The Future of Digital TV

Editorial

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Digital TV presents a range of technical, business, and content issues for companies, industries and society. Among the most central issues are the technology itself, which is not well understood by the general public, the likelihood of a successful and timely distribution of digital television in the US and elsewhere, and speculation about future content.

Since the mid-1990s increasing attention in the US has focused on the commercial broadcasters who must decide whether and how to broadcast digital high-definition TV (HDTV), standard-definition digital TV (DTV), or a combination of both. So far American broadcasters have not settled on a technical format specification. Nor have they been able to develop economically viable business plans. While hardware manufacturers of production equipment and consumer products can build products to many standards, they too are understandably reluctant to commit themselves before a standard has been adopted. The FCC's 8-year effort, under the chairmanship of Richard Wiley, went a long way toward establishing an HDTV standard for the US, but many technical issues remain unresolved. Nor is the US the only place in the world where digital television standards are being debated and established. Technology issues are not the only ones requiring attention. Who will develop content, what form will new content take, how will it be produced, and what if any new distribution channels will emerge are among the questions about the future of digital television which engender considerable speculation.

This symposium issue covers four broad topics: delivery systems and technology issues, impact on content and programming, the changing economics of TV industries, and international perspective.

Delivery Systems and Technology Issues

Several systems for digital TV distribution are being deployed, including today's digital DBS and DVD. Delivery systems, including over-the-air broadcast, optical fiber, Internet and server-based systems can all provide digital TV with various levels of support for

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interactivity. Interoperability issues for many of these systems need to be resolved and an integration of some of these technologies is likely to occur. It remains to be seen which suite of technologies will prevail. Improved compression standards, such as MPEG4, are on the horizon. Broadband loop technologies and cable modems promise increases in internet access speeds. To bring high-quality video to the Internet, however, additional technological solutions are needed. It is not clear that the computer industry's progressive scan approach to digital TV will be reconciled with broadcasts' interlaced scan. Incompatible systems may result in market fragmentation, adversely impact both content providers and consumer electronics manufacturers, and result in higher costs for consumers.

A. Michael Noll's article introduces this symposium with a tutorial on the analog and digital technology used in television, radio, and telephony. He takes a skeptics view of digital broadcast and points out some of the disadvantages of going digital. This article is a primer for anyone who does not understand the strengths and limitations of these technologies or has difficulty sorting out the information in the technical arguments being made by competing companies and industries.

William Schreiber, whose research sought to answer both technical and consumer preference questions, has written a thorough and critical review of the HDTV standards process, agreements, and aftermath in the US, which he both witnessed and participated in, from their beginnings more than 10 years ago. It is his strong and considered opinion, backed by considerable research and technical expertise, that the decisions and direction taken are severely flawed. He offers thoughtful suggestions for correcting some of these problems. It is his view that the current proposed DTV and HDTV broadcast standards are not in the public interest.

Impact on Content and Programming

Digital TV may significantly change the number and nature of programs available to consumers. Some content developers have begun experimenting with programs which incorporate various degrees of interactivity. The broadcast and cable industries are also looking at new opportunities to increase the number of programs they can offer.

Several companies, including the BBC, have been experimenting with interactivity to begin to understand what if any affect it will have on entertainment, news and education. The Internet may be the test bed for interactive TV, but it is not known how it will influence future TV content. Digital TV may change television viewing habits. Television may become a more active and social experience, or a more solitary computer TV viewing event. It may become easier to target groups with focused programs and advertising. Content production may change with the opportunity to provide multiple language audio tracks. Some TV programs are likely to work with information provided on DVD and the web particularly for news, education, shopping, and financial transactions. TV content might be direct-linked to shopping and other transactions. Server-based TV might increase the number of voices, but it can also be argued that major mainstream firms and their content will continue to dominate distribution channels. Local cable companies, with their public access obligation, have served as input points to media distribution, but this could change.

