

“Education, Public Broadcasting and the Internet: Keys to Collaboration”

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Last November, the Institute of Museum and Library Services and the Corporation for Public Broadcasting jointly sponsored a “partnership for a nation of learners” summit.

The invitation to that meeting encouraged participants to join in supporting community-based collaborations that foster learning and civic engagement, “growing out of a belief in the value of lifelong learning and in the potential of collaborations . . . to serve learners in new ways; and in the positive impact that both can have on community priorities and civic engagement.”

A very few years ago, many of us would have wondered what representatives from public broadcasting and representatives from universities would be doing in the same room talking about making common cause in developing frameworks for interoperability and collaboration on the Internet.

After all, broadcasting was an ephemeral medium, not known for permanence. And universities are quite the opposite – repositories of knowledge, many of them hopefully for the long haul.

For all of us who grew up with television, TV was about being there when it happened, or missing out entirely. Until about twenty-five years ago, anyone who wanted to watch television was totally dependent upon the broadcasters' real-time delivery of programs. If you weren't available on - say - Tuesday night at 8PM to watch NOVA, you didn't watch NOVA - unless the station chose to repeat it.

Given the ephemeral nature of the medium, most local stations saw little value in keeping the content they created after it was broadcast. It just took up space.

Early in her career, PBS president Pat Mitchell worked at the Westinghouse station in Boston. She recalls that when the station converted its news operation from film to videotape, the film library was thrown into dumpsters and hauled away. They were hardly alone in this kind of aggressive “housekeeping”. Later, it became almost universal practice in the industry for stations to re-use videotape to save money, to record over content which was deemed at that time to have no further value.

Fortunately, in a few instances, some of our foresighted predecessors anticipated that there might be a use for these materials, and began at least to warehouse

them. I consider myself fortunate to be at one such organization. At WGBH, we have audio and video materials dating back more than fifty years. We have the field original interviews from which excerpts were pulled for series such as Vietnam: A Television History and The Nuclear Age, with key players, many of whom are now long-gone. These days, we put that kind content on the web when the programs are broadcast, but I'm getting ahead of myself.

This evening, I want to talk about

What's changing on "the supply side" - in how content is created, packaged, distributed, stored and retrieved for later access

What are the technological drivers of those changes?

What's changing on "the consumer side"?

Give a few examples of collaborative efforts underway

And then ask – What do those who use our services expect from us?

THE CHANGING ROLES OF PUBLIC BROADCASTING

Public broadcasters began as broadcasters because that was the only technology available in the early 1950's – no cable or satellite, no home video, internet or broadband.

Now we are becoming platform independent – some of us say “platform agnostic” - public telecommunications organizations, with historic commitments to education, to life-long learning, to teacher training, and to community service

We're no longer tied to the dictates of single channel, one-way distribution of content to an audience which is largely anonymous to us.

Perhaps most significantly, the ephemeral nature of broadcasting has been replaced by an ever-increasing array of new technologies - most notably the Internet and DVDs, and most recently by Personal Video Recorders such as TiVo, and Video on Demand - which extend the shelf life of content for years beyond the normal broadcast window.

It's now clear that in many cases, the broadcast program is the executive summary of the materials collected by a producer in the course of preparing a program for broadcast. And that the first broadcast of a program is the beginning of its useful life, not the end. Using the Internet, we now have the means to provide access to those materials, whether they're full length interviews, extensive additional resources in the form of text, graphics, audio, video. PBS.org is reported to be the most visited .org site in the world, logging 2.3 Billion page views in 2002 alone.

On the “supply side”, it is now the norm, rather than the exception, that newly-created content is "born digital". The move to digital formats throughout the life cycle of content is the key to exploiting the full public service value of that content.

The migration to digitized content also creates opportunities to realize enormous efficiencies in workflow, as well as new opportunities for collaboration and linkage.

How totally the infrastructure of broadcasting and cable have migrated to digital technology is perhaps best illustrated by a few reports from the field:

Here’s one from a field trip which I – along with several of my public broadcasting colleagues – took to the NBC Network Operations Center at 30 Rockefeller Plaza in NY, not far from where the Today Show originates each morning.

