

**Facing the Digital Future, Darkly: Television Station
Managers' Approach towards the Implementation of Digital
Broadcasting**

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Abstract

The purpose of this study was to understand how local broadcasters are approaching the era of digital broadcasting.

Among the important discoveries from this study is the discovery of a possible shift in the business definition for local broadcasters. Initially, 163 respondents indicated that their current business definition is as broadcasters, compared with only 13 who said they are information providers. However, when respondents were asked what they envision their future definition to be, the number of respondents who identified themselves as future information providers had grown to 63 while the number of future broadcasters was down to 107.

The researcher uncovered several key differences among future information providers and future broadcasters in how they view the future of their industry. Among the differences are how great of an impact digital television will have on their business definition and the levels of interests the two groups have in providing additional digital services. Overall, future information providers felt that digital broadcasting will have a greater impact on their business definition than did future broadcasters. Also, future information providers expressed greater levels of interest than future broadcasters in providing additional digital services.

This study also explored progress in planning for digital broadcasting. All indications are that broadcasters are only doing what is necessary to comply with Congress and the FCC by planning to purchase digital transmitters in order to broadcast a digital signal. All other areas of planning, including purchasing digital studio equipment and planning for digital programming, lags far behind planning for purchasing digital transmitters.

Facing the Digital Future, Darkly: Television Station Managers' Approach towards the Implementation of Digital Broadcasting

Introduction

The broadcast television industry is in the midst of a revolution in the way it does business. The Federal Communications Commission (FCC) has mandated that by May 1, 2006, television, at least as most consumers in the United States know it, will cease to exist. In the place of the three-generation old analog system will be a new digital system

capable of broadcasting high-quality video signals, CD-quality sound, and other digital signals.

The near overabundance of possibilities facing the broadcasting industry in the digital age is potentially very rewarding, and at the same time cause for great concern for broadcasters. As of November 1, 1999, all top-30 market affiliates of the four major networks were scheduled to be broadcasting in a digital signal as well as their analog signal. Several have delayed launching DTV due to technical difficulties, but even the ones that have made it on the air with digital broadcasting are facing a multitude of uncertainties as to how this new medium will evolve. In this respect, there is little difference between a top-10 market like Boston and a 101+-size market like Boise, Idaho. Both markets are dealing with few certainties and thousands of guesses as to exactly what will happen with television in the six-plus years between now and the demise of the current NTSC system.

Most experts predict the industry will eventually migrate towards the highest-definition of the new digital signal -- the 1080-line progressive (1080p) format -- but just if and how it will get there is in question. By choosing any format from 480i to 720p, and even, to a point, 1080i and 1080p, broadcasters have a world of opportunities to provide consumers with services that they never were able to provide before. How broadcasters manage the opportunities afforded by the digital broadcasting will require them to reevaluate the basic definition of the broadcast television industry in the digital age.

Literature Review

Implementation of DTV

Both Congress and the FCC have clearly expressed that the switch from analog to digital is going to happen, and, in fact, is happening. However, both regulatory bodies have been purposely vague in directing the switch by avoiding clear mandates and technical specifications. The FCC has specifically spelled out its desire to implement as few technical mandates as possible in order to let the market decide the end products of digital broadcasting.

This has led to a feeling of uncertainty among broadcasters, many of whom express excitement and optimism over the potential of digital broadcasting, although the

uncertainty aspects of the high-stakes gamble temper the optimism somewhat or, perhaps, significantly. An engineer from WJLA, Mike Olingy, summed up that attitude of a large segment of the broadcasting industry when he said, "It's (digital broadcasting) like the brave new world. Actually, it's more like what Yogi Berra once said, 'It's an insurmountable opportunity'" (qtd. in Mundy, 1998a, p. 27).

Digital broadcasting may not exactly be insurmountable, at least in the short term, as 69 stations -- as of July 2, 1999 -- are proving or in the process of proving with their current digital transmissions (National Association of Broadcasters Online, accessed July 17, 1999). Nearly half (30) of the stations currently broadcasting a digital signal are in markets other than top-10 markets, meaning they are not currently required to be broadcasting a digital signal according to the FCC. Of those 30 stations, 19 are in top-30 markets, thereby required to commence broadcasting a digital signal by November 1, 1999. While these stations could be regarded as early adopters based on their willingness to beat the FCC deadline to begin broadcasting a digital signal, the 11 other stations broadcasting a digital signal in markets smaller than top-30 are definitely early adopters. Their deadline to begin broadcasting a digital signal is not until May 1, 2002, yet they are doing so nearly three years early. For these stations, and the 19 stations in markets 11-30, the choice to begin digital broadcasting prior to the deadline date introduced an element of natural diffusion to the FCC's and Congress' forced diffusion via laws and regulations.

Instead of an insurmountable opportunity, as Olingy called digital broadcasting, it is more like an uncertain opportunity that is cause for broadcasters to reinvent themselves. For most broadcasters, the current system is working just fine, at least, according to the bottom line on their balance sheets.

A majority of broadcasters are doing rather well financially. The current status of traditional broadcasters under the NTSC system is producing, on average, rather healthy profits for broadcasters. Geismar (1993) said that operating margins for broadcasters are significantly higher than can be obtained through most other investments (p. 50). In that case, what incentives do broadcasters have to risk the expensive switch from analog to digital broadcasting? Actually, for most broadcasters there are few

incentives other than the fact their competitors are already making, or planning to make the switch to digital. However, is that really enough to justify such an expensive risk?

If digital television went away tomorrow, never to be heard of again, broadcasters would not be overly upset, at least if the current economic conditions continued. In the first quarter of 1994, publicly reporting television station group owners showed profits up at least 30 percent on revenue gains of high single to low double-digits (Foisie, 1994, p. 18). That trend continued in 1998. For the quarter ending March 31, 1998, Tribune, Pulitzer Broadcasting, Meredith, Univision, and Granite Broadcasting reported record, or at least healthy, profits (McClellan, 1998c, p. 18). For the 1998 fiscal year, CBS owned stations achieved a group-wide cash-flow margin of 50 percent while posting a 45 percent gain in operating profit. NBC stations posted healthy profits of \$560 million while ABC owned stations saw profits climb 11 percent over a year earlier to \$510 million (McClellan, 1999, p. 10).

