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0521826241 - Technology, Television, and Competition: The Politics of Digital TV

Jeffrey A. Hart

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1 Introduction

We live in the midst of a transition to an age of digital technologies. As in previous large technological transitions, many established interests are threatened and many new ones have arisen. The semiconductor, computer, telecommunications, and software industries (the core information technology industries) have become the political voice of these new interests. Just as innovators like Andrew Carnegie came to symbolize the iron and steel industry in the nineteenth century, and Henry Ford the automobile industry in the early twentieth century, industry figures like Steve Jobs of Apple, Andy Grove of Intel, and Bill Gates of Microsoft represented the spirit of the information age. These new icons of innovation lobbied for policies that were sometimes inconsistent with those favored by older industries, such as textiles, steel, chemicals, and motor vehicles.

Joseph Schumpeter called this displacement resulting from technological change of old interests by new ones “creative destruction.”¹ Older industries, according to Schumpeter, would organize politically to block the institutional changes that accompanied the introduction of new technologies. If these changes were delayed, then a shift in the distribution of political power could also be delayed. But eventually, competitive pressures would overcome the resistance to institutional change and a new distribution of power would emerge to force the old interests to come to terms with the new.

Something of this sort occurred in the debates over high definition television (HDTV) and digital television (DTV) that began in the early 1980s. The established interests connected with broadcasting, program production, and consumer electronics resisted the changes that advances in digital technologies made possible. However, some within this group of established interests transformed themselves into advocates for change. Representatives of the information technology industries advocated more

¹ Joseph Schumpeter, *Capitalism, Socialism and Democracy* (New York: Harper, 1975), pp. 82–5.

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radical change than those pushing for change in the established industries were willing to embrace. What emerged was a compromise that did not satisfy anyone and confusion on the part of both consumers and producers.

The uncertainty associated with technological transitions results in a search for new ways of conceptualizing problems and formulating solutions. Sometimes this search for new ideas is purely opportunistic: new ideas are used to justify actions taken for reasons of expediency. Sometimes the search for new ideas is motivated by a genuine puzzlement and a sincere desire to do the right thing. During periods of transition, different political and social actors may adopt divergent policies with respect to change that have long-lasting consequences.

In *The Second Industrial Divide*, Charles Sabel and Michael Piore argued that:

relatively short periods of technological diversification punctuate longer periods of uniformity. The technical knowledge that is accumulated during interludes of diversity creates the possibility of divergent breakthroughs: circumstances in different regional or national economies move technology down correspondingly different paths.²

One of the key questions raised by Sabel and Piore was the extent to which divergent policies would converge after the dust settled and a “period of uniformity” was reestablished.

I will be arguing below that one of the more important ideas that influenced the decisions of the major industrialized countries with respect to HDTV and DTV was the idea of *digital convergence*. Digital convergence is the blurring of boundaries between previously separate industries made possible by the transition to digital technologies. My argument about the impact of the idea of digital convergence will be defended in greater detail below.

The debates over HDTV and DTV are an important window into the transition from analog to digital electronic technologies – what some people call *digitalization*. This book focuses on HDTV and DTV because of what they might tell us about that broader transition, even though television broadcasting is an important subject itself.

This book focuses on the debates over television standards that occurred between 1984 and 1997 in the United States, Western Europe,

² Charles Sabel and Michael Piore, *The Second Industrial Divide* (New York: Basic Books, 1984), p. 39.

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and Japan – often referred to as the “triad.” The economies of the triad are the largest and strongest of the capitalist world. Because of the overwhelming economic power of the triad countries, it is always helpful to try to understand how their domestic decisions affect their relations with one another and the rest of the world. HDTV was one of many issues that divided rather than united these countries during the 1980s and 1990s, but that does not necessarily mean that it will continue to do so, especially if a consensus on collective interests emerges. Such a consensus cannot emerge, however, unless everyone has an accurate perception of what the others are doing and why. It will become evident by the end of this book that such accurate perceptions were distinctly lacking in the 1980s and 1990s.