There wasn't a single tape machine in sight. It looked like an I.T. operations hub, with rack after rack of video servers. Because the whole operation was server-based and automated, the previous standard crew complement of 15 was now down to three technicians.

Thursday night's episode of ER - which the NBC operations center distributes to all NBC affiliates around the country - arrives there only a few hours before air time as a file transfer from the studio in Burbank, over a dedicated data line.

As part of what we're calling "The Next Generation Interconnection System", PBS is moving to a similar technology, involving not only the replacement of videotape with file servers, but a migration away from real-time feeds between the network and the stations. For all but timely news and public affairs programs, programs can be fed to stations on a non-real-time basis, to be stored on servers at each local station for broadcast at the appropriate time.

It's analogous to downloading files from a website, or sending emails with very fat attachments. And program producers will be delivering their programs to PBS the same way. (You’ll hear more about this tomorrow at lunch from Andre Mendes, chief technology integration officer at PBS.)

What’s driving these changes is a remarkable alignment of the technological stars, familiar to many of you:

The cost of digital storage continues to plummet, dropping by 50% every 9-12 months;

It appears that Moore’s Law continues to hold true, as computer processing power doubles about every eighteen months;

Improvements in compression algorithms enable more content to be delivered with fewer bits;

We've significantly improved our ability to move content at speeds both faster and slower than real time;

And the metadata schema, which are essential to facilitate the cataloging, tracking and retrieval of digital content continue to be refined.

These same factors – the plummeting costs of processing power and digital storage; improvements in compression; refinement of metadata; moving content faster and slower than real-time, are also having enormous impact on the consumer side of the equation, where additional stars have aligned to include:

Increasing bandwidth to the home thru cable, DSL, wireless applications, and now high speed data over electric utility lines, the plummeting cost of “packaged media” – (for example, you can now buy a DVD player for less than \$30) – and the convergence which is blurring the line between computers and TV sets, among cell phones, digital cameras, PDAs and hand-held devices which access the Internet; and between videogames and other interactive media.

As a direct result of these technological changes, control of what content can be accessed, and when, and at what level of quality is shifting steadily and inexorably from content distributors directly to consumers.

Adults may understand these new media intellectually, but kids are growing up with an intuitive, visceral relationship to emerging media.

They expect interactivity and control.

These changes in technology and in consumer expectations have a direct impact on the work done by every one of us in this room.

One consumer electronics device that is gaining attention and popularity is the “TiVo Box” (SHOW OF HANDS??) also known as a "PVR" - personal video recorder - or a "DVR" - a digital video recorder.

This is the device which enables the user to pause live television, to easily skip over commercials, to search television schedules for programs which meet the user's individual interests, and then record them for later viewing. It's the device which "learns" about the user's program preferences - just as Amazon.com suggests books you might be interested in reading, and records programs you didn't ask for so you can check them out.

It's a revolutionary, stunningly subversive technological development, what Clayton Christensen at the Harvard Business School might refer to as "a

disruptive technology", because it changes the fundamental assumptions about how the marketplace works, and threatens the incumbent players.

If you ask people who have personal video recorders - there are already several million of them - how they like their PVRs, they will say - without prompting - "It has changed my life" - especially parents of young children, who delight in the ability to free themselves of the tyranny of television schedules to attend to their kids' needs. And people with very busy schedules, who delight in the ability to instruct the box to record a specific program or series, and then watch it at their convenience, much as we do with a favorite magazine which arrives in the mail and sits on the table until we have time to get to it.

PVRs are now being incorporated into satellite and cable set-top boxes, and they're being built into DVD players as well. These integrated PVRs already far outnumber the stand-alone boxes. As the cost of computer processing and storage continue to plummet, it appears likely that consumers increasingly will expect - as a default feature of consumer electronics devices - the ability to control what they watch and when.

And at the same time as PVR penetration is increasing, cable companies are rolling out video on demand services, providing individual subscribers will complete VCR-like control over hundreds of hours of movies and television programs.