With the current television system providing such broadcasters with such a good economic state, the FCC and Congress would need to do more than mandate a switch to DTV if the venture was going to go over well with the powerful broadcast industry. Indeed, if Congress felt that DTV was best for the American public, it would have to coax the broadcast industry out of its current comfortable position and into taking a substantial risk by reinventing itself in digital form. In reinventing itself in digital form, broadcaster television stations will be forced to spend on average \$8-15 million to upgrade their equipment with no guarantee that the investment will pay off in the form of increased profits from additional revenue streams. In the end, broadcasters could lose their investments in digital equipment only to end up with a product very similar to what they produce today. That, they feel, would not justify the expense of converting to digital broadcasting.

Flexibility in the Digital Age

The issue of flexibility gets to the root of defining the local broadcaster in the digital age. When the FCC took up the issue of digital broadcasting, it was not trying to define the broadcaster, but instead it was trying to decide to what extent it should mandate particular uses of the digital spectrum. Its solution was to promote flexibility within the rigid timetable it mandated for the introduction of digital broadcasting. In

doing so, the FCC introduced the option of addressing the needs and concerns of broadcasters' markets into what was previously a non-market-driven, mononuclear transition to digital broadcasting.

Voices opposed to flexibility in DTV formats argued the original intent of DTV was HDTV and that to promote anything less would be a disservice to the American public. In a transcript of the FCC's Advisory Committee in December, 1995, Ed Grebow said, "The Commission should encourage broadcasters to offer a minimum amount of HD content. There are several sound public interest reasons for such an approach: the public interest in assuming technical excellence in the broadcasting service, the public interest in stimulating the marketplace for new and innovative HDTV digital TV sets and the public interest in avoiding confusion between standard definition and HD standards" (14).

Grebow's call for HDTV was in line with several important members of Congress whose original intent in providing 6 MHz of free spectrum space for DTV was for broadcasters to operate at a HDTV standard. Congressman Billy Tauzin said, "That (HDTV) is why we gave them 6 MHz." (Mundy, 1998b, p. 16).

Nevertheless, the overriding voice in the FCC's initial standards discussion was one of flexibility. As Lawrence Grossman said, "...commercial broadcasting is a business first and foremost, and a very good one. And not basically either a public service, and certainly not a public trusteeship..." (FCC, 1995, p. 19). In that vein, the FCC adopted the Fifth Report and Order, which laid the groundwork for the introduction of a digital broadcasting system that would allow for broadcasters to take into account their local markets and develop a business strategy to explore the potential of their markets. In the press release accompanying the Fifth Report and Order (1997a), the FCC said, "To bolster DTV's chance for success, the Commission's decisions today allow broadcasters to use their channels according to their best business judgement, as long as they continue to provide free programming on which the public has come to rely. Broadcasters will be able to put together whatever package of digital product they believe will best attract customers and to develop partnerships with others to help make the most productive and efficient use of their channels" (FCC, 1997b, p. 1).

In adopting a wide range of standards, including SDTV, the FCC agreed with the statement made by Grossman and dismissed, for the most part, broadcasters' societal duties in favor of standards that will give broadcasters the right to decide how best to pay for the transformation to digital. Before the order, this was a major concern for broadcasters and investors, who saw the mandated switch to DTV as having little financial reward. With little promise for reward, investors would find it difficult to raise the necessary capital to finance the transformation.

Cost of Converting to Digital

Converting from analog to digital technology is not cheap for broadcasters, especially broadcasters in small markets whose resources are often more limited compared to broadcasters in larger markets. Nick Trigony, president of Cox Broadcasting, estimates the initial investment for tower construction and installation of new transmitters to be between \$2 -5 million per station. To complete the move to digital with new cameras, remote news-gathering equipment, switchers, routers, computer servers and digital downlink equipment is an additional \$6 million to \$10 million (Freeman, 1998, p. 46).

Market size will have little to no bearing on the cost to convert a station to DTV. Moreover, with smaller market stations not generating the same revenue streams of large market stations, some owners, according to Freeman, may opt to get out of the business. "With the sort of investment that it is going to be required for each station ... it could be conceivable that some of the small market operators will sell instead of converting," said Trigony (qtd. in Freeman, 1998, p. 46).

The difficulties faced by smaller markets are made even greater by the model of technological change proposed by David Clark (1975). Clark proposed that it is conventional that within the second phase of technological change, which covers the period between the manufacture of a technology and its complete market penetration, there are early and late adopters. Early adopters are often characterized as providing agencies, in this case broadcasters, in those markets locational and growth advantages. Despite the spatially related differences that will be removed as diffusion becomes total, early adopters -- in this case most of whom will reside in the large markets as digital broadcasting will first be introduced in large markets -- should retain the advantage

gained as early adopters (Clark, 1975, p.2). So, even though diffusion should become total and reach smaller markets, the advantage gained by the early adopters in the large markets will be difficult, if not impossible, for smaller markets to overcome.

For the owners who elect to stay the business, though, the flexibility provided by the FCC is designed to help broadcasters finance the \$8-15 million price tag of converting to digital. Steven Rattner, speaking before the FCC in December 1995, said:

Since we all have difficulty predicting new technological developments and consumer preferences, investors generally hope that the government will let companies make their own strategic choices... This is certainly true in the case of digital television, which has the potential to provide new services for consumers and help insure that broadcasters become active participants in the next phase of information delivery... The fact that a broadcaster would not be restricted to providing one form of service or another, whatever that might be, would enhance the broadcaster's ability to finance because, left to his own devices, the broadcaster is going to develop more or more projects that represent in his mind the most profitable use of the spectrum (FCC, En Banc Hearing on Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service, 28-29).

According to Rattner, in order for broadcasters to lure in investors who, in turn, can finance the capital expenditures (i.e. transmitters, towers, digital equipment) necessary to begin broadcasting digital signals, broadcasters need to show a way that digital television will increase revenue. He argued that HDTV alone will not do that. Instead, broadcasters need the flexibility to provide other services that will provide additional streams of revenue in order to raise the capital necessary to finance the expenditure of new digital equipment. To do that, broadcasters will have little choice but to move away from their roles as traditional broadcasters and become information providers.

The FCC and Congress agreed, to a point, with this argument, and left it up to individual broadcasters to decide which format, from 480i to 1080p, to use. However, for many in Congress, that was not the end of it. The feeling was the free allocation of 6

MHz frequencies to broadcasters was for HDTV, not for broadcasters to find other avenues by which to make a profit (Mundy, 1998a). Thus, Congress and the FCC generated conflict between the original intent of the digital frequency allocation and the practical application of the FCC's final standards in the current business climate.

