

Inside the Four Screen Consumer

Keynote Presentation
Google “Think Tech” Conference New York
October 5, 2011

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Good morning to Google’s marketing and advertising guests here in New York, and staff members watching at Google offices around the USA.

INSIDE THE FOUR SCREEN CONSUMER

A Special Presentation For

***The Google
Think Tech Conference***

*Live in New York
October 5, 2011*

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Over the next 50 minutes we’ll be looking at how the consumer uses and could use the four screens—TV, Computer, Tablet/pad/eReader, and smart phone. We’ll start with a snapshot of penetration, and then shift to usage of those devices and the DVR where you’ll see some fascinating second by second data. Next we’ll look at what drives the consumer—the availability, convenience, and cost of content, including what the consumer may actually be able to pay in today’s difficult economy, and a personal story of reading War and Peace...on a smart phone and other pads. I’ll raise the question of whether the four screens are

independent devices, or will become an integrated, multi-screen consumer experience...even with massive multiplayer games on TV, complete with a new type of Play by Play. And finally I’ll wrap it up with a discussion of the opportunities of complexity.

I hope this will serve as a good foundation for your discussions today of social media, ESPN’s multi-screen efforts, YouTube use, and how mobile fits in.

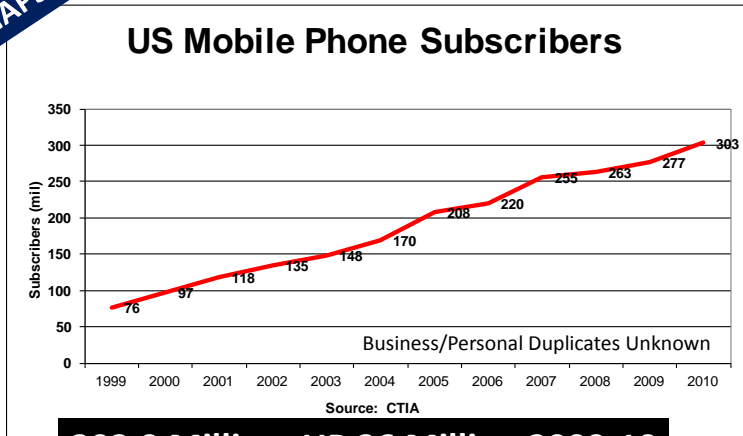
Before we start, I believe that you have a right to know who else I’m working with, so you can make judgments accordingly. Long term, continuing clients are Discovery Communications and the Directors Guild of America. Of course, nothing I say here reflects their views. In the six years since leaving Wall Street, I’ve also had major and lengthy gigs with Warner Brothers, Microsoft E&D, McGraw Hill, and Cable Labs, among others. I work with the TiVo Board of Directors as lead independent director, and you’ll see that second by second data from TiVo today. And I also continue as an independent inventor, moving from patents linking TV and the internet back in the 1990s that have been sold, to the most recently granted patent in the area of content optimization automation.

Let’s start with the numbers snapshot.

Mobile: There are now enough mobile phones operating in the US to cover 97% of the population. That's 303 million subs at the end of 2010, up 26 million from 2009, according to the Wireless Association CTIA. Pew Research tells us that 83% of adults own cell phones in the US, and 35% have smartphones. In case you're counting, text messages are running at a 2.25 TRILLION annual rate. That's Trillion. And 32 million, or 26% of US households do not have wired phone service, again according to CTIA.

NUMBERS SNAPSHOT

Mobile Now 97% of US



302.9 Million=UP 26 Million 2009-10

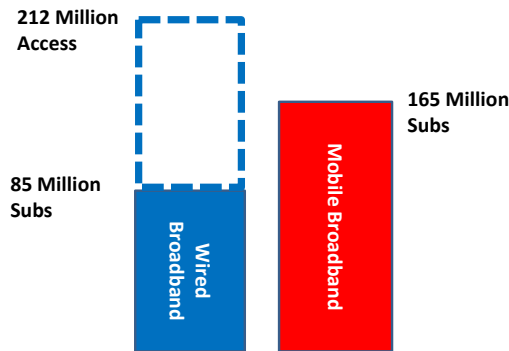
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Mobile Broadband now reaches about 53% of the US, with 165 million subscribers.

Wired Broadband reaches 85 million subscribing households, or about 212 million people in the US at 2.5 people per household, a bit more than wireless broadband subscribers. ComScore tells Google it believes 90% of mobile subs are web capable. And for reference, the Pew Internet in American Life study finds that 78% of US adults now use the web.

NUMBERS SNAPSHOT

Wired Broadband 68% of US Pop

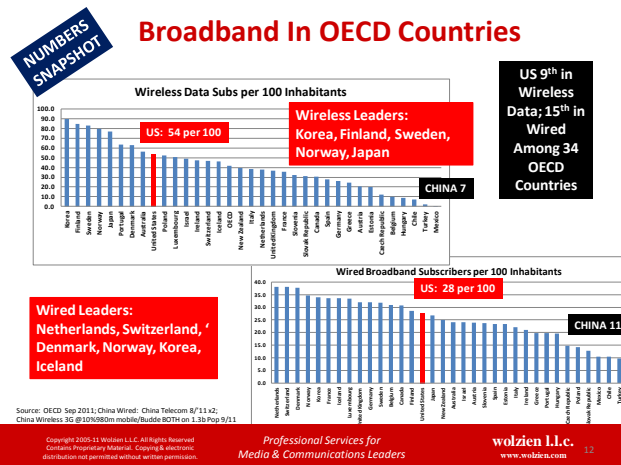
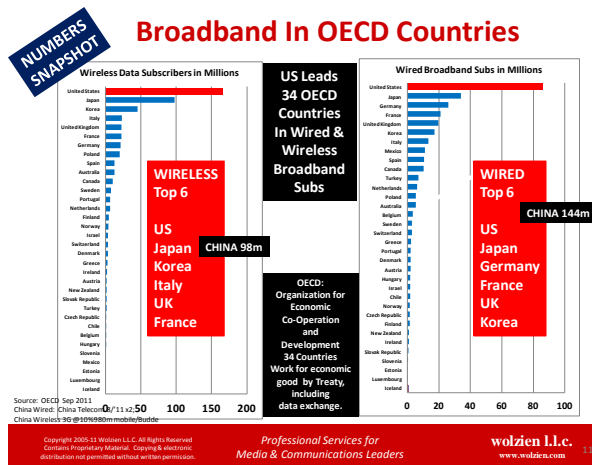