Here's how Comcast is promoting the roll-out of Video-on-Demand in New England.

(SHOW SPOTS)

An estimated 9 million cable subscribers now have access to Video on Demand, and that number is likely to grow to 20-30 million in the next 3-5 years.

So with video on demand, personal video recorders, DVDs, and the availability of video streaming and downloads on the Internet, increasing numbers of consumers now expect to be able to search for and access specific video programming to watch at their convenience.

Kids who are growing up in this environment will wonder why anyone ever sat around waiting for a program to begin.

And this isn't just about kids' expectations. My wife and I bought a TiVo box a few months ago. She's no techie, but within a few days she easily figured out how she could watch West Wing - which NBC broadcasts at 9PM on Wednesday - from the top beginning at 9:15 - and by skipping over the commercials and the packaging, she could be out by ten. It's a time machine.

She watched the EMMY Awards - from the top - an hour after they began, and by skipping over the commercials and most of the "I'd like to thank my mother"s, she was out in time to watch the late news. She no longer has the patience to watch live television, reflexively reaching for the TiVo remote control to skip over the commercials.

I'm sharing this with you because it has a direct bearing on consumer expectations for how they will access digital content in the future. The notion of "looking up a program", the way one looks up a book or searches for content on line, is revolutionary to most people. For kids, it is becoming the norm.

So given all that technology, it won't surprise you to know that a number of public broadcasters have seen an opportunity to serve the needs of teachers and school children more effectively by creating on-line services which can deliver content on demand to homes and schools.

At WGBH, we've created a service called Teacher's Domain, a multimedia digital library with emphasis on science education for K-12 teachers and students, providing access to a robust collection of classroom-ready digital resources, as well as multimedia lesson plans and professional development resources. Each resource is tailored to specific grade levels and correlated to national and state standards. (You're welcome to visit at www.teachersdomain.org). It's a collection of the National Science Digital Library, funded by the National Science Foundation.

And soon to be added to the Teachers Domain is "The Civil Rights Movement: 1950 to the Present", a prototype digital library collection in the social sciences - funded by an IMLS grant - being developed by the WGBH Media Library partnering with the Birmingham Civil Rights Institute (BCRI) and Washington University. Both the completed project and the collaboration itself will serve as models for other organizations seeking broadband solutions to the challenge of matching rich media archives with educational needs.

In a model of collaboration which we hope other public broadcasters will emulate, the WGBH Forum Network (at wgbh.org) now provides on-demand audio and video streaming of public lectures and panel discussions in collaboration with:

JFK Library and Museum; MIT; Harvard Graduate School of Education; Boston College; Cambridge Forum; The Ford Hall Forum; Mass Historical Society; The Museum of Afro-American History; The Museum of Science; The New England Aquarium; and others – a total of more than twenty cultural and educational institutions in the Boston area.

So public broadcasters are morphing into digital libraries. But to do this well, we need to get our house in better order.

At WGBH we're working on a major digital asset management initiative, in partnership with Sun Microsystems and Artesia Technologies. With support from Sun, we're creating a reference architecture for DAM for use within organizations with digital assets they'd like to manage more effectively and efficiently. I'll have more to share with you about this effort during our first session tomorrow morning.

As part of the growing awareness of the importance of digital asset management to the future of public broadcasting, CPB has been supporting the development of a Public Broadcasting Metadata Dictionary – again, more on that tomorrow morning.

Needless to say, consumer media use patterns are becoming increasingly complex. It's particularly important, in this environment, that we make every effort to learn more about what our audiences expect from us, both from traditional broadcast television, and on the web.

We are in the middle of several major research projects underway in cities across the country, funded by the Corporation for Public Broadcasting, looking principally at the broadcasting side.

It's too early to report any findings - We began with individual interviews and focus groups with hundreds of viewers, and we're now in the midst of a quantitative study to further explore some of the themes which emerged in the qualitative phase.

But what became clear in the focus groups is that different viewers had differing expectations of what needs they wanted television - and particularly public television - to fulfill for them.

Not surprising. But what was worthy of note was that each individual viewer had differing expectations depending upon the particular circumstance in which they found themselves when they turned on the TV.