The networks have made their decisions, at least for now, which format they intend to broadcast. CBS and NBC are committed to delivering true HDTV at 1080i, ABC is set to go with 720p and Fox and Sinclair are lined up with 480 for their prime-time broadcasting schedule. Fox has expressed the possibility of going with some 720 broadcasts during primetime and major sporting events, but not for another year at least. The WB Network and UPN are currently taking a wait-and-see approach (McClellan and Dickson, 1998a, 1998b, 6, 8).

The reason for going with 1080 resolution broadcasts is quite clear – better picture and sound is the selling point used by both NBC and CBS. Moreover, even at 1080, the networks still have about 1.5 megabits of bandwidth available by which to broadcast large quantities of data to PCs (Consolli and Freeman 12). Basically, there is no reason, therefore, for broadcasters not to get into providing additional digital services if there is the potential for making a profit by providing digital services. The only factor in selecting a resolution quality is how many additional services a broadcaster would like to offer. Lower resolutions still allow for more services in addition to the free, over-the-air signal, than do higher resolution formats.

Regardless of what resolutions the networks plan on broadcasting, local broadcasters have the ability to up-convert or down-convert the network signal into whatever resolution they chose, and initially, it looks as though local broadcasters are opting for SDTV. SCRI International found that initially, 49.3 percent of stations surveyed plan on broadcasting in 480, a figure that will grow to 56.2 percent a year after commencing digital broadcasting (1999, p.15).

A Time of Decision for Local Broadcasters

Broadcasters now are in position to approach digital broadcasting, and more specifically, providing additional digital services, in a polynuclear diffusion model. While the initial push to get digital broadcasting on the air was a mononuclear effort by Congress and the FCC, every other decision concerning digital broadcasting, will be

made under a polynuclear framework. From purchasing digital studio equipment to providing additional digital services, broadcaster will make digital decisions in an entrepreneurial environment where competition from other broadcast entities is the overriding concern.

Unlike the mononuclear model for diffusion used by Congress and the FCC to get digital broadcasting on the air initially, the option to explore the potential of digital broadcasting presents a polynuclear setting for broadcasters. If the word "agency" is substituted for broadcasters in the creation of non-television digital, then Malecki's (1975) criteria for establishing agencies can be applied to the innovation of digital services by broadcasters.

Digital services can be innovated with or without a centralized propagator, which is an important aspect in establishing an agency. In this case, the central propagator is the corporation or television network to which a local broadcaster belongs. In the case of a centralized propagator, the propagator would provide information about the innovation, support in establishing the agency, and assistance in the promotion of the innovation by providing integrated promotional packages (Malecki, 1975, p. 8-9).

In the case where the local broadcast outlet is locally owned, or where the local broadcaster is independent of a corporation in its digital broadcasting decisions, a central propagator is not a factor. In this case, it is imperative that broadcasters seek out support from prior adopters and make significant use of personal communication channels (Malecki, 1975, p. 8-9).

Methodology

The research was conducted through a mail survey of a target population of General Managers at affiliates of the four major networks. On April 2, 1999, the survey was mailed to every broadcast station fitting the research criteria. The population for the survey was a census of every ABC, CBS, NBC, and Fox affiliate in the United States. A mailing list provided by the National Association of Broadcasters provided the names and addresses of stations fitting the research criteria.

On May 6, 1999, a second mailing was sent to the survey population, thanking survey respondents for their cooperation, and requesting responses from stations who had yet to respond.

The survey was closed on June 1, 1999. A total of 188 responses were received. One mailing came back undeliverable, leaving a population size of 714, for a response rate of 26.33 percent.

Results

Research Question 1. Is there an initial inclination for broadcasters to move from the business of broadcasting to providing information and are there different trends between different size markets?

Data for this research question were obtained by asking respondents to identify what one word best describes their current business definition and what phrase best describes what they envision their future definition to be. Respondents were given the choices for each question of "Broadcaster," "Information Provider," "Entertainer," and "Other" followed by a blank in which to clarify their response. The researcher was looking for a trend where those who answered their current definition to be "Broadcaster" would chose "Information Provider" for the answer to what their future business will be.

There is an initial inclination of broadcasters towards changing the definition of their business from broadcasting to providing information. Currently, with 100 stations broadcasting a digital television signal as of November, 8, 1999 (NAB), it should come as little surprise that broadcasters still see their primary business as broadcasting. More than four in five (85.6%) respondents defined their primary business as "Broadcasters" followed by "Information Provider" (6.9%) and "Entertainer" (5.3%). Four respondents (2.1%) marked other and indicated that no one word effectively encompassed the definition of their business. (See Table 1)

(Table 1 here)

Most respondents who identified themselves as broadcasters (56.9%) continued to say broadcasting would be their primary business in the future. However, the fall off from those answering "Broadcaster" as the current definition to those answering "Broadcaster" in the second question (n=54), can be seen in a dramatic rise of those seeing the future of their business as that of "Information Provider" (33.5%). The percentage of respondents answering "Entertainer" remained steady at 5.3 percent. (See Table 2) Therefore, while the shift may appear to be modest based on the statistics generated by this study, they are substantial enough not to be easily dismissed as inconsequential.

(Table 2 here)

Research Question 2. How do perceptions of the impact DTV will have on the business of broadcasting differ between those who identify their future business to be broadcasting versus those who identify their future business to be providing information?

For this question, researchers were asked to rank on a 5-point Likert scale from (1) None to (5) Very Much the extent to which DTV will have an impact on the current business definition.

This study found that broadcasters' current definition of their primary business might be changing. Most respondents indicated digital television will, in fact, change their current definition significantly ($M=3.34$, $Mdn.=4$, $Mo.=4$). (See Table 3) Respondents who answered that their primary future business will be broadcasting were found to have greater variance of opinion on the impact of DTV ($Std. Dev.=1.47$) than those who answered that their future will be as information providers ($Std. Dev.=.82$). When equal variances were not assumed, the researcher found that future information providers also felt significantly stronger that DTV will have an impact on their business ($M=3.9$) than did future broadcasters ($M=3.06$) ($t=-4.423$, $df=162.486$, $p<.001$).

(Table 3 here)

Planning for Digital Broadcasting

Research Question 3. Where are digital programming and digital equipment purchasing decisions being made, how far along are broadcasters in planning for DTV and are there differences between how far along broadcasters are in planning for digital television and stations of various market sizes and based on who answered the survey?