The selected period is particularly interesting because it coincides with a time of questioning of the ability of the United States to lead the capitalist world as it had done since the end of World War Two. Concerns about US global competitiveness grew steadily through the 1980s as the “twin deficits” (spending and trade) mounted. Public worries about US competitiveness had a lot to do with the outcome of the 1992 presidential elections. Bill Clinton scored many points against George Bush with the electorate in 1992 by criticizing his administration for ignoring the decline in US international competitiveness. When Clinton took office, he put into place an economic team that would be considerably more aggressive than the Bush Administration in the area of trade and competitiveness.

During the period studied here, the US Congress frequently disagreed with the Executive Branch on what should be done to promote US competitiveness. During the Bush Administration, the Democrat-controlled Congress frequently introduced proposals to promote specific industries in response to perceived weaknesses in the US position. The Bush Administration consistently blocked these initiatives only to see them reinstated later on. In the mid-to-late 1980s, Congress targeted HDTV for special assistance from the Department of Defense (DoD). When a Republican-controlled Congress was elected in 1994, Congress continued to support these programs for HDTV even while opposing initiatives by the Clinton Administration to assist related industries, including the flat panel display industry.

Similar debates occurred within Western Europe and Japan, although there was generally less controversy over the need for governments to help new industries in both regions. Instead, the Europeans and the Japanese responded to the challenges posed to established industries – especially public broadcasters and consumer electronics manufacturers – by the

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growing importance of digitalization and US policies promoting digital television broadcasting.

The methods used in this book to describe these debates include the usual documentary sources combined with field research with a heavy emphasis on elite interviews. I was fortunate to receive small amounts of funding over a span of about ten years that enabled me to visit and interview key officials and business representatives who participated directly in the HDTV and DTV debates. In addition, I compiled some statistical information about the consumer electronics and related industries (see chapter 3).

The role of TV broadcasting in advanced industrial societies

Television broadcasting is a particularly sensitive area for policy-making in advanced industrial countries. Television is particularly important because it is the only visual medium (with the possible exception of print media) that commands large enough audiences to create and maintain a sense of national community and purpose. The leisure time available to the citizens of advanced industrial countries and their increased reliance on television for entertainment and news makes television particularly important to national policy-makers.

In most wealthy nations, over 95 percent of households own at least one television receiver. In the United States, the average household views over seven hours of television programming per day. Watching television has partially displaced both reading and attendance of cinemas as a leisure-time activity in the United States. Some scholars have argued recently that this shift has undermined important community-building activities that traditionally helped to build “social capital.” Instead of engaging in social activities outside the home, people are spending more of their time at home in front of a video screen.

Robert Putnam, in an article entitled “Bowling Alone,” makes the following observations:

There is a reason to believe that deep-seated technological trends are radically “privatizing” or “individualizing” our use of leisure time and thus disrupting many opportunities for social-capital formation. The most obvious and probably the most powerful instrument of this revolution is television. Time-budget studies in the 1960s showed that the growth in time spent watching television dwarfed all other changes in the way Americans passed their days and nights. Television has made our communities (or, rather, what we experience as our communities) wider and shallower. In the language of economics, electronic technology enables individual tastes to be satisfied more fully, but at the costs of positive social

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externalities associated with more primitive forms of entertainment. The same logic applies to the replacement of vaudeville by the movies and now of movies by the VCR.³

It should be noted that the introduction of television was but one of the hypothesized causes of the decline in social capital formation in Putnam's argument. Putnam's thesis was by no means universally accepted by students of American politics and society. In a debate on this subject published by *The American Prospect*, several noted social scientists criticized Putnam for overemphasizing the decline in civic participation and giving too much weight to television in changing patterns of behavior in the American public.⁴ However, there was little dispute about the changes in the importance of television in leisure-time activities and of increased reliance on television news for information about political candidates and elections.

What is HDTV?

