

Over the last 10 years, since the advent of digital cable and satellite, we have seen ratings for top TV shows decline. Ratings for top 10 shows today, wouldn't have cracked the top 20 ratings back in the 1980s and early 1990s. Call it the longtail affect. More choices allow people to be more selective in their viewing, hence lower ratings for the top shows.

The satellite and cable companies have been brilliant in leveraging new technology to create more value and lock in their customers. They have used technology to offer more and more channels. The services offered by each have continued to expand, as has the profitability that comes with offering, telephony, High Speed Data, Video on Demand, Subscription Music Services and more.

Technology marches on. BusinessWeek proclaimed this week ["The End of TV \(As you know it\)."](#) My perception of the article is that they wanted to drive home the point that technology is expanding how viewers receive content and the number of content choices will result in ongoing decline in audience sizes. The drop could, in turn could destabilize the TV business as we know it.

I think they are wrong. They are leaving out two key technological issues that will completely change the dynamics of TV, but for the better....for those that recognize what is happening.

First, as I have written in the past, I think it's great news for any TV network [that Bob Iger broke the links to the past and opened new revenue streams by selling hot shows while they are hot](#). People want content, where and when they want it. It's found money that will just improve the ability of networks to invest in content. I also think these revenue streams will end up being driven by out of home, mobile devices rather than being downloaded for viewing at home.

That's not to say that downloading of content being offered today won't be watched from media center PCs, laptops, iPods, PVRs and other devices when connected to TVs. They will. Because today, DVD quality, or anything close is good enough for 90 pct of homes.

That will change. Quickly. Very quickly.

Some simple observations to consider:

HDTV pricing is falling like a rock. You can go to Best Buy and get a 27" HDTV for under 400 dollars. Those prices will continue to fall. Within the next 2 years, analog TV will have gone the way of black and white. It will become unusual to see them in stores in all but tiny sizes.

HDTV viewers love HD quality. The more HD you watch, the more important HD quality becomes to you. HDTV viewers aren't accepting by programming type. Once a viewer goes HD, he/she wants all programming in HD.

Now some may question this. I have heard it many times that DVD quality is "good enough". Back in 1998, VHS quality was good enough. It's not good enough now. Would you accept VHS quality on the DVD of a movie you just bought? Of course not. Nor will you accept DVD quality in a few years when you have expectations of HD 1080i quality for the shows you watch or buy.

HDTV viewers watch more TV. The increases are in HD channels, with decreases in standard definition viewing.

Now some may say this is no big deal. That all the cable and satellite networks out there will just naturally migrate to High Definition.

Those same people may say the same thing about video on demand. That the content will just migrate to HD. No big deal. Instead of downloading DVD quality video, the content will be upgraded to HD quality and we will download HD quality.

That's not going to happen and here is why.

Of all the advances in technology that will occur over the next 5 years in hard drives, CPUs, HDTVs, PDAs and other mobile technology, the one area that we will see the least amount of improvement is in bandwidth to the home.

Over the past 5 years, bandwidth to the home has grown from 300k for broadband to 5mbps, and in some cases even 10mbps. But that bandwidth is not dedicated per user. That bandwidth is shared. The number of users sharing that bandwidth has increased even faster than the size of the pipe. That's not going to change. Sure we will see optimizing efforts from network providers, but the average bandwidth available to the home isn't going to change. In fact, there is every chance it will decrease because the number of homes, the number of users per home, and the number of tuners in PVRs that are recording simultaneously will increase.

#### **So what does this have to do with HDTV and the future of television ?**

Simply put, using all the compression tools and best codecs available today, the amount of bandwidth required to transmit an HDTV show vs the amount of bandwidth required to transmit a DVD quality show is about 8mbps to 1mbps. That's for download and doesn't take into account shows that require more bandwidth, like sports and

movies.

For broadcast, again, using compression, it takes 2 to 3mbps to transmit a standard definition show, and 10mbps to transmit an HDTV, non sports program at quality that is equal to what is available from over the air HDTV broadcasters like CBS and NBC.

Which leads to point. Bandwidth to the home is not expanding as fast as the bandwidth required to transmit content. So something has got to give.

Satellite companies have recognized their expanded need for bandwidth and have purchased launched multiple satellites.

Cable companies are doing everything they can to improve bandwidth. Going to IP driven, switched networks. Using statistical multiplexing techniques. All provide help, but not enough to solve the problem. Plus, they have another HUGE problem.