Nine questions encompassed the section of the survey dealing with planning for digital broadcasting. However, before the researcher probed individual elements of planning, the survey posed a question asking respondents to indicate how far along they were in overall planning for digital television and where digital planning decisions were being made. For the question regarding overall planning for digital television, respondents were asked to indicate on a 5-point Likert scale how far along they are in the overall planning for digital television. For where digital decisions are being made, the

researcher broke the issue of planning into two categories -- programming and purchasing digital equipment.

Despite broadcasters' reluctance to embrace digital television, most believe they are well along in the overall planning process for its implementation. Using a 5-point Likert scale, respondents were asked to rank their current digital planning status (1 equaled No planning and 5 equaled Implementing planning). Just over 45 percent of respondents (n=85) indicated that when it came to overall planning for digital television, they were either very far along in their planning or actually implementing their planning (M=3.38, Mdn.=3, Mo.=3, Std. Dev.=1.2). (See Table 4) The relationship between market size and overall planning for digital television is statistically significant (F(3, 184)=10.593, p<.001). Tukey did find that top-30 markets perceived themselves to be significantly ahead of all other markets in planning for digital television (Table 5). In addition, a significant difference was found between those who identified themselves as a General Manager, President, Vice President, Operations Manager or some variation of like and those who had "Engineer" in their title. Engineers (M=3.81) were found to be significantly further along (t=-3.11, df=101, p=.002) in the planning process for DTV than were General Managers (M=3.22) (Table 6, 7).

(Table 4 here)

(Table 5 here)

(Table 6 here)

(Table 7 here)

For the most part, broadcasters have a tremendous amount of say at the local level when it comes to planning for the two key components of digital broadcasting -- equipment purchases and programming. Nearly 70 percent (n=131) said they have at least an equal say with the corporate level when it comes to making digital purchasing decisions (Table 8). An even greater 76.9 percent (n=143) indicated the same level of input for digital programming (Table 9). A direct relationship exists between where decisions are being made for both technology purchasing and digital programming. Broadcasters have the same level of autonomy for purchasing digital equipment as they do for planning digital programming (Chi-Square=10.272, df=4, p=.036) (Table 10). So despite the minor differences in mean between programming and digital equipment

purchasing, for the most part broadcasters have the same level of autonomy when deciding how best to handle each decision.

(Table 8 here)

(Table 9 here)

(Table 10 here)

Research Question 4. How far along are broadcasters in the planning process to purchase DTV equipment and is there a relationship between planning status and market size, number of hours of locally produced programming, and those who answered the survey?

In order to understand all the elements of purchasing decisions, the researcher broke down digital purchasing decisions into four separate questions. The four questions covered: (1) Overall planning for purchasing digital production equipment; (2) Overall planning for upgrading studio facilities to digital; (3) Overall planning for purchasing digital transmitting equipment; and (4) How integrated with digital technology the station hopes to be within two years of commencing digital broadcasting.

Despite how far along broadcasters think they are towards planning for making digital purchases, a more detailed look at individual digital planning factors indicates that broadcasters may not be as far along in planning for digital television as they initially indicated. No other question concerning DTV planning approached the mean for overall planning, with the exception of planning for purchasing a digital transmitter. The remaining digital equipment purchasing questions showed just how far broadcasters still have to go to get a product, produced from start to finish in digital, on the air.

When it comes to overall planning for purchasing digital equipment, broadcasters have made very little headway. Eighty-five (48.9%) respondents indicated little or no planning in purchasing digital equipment (M=2.7, Mdn.=3, Mo.=2, Std. Dev.=1.27). (See Table 11)

(Table 11 here)

When digital equipment purchasing decisions are broken down into two categories -- studio and transmitter -- it is clear what direction broadcasters are pursuing for the near future. Purchasing a digital transmitter is perhaps the easiest and quickest way in which a television station can comply with Congress and the FCC. That fact may

be why 44.1 percent (n=75) indicated they were either far along with their planning or implementing planning for purchasing a digital transmitter (M=3.23, Mdn.=3, Mo.=2, Std. Dev.=1.32). (See Table 12) Broadcasters are apparently looking just to comply with Congress and the FCC, and see purchasing a digital transmitter as the way to do just that. Purchasing digital equipment for the studio lags far behind. Just 52 respondents (27.6%) indicated they were either far along or finalizing planning for purchasing digital studio equipment (M=2.63, Mdn.=2, Mo.=2, Std. Dev.=1.33). (See Table 13)

(Table 12 here)

(Table 13 here)

As should be expected, market size plays a significant role in how far along stations are in planning for purchasing digital equipment (F(3, 184)=2.793, p=.042). The larger markets -- 1-30 (M=3.3) and 31-50 (M=3.05) -- were on average further along in planning for purchasing digital equipment than the smaller markets -- 51-100 (M=2.63) and 101+ (M=2.51). (See Table 14) Likewise, market size plays a significant role in how far along stations are in planning to purchase both studio equipment (F(3, 184)=7.026, p<.001) (Table 15) and transmitters (F(3, 184)=16.045, p<.001). (See Table 16) Markets 1-30 are ahead of markets 101+ in the planning process to purchase digital transmitters by a statistically significant margin. There is no significant difference in opinion concerning planning for DTV purchasing between General Managers and Engineers. While the two groups differed on overall planning progress, General Managers and Engineers were in agreement concerning how far along they were in planning for purchasing digital equipment (t=-.326, df=100.18, p=.748)

(Table 14 here)

(Table 15 here)

(Table 16 here)

The number of hours of locally produced programming is somewhat a factor in how far along television stations are in planning on purchasing digital studio equipment (F(2, 185)=3.201, p=.043) (Table 17) and purchasing a digital transmitter (F(2,185)=9.12, p<.001) (Table 18). In all cases, stations that produce more than 20 hours of local programming per week (group 3 on Tables 19, 20) are significantly more likely to be further along than stations that produce 0-10 hours per week (group 1 on Tables 17, 18)

and stations that produce 10.5-20 hours per week (group 2 on Tables 17, 18) in planning for every category involving purchasing digital equipment. The only exception is that stations that produce 0-10 hours per week are more likely to be further along in the planning process for purchasing digital studio equipment, and more likely to be further integrated with digital technology in the future than are stations that produce 10.5-20 hours per week.

(Table 17 here)

(Table 18 here)

The title of the person answering the survey was not related to the progress made in overall planning for purchasing digital equipment. The researcher found no statistically significant difference between General Managers ($M=2.71$) and Engineers ($M=2.77$) when it comes to the overall planning for digital equipment purchases ($t=-.326$, $df=100.184$, $p=.745$).

