

BEING DIGITAL: THE DISAPPOINTING DIGITAL BROADCAST POLICY IN THE US

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Abstract

Digital broadcasting policy in the US has been ineffective in creating incentives, a market structure, or consumer interest sufficient to enable the broadcast industry to transition to digital signals. In spite of the early promises of interactivity that digital broadcasting appeared to offer, digital television now appears to be condensed into services emphasising further consumer transactions. The technical standards adopted for it provided little certainty to wary manufacturers and broadcasters, digital television prices have been too high for consumers to purchase sets, set top box technology is unsettled, and consumers do not know very much about digital systems. Moreover, since cable television distributes broadcast fare to 70% of the population, that industry's carriage of digital broadcast signals is crucial, and to date, US policy has not mandated that carriage. In the meantime, cable operators have developed their own digital services to add numerous additional channels, most of which offer video-on-demand programming.

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Background

When Nicholas Negroponte published *Being Digital* in 1995 at the cusp of the Internet's spread across the globe, he predicted that once all media – text, sound, graphics – were digital, there would be massive alterations in how we interact with this content. Spectrum would be used for more point-to-point applications, and what is now considered mass audience, broadcasting content would perhaps be delivered entirely over fiber-based landlines. Infinitely malleable and variable, the digital environment would provide all manner of information and entertainment, on demand at any time and place, rendering geography irrelevant. For Negroponte, being digital means being equal, that bits are bits, and that the future will be replete with instantaneous content and connections. Unfortunately, his vision is one remarkably devoid of considerations of social class, culture, and government policy. Yet *Being Digital* captured a wide audience when it was published, heir to a strong American tradition of techno-optimism and of equating technology with progress.

This paper addresses the case of the digital transformation in the US, focusing particularly on the status of digital systems in media networks such as broadcasting and cablecasting. When the material and political bases of a transition to digital systems are examined, the conclusion one must draw is that a US digital broadcasting policy that heavily favoured incumbent broadcasters has failed to introduce a viable plan for incorporating digital systems. Instead, another technological system, cable television, occupies a central role as a gatekeeper for digital broadcasting in its capacity as the predominant system that enables people to watch *broadcast* fare. The political, industrial and popular machinations surrounding digital broadcasting also cannot be separated from plans for and discussions of interactivity insofar as interactive television blends into digital television in discursive and developmental ways. Interactive television has generally been envisioned as digital, although digital television has not always been envisioned as very interactive. That digital television has been the terrain of substantial industry battles regarding technical specifications, that it has received very little developmental direction from the government, and that it now takes shape primarily to extend temporally the same programming available already on television (broadcast or cable), suggest that digital broadcasting in the US is at best disappointing and at worst another technological system whose potential for decentralised, diverse, shared content distribution has been evacuated. The promises of digital broadcasting are linked to ideas about interactive or “advanced” television, ideas that have intrigued designers, scholars, and the industry. At root, such ideas presented a vision of interactivity that promised to redeem both the highly commercialised programming aired on television as well as the mode of social detachment that accompanies contemporary TV viewing.

Interactivity and Digital Formats

Interactivity has long interested various communication industries. While there is no single definition of interactivity, an idealised conversational model, that is to say one in which the communicating parties easily and spontaneously exchange information (used here in its broadest sense), dominates much of the thinking about interactivity. While we might easily identify letters to the editor, calls to talk radio,

and participation in computer-based forums (chat rooms, listservs, weblogs, email, and so forth) as successful examples of communicative interactivity, these forms are limited in both access and reach, and most fall far short of constituting a public forum.