If it had been a very busy day, for some the best cure was to "veg out" in front of the TV for passive entertainment. Or perhaps they were up for intellectual stimulation, for an experience of time well-spent. Were they prepared to engage, and be challenged, by television, or simply use it as wallpaper, as background for routine household activities?

(It's remarkable how much television viewing is accompanied by folding laundry. When else can a woman who works outside the home - and none of the men said they folded laundry - catch up on household chores?)

It shouldn't surprise you to know that you couldn't easily predict a viewer's behavior based solely on stereotypes of socio-economic status or formal education.

Intellectual curiosity knows no bounds, and the producers on the other side of the one-way glass watching the focus groups were caught up short by seeing first-hand which viewers had been fully engaged by a NOVA program on "string theory". Check your stereotypes at the door.

I was sitting next to an executive producer of a public affairs program who groaned when a new group - all men - entered the room on the other side of the glass. They looked like they were just back from a tailgate party at a New England Patriot's game. "Where are my viewers?" he grumbled. Well, it turned out that these were his viewers - and loyal viewers at that.

In reviewing the tapes from the focus groups, it became clear that the answer to the question "What do viewers expect from us" is, in part, "it depends".

Obviously, it depends on who they are, what we are offering, what's on the other channels, "how was your day, dear?" what else is competing for their attention.

I was looking for a succinct way to capture this idea as I was reading a recent book by Clayton Christensen of the Harvard Business School titled "The Innovator's Solution". It's a sequel to his book "The Innovator's Dilemma". Dennis Haarsager recommended both of them to me - for which I am grateful - and I in turn recommend them to you.

In "The Innovator's Solution", Christensen and his co-author Michael Raynor talk about how companies typically segment their markets - identifying groups of customers who are similar enough so that the same product or service will appeal to all of those in that segment.

They segment markets by product type, by price point, or by the demographics and psychographics of their customers. They use the attributes of their products and customers to delineate the segments

The problem is that this approach often fails because it assumes that there is a cause-effect correlation between the characteristics of a customer and the likelihood that a customer will purchase a product. For those of us in public broadcasting, it's like saying that a viewer is more likely to watch NOVA because the viewer is a 35-49 year old male.

But what causes audiences to behave the way they do?

Christensen and Raynor assert that "predictable marketing requires an understanding of the circumstances in which customers buy or use things.

Specifically, customers - people and companies - have “jobs” that arise regularly and need to get done.

“When customers become aware of a job that they need to get done in their lives, they look around for a product or service that they can “hire” to get the job done. This is how customers experience life.” . . .

“.....Companies that target their products at the circumstances in which customers find themselves, rather than at the customers themselves, are those that can launch predictably successful products. Put another way, the critical unit of analysis is the circumstance and not the customer.”

So here’s a clue to how we can determine why people watch certain television programs, or find certain web sites particularly appealing and useful.

The example they cite is a fast-food chain which wanted to increase its sales and profits from milkshakes.

First, the chain segmented their customers using a variety of psycho-behavioral descriptors to develop a profile of the customer who was most likely to buy a milkshake. They then assembled panels of customers with these attributes, to determine whether making the shakes thicker, or more chocolate-y, or cheaper or chunkier would help them sell more milkshakes. The chain got clear feedback, but none of it affected sales or profits.

Then a new group of researchers came in to understand what customers were trying to get done for themselves when they “hired” a milkshake. They determined that - surprisingly - nearly half of all milkshakes were bought in the early morning by people who commuted to work in their cars. Most often, they were the only items these customers purchased, and they were rarely consumed in the restaurant.

Further research revealed that most of the customers had “hired” a milkshake to achieve a similar set of outcomes. “They faced a long, boring commute and needed something to make the commute more interesting”. They were in a hurry, were wearing their business clothes, and had only one free hand – they needed one to drive the car.

If they “hired” a bagel, it got crumbs all over their clothes and the car. Any cream cheese or jam, or eggs or sausage got their fingers and the steering wheel sticky or greasy. And if they tried to drag out the time they took to eat a sandwich, it got cold. On the other hand, it took at least twenty minutes to suck a milkshake through a skinny straw.