Research Question 3. How far into the planning process for planning digital programming are broadcasters and are there differences in planning stages between various stations based on where they identified programming decisions are being made and based on the title of the person answering the survey?

For this research question, the researcher posed one question to respondents: How far along in the planning process for digital television are they. Respondents were asked to indicate on a 5-point Likert scale ranging from (1) "No Planning" to (5) "Implementing Planning" how far into the planning process they were.

Further evidence that currently broadcasters are only trying to meet the FCC's minimum DTV requirements is found in how broadcasters are approaching digital programming. To put it simply, for the most part they are choosing not to approach digital programming at all. Broadcasters are ignoring digital programming by simply not planning for it. Table 19 demonstrates that broadcasters have made few digital programming plans ($M=1.99$, $Mdn.=2$, $Mo.=1$, $Std. Dev.=1.08$). Seventy-one percent ($n=134$) said they had done little or no planning for digital programming while only 3.7 percent ($n=7$) said they were implementing their DTV programming planning.

(Table 19 here)

Network affiliation is a significant factor in television stations' planning for digital programming ($F(3, 184)=3.693, p=.013$). Stations affiliated with CBS perceive that they are further along in planning for digital programming ($M=2.4$), than ABC ($M=1.74$), Fox ($M=1.83$) and NBC ($M=1.94$). (See Table 20) The difference in planning between NBC and ABC and Fox was statistically significant.

(Table 20 here)

Whether digital programming decisions are made locally or not is not a statistically significant factor in how far along a station is in planning for digital programming ($F(2, 183)=1.044, p=.354$). Likewise, market size plays no statistically significant role in planning for digital programming ($F(3,184)=.931, p=.427$). However, there was a surprising difference of opinion found between engineers and general managers. Though no statistically significant relationship was found to exist between the title of the person answering the survey and the perception of progress made towards planning to purchase digital equipment ($t=-.326, df=100.184, p=.745$), a relationship was found to exist between the title of the person answering the survey and the perception of progress made towards digital programming ($t=-2.2, df=93.22, p=.03$). It is not surprising that a difference in perception exists, but rather the manner in which it exists. Engineers perceive that they are further along in planning for digital programming ($M=2.3$) than general managers ($M=1.9$).

Additional Digital Services

Research Question 4. How far along are broadcasters in planning to provide additional digital services and are there differences between stations in various sized markets and network affiliations?

For this research question, the researcher asked respondents to indicate on a 5-point Likert scale how far along in the planning process for additional digital services they were. The scale ranged from (1) "No Planning" to (5) "Implementing Planning." A One-Way ANOVA was conducted to measure for statistical significance between different market sizes and planning for digital broadcasting. Market sizes were consolidated into markets 1-30, 31-50, 51-100, and 101+ to provide more equal representation per group. In addition, a One-Way ANOVA was conducted to see if there was a correlation between amount of HDTV programming and network affiliation.

With broadcasters still in the very early stages of planning DTV programming, it should come as no surprise that few have even begun to think about taking advantage of being able to split a digital signal and provide additional services. On a 5-point Likert scale ranging from (1) No planning to (5) Implementing planning, respondents were asked how far along they were in planning for additional digital services. Overall, broadcasters have barely begun to think about providing additional digital services ($M=1.8$, $Mdn.=2$, $Mo.=1$, $Std. Dev.=.982$). Just 5.3 percent ($n=10$) answered a 4 or 5, indicating that they were either far along in the planning process to provide additional digital services or were actually implementing their planning (Table 21). Just over 48 percent (48.4%, $n=88$) said they had not begun planning for additional digital services. Neither market size ($F(3, 184)=1.673$, $p=.174$) nor network affiliation ($F(3, 184)=.215$, $p=.886$) play a statistically significant role in a station's planning for digital services.

(Table 21 here)

Research Question 13. What are some of the services broadcasters may be interested in offering and are there differences between future information providers and future broadcasters in what digital services stations would be interested in providing?

For this research question, the researcher presented respondents with a list of eight potential services broadcasters may have the option of offering their respective markets at some point in the future. The list of potential digital services was compiled from the review of literature.

For each potential digital service, the respondents were asked to indicate on a 5-point Likert scale how interested their station might be in offering the service. The Likert scales accompanying each digital service ranged from (1) "Not at all" to (5) "Extremely." The researcher wanted to see if differences exist between what future broadcasters might be interested in providing and what future information providers might be interested in providing.

While no one service hit a major cord with broadcasters, several digital services found potential interest among broadcasters. Interactive television ($M=3.63$), data enhancement ($M=3.62$), high-speed Internet access ($M=3.6$) and at-home shopping ($M=3.16$) all drew high levels interest among broadcasters. Broadcasters evidently have

little or no interest in providing some services such as; on-line gaming (M=1.94), cellular phone service (M=2.6), and in-home schooling (M=2.73). For complete results, please see Table 22.

(Table 22 here)

Several potential digital services proved to have statistically significant differences between future broadcasters and future information providers as defined earlier in this study. For a complete list of means for potential interest in providing additional digital services, broken down between future information providers and future broadcasters, see Table 23. For the following potential services future information providers were significantly more interested in providing the service than were future broadcasters (equal variances is not assumed): Pager service ($t=-1.981$, $df=126.331$, $p=.05$); Data enhancement service ($t=-2.348$, $df=137.555$, $p=.02$); Interactive television ($t=-2.0$, $df=138.48$, $p=.047$). (Table 24).

(Table 23 here)

(Table 24 here)

Conclusions

Differences Between Future Broadcasters and Future Information Providers

The most important finding from this study is that a shift is underway in how broadcasters may define themselves in the future. Sixty-three respondents (33.5%) say their future is as information providers. That is up from 13 (6.9%) who now define themselves as information providers. Not only is the trend of moving from broadcasting to providing information likely to continue, it is also likely to define the industry. As information providers become a larger segment of the broadcast television industry, their new business strategies, especially towards multicasting and additional digital services, will be an influential force on the entire industry. If future information providers' business strategies prove successful, the entire industry may be forced to adopt their strategies or risk being overtaken by information providers.