The functions of interactivity or operational definitions of it are far from uniform – and indeed, very few exist. Van Dijk and deVos (2001) identify the origins of the media-related use of interactivity in sociology and social psychology, and note that most articulations of interactivity add a feedback loop to the classic sender-message-channel-receiver model. Rafaeli's (1988, 120) mechanistic description of interactivity as "any third (or later) transmission (or message) is related to the degree to which previous exchanges referred to even earlier transmissions" barely helps explain the concept's applicability to a medium such as broadcasting, while Jensen's (1999) bifurcation of interaction and interactivity, the one referring to an action component and the other capturing mediated communication transactions, likewise does little to extend a definition of interactivity to environments that create opportunities for new modes of communication and new processes of sharing, and for the formation of communities of interest. Van Dijk and deVos propose a concept of interactivity that encompasses dimensions of choice, information production, and information exchange. Moving toward taxonomy of interactive television, these authors begin to grapple with how theoretical issues of agency, power, and the process of making meaning translate to the contemporary environments – technological, economic and cultural – of interactive television.

As a pervasive and powerful electronic medium, broadcasting has been the object of a great deal of investigation regarding interactivity. Particularly with the onset of land line-based video distribution systems such as cable television, which introduced opportunities for direct connections between sources and receivers of programming, interactive television has been the object of a great deal of hype, experimentation, and trial and error. Qube was one widely touted interactive element in some early US cable systems. By contemporary standards, it was a primitive apparatus that allowed cable subscribers to "vote" on a numeric keypad. Special programming was developed that would solicit votes from viewers – which book to review on a book program, which performer seemed most enticing, which performer pleased the most people, and so forth. Qube was implemented in only a handful of systems because it represented far more expensive two-way engineering and was unproven in terms of consumer acceptance. Ultimately it was abandoned, ostensibly for lack of viewer interest although there are reports that the system maintenance was costly as well. Teletext and other interactive systems in Europe and Japan (HI-OVIS, for example), as well as some limited trials of similar systems in the US, likewise met with only limited success, and cost huge amounts of money (Dutton, 1987). Even mounting electronic program guides, the television-based version of the popular pamphlet *TV Guide*, proved an unwieldy task in the 1980s (Byron 1986). These early attempts at overlaying interactive capabilities onto cable television systems underscored the limits in the predominant engineering model adopted by cable television systems as well as the uncertainty regarding what consumers might actually respond to in interactive services.

The broadcast domain poses particular challenges for interactivity in that it has been organised as a one way, mass distribution systems. When Raymond Williams in *Television: Technology and Cultural Form* characterises broadcasting as a response

to a mobile, privatised form of social organisation, he highlights the intrinsic control properties of the system, properties amenable to reaching increasingly individualised and compartmentalised private households and a population that is geographically mobile but socially divorced from many of the cultural and social communicative forms and conventions characteristic of smaller, immobile social units. When examined from this perspective, the idea of incorporating interactivity into broadcasting in a manner that reinforces individuality rather than one that reinforces the group or community perhaps seems logical.

The brief history of interactive television efforts suggests that developers have “discovered” this as they sought to create a viable business model for interactive television. Kim and Sawhney (2002) add a dark note to this position when they argue that interactive TV is similar to conventional TV in its basic structure and in its ideological basis: “Interactive TV is not very far from conventional TV with regard to how it is organised. It is a modified TV machine with a little more intelligence in the form of yes-no polls, multiple choice responses, and other such options which offer limited interactivity” (227). As cable television has expanded its own internal spectrum through digital signals to accommodate more channels, it has become the predominant interactive, digital television service in the country. Its interactive offerings largely are comprised of an extensive schedule of video-on-demand services for movies, as well as near video-on-demand services for reruns of popular television programs. The excited promises of television-based interactivity’s revitalisation of social relationships and social organisations have entirely missed the mark.

US Digital TV Policy

The prospect of High Definition Television prompted the initial serious policy considerations of digital television in the US. With Japan being the first country to announce an operational high definition system, the US scrambled to figure out how to launch a new phase of broadcasting that would allow its industries both to capitalise on the new equipment and programming that high definition would require as well as to help American TV viewers to enjoy the latest entertainment fare.¹ The major stumbling block faced by interested industries focused on coming up with an acceptable set of technical standards. The Japanese choice of an analogue high definition system was closely analysed and ultimately rejected in favour of a digital signal. Against the background of the computer industry’s explosive growth and new awareness of the potential of digital, the discourse on high definition television metamorphosed into one addressing “advanced television.” How the actual picture would be composed, particularly whether it would incorporate progressive scanning as favoured by the computer industry or interlaced scanning, familiar to and supported by the broadcast industry, catalysed a solution that minimally satisfied everyone but at the same time did not produce the necessary momentum for high definition or digital television. Developed by a consortium of companies, the standard endorsed multiple scanning formats, resolution lines, and compression ratios, but did declare that the format should be digital, not analogue.² The Grand Alliance recommendation, adopted by the FCC in 1996, was an accommodation to both broadcasters and computer makers, signalling the coming uncertainty over whether the next stage of “broadcasting” would be staged

