

New technology can be incredibly exciting. It seems to be always improving. Getting faster, cheaper, smaller, with seemingly no end to that trend in site. While that was always the case in the 1980s and 1990s and early 2000s, it is no longer the case that all technology improves with age.

What I am about to tell you will sound like heresy to many, but the reality is that the consumer internet, as it is constructed today has matured and its future, unless there is significant investment will constrain economic development in this country.

First, let me say that there is plenty of bandwidth and upside for the backbone of the internet. Those fibers that connect the networks of internet providers have plenty of room to grow. Unfortunately, the quality of the internet experience to consumers and the opportunity to provide products and services, particularly using video, over the internet to the consumer are only as good as its weakest link. Right now, with limited exceptions, those links are pretty weak.

The vast majority of broadband users in this country today are connected via coaxial cable or copper wiring. Coaxial cable was exciting in the 1970s and early 80s, but was used as the foundation of major cable system upgrades in the 1990s. For Telco broadband users, basic phone wiring is still the primary method of access for DSL subscribers. (Although Verizon's FIOS product and some other companies have installed fiber to or close to the home, they are still small in number)

Both of these technologies are limited not only in by their intrinsic bandwidth capacity, but also by the networks they can be attached to and the distances over which they can deliver bits. The bottom line is that the future of broadband and consumer connectivity for more than 95 pct of broadband users is built upon ancient "technology".

That is a problem for our country.

This bandwidth limitation for the last mile of consumer internet connectivity means we are severely limited in heavy bandwidth consuming applications that exist today, such as video, and completely excludes unique applications that could positively impact not only our economy, but our quality of life.

The issue of net neutrality is the perfect example of how constrained bandwidth creates conflicts between the interests of consumers and broadband providers. Internet consumers are concerned that their favorite websites will either cost more due to increased hosting costs, or will be slow or erratic when accessed because they are not given the priority of those who pay more. This issue goes away completely if bandwidth constraints go away. In an all fiber network, bandwidth gigabits per second to the home and throughout the network, making net neutrality a non issue.

In our current bandwidth constrained environment, the concept of internet video replacing standard definition TV is laughable. The perspective that it could replace HDTV programming isn't even on the radar. With the current design of the net, every

single video stream must be delivered individually to the consumer. It doesn't matter if the video stream is transported from a centralized host server, from a locally hosted server, or from a peer on a P2P network. You may have noticed that CBS made a big deal of delivering 300k simultaneous video streams at 350k of bandwidth each (less than TV quality) of the NCAA final four last year. They demand was far greater, but 300k was the most they could support at a single time. They could have served many, many more had they been able to, but the net does not have the capacity, nor are the costs reasonable to be able to deliver live TV over the net.

Now there are some that will tell you that internet video will replace TV using P2P technology, but it will not happen. P2P technology doesn't reduce the amount of bandwidth required to deliver video content over the net, in fact, it moves much of the requirement for bandwidth from the backbone, which is built primarily on fiber and has no bandwidth limits, to the individual consumer, where the user must not only receive the entire amount of bits required for the delivery of the video they have chosen, but must retransmit it to peers on the network, resulting in significant inefficiencies and over consumption of bandwidth. The reason this method of delivery has become so popular is that it shifts the cost from the distributor of the video, to the consumer of the video.

This isn't to say that consumers won't want and won't consume video and TV programming over the internet. They will. In particular, internet video consumption is very high during the day. At work, people will watch their favorite shows that they missed at lunch or on breaks. They may stream it, they may download it, and they may save it to their iPods or phones. There is certainly a market for video content on PCs, but it is a complementary market, not a primary market for content. People of all ages will watch video on their PCs, mobile devices and phones, their PDAs, when they don't have access to their TVs.

Over the last few years the technology industry and the media have become fixated on internet video. The explosive success of YouTube has convinced many that it foreshadows a future of people sitting in front of their PCs watching user generated videos. It doesn't.

The area of consumer video consumption that is going through the most significant change and upheaval is not internet video, its HDTV.

If you look at the PC on your desk at home or work, it looks and works pretty much exactly like it did 5 and even 10 years ago. There was a time when people felt that upgrading their PC was a rite of passage that happened every few years. Not any longer. There was a time when new PC based software was coming out on a regular basis impacting our work productivity or creating new entertainment options for us. Not anymore. It's stagnant.

The same applies to internet applications. What we call Web2.0 isn't a reflection of new and exciting technology. It's a reflection of the maturity of the Web from Web 1.0. MySpace, Face book, YouTube, Digg, any Web 2.0 site you can think of are certainly not

technological breakthroughs. They are applications developed with mature programming tools that users feel confident to use.

Contrast that with what is happening in the HDTV market. Like the PCs of yesteryear, HDTVs are getting bigger, faster, cheaper, better on an almost monthly basis. It was just 3 years ago that if you were in the market for a TV, you would expect to go to the store and pay 800 or more dollars for a 27" tube TV that weighed 300 or more pounds. It was just 3 years ago that if your friend had a big screen TV, which probably was a 40" or more monstrosity that cost 3,000 dollars or more, you went over to his or her house for the big game.

Today, those types of TVs can't even be found on retailers' shelves. They are no longer even being made. They are part of history. Instead, 10s of millions of homes have purchased LCD and Plasma TVs that hang on the wall (remember when that was a Jetsons like fantasy?). Today's 42" flat screen can cost under \$1,000 dollars. That's today. Screens are getting bigger and bigger. We can expect that a 70" flat screen will cost under \$1500 dollars within 3 to 4 years. It is expected that more than half of all households will have HDTVs by 2010.

This leads to a simple question. If more than half of all households are buying HDTVs, and I expect HDTVs to be ubiquitous by 2012, why would someone buy an HDTV and then want to watch TV on their PC?

Of course they wouldn't. Which is exactly the reason I started HDNet and HDNet Movies and continue to invest in developing programming like Dan Rather Reports, HDNet World Report and movies like Good Night and Good Luck. The future of digital video and programming isn't on the net; it's on HDTV and in movie theaters.

The excitement in Digital Video will come not on the internet, but in programming for HDTV, Digital Cinema, 3D Cinema, medical and security video developments and other new applications that some kids will come up with while laughing at "the old internet"

Right now there are cameras that can capture 4k resolution video that are being readied for sale for fewer than 20k dollars. There are 3D cameras and rigs being sold and enhanced on a daily basis. I wish I had more time to discuss the upside here.

These new and exciting applications could potentially be delivered over the net, but not as it's built out today. Not even close. Until we see fiber to the home as a prerequisite for broadband we face the real risk of the internet becoming this century's equivalent of the highway system or electrical grid. Revolutionary when built. Impactful beyond belief while expanding. A limitation and source of traffic backups and irritation when mature.