Broadband Source: OECD YE 2010; Mobile Subs fm Comscore/Google

Phones of 90% of US Mobile Subs Web Capable

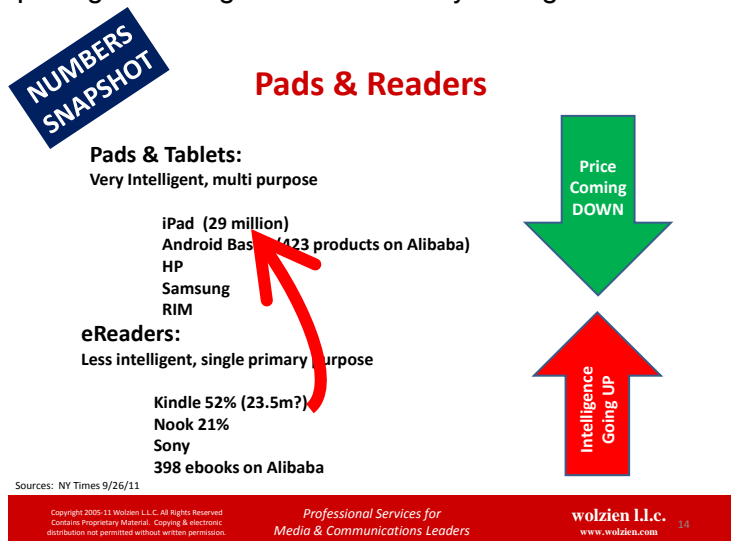
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International Broadband: There's a prevailing view that the US is way behind much of the world in broadband. I've been curious about how true that is, and took a look at data from the OECD—that's the international treaty Organization of Economic Cooperation and Development out of Paris. The US, Japan, Korea, and European countries are part of the 34 members. China is not part, so I've separately teased out data from China Telecom and others.



The results are mixed, but not horrible. If we look at pure subscribers, the US tops wireless broadband among all countries, according to the OECD, with China second and Japan third. In wired broadband, China is on top with 144 million, and the US comes in second. If we look at users as a percentage of total population, Korea, Finland, Sweden, Norway, and Japan lead wireless data penetration, with the US coming in 9th. And, for wired penetration per hundred inhabitants, the US with its spread out population is 15th. China comes in near last on a percent of population basis.

Tablets/Pads/eReaders: Data is pretty light on pads and eReaders. We can clearly say that pricing is coming down for the very intelligent devices at the high end like the iPad, Android tablets, and others, while intelligence is improving for the e-readers, most recently with the new Kindle Fire from Amazon. There are published accounts that 29 million iPad are out there, and 23 or 24 million Kindles. Forrester tells Google that there are now 26 million tablet users in the US, going to 82 million by 2016, Forrester says. IDC tells Google that 27 million eReaders will be shipped in 2011. As we talk about these devices, we need to remember that there are two very different business models: sell the device...and sell the content while subsidizing the device.



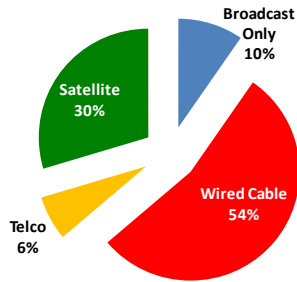
As we talk about these devices, we need to remember that there are two very different business models: sell the device...and sell the content while subsidizing the device.

TV: About 90% of US households now have some sort of multichannel subscription, Nielsen says, with 54% coming from cable, 6% from telcos, and 30% from satellite. Broadcast over the air only reaches 10% of households, according to Nielsen, though broadcasters and some other approaches put the over air only number a bit higher.

**NUMBERS
SNAPSHOT**

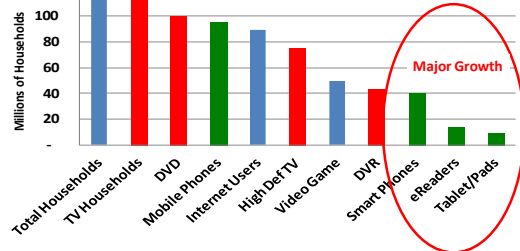
US TV: 90% Multichannel

TV Distribution to 115 Million Households



Summary: TV Remains Top Device

Household Penetration



Sources: Nielsen Cross Platform Report Q1 2011

Sources: Am Community Survey 2011, Nielsen 2011, Pew 2010-11

If we check devices connected to our TVs, DVDs are in 87% of households, two thirds of households have HDTVs, TV connected video games like Xbox are in 43% of homes, while 38% have DVRs.

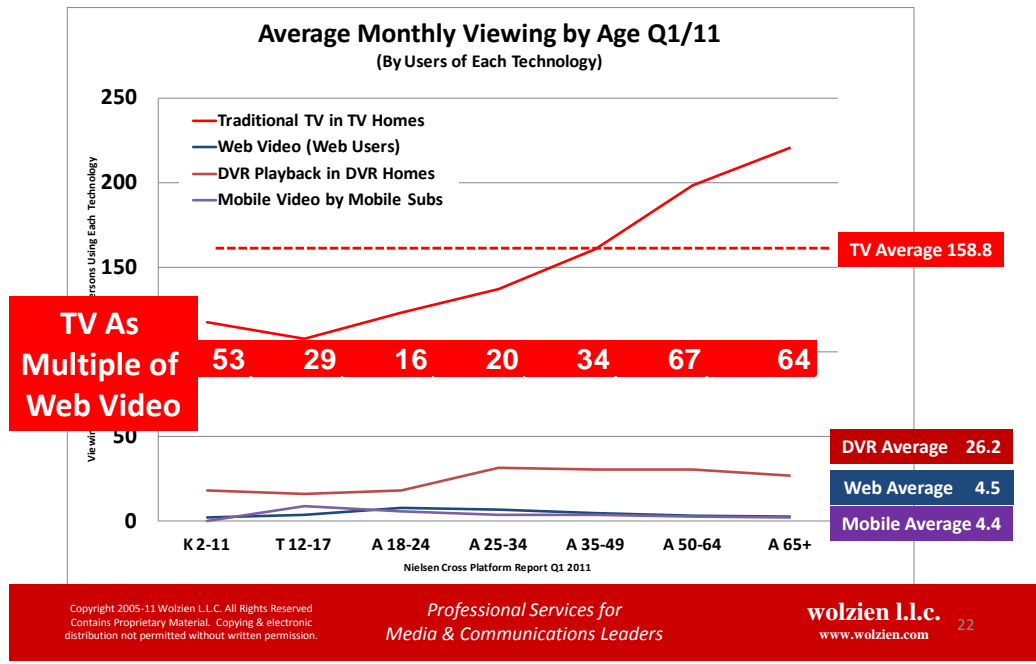
When you look at this summary chart, you see heavy penetration of the most established devices, but at the right end is where the fastest growth is coming with smart phones, tablets and eReaders.

II. Usage

How's all this stuff being used?

TV Usage: Nielsen tells us that TV is still the top viewing option, with an average of 159 hours a month, ranging from just over 100 hours for teenagers, up to well over 200 from persons 65 plus. Now compare this to web video users, where they are watching only, on average, 4.5 hours a month, and viewers of video on mobile phones at about the same level among those that view video on their mobiles. While the growth of these two has been substantial over the past couple of years, usage still pales against TV. Depending on age demo, TV viewing is 16 to 67 times the viewing of web video.