“It turned out that for the commuters, the milkshake did the job better than almost any available alternative.”

But there was another group of consumers who showed up later in the day. They were the parents who were tired of saying “no” to their kids, and wanted to placate their children and feel like they were loving parents.

But there was a problem - It took so long to drink the milkshakes that parents ran out of patience after they had finished their own meals. Many of the milkshakes were discarded, half-full, when the parents decided that it was time to move on.

So a parent who is a commuter in the morning “hires” a milkshake to do a very different job than that same parent in the afternoon with kids in tow.

“Knowing what job a product gets “hired” to do (and knowing what jobs are out there that aren’t getting done very well)” may be the key to addressing audience needs.

So we need to develop a far better understanding of what our audiences want and need us to do for them.

Research doesn’t have to be expensive. In Boston, we’re creating audience panels to provide us with regular feedback across a broad range of issues.

While the plural of “anecdote” may not be “data”, any additional insight into audience expectations can only help us meet their needs.

We need to back away from over-dependence on quantitative audience data, which provides little insight into effects.

WGBH produces a program called *Between the Lions*. It teaches reading to kids, but it doesn’t do very well in the ratings. But last year, when we got up close and personal through research with kids in the Mississippi Delta, independent researchers were able to document very significant increases in reading skills in those schools and homes where *Between the Lions* was used by teachers and parents and kids.

The results were so compelling that we’ve just received funding to continue this outreach project in New Mexico.

That’s the job we were hired to do.

We need to pay attention to the individual stories –

The fact that we reach tens of millions of viewers and listeners each week - and attract billions of page views on pbs.org each year - should not be allowed to obscure the fact that ultimately we’re trying to reach audiences one at a time.

Here’s a letter sent to Brian Greene, author of *The Elegant Universe* and host of the recent NOVA program based on his book:

Mr. Greene -

“I had to take the time to let you know that my 6-year old, (yes six!), son has become completely obsessed with quantum physics, especially in the area of string theory. We happened to tape one of your excellent Nova programs which he sat down and watched. Subsequently, his number one Christmas gift from Santa was the 3-hour video. I was also dragged off to Borders where he picked up a copy of John Gribbin's book 'The Search for Superstrings, Symmetry and the Theory of Everything'. Admittedly this proved to be too much of a challenge for him to read on his own but I am diligently reading ahead and then reading bits of it with him . . .

“..... I really wanted to thank you from the bottom of my heart for the spark you lit in (my son's) heart. He is a gifted and extremely talented child, and string theory has given him an infinite number of interesting topics to get his hands onto... (He) would be absolutely thrilled if he could receive a signed photo of you. “

While we don't get letters like this every day, I am pleased to say that there have been others like it, from viewers and listeners who - as a result of programs they have seen on public television or heard on public radio, have pursued careers in marine biology, in architecture, in music, dance and the arts, in teaching.

It turns out that, whether or not they knew it at the time, that's the job they hired us to do.

WHAT'S ON OUR COLLECTIVE "TO DO" LIST?

There is considerable potential for universities and public broadcasters to collaborate. As the technologies which enable all of us to better fulfill our missions converge, we can only benefit from making common cause.

We're working on many of the same challenges and opportunities, serving many of the same constituents and community needs. We are like-minded, public service institutions, committed to lifelong learning and education.

From the perspective of the future looking back, it is appropriate to consider what our successors will make of our efforts. From fifty thousand feet, this is all one large project, an enormous opportunity for us to better serve our communities and our constituents.

These days, literally billions of dollars are being invested by for-profit companies in building out the global telecommunications infrastructure. We have to know that when those who are accountable for those investments get up in the morning, the first thing on their minds is not "How do we better serve the public interest." No, that's our job.

What these companies will do, however, is to provide the technical where-with-all for us to extend our services to every neighborhood in our communities, and to every corner of the globe.

At long last, the technology is catching up with our missions. Let's make the most of the opportunity by working together.

I thank you for your attention.