In CCIR Report 801, high definition television (HDTV) was defined as follows:

A high-definition television system is a system 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.⁵

The dream of an electronic window on the world has been around since the beginning of television. One of the major differences between film and TV is that TV is a real-time medium, producing pictures immediately without photographic processing. This means that any full-motion coverage of immediately unfolding events has to be on video rather than film. Of course, the two media coexist even in the realm of news coverage, as most TV news broadcasts combine filmed and videotaped material with live broadcasts to provide the variety of images that appeal to viewers. The actual performance of current video systems is less than perfectly window-like, as anyone with a big-screen TV knows quite well. The difference in resolution between video and film is quite noticeable,

³ Robert Putnam, "Bowling Alone: America's Declining Social Capital," *Journal of Democracy*, 6 (January 1995), pp. 65–78. Also available at http://muse.jhu.edu/demo/journal_of_democracy.

⁴ See Michael Schudson, "What if Civic Life Didn't Die?" *The American Prospect*, 25 (March–April 1996), pp. 17–20; Theda Skocpol, "Unravelling from Above," *ibid.*, pp. 20–5; and Richard M. Valelly, "Couch-Potato Democracy?" *ibid.*, pp. 25–6.

⁵ Appendix II of CCIR Report 801.

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especially when comparing projected video and film on a theatre-sized screen. So one aspect of the dream of producing an electronic window is to reduce the gap in resolution, contrast, color quality, etc., between film and video.

Current TV systems are more window-like than the earliest TVs. The first TVs were not capable of displaying real-time motion, only a series of static frames. The first cathode ray tubes (CRTs) produced distorted and unrealistic pictures because of the technical difficulty of constructing accurate magnetic yokes for directing the flow of electrons from cathode to screen and of getting flat rectangular surfaces for the imaging end of the tube. It is for this reason that the post-World War Two generation of monochrome TV technology was initially billed as “high definition television” when it was first introduced.

A perfect electronic window on the world is an ideal that is not likely to be realized. Even if the HDTV picture is much sharper than current TV, it will still fall short in some respects. It will be lacking in contrast, color accuracy, depth of field, three-dimensionality, and other qualities enjoyed by reality. It will continue to be of lower quality than the images produced by film because film technology is continually improving. While better images can be obtained by the application of advanced technologies, the cost increases dramatically as one pushes out the technical envelope. A more practical definition of HDTV arose out of series of investigations conducted by a variety of television research laboratories about what viewers were likely to want in a next-generation TV system. These scientific and technical investigations led to negotiations among television programming producers, broadcasters, and other actors to come up with a working definition (more on this below).

HDTV, in practical terms,

is defined as having twice the vertical and twice the horizontal resolution of conventional television, a picture aspect ratio of 16:9, a frame rate of 24 Hertz or higher, and at least two channels of CD-quality sound.⁶

The higher resolution and wider aspect ratio are designed to make the viewing of HDTV more like the viewing of wide-screen cinema images. When the picture is sharper, the viewer can sit closer to it without seeing visual “artifacts.” When the aspect ratio is wider and the viewer is closer to the image, there is more viewer involvement in the action portrayed. This is why the modern wide-screen cinema displaced the earlier narrower screen.

⁶ Charles Poynton, *A Technical Introduction to Digital Video* (New York: Wiley, 1996), p. 29.

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The widening of cinema screens has created something of a problem for the producers of films:

As widescreen films moved “down” through each successive tier of exhibition, the participatory experience of the original theatrical presentation of these works diminished. They played on smaller and smaller screens; they were cropped to fit the much narrower TV screen; and they were edited to meet community standards.⁷

With the increasing viewing of films in VHS format on videocassette recorders (VCRs), many film viewers were seeing movies only on the smaller TV screens despite the fact that they were made to be seen on the wider screens in movie theatres. A famous example of this is a scene in *The Graduate*. The graduate (played by Dustin Hoffman) is speaking with Mrs. Robinson (played by Anne Bancroft), and in the wide-screen version you can see both of them on opposite sides of the screen, but in the VHS version you can see only one of them. There is also a scene in a Fred Astaire movie where the VHS version has Fred jumping from off-screen onto a table, whereas in the wide-screen version he is quite visible prior to the jump.

