HD DVD is also encouraging, as an added incentive for households to become HDTV ready. In fact, as evidenced by the astonishing growth of DVD, the release of HD DVD may drive HDTV take up beyond 30% by 2008.

**HDTV Content**

While hardly surprising, the nexus between HDTV take-up and HDTV content is becoming increasingly apparent as American broadcasters increase HDTV program offerings. With the exception of News Corporation’s Fox Network, every major and minor U.S. network is either currently broadcasting HDTV or will start this year. CBS broadcasts all its primetime drama and comedy in HDTV, as well as sports, movies, specials, and a day time soap. Martin D. Franks, an executive vice president at CBS, recently said that HDTV was crucial to the network’s competitive advantage. “HDTV gives us the ability to differentiate ourselves....As good as ‘C.S.I.’ is in standard (definition) television, it’s a different experience in HDTV”. The U.S. ABC broadcasts almost all of its primetime comedy and drama in HDTV, plus movies, specials, and sports. Following the success of the Super Bowl in HDTV, ABC plans to also broadcast Monday Night Football in it in 2003. Meanwhile, NBC is now broadcasting approximately half of its primetime in HDTV.

Previously an obstacle to HDTV content delivery, the cable industry now strongly supports it. In May 2002, after pressure from the FCC, the 10 largest cable companies pledged to offer HDTV programming in 2003. This was followed in December 2002 with an agreement between the cable companies and television manufacturers to provide HDTV plug and play capability for all digital ready sets, thus eliminating the need for an HDTV cable set-top box.

Where 750Mhz systems exist, cable companies are passing through most network HDTV programming, along with a range of premium HDTV channels, including HDNet, HBO HD, Discovery HD and ShowTime. HDNet plans to transmit three new HD channels: sports, movies and a variety channel. HBO is transmitting around 70% of its programming in HDTV, while Bravo is looking to roll out HDTV programming during 2003. Perhaps the most exciting development in the cable industry is the March 2003 launch of ESPN HD, a dedicated sports channel promising over 100 live HDTV sporting telecasts in its first year. ESPN president George Bodenheimer stated, “ESPN’s programming is a perfect match for high definition technology, and this schedule offers a


7. Ibid.
tremendous opportunity to demonstrate unprecedented value to our fans, affiliates, rights holders and advertisers.8 High definition sports is now referred to as the ‘killer app’ of HDTV.

Comcast’s CEO recently claimed HDTV is destined to be a big success in the years ahead, while the CEOs of Cox Communications and Time Warner Cable noted their cable audiences were moving to HDTV services offered on satellite and that offering it themselves would serve as a retention tool against satellite.9 Faced with a multi-channel onslaught, American broadcasters are counting on HDTV to differentiate their product, capture valuable ‘upscale’ viewers, increase their advertising revenue, respond to viewer demand and ultimately protect themselves from lower quality multi-channel services.

**Package Media**

Encouraged by the growth in HDTV monitors, Sony recently made a foray into HDTV recording with the Japanese release of Blu-ray DVD, a format capable of recording up to 23 Gigabytes of data (36Mbps data rate), or two hours of high definition television. Sony plans to introduce the Blu-ray format in the United States by the end of 2003. Toshiba-NEC and the Hollywood studios also plan to introduce their own competing formats, but it is anticipated that the formats will support cross platform playback. With standard definition DVD player sales booming around the world, the advent of high definition DVD is likely to be a ‘killer application’ for the entertainment industry, providing the ability to record and playback full 1920 x 1080 HD resolution images in a climate of expanding home theatre sales. It is therefore highly probable that the roll-out of HD package media proves to be the greatest driver of HDTV. Again, broadcasters will find it necessary to improve the resolution of their broadcasts to meet this package media challenge. Another challenge is likely to come in the form of HDTV console games, such as Sony PlayStation.

Unfortunately, with HDTV capable DVD not yet released in Australia, HD DVD still pending, and with satellite and cable companies unwilling or unable to provide HDTV content, Australians are reliant on the free to air broadcasters for HDTV. It is encouraging that Channel Nine (Melbourne) is already broadcasting approximately 22 hours per week of HDTV content, surpassing even the 20 hours per week mandated by legislation. However, with the roll-out of HDTV in the U.S. significantly more advanced than Australia, it is important to recognise that HDTV does not officially begin in Australia until July 1st 2003.

Another breakthrough likely to stimulate HDTV acceptance is the May 2003 release of the JVC FY-HD10U consumer HD camcorder. Priced at $3500US, it may have far reaching consequences for broadcasters, independent filmmakers, consumers, and equipment manufacturers. Broadcasters and content creators resisting HDTV are potentially faced with a situation where consumers have higher resolution images that they do - a less than ideal business model.

In conclusion, we need look no further than the bastion of the non-HDTV multi-channel broadcasting regime, Europe, to measure the potential impact of HDTV services. Amid growing industry disquiet about the increasing success of HDTV in the U.S., the European Broadcasting Union stated in late 2002, “New thinking will soon be required about the delivery strategy for digital television as public expectations for quality rise through exposure to DVD quality, and as display transparency rises through global penetration of flat panels and other large screen displays”.10 Manufacturers of large screen displays, lamenting the lack of resolution inherent in SDTV are applying pressure to the EU, along with content creators concerned about the future of HD DVD package media. An anonymous delegate to a secret EBUHDTV meeting went as far as describing HDTV as Europe’s “ticking time bomb...that won't go away”.11 In an attempt to meet this challenge, Gabriel Fehervari of Alfacam recently announced the January 2004 launch of EURO 1080, the first European HDTV subscription channel.

Far from the failure that sections of the Australian press and others with potentially vested interests have vocally proclaimed, HDTV adoption is gathering pace around the world, stimulated by advances in large screen display technology, consumer demand for near-cinema quality content, regulatory intervention, and established and emerging high resolution media. Ultimately, it is the digitally empowered viewer that will determine the success or failure of HDTV - governments and broadcasters need to ensure that viewers are given that power.

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11. Ibid.