TV Still Top Viewing Option

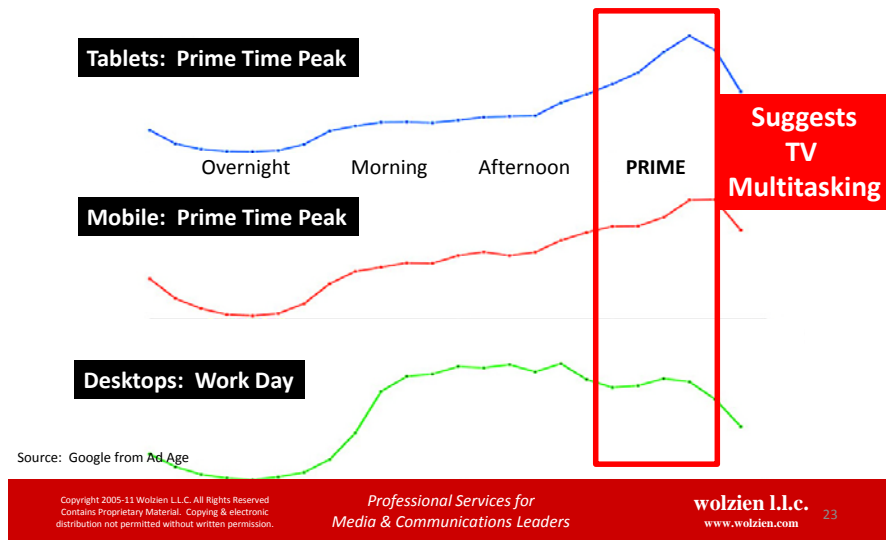


While the growth of these two has been substantial over the past couple of years, usage still pales against TV. Depending on age demo, TV viewing is 16 to 67 times the viewing of web video.

It is interesting to note that Nielsen reports the heaviest TV viewers are watching more TV, and the lightest TV viewers use the most streaming video...but their TV viewing has also gone up.

Tablet Usage: As I mentioned, data is pretty scarce for pads/tablets and eReaders. But Google recently gave AdAge some interesting graphs showing search characteristics by time day. What you see here is that both tablets and mobile phone searches peaked during TV prime time, while PCs searches were primarily during the day. That suggests multitasking with tablets and mobiles while people are watching TV. More on that opportunity later.

Heavy Search by Pads, Mobile In TV Prime



There are a couple of other interesting studies about tablet and smartphone usage recently. Forrester told the Wall Street Journal that the incidence of people who use tablets to buy on the web is 4-5%, while computer access delivers around 3%. Clearly there is some economic self-selection in that one third to two thirds improvement over the computer, because iPad users appear to be more affluent...at least for now.

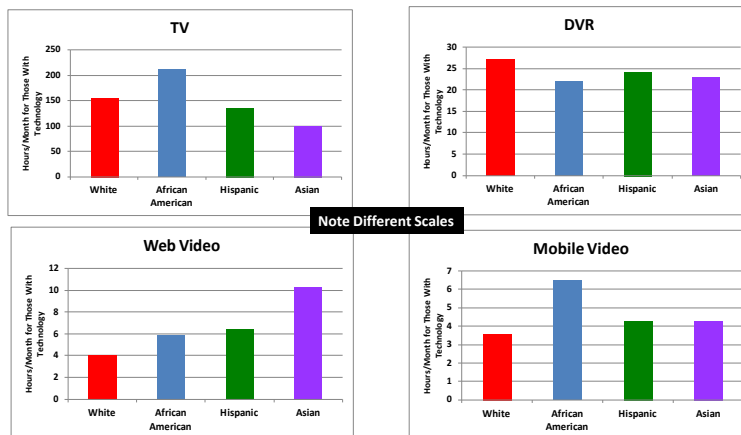
Then there's the study published this past weekend in the New York Times by the marketing pundit Martin Lindstrom, who says he has been using functional MRIs to scan the heads of mobile phone users. The good news, he writes, is that brain reactions of people hearing their smart phones ring are not indicative of drug addicts. So as all of you instinctively reach to check your phones now, you can feel good that you're not looking for some sort of addictive fix. However, the less good news is that those brain scans show that when smart phones ring, brains react in the same way as they do when people see their boy or girl friends. Lindstrom claims that we are, literally, in love with our smart phones.

Oops, news flash. The New York Times just published a letter to the editor this morning signed by 45 neuroscientists saying that Lindstrom has mis-interpreted the MRI data and taking The Times to task for publishing the column in the first place. Too bad; was a great story.

Race & Ethnicity: Some important information on who is using these devices. Nielsen tells us that usage of devices varies significantly by race and ethnicity—be careful of the scales here-- with African Americans being the heaviest users of television, Whites of the DVR, Asians of Web Video, and African Americans of Mobile Video.

On Demand & DVRs: All of us are looking for indicators of future use of devices, and the DVR may provide a way to view the broad on-demand universe for commercial video content. There are three delivery methods for demand video content—the web, inside cable’s walled garden, and today’s most prevalent form of consumer controlled video on demand—the DVR, in 38% of households. So what can we learn from the DVR that we should keep in mind as VOD become ubiquitous?

Different Usage Among Different Audiences



Source: Q1 2011 Nielsen Cross Platform Report/ Usage among those using technology. Web video among all using web.

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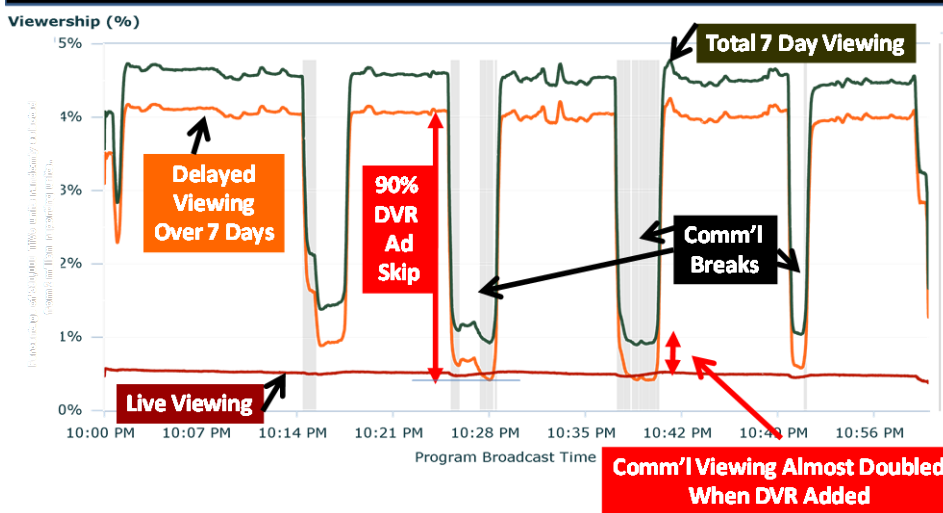
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As I mentioned, TiVo has been collecting data on every second of use across two million units. CEO Tom Rogers and GM Tara Maitra have made this data and a coordinated 40,000 person opt-in panel a company priority, and some of you may be buying it now. It’s unique data, because it actually tells us how people are reacting to every change on the screen as programs and commercials come through those 2 million units for both live or delayed viewing. I asked to be allowed to explore some of that data, because as a former show runner and Wall Street

analyst, I was really curious what we could learn on a second-by-second basis that traditional minute-by-minute averaging may obscure. Tara, who is here today, was quick to help.