Reformatting wide-screen films for video formats often involves a technique called “panning and scanning.” In this technique, the reformatter moves the window that is available for video viewing according to where the main action is. In order to reduce the expense connected with panning and scanning, contemporary directors often try to keep the main action relatively centered in the film. Doing so, of course, reduces the artistic room for maneuver created by the wide-screen format. Thus directors, film producers, and Hollywood producers especially, have a reason to support wider aspect ratios for television. They will still have to crop the pictures produced for cinemas to reformat them for television viewing, but the process will be simpler, less expensive, and less of a sacrifice in image quality than is currently required.

Viewers tend to perceive an interrelationship between the quality of images and the quality of sound. A TV picture with higher quality sound has been perceived by subjects in laboratory tests to be sharper than a TV picture of equivalent resolution but with lower quality sound. In any case, the addition of CD-quality sound to the specifications for HDTV is driven by the importance of increasing both picture resolution and audio quality to achieve higher levels of viewer satisfaction and involvement, similar to those achieved in wide-screen cinemas.

⁷ John Belton, *Widescreen Cinema* (Cambridge, MA: Harvard University Press, 1992), p. 211.

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The basic intention behind the development of HDTV, at least for mass consumer applications, is to create a viewing experience in the home that is similar to that in a movie theatre. One of the key questions behind the development of HDTV technology, therefore, was how costly and difficult it would be for HDTV to approximate the brightness, resolution, and contrast ratios of contemporary film technology. Since film technology was a moving target, there was always the risk that HDTV would fall short of the mark. The various HDTV systems already deployed and still under development were designed to produce images more like the highly involving images seen in contemporary movie theatres than those on TVs in contemporary living rooms. It remains to be seen whether consumers will be willing to pay the premium required to purchase these new systems.

In a survey of the literature on consumer acceptance of HDTV, Michel Dupagne and Peter Seel concluded that viewers would prefer HDTV to conventional television but that most of them would be unwilling initially to pay the price premium that would be associated with HDTV receivers.⁸ Thus, the diffusion of HDTV would depend on the ability of set manufacturers to quickly realize static and dynamic economies of scale. This, in turn, would depend on the ability and willingness of content producers to make HDTV programs and of broadcasters to broadcast them.

The development and deployment of HDTV technologies would involve major shifts all along the well-developed chain of production of video images. Video producers would have to convert their equipment and techniques to the new HDTV formats. Signal deliverers – the network and local over-the-air broadcasters, cable operators, satellite operators, and video rental stores – would have to do the same. Consumers would have to buy new televisions, VCRs, video cameras, etc., to take advantage of the new format. In short, the television production, transmission, and reception systems would have to be transformed to deal with the new TV images. Thus, there were three principal areas of uncertainty in connection with the transition to HDTV:

- Would producers of video materials convert to HDTV formats?
- Would video signal deliverers modify their existing delivery systems to accommodate HDTV signal delivery?
- Would consumers buy HDTV equipment?

Before any of these questions could be answered even approximately, uncertainties about the HDTV system itself, with its requisite underlying

⁸ Michel Dupagne and Peter B. Seel, *High-Definition Television: A Global Perspective* (Ames, IA: Iowa State University Press, 1997), ch. 8, pp. 284–9.

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technologies, had to be reduced so that producers, broadcasters, and consumers could make the necessary calculations about potential profitability and value. This was where technical standards played a central role. Much of this book deals with the politics of HDTV standards. Understanding the politics of HDTV standards requires a bit of background in related technologies, which will be provided in the remainder of this chapter. But first I would like to develop the theme of digital convergence.

Digital convergence or digital divergence?