This study found that future broadcasters and future information providers see the digital future much differently. For instance, the perception that broadcasters have of the impact digital broadcasting will have on the industry is related to how broadcasters envision the future definition of their business to be. The mean for all respondents was

3.32. However, when respondents were broken down into two groups -- future broadcasters and future information providers -- statistically significant differences appeared. Future broadcasters were less consistent (Std. Dev. 1.47) than future information providers (Std. Dev.=.82) on the impact DTV will have on their business definition. Overall, future information providers were felt DTV will have a greater impact on their business definition than future broadcasters (M=3.9 vs. M=3.06, $p<.001$). In addition, future information providers have a greater interest in providing every potential digital service included in the researcher's survey, with significant differences found for providing pager service, data enhancement and interactive television.

Planning for Digital Broadcasting

When it comes to overall planning for digital broadcasting, television stations in top-30 markets are generally ahead of those in other sized markets ($p<.001$). However, this may be, at least in part, a misperception. How far along broadcasters think they are in planning for digital broadcasting and how far along they actually are may be two different things. The mean score for broadcasters' overall planning for digital broadcasting (M=3.38) was significantly higher than the two main planning areas for digital broadcasting -- digital programming (M=1.99) and digital equipment purchasing (M=2.7). Only planning for purchasing a digital transmitter (M=3.23) comes close to the mean for overall digital planning. This discrepancy was not expected. A possible explanation is that broadcasters looking at the overall picture of what needs to be done to broadcast digitally are thinking about how far along they are in planning to purchase a digital transmitter, which is the least they need to do to begin broadcasting digitally. The mean for that planning was 3.23. At this point, broadcasters are not thinking much about upgrading digital studio equipment or planning for digital programming. So when asked about overall planning for digital broadcasting, they think only of purchasing a digital transmitter, not of other factors of digital broadcasting.

The planning for digital broadcasting predominately is done at the local level. For both digital equipment purchasing and digital programming, most respondents said the decision making was split evenly between corporate and local. However, for both programming and equipment purchasing, more respondents (33.5% equipment, 34.5% programming) indicated decisions were either "totally local" (13.8% equipment, 19.4%

programming) or "mostly local/some corporate" (19.7% equipment, 15.1% programming) than respondents (30.3% equipment, 23.1% programming) who indicated they were "totally corporate" (8.5% purchasing, 5.4% programming) or "mostly corporate/some local" (21.8% equipment, 17.7% programming). In addition, a Chi-Square indicated that the level of local involvement in decisions for both digital programming and digital equipment purchases was found to be consistent both areas for the individual broadcaster (Chi-Square=91.363, df=4, $p<.001$).

As should be expected, larger markets were found to be further along in planning to purchase digital equipment and more likely to plan to be more integrated with digital technology within two years of commencing digital broadcasting. Also, hours of local programming played a significant role in planning to purchase digital equipment with stations that produce 20.5 or more hours per week of digital programming more likely to be further along in the planning process.

At this point, broadcasters are simply not planning for digital programming. Only seven respondents (3.7%) indicated they were implementing digital programming planning. Surprisingly, network affiliation plays a role in how far along broadcasters perceive themselves to be when it comes to planning for digital programming. CBS affiliates perceive themselves to be further along ($M=2.4$) in planning for digital programming than were ABC, NBC and Fox, though the mean for CBS indicates they too are not very far along in this category.

A noteworthy finding concerned differences in perceptions of planning between General Managers and Engineers. Overall, Engineers ($M=3.81$) felt that they were further along in planning for digital television than did General Managers (3.22). This difference was found to be statistically significant ($t=-3.11$, $df=101$, $p=.002$). There were no statistically significant differences in how they perceived how far along they were in overall planning for digital purchasing ($t=-3.26$, $df=100.184$, $p=.745$). However, Engineers ($M=2.3$) perceived their respective stations to be further ahead in planning for digital programming than General Managers ($M=1.9$). This difference was found to be statistically significant ($t=-2.2$, $df=93.224$, $p=.03$).

Digital Services

The opportunities to expand the business of broadcasters as presented by digital broadcasting has barely been tapped as of yet. Whereas planning for digital purchasing is beginning to take shape and planning for digital programming is entering its initial stages, planning to provide additional digital services has basically not even been conceived as of yet (M=1.8). Nonetheless, a profile of what services the public might see their local broadcasters provide in the future can be made. For the most part, broadcasters are most interested in providing services supplied by few, if any other businesses today. Interactive television and data enhancement services topped the list of potential future services they may be interested in offering. High speed Internet access and at-home shopping, two services offered by others in many markets but not saturating most markets, rounded out the list of services broadcasters are most interested in possibly providing consumers.

When broadcasters are broken down into two groups on the basis of how they are likely to define themselves in the future, an interesting split is seen between future information providers and future broadcasters. No differences exist between the two groups in regards to how far along in planning for digital services either group is. However, future information providers are overall more interested in exploring digital services than are the future broadcasters. The differences in means are significant for pager service, data enhancement service, and interactive television, though future information providers scored higher means for every digital service than did future broadcasters.

Summary

With all the uncertainty concerning what shape digital broadcasting will take, and even if it will be commercially successful, broadcasters are evidently taking a wait-and-see approach, considering far along they are in planning for certain digital elements. Curiously, broadcasters seem to think they are further along in the overall planning process than they may actually be. The mean for overall planning was greater than the mean for any other question concerning planning for digital broadcasting.

What broadcasters are planning for is just to comply with Congress and the FCC in the immediate future by purchasing a digital transmitter to broadcast the digital signal.

Other planning areas such as purchasing digital studio equipment, planning digital programming, and planning for additional digital services lag far behind planning for a digital transmitter.

Larger markets are well ahead of smaller markets in planning to purchase digital equipment, though when it comes to all other facets of digital planning, market size appears to make no difference. And considering how much more concerned smaller markets are towards financing new digital equipment, smaller markets would just assume put off any planning for digital broadcasting for as long as they possibly can.

Besides the expected differences in market size, two other interesting divisions appeared in this study. Differences emerged based on who answered the survey and what broadcasters envisioned their future business to be.

One possible explanation as for the differences in opinion between engineers and management when it comes to DTV planning is a difference in opinion as to what constitutes planning. The transition to digital broadcasting is confusing to even the most technologically knowledgeable people, of which most engineers probably belong. Their technological expertise could explain why they feel their stations are further along in the overall planning for digital broadcasting. The presumption that engineers are not passing that expertise along to management, which is why management is not of the opinion that they are as far along in the planning process as they are, could be made if not for two other general planning questions. Engineers and management are of like mind when it comes to planning for digital purchasing -- an area requiring a certain level of technical knowledge. However, the two groups differ when it comes to planning for digital programming, an area engineers typically are not involved in. The only possible explanation the researcher could deduce was that planning for digital programming means something different to engineers than to management. Management may view programming in terms of content while engineers may view programming as possessing the necessary tools through which to get digital programming on the air. Barring that explanation, the researcher could develop no explanation as to why management and engineers are in agreement in one area and not the other.