Mad Men Season Finale “Tomorrowland” AMC 10PM Oct 17, 2010 Live, DVR Delayed & Total Viewing Over 7 Days



Source: TiVo Stopwatch Data
Second-by second report from rotating random 350,000 of 2 million units.
Does not indicate viewing on non-TiVo connected sets in home.
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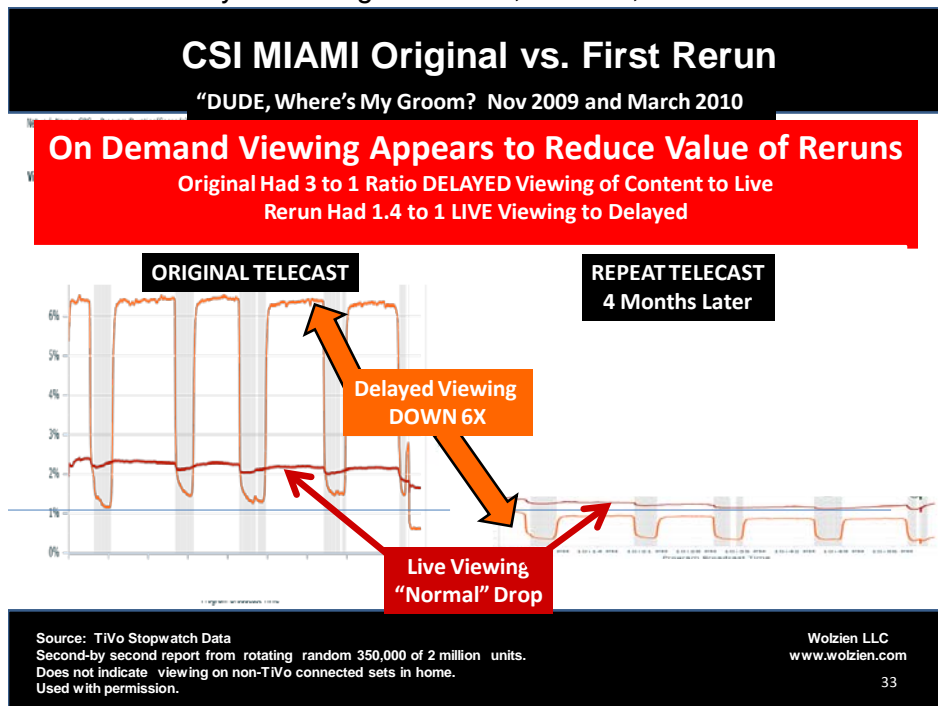
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Madison Avenue and Emmy winner, Madmen, was impacted by ad skipping. I looked at last year's season finale. Many of you may not have seen a chart like this before...so here's how it works. The X axis is second by second timings across the 60 minutes of the show. The Y axis is percent of total TiVo units being tracked, about 2 million. The red line down toward the bottom shows the low number of units where Madmen was actually being viewed when it aired in the live transmission from AMC. The orange line shows delayed viewing on the DVR unit across 7 days. And the top green line is the total. Now what does this tell us?

These big dips in the orange delayed viewing line are where viewers are skipping ads during delayed playback. So remember, this show is the darling of Madison Avenue, with ads actually being made to look like the show, in some cases. And those folks who watch from Madison Avenue...and many others...are skipping ads at an average 90% rate, according to actual data of each viewing second on these units. Now there is another way to look at this, and that is that delayed viewing of ads on these units actually doubles the live viewing of the same ads. So in a way we have two views: a negative, glass 90% empty view versus a positive glass is 200% full view. Broadly, advertisers aren't being charged for the 90% skip because they are paying on average commercial minutes for the whole show. Of course, the second by second data shows big discrepancies between spots and positions, so some advertisers are getting overcharged, even so. Sorting that out is what Tara and the TiVo folks do.

But my concern is a broader, media industry problem...those 90% of the people who are consuming a show but skipping the ads are freeloading on the whole industry. That viewing cannot be monetized by AMC with Madmen...or by anybody else. It's money gone, and over time raises the question of how to pay for the creation of high class content in the future. Product placement, show naming rights, and back end deals from Netflix and Blockbuster are probably not going to be able to cover that. So you've got to ask how multiple screens can be used to cover some of those costs.

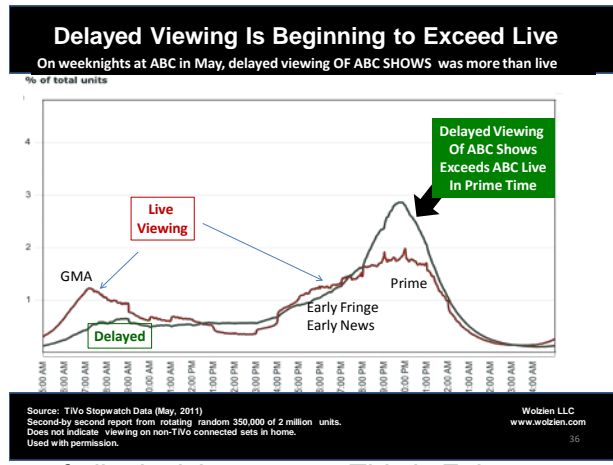
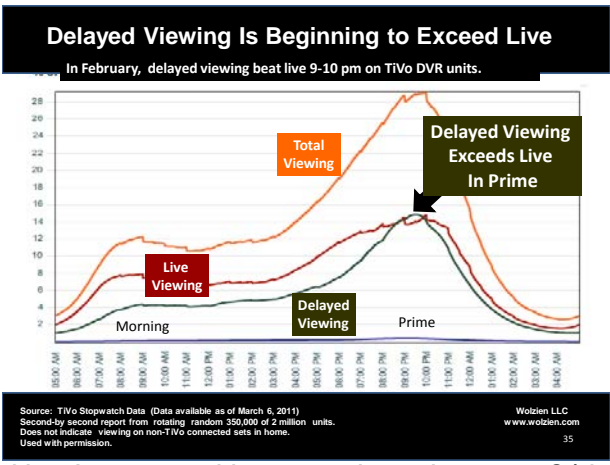
There's another problem brewing with delayed viewing, and it will probably apply regardless of whether the delayed viewing is on DVR, the web, or inside the cable walled garden. It's a rerun problem.