John Carey's article identifies and discusses a number of content issues which may arise with digital TV broadcast. He discusses content in the context of consumer acceptance, production and distribution. His discussion is informed by his knowledge of the history of TV programs and programming. His position is that TV is going digital

and that new and profitable forms of content are likely to emerge from sources which cannot now be identified. In his opinion, content and not technology will determine the success or failure, consumer acceptance or rejection, of digital TV. This does not imply that he is unaware of the myriad factors impacting what content is available to customers. Carey discusses many content options, from repurposing and availability of multiple channels for the same content, to interactivity and hybrid distribution channels.

The Changing Economics of TV Industries

The investment required for a new digital TV infrastructure and expanded content production needs to be financed. Consolidation in both the cable and telephone industries, and vertical integration in the entertainment industry, have produced large companies with broad media scope. New distribution opportunities are emerging. It is not clear, however, whether changes in the traditional advertiser-supported broadcast model may result. It is speculated that new broadcast and satellite channels will have a negative impact on cable distribution and video rental, but it may turn out that each will fill different niches. The same might be speculated about video servers and their potential impact on video rental chains and traditional broadcasters. Traditional industry structure and economies of scale may also be affected by digital TV. The proliferation of specialized narrowcast channels may not provide sufficiently large TV markets. Network affiliate relations are also likely to be affected. New financial support mechanisms may emerge and the release sequence of movies and syndicated programs may change.

David Waterman develops a proposal for increasing revenues from film and video distribution. After reviewing the current price structure for content distribution in the film and TV industries, he makes a case for moving to digital technology. His thesis is based on a belief that revenues can be increased through the additional market segmentation opportunities which digital technology will provide. His review of the distribution process makes it clear that segmentation is already a key part of achieving the revenues necessary to finance production. He speculates that increasing the segmentation will lead to increased production capital. He then develops a strategy of segmentation based on quality and shows how its advantage will persist even after a complete transition in the marketplace, from analog to digital, has occurred.

Richard Parker's article takes a hard look at the economic issues raised by the changes implied by digital TV adoption. He points out the dilemma confronting the broadcasters, consumer electronics manufacturers, and content producers who are facing no demand and the high costs of supply. His article acknowledges the power of technology, which he characterizes as the locomotive pulling the caboose of digital TV broadcast. He makes the point that it is easy for economists to be distracted by the technology but that it is important for them to stick to an economic analysis. He draws sharp attention to the current competitive market environment and reminds us of not dissimilar historical antecedents.

International Perspective

Digital TV promises to be a global phenomenon, but initially, analog not digital HDTV was being broadcast in Japan. In the US only satellites transmit digital TV signals and these are converted to analog NTSC for TV viewing. In addition, Europe has developed its own DTV standard and has commenced broadcasting for reception on wide-screen, 16 : 9 format, television sets.

It is likely that digital TV technology will have to accommodate multiple regional standards because, even though it can be shown that a single standard would be desirable, competing countries and country groups have so far been unable, or unwilling to develop a common standard. Digital TV may be able to serve national culture segments of globally dispersed groups who share common interests, languages or vocations. It is not clear whether digital TV will increase content development or distribution internationally. One can only wonder whether the world wide web will eventually evolve to provide instantaneous global access to digital TV. If so it is certainly a long way off.

Peter Seel provides an in-depth look at both HDTV and DTV in Japan. He asserts that Japan is certainly not behind the rest of the world in digital television production equipment and standards development, has more experience than any other country in analog HDTV broadcasting and is poised to convert to DTV broadcast by the year 2000.

Jeffrey Hart looks at the directions chosen for future TV broadcast, analog and digital, in both Europe and Japan. He notes that in Europe, where the EU-subsidized programs are broadcast in the wide-screen format, 16 : 9, the broadcast of an increasing number of analog wide-screen programs has led to an increase in sales of wide-screen television receivers. Having taken a more conservative position than the FCC and US congress, the European standards committee, DVB Group, has sought to guide participants toward standards resolution rather than dictate specific HDTV broadcast requirement or deployment deadlines. In Europe, first analog wide-screen was broadcast, now digital TV and perhaps later, HDTV. Hart's review of the controversy in Japan over analog Hi-Vision versus digital HDTV provides insights into the motivations and relative power of the consumer electronics manufacturers, NHK, the new satellite broadcast providers, and the MPT.