From a theoretical standpoint, digital broadcasting offers an interesting look at an unusual case study in diffusion. With the exception of broadcast television stations that

chose to begin broadcasting a digital signal before their FCC set deadline, natural diffusion has been eliminated from one facet of DTV. By establishing a firm timetable for the implementation of DTV, the FCC and Congress have eliminated natural diffusion from the products initial introduction.

It has already been discussed, however, that broadcasters are only doing what is necessary to comply with the FCC by planning to purchase digital transmitters. All other elements of digital broadcasting -- digital studio purchasing, digital programming, additional digital services -- will be introduced and accepted by the industry and by consumers, through natural, polynuclear diffusion model.

This study also exposed strong, and possibly growing, difference of opinion concerning the future of the broadcasting industry. Two trains of thought are emerging. One is that the industry will not change significantly and that the business of broadcasting will remain broadcasting. The second train of thought is that the industry will experience great changes that will take advantage of the diverse applications offered by digital and that the industry will migrate away from broadcasting in favor of providing information. The future information providers and future broadcasters differed on how much digital would change their business and what digital services they might be interested in providing. As few broadcasters have given much thought to this level of planning for digital broadcasting, it is understandable that the group that identified itself as future information providers is considerably smaller than future broadcasters. However, as more than 30 percent of the respondents indicated themselves to be future information providers despite the low levels of planning devoted towards digital programming and digital services, it is a safe assumption that the number of future information providers is sure to grow.

The confusion associated with the early stages of a major change in the way an industry does its business is sure to bring about anger and frustration within the group as a whole and is likely to divide the group into several smaller camps. That is exactly what has happened so far with digital broadcasting. Nearly all broadcasters harbor a number of concerns over the unknowns connected to digital broadcasting. They are divided based on market size and by the visionaries (future information providers) and those who prefer to stick to the status quo (future broadcasters). In ten or more years, however, the

industry will settle down into a standard, bitterness towards Congress and the FCC will cease, the information providers will absorb the broadcasters, and television as we know it will cease to exist. In its place a new medium, offering potential unimagined today, will emerge.

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Tables

Table 1: Current Definition of Stations Answering Survey.

		Frequency	Percent	Cumulative Percent
Valid	Broadcaster	161	85.6	85.6
	Information Provider	13	6.9	92.6
	Entertainer	10	5.3	97.9
	Other	4	2.1	100.0
	Total	188	100.0	

Table 2: Future Definition of Stations Answering Survey

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Broadcaster	107	56.9	57.2	57.2
	Information Provider	63	33.5	33.7	90.9
	Entertainer	10	5.3	5.3	96.3
	Other	7	3.7	3.7	100.0
	Total	187	99.5	100.0	
Missing	No answer	1	.5		
	Total	188	100.0		

Table 3: Broadcasters' Perception of How Great an Impact DTV Will Have on Their Business Definition

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	30	16.0	16.0	16.0
	2.00	21	11.2	11.2	27.3
	3.00	37	19.7	19.8	47.1
	4.00	54	28.7	28.9	75.9
	5.00	45	23.9	24.1	100.0
	Total	187	99.5	100.0	
Missing	.00	1	.5		
	Total	188	100.0		

Table 4: Overall Planning for Digital Television.

	Frequency	Percent	Cumulative Percent
Valid	1.00	11	5.9
	2.00	36	25.0
	3.00	56	54.8
	4.00	41	76.6
	5.00	44	100.0
Total	188	100.0	

Table 5: Means of DTV Planning by Market Size.

Tukey HSD^{a,b}

Market Size	N	Subset for alpha = .05	
		1	2
101+	86	3.0233	
51-100	60	3.4000	
31-50	22	3.6364	
1-30	20		4.5500
Sig.		.122	1.000

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 32.323.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 6: Means of DTV Planning by Title of Person Answering Survey.

	Title of Person Answering Survey	N	Mean	Std. Deviation	Std. Error Mean
Overall Planning for DTV	GM/V.P/Pres./OM	126	3.2222	1.1858	.1056
	Engineer	53	3.8113	1.1445	.1572

Table 7: Statistical Difference in Perceptions of DTV Planning by Title of Person Answering Survey.

	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Overall Planning for I	.000	.999	-3.065	177	.003
Equal variances assumed			-3.110	101.000	.002

Table 8: Where Digital Equipment Purchase Decisions are Made.

		Frequency	Percent	Cumulative Percent
Valid	Totally local	26	13.8	13.8
	Mostly local/Some corporate	37	19.7	33.5
	Local and Corporate	68	36.2	69.7
	Mostly corporate/Some local	41	21.8	91.5
	Totally corporate	16	8.5	100.0
	Total	188	100.0	

Table 9: Where Digital Programming Decisions are Made.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Totally local	36	19.1	19.4	19.4
	Mostly local/Some corporate	28	14.9	15.1	34.4
	Local and Corporate	79	42.0	42.5	76.9
	Mostly corporate/Some local	33	17.6	17.7	94.6
	Totally corporate	10	5.3	5.4	100.0
	Total	186	98.9	100.0	
Missing	No answer	2	1.1		
Total		188	100.0		

Table 10: Relationship Between Where Digital Programming and Digital Equipment Purchasing Decisions are being Made

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.272 ^a	4	.036
Likelihood Ratio	10.372	4	.035
Linear-by-Linear Association	.607	1	.436
N of Valid Cases	186		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.94.

Table 11: Broadcasters' Perceptions of Progress Made Towards Purchasing Digital Equipment.

	Frequency	Percent	Cumulative Percent
Valid	1.00	38	20.2
	2.00	54	48.9
	3.00	43	71.8
	4.00	33	89.4
	5.00	20	100.0
Total	188	100.0	

Table 12: Broadcasters' Perceptions of Progress Made Towards Purchasing Digital Transmitters.

	Frequency	Percent	Cumulative Percent
Valid	1.00	18	9.6
	2.00	48	35.1
	3.00	39	55.9
	4.00	39	76.6
	5.00	44	100.0
Total	188	100.0	

Table 13: Broadcasters' Perceptions of Progress Made Towards Purchasing Digital Studio Equipment.