For example, take a look at the difference between delayed viewing in the first run and first rerun on this CSI Miami episode. Here you see the very high level of delayed viewing of the first run. Here's the much lower level viewing of the live transmission of the first run. When you shift over to the rerun, the red line for live viewing drops the appropriate 20-50% from first run,

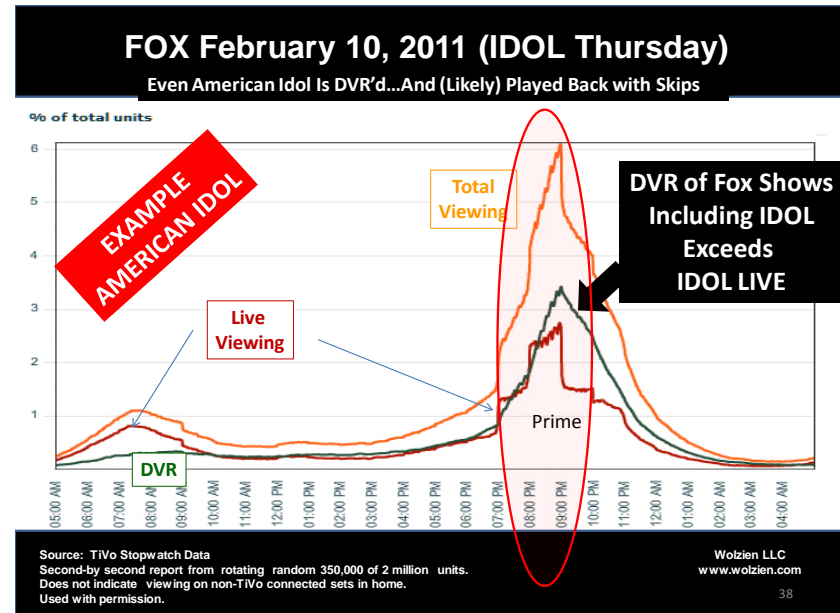
but the delayed viewing line is down to one sixth of the delayed viewing on the first run. Delayed viewing of reruns almost evaporates, not just on this show, but, as I've looked, on different genres, and on different networks.

We all know that reruns are a big part of the TV industry, but it appears that VOD is pulling viewing of some of the top shows to the days of and just after the first run of an episode—sounds like opening weekend of a movie. That jeopardizes economic value of the back end of shows for the ad sales on the network that is rerunning it, while possibly threatening those shows in syndication, which could hurt the producing studio as well. Put another way...there is definitely a long tail in this world...but it is a very thin tail.



Here's a second by second graph across 24 hours of all television usage. This is February, and it shows that in some months delayed viewing in the green is at a higher level in prime time than the viewing of live transmissions on these two million DVRs.

And here's ABC in May, where the green delayed line was way higher than the red live line in prime. These are people recording and delaying viewing...instead of watching live. And what happened in May on ABC? Must see TV...with the end of Lost.



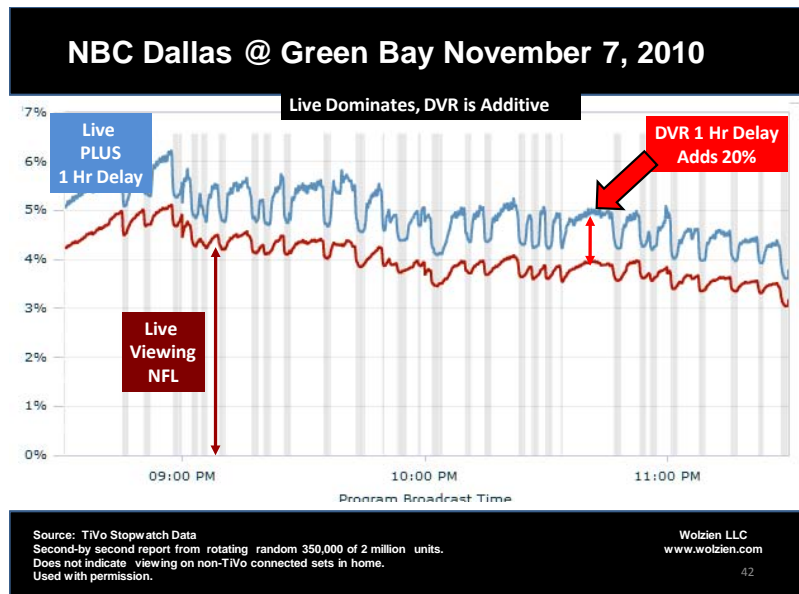
So is this delayed viewing coming from people who are out of the house...and want to catch up the next day? Not exactly. To great extent, they are watching the same hit shows...just a little bit later so they can skip commercials. Call it a consumer arbitrage using TiVo's patented "time warp" technology.

Let's look at American Idol. Here's 24 hours of Fox in February, where you see the delayed viewing jumping above live transmission just behind the start of Idol. And

when we take the second by second data across the hour, the DVR viewing doubled the live audience over the next hour...but, like Madmen, the skip rate was around 90%.

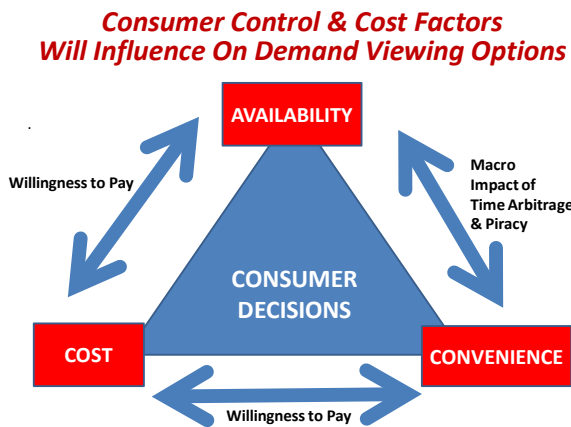
There's an irony here that the most popular shows seem to get delayed the most....and their ads skipped...the most.

OK, so what works? What works is Sports. Example: football on NBC Sunday nights. Here we see delayed viewing of a Dallas Green Bay game adding only about 20% to total viewing—much lower than the prime time entertainment shows--AND with very little add skipping. We might conclude that Sunday Night Football is a good time for people to lay back, and just vege. So what does this say about the whole argument over sports rights payments being too high? If people are watching, not skipping, maybe they aren't too high.



III. The Consumer.

Seems to me that consumer decisions on what to view on any device are a blend of availability, cost, and convenience. Availability and convenience are both, to some extent, based on a consumer's willingness to pay, while ultimately availability depends on networks and studios getting paid for commercials and rights fees at levels to offset any higher levels of piracy.



Availability: Across time, just about all content is available at some time or another. Just when is determined by a negotiation between the content owner—the studio or network—and the distributor like the cable or satellite company, a broadcast station, or Netflix. Over the past couple of years, for example, we've seen VOD movies become available from cable day and date with physical distribution. With more availability via cable, splits were changed from 50-50 between cable and studio to about two thirds in favor the studio, and the windows were brought up. And now you have

experiments with still earlier VOD releases at higher costs. More broadly, however, is the impact of changing economics and piracy that could impact just what types of content are produced—decisions that would limit availability of certain types of content, while other types emerge that are cheaper to produce or where the economic model is less vulnerable to piracy.