Basic cable TV networks, USA, TNT, TBS, CNN, all the networks that have full penetration and reach 95pct plus of cable homes are carried through your cable provider on analog channels. This means they use 6mhz each. 6mhz is the equivalent of about 38mbps. Thats a lot of bandwidth.

Now common sense might say, why not just switch them to digital and send them using 3mbps for standard definition and 10mbps for High Definition. Well the problem is that not all homes have digital cable, which means that if the networks were willing to give up their 6mhz of spectrum, they wouldnt be able to reach the 50 plus percent of cable users that dont get digital. Which means that its not going to happen anytime soon. In fact, in response to this problem, some cable systems are trying to go "pseudo digital", but thats going to take years and years to rollout.

So in a nutshell, at the very point in time when a rapidly growing number of consumers are going to be expecting programming at the highest possible High Definition bitrate, there isnt enough bandwidth to deliver it.

Thats unbelievably good news for the cable and satellite companies and for cable networks like ESPN, HDNet, TNT and Discovery that have invested in high definition.

As i said earlier, consumers are going to expect more and more High Definition programming. They will be buying 10s of millions of High Definition sets over the next couple years and the more HD content, they get, the more they will want.

Cable and satellite companies are going to have to compete in a high def world. People with high def sets are going to buy their video content from providers who provide the most high def content. Having the 5 or so broadcast networks that only broadcast in HD 70pct of primetime, plus 2 or 3 cable networks in HD is not going to be enough.

So why wouldnt every cable network just switch to broadcasting in High Definition ? For 3 reasons; cost, licensing problems and because a lot of their content is worthless in high definition.

It costs millions of dollars to build or convert a network to High Definition. Given that you can count the number of independently owned networks on one hand, that means that all the major media companies have multiple networks that they have to convert. If they own a news network.. The cost is enormous. Thats a sunk cost that cant be recaptured.

What makes a program worthless in High Definition ? If it was shot or mastered on tape. Shows from the 1980s, 1990s, and even some shows today, are shot using standard definition tape. Other shows and movies were shot using film, (which is high resolution and can be nicely converted to HD), but were edited and had special effects added using tape as the master format. Why is it worthless ? Because standard definition video doesnt have enough resolution to look good in high definition. To up convert it to HD would be like up converting music from mono to 5.1 Surround Sound. You can fake it and improve it a little, but when compared to music captured in Surround Sound or even stereo, its obviously inferior.

If you go through the schedules of many cable networks, some are made up completely or substantially of shows shot or mastered on tape. The networks that are full of music videos from the past 20 years. Networks with comedies from the 1980s and 90s. Science Fiction created for syndicated TV (Most primetime scifi was shot on Film and then HD). There is **nothing** their owners or licensors can do to make them look good in HD. I dont think they will even try. Which in turn means we are going to see some of those cable networks that are dependent on these shows just disappear.

Then there is the cost of converting shows that can look good in HD into High Definition quality. There are two ways to convert programs that were not created in High Definition into high definition content.

The cheapest is called upconverting. Quick and easy, a standard definition master tape of a show is just run through some software which tries to create pixels and resolution that are not there through and render out a higher resolution version. The problem is that it looks like crap once its converted. The only reason it still exists is that some current networks that are broadcasting in High Definition dont feel the need to spend

the money to do it right. Probably because they don't think the audience size is big enough. Personally, I think they are killing their brand equity with HD viewers. The difference in quality is obvious. The recurring comment I hear is "what's wrong with XYZ show on XYZ network it doesn't look near as good as HDNet" So for that reason, I hope they continue upconverting content although they are making a huge mistake doing so.

The more expensive option is for shows that are shot on film, to go back to the master elements, clean them up and telecine them to high definition. From there they can be touched up even further to look really good. Unfortunately it's not cheap. The cost can start at 20k for a movie and go up from there. The good news is that this is happening more and more because some smarter content companies are preparing for converting to HD and because they realize the same HD version can be used as a master to sell a DVD today, and an HD version of that DVD in the near future.

But not all the networks can afford to pay the cost to convert. If they licensed 100 eps of a single show that was shot on film, at 10k per hour minimum, that's 1mm dollars for a single show! Multiply that by all the shows and all the episodes involved, and it can turn into millions of dollars per network.