entirely on television sets or on computer screens as well. The FCC's deliberations on the matter are illuminating for their insistence that advanced television would be a profoundly important opportunity and their public trumpeting of its potential social benefits.

In a 1995 FCC hearing on advanced television systems, Commissioner Reed Hundt remarked on the significance of the regulatory agency's imminent decision regarding a new television system:

Should we order that transmission standards should be used to deliver only one particular format? ...Or should we strive to be deregulatory and to keep our mitts off the marketplace?...as opposed to interfering with business judgments about transmission standards and formats, a different question is whether the FCC should ask licensees of analogue or digital spectrum to deliver programs that serve the public interest in ways that mere marketplace competition might not do. It comes as no surprise to anyone that, speaking personally, that I'm very interested in hearing the views of the panelists about the possibility of using the increased capabilities of digital transmission to serve the ends of children's education and reform of the campaign process. It is certain that digital transmission will increase the number of TV programmes broadcast over the air. Doesn't that mean that it can also increase America's ability to use the wonderful medium of broadcast to serve all the dimensions of the public interest? (FCC 1995).

So too, fellow Commissioner James Quello, responded at the same hearing that "...I hope that maybe years from now, during my fifth and sixth terms as Commissioner, I hope to be able to say I was there when HDTV, the greatest invention since colour television, was just a glimmer in the FCC's eye, and I hope to be able to look around at the dramatic and widespread public excitement about high definition pictures, at the high penetration levels of digital television that surpass all instruments, and at the proliferation of high definition programming, and at a stronger than ever broadcast industry available free to all the public." The tenor of the hearing was optimistic about bringing forth the newest round of programming that would serve the public interest through the existing broadcast industry that was "free" to all American viewers. High definition television was still the daring and central proposition of advanced television.

The promise of digital television was largely conveyed to the public as translating into improved picture and sound quality. The FCC's "FAQ's" on digital television, for example, emphasise broadcasters' ability to offer "free television of higher resolution and better picture quality than now exists under the current mode of TV transmission" (www.fcc.gov/mb/policy/dtv). The FAQ's also discuss some of the "other information" that broadcasters can develop in their data bitstreams, including that "broadcasters will be able to transmit to your television an entire edition of a newspaper, sports information, computer software, telephone directories, stock market updates..." That such services resemble what one can obtain through the Internet, and that they dramatically depart from what most broadcasters do is barely noted in any official literature. Gaming, gambling, shopping, adding additional TV program-related information are among the most popular additional interactive services many broadcasters are exploring. Many have extensive plans to ways to generate additional revenue from services embedded in the channel

space they would have available with digital television. Still, television viewers are largely unaware of digital television: a 2002 government report found that 40% of a national random sample did not know what digital television was, and another 45% were only “somewhat aware” of it.³ In 2002 both the broadcasting as well as the consumer electronics industry associations conducted major national advertising campaigns simply to inform viewers about digital television.

However, the political and governmental systems in the 1990s were not about to demand any particular programming as a condition of facilitating the way for digital television in the country. Indeed, the policy that unfolded gave broadcasters entirely new spectrum allocations so that they could develop digital transmission systems, with no cost to the broadcasters. They would develop their digital systems while maintaining their analogue transmissions, and thus have two channels. This is remarkable if only because the FCC had for several previous years embarked on an ambitious scheme of auctioning spectrum for applications such as wireless telephone systems. The agency – and Congress – was very aware of the financial worth of what became known as a “spectrum give-away.” Some estimated the value of the spectrum awarded to the incumbents could be as high as \$100 billion. In 1996 incumbent broadcasters were awarded an additional 6 MHz channel for new digital services, the idea being that once the transition to digital was complete, their prior spectrum assignment would be returned so that the FCC could reassign it. Hence, by the close of 1996 the FCC had a plan for the broadcast industry’s move toward providing digital signals, as well as technical standards that it hoped would facilitate industry investment in the new technology.