Cost: What the consumer pays is determined by that negotiation over the release window, how much it costs to run the delivery platform—cable or satellite, or in the case of the web, the cost of broadband transport. That broadband cost will become increasingly important as we move toward significant data caps. Another factor is the consumer’s time, as we’ve discussed with DVRs. And finally, but very importantly, there is the very real question of the consumer’s ability to pay.

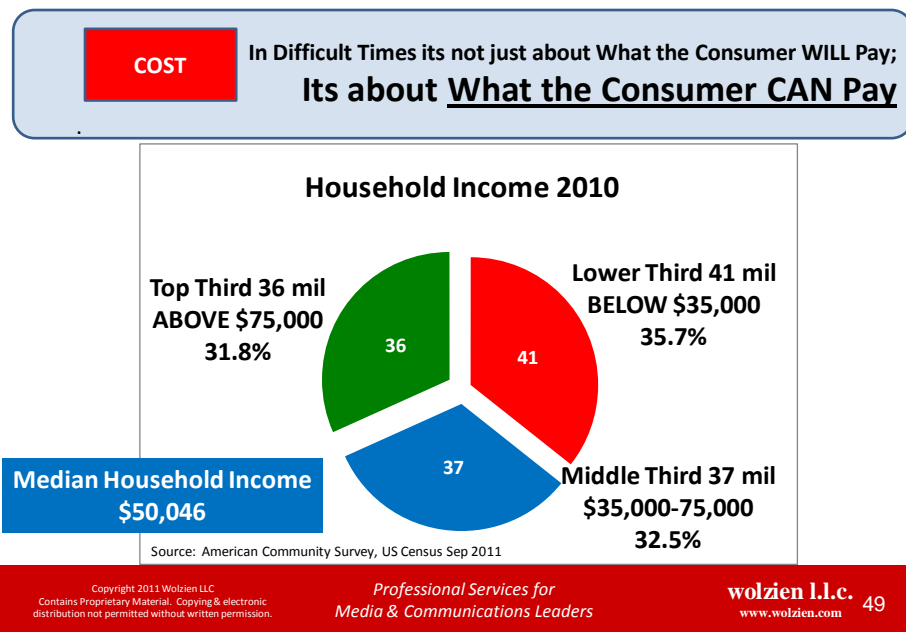
Now, I don’t know how many of you contemplate much what households in this country actually make, but in these tough times if you don’t, you might want to consider the following. The median household income in the US is now \$50,046, with

32% above \$75,000, 33% in what is really the middle class, between \$35-75,000, and 36% earning below \$35,000. These numbers are from the just-out American Community Survey from the Census Bureau. From this, you could make a good case that growth for your products and services will come most easily from

that upper third, not the mass population. Please note that the average hourly wage is about \$23, according to the Bureau of Labor Statistics, and therefore it would take the average household 41 hours of work each week, no vacations, to reach the average \$50,046 annual income.

When we think about building value with our products across the full population of consumers, we really need to consider how to help the consumer understand why they should be spending here...rather than for food, shelter, clothing, or transportation, etc. Lets translate some of our monthly media and communications bills into the \$23 average hourly wage and see just what it takes to buy media and communications services.

Consumer Filters: About Price



So each year your cable bill at \$65 a month without HBO takes almost a full week's work to pay, 34 hours, or 4.2 work days. Wired broadband is close to the same. Your land line would cost you 2.3 days of work each a year. The first line for a cell phone is 3.2 days...and double that if you have a data plan. The second mobile is less, of course. And streaming Netflix at \$8 takes about a half a day a year, plus your previous payment for broadband transport. In all for an average household with a couple of cell phones and data, cable without HBO, a land line, and Netflix, it takes a household almost four weeks of work a year to pay for those services. Four weeks. And if you calculate what flat screens TVs, smart phones, computers, iPad, and DVD players cost...on a one time basis, that's three weeks more if you're starting from scratch.

Consumer Filters: About Price



Average Hourly Wage (Non Farm) \$23.09 for 41 Hours Week per HHLD

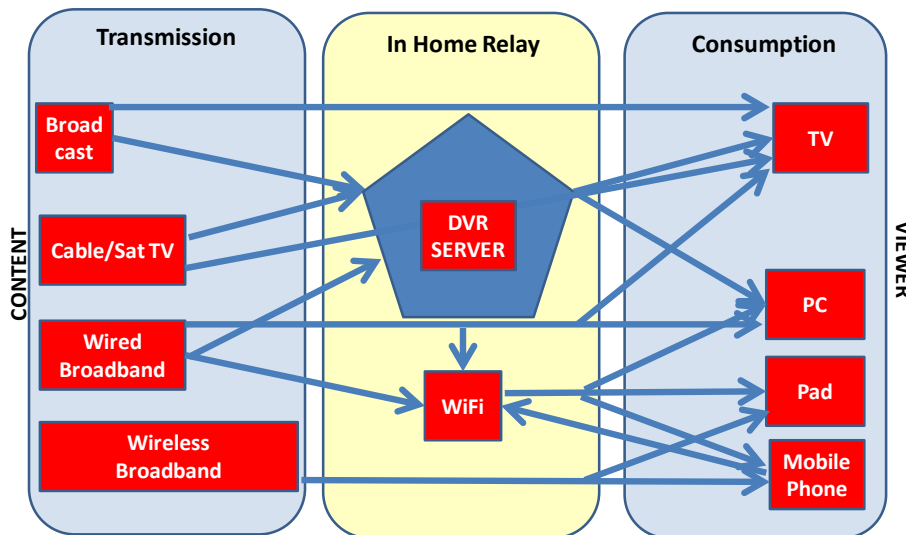
	Cost/mo	Hours/Yr	Days Yr @ 8
Cable TV Video/Mo	\$65	34	4.2
Broadband Fixed	\$55	29	3.6
Landline	\$35	18	2.3
Cell 1 Line	\$50	26	3.2
Cell 2nd Line	\$10	5	0.6
Cell Data Line 1	\$50	26	3.2
Cell Data Line 2	\$20	10	1.3
Netflix	\$8	4	0.5
Total Commo, Data, Video & Voice	\$293	152	19.0

Source: BLS 9/2011, Wolzien LLC

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Is there any reason to question that consumers will continue to arbitrage, and that they will try to find the least expensive, most adequate means of satisfying their entertainment and

Consumer Will Find Lowest Cost Route



communications needs? And that means they will be looking at what comes into their home...and how it is distributed within the household...to arrive at the optimum efficiency. This slide shows the options, and the question is which boxes and lines will be dropped the consumer will find more value both now, and if data usage caps become prevalent.

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Convenience: Convenience is the final leg of this triangle. Is content available at the desired viewing time, at the location where you are, and on the device that you have? And, if you don't finish your consumption on one device, can you complete it on another at a different time and location without losing your place?

That brings us to War and Peace. Yes. I'm holding a three volumes edition of the Tolstoy classic: 537,287 words on 1615 pages. Not quite conducive to reading whenever and wherever you are...in line at the station, by the pool, in bed with the light out, wherever.