Then there are the licensing problems. A lot of programs were licensed as part of long term deals before High Definition was even contemplated. In some cases the High Def rights were split apart from the standard definition rights. Which means that some networks either have to go back and procure the HD rights, or they can't get them at all.

Add all of this up and it creates a very unique dynamic in the TV world. There are some networks where it doesn't make any sense for them to even try to go High Def. Whether it's cost, licensing issues or lack of HD quality, it's just not going to happen. Which in turn is going to lead to a CONTRACTION in the number of total TV channels in the HD universe.

Then you have the issue of available bandwidth on cable and satellite providers. Because HD versions of networks take 4x to 5x as much bandwidth as their standard definition counterparts, even with full compression, there isn't enough bandwidth available for all the networks that feel like they can and have to go High Def. Which will result in any of three outcomes

1. There will be a standard definition ghetto created on cable and satellite. Just as talk radio and niche stations are now on the AM radio dial, there will be an analogous area where networks that can't or won't go HD can reside. Of course the bad news is that with just a few exceptions, these networks will be considered 2nd class networks and the rates they receive and can charge advertisers will be far less than their HD counterparts
2. Cable networks will trade the bandwidth being consumed by "can't go HD" networks and/or analog carriage for bandwidth for their biggest networks who got to the HD party late.
3. Five or so years from now, those networks who didn't think HD was important will find themselves on the outside looking in, realizing that there isn't enough bandwidth and they will have to pay for carriage.

There are going to be fewer networks being broadcast in the future. Not more. That should lead to ratings expansion, not contraction as some would have you believe.

***But wait, there's more. In an HD universe, not only will there be fewer channels to compete with in the long term, but because the adoption of HD will happen faster than most people realize, the ratings for those networks that do broadcast in HD will EXPLODE in the next two to three years. The next few years will still have a limited number of HD channels available to viewers while conversion and bandwidth issues are worked out. Which means in HD households, rather than a 150 channel universe, there may only be a 30 channel HD universe. That's a goldmine for those networks in HD.***

Not only that, but the HD universe has several advantages for advertisers over the standard def world, which of course is money in the bank for networks and their distributors.

First is that 99 pct of the PVR/Tivo devices already installed in homes that go HD, don't support HD programming. Which means no skipping commercials in HD programming until they upgrade.

More importantly, with more resolution, a wide screen and 5.1 audio, advertisers have a bigger and better palette to work with and get creative with. Which just might enable commercials we like to watch for a while.

Then there is the competition from the internet that is supposed to make things so difficult for tv networks.

Unfortunately for the internet, offering high definition downloads isn't cost efficient. It's down right expensive. And it's god awful slow. Sure, companies like [Redswoosh.net](http://Redswoosh.net) will provide better bandwidth solutions, and we have tested it at HDNet. But it's still going to take 10gbs to deliver a movie, and it's going to take over night downloading to deliver that movie on 99 pct of home connections. And it's not going to get any better for a long long time. Which in turn makes downloading High Def content a very small internet business. Which in turn means that all the prognosticators who think that internet download to the home will replace the rental business and rival cable or satellite are just plain wrong.

In fact, I think that smart rental companies like Hollywood Entertainment and Netflix will embrace HD on DVD. Whether its for the Xbox 360 or PS3 which will both be inexpensive HD playback devices, or on future HD DVD and Blu Ray Devices, rentals for HD content will bring people back to the stores because of higher buy to own prices of the disks.

So when you add it up.

Consumers are going HD. HDTV will replace analog tv as surely as DVDs replaced VCRs. Those consumers will demand HD programming. The distributor that can provide it, will get their business. That competition will push networks to go HD, but for a variety of reasons, not all can or will, which means there will be fewer networks competing for viewers and some of those networks will be "AM band", reducing the competition for viewers and advertisers even more.

HD technology will also bring more viewers to watch programming on HDTVs because its so new and different. Which in turn will bring advertisers and will extend the life of the 30 second commercial.

The impact of the internet on inhome viewing will diminish until bandwidth to the home can increase by the same 4x or 5x that HD programming bandwidth increased. I dont see that happening for a long time.

And I didnt even get into the demand creation for HD programming that HD gaming and its devicessupport ofplayback ofHD content will have

**We are entering the Golden Age of Television.**

[Television like you have never seen it before](#), and of which you will want more more more