The initial timeline for the transition to digital broadcasting was fast paced, but its goals have not been met. Congress established a deadline of December 31, 2006 for broadcasters to complete the move to digital and to relinquish their analogue transmissions, although there were provisions that would extend this date if insufficient numbers of consumers were able to receive digital broadcasts, if one or more of the signals from the four largest networks had an affiliate in a market that was not broadcasting a digital signal, or if set top box converters were not available in the market. Subsequently, these timelines slipped because broadcasters were slow to make the necessary investments. As of November, 2001, only 172 of 1250 commercial stations were operating with digital television signals. Of the 350 public television stations, only 38 had launched digital services. Roughly ten percent of all TV households received digital broadcasting in 2001.

The consumer market for digital television sets has been slow to develop, and incompatible, competing technical standards in manufacturing set top boxes inhibited investment in that technology. Re-enacting a classic chicken-and-egg problem, the digital TV set manufacturers have priced their televisions at over \$1000, far above the normal cost of a colour television. They argued that prices would come down when demand rose. Although many believed that as broadcasters began to broadcast digital signals, the sets would gain popularity, sales of sets in fact have languished: only 5% of all televisions sets sold in 2001 were digital. Programmers too have been slow to produce digital fare. Responding to this dilemma, the FCC ordered in August, 2002 that television manufacturers include digital tuners. It is striking that the FCC would take such action since it has been so staunchly wedded to allowing “competitive forces” to meet consumer needs in most of its

decisions. However, the slow performance of the broadcasting industry in moving toward a digital future prompted the Commissions to look to the All Channel Receiver Act of 1962 as a precedent for such action. This Act required set manufacturers to tune UHF signals as well as VHF, effectively extending the practical domain of commercial television. In that case, the spectrum had been allocated already, but viewers had trouble finding the stations because the tuning for UHF was awkward. In the cases of both UHF tuning and digital receivers, such action too comes well after the technology has been realised, even after major government policy established the basic outlines of industry obligations, and in response to a slow industry pace that effectively threatened the realisation of broader government policy – the use of a more complete range of spectrum in the earlier case, and the more efficient use of spectrum in the second case.

The set-top boxes required to receive digital television also created new bottlenecks to implementing digital broadcasting. The models favoured now are reasonably sophisticated, well beyond the simple descramblers, for example, that the cable industry has used to prevent theft of pay television services. The boxes include an application program interface, a software layer to interface the operating system and the different applications available; an interface that allows users to navigate the digital television system and to make choices, play games, and so forth; and software that controls users' access to programming. Although some set top boxes conform to open standards, many do not. The software and hardware in the set top box are subject to predictable proprietary claims and overtures that would advantage one vendor at the expense of another, the net effect being to drag down the deployment of digital broadcasting. To date, the FCC has not intervened in this domain, unlike its counterparts in several European nations.⁴

Between the inability of the broadcasters to manage the move to digital broadcasting, the fracas among manufacturers over standards (including software) for set top boxes, and the dearth of affordable digital televisions, the entire transition process has been slow. Moreover, as the numbers of households receiving television either via cable or satellite continue to creep up, the large investment required of broadcasters increasingly seems like a moot point unless these other systems are obligated to carry the broadcast signals. This issue now constitutes a critical constraint on digital broadcasting. In essence, by emphasising a market-based approach to developing digital broadcasting, government policy turned over the opportunities to shape these capabilities to industries bereft of public interest obligations and most attentive to their own profitability. Even when the Clinton Administration attempted to open a dialogue regarding public interest dimensions of digital television in 1997 with the establishment of the Gore Commission, it already was too late: the FCC decision a year earlier had established a trajectory for digital TV decidedly in the hands of the major industry developers. However, it was shortsighted in not planning for the important role of the cable television industry.