WAR & PEACE IN THE DIGITAL AGE

CONVENIENCE

Let us consider

Access whenever & wherever you want it

537,287 Words
1615 Pages
Three Volumes

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Format Lessons From War & Peace

	Book	iPad	Kindle	Phone
Content Cost	\$30	\$0	\$0	\$0
Weight (pounds)	4.3	1.3	0.6	0.4
Words	587,287	587,287	587,287	587,287
Pages	1615	3,263	4,195	7,341
Words per Page	364	180	140	80
Cost per Page	\$0.02	Zero	Zero	Zero
Weight per Page	0.003	0.0004	0.0001	0.00005
Intimidates your Friends	YES	NO	NO	NO

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I'm enjoying reading War and Peace on the iPad, where it runs some 3263 pages when legible type is used, on my Kindle at 4195 legible pages, and on my Android phone...that's the one the marketing pundit says I'm in love with but the neuroscientists say I'm not...at a mere 7341 pages. Now, the key is the devices are *interchangeable*, so I can read anywhere I like, and never lose my place. Most surprisingly, was when I found myself in the long taxi line at Union Station in DC reading War and Piece on my phone, paragraph by paragraph. And it worked.

So why am I talking about this? Because the ability to swap devices without taking a beat on the content is what I, as a consumer, am now expecting with text. For me, that's thanks to Amazon and Kindle. And because of that capability with text, I now also expect the same thing to happen with video. Anywhere, any device...best most convenient screen...all without losing my place. Start watching the live transmission on the big screen, move to iPad at the diner, then to the phone on the train or while waiting to pick up the kids at soccer.

Format Lessons From War & Peace

Take Away:
TEXT INTEROPERABILITY IS
CONDITIONING US FOR
VIDEO

1. Convenience counts first, not the quality.
2. Video rights and platforms will need to pick up pace.
(DLNA, ULTRAVIOLET, etc.)

iPad Kindle Phone

Interoperability

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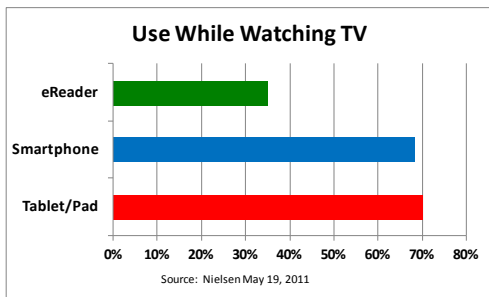
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know the significance, but it's pretty clear that a trailer in a Vegas parking lot does not instill confidence that the industry is playing as one team for the consumer. And that, I think, is to the industry's detriment.

IV. Integrating the Four Screens.

You'll remember the slide showing Google searches on tablets and mobiles in prime time, where I suggested multitasking. And then there's this study from Nielsen showing how Smartphones and Tablet/Pads have 70% usage while people are watching TV. So this raises the question for content producers, consumer electronics folks, and distribution players—should the four screens always be separate...or should they become part of an integrated consumer experience?

Pads, Phones & TV's Are Couch Buddies



Many smart phones and pads have aps now to replace the remote control. This would seem to be a no brainer, so long as they are easy to use.

Third is a light relationship between TV content and content on the other screens. For example, talent or lower third supers suggest that TV viewers should check out a specific web site. This can drive online usage, or give a platform for commerce. On the other side, web and social sites are used to encourage TV viewership. All very loose and difficult to track results.

Finally, is design of a completely coordinated multiscreen experience. Either through synchronous programming of the TV and at least one other screen during the same show—whether live transmission or delayed. Or though a trigger embedded in a TV signal that lets the TV viewer go directly to a web or social site to sync up with content directly related to the current program or commercial. Now

At CES Digital Living Network Alliance Relegated to Parking Lot



While all the other standards organizations found homes on the convention floor.... DLNA* was relegated to a temporary trailer in the parking lot.

Significance unclear.

*Consortium of most major manufacturers EXCEPT Apple.

Seems to me, there are four choices to apply at different times.

First, operating on a totally unrelated basis.

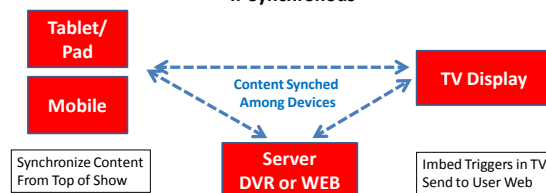
Content is presented and consumers use content on different screens without regard for what's on any other screen. If two screens are on at the same time, the content is unrelated. Even TV Everywhere from the cable industry is about using separate screens as separate display devices for the same content. Effectively this is just another TV in a different form factor.

Second is use of one screen to control another.

Are They Multiple, but Separate Screens, OR Is It an Integrated Consumer Experience?

OPTIONS

1. Not Related
2. Control
3. Related
4. Synchronous



these approaches have been around for years—my original patent on embedded triggers was filed in 1996 and granted in 1998—but a convenient second screen used by a large portion of the audience has always been the limiting factor. Wide availability and multitasking with pads and mobiles would seem to have removed that limiting factor.

I think of a synchronous approach to multiple screens as being similar to 80 years ago when sound was synched with film....and it has been the norm ever since.

So how might this be used? Shows can be designed to push people back and forth between screens, resulting in access to increased content and marketing messages on the web side, and reducing skip on the TV side. Commercials can motivate consumer responses, and eventually be paid for accordingly.

And the MMOG Massive Multiplayer Online Game, could become the MMMOG, or the Massive Multiplayer Multiscreen Online Game. I guess I'd call that Triple-MOG. For example, consider World of Warcraft or Farmville being run not just on your web-linked screen...but your output and that of other players being pulled up on the TV, along with national play by play commentary by the Triple-MOG announcers... just like football. Eventually it may evolve into team-based play with national championships. If I were a predicting person, I'd predict that within a few years this will become the programming for at least some TV channels in the Friday and Saturday night dead zones. And that integration will benefit everyone—content owners, distributors, transporters, device makers, and hardware and server-farm makers and operators.

**Are They Multiple, but Separate Screens,
OR Is It an Integrated Consumer Experience?**

Triple-MOG Massive Multiscreen Multiplayer Online Games

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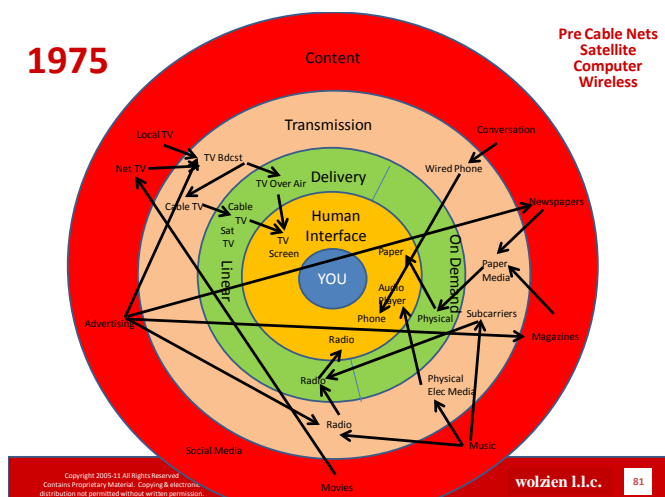
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Whether play by play Triple-MOG comes to pass or not, the point is that more screens means more options for creative use, and the integration of those screens multiplies all the options of content for one screen across multiple screens, exponentially increasing the number of creative options that we've seen to date.