It can be argued that HDTV is a technology that is inherently too expensive for most consumers and that therefore it is likely to remain a relatively small “niche” in the market for video images. This may indeed be true – only time will tell. But HDTV is part of a larger process of the digitalization of information and the creation of a new infrastructure for delivering that information. So by studying HDTV we can learn quite a bit about that larger process.

One of the ideas associated with the larger process is *digital convergence*. With the rapid increases in the capacity of computers to process digital information and of telecommunications infrastructures to deliver that information, many new opportunities for realizing synergies in information-related businesses have arisen. This was already occurring to some extent in the creation of multi-media firms, such as AOL Time-Warner, Disney Corporation, Bertelsmann, Rupert Murdoch’s News Corporation, and Hachette, where the ability to cross-merchandize films, magazines, books, and other types of intellectual property was the basic incentive behind the mergers of book and magazine publishers with film studios, record producers, broadcasting networks, etc. Because consumers often purchased book versions of movies they had seen, were more likely to buy a record if they saw a music video, and so forth, the competitive advantages of being able to repackage and resell more or less the same content in different formats was evident to the owners of large media firms.

The delivery of that content is still a major expense for media firms. For example, film studios must produce multiple prints of a film for showing in a network of theatres, book publishers must print out multiple copies of books for delivery to bookstores, magazine publishers must print copies of magazines for delivery to newsstands, etc. They spend enormous sums advertising their latest products.

The possibility of supplementing the existing delivery systems with digital ones, either through computers or (possibly in the near future) advanced television systems, is attractive to media firms because it may reduce their production, delivery, and advertising costs and open up new

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markets. With the very rapid proliferation of personal computers, the rapid growth of the Internet, the (rather slower) conversion of the public telephone networks into high-speed digital telecommunications networks (the so-called Information Superhighway), and the increasing rates of subscription to digitized cable and satellite television systems, the opportunities for accessing mass audiences via digital delivery of text, audio, and video materials are fueling mergers, new investments, and cross-industry partnerships that bridge the electronics and media industries.

One example of this is the partnership between NBC and Microsoft Corporation called MSNBC. NBC agreed to produce television news programming for digital delivery over the Microsoft Network (MSN). NBC is a broadcasting company; Microsoft is a computer software firm; MSNBC broadcasts news and other content in a multimedia format over the cable networks and the Internet.

Similarly, the Cable News Network (CNN) opened an online version of its news coverage on the World Wide Web called CNN Interactive. Within a year, CNN Interactive was receiving millions of “hits” by web cruisers, especially after big stories like the death of Princess Diana, and was able to break even financially by selling advertising on its web pages.⁹

All the major producers of small computers began building and selling machines that were capable of displaying high-resolution video images on the computer display in the mid-1990s. In 1996, Gateway Computers began to offer for sale a personal computer with a large (31-inch) monitor and a keyboard with an infrared interface that could be used either to watch TV or to cruise the Internet from the sofa in your living room.

In April 1997, Microsoft announced the purchase for \$425 million of WebTV Networks of Palo Alto, California, a small firm that made set-top boxes for TV sets to permit TV owners to cruise the Web inexpensively. The basic idea was to simplify the interface between consumers and the Web by using a device very similar to a TV remote control. The WebTV box initially cost around \$300 but soon dropped to the \$150–\$200 range.

Microsoft bought 11.5 percent of the shares in Comcast Corporation, a cable television operator, in June 1997. The investments in WebTV and Comcast were part of a larger shift in Microsoft strategy toward a more Web-oriented approach to software. Microsoft’s CEO Bill Gates began talking about supporting a “Web lifestyle” with Microsoft products, especially after the phenomenal early success of Netscape Communications,

⁹ Based on a presentation by Christine Ciandrini of CNN Interactive at a conference on “Toward a New Curricular Architecture: IPE, Telecommunications, and International Affairs Programs in a Networked Era” in Atlanta, Georgia, 26–27 September 1997.