The Cable Industry

The gatekeeper on digital television in the US is now recognised as the cable television industry. Because cable is the bottleneck distributor for broadcast television to most of the population, whether people will receive “digital broadcasting”

is curiously dependent on a different industry, that of cable television. In the US, cable television is on a different regulatory footing than is broadcast television, although like broadcasting, it is an industry that has enjoyed substantial legislative and regulatory support for its expansion over the last three decades. Cable television has very limited public interest obligations, and likened itself to an “electronic publisher” from the 1980s onward in order to underscore its independence and legitimate freedom from regulation. The critical issue with cable television concerns how many signals it will carry from local digital broadcasters, and it is in a strong position to deny potential “must-carry” claims.

It is clear that once broadcasters establish not only digital video content channels but also so-called “value added” digital programming, the demands for placement on the cable “spectrum” begin to grow. Value added programming includes high definition programming, multicasting, interactive services, games, and other fare that is substantially different from the normal programming. Indeed, such services are the quiet but potentially very lucrative side of digital broadcasting. The dependence of broadcasting on cable for making headway in becoming digital reached the point that FCC Chairman Powell proposed “voluntary industry actions” in April, 2002 in order to speed the digital transition. These included the recommendation that cable systems with 750 MHz of higher channel capacity will offer to carry at no cost the signals of up to five broadcast or other digital programming services that are providing value-added programming during at least 50% of their prime-time schedule.

To date, no regulatory action has occurred that would mandate cable operators to carry multiple digital streams from one broadcaster. Many cable systems have implemented a digital infrastructure so that they can offer additional video-on-demand channels as well as Internet access. Repeats of popular programmes and a menu of movies constitute the interactivity that most systems offer. As of June 2002, about 16.8 households were receiving digital cable signals. As cable television systems quickly ramp up their digital capabilities and insist on limiting the number of broadcast digital channels they plan to carry, this industry’s bottleneck role in digital broadcasting is clear.

Digital Broadcasting and the Post-information Society

In its headline “‘Interactive’ isn’t a word cable customers are interested in,” the *New York Times*’ column on the New Economy (5/13/02, C4) notes that “expansive visions” of the future are gone. Digital television has moved from an imagined interactive environment providing numerous types of services, linking people to each other, toward one composed of just two services: high speed Internet access and video-on-demand. Being able to watch a plethora of popular – or not particularly popular – programmes at any time now dominates the operationalisation of digital television, an emaciated vision of its promise. With roughly 70% of the population watching television via cable systems, this industry’s hold on digital broadcasting’s future is powerful.

Beyond this scenario, however, lies another one just as discomfiting. Negroponte (1995) calls attention to the difference between digital media’s ability to narrowcast as opposed to its ability to reach isolatable, distinguishable viewers. He revels in the idea that his exact demographics, his precise tastes, behaviours, and

predilections can be knowable in the digital world, thus facilitating mediated experiences that are more meaningful just to him. Narrowcasting is crude compared to such intimate knowledge of discrete individuals. This post-information environment rife with what some might call surveillance and privacy intrusions is exciting to him, as he envisions a placeless, timeless flow of bits that cater to his exact needs. His musings on this digital future recall a realisation of digital media that exaggerates and further separates people from each other, from opportunities to share and to spontaneously create. Contemporary government policy and industrial activity around digital broadcasting and cablecasting appear to be driving the US toward that future, entrenching television as a medium that caters to the private individual, detached from specific times and specific places as the digital eternal is just a click away.

Notes:

1. Sony and NHK had worked on high definition since the 1968, and produced a system that they offered movie producers in the early 1980s.
2. Called the Grand Alliance, this consortium included AT&T, GI, MIT, Philips, Sarnoff, Thomson and Zenith.
3. Reported in *San Jose Mercury News*, December 2, 2002: "Consumers in the dark, GAO study finds." Available at <http://www.siliconvalley.com/mld/siliconvalley/4651516.htm>.
4. See Galperin, 2002 for a thorough discussion of comparative policy on electronic program guides, for example.

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