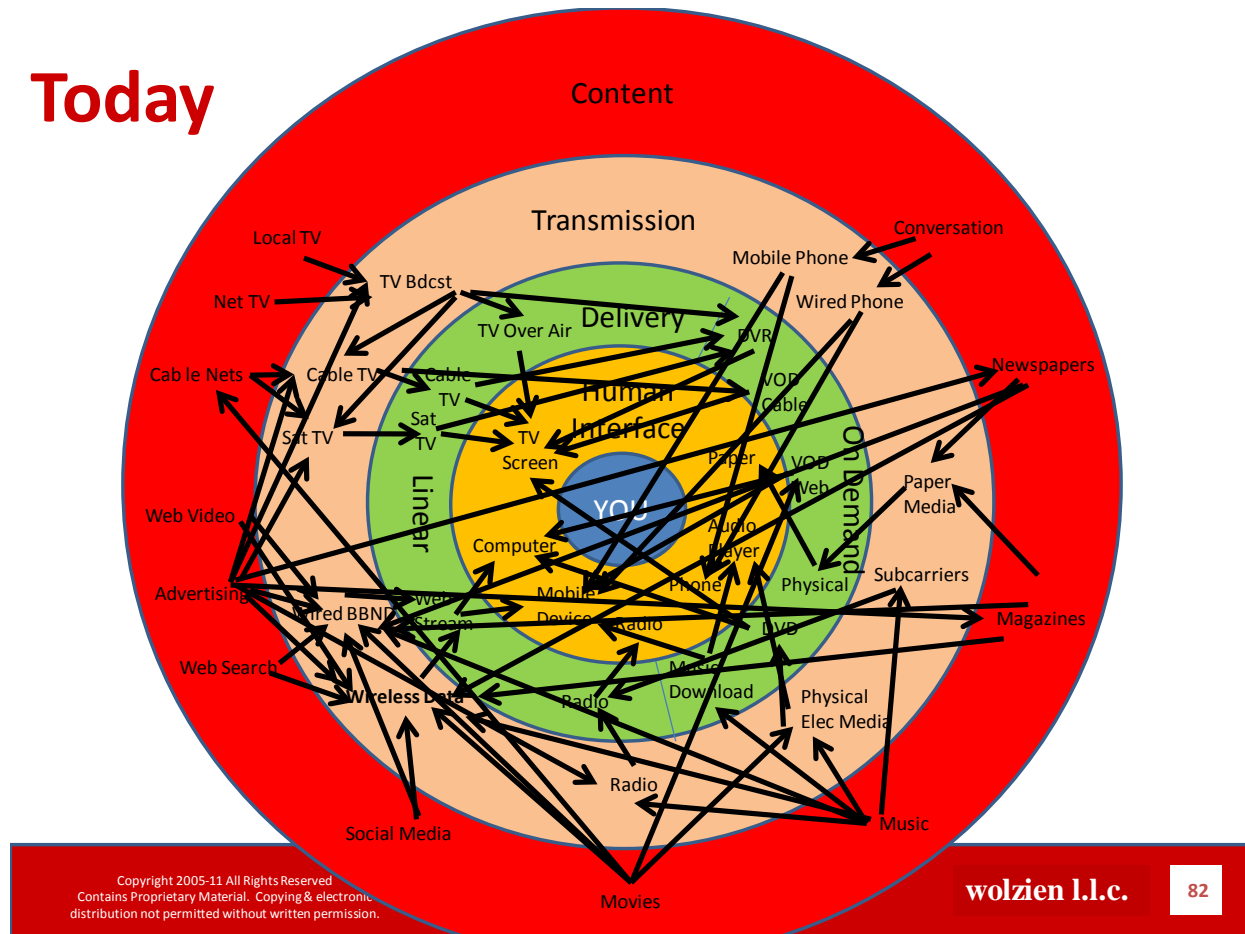
V. Summary

So that's the opportunity, using the multiples of human interfaces to reach you, and then delivery methods, and transmission methods, all to bring various forms of content .



Back before the computer and wide spread cable TV, back 35 years ago in 1975, life was much simpler.

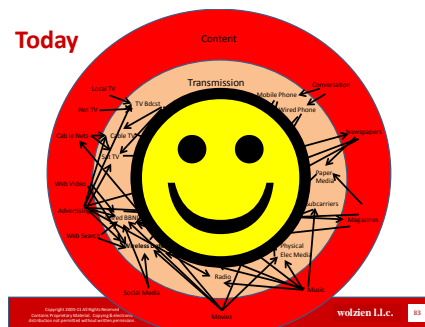
Today



But with the explosion of devices, distribution and transport, here's the picture of today's challenges...and opportunities you'll be grappling with during your sessions here at Google.

And looking at that mess, all I can say is good luck, and with just a touch of sarcasm... "have a nice day."

Thank you very much.



[Note: All numbers are from or derived from publicly available reports and sources except where indicated as being made available by Google for this presentation, or from proprietary data provided by TiVo. None of the comments or conclusions are intended to represent the views of clients of Wolzien LLC. Wolzien LLC does not comment on public equities and does not provide “sell-side” research.]

About Tom Wolzien & Wolzien LLC

Tom Wolzien has spent four-decades in line operations, executive management, and Wall Street analysis of the media and communications industries. Since 2005 through Wolzien LLC, he has provided industrial analysis and strategic services to Discovery Communications, Warner Bros., Microsoft, McGraw Hill, Cable Television Laboratories, the Directors Guild of America, and others.

As the high profile media analyst for Sanford C. Bernstein & Co for 14 years, Wolzien was known for his ground breaking research into the impact of industrial trends such as cable modems and the use of the internet as a video program delivery system bypassing cable. Wolzien spent 16 years at NBC in production and senior management of NBC News, and in corporate business development where he was part of the team that started CNBC.

Wolzien began his career as a reporter, photographer, and producer at local television stations in the Midwest owned by CBS, Time-Life, and McGraw-Hill. After graduating from the University of Denver in 1969 and completing Army Officer Candidate School, he served in Vietnam as officer in charge of an Army combat photography unit.

Wolzien is an active inventor. He was awarded multiple patents which are foundational in the interactive media area linking television and the internet (since sold), and received his latest patent for an automated process to maximize the value of media assets in secondary markets.

He is a member of the Board of Directors of TiVo, Inc., and was elected Lead Independent Director by the company's Board in 2010.

More details are available at www.wolzien.com