	Frequency	Percent	Cumulative Percent
Valid	1.00	45	23.9
	2.00	54	52.7
	3.00	37	72.3
	4.00	29	87.8
	5.00	23	100.0
Total	188	100.0	

Table 14: Overall Planning for Purchasing Digital Equipment in Relationship to Market Size.

DTV Equipment Purchasing					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13.142	3	4.381	2.793	.042
Within Groups	288.576	184	1.568		
Total	301.718	187			

Tukey HSD^{a,b}

Market Size	N	Subset for alpha = .05
		1
101+	86	2.5116
51-100	60	2.6333
31-50	22	3.0455
1-30	20	3.3000
Sig.		.055

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 32.323.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 15: Planning for Purchasing Digital Studio Equipment by Market Size.

Tukey HSD^{a,b}

Market Size	N	Subset for alpha = .05	
		1	2
101+	86	2.2791	
51-100	60	2.6833	
31-50	22	2.9545	2.9545
1-30	20		3.6500
Sig.		.140	.122

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 32.323.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 16: Planning for Purchasing Digital Transmitters by Market Size.

Tukey HSD^{a,b}

Market Size	N	Subset for alpha = .05		
		1	2	3
101+	86	2.7907		
51-100	60	3.1833	3.1833	
31-50	22		3.6818	
1-30	20			4.7500
Sig.		.541	.327	1.000

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 32.323.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 17: Planning for Purchasing Digital Studio Equipment by Hours of Locally Produced Programming

Tukey HSD^{a,b}

HRLOCAL2	N	Subset for alpha = .05	
		1	2
2.00	63	2.3333	
1.00	48	2.6042	2.6042
3.00	77		2.8961
Sig.		.493	.440

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 60.370.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 18: Planning for Purchasing Digital Transmitters by Hours of Locally Produced Programming.

Tukey HSD^{a,b}

HRLOCAL2	N	Subset for alpha = .05	
		1	2
1.00	48	2.8750	
2.00	63	2.9206	
3.00	77		3.7013
Sig.		.979	1.000

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 60.370.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 19: Broadcasters' Perceptions of Progress Made Towards Digital Programming.

		Frequency	Percent	Cumulative Percent
Valid	1.00	80	42.6	42.6
	2.00	54	28.7	71.3
	3.00	37	19.7	91.0
	4.00	10	5.3	96.3
	5.00	7	3.7	100.0
Total		188	100.0	

Table 20: Broadcasters' Perception of Progress Towards Planning DTV Programming by Network Affiliation.

Tukey HSD^{a,b}

Network Affiliation	N	Subset for alpha = .05	
		1	2
ABC	51	1.7451	
Fox	35	1.8286	
NBC	52	1.9423	1.9423
CBS	50		2.4000
Sig.		.811	.166

Means for groups in homogeneous subsets are displayed.

- a. Uses Harmonic Mean Sample Size = 45.761.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 21: Broadcasters' Perceptions of Planning for Digital Services.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	88	46.8	47.6	47.6
	2.00	54	28.7	29.2	76.8
	3.00	33	17.6	17.8	94.6
	4.00	7	3.7	3.8	98.4
	5.00	3	1.6	1.6	100.0
	Total		185	98.4	100.0
Missing	.00	3	1.6		
Total		188	100.0		

Table 22: Broadcasters' Interests In Potential Digital Services.

	Mean	Median	Mode	Std. Deviation
Cellular Phone Service	2.5904	3.0000	1.00	1.4652
Pager Service	2.9149	3.0000	1.00	1.4564
High-Speed Internet Access	3.5957	4.0000	5.00	1.3628
Data Enhancement Service	3.6170	4.0000	5.00	1.2548
Interactive Television	3.6330	4.0000	5.00	1.3318
In-Home Schooling	2.7340	3.0000	3.00	1.3498
On-Line Gaming	1.9415	1.5000	1.00	1.2331
At-Home Shopping	3.1649	3.0000	3.00	1.3402

Table 23: Potential Interest in Digital Services Based on Future Definitions.

	future definition	N	Mean	Std. Deviation	Std. Error Mean
Cellular Phone Service	Broadcaster	107	2.4299	1.3948	.1348
	Information Provider	63	2.7302	1.5049	.1896
Pager Service	Broadcaster	107	2.7196	1.4128	.1366
	Information Provider	63	3.1746	1.4651	.1846
High-Speed Internet Access	Broadcaster	107	3.4673	1.3481	.1303
	Information Provider	63	3.6984	1.3635	.1718
Data Enhancement Service	Broadcaster	107	3.4860	1.2617	.1220
	Information Provider	63	3.9365	1.1760	.1482
Interactive Television	Broadcaster	107	3.4766	1.3622	.1317
	Information Provider	63	3.8889	1.2587	.1586
In-Home Schooling	Broadcaster	107	2.6822	1.3289	.1285
	Information Provider	63	2.8413	1.4166	.1785
On-Line Gaming	Broadcaster	107	1.8879	1.2157	.1175
	Information Provider	63	2.0000	1.2048	.1518
At-Home Shopping	Broadcaster	107	3.0000	1.3318	.1287
	Information Provider	63	3.3810	1.3251	.1669

Table 24: Significance of Interest In Additional Services Based on Future Definitions.

		Levene's Test for		t-test for Equality of Means	
		F	t	df	Sig. (2-tailed)
Cellular Phone Service	Equal variances assumed	1.271	-1.316	168	.190
	Equal variances not assume		-1.291	122.282	.199
Pager Service	Equal variances assumed	.175	-2.000	168	.047
	Equal variances not assume		-1.981	126.331	.050
High-Speed Internet Acces	Equal variances assumed	.020	-1.075	168	.284
	Equal variances not assume		-1.072	128.924	.286
Data Enhancement Service	Equal variances assumed	1.184	-2.305	168	.022
	Equal variances not assume		-2.348	137.555	.020
Interactive Television	Equal variances assumed	2.936	-1.959	168	.052
	Equal variances not assume		-2.000	138.480	.047
In-Home Schooling	Equal variances assumed	1.516	-.735	168	.463
	Equal variances not assume		-.723	123.504	.471
On-Line Gaming	Equal variances assumed	.000	-.583	168	.561
	Equal variances not assume		-.584	131.063	.560
At-Home Shopping	Equal variances assumed	.221	-1.805	168	.073
	Equal variances not assume		-1.